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LONDON CITY AIRPORT

2022 REVIEW OF NOISE MONITORING AND MITIGATION STRATEGY (NOMMS)

Report to

London City Airport
City Aviation House
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1.0 INTRODUCTION

The City Airport Development Programme (CADP1) planning application (13/01228/FUL) was granted planning permission ('the CADP1 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.

Planning Condition 31 of the CADP1 permission required a Noise Management and Mitigation Strategy (NOMMS) to be submitted to the Local Planning Authority (LPA), the London Borough of Newham (LBN), prior to the commencement of development. The condition also requires the approved NOMMS to be reviewed not later than the 5th year after approval and every 5th year thereafter. The reviews are to be submitted to the LPA within 3 months of such review dates for approval and are to be implemented as approved.

This report details the 2022 review of the NOMMS. It is proposed that once the dialogue with the LPA has concluded, the existing NOMMS document will be updated to reflect that it has now been in operation for 5 years, so the elements previously listed as new are no longer so. The references to the scheme which NOMMS superseded will also be removed as they are no longer relevant.

2.0 CURRENT NOMMS

The Noise Management and Mitigation Strategy (NOMMS) was approved by London Borough of Newham (LBN) in May 2017.

In March 2019 the Airport resubmitted details to reflect:

i. A change to the penalty limits within the Incentives and Penalties Scheme (IPS) to reflect the outcome of the 12-month review process with LBN; and

ii. A change to the wording of the Sound Insulation Scheme (SIS) to reflect some minor amendments agreed in principle with LBN officers. The revised wording clarified the temporary measures that are available in exceptional circumstances where SIS works have been accepted but not yet delivered.

The resulting current NOMMS document dated March 2019 is included as Appendix 1.

2.1 Scope, Aim and Purpose

2.1.1 Scope

The scope of NOMMS is detailed in Condition 31 which states that:

Prior to the Commencement of Development a Noise Management and Mitigation Strategy (NOMMS) shall be submitted to the Local Planning Authority for approval in writing.

The NOMMS shall be implemented as approved and thereafter the Airport shall only operate in accordance with the approved NOMMS.

Following implementation of the approved NOMMS, a report shall be submitted to the Local Planning Authority annually on 1 June (or the first working day thereafter) as part of the Annual Performance Report on the performance and compliance with the approved NOMMS during the previous 12 month period.

The approved NOMMS shall be reviewed not later than the 5th year after approval and every 5th year thereafter. The reviews shall be submitted to the Local Planning Authority within 3 months of such review dates for approval, and implemented as so approved.

The NOMMS shall include, but not be limited to:

- *Combined Noise and Track Monitoring System*
- *Quiet Operating Procedures*
- *Penalties and Incentives*
- *Control of Ground Noise*

- *Airport Consultative Committee*
- *Annual Noise Contours*
- *Integrity of NOMMS*
- *Auxiliary Power Units*
- *Reverse Thrust and*
- *Sound Insulation Scheme*

2.1.2 Aim

Section 3.1 of the NOMMS states that:

The aim of the NOMMS is to set out 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:

- *Aircraft departure noise;*
- *Aircraft arrival noise; and*
- *Ground based aircraft related sources of noise.*

The NOMMS will also deal with the recording and monitoring of track keeping information of aircraft using the airport.

2.1.3 Purpose

Section 3.3 of the NOMMS states that:

The purpose of the CADP1 NOMMS is to:

1. Appropriately record relevant noise and track keeping data at the airport on a continuous basis as far as reasonably possible;

2. Use reasonable endeavours to prevent the loss of noise monitoring data collection either through the failure of noise monitoring equipment or due to external influences such as construction locally of new development or other noise-reflective surfaces;

3. Ensure on-going maintenance of the noise and track-keeping system;

4. Adequately maintain the integrity of such data for the purposes of categorisation and management;

5. Analyse and report such data to LBN and other parties as agreed between LBN and LCA from time to time;

6. Present relevant data in regular meetings and undertake consultation with the Airport Consultative Committee and such other statutory body or bodies as may be reasonably nominated by LBN;

7. Record track-keeping information and identify any deviations from standard routes that should be followed by aircraft;

8. Undertake annual Aircraft Categorisation Reviews;

9. Provide data for noise contour validation purposes;

10. Introduce mitigation measures and incentives to encourage the quiet operation of aircraft by airline operators;

11. Manage, mitigate and monitor aircraft related noise sources on the ground;

12. Administer and implement the airport's sound insulation scheme; and

13. Ensure that new planning and construction of new Developments in the vicinity of the airport are in conformance with the necessary planning guidelines regarding the quality of sound insulation utilised in their construction.

2.2 Operation

The current NOMMS has been in operation since it was approved in 2017. During this time, and despite the challenges of the Covid-19 pandemic, it has performed as intended with the activity at the airport being continually monitored, which has demonstrated compliance with the planning obligations, and mitigation measures being provided and developed further.

This has included:

- Producing a record of relevant noise and track keeping data at the airport on a continuous basis;
- Keeping the loss of noise monitoring data collection to a minimum;
- Ensuring on-going maintenance of the noise and track-keeping system;
- Maintaining the integrity of noise and track data for the purposes of categorisation and management;
- Analysing and reporting noise and track-keeping data to LBN on a quarterly basis;
- Presenting relevant data in regular meetings and undertaking consultation with the London City Airport Consultative Committee (LCACC) and such other statutory body or bodies as are reasonably nominated by LBN;

- Recording track-keeping information and identifying any deviations from the standard routes that should be followed by aircraft;
- Undertaking annual Aircraft Categorisation Reviews, until these were superseded by the Aircraft Noise Categorisation Scheme (ANCS);
- Providing data for noise contour validation purposes;
- Maintaining and developing mitigation measures and incentives to encourage the quiet operation of aircraft by airline operators;
- Managing, mitigating and monitoring aircraft related noise sources on the ground;
- Administering and implementing the airport's sound insulation scheme; and
- Monitoring and commenting on the planning and construction of new developments in the vicinity of the airport with the intention of ensuring they are in conformance with the necessary planning guidelines regarding the quality of sound insulation utilised in their construction.

3.0 EXISTING CONTROLS AND MITIGATION

There are many controls and mitigation measures related to noise that are in place at the airport, which are defined in various documents, such as planning permissions, Section 106 agreements, the NOMMS, or other documents such as the Aircraft Noise Categorisation Scheme (ANCS) or other strategy documents.

When the NOMMS was written, many of the other documents had not yet been approved, and therefore the NOMMS contains a number of details and controls which are now repeated elsewhere.

It is recommended that where controls are defined elsewhere, the NOMMS will be updated to refer to the other location of the control, with a summary retained in the NOMMS where this is considered to be useful.

A summary of the current operational noise controls (i.e. not those related to construction noise) and which document(s) they are derived from are listed in Appendix 2.

4.0 NOMMS IMPLEMENTATION GUIDELINES

As detailed in Section 2.2, the current NOMMS has a successful track record suggesting that no significant changes to it are required at this review.

It is also noted that there have not been any significant changes to Government policy in the last few years. Although the *Aviation 2050 – the future of UK aviation* consultation[1] has now concluded, the resulting updates to aviation policy are awaited.

Given the above, this review considers the details of the current NOMMS, which are set out in Appendices A to J of that document, in the following sections.

4.1 Appendix A: Combined Noise and Track Monitoring System

Since the implementation of NOMMS in 2017, the Noise and Track Keeping (NTK) system has comprised NMTs 1-6 which are in fixed locations and measure the noise of airborne aircraft, and NMT 7 which is a mobile NMT but since 2017 has been situated close to Building 1000 and used to measure aircraft noise on the ground.

The system can be supplemented by further mobile monitors, either owned by the airport or provided by external consultants, that can be used as required to monitor noise in the community or stand in for one of the other monitors in the event of a fault.

The key functions of this system are listed in the NOMMS Appendix A. These are discussed in turn in the following sections.

4.1.1 Identify any deviations from standard routes that should be followed by aircraft

LCA do not currently operate noise preferential routes such as those that are in place at some other airports. In the absence of an agreed swathe to assess against, to date (since Q2 of 2018) analysis has been carried out on the tracks flown to identify any aircraft which appear to be 'off track', based on whether they go through a 'gate' which has been set up in the NTK system for each route.

The number of flights identified as being 'off track' is given in Table 1 below.

[1] https://www.gov.uk/government/consultations/aviation-2050-the-future-of-uk-aviation

Year	Number of flights 'off track'	Total Departures	Percentage 'on track'
2018 (Q2-Q4)	8	30,778	100.0%
2019	10	41,992	100.0%
2020	0	9,694	100.0%
2021	7	7,219	99.9%

Table 1: 'Off Track' Flights, 2018-2021

The NOMMS section C.4 states that:

> *"The purpose of the monitoring of flight tracks within the standard route will be to identify those 'off track' departures with the aim of working towards achieving at least 95% of all departures within an agreed route."*

The data presented above shows that only 25 out of 89,683 departures have been identified as 'off track', which implies that over 99.9% of departures have been 'on track'. Therefore the target of 95% is currently being achieved.

This implies that track keeping is not currently a significant noise issue at the Airport, which is further supported by that fact that there have only been two complaints received by the airport relating to aircraft being off track in the last 5 years.

If 'corridors' for the standard routes were agreed and implemented, then the existing NTK system could be used to assess whether aircraft are complying with them. However, these would potentially need to be revised with any airspace change, and as noted above track keeping is not currently a significant noise issue at the Airport.

It is therefore proposed to remove the requirement to report airline/aircraft performance with respect to track-keeping from the NOMMS (Section A.8 iii, Section C.2.7) and the requirement to maintain a log of 'off track' departures (Section C.4). The airport will however continue to present the track plots in the quarterly and annual reports. If these, or a sudden influx of related complaints, suggest 'off track' flights has become an issue, the analysis undertaken to date will recommence.

4.1.2 Monitor for noise categorisation purposes following implementation of the Aircraft Categorisation Review and the introduction of the Aircraft Noise Categorisation Scheme, in compliance with Condition 18 of CADP1

The NTK system provides sufficient data for determining the Quota Count (QC) classification of arriving propeller aircraft under the Aircraft Noise Categorisation Scheme (ANCS), which has

now been introduced. Data was previously used in Aircraft Categorisation Reviews, which are now superseded.

4.1.3 Provide data for noise contour validation purposes to produce noise contours for the Sound Insulation Scheme and to check compliance with Condition 33 regarding the size of the contour area

The NTK system provides sufficient data for noise contour validation purposes, to ensure that the noise contours produced are based on real-world measurements taken at LCA. The latest review was submitted in 2019[2], and another will be submitted in 2022.

4.1.4 Provide data on ground based sources of noise

NMT 7 has been situated close to Building 1000 since 2017 and is used to measure aircraft noise on the ground. Further mobile monitors can also be made available to measure ground noise as and when the need arises.

In addition to the NTK system, attended measurements of ground noise are also undertaken as and when required, for example to check the noise levels generated during high power ground runs. This was last undertaken in 2020 and is due to be repeated in 2023 in accordance with the Ground Running Noise Limit Strategy.

4.1.5 Record noise levels produced during aircraft departures and arrivals

Since the implementation of the NOMMS, NMTs 1-6 have consistently measured the large majority of aircraft operating at the Airport, as shown in Table 2.

Year	Correlation Rate		
	NMTs 1-4 (Sideline)	NMTs 5-6 (Flyover)	NMTs 5-6 (Approach)
2017	95%	92%	92%
2018	95%	94%	94%
2019	93%	93%	94%
2020	89%	89%	90%
2021	95%	95%	95%

Table 2: NMT Correlation Rates, 2017-2021

[2] A1125_03_RP002_1.0 Validation Update 2019, dated 29 August 2019

The current requirement in the NOMMS (Section A3.1) is for 80% of departures to be correlated when averaged over a 12 month period. This requirement was based on the previous system which only included NMTs 1-4 and did not reliably correlate arrivals. It is recommended that this requirement is extended to also include arrivals. The results above show that this is currently being achieved.

4.1.6 Ensure appropriate access to data by the Council

Data from the system is provided to the Council by the Airport in response to requests, in addition to through the regular reporting requirements. The Council also have independent access to the NTK system.

4.1.7 Provide data to investigate environmental related complaints

As required data from the system is used to investigate environmental complaints. Given the high level of correlation, this has been found satisfactory. The process has also been supplemented by noise surveys conducted at more distant locations from the airport such as in the grounds of the Catholic Parish of Corpus Christi, Lowshoe Lane, Romford, and in Pintail Close in Beckton.

4.2 Appendix B: Quiet Operating Procedures

The Airport requires that every operator of aircraft adopts procedures which produce the least noise disturbance compatible with safe operation. Where aircraft manufacturers have established special procedures for the purposes of reducing noise, these are applied to operations at London City Airport, subject always to the safe operation of aircraft.

Quiet operating procedures at London City Airport include the following:-

- Minimum use of reverse thrust
- Use of fixed electrical ground power or battery-powered mobile ground power units
- Minimum use of auxiliary power units
- Operation of a steep glide slope (5.5 degrees)

Several of these procedures are now covered in separate approved strategies that are reviewed independently of the NOMMS itself. The review will reflect and refer to these approved documents where applicable.

4.3 Appendix C: Incentives and Penalties Scheme (IPS)

The IPS is reviewed annually, with the review considering amongst other matters, the efficacy of the noise limits and threshold values, the suitability of the financial penalty, and the effectiveness of the noise threshold system as a component of the LCA NOMMS scheme.

Given the IPS is separately reviewed the finer details of it have been excluded from this review of the NOMMS scheme. It is however confirmed that the IPS should continue to be part of NOMMS and feature regular reviews.

Currently reviews of the IPS are required on an annual basis, and so are more frequent than many of the reviews of other Airport controls. The IPS is now well established and the recent reviews have found that none of the points considered by the review, in particular noise levels of regularly-operating aircraft, tend to vary significantly year-on-year. Consequently the recent reviews have not suggested any changes.

It therefore seems unnecessary to continue to review the scheme annually, and it is recommended that after 2022, the reviews are carried out as part of the review of the NOMMS, i.e. at least every 5 years.

4.4 Appendix D: Control of Ground Noise

The Airport seeks to ensure as far as reasonably practicable that every aircraft operator adopts the operating practice which generates the least amount of noise from aircraft taxiing, manoeuvring or holding on stand, at the runway, and prior to take off, subject to the requirement of ensuring the safe operation of the aircraft at all times.

As part of this the airport have in place a number of measures which are described in the NOMMS. These now largely replicate information or controls which are contained within Conditions 44 to 55 and their related strategies.

When the NOMMS was originally written, many of the strategies required by the conditions were not yet in place. However, they have now all been approved by LBN and implemented.

Where requirements are duplicated, this has the potential to create inconsistency when documents are updated. It is recommended that the control of ground noise section of NOMMS be revised to remove duplication where possible, and otherwise ensure that the wording makes it clear that the document being referenced defines the requirement and the NOMMS is just summarising it.

4.5 Appendix E: Airport Consultative Committee

The London City Airport Consultative Committee (LCACC) has been meeting regularly, with the airport providing a report, on such matters as the Environment and Community Relations Activity, prior to each occasion. These reports have provided sufficient information for the committee and so no changes are proposed at this review.

4.6 Appendix F: Annual Noise Contours

Annual noise contours are prepared for the airport and are used to demonstrate compliance with the noise contour area limit (CADP Condition 33), to assess the eligibility of both dwellings and public buildings under the sound insulation scheme, and to assist the local authority in ensuring appropriate planning conditions are imposed on new development within the Airport noise contours.

No changes to the noise contours produced are proposed, however the methodology will be updated to reflect the change from using the Federal Aviation Authorities Integrated Noise Model Version 7.0 to their Aviation Environmental Design Tool (AEDT) which replaced it. This update was set out in the London City Airport Air Noise Contour Validation 2019 Assessment which was reported to the LBN. That formed one of the required checks that the noise levels of aircraft on departure and arrival are in keeping with those predicted using software used for the noise contour methodology. The 2022 check will be issued to LBN later this year.

4.7 Appendix G: Integrity of NOMMS

The reliability and accuracy of the noise and track monitoring system is an integral element of the NOMMS. In order to ensure that this is maintained LCA need to be consulted by the relevant local planning authorities on any proposed development that might affect the operation of the monitors. The Airport are notified for safeguarding purposes of planning applications in the vicinity. These are reviewed and any proposals that have the potential to impact the monitors would be escalated.

To date, as illustrated by the high rate of correlation of noise events to movement given in Section 3.1.5, and sufficient data for all the purposes identified being provided, the noise and track monitoring system is performing reliably. No change to this element of the NOMMS is therefore proposed at this review.

4.8 Appendix H: Auxiliary Power Units

An Auxiliary Power Unit Strategy was submitted to LBN in 2020 and, following approval, has been implemented in compliance with CADP1 Condition 47. The strategy includes provision of

details of the position, orientation and use of aircraft before and after landing and taking off including conditioning of the cabin and equipment.

As part of the Annual Performance Report, a report is submitted containing details of the use of Auxiliary Power Units at the airport in the previous calendar year.

Given the presence of an approved dedicated strategy which has been implemented, and regular reporting, it is proposed to update Appendix H of the NOMMS to refer to this strategy.

4.9 Appendix I: Reverse Thrust

The use of reverse thrust on the landing roll is kept to the minimum required for the necessary deceleration of the aircraft and within the limits of the airline's standard operating procedures.

In compliance with a requirement of the CADP1 planning permission any instance of unusual or excessive use of thrust reversers is investigated by the airport. This refers to noise data collected at NMT 7, which has been installed for this purpose and records the noise events triggered by arriving aircraft. These are then correlated with the aircraft movement data.

In 2018, BAP carried out a review of the NMT 7 data collected for a 12 month period in order to determine a suitable noise threshold above which events will be investigated. This was defined as 88 dB L_{ASmax} for runway 09 arrivals and 90 dB L_{ASmax} for runway 27 arrivals.

Where either of these levels are exceeded by the noise event from an arriving aircraft the airport contacts the airline and seeks an explanation in order to minimise future occurrences. This is reported in the Quarterly Noise Reports.

4.10 Appendix J: Sound Insulation Scheme

The Sound Insulation Scheme at the airport is defined in the Section 106 agreement. The details are repeated in the NOMMS appendix with further details on how the scheme operates in practice.

There has been no change to the Section 106 agreement, and the implementation of the scheme has been proceeding, despite the complication of the Covid pandemic. No changes are therefore proposed at this review.

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for Bickerdike Allen Partners LLP

David Charles
Partner

APPENDIX 1
Current NOMMS

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City Airport Development Programme (CADP1)

Condition 31: NOISE MANAGEMENT AND MITIGATION STRATEGY (NOMMS)

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1.0 INTRODUCTION

1.1 General

1.1.1 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.

1.1.2 The definitions within the CADP1 planning consent define the NOMMS as the strategy that monitors and manages the noise impact of London City Airport (LCA) operations, to be approved under Condition 31 and to replace the Noise Management Scheme dated December 2009 currently in place at the airport.

1.1.3 This report, together with the NOMMS Implementation Guidelines, is submitted to satisfy the requirements of Condition 31 and includes the strategy relating to noise management and mitigation set out in Section 3.0 below.

1.1.4 Condition 31 states that:

Prior to the Commencement of Development a Noise Management and Mitigation Strategy (NOMMS) shall be submitted to the Local Planning Authority for approval in writing.

The NOMMS shall be implemented as approved and thereafter the Airport shall only operate in accordance with the approved NOMMS.

Following implementation of the approved NOMMS, a report shall be submitted to the Local Planning Authority annually on 1 June (or the first working day thereafter) as part of the Annual Performance Report on the performance and compliance with the approved NOMMS during the previous 12 month period.

The approved NOMMS shall be reviewed not later than the 5th year after approval and every 5th year thereafter. The reviews shall be submitted to the Local Planning Authority within 3 months of such review dates for approval, and implemented as so approved.

The NOMMS shall include, but not be limited to:

- *Combined Noise and Track Monitoring System*
- *Quiet Operating Procedures*
- *Penalties and Incentives*

- *Control of Ground Noise*
- *Airport Consultative Committee*
- *Annual Noise Contours*
- *Integrity of NOMMS*
- *Auxiliary Power Units*
- *Reverse Thrust and*
- *Sound Insulation Scheme*

1.1.5 The above requirements are addressed in the Implementation Guidelines included as part of this report. Each requirement is addressed within an appendix as described in Section 3.5.3 below.

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2.0 PREVIOUS NOISE MANAGEMENT AND MONITORING PROVISIONS UNDER 2009 SECTION 106 AGREEMENT

2.1.1 The Airport has operated a four point noise monitoring system since 1991. The noise and flight track monitoring system is used to measure the noise as an aircraft departs from the Airport.

2.1.2 The Noise Management Scheme under 2009 S106 Agreement includes a range of noise control measures that have been in place at the Airport for many years, developed as part of the planning permission of 1992 when turbofan aircraft were first introduced at LCA. The Noise Monitoring System was introduced at the same time to monitor departure noise and to assist in the categorisation of aircraft and management of aircraft noise.

2.1.3 It was a requirement under Part 10, Fourth Schedule, of the Section 106 Agreement dated 9th July 2009 between London City Airport (LCA) and the London Borough of Newham (LBN) that LCA submit a draft NOMMS for the written approval of LBN.

2.1.4 NOMMS is defined in the 2009 Section 106 Agreement as:

A noise monitoring and mitigation strategy as more particularly defined at Part 9 of the Ninth Schedule which is intended to improve and replace both the Noise Management Scheme and the Noise Monitoring System to provide a more robust system of noise monitoring and mitigation including the measurement and monitoring of ground based sources of noise as well as airborne noise and/or other measures agreed between the Airport Companies and the Council from time to time.

2.1.5 LCA submitted a draft NOMMS strategy to the LBN on 9th October 2009 with a final version submitted on 10th February 2010. LCA also issued a draft set of Implementation Guidelines addressing the requirements set out in Part 9, Ninth Schedule, of the Section 106 Agreement. LBN approved the NOMMS in February 2010 subject to the details of the Implementation Guidelines being submitted and agreed. These have been subject to technical discussions between LCA and LBN since and include:

- a combined noise and track keeping monitoring system to:
  - identify track deviations,
  - perform noise categorisation functions,

- collect noise data for contour validation purposes and on ground based noise sources;

- a strategy to prevent the loss of noise monitoring data collection;
- a scheme to encourage airline operators to use quiet operating procedures;
- a system of incentives and penalties for airlines;
- minimising noise disturbance from aircraft ground operations or the running of engines for maintenance purposes;
- regular meetings and consultation with the Airport Consultative Committee and such other relevant bodies nominated by the Council;
- procedures to calculate air noise contours;
- measures to maintain the integrity of the NOMMS;
- maintenance of the existing glide slope (5.5 degrees);
- limiting use of Auxiliary Power Units before departure and after landing;
- encouraging minimum use of reverse thrust on landing.

2.1.6 In accordance with Part 7 of the Fourth Schedule to the 2009 Section 106 Agreement, the Airport has continued to operate the Noise Management Scheme and the Noise Monitoring System until the NOMMS is fully implemented and to ensure that the equipment for the combined noise monitoring and track keeping system is properly maintained at all times. This has been achieved through the implementation of the Temporary Noise Monitoring Strategy required under Part 11, Fourth Schedule, of the 2009 Section 106 Agreement.

2.1.7 The Noise Management Scheme and Noise Monitoring System under 2009 S106 Agreement include measures to control:

- the use of auxiliary power units (APUs);
- mobile ground power units (GPUs);
- aircraft engine test runs;
- the logging of aircraft movements and the reporting of measured noise levels to meetings of the London City Airport Consultative Committee (LCACC).

2.1.8 The NOMMS required under Condition 31 of the CADP1 permission is substantially similar to that which has been agreed in principle with LBN Officers under the 2009 Section 106 Agreement.

2.1.9 In parallel with this submission the Airport will be utilising the NOMMS Implementation Guidelines developed for CADP1 to discharge the remaining requirements of Part 10 of the Fourth Schedule to the 2009 Section 106 Agreement so that the NOMMS would still become fully operational even in the unlikely event that CADP1 is delayed or not implemented.

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3.0 CADP1 NOMMS STRATEGY

3.1 Aim of CADP1 NOMMS

3.1.1 The aim of the NOMMS is to set out 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:

- Aircraft departure noise;
- Aircraft arrival noise; and
- Ground based aircraft related sources of noise.

3.1.2 The NOMMS will also deal with the recording and monitoring of track keeping information of aircraft using the airport.

3.1.3 The planning conditions relevant to noise control and mitigation at the airport form part of the CADP1 permission and are listed in the CADP1 NOMMS Implementation Guidelines appended to this document (Appendix K). These CADP1 planning conditions lay down the rules, so far as noise is concerned, within which the Airport must operate and include requirements concerning the types and number of aircraft that can operate at the Airport and the hours of operation of such aircraft at LCA.

3.1.4 The CADP1 NOMMS will be delivered by the Implementation Guidelines appended to this Strategy. The Guidelines reflect the terms of the CADP1 planning conditions and associated Section 106 Agreement.

3.1.5 The CADP1 Implementation Guidelines retain all of the measures previously submitted to the Council as part of the NOMMS required under the 2009 permission. They have however been expanded to include the enhancements arising out of the mitigation measures and CADP1 planning conditions (listed in Appendix K of the Implementation Guidelines). These include:-

- New penalties and incentives scheme;
- Ground Engine Running Strategy;
- Ground Running Testing and Maintenance Strategy;

- Ground Running Noise Limit;
- Ground Running Annual Performance Report;
- Auxiliary Power Unit Strategy;
- Enhanced Sound Insulation Scheme; and
- Reinspection Scheme.

3.2 CADP1 NOMMS Strategy

3.2.1 The CADP1 NOMMS Strategy is to monitor and manage the noise impact of LCA operations by measures and procedures including, but not limited to:

- Combined Noise and Track Monitoring System;
- Quiet Operating Procedures;
- Penalties and Incentives;
- Control of Ground Noise;
- Airport Consultative Committee;
- Annual Noise Contours;
- Integrity of NOMMS;
- Auxiliary Power Units;
- Reverse Thrust;
- Sound Insulation Scheme.

3.3 Purpose of NOMMS

3.3.1 The purpose of the CADP1 NOMMS is to:

1. Appropriately record relevant noise and track keeping data at the airport on a continuous basis as far as reasonably possible;
2. Use reasonable endeavours to prevent the loss of noise monitoring data collection either through the failure of noise monitoring equipment or due to external influences such as construction locally of new development or other noise-reflective surfaces;
3. Ensure on-going maintenance of the noise and track-keeping system;

4. Adequately maintain the integrity of such data for the purposes of categorisation and management;
5. Analyse and report such data to LBN and other parties as agreed between LBN and LCA from time to time;
6. Present relevant data in regular meetings and undertake consultation with the Airport Consultative Committee and such other statutory body or bodies as may be reasonably nominated by LBN;
7. Record track-keeping information and identify any deviations from standard routes that should be followed by aircraft;
8. Undertake annual Aircraft Categorisation Reviews;
9. Provide data for noise contour validation purposes;
10. Introduce mitigation measures and incentives to encourage the quiet operation of aircraft by airline operators;
11. Manage, mitigate and monitor aircraft related noise sources on the ground;
12. Administer and implement the airport's sound insulation scheme; and
13. Ensure that new planning and construction of new Developments in the vicinity of the airport are in conformance with the necessary planning guidelines regarding the quality of sound insulation utilised in their construction.

3.4 CADP1 NOMMS FURTHER APPORVAL OF DETAILS

3.4.1 The NOMMS was previously approved by the London Borough of Newham (LBN) in May 2017 (ref. 17/01002/AOD). However, the Airport propose to resubmit details in March 2019 to reflect

i. A change to the penalty limits within the Incentives and Penalties Scheme (IPS) (Appendix C) to reflect the outcome of the 12-month review process with LBN; and
ii. A change to the wording of the Sound Insulation Scheme (SIS) (Appendix J) to reflect some minor amendments agreed in principle with officers. The revised wording clarifies the temporary measures that are available in exceptional circumstances where SIS works have been accepted but not yet delivered.

3.5 CADP1 NOMMS Implementation Guidelines

3.5.1 The CADP1 NOMMS will be delivered by the Implementation Guidelines that form the appendices to this Strategy.

3.5.2 As noted in Section 2 above, the NOMMS required by condition 31 of the CADP1 permission is substantially similar to under the 2009 permission. There are a number of enhancements in the Implementation Guidelines over and above the current Noise Management Scheme (NMS), although many are retained. To assist the reader, where enhancements from the existing NMS are included in the Implementation Guidelines, the text has been coloured in blue to distinguish it. In addition, further enhancements are now included in the CADP1 NOMMS either as a result of mitigation measures in the CADP1 UES or as required by the CADP1 planning conditions;

these enhancements are differentiated by emboldened italics and will only come into effect once the CADP1 permission is implemented. In the unlikely event that CADP1 is not implemented, the measures in emboldened italics will not apply to the Implementation Guidelines

3.5.3 The Implementation Guidelines are included in the appendices as follows:

Appendix A:	Combined Noise and Track Monitoring System
Appendix B:	Quiet Operating Procedures
Appendix C:	Incentives and Penalties Scheme
Appendix D:	Control of Ground Noise
Appendix E:	Airport Consultative Committee
Appendix F:	Annual Noise Contours
Appendix G:	Integrity of NOMMS
Appendix H:	Auxiliary Power Units
Appendix I	Reverse Thrust
Appendix J:	Sound Insulation Scheme
Appendix K:	Relevant Planning Conditions (Extracts)

NOMMS

IMPLEMENTATION GUIDELINES

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The blue text in this document identifies those elements of the NOMMS that are enhancements over the monitoring and mitigation measures provided under the airport's current Noise Management Scheme.

The *text in **emboldened blue italics*** in this document identifies those elements of the NOMMS that would ONLY apply under the CADP1 application, that is, those that are additional to the NOMMS requirements under the 2009 planning permission. These will only take effect once CADP1 is implemented.

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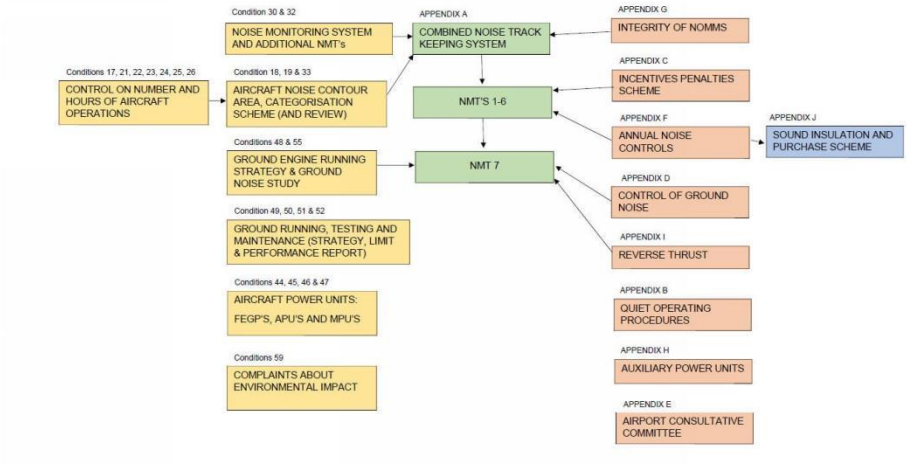
NOISE MANAGEMENT AND MITIGATION STRATEGY (NOMMS – CONDITION 31)

SCHEMATIC LAYOUT OF NOMMS IMPLEMENTATION GUIDELINES AND ASSOCIATED PLANNING CONDITIONS



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Preface

These appendices together constitute the NOMMS Implementation Guidelines. They fulfil the requirements of both the "with CADP1" and the "without CADP1" planning controls[1], which improve upon the existing noise management system. However, not all of the measures and initiatives in these Guidelines will apply under the without CADP planning controls. Therefore, where appropriate the measure and initiatives are differentiated as follows:

Font	Applies Without CADP1?	Applies With CADP1?
Normal	Yes	Yes
Blue	Yes	Yes
Emboldened blue italics	No	Yes

[1] **With CADP1 planning controls** are the planning permission dated 26 July 2016 (ref APP/G5750/W/15/3035673) and the associated Section 106 Agreement dated 27 April 2016. **Without CADP planning controls** are the planning permission dated 9 July 2009 (ref 07/01510/VAR) and the associated Section 106 Agreement also dated 9 July 2009.

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APPENDIX A

COMBINED NOISE AND TRACK MONITORING SYSTEM

A.1 General

A continuous noise monitoring system was first installed and became operational at the Airport in 1992. A system of this type has been in place ever since that time and was upgraded in 1999 when a flight track monitoring system was also installed. Historically, this noise and flight track monitoring system (NFTM) comprised four fixed noise monitors. These four monitors known as NMT's 1 to 4 are all located close to and sideline of the Airport, to reflect the noise regime that has existed local to the Airport. To adequately monitor areas to the east and west of the Airport, some account of aircraft take off noise and approach noise is also now required. LCA has therefore introduced additional noise monitors in order to better monitor and evaluate the effects of take-off and approach noise in these areas to supplement the sideline departure noise currently considered.

The NFTM has been enhanced, with the acquisition of two new fixed noise monitors (NMT's 5 & 6 ***in compliance with Condition 32***) and a mobile noise monitor. Two additional backup mobile monitors have also been acquired. The NFTM introduces a more robust system of noise monitoring that includes the measurement and monitoring of ground based sources of aircraft related noise as well as airborne aircraft noise. The key functions of this system are to:-

- identify any deviations from standard routes that should be followed by aircraft,
- monitor for noise categorisation purposes following implementation of the Aircraft Categorisation Review ***and the introduction of the Aircraft Noise Categorisation Scheme, in compliance with Condition 18 of CADP1;***
- provide data for noise contour validation purposes to produce noise contours for the Sound Insulation Scheme ***and to check compliance with Condition 33 regarding the size of the contour area;***
- provide data on ground based sources of noise;
- record noise levels produced during aircraft departures and arrivals;
- ensure appropriate access to data by the Council;
- provide data to investigate environmental related complaints.

This appendix sets out the principles of the noise and flight track monitoring system and the improvements that have been introduced.

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A.2 Existing Noise and Flight Track Monitoring System

The original system comprised four noise monitors, each located relatively close to and sideline of the Airport. A brief description of their positions is given below which are shown in Appendix A1:-

- NMT 1 - NW Position On grassy bank on dockside close to the Ramada Hotel.
- NMT 2 - SW Position On cleared land, north of Charles Street.
- NMT 3 - NE Position On dockside, south of Gallions Road.
- NMT 4 - SE Position On quayside, east side of King George V Dock.

This system continues in operation subject to the enhancements noted below.

A.3 New Noise and Flight Track Monitoring System

A.3.1 Noise Monitoring

The original NFTM system has recently been enhanced by the addition of two additional fixed noise monitoring terminals (NMTs) and one mobile NMT. In addition two back-up mobile NMTs have been acquired. The improved NFTM provides the facility to measure aircraft and ambient noise levels at locations on-site and off-site as required.

The measured noise data is retrieved automatically from the NMTs (plus two back-up monitors as required) by a central NFTM server. The system downloads data from the Airport flight information database and radar information database on a daily basis, to enable correlation of noise event data with aircraft flight information, so as to determine the aircraft flight number and type causing the event.

Appendix A1 shows the locations of the original fixed NMT's and the locations of the two new fixed NMT's and one mobile NMT. The three new proposed NMT locations shown in Appendix A1 are:

- NMT 5 to the west of the runway, near East India Lock, approximately beneath the take off/approach path.
- NMT 6 to the east of the runway, in Thamesmead, also beneath the take off/approach path.
- NMT 7 (mobile) located initially near to the London Borough of Newham Offices (Building 1000) to the north of the runway but will be used in various locations as

required. This monitor is used primarily for the monitoring of aircraft related ground noise.

NMT's 5 & 6 have been installed and are now operational. NMT 7 will be installed and also operational by the end of the first quarter of 2017. The two back-up monitors (NMT 8 and 9) were acquired in 2015 and can be used either on or off site as and when required.

Noise data is collected from the NMT's and processed for the purposes of aircraft categorisation and also noise management. The new noise and flight track monitoring system will ensure aircraft recognition and correlation is achieved for at least 80% of all aircraft departures when averaged over a 12 month period.

The improved NFTM will include the capability to monitor departure and arrival noise levels in terms of effective perceived noise levels for the purposes of checking on the efficacy of the outcome of the proposed Aircraft Categorisation Review.

An indication of the type of information collected by the noise monitoring system is contained in Appendix A2.

A.3.2 Flight Track Monitoring

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 TRAVIS[2]) to share data from the flight track monitoring system with the public.

Flight tracks are capable of real-time inspection and are stored for later processing and analysis. This allows deviations from the departure and arrival flight paths at the Airport both in plan and elevation to be determined. The facility to identify excursions by aircraft beyond a user-defined envelope associated with departure and arrival routes is provided. The information obtained from this system will be used to advise those airlines who frequently fly outside the agreed departure or arrival corridor (set out by a number of virtual gates as part of the NFTM) to alter their operational procedures as necessary to maintain acceptable track keeping. Further detail of the procedures related to this are set out in Appendix C.

An indication of the type of information that may be collected by the flight track monitoring system is contained in Appendix A2.

[2] https://travislcy.topsonic.aero/

A.4 Maintenance

The noise and flight track monitoring system is maintained by the equipment suppliers based on a contract that ensures speedy resolution of any hardware or software malfunctions. The following response times will apply:

Hardware response times:

- Maximum two working days to ensure the Noise and Flight Track Monitoring System is logging data at all 7 NMT's;
- Maximum five working days to have all faulty hardware repaired/replaced and operational;
- Software response times;
- Maximum one working day to ensure a system is in place to log data in the database and to provide the user(s) with access to the noise server for noise analysis and reporting;
- Maximum of five working days to fix software errors (especially mean track calculations, gate dispersion, gate penetration module and complaint handling);
- Maximum 10 working days to fix smaller software errors which do not affect the operation of the software module.

In addition to the above maintenance contract, the system has been developed with the flexibility to allow the management of its operation to take place either locally or remotely via an external management service. External consultants have been engaged to ensure that the system is adequately maintained and to ensure the robustness of the data acquired.

A.5 Local Authority Data Access

An on-line terminal or alternatively, access to a web-based service is provided by LCA to a building designated by the London Borough of Newham which provides details of noise and flight track monitoring data for independent appraisal.

On request from the Council, LCA will provide training free of charge to the Council for up to five members at least once a year in the use of the Council's Terminal and interpretation of data.

A.6 Re-location of Noise Monitoring Terminal

In the event that it becomes necessary to re-locate one of the fixed noise monitoring terminals for any reason, LCA will provide advance written notice to the Council and seek written approval for

the siting of any monitor in a suitable location, taking account of the requirements of the Section 106 Agreement.

A.7 Complaint Handling

The noise and flight track keeping system provides information to assist in the investigation and recording of complaints relating to aircraft noise and aircraft flight routes.

A summary record will be maintained of all complaints about the environmental impact of the operation of the airport and any action taken to address such complaints.

A detailed report will be submitted of all complaints and any action taken:

- to LBN within 15 days of that complaint being made or that action being undertaken;
- to the Airport Consultative Committee at the meeting of that Committee next following that complaint or that action; and
- as part of the Annual Performance Report in relation to such complaints and actions in the preceding calendar year.

Complaint records will be available for inspection by LBN at all reasonable times.

A.8 Reporting

In June each year, data from the noise monitoring system for the previous calendar year is used to prepare and publish an Annual Performance Report (APR). This report sets out information on how aircraft and airlines using the airport have performed in respect of various noise parameters. The report includes air noise contours (actual and predicted) in terms of dB $L_{Aeq,16h}$, an aircraft noise categorisation report setting out the current noise categories of each aircraft type and a noise management report which includes data on use of auxiliary power units, ground running activity and aircraft movement data.

The APR will also include information on the following:-.

i) Average departure ***and arrival*** noise levels by aircraft type and airline ***(including sideline, flyover and approach noise levels under CADP1, see Annex 1 in Appendix C).***

ii) Data on reverse thrust by aircraft type and airline.

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iii) Data on flight track keeping performance by aircraft type and airline relative to corridors associated with departure standard instrument departure routes.

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APPENDIX A1

Location of Original and New Noise Monitoring Terminals

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APPENDIX A2

Information collected by the Noise and Track Monitoring System

Noise Data Collection

The basic noise monitoring software shall:

Call up and receive data from the NMTs and identify the monitor transmitting the data. This data shall include:

- $L_{Amax,S}$, SEL and duration of each event,
- PNL and EPNL values of each event (when necessary),
- statistical hourly data (L_{Aeq} and L_{A90}) on the ambient noise levels at the monitor,
- 0.5 second, one-third-octave noise event data (when requested),
- calibration records,
- weather data (at no less than one monitor).

In addition the software shall call up and receive:

- radar data (flight identification and aircraft positional information)
- flight information from the Airport flight information system (scheduled and actual time of the movement, whether the movement was an arrival or a departure, the runway in use, the airline and flight reference number, the type of aircraft and flight route in use).

The following information will also be recorded:-

- The NMT reference defining its location (e.g. NMT1)
- Date and time of measurement of $L_{Amax,S}$.
- Flight number (airline and flight reference)
- Flight operation (e.g. Scheduled or chartered etc.)
- Aircraft type (e.g. BAe146 RJ85)
- Event description (e.g. arrival (ARR), departure (DEP))
- Runway in use during event (e.g. 27 or 09)
- Flight route used
- Noise level at monitor in terms of $L_{Amax,S}$ and SEL (e.g. 75 dB L_{Amax} and 85 dB(A) SEL)
- PNL and EPNL where necessary
- Background ambient noise data (L_{A90} and L_{Aeq} with and without aircraft events)

- Event duration (e.g. 18 s.)

Ground Noise Data Collection

At NMT 7 ground noise will be monitored, and it is proposed to filter out other noise sources at this position to provide an estimate of ground noise level. This NMT 7 shall be used to record (1) the total ambient noise level during the day, and (2) the total aircraft events noise level. From these two sets of information, the system shall calculate the residual noise level.

The noise monitoring system at LCA provides the capability to set triggers, based on both absolute noise thresholds and time durations over which a specified threshold is exceeded. This provides the facility for identifying peak noise events produced by, for example, an aircraft on departure, on arrival and also when undertaking reverse thrust on landing. This facility, when used in conjunction with data from the noise track keeping system, enables the correlation of noise events with aircraft events at the airport. As the noise monitor at NMT 7 will record the prevailing noise environment on a continuous basis, it is possible to determine the underlying residual noise level at this monitor, excluding peak noise events produced by aircraft on departure and during arrivals by subtracting the noise produced by such events from the total noise recorded. This same principle can be used to determine the noise contribution made by aircraft undertaking reverse thrust over a specified period.

Flight Track Data Collection

Flight track data shall be obtained from the radar link at the Airport including at least the following:

- transponder code for aircraft type obtained from transponder
- dimensional data based on the x, y and z co-ordinate system
- temporal data identifying actual time of each track position

The system shall be able to:

- obtain a record of the lateral and vertical position of aircraft relative to the Airport and record the ground track and vertical profile of the event using QNH corrected data as appropriate (QNH data interface to be organised by the Vendor in the same way as the Airport radar system).
- display and print individual aircraft ground tracks, in real-time and also retrospectively, superimposed onto an Ordnance Survey (OS) style (e.g.1:50,000) base map.
- display and print "spaghetti" diagrams showing the ground tracks of a group of aircraft selected by user definable variables by means of a suitable data filter.
- display and print "scatter" diagrams at set gate positions

The system shall:

- enable gates and corridor envelopes to be set up to assess vertical and lateral track violations by departing or arriving aircraft.
- have the capability to provide input data to the FAA Integrated Noise Model (INM).

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APPENDIX B QUIET OPERATING PROCEDURES

The Airport requires that every operator of aircraft adopt procedures which will produce the least noise disturbance compatible with safe operation, and where applicable, such procedures should follow any promulgated noise abatement routing for the Airport. Where aircraft manufacturers have established special procedures for the purposes of reducing noise, these should be applied to operations at London City Airport, subject always to the safe operation of aircraft.

Quiet operating procedures at London City Airport include the following:-

- Minimum use of reverse thrust (see Appendix I)
- Use of fixed electrical ground power where possible (see Appendix H)
- Minimum use of auxiliary power units (see Appendix H)
- Operation of a steep glide slope (5.5 degrees)
- An EFPS[3] system (see Appendix D1).

[3] Electronic Flight Progress Strips (EFPS) which has replaced the system of writing on paper Flight Plan Strips (FPL's) for Air Traffic Control personnel.

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APPENDIX C INCENTIVES AND PENALTIES SCHEME

C.1 Introduction

This section describes a new incentives and penalties scheme that focusses primarily on incentives for airlines to operate their fleets in a quieter manner.

LCA will set up and fund an annual Community Projects Fund which will be used to deliver specific projects in the local community. The Community Projects Fund will be delivered in partnership with the most improved airline under the Incentives and Penalties Scheme and sponsor up to three projects per annum.

For those operators whose aircraft produce noise levels that exceed the fixed penalty limits set out in Appendix C1 when departing at the Airport and for which no reasonable explanation is given, a financial penalty will be levied. Additionally, flight track keeping will be monitored.

In summary the scheme includes:-

i) The introduction of an incentives scheme to encourage airlines to operate aircraft more quietly, rewarding those airlines with credits towards co-partnering LCA delivering a Community Projects Fund each year.

ii) The introduction of a fixed penalty for infringement of an upper noise limit as measured at the airport's permanent noise monitors 5 and 6 to penalise those operators producing departure noise well above the expected range for an aircraft type. An upper noise limit applies for an aircraft during its later phase of departure from LCA (Flyover Noise).

Consultation has been undertaken with airlines as part of the preparation of this scheme. All airlines operating at the airport to which this scheme relates, in addition to the London Borough of Newham (LBN), have been consulted and following feedback the details of the Scheme have changed slightly from those previously approved by London Borough of Newham Officers following a review that was carried out with LBN following the first 12 months of operation. The change following the 12 month review resulted in the removal of the fixed penalty limit for aircraft during the early phase of departure (Sideline Noise), and to reduce (i.e. make more stringent) the fixed penalty limits for Flyover Noise.

C.2 Overview of Incentives and Penalties Scheme

C.2.1 Community Trust Fund

Under the proposed penalties and incentives scheme, LCA will set up and fund an annual Community Projects Fund which will be used to deliver specific project(s) in the local community.

The Community Projects Fund will be delivered in partnership with the most improved airline under the Incentives and Penalties Scheme and sponsor up to three projects per annum. It will be administered by a Board of Trustees (BoT) comprising a single representative from LCA, a

representative from the most improved airline from the previous year and the Chair of the London City Airport Consultative Committee (LCACC). Community projects and charities from the Local Area[4] can apply to the BoT to fund a specific project. Each year advertisements will be placed in local newspapers to make the local community aware of the fund and how to apply.

All airlines operating at LCA will be ranked by their performance with respect to departure noise levels annually. The most improved airline will partner LCA in delivering the Community Projects Fund the following year. An award will also be given to the best performing airline. A publicity strategy for these awards will be agreed and implemented with the most improved airlines.

Where airlines operate well above their expected departure range, a financial penalty will be raised for that departure and that airline will be required to pay additional monies towards the Community Projects Fund. The more penalties an airline accrues, the bigger impact it will have on their ranking in the Incentives and Penalties league table overall.

C.2.2 Credits

As summarised above, an aircraft is encouraged to fly quietly by the award of a "credit" point towards the noise league table which determines the most improved airline that will deliver the Community Projects Fund in partnership with LCY. The quieter that aircraft fly, the greater the number of credit points awarded to this fund. Conversely, for any aircraft that departs from the airport above an agreed noise credit threshold, credit points will be removed from the airline's credit point account unless there was good reason for flying in such a manner.

C.2.3 Fixed Penalties

If noise levels from an aircraft departure exceed a fixed upper noise limit, known as a fixed penalty limit, then a fixed financial penalty will be levied. This element of the scheme is not intended to penalise a heavily loaded aircraft which, by the very nature of its operational requirements, may cause more noise than a similar aircraft in its class.

In view of the differing capabilities of turbofan and turboprop aircraft, different noise limits will apply for these two aircraft categories, see Appendix C1.

The LCA system seeks to be fair to operators, by ensuring before any financial penalty is sought that there are not any special circumstances that caused the noisy departures. Such

[4] The "Local Area" Boroughs to include 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. These are defined in the 2009 S106

circumstances would include the instruction by air traffic control on the basis of safety to alter normal departure operational procedures.

Penalties will be reviewed and fall payable at the end of each quarter. All financial penalties collected in a calendar year will be added to the Community Projects Fund for the following year. Financial penalties will be charged at £600 per dB(A) in excess of the fixed penalty limit or any alternative sum agreed with the airlines and approved by the Council.

In summary, the credits and penalties thresholds will operate as follows:

- if upper noise limit (fixed penalty limit) is exceeded, a penalty accrues for the operator
- If upper credit threshold (credit removal threshold) is exceeded, a credit point is removed for the operator
- if lower credit threshold (credit award threshold) is not reached, a credit point accrues for the operator.

C.2.4 Use of Fixed Noise Monitors to Determine Credits and Penalties

The LCA fixed noise monitors shown in Figure 1 are used to measure noise levels during an aircraft departure. These measured noise levels are used to determine the Flyover Noise Level (described below) which is then compared against the fixed penalty limit and credit thresholds to determine whether a credit or penalty should be applied to the airline.

NMTs 5 and 6 are used to measure flyover noise. Annex 1 of this appendix provides further explanation of this term.

Flyover Noise

NMT's 5 and 6 are used to determine the Flyover Noise Level as follows:

For aircraft departures on Runway 27, the Flyover Noise Level is determined from the maximum noise level ($L_{Amax,S}$) measured at NMT 5.

For aircraft departures on Runway 09, the Flyover Noise Level is determined from the maximum noise level ($L_{Amax,S}$) measured at NMT 6.

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C.2.5 Procedure for Awarding Credits and Penalties

The noise levels of departing aircraft will be recorded at NMTs 5 and 6 at either end of the runway, as shown in Figure 1. The results will be compared with the noise limits and thresholds as set out in Appendix C1 or as otherwise agreed in writing with the Local Authority.

Where a fixed penalty limit is exceeded the Airport will write to the airline operator of the particular departing aircraft, and seek an explanation. If no explanation is given that justifies the individual noisy departure, then a fixed financial penalty will be established against the operations of that airline and one credit point removed from the airline's credit account. Examples of matters that could be taken into consideration in reviewing whether an exceedance of a fixed penalty limit is justified are:-

i) Visibility conditions on the airfield.

ii) Wind speed and direction on the airfield.

iii) Past noise performance of this aircraft type.

iv) Payload of the aircraft.

Each exceedance event would be considered on a case by case basis to establish whether or not a fixed penalty is to be applied.

Consideration has been given to the equitability of the scheme at NMT 5, as those aircraft flying closest to the monitor (which is approximately 200m to the north of the extended centreline of the runway) could produce higher noise levels at the monitor due to their proximity rather than the inherent noisiness of the aircraft. The following procedure has therefore been agreed with LBN when assessing penalties at NMT 5:

1. Determine which flights exceeded the fixed penalty limits;
2. For each of these flights, check whether the track was between 100m and 300m north of the track centreline when passing NMT 5;
3. If this was the case, then apply a reduction of 0.2 dB(A) to the measured noise level to determine whether the penalty limit has still been exceeded and, if so, the extent of the fine potentially liable.

Where the credit removal threshold is exceeded the Airport will write to the airline operator of the particular departing aircraft, and seek an explanation. If no explanation is given that justifies the individual noisy departure, one credit point will be removed from the airline's credit account. If no

credits have been accrued by the airline, a negative credit score will be registered.

Where the credit award threshold is not reached the Airport will award one credit point to the airline's credit account.

The number of fixed penalties and credit points gained by each airline will be reviewed on a quarterly basis and the results reported to airlines operating at LCY, as well as LBN and the LCACC. Credit points will be carried over to the following quarter in a given calendar year. An airline's credit account becomes zero at the start of the following calendar year.

C.2.6 Reporting Credits and Penalties to Airlines

The occurrence and investigation of a potential fixed penalty (for a noisy departure) shall be recorded to identify the level of exceedance, the monitor(s) at which the exceedance occurred, the potential cause and whether any mitigating circumstances were present at the time. Where no acceptable explanation is provided by the airline, a fine shall be levied in accordance with the procedures set out in this document. A short "fixed penalty" event report will be prepared for record purposes.

Credit points will be accrued in accordance with the procedures set out in this document. Should a credit removal threshold be exceeded, an investigation will take place to identify the level of exceedance, the monitor at which the exceedance occurred, the potential cause and whether any mitigating circumstances were present at the time. Where no acceptable explanation is provided by the airline, a credit point shall be removed from the airline's credit account in accordance with the procedures set out in this document. A short "credit removal" event report will be prepared for record purposes.

Should a credit award threshold not be reached, a credit point will be added to an airline's credit account in accordance with the procedures set out in this document. A short "credit award" event report will be prepared for record purposes.

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C.2.7 Community and Airline Annual Report

An annual report shall be produced as part of the Annual Performance Report describing aircraft/airline performance with regard to noise monitoring and flight track keeping in terms of good and poor performers and league tables, for the period relating to the immediately preceding calendar year. The most improved airline will be awarded with a partnership delivering the Community Projects Fund with LCA in the following year. The report will be submitted to the airlines, LBN and the LCACC and will also be included in the APR.

C.3 Operation of Incentives and Penalties Noise Scheme

The incentives and penalties scheme is more akin to a type operated at other airports – taking into account flyover noise for the first time and not side-line noise. The key difference is that while other airports normally just impose a financial penalty when an aircraft flies above a specified noise limit, the new scheme will also see credit points awarded to aircraft that depart from the airport below an agreed noise threshold. In addition, for any aircraft that departs above an agreed noise threshold, credit points will be removed from the airline's credit point account unless there was good reason for flying in such a manner. Additionally, any aircraft that exceeds the fixed penalty limit would automatically trigger an immediate financial penalty without good reason for flying in such a manner.

The noise limits and thresholds for the incentives and penalties scheme are set out in Appendix C1. Fixed penalty limits, credit removal thresholds and credit award thresholds are presented separately for both turbofan and turboprop aircraft, by runway. The Flyover Noise Level measured during a departure is rated against these thresholds and limits. These thresholds and limits will be subject to an annual review by LCA

In practice, the scheme will operate as follows:-

i) a community trust fund will be set up and fully funded by LCY. It will be subject to an annual minimum of £75,000. Any financial penalty payments accrued will be added to the fund the following year;

ii) the number of penalties and/or credit points gained by each airline will be reviewed and reported on a quarterly basis to airlines LBN and the LCACC;

iii) financial penalties will fall payable on a quarterly basis;

iv) an annual Community and Airline Report will be published by LCA that will highlight performance of the scheme and identify the most improved airline for the previous calendar year;

v) the Community and Airline Report will identify the details of the community projects that have been sponsored in the previous year in partnership with the winning airline and administered by the BoT. The report will be published as part of the Annual Performance Report.

C.4 Operation of Flight Track Monitoring System

At London City Airport, departing aircraft are required to follow standard instrument departure routes (SIDs) as described in the UK AIP. The Airport operates a flight track monitoring system that can be used to record the degree to which a departing aircraft follows the described SID.

The purpose of the monitoring of flight tracks within the standard route will be to identify those 'off track' departures with the aim of working towards achieving at least 95% of all departures within an agreed route.

A log of 'off track' departures shall be maintained by the Airport and the relevant aircraft and airlines shall be identified in a quarterly report, or as otherwise agreed in writing with the Local Authority.

Any persistent offenders shall be requested by the Airport to provide a written explanation for the 'off track' events and, unless a reasonable explanation can be provided, shall be requested to provide corrective action for future departure operations.

A report shall be submitted quarterly to the Local Authority or as otherwise agreed in writing with the Local Authority.

C.5 Review Periods

At the commencement of implementation of the system, noise thresholds will be based on the limits and thresholds set out in Appendix C1. The system shall be reviewed annually. The review shall consider amongst other matters, the efficacy of the initial noise limits and threshold values, the suitability of the financial penalty, and the effectiveness of the noise threshold system as a component of the LCA NOMMS scheme. Written agreement shall be received from LBN prior to the introduction of any modifications to the system.

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APPENDIX C1

Fixed Penalty Noise Limits and Credit Thresholds
All noise limits are expressed as dB $L_{Amax,S}$

		Runway 09	Runway 27
		Flyover Noise Level (NMT 6)	**Flyover Noise Level (NMT 5)**
Fixed Penalty Limit			
Turbofans		84	84[1]
Turboprops		78	78
Credit Removal Threshold			
Turbofans		81	82
Turboprops		75	77
Credit Award Threshold			
Turbofans		73	72
Turboprops		66.5	65.5

[1] If aircraft is between 100m and 300m north of the extended runway centreline, a 0.2 dB reduction is applied

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ANNEX 1

EXPLANATION OF "SIDELINE" AND "FLYOVER" POINTS IN THE NOMMS AND ANCS

The terms "sideline" and "flyover" are used in the NOMMS[5] and ANCS[6] to describe a point or location where aircraft noise is either measured or assessed. In the NOMMS, the terms are used to describe locations where London City Airport's (LCA's) fixed noise monitors are located. In the ANCS, the terms are used to describe noise certification points prescribed by the International Civil Aviation Organisation (ICAO). Although the terms "sideline" and "flyover" used in the NOMMS and ANCS are identical, they are not in the same position. To avoid confusion, this note provides a short description of the location of the sideline and flyover points for both the NOMMS and ANCS.

NOMMS uses a number of fixed noise monitors to determine noise levels from departing and arriving aircraft at the airport. For historic reasons the location of these monitors are categorised as either sideline or flyover locations depending on where they are with respect to the flight path of departing or arriving aircraft. The results are used primarily for noise management purposes through a Penalties and Incentives Scheme.

The ANCS categorises and assesses aircraft by using noise certification data determined in accordance with procedures set out by ICAO. Each aircraft operating in the UK has a noise certificate describing its noise emissions under carefully controlled conditions, at three noise certification points. These certification levels are indicators of aircraft noise performance and are determined at three points in accordance with prescribed international procedures. These procedures also use the terms sideline and flyover for two of these three points (the third is the approach point).

NOMMS - noise monitor locations

A continuous noise monitoring system was first installed and became operational at the Airport in 1992. A system of this type has been in place ever since that time and was upgraded in 1999 when a flight track monitoring system was also installed. The noise and flight track monitoring system was further updated in 2013. Historically, this noise and flight track monitoring system (NFTM) comprised four fixed noise monitors. These four monitors known as NMTs 1 to 4 are all located close to the Airport.

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[5] NOMMS – Noise Management and Mitigation Strategy

[6] ANCS – Aircraft Noise Categorisation Scheme

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Under the NOMMS, two new fixed noise monitors (NMTs 5 and 6) and a mobile noise monitor are incorporated within the NFTM.

The six fixed noise monitors shown in Figure 1 are used to measure noise levels during an aircraft departure. The measured noise levels at NMTs 5 and 6 are used to determine the Flyover Noise Level for comparison with limits set in relation to the airport's Incentives and Penalties scheme which forms part of the NOMMS. The Flyover Noise Level is compared against the fixed penalty limit and credit thresholds to determine whether a credit or penalty should be applied to the operator of the aircraft.

As NMTs 1 and 2, and 3 and 4 lie on either side of the flight path of a departing or an arriving aircraft these are designated as "sideline" locations. For aircraft departures on Runway 27, the Sideline Noise Level is determined from the arithmetic average of the maximum noise level ($L_{Amax,S}$) measured at NMT 1 and 2.

For aircraft departures on Runway 09, the Sideline Noise Level is determined from the arithmetic average of the maximum noise level ($L_{Amax,S}$) measured at NMT 3 and 4.

As NMTs 5 and 6 lie approximately underneath the flight path of a departing aircraft these are designated as "flyover" locations. For aircraft departures on Runway 27, the Flyover Noise Level is determined from the maximum noise level ($L_{Amax,S}$) measured at NMT 5. For aircraft departures on Runway 09, the Flyover Noise Level is determined from the maximum noise level ($L_{Amax,S}$) measured at NMT 6.

The locations of NMTs 1 to 6 are shown in Figure 1.

Figure 1: NOMMS - Location of Noise Monitoring Terminals

ANCS - noise certification level positions

The ANCS uses a Quota Count (QC) system as a means of limiting the noise generated by aircraft movements in a transparent and easily administered manner. It operates in a similar manner to the Night Noise Quota Count scheme used at the designated airports such as Heathrow, Gatwick and Stansted, and used at other UK airports such as Manchester. As is the case for the Night Noise Quota Count scheme, the QC system is based on aircraft noise certification data where each aircraft type is allotted a QC value based on the noise generated by the aircraft type on departure and arrival under prescribed certification conditions[7].

[7]. Based on the certified operating weight or maximum permitted operating weight at LCA or on evidence presented to the Council which demonstrates to their satisfaction, confirmed in writing, that the aircraft is capable of operating at its permitted MTOW at LCA within the noise constraints applicable at the airport.

Certification levels, determined in accordance with prescribed procedures under ICAO Annex 16[8] and given in terms of the Effective Perceived Noise Level (EPNL), are used within the ANCS for a variety of reasons, including:

- to comply with UK Regulations[9]
- they are reliable and independently verified indicators of aircraft noise performance;
- they are freely available for practically every relevant aircraft type[10].

Certificated noise levels for departing and arriving aircraft are determined under carefully controlled conditions at three positions:

- 450 metres sideline at noisiest point during an aircraft departure (referred to as Sideline or Lateral point);
- 6500 metres from start of roll, directly beneath the departing aircraft (referred to as Flyover point);
- 2000 metres from runway threshold, directly beneath the arriving aircraft (referred to as Approach point).

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[8]. Annex 16 to the Convention on International Civil Aviation, Environmental Protection, Volume 1, Aircraft Noise

[9]. Aerodrome (Noise Restrictions) (Rules and Procedures) Regulations 2003

[10]. European Aviation Safety Agency (2016) *Aircraft type certificate data sheets*, [Online], Available: http://www.easa.europa.eu/certification/type-certificates/aircraft.php [6/09/2016].

Figure 2, reproduced from ERCD 0205[11], illustrates these three noise certification points below.

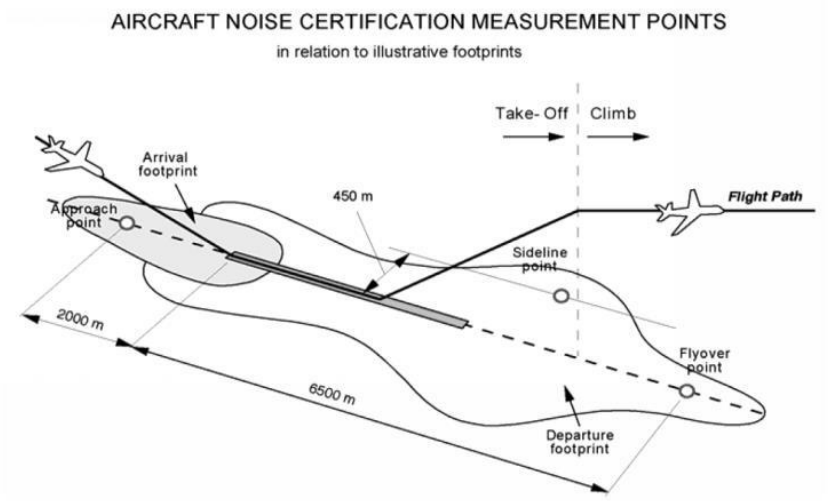

Figure 2: Aircraft noise certification measurement points

[11]. ERCD Report 0205 Quota Count Validation Study: Noise Measurements and Analysis, Civil Aviation Authority

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APPENDIX D CONTROL OF GROUND NOISE

D.1 General

The Airport will seek to ensure as far as reasonably practicable that every aircraft operator adopts the operating practice which generates the least amount of noise from aircraft taxiing, manoeuvring or holding on stand, at the runway, and prior to take off, subject to the requirement of ensuring the safe operation of the aircraft at all times, ***all in accordance with the procedures set out in the Ground Engine Running Strategy in compliance with CADP1 Planning Condition 48***. This should involve the minimum power settings necessary and, in the case of propeller aircraft, pitch settings should as far as possible be those which produce the least propeller noise.

The introduction of nose-in parking at LCY is currently under consideration. This procedure is expected to have a negligible effect on the future ground noise levels around LCY. This is because in general terms, the ground noise generated by an aircraft parking and departing a stand when nose in manoeuvring will differ little, albeit it will be possibly marginally less at a receptor, as compared to when self-manoeuvring. It will be reviewed under the Ground Engine Running Strategy in compliance with CADP1 Condition 48 and assessed in the Ground Noise Study in compliance with CADP1 Condition 55.

An Electronic Flight Progress Strips (EFPS) system has been installed at London City Airport which provides the ability to monitor the time that aircraft operate engines on the ground, from engine start-up until the time of departure and following the time of landing until engine shut- down. The time of any engine ground running on the apron for maintenances will also be monitored. Any excessive or unnecessary operation of aircraft engines will be investigated by the Airport. Information will be required from both ATC and the airline responsible in order that a report can be generated.

D.2 Ground Engine Running Strategy

The approved Ground Engine Running Strategy is to be implemented upon commencement of the CADP1 Development and a report issued annually on 1 June (or the first working day thereafter) as part of the Annual Performance Report on the performance and compliance during the previous calendar year with the approved targets in the Ground Engine Running Strategy.

The strategy shall identify measures to:

- ***minimise engine usage while aircraft occupy stands;***
- ***minimise the duration of engine usage whilst taxiing; and***

- ***ensure the operators of aircraft at the Airport comply with the approved strategy in order to mitigate as far as practicable the emissions from aircraft engines.***

D.3 Ground Noise Monitoring

The Airport will carry out noise monitoring in the vicinity of the Airport to record the level of ground noise generated by aircraft and support vehicles and plant operating on the ground. This will be carried out by NMT 7 where ground noise arising from day to day operations on the Airport apron and runway can be monitored on a continuous basis. The equipment will be of a high specification since the aim will be to separate out as far as possible those sources of noise caused by the Airport and those caused by other non-Airport activities, such as from passing cars and trains as well as general activity near to the noise monitor. The contribution of noise from aircraft involved in take-offs and landings, as opposed to ground operations, will also be determined as far as practically possible although any noise produced by such aircraft will be subject to control by aircraft categorisation as occurs now or in accordance with new procedures following the Aircraft Categorisation Review.

As noted in Appendix A two back-up mobile noise monitors will also be available for deployment at selected locations around the community to monitor the prevailing environmental noise levels.

D.4 Auxiliary power units (APU), Mobile Ground Power Units (MGPU) & Fixed Electrical Ground Power

Refer to Appendix H of the NOMMS Appendices.

D.5 Ground running of engines for test and maintenance purposes

D.5.1 General

The running of aircraft engines is permitted only during the approved operating times for the Airport.

The running of engines at high power settings for the purposes of test and maintenance shall be limited to the minimum periods possible ***and in future will be carried out in accordance with the Ground Running Testing and Maintenance Strategy in compliance with CADP1 Condition 49 and 50.*** Aircraft operators wishing to carry out high power engine runs must obtain prior approval from the Airfield Operations Duty Manager. Approval to start the engine run will be given by ATC. All high powered engine runs must take place in the engine ground running location.

The Airport will record written details of ground running that has taken place during the preceding calendar year including details of the number duration and power settings of ground runs (High and Low) and the types of aircraft involved.

Written measurements and calculations, in accordance with the procedure described in Appendix D2, will be presented annually to show whether the Ground Running Noise Limit has been exceeded during the preceding calendar year.

In the event that measurements and calculations identify that noise generated by running of aircraft engines has or is likely to approach within 1 dB of the Ground Running Noise Limit, LCA shall take such action as necessary, for example undertaking ground running on an alternative stand, instead of or in addition to Stand 24, determined as described in D.6 below, to prevent exceedance of the Ground Running Noise Limit.

In the event that the Ground Running Noise Limit has been exceeded proposals will be submitted to the Council for their approval for the carrying out of measures to ensure that Ground Running complies with the Ground Running Noise Limit and such approved measures shall be carried out in accordance with the approved time scale, all in accordance with the Ground Running Noise Limit Strategy.

D.5.2 Ground Running Testing and Maintenance Strategy

The approved Ground Running, Testing and Maintenance Strategy, in compliance with CADP1 Condition 49, is to be implemented on commencement of the CADP1 Development and a report issued annually on 1 June (or the first working day thereafter) as part of the Annual Performance Report on the performance and compliance during the previous calendar year with the targets in the Ground Running, Testing and Maintenance Strategy.

This Strategy will be reviewed every 3 years after first implementation and submitted to the Local Planning Authority for approval on 1 June (or the first working day thereafter) and implemented as approved.

The strategy shall identify:

- ***the long-term area for testing; and***
- ***areas for testing during periods of construction affecting the long term agreed location.***

D.5.3 Ground Running Noise Limit

The approved Ground Running Noise Limit Strategy, in compliance with CADP1 Planning Condition 51, is to be implemented on commencement of the CADP1 development and will

demonstrate how any breach(es) of the Ground Running Noise Limit through Ground Running are to be prevented.

D.5.4 Ground Running Annual Performance Report

On 1 June (or the first working day thereafter) as part of the Annual Performance Report, in compliance with CADP1 Condition 52, the following shall be provided to the Local Planning Authority:

a) Written details of Ground Running that has taken place during the preceding calendar year including details of the number, duration and power setting of ground runs and the types of aircraft involved; and

b) Written measurements and calculations to show whether the Ground Running Noise Limit has been exceeded as a result of Ground Running during the preceding calendar year.

D.6 Ground Running Location

The current location for Ground Running for test and maintenance purposes is on Stand 24 at the eastern end of the Airport apron. From time to time the Airport will use reasonable endeavours to search for an alternative location or locations for Ground Running in order to mitigate any noise impact arising from Ground Running upon any existing residential premises and, where appropriate, Public Buildings. Alternative locations for ground running will also be required on occasion to accommodate periods of construction at the airport when necessary, ***in accordance with procedures developed through compliance with the Ground Running, Testing and Maintenance Strategy. Approval of all positions for Ground Running shall be in accordance with the Ground Running, Testing and Maintenance Strategy in compliance with Condition 49 of CADP1.*** If any alternative locations are approved by LBN the Airport shall ensure that the alternative locations are brought into use as soon as reasonably practicable in place of any previous location approved for Ground Running and the approved noise protection measures shall be carried out in accordance with the approved timescale.

The running of aircraft engines, APU's, Mobile GPU's or other ground equipment is strictly prohibited outside of the published Airport operating hours, other than when instructed otherwise by air traffic control in relation to matters about which neither the airlines or the Airport has any control.

D.7 Noise from Aircraft Maintenance Activities

No aircraft maintenance or repair work will normally be permitted at the Airport other than:

(a) between the hours of 06.30 and 22.00 hours from Monday to Friday inclusive; and

(b) other than between the hours of 06.30 and 12.30 on Saturdays; and

(c) other than between the hours of 12.30 and 22.00 on Sundays;

(d) and other than between the hours of 09.00 and 22.00 hours on Bank Holidays and Public Holidays

Where such work is essential outside these hours, this will only be permitted provided that any noise generated by these activities is not discernible at the boundaries of the Airport Site. A typical test to check on the acceptability of noise would be to ensure that when the maintenance or repair work is taking place, no increase results to the $L_{Aeq,5\ min}$ at the Airport Site boundary over that in the absence of the work.

D.8 Ground Noise Study

LCA are required to carry out a Ground Noise Study every 3 years for submission to the London Borough of Newham. A previous Ground Noise Study was undertaken in 2013. This study reports on a measurement exercise undertaken to determine the noise exposure levels arising from aircraft operations on the ground in the immediate vicinity of the Airport. A comparison is made with the results of previous, similar studies and for the purpose of ensuring that the magnitude of such noise exposure levels do not exceed reasonable levels (as defined by current recognised guidance on the acceptability of such environmental noise levels) outside any nearby residential premises and Public Buildings, including (where appropriate) advice on noise mitigation measures.

The Ground Noise Study is to be undertaken at least every three years following the submission of the first report to the London Borough of Newham. The next study has just been completed this year (2016) and, reports on ground noise in respect of the proposed Development. .

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APPENDIX D1

Initial Location of NMT 7

NMT 7

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APPENDIX D2

Method of Calculation of Engine Ground Run Noise

Introduction

LCA is required to provide written details of ground running and, in particular on an annual basis, calculations to show whether the Ground Running Noise Limit has been exceeded during the preceding calendar year. The Ground Running Limit means the noise level arising from Ground Running which shall not exceed the equivalent of 60 dB $L_{Aeq,T}$ (where T shall be any period of 12 hours) free field as measured outside and at one metre from any existing residential premises in the vicinity of the Airport.

Calculation Method

To assess engine ground run noise at the nearest existing residential area, the following steps are necessary:

(A) From the Airport Ground Run Record Sheets, determine the monthly number and duration of high power ground runs made at the Ground Running Location during the year. (NB. The current Ground Running Location is on Stand 24 at the east end of the apron). Determine the longest duration of such runs in a month during the year, x minutes.

(B) Then compute the average daily duration during the worst months ie. x/n = y minutes where n is the number of days in the month.

(C) Then compute the resultant noise level at the reference distance of 152 metres in terms of the dB $L_{Aeq,12h}$, ie.

Resultant Noise Level at 152 metres:

= Reference Noise Level[12] + 10.log(Duration(y)) – 10.log (12 x 60)

= Reference Noise Level + 10.log(y) – 28.6

[12] Reference Noise Level is the sound pressure level at a distance of 152 metres produced during a high power ground run by an aircraft typical of that operating at LCY. In previous years, a value of 84 dB L_{Amax} has been used based on studies undertaken at the airport.

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(D) Then compute the consequential noise level at the nearest residential premises by allowing for the greater distance of these properties (d) from the aircraft than the reference distance of 152 metres and any consequential screening (S dB).

Noise Level at nearest residential premises

= Resultant noise level at 152m – 26.7.log(d/152) - S

The result of this calculation can then be compared directly with the Ground Running Noise Limit of 60 dB $L_{Aeq,12h}$ to determine whether this limit has been met or exceeded.

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APPENDIX E AIRPORT CONSULTATIVE COMMITTEE

The Airports Consultative Committee (LCACC) meets on a Quarterly basis and is made up of members from the local community, Council's and interest groups. The Airport will continue to provide the LCACC with quarterly reports on the following:-

- Airport Director's Report
  - recording general information on activities or developments at the Airport over the previous three monthly period.
- Environmental Report
  - Reporting on the number of environmental complaints/enquiries received over the period and the actions taken to address them together with data on the operational status of the noise and track monitoring system.
  - Providing quarterly an Air Quality Report that records the results arising from a programme of air quality monitoring in and around the Airport.
- Community Relations Activity Report
  - Reporting on activities taken by the Airport in the local community including details of sponsorship provided to various bodies and work undertaken with schools and higher education establishments.
- The above reports are attached to minutes of the Committee's meetings which are widely circulated and are also published on the Committee's website.

In addition, the Airport provides on a quarterly basis, figures showing the number of flights as well as the numbers and types of aircraft using the Airport.

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APPENDIX F ANNUAL NOISE CONTOURS

As part of the Annual Performance Report the Airport will produce annual daytime noise contours depicting the air noise produced during an average summer's day.

F.1 Uses of Noise Contours

These contours will be used for the following purposes:-

- To assess the eligibility of both dwellings and public buildings under the sound insulation scheme
- To assess the eligibility for a purchase offer of those exposed to air noise levels in excess of 69 dB $L_{Aeq,16h}$.
- To assist the local authority in ensuring appropriate planning conditions are imposed on new development within the Airport noise contours.
- To enable members of the local communities and the Consultative Committee to view the current noise exposure levels.
- ***To check compliance with the contour area limit set out in CADP1 Condition 33.***

F.2 Methodology

In 2006, the Environmental Noise (England) Regulations came into force, in response to the European Noise Directive (END). These Regulations resulted from requirements set out in the European Noise Directive which, in the interests of harmonisation, sought noise mapping to be produced by all Member States. The END requires the use of a common aircraft noise contouring methodology which is set out in ECAC CEAC Document 29. Although these requirements relate currently only to strategic noise mapping, all recognised noise contouring methodologies in use in the UK now satisfy the requirements of this document (such as the Federal Aviation Authorities Integrated Noise Model Version 7.0).

LCA currently use the Integrated Noise Model Version 7.0 (and later versions as they emerge) to produce air noise contours.

The Airport will produce 57, 63, 66 and 69 dB LAeq,16h average mode[13] summer daytime noise contours based on the following:-

- Actual aircraft movements for the summer period (16 June to 15 September inclusive) in the calendar year immediately preceding the due date for the submission of the Annual Performance Report.
- Forecast aircraft movements for the summer period (16 June to 15 September inclusive) in the calendar year of the due date for the submission of the Annual Performance Report.
- Forecast aircraft movements for the summer period (16 June to 15 September inclusive) in the calendar year of the due date for the submission of the Annual Performance Report but reduced to take into account likely cancellation of flights and other matters affecting numbers of aircraft movements, having regard to historical data from the preceding five calendar years.

F.3 Validation

The combined noise monitoring and track monitoring system will be used for the purposes of obtaining data for the validation of the noise contours, ***in compliance with CADP1 Condition 30***.

Periodically, and not less than every three years, a measurement survey will be undertaken in the vicinity of the Airport to check at the six fixed noise monitors (and any other positions as necessary) that the noise levels of aircraft on departure and arrival are in keeping with those predicted using software used for the noise contour methodology. Where any significant differences are found, adjustments shall be made to the noise contour input data in order to reflect the typical departure and arrival noise levels produced by individual aircraft around the Airport. The contour validation report will be available for review by LBN.

F.4 Noise Contour Strategy

In accordance with CADP1 Condition 33, within 5 years of the commencement of the CADP1 Development, a Noise Contour strategy shall be submitted to LBN for approval in writing which defines the methods to be used by LCA to reduce the area of the Noise Contour by 2030.

The approved Noise Contour strategy shall be reviewed within 5 years of its approval and every 5th year thereafter in order to seek further reductions in the size of the Noise

[13] The average mode is determined from statistics for annual aircraft movements for the previous five calendar years.

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Contour by 2030 and beyond. The reviews are to be submitted to LBN within three months of the review dates and implemented once approved.

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APPENDIX G INTEGRITY OF NOMMS

The reliability and accuracy of the noise and track monitoring system is an integral element of the NOMMS. In order to ensure that this is maintained. LCA will need to be consulted by the relevant local planning authorities on any proposed development that might affect the operation of the monitors. The current system of referral from the London Borough of Newham takes this issue into account; LCA will contact the London Boroughs of Greenwich and Tower Hamlets to ensure that a similar system of referral operates in those areas.

Measures to ensure the continued functioning of monitors could include, but are not limited to:-

a) steps to ensure sufficient clearance between the noise monitor and any new buildings or structures

b) a planning condition requiring re-location of the noise monitor to an alternative location on any development site, to be agreed with the Airport

c) if b) is not possible, then the Airport will review potential alternative sites

d) Any changes to the location or surroundings of a noise monitor that affect its ability to perform its function in the NOMMS, including any correction factors or adjustments to noise thresholds, will require the written approval of the London Borough of Newham.

A review of Aircraft Categorisation is currently being undertaken to reassess the methodology, categories, noise reference levels, noise factors and procedures for categorisation. Dialogue with the London Borough of Newham (LBN) and the Greater London Authority (GLA) has been held as part of this review. The outcome of this review is the new Aircraft Noise Categorisation Scheme (ANCS) which will be subject to LBN approval. It will be submitted in the second quarter of 2017 after public consultation has taken place of the draft version. This is to replace the existing aircraft categorisation regime (the Noise Factored Scheme) after an initial period of both systems being run in parallel.

This proposed introduction of the ANCS constitutes a new 'operating restriction' in accordance with the Aerodrome (Noise Restrictions) (Rules and Procedures) Regulations 2003 and, as part of this procedure, the ANCS is due to be subject to consultation during 2017 .

The growth of the airport has been matched by extensive development of the Docklands area as a whole. This has affected the operation of the Noise Monitoring System (NMS) which has been in place since 1991 and was most recently upgraded in 2013. The current noise categorisation regime is heavily reliant on accurate and continuous noise monitoring data output from the NMS.

It is therefore also necessary to review the role that monitoring takes in the policing and operation of the regime. This is particularly the case as Government advice under the Aerodrome Regulations 2003 is that any operating restrictions at an airport based on the noise performance of an aircraft should be based, not on measured data, but on noise certification levels determined in accordance with prescribed procedures under ICAO Annex 16[14].

Details of the ANCS[15] are separate to those details included in the NOMMS.

[14] Annex 16 to the Convention on International Civil Aviation, Environmental Protection, Volume 1, Aircraft Noise

[15] New Aircraft Noise Categorisation Scheme, February 2017, London City Airport

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APPENDIX H AUXILIARY POWER UNITS

H.1 General

An Auxiliary Power Unit is a small engine or generator used to power an aircraft's primary systems when its engines are not running. Further definitions are given at the end of this appendix.

An approved Auxiliary Power Unit Strategy is to be implemented prior to or on the use of any phase of the CADP1 Development in compliance with CADP1 Conditions 44, 45 and 47 and shall include but not be limited to provide details of the position, orientation and use of aircraft before and after landing and taking off including conditioning of the cabin and equipment.

Except in cases of immediate emergency to persons on board an aircraft, or where fault occurs, no Auxiliary Power Unit is to be used other than for essential conditioning of aircraft cabins and equipment prior to departure limited to a maximum of 10 minutes before an aircraft's departure from the stand or 10 minutes after an aircraft's arrival on the stand.

H.2 Management

The Airport operates a control over the permitted use of auxiliary power units (APU) at the Airport. Permitted use of the APU is contained in AOI 06 APRON MANAGEMENT and in AOI 07 Aircraft Noise & Maintenance. Details of the restrictions on their use are contained in the "Terms and Conditions" for all Aircraft Operators.

The Airport shall ensure as far as reasonably practicable that the auxiliary power unit of any aircraft will not be used except for essential conditioning of the cabin and equipment prior to departure. The Airport requires that the use of auxiliary power units is limited to a maximum of 10 minutes before departure from the stand except under exceptional circumstances, such as during adverse weather conditions, or where no serviceable GPU provision has been provided by the authority Any such exceptional usage shall only be permitted following a request for and receipt of approval from the Airport.

The use of APU's on arrival is not normally required except when a technical fault gives rise to a request to the Airport for continued use of the APU on arrival on the stand.

The Airport will determine all current aircraft operational at the Airport which require the essential use of APUs. This information will be submitted to the local authority for approval for the continued APU operation of the identified aircraft.

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The Airport operates fixed electrical ground power at Stands 1-10 and Stand 15 (Jet Centre). The Airport will continue to work towards installing fixed electrical ground power at aircraft stands. ***In any event, fixed electrical ground power will be installed at each new or altered stand before it comes into use at LCA (as part of CADP1)*** Where fixed ground power is not available to an aircraft, mobile ground power units (MGPUs) shall be used and a record of their noise output made available for inspection to the Council. The Airport will seek to reduce noise produced by MGPUs by encouraging the use of newer, quieter models and ensuring that the time in use is kept to a minimum. All new or replacement MGPUs must meet the noise requirements set down in the IATA Airport Handling Manual or other such guidelines as may be relevant or issued from time to time modifying extending or replacing those within the IATA Manual.

In compliance with CADP1 Condition 46, no Mobile Ground Power Unit shall be used anywhere within the Airport after 31st December 2020. Up to and including 31st December 2020 Mobile Ground Power Units shall only be used during, and in the period 30 minutes before and the period 30 minutes after the permitted take-off and landing times set out in CADP1 Condition 17.

H.3 Reporting

Each year on 1 June (or the first working day thereafter) and as part of the Annual Performance Report, a report shall be submitted containing details of the use of Auxiliary Power Units at the airport in the previous calendar year.

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Definitions:

- Fixed electrical ground power
  FEGPs as they are known are ground power systems installed to supply 400Hz electrical power to aircraft on Stands 1-10 and Stand 15. The current system comprises of converters and distribution panels located adjacent to the terminal building. Cables in a pit and duct system transfer power to ISO (International Standardisation Organisation) pits located adjacent to the aircraft nose wheel. FEGP systems can reduce the amount of ground handling equipment required on a stand during aircraft turnaround and are more efficient than diesel driven mobile units.

- Auxiliary power unit
  An **Auxiliary Power Unit** (**APU**) is a device whose purpose is to provide energy for functions other than propulsion. The primary purpose of an aircraft APU is to provide power to start the main engines. APUs also have several auxiliary functions. Its power is used to run the heating, cooling, and ventilation systems prior to starting the main engines. This allows the cabin to be comfortable while the passengers are boarding without the expense, noise, and danger of running one of the aircraft's main engines.

- Mobile Ground power unit
  A **Mobile Ground Power Unit (MGPU)** is a vehicle capable of supplying power to aircraft parked on the ground, making it even easier to supply electrical power to aircraft. All aircraft require 28V of direct current and 110V 400 Hz of alternating current. The electric energy is carried from a generator to a connection on the aircraft via 3 phase 4-wire insulated cable capable of handling 200 amps. These connectors are standard for all aircraft.

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APPENDIX I REVERSE THRUST

The use of reverse thrust on the landing roll should 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 will be investigated by way of reference to noise data collected at NMT 7 by the Airport and a report generated by the Airport.

A description of the events for which a report has been generated by the Airport for the period relating to the immediately preceding quarter year shall be submitted to the London Borough of Newham Council within 30 days of the following dates: 1 January, 1 April, 1 July and 1 October.

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APPENDIX J SOUND INSULATION AND PURCHASE SCHEME

J.1 SOUND INSULATION

LCA are required to mitigate the impact of environmental noise on residential premises and public buildings as a result of Airport operations. The Sound Insulation Scheme offers the communities living close to the Airport within the Scheme boundaries the opportunity to treat their homes and community buildings against noise.[16]

The Airport currently operates a sound insulation scheme comprising a two tier system. Residential and Public Buildings become eligible under the scheme, subject to when they were built, when first exposed to air noise at the First Tier Eligibility Criterion of 57 dB $L_{Aeq,16h}$. Additional mitigation is offered at air noise exposure levels of 66 dB $L_{Aeq,16h}$.

As part of the CADP1 development, the Airport will improve the first tier of works, introduce an intermediate tier of treatment, and also upgrade the second tier to further protect those Residential and Public Buildings most affected by noise. The enhanced sound insulation scheme under CADP1 for Residential Buildings is summarised below.

[16] The full details of the Scheme (with CADP1) are documented within Annexures 2, 7 and 12 of the Section 106 Agreement dated 27th April 2016. A summary of the existing scheme (documented in the Fourth and Ninth Schedules of the Section 106 Agreement dated 9 July 2009) and the upgraded scheme that is to be introduced as part of the CADP1 development is provided below.

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Current and Proposed (CADP1) Sound Insulation Schemes – Residential Buildings

Scheme	Threshold $L_{Aeq,16h}$	Enhanced Scheme under CADP1
First Tier	57 dB	100% costs of secondary glazing ***or 100% costs of DG*** to existing single glazed properties. Acoustic vents
Intermediate Tier	63 dB	***Secondary glazing and acoustic vents or*** ***£3000 towards HPDG and acoustic vents***
Second Tier	66 dB	***100% costs of secondary glazing or HPDG*** in place of only a contribution to HPDG. Acoustic vents

DG – Standard thermal double glazing, HPDG – High (Acoustic) Performance double glazing

The first tier of works will be improved by ensuring any existing single glazed properties that are eligible under the scheme will be offered 100% of the cost for replacement standard thermal glazed windows or secondary glazing, whichever is preferred. Currently, only secondary glazing and acoustic vents are available to these single glazed properties. Residential premises in general will continue to be offered sound attenuating ventilators (acoustic ventilation) to provide background ventilation without the need to open windows.

Under the new intermediate tier works, for those residential properties that are already or become exposed to air noise at a level of 63 dB $L_{Aeq,16h}$, an offer of secondary glazing and acoustic ventilation will be made or alternatively, a contribution of £3,000 towards high performance acoustic double glazing and acoustic vents. Under this scheme, residents who prefer the high performance double glazing option may choose to treat only one or two rooms, such as those most affected by aircraft noise, as opposed to all rooms, to remain within the £3,000 budget available or they may use the £3,000 as a contribution towards more extensive works. Furthermore, this additional tier of works will be eligible to all existing dwellings exposed currently to 63 dB or more as well as any existing dwellings that come into the eligibility noise contour in the future.

For those most affected, that is those that become exposed to air noise at the Second Tier Eligibility Criterion of 66 dB $L_{Aeq,16h}$, they are currently offered improved secondary glazing or a

monetary contribution of equivalent value towards high acoustic performance thermal double glazing, together with acoustic ventilation. ***The Airport is to enhance the scheme to offer improved secondary glazing or a 100% contribution towards high performance double glazing, together with acoustic ventilation. This will ensure that all of those most affected by noise are afforded the maximum noise protection opportunity.*** The Airport will also inspect any previous treatments and rectify any damage caused by reasonable wear and tear.

The eligibility contours are currently produced every year as part of the Annual Performance Report. The scheme is delivered to eligible properties in accordance with a timescale agreed with the local authority and set out in detail in the current Section 106 agreement. ***Second Tier and Intermediate Tier properties that are exposed to higher levels of noise will be treated as a priority in the new scheme.***

If an urgent need arises for installations in eligible properties closest to the Airport (within the 63 and 66 dB contours) that have not been treated but have already accepted an offer of works, the Airport shall target the following response times for installation:

- 1 month for double glazing (from complaint received to installation)
- 21 day for secondary glazing
- 1 week for ventilation units.

Properties that are being prioritised will be tracked and managed on a case-by-case basis. Urgency will be based on factors such as which contour they sit in, occupant's sensitivity and current level of insulation.

The noise contours are produced annually (using actual summer-period operational data), compliant with approved European calculation methodology. The noise contours are used, along with information on when the properties were built, to determine eligibility for sound insulation treatment.

The sound insulation requirements of all public buildings in community use within the 57, 63 and 66 dB $L_{Aeq,16h}$ noise contours are to be assessed individually, based on the use of the building, the current and future levels of aircraft noise and recommended internal noise standards, and works agreed as necessary with the local authority.

In addition to the above, all properties that have been treated under the scheme will be inspected on a ten yearly basis after initial installation of any treatment, and provided they have not been altered, rectification works will be carried out as necessary to ensure the sound insulation standard does not decline over time.

Where new properties are granted planning consent within the Airport's noise contours, the Airport will encourage local planning authorities to incorporate published noise contours into decisions on new residential development, with a view to ensuring that acceptable noise levels will be achieved

within new homes and other noise sensitive developments through the use of reasonable, robust and enforceable design standards.

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J.2 PURCHASE SCHEME

Any eligible properties that fall within the 69 dB $L_{Aeq,16h}$ noise 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[17]..

Any properties that are found to lie within the current 69 dB $L_{Aeq,16h}$ noise contour would be identified and contacted in accordance with the Purchase Scheme's requirements.

J.3 REINSPECTION SCHEME

For those eligible residential properties that were treated under the scheme at least 10 years ago, a free inspection is offered and rectification works undertaken where appropriate to ensure that the standard of sound insulation does not decline over time[18]..

[17] The full details of the Scheme are documented within Annexure 5 of the Section 106 Agreement dated 27 April 2016 (with CADP1) and within Part 12 of the Fourth Schedule and Part 14 of the Ninth Schedule to the Section 106 Agreement dated 9 July 2009 (without CADP1).

[18] The full details of the Scheme are documented within Annexure 6 of the Section 106 Agreement dated 27 April 2016 (with CADP1) and Part 1 of the Fourth Schedule to the Section 106 Agreement dated 9 July 2009 (without CADP1).

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APPENDIX K ***13/01228/FUL PLANNING PERMISSION NOISE CONTROL & MITIGATION CONDITIONS (2016)***

No.	Condition Title	Description (Extract)
17	Aircraft Take-Off and Land Times	Except in cases of immediate emergency to an aircraft and/or the persons on board, the Airport shall not be used for the taking off or landing of aircraft at any time other than between: Weekdays 0630 and 2200 hours Monday to Friday; and Bank Holidays and Public Holidays (with the exception of Christmas Day – see condition 27) 0900 and 2200 hours on Bank Holidays and Public Holidays; and Saturdays 0630 and 1230 hours on Saturdays; and Sundays 1230 hours and 2200 hours on Sundays. Provided that these restrictions shall not prevent an aircraft which was scheduled to take off from or land at the Airport but which has suffered unavoidable operational delays, from taking off or landing at the Airport between 2200 and 2230 Sunday to Friday and 1230 to 1300 on Saturday and where that taking off or landing would not result in there being more than 400 Aircraft Movements at the Airport per calendar year outside the above permitted hours of operation comprising no more than 150 such movements in any consecutive three months.
18	Aircraft Noise Categorisation Scheme	a) Prior to the first beneficial use of the Development an Aircraft Noise Categorisation Scheme shall be submitted to and approved in writing by the Local Planning Authority; and b) such an Aircraft Noise Categorisation Scheme shall be implemented as approved and thereafter the Airport shall be operated in accordance with the approved Aircraft Noise Categorisation Scheme or any review thereof that has been approved in writing by the Local Planning Authority; and c) subsequent to implementation of the approved Aircraft Noise Categorisation Scheme (except in the case of immediate emergency to aircraft and/or persons on board), no aircraft shall land at or take off from the Airport unless the type of aircraft has first been categorised in accordance with the approved Aircraft Noise Categorisation Scheme; and d) the Aircraft Noise Categorisation Scheme shall be based on and include (but not be limited to): i. a Quota Count System in use for night noise at other UK designated airports; ii. the use of the Integrated Federal Aviation Authority Integrated Noise Model Version 7 or later version adjusted for the specific characteristics of London City Airport; iii. a Quota Count classification in 1dB steps; iv. a programme of parallel operation with the Noise Factored Scheme; v. an overall Quota Count budget for each calendar year; vi. a maximum permitted noise level or Quota Count classification; and vii. the noise exposure permissible as a result of Quota Count Budget for annual Aircraft Movements, which shall be:

		• *equivalent to 120,000 Noise Factored Movements per calendar year (as determined in accordance with the Noise Factored Scheme set out in Appendix 2);* • *no worse than the airborne aircraft noise effects assessed in the UES; and* • *in accordance with Condition 33 (noise contour area)* *The approved Aircraft Noise Categorisation Scheme will supersede the Noise Factored Movement Scheme, immediately upon the written approval by the Local Planning Authority of the review of the Aircraft Noise Categorisation Scheme after 12 months of its introduction in accordance with Condition 19, and subsequently the total realised Quota Count at the Airport shall not exceed the approved Quota Count Budget in any calendar year.*
19	*Review and Reporting on the Approved Aircraft noise Categorisation Scheme*	*Following implementation of the Aircraft Noise Categorisation Scheme approved pursuant to Condition 18:* *a) a report shall be submitted to the Local Planning Authority annually on 1 June or the first working day thereafter as part of the Annual Performance Report on the performance and/or compliance with the approved Aircraft Noise Categorisation Scheme during the previous calendar year; and* *b) the approved Aircraft Noise Categorisation Scheme shall be reviewed not later than the 1st and 4th year after its introduction and every 5th year thereafter. The reviews shall be submitted to the Local Planning Authority within 3 months of such review dates for written approval and implemented in accordance with an approved timeframe and maintained thereafter.*
30	*Noise Monitoring System*	*The Airport shall operate the Noise Monitoring System referred to in the Noise Management Scheme dated December 2009 for the purpose of:* • *the Aircraft Categorisation Review;* • *producing the noise contours for the Sound Insulation Scheme in accordance with the Federal Aviation Authority Integrated Noise Model Version 7 or later version and as part of the Annual Performance Report; and* • *continuing to provide the noise monitors in the four locations (NMT1, NMT2, NMT3 and NMT4) shown on approved Plan P6, or such alternative equipment and/or locations as shall be approved in writing by the Local Planning Authority are in place and operational provided that such equipment and locations shall be at least as effective for the purposes of monitoring aircraft noise.* *The Noise Management Scheme shall remain in place until such time as the NOMMS is approved and operational pursuant to Condition 31.*
31.	*NOMMS (Noise Management and Mitigation Strategy)*	*Prior to the Commencement of Development a Noise Management and Mitigation Strategy (NOMMS) shall be submitted to the Local Planning Authority for approval in writing. The NOMMS shall be implemented as approved and thereafter the Airport shall only operate in accordance with the approved NOMMS.* *Following implementation of the approved NOMMS, a report shall be submitted to the Local Planning Authority annually on 1 June (or the first working day thereafter) as part of the Annual Performance Report on the performance and compliance with the approved NOMMS during the previous 12 month period. The approved NOMMS shall be reviewed not later than the 5th year*

		after approval and every 5th year thereafter. The reviews shall be submitted to the Local Planning Authority within 3 months of such review dates for approval, and implemented as so approved. *The NOMMS shall include, but not be limited to:* □ *Combined Noise and Track Monitoring System* □ *Quiet Operating Procedures* □ *Penalties and Incentives* □ *Control of Ground Noise* □ *Airport Consultative Committee* □ *Annual Noise Contours* □ *Integrity of NOMMS* □ *Auxiliary Power Units* □ *Reverse Thrust and* □ *Sound Insulation Scheme*
32	*Additional Noise Monitoring Terminals*	*No part of the Development shall be brought into beneficial use unless and until the Noise Monitoring Terminals (NMT) 1 to 6 inclusive as shown on approved Plan P6 are in place and operational or such alternative equipment and/or locations as shall be approved in writing by the Local Planning Authority are in place and operational.* *Thereafter such Noise Monitoring Terminals shall be retained and operated in accordance with details first to be submitted to the Local Planning Authority for approval in writing.*
33	*Fixing the Size of the Noise Contour*	*The area enclosed by the 57 dB(A) LAeq, 16hr Contour shall not exceed 9.1 km^2 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 within 3 months of such review dates and implemented as approved.*
44	*Fixed Electrical Ground Power (FEGP)*	*No Phase of the Development shall Commence until a strategy setting out how existing and proposed aircraft stands will be upgraded to include FEGP has been submitted to and approved in writing by the Local Planning Authority.* *Such approved strategy shall be implemented as approved and retained thereafter. No new or reconfigured Aircraft Stand shall be operational until the FEGP for that stand has been brought into operation.*
45	*Use of Fixed Electrical Ground Power*	*Except in a case of emergency or if faults occur with the FEGP, no aircraft on an operational aircraft stand with Fixed Electrical Ground Power shall use a Mobile Ground Power Unit for conditioning an aircraft prior to engine start-up or for the starting of an aircraft engine.*
46	*Mobile Ground Power Units*	*Except in emergency or if faults occur with the Fixed Electrical Ground Power Units, no Mobile Ground Power Unit shall be used anywhere within the Airport after 31st December 2020. Up to and including 31st December 2020 Mobile Ground Power Units shall only be used during, and in the period 30 minutes before and the*

		period 30 minutes after the permitted take-off and landing times set out in Condition 17.
47	*Auxiliary Power Units*	*The use of any Phase shall not begin until an Auxiliary Power Unit Strategy for that Phase shall be submitted to and approved in writing by the Local Planning authority and implemented.* *The submitted strategy shall include but not be limited to provide details of the position, orientation and use of aircraft before and after landing and taking off including conditioning of the cabin and equipment.* *Except in cases of immediate emergency to persons on board an aircraft, or where fault occurs, no Auxiliary Power Unit shall be used other than for essential conditioning of aircraft cabins and equipment prior to departure limited to a maximum of 10 minutes before an aircraft's departure from the stand or 10 minutes after an aircraft's arrival on the stand.* *Annually on 1 June (or the first working day thereafter) in each year after the Commencement of Development and as a part of the Annual Performance Report, LCA shall provide a report containing details of the use of Auxiliary Power Units at the Airport in the previous calendar year.*
48	*Ground Engine Running Strategy*	*No Development shall Commence until a Ground Engine Running Strategy has been submitted to and approved in writing by the Local Planning Authority.* *The Ground Engine Running Strategy as approved shall be implemented upon Commencement of Development. The Local Planning Authority shall be notified in writing within 14 days of implementation of the Ground Engine Running Strategy.* *A report shall be submitted to the Local Planning Authority annually on 1 June (or the first working day thereafter) as part of the Annual Performance Report on the performance and or compliance during the previous calendar year with the approved targets in the Ground Engine Running Strategy.* *Every 3 years after first implementation the Ground Engine Running Strategy shall be reviewed and the review shall be submitted to the Local Planning Authority for approval on 1 June (or the first working day thereafter) and implemented as approved.* *The strategy shall identify measures to:* • *minimise engine usage while aircraft occupy stands;* • *minimise the duration of engine usage whilst taxiing; and* • *ensure the operators of aircraft at the Airport comply with the approved strategy in order to mitigate as far as practicable the emissions from aircraft engines.*
49	*Ground Running, Testing and Maintenance Strategy*	*No Development shall Commence until a Ground Engine Running Strategy has been submitted to and approved in writing by the Local Planning Authority.* *The Ground Engine Running Strategy as approved shall be implemented upon Commencement of Development. The Local Planning Authority shall be notified in writing within 14 days of implementation of the Ground Engine Running Strategy.* *A report shall be submitted to the Local Planning Authority annually on 1 June (or the first working day thereafter) as part of the Annual Performance Report on the performance and or compliance during the previous calendar year with the approved targets in the Ground Engine Running Strategy.* *Every 3 years after first implementation the Ground Engine Running Strategy shall be reviewed and the review shall be submitted to the Local Planning Authority for approval on 1 June*

		(or the first working day thereafter) and implemented as approved. *The strategy shall identify measures to:* • *minimise engine usage while aircraft occupy stands;* • *minimise the duration of engine usage whilst taxiing; and* • *ensure the operators of aircraft at the Airport comply with the approved strategy in order to mitigate as far as practicable the emissions from aircraft engines.*
50	*Ground Running, Testing and Maintenance*	*Unless in exceptional circumstances, the Ground Running of aeroplane engines for testing or maintenance purposes shall only take place at the following times:* *i. 0630 to 2200 hours Monday to Friday;* *ii. 0630 to 1230 hours on Saturdays;* *iii. 1230 to 2200 hours on Sundays;* *iv. 0900 to 2200 hours on Bank Holidays and Public Holidays (but not at all on Christmas Day); and* • *in such locations and with such orientation of the aircraft as set out in the approved Ground Running, Testing and Maintenance Strategy; and* • *employing such noise protection measures as set out in the approved Ground Running, Testing and Maintenance Strategy;* *provided that the restrictions above shall not prevent aircraft maintenance work taking place outside of these hours where that work will not be audible at the Airport Boundary or at any Sensitive Receptor and provided this restriction shall not prevent Auxiliary Power Unit usage for essential conditioning of aircraft cabins and equipment prior to departure limited to a maximum of 10 minutes before an aircraft's departure from the stand or 10 minutes after arrival on the stand.*
51	*Ground Running Noise Limit*	*The noise level arising from Ground Running shall not exceed the Ground Running Noise Limit.* *Prior to the Commencement of the Development hereby approved a strategy demonstrating how any breach(es) of the Ground Running Noise Limit through Ground Running are to be prevented shall be submitted to and approved in writing by the Local Planning Authority.* *The Strategy as approved shall be implemented upon commencement of use of the Development.*
52	*Ground Running Annual Performance Report*	*The Local Planning Authority shall be provided with the following annually on 1 June (or the first working day thereafter) as part of the Annual Performance Report:* *a) written details of Ground Running that has taken place during the preceding calendar year including details of the number, duration and power setting of ground runs and the types of aircraft involved; and* *b) written measurements and calculations to show whether the Ground Running Noise Limit has been exceeded as a result of Ground Running during the preceding calendar year.*
55	*Ground Noise Study*	*No Phase of the Development shall Commence until a Ground Noise Study has been submitted to and approved in writing by the Local Planning Authority in respect of that Phase.* *Noise mitigation measures identified as being necessary in each Ground Noise Study as approved by the Local Planning Authority shall be provided within six months of obtaining any necessary consents for these identified mitigation measures.*

		Thereafter ground noise studies shall be undertaken at intervals of not less than three years from the date of approval of the first Ground Noise Study. Such additional ground noise studies shall be submitted to the Local Planning Authority within 30 days of their completion. Any necessary mitigation measures identified within those studies shall be implemented as approved.
59	*Complaints About Environmental Impact*	*1) A summary record shall be maintained of all complaints about the environmental impact of the operation of the Airport and any action taken to deal with or remedy such complaints.* *2) A detailed report shall be submitted of all complaints and any action taken:* • *to the Local Planning Authority within 15 days of that complaint being made or that action being undertaken;* • *to the Airport Consultative Committee at the meeting of that Committee next following that complaint or that action; and* • *as part of the Annual Performance Report in relation to such complaints and actions in the preceding calendar year.* *3) Complaint records shall be made available for inspection at all reasonable hours by the Local Planning Authority pursuant to Part 1 of this condition.*

APPENDIX 2
Summary of Current Operational Noise Controls

Table A2.1 below summarises the operational noise controls currently in place at the airport which limit or require certain things. This does not include requirements which are only to record, report, or review.

Control Summary	**Source**
Noise barriers to be installed/retained.	Conditions 6, 53, 54
No aircraft maintenance or repair work, including running of engines for maintenance purposes, to take place outside of: • 0630 and 2200 Monday to Friday inclusive; and • 0630 and 1230 on Saturday; and • 1230 and 2200 on Sunday; and • 0900 and 2200 on Bank Holidays and Public Holidays.	Conditions 8 and 50
Only conventional fixed-wing aircraft can use the airport (i.e. no helicopters).	Condition 14
The Avro RJ100 aircraft type is not permitted to use the airport unless approved in writing by the LPA.	Condition 15
Aircraft can only take-off and land in the following periods: • Weekdays; 06:30-2200 • Saturdays; 06:30-12:30 • Sundays; 12:30-22:00 • Bank and Public Holidays (except Christmas Day); 09:00-22:00 Aircraft scheduled in these times can operate up to 30 minutes later if they have suffered unavoidable delays.	Condition 17
Restrictions on the number of flights permitted in certain periods (e.g. before 07:00) and on individual days. Certain days (e.g. Bank Holidays) have separate limits.	Conditions 17 and 22 to 27
Maximum certificated noise limits for aircraft to be permitted to operate.	ANCS AOD (Required by Condition 18)
Quota Count (QC) scheme to control 'total noisiness' of aircraft with limits on the total daily, weekly and annual QC.	
Overall limit of 111,000 aircraft movements per calendar year.	ANCS AOD and Condition 23
Incentives and Penalties Scheme and Community Project Fund which fines the noisiest aircraft and ranks airlines and aircraft types by noise performance.	NOMMS AOD (Required by Condition 31)

Various noise contours to be produced to inform eligibility for insulation schemes. Validation of noise contour methodology to be undertaken every 3 years.	NOMMS AOD and S106
NMTs 1-6 to be retained and operational.	Condition 32
Area of 57 dB $L_{Aeq,16h}$ noise contour not to exceed 9.1 km^2. To reduce by 2030.	Condition 33
Ground power to be supplied by FEGP or battery-powered MGPUs or equivalent (i.e. no diesel-powered MGPUs). (note – different wording in NOMMS as strategy has been updated)	NOMMS and Ground Power Strategy AOD (Required by Condition 44)
Diesel-powered MGPUs not to be used by aircraft on stands except in cases of emergency or if a fault occurs. (note – different wording in NOMMS as condition has been updated)	NOMMS and Conditions 45 and 46
APUs to only be used when essential, limited to 10 minutes before departure from stand or 10 minutes after arrival on stand.	NOMMS and APU Strategy AOD (Required by Condition 47)
Ground engine running to be undertaken with the minimum amount of power and for the minimum amount of time as practically possible while aircraft on stands, taxiing or holding.	NOMMS and Ground Engine Running Strategy AOD (Required by Condition 48)
If time spent running engines on stands, taxiing on departure or taxiing on arrival is above specified thresholds then the airline to be contacted to explain.	Ground Engine Running Strategy AOD (Required by Condition 48)
Duration of high power engine runs to be kept to a minimum and to generally take place on eastern-most stand in operation. They are also permitted on stands further west up to Stand 24 where this is operationally preferable.	NOMMS and Ground Running, Testing and Maintenance Strategy AOD (Required by Condition 49)
Ground running noise limit not to be exceeded.	Condition 51

If ground running noise limit is approached (within 1 dB), measures to be submitted to LBN for approval to ensure limit not exceeded.	NOMMS and Ground Running Noise Limit Strategy (Required by Condition 51)
Measurements to be undertaken every 3 years to check noise levels of high power ground runs.	Ground Running Noise Limit Strategy (Required by Condition 51)

Table A2.1: Current Noise Controls