

LONDON CITY AIRPORT
QUARTERLY NOISE REPORT
OCTOBER - DECEMBER 2018

Report to

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Contents	Page No.
1.0 Introduction.....	3
2.0 Aircraft Movement Numbers.....	4
3.0 Aircraft Noise Categorisation Scheme (ANCS) Quota Count System	5
4.0 Noise Management And Mitigation Strategy (NOMMS)	11
5.0 Ground Engine Running.....	21
Appendix 1: Extract From Planning Conditions	
Appendix 2: Number of Aircraft Operating at LCA	
Appendix 3: Derivation of Departure and Arrival Level for Quota Count Assessment	
Appendix 4: Quota Count Daily Totals	
Appendix 5: NMT Status by Date	
Appendix 6: Penalties and Incentives	
Appendix 7: Summary of Reverse Thrust Noise Levels	
Appendix 8: Summary of EFPS Data	

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1.0 INTRODUCTION

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

Contained within that permission are a number of planning conditions imposed on London City Airport (LCA) with requirements to report quarterly. They are in summary:

- Conditions 17 and 21 to 27: Aircraft movement limits
- Condition 18: Aircraft Noise Categorisation Scheme (ANCS) Quota Count System
- Condition 31: Noise Management and Mitigation Strategy (NOMMS)
- Condition 48: Ground Engine Running Strategy

This report fulfils the reporting requirements for the above conditions for the fourth quarter of 2018. Additionally, this report contains a report on the status of the Noise and Track Keeping (NTK) system, as requested by the London Borough of Newham (LBN).

2.0 AIRCRAFT MOVEMENT NUMBERS

Conditions 17 and 21 to 27 of the CADP1 planning permission, which are reproduced in Appendix 1, detail the maximum number of actual and noise factored movements that are permitted at the airport.

All aircraft operating at LCA are required to be categorised by their departure noise levels into one of five noise categories. Only aircraft which have been approved by LBN and have been categorised in this manner, provisionally or otherwise, are permitted to land or depart the airport (excepting emergencies).

The 2016 planning permission allows up to 111,000 total aircraft movements per annum, including both scheduled and general aviation aircraft. The planning permission also contains specific limits on daily and weekly movements, as well as limits on the numbers of noise factored movements.

The airport also records the numbers and types of aircraft that use the airport daily and submits aggregate figures to LBN on a quarterly basis for information purposes. The daily records for the number of aircraft movements and noise factored movements in the fourth quarter of 2018 are presented in Appendix 2, where they are compared with the relevant daily, weekend and weekly limits.

Appendix 2 also presents the number of aircraft movements that took place each day during the restricted early morning periods of 06:30 to 06:44 and 06:30 to 06:59, during the late operating period of 22:00 to 22:30 on weekdays and Sundays and from 12:30 to 13:00 on Saturdays.

The data shows that throughout the fourth quarter of 2018, LCA has operated within its planning consent in regard to the number of daily and weekend aircraft movements, including those during early morning and late evening periods, as well as weekly noise factored movements.

3.0 AIRCRAFT NOISE CATEGORISATION SCHEME (ANCS) QUOTA COUNT SYSTEM

Condition 18 requires a new Aircraft Noise Categorisation Scheme (ANCS) to be submitted and approved to the Local Planning Authority (LPA) prior to the first beneficial use of the development. The ANCS was approved in December 2017 and implemented in January 2018. The ANCS will supersede the Noise Factored Scheme that is currently in place at the airport following approval by the London Borough of Newham of the review of the ANCS after 12 months of its introduction. This review has been submitted by LCA and is currently being considered by LBN. No significant changes to the ANCS are currently proposed as part of the review.

The ANCS comprises a Quota Count system as well as a maximum permitted noise level for aircraft based on their noise certificate. Each aircraft has a certificated 'sideline', 'flyover' and 'approach' noise level. These are described in Appendix 3 and are used to determine whether or not an aircraft is permitted to operate at the airport. The ANCS is being run in parallel with the previous scheme (the Noise Factored Scheme) for the first year of its operation.

The ANCS states that *"A report on the ANCS shall be submitted to LBN and the London City Airport Consultative Committee (LCACC) on a quarterly basis which sets out the daily and weekly quotas attributable to the actual aircraft movements at the airport. The values will be compared with the permitted weekly and annual quota budgets (refer to Section 2.5) to identify if and when any limits are approached or exceeded."*

This section forms the aforementioned quarterly report for the fourth quarter of 2018.

The ANCS uses a Quota Count (QC) classification system which, in the case of departure noise, is based on official noise certification data derived from measurements made on actual aircraft which have been conducted in accordance with the International Civil Aviation Organisation (ICAO) certification process.

A similar noise certification process exists for civil aircraft on approach, but this is normally based on operations at a glide slope of 3 degrees, not 5.5 degrees as used at LCA. To account for this difference, aircraft noise modelling software (INM)¹ has been used to compute, at the approach noise certification point, the noise level based on a 5.5 degree glide slope using the INM in-built aircraft database. Whereas this method provides a reasonable correlation with measurements of turbofan aircraft at LCA, it does not reflect well the noisiness of turboprop aircraft on approach. As a result, measured data at LCA has been used to validate the

¹ Integrated Noise Model (INM) Version 7.0d, developed by the Federal Aviation Administration (FAA)

turboprop aircraft types within the INM software to achieve a reasonable correlation between prediction of approach noise at the noise certification point and measurement.

The ANCS takes manufacturers' departure noise certification data and approach data determined as described above to categorise aircraft and allocate a specific 'QC score' to each aircraft type permitted to fly into and out of the airport.

Each aircraft in operation at the airport is allocated a separate QC score (or 'count') for arrival and departure operations, based on its certificated noise levels (adjusted to reflect the approach glide slope used at LCA), and categorised into 1 dB bands (rather than 3 dB bands under the previous Noise Factored Movements (NFM) system). As an example, the ANCS would allocate 1 'count' to one aircraft departure or arrival in a noise band range of 91.0 dB to 91.9 dB and 0.1 'counts' to a quieter aircraft departure or arrival in a noise band range of 81.0 dB to 81.9 dB.

The QC classification bands are set out in Table 1 below:

Noise Level Band ² , EPNdB	Quota Count (QC) Classification	Noise Level Band ² , EPNdB	Quota Count (QC) Classification
94 – 94.9	2	80 – 80.9	0.08
93 – 93.9	1.6	79 – 79.9	0.063
92 – 92.9	1.25	78 – 78.9	0.05
91 – 91.9	1	77 – 77.9	0.04
90 – 90.9	0.8	76 – 76.9	0.0315
89 – 89.9	0.63	75 – 75.9	0.025
88 – 88.9	0.5	74 – 74.9	0.002
87 – 87.9	0.4	73 – 73.9	0.016
86 – 86.9	0.315	72 – 72.9	0.0125
85 – 85.9	0.25	71 – 71.9	0.01
84 – 84.9	0.2	70 – 70.9	0.008
83 – 83.9	0.16	69 – 69.9	0.0063
82 – 82.9	0.125	68 – 68.9	0.005
81 – 81.9	0.1		

Table 1: Aircraft Noise Classifications

(NB. This classification system is a modification and extension of that operated by the designated airports in their Night Noise Quota Count System)

3.1 Derivation of Noise Certification Levels - Departures

Under regulations laid out by the European Commission³, all aircraft of the types used at LCA are required to hold a certificate that sets out the departure noise certification levels for the aircraft and states the weight at which the aircraft was certified.

Noise certification data for a given aircraft type can exist at a variety of different take-off weights. In addition, some aircraft of a given type are fitted with (quieter) modifications, such as new engines or winglets, and are certificated accordingly.

² The grey noise bands are presented for information purposes only as no aircraft would be permitted to commence operations at LCA within these noise bands as a result of a need to comply with the noise certification level limits within the scheme.

³ Commission Regulation (EU) 748/2012

Noise certificates have been provided by LCA for the majority of aircraft that operated during the fourth quarter of 2018. However, certificates are not available for all aircraft. As a result of this, the selection of noise certification levels for an individual aircraft has been based on:-

- i. the sideline and flyover departure noise values set out on the noise certificate for the individual aircraft; or
- ii. the values set out in the EASA⁴ database for the specific aircraft type⁵ accounting for the permitted Maximum Take-Off Weight (MTOW) of that aircraft at LCA. If no entry in the database is available for the specific aircraft at this MTOW, the entry for the next highest MTOW has been used, or, and only under exceptional circumstances,
- iii. evidence presented to LBN 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.

Appendix 3 sets out how to derive the Departure Noise Level from the sideline and flyover noise certification values to enable a QC classification to be derived from Table 1.

3.2 Derivation of Noise Certification Levels - Arrivals

The INM software is used to predict the noise generated by an aircraft on arrival at LCA and contains an in-built database of aircraft types, flight, thrust and noise parameters. This database of information has been developed in consultation with aircraft manufacturers.

The approach noise level for a given type of turbofan aircraft is derived by modelling with a glide slope of 5.5 degrees using the INM software, at the approach noise certification point described in ICAO Annex 16⁶. The resulting value is equivalent to the noise certification level for that given turbofan aircraft type for a 5.5 degrees approach.

The approach noise level for a given type of turboprop aircraft is derived by firstly adjusting the noise profile of the most appropriate aircraft type within the INM software to best match the approach noise level measured at LCA during a 5.5 degree approach. This aircraft type is

⁴ 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].

⁵ This relates to the noise certification levels given for the aircraft at a MTOW in the EASA database that equals the average of the maximum take-off weights specified for that aircraft type. If no entry is available, the noise certification levels for the next highest MTOW is to be used.

⁶ Annex 16 to the Convention on International Civil Aviation, Environmental Protection, Volume 1, Aircraft Noise

then modelled with a glide slope of 5.5 degrees using the INM to derive the noise value at the approach noise certification point described in ICAO Annex 16⁶. This resulting value is used as the approach noise certification level for that given turboprop aircraft type for the purposes of quota count classification.

Appendix 3 sets out how to derive the Arrival Noise Level from the approach noise level to enable a QC classification to be derived from Table 1.

3.3 Quota Count Assessment

3.3.1 Quota Count Period

The quota count period applies throughout the operational hours of the airport as specified in the airport's entry in the UK AIP⁷. For the purposes of an annual assessment of the quota count and quota, the calendar year shall apply.

3.3.2 Budget

LCA are required to operate within an overall noise quota budget as set out in the ANCS, which limits the number of annual flight movements. Each aircraft landing or taking-off counts towards the overall quota budget at the airport. The noisier the aircraft type, the higher its QC score and the more it counts towards the total budget, resulting in fewer permitted flights within the limit. The use of 1 dB bands means that a small reduction in noise levels may result in a lower QC score, thereby incentivising the use of quieter aircraft.

Performance against the quota budget is calculated by multiplying the number of departures and arrivals by the respective QC scores for an aircraft and adding together the totals for each aircraft type using the airport.

All aircraft operating at LCA are included in the quota, other than those engaged in training, aircraft testing and/or evaluation.

The quota budget is:

- i) 22,000 per calendar year; and
- ii) 742.5 in any one week

The total quota count for each week or year is determined based on the schedule of actual aircraft movements for the year and established QC scores. The results are compared against

⁷ The UK Aeronautical Information Package, NATS Aeronautical Information Service

LCA's permitted noise quota budget as specified in i) and ii) above. The total quota count for the year is assessed as part of the airport's Annual Performance Report (APR). This report compares the results for each week in the fourth quarter of 2018 with the appropriate limit.

3.3.3 2018 Q4 QC Assessment

The QC score has been calculated for each aircraft movement during the fourth quarter of 2018. Totals for each day and week are presented in Appendix 4. These show that the airport has operated within its quota budget of 742.5 per week during this period.

Also presented in Table 2 below is the total QC score for the last 12 months, broken down by quarter. This shows that the airport has operated within its quota budget of 22,000 for 2018.

Period	QC Total
Jan-Mar 2018	3693.248
Apr-Jun 2018	4084.606
Jul-Sep 2018	3971.863
Oct-Dec 2018	3831.474
Jan-Dec 2018	15581.191

Table 2: Summary of QC Total, Jan 2018 – Dec 2018

4.0 NOISE MANAGEMENT AND MITIGATION STRATEGY (NOMMS)

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”*

The NOMMS which addresses the above requirements was formally approved by the London Borough of Newham (LBN) on 18 May 2017 and has been in operation since then.

This section reviews the performance and compliance with the NOMMS in the fourth quarter of 2018, as part of the Condition 31 requirements.

4.1 Combined Noise and Track Monitoring System

Prior to the implementation of NOMMS, under paragraph A6.0 of the approved Temporary Noise Monitoring Strategy, the airport was required to provide quarterly reports on the status of the Noise and Track Keeping (NTK) system to the Local Planning Authority. Each report was required to record the daily operational status of each Noise Monitoring Terminal (NMT) together with the total monthly correlation rate of noise events to aircraft departures over a specified quarter year period.

Although no longer a planning condition, at the request of the London Borough of Newham (LBN), the airport have agreed to continue providing these reports, and also to include the new corresponding information for NMTs 5 & 6 from the fourth quarter of 2017.

A summary of the status of each Noise Monitoring Terminal (NMT) for the fourth quarter of 2018 is given in Table 3 below. A detailed log is given in Appendix 5 showing whether each NMT was operational on a daily basis.

During this quarterly period, all 6 NMTs were operational, and data was received on each day, with the exception of 28th November. On this date at NMT 2 there was an empty ethanol canister which meant that only solar power could be used. This caused intermittent issues until it was replaced on 6th December, although after 28th November some measurements were recorded on each day.

NMT	Calibration	Data
1	OK	Data received on all days
2	OK	Data received on all days except 28 November
3	OK	Data received on all days
4	OK	Data received on all days
5	OK	Data received on all days
6	OK	Data received on all days

Table 3: Summary of NMT Status, 2018 Q4

A summary of the level of correlation for each month is given in Table 4 below. In order to subsequently calculate the rate of correlation, the number of aircraft movements correlated has been compared against the number of operations at London City Airport during the same period. It has been assumed that the number of arrivals and departures each constitute fifty percent of the total number of operations.

Month	No. Operations	No. Correlated Departures (Sideline)	No. Correlated Departures (Flyover)	No. Correlated Arrivals
October	7,236	3,596	3,537	3,554
November	6,854	3,201	3,253	3,334
December	5,942	2,798	2,841	2,762

Table 4: Summary of Correlated Aircraft Movements, 2018 Q4

The target correlation rate (80%) at NMTs 1-4 for departures was met for the fourth quarter of 2018. A total of 9,595 aircraft departures were recorded, and an average correlation rate of noise events to aircraft departures of 96% was achieved.

In the fourth quarter of 2018, a total of 9,631 (96%) departures and 9,650 (96%) arrivals were correlated at NMTs 5 and 6.

4.2 Flight Track Monitoring

The airport are required to maintain a log of 'off track' departures that do not stay within a certain distance of the agreed routes, with the aim of working towards achieving at least 95% of all departures within agreed swathes.

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, analysis has been carried out on the tracks flown in the fourth quarter of 2018 in order to identify any aircraft which appear to be 'off track'. The results of this analysis are presented in this section.

Figure 1 shows a heat map of all departures from LCA during the fourth quarter of 2018. The colour of each tile represents the number of aircraft that passed through it. The blue tiles represent the lowest frequency of departures and the red tiles represent the highest, as per the key in the bottom left of the image.

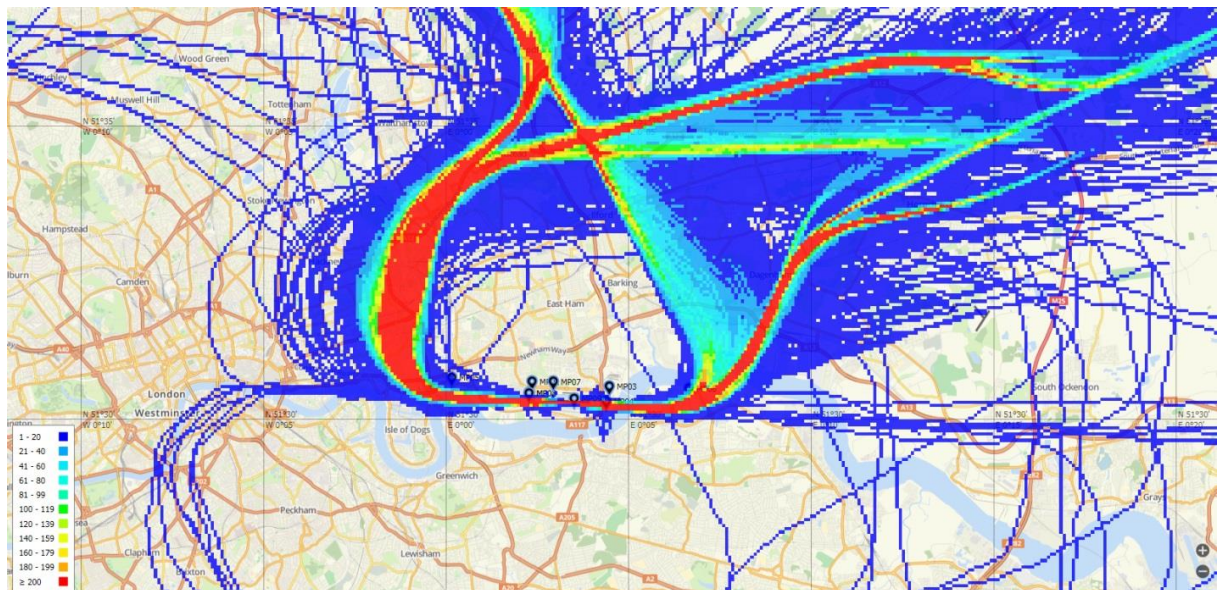


Figure 1: Departure Heat Map, 2018 Q4

4.2.1 Runway 27 Departures

Departures using runway 27 initially go straight before turning right (northwards) to head in a northerly or easterly direction. All Standard Instrument Departures (SIDs) follow the same route initially. To illustrate the spread of aircraft departing from runway 27 during the fourth quarter of 2018, Figure 2 illustrates the track plot.

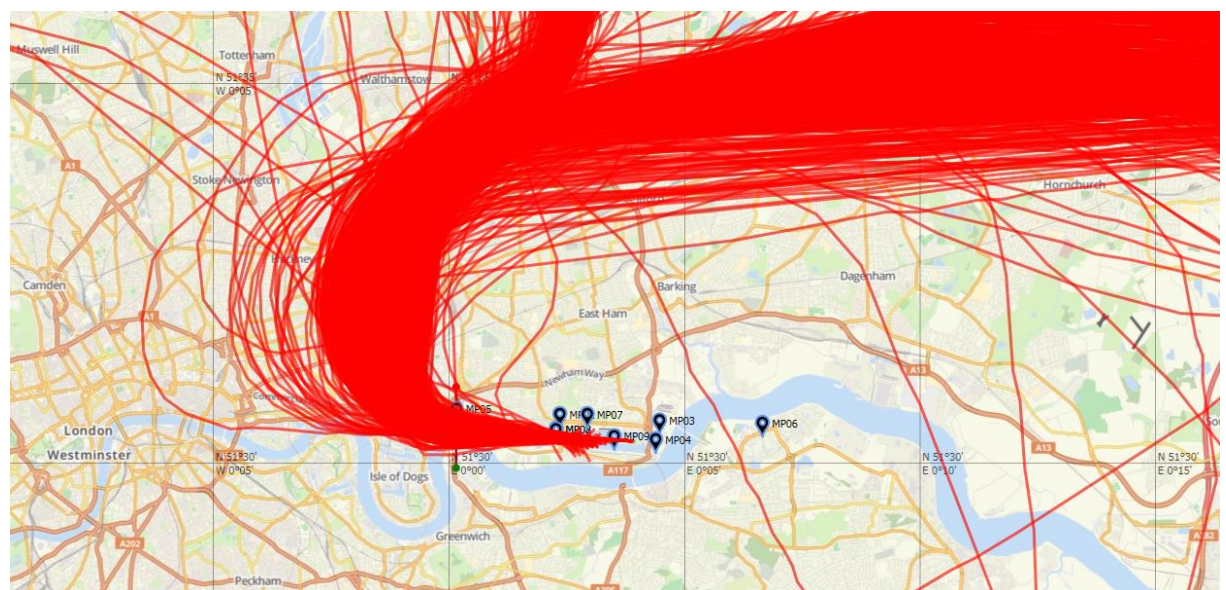


Figure 2: Runway 27 Departure Track Plot, 2018 Q4

A gate has been set up in the track keeping system at the location of NMT 5. The gate is 2 km wide and is shown in the above figure. The middle of the gate has been set up to coincide with the extended centreline of the runway.

Only one departure failed to pass through the gate, which is detailed in Table 5 below. This aircraft passed slightly to the north of the gate.

Date	Departure Time	Aircraft Type	Airline	SID
20/10/2018	10:26	RJ85	BCY	BPK

Table 5: Runway 27 Off Track Departures, 2018 Q4

A number of KLM aircraft continue to take a wide track when turning right, as was the case in 2018 Q2 and Q3. KLM are having procedural issues with the implementation of the RNAV procedure and have currently reverted to the historical procedure which results in a wider spread of aircraft. This issue is due to be fixed shortly.

4.2.2 Runway 09 Departures

Departures using Runway 09 initially go straight before following departure routes that diverge soon after departure depending on which SID is being followed. There are two distinct initial routes; the DVR, CLN and LYD SIDs turn towards the north-east whereas the BPK and CPT SIDs turn towards the north west soon after departure. For the purpose of this analysis, these have been split into two separate track plots in Figure 3 and Figure 4.

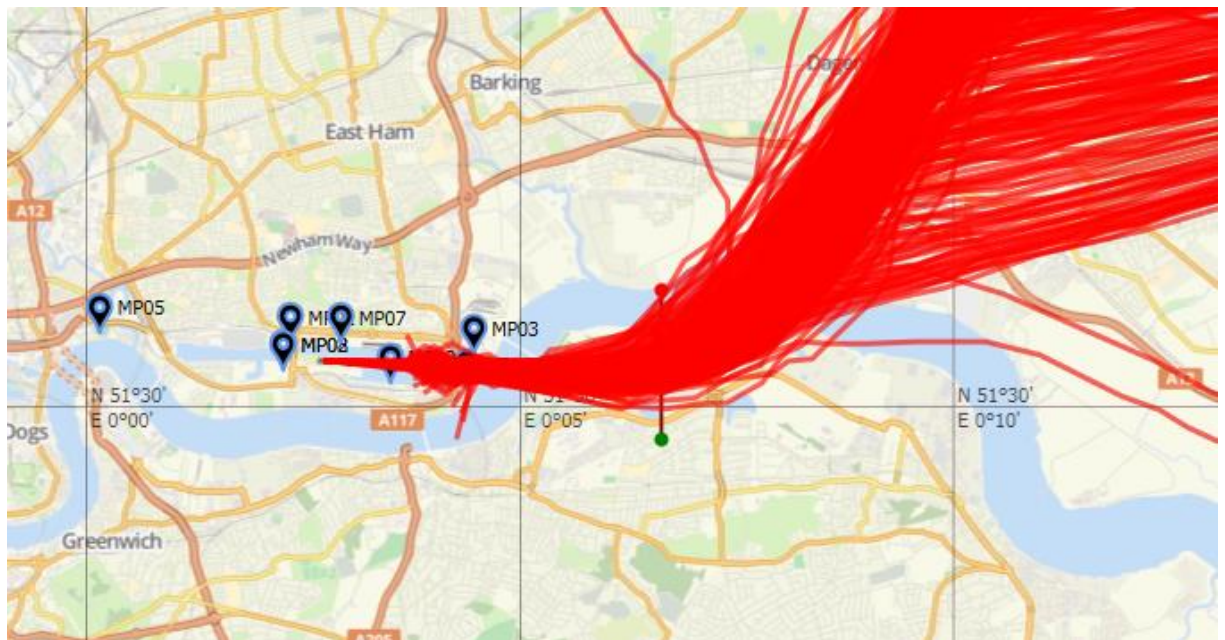


Figure 3: Runway 09 Departure Track Plot for 2018 Q4 – DVR, CLN and LYD SIDs

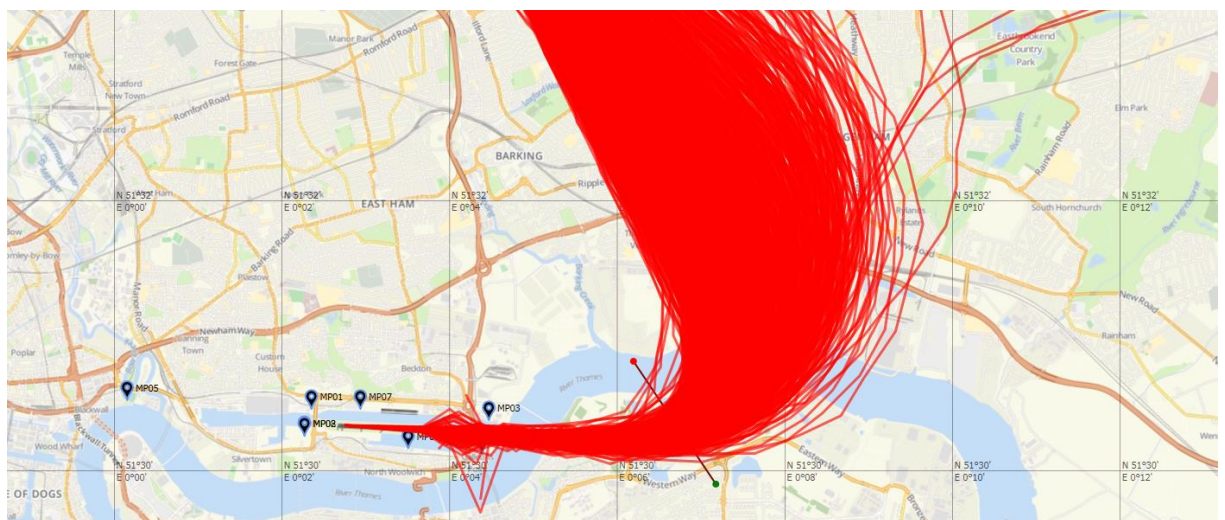


Figure 4: Runway 09 Departure Track Plot for 2018 Q4 – BPK and CPT SIDs

For the DVR, CLN and LYD routes, a gate was established at the location of NMT 6. The gate is 2 km wide and set up to coincide with the extended centreline of the runway, similar to the corresponding gate at NMT 5. All aircraft passed through this gate during the fourth quarter of 2018.

For the BPK and CPT routes, aircraft commence a turn as they track over NMT 6, so a 2 km wide gate was established prior to the turn commencing. All aircraft passed through this gate during the fourth quarter of 2018.

4.3 Incentives and Penalties Scheme

The NOMMS includes a new Incentives and Penalties Scheme (IPS) to include financial penalties for noisy departures (following a review after its first year of operation). In addition the IPS includes thresholds for the award and removal of “Credits” based on departure noise levels. The new IPS was implemented on 18 August 2017 and is intended to introduce a more equitable approach to determining penalties and credits including the use of the two new fixed noise monitors (NMTs 5 and 6) at either end of the runway to monitor departure noise levels. The IPS focuses on incentivising quieter operation of aircraft on departure and penalising noisy departures.

The airport is setting up an annual Community Trust Fund of £75,000 and the most improved airline each year will partner the airport delivering the fund. Following the completion of the review of the scheme after a year of operation, as of 1st November 2018 the IPS will charge financial penalties of £600 per dB(A) above a fixed upper limit for each movement that exceeds the upper limits. The financial penalties will top up the annual funds.

Following the review of the scheme, the fixed penalty limits for the sideline NMTs (1-4) have been removed, the fixed penalty limits for both turbofan and turboprop aircraft at NMT 5 have been lowered (i.e. made more stringent) and the credit award thresholds for turboprop aircraft at NMTs 5 and 6 have been lowered (i.e. made more stringent).

The scheme works as follows:

- The flyover noise level for a given departure is defined as the $L_{Amax,s}$ noise level measured at the relevant NMT (NMT 5 for runway 27 departures, and NMT 6 for runway 09 departures).
- The measured noise levels are compared with the thresholds given in Table 6.
- If the Fixed Penalty Limit is exceeded, the airline responsible is fined £600⁸ per dB(A) of exceedance, and one credit point is removed from the airline’s credit account.
- If the Fixed Penalty Limit is not exceeded, but the Credit Removal Threshold is exceeded, one credit point is removed from the airline’s credit account.

⁸ Fines were not payable prior to 1st November 2018

- If the Credit Award Threshold is not exceeded, one credit point is added to the airline's credit account.
- An airline may avoid a fixed penalty or credit removal for a particular flight, if they are able to provide a reasonable explanation for the noisy departure. Each exceedance event is considered on a case by case basis to establish whether or not a penalty or credit removal is applied.
- An airline's credit account is reset to zero at the beginning of each calendar year.
- The current penalty and credit limits (noise levels) are set out in Table 6 below.

Threshold Description	Aircraft Category	Flyover Noise Level, dB L _{ASmax}	
		Runway 09	Runway 27
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
N.B. All noise limits are expressed as dB L_{ASmax}

Table 6: IPS Fixed Penalty Noise Limits and Credit Thresholds

Appendix 6 of this report gives the number of fixed penalties, credit removals and credit awards for the fourth quarter of 2018, split by airline and aircraft type. A summary of the total number and value of penalties, credits removals and credit awards which have been accrued is given by month in the table below.

Month	Fixed Penalties (# aircraft)	Fixed Penalties (total value)	# Credits Removed	# Credits Awarded
October	0	£0	18	297
November	1	600	32	317
December	0	£0	16	233
Total	1	600	66	847

Table 7: Monthly Penalties, Credit Removals and Credit Awards, 2018 Q4

4.4 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.

A new requirement as part of the CADP1 planning consent is that any instance of unusual or excessive use of thrust reversers will be investigated by the airport and a report generated. This will make reference to noise data collected at NMT 7, which has been installed for this purpose.

Noise events at NMT 7 are triggered by arriving aircraft. These are then correlated with the aircraft movement data. Many of these noise events are caused by arrivals which did not use reverse thrust, particularly those using runway 09. The loudest events are investigated to determine whether there were cases of unusual or excessive use of reverse thrust. When this is found to have been the case, the airport will contact the airline and seek an explanation in order to minimise future occurrences.

BAP carried out a review of the NMT 7 data collected for the 12 month period from July 2017 to June 2018 in order to determine a suitable noise threshold above which events will be investigated. This has been defined as 88 dB $L_{A_{Smax}}$ for runway 09 arrivals and 90 dB $L_{A_{Smax}}$ for runway 27 arrivals.

10 aircraft arrivals exceeded these thresholds at NMT 7 in the fourth quarter of 2018. Details of these are presented in Table 8.

Date	Arrival Time	Runway	Aircraft Type	Airline	NMT 7 Noise Level, dB L _A max
09/10/2018	06:38:00	27	A318	BAW	91.2
11/10/2018	15:23:00	27	FA8X	GXI	91.1
11/10/2018	15:48:00	27	DH8D	LGL	93.1
13/10/2018	06:34:00	27	A318	BAW	92.3
08/11/2018	06:32:00	27	A318	BAW	90.4
10/11/2018	06:41:00	27	A318	BAW	90.7
14/11/2018	06:32:00	27	A318	BAW	90.2
29/11/2018	06:47:00	27	A318	BAW	94.1
02/12/2018	13:27:00	27	E135	ABP	90.1
04/12/2018	06:32:00	27	A318	BAW	91.7

Table 8: Log of Potentially Unusual or Excessive Reverse Thrust Use, 2018 Q4

LCA have contacted the airlines involved and received the following responses:

- BAW advised that when there are adverse conditions, such as the runway being wet, then the A318 aircraft requires the use of reverse thrust for safety reasons.
- LGL advised that reverse thrust was required for safety reasons on the flight that triggered the high noise level, but that it is not typically used.
- ABP advised that the use of full reverse thrust is highly recommended by their standard operating procedures for this aircraft at LCA, and that there was nothing unusual about this flight from their perspective.
- A response have not yet been received from GXI.

The distribution of measured noise levels at NMT7 in the fourth quarter of 2018 are presented in Appendix 7 for reference.

5.0 GROUND ENGINE RUNNING

Ground engine running relates to the use of aircraft engines from the time of engine start-up prior to departure, during taxiing and during holding, to the time of departure. Similarly, it relates to the time following an aircraft arrival from the time when it has reduced to taxiing speed on the runway, or when the aircraft turns off the runway, whichever occurs first, to the time when an aircraft switches off its engines on a stand.

Condition 48 required that a Ground Engine Running Strategy be implemented (after Local Planning Authority approval). The approved Ground Engine Running Strategy requires that ground engine running by aircraft is to be undertaken with the minimum amount of power and for the minimum amount of time as practically possible (except when operational or safety requirements dictate otherwise) to reduce noise emissions from the use of aircraft engines while on a stand, while taxiing or while holding at any point around the airport, all in accordance with procedures and requirements set out in AOI 06 Apron Management.

The strategy requires various parameters to be reported which are covered in this section:

5.1 Average Engine Running time on Stands (ERS)

This is the time taken for an aircraft to operate its engines, once approval to start has been given, to the time of pushback from the stand, and is required to be reported for each airline and aircraft type, with a target to keep it below 7.5 minutes on average.

Where ERS times are found to exceed 7.5 minutes on average over a quarter on a regular basis for a given aircraft type and airline, the relevant airline will be contacted to seek an explanation and to identify ways of ensuring ERS time is reduced as far as practicable. The average time by aircraft type and airline is given in Appendix 8.

The overall average ERS time for the fourth quarter of 2018 was 4 minutes and 33 seconds. There were two airline/aircraft combinations with a minimum of one result per week which on average exceeded an ERS time of 7.5 minutes; these were the Cessna C510 operated by Globe Air and the Cessna C550 operated by Xclusive Jet Charter Limited. These airline/aircraft combinations both also had an ERS time exceeding 7.5 minutes in 2018 Q2 and Q3. Therefore an explanation has been sought from the relevant airlines to seek to reduce this time in the future.

Globe Air have responded and sought to reduce their ERS time, this has initially proved successful with an ERS of under 7.5 minutes in December 2018.

Xclusive Jet Charter Limited have recently responded that they will seek to reduce their ERS time as far as practicable.

5.2 Average Taxi Time on Arrival (TTA)

This is the time between an aircraft arriving at LCA and the time it arrives on the stand. This information is recorded in the EFPS. The average time by aircraft type and airline is given in Appendix 8.

The overall average TTA for the fourth quarter of 2018 across all aircraft was 3 minutes and 18 seconds.

5.3 Average Taxi Time on Departure (TTD)

This is the difference between the time of pushback on the stand and the time of departure. This information is recorded in the EFPS. The average time by aircraft type and airline is given in Appendix 8.

The overall average TTD across all aircraft was 8 minutes and 8 seconds.

5.4 Average Hold Time (HT)

This is the time that departing aircraft are held at a remote hold position. BAP understand that remote holds are not currently used at LCA, and therefore this time is always zero.

Nick Williams
for Bickerdike Allen Partners

Peter Henson
Partner

APPENDIX 1

EXTRACT FROM PLANNING CONDITIONS

LBN/107(b)

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.

Reason: In the interests of limiting the number of aircraft movements in order to protect the amenity of current and future occupants and neighbours and with regard to saved Policy EQ47 of the London Borough of Newham Unitary Development Plan (adopted June 2001 and saved from 27 September 2007 by direction from the Secretary of State and not deleted on adoption of the Core Strategy on 26 January 2012), Policy 7.15 of the London Plan (consolidated with alterations since 2011 and published March 2015), and Policies SP2 and SP3 of the Newham Core Strategy (adopted 26 January 2012).

LBN/107(b)

the London Plan (consolidated with alterations since 2011 and published March 2015), and Policies SP2 and SP3 of the Newham Core Strategy (adopted 26 January 2012).

21. Maximum Permitted Noise Factored Aircraft Movements

Until such time as the Aircraft Noise Categorisation Scheme has been approved and implemented in accordance with Condition 18 and the review of the Aircraft Noise Categorisation Scheme after its first year of operations has been submitted to and approved in writing pursuant to Condition 19, the number of Noise Factored Movements shall not exceed:

- in any one week the number of permitted Aircraft Movements for that week by more than 25%; and
- 120,000 Noise Factored Movements per calendar year.

Reason: In the interests of limiting the number of Aircraft Movements in order to protect the amenity of current and future occupants and neighbours and with regard to saved Policy EQ47 of the London Borough of Newham Unitary Development Plan (adopted June 2001 and saved from 27 September 2007 by direction from the Secretary of State and not deleted on adoption of the Core Strategy on 26 January 2012), Policy 7.15 of the London Plan (consolidated with alterations since 2011 and published March 2015), and Policies SP2 and SP3 of the Newham Core Strategy (adopted 26 January 2012).

22. Maximum Permitted Actual Aircraft Movements per hour as Timetabled

The scheduled number of Actual Aircraft Movements including business, commercial, charter and private Aircraft Movements shall not exceed 45 in total in any given hour.

Reason: In the interests of limiting the number of aircraft movements in the peak periods in order to protect the amenity of current and future occupants and neighbours and with regard to saved Policy EQ47 of the London Borough of Newham Unitary Development Plan (adopted June 2001 and saved from 27 September 2007 by direction from the Secretary of State and not deleted on adoption of the Core Strategy on 26 January 2012), Policy 7.15 of the London Plan (consolidated with alterations since 2011 and published March 2015), and Policies SP2 and SP3 of the Newham Core Strategy (adopted 26 January 2012).

23. Maximum Permitted Actual Aircraft Movements (days/year)

The number of Actual Aircraft Movements at the Airport shall not exceed:

- a) 100 per day on Saturdays; and
- b) 200 per day on Sundays but not exceeding 280 on any consecutive Saturday and Sunday; and
- c) subject to (d) to (j) below 592 per day on weekdays; and
- d) 132 on 1 January; and
- e) 164 on Good Friday; and
- f) 198 on Easter Monday; and
- g) 248 on the May Day Holiday; and
- h) 230 on the late May Bank Holiday; and
- i) 230 on the late August Bank Holiday; and
- j) 100 on 26 December; and
- k) 111,000 per calendar year.

Reason: In the interests of limiting the number of Aircraft Movements in order to protect the amenity of current and future occupants and neighbours and with regard to saved Policy EQ47 of the London Borough of Newham Unitary Development Plan (adopted June 2001 and saved from 27 September 2007 by direction from the Secretary of State and not deleted on adoption of the Core Strategy on 26 January 2012), Policy 7.15 of

LBN/107(b)

the London Plan (consolidated with alterations since 2011 and published March 2015), and Policies SP2 and SP3 of the Newham Core Strategy (adopted 26 January 2012).

24. Maximum Permitted Actual Aircraft Movement on Other Bank Holidays

In the event of there being a Bank Holiday or Public Holiday in England which falls upon or is proclaimed or declared upon a date not referred to in sub-paragraph (d) to (j) (inclusive) of Condition 23 above, then the number of Aircraft Movements permissible on that date shall not exceed 330 unless otherwise agreed in writing by the Local Planning Authority but in any event shall not exceed 396.

Reason: In the interests of limiting the number of Aircraft Movements in order to safeguard the quality of life in the local area.

25. Maximum Permitted Actual Aircraft Movement limit between 0630 and 0659

Mondays to Saturdays

The maximum number of Actual Aircraft Movements between 0630 and 0659 hours on Mondays to Saturdays (excluding Bank Holidays and Public Holidays when the Airport shall be closed for the use or operation of aircraft between these times) shall not exceed 6 on any day.

Reason: In the interests of limiting the number of movements in and to protect the amenity of current and future occupants and neighbours and with regard to saved Policy EQ47 of the London Borough of Newham Unitary Development Plan (adopted June 2001 and saved from 27 September 2007 by direction from the Secretary of State and not deleted on adoption of the Core Strategy on 26 January 2012), Policy 7.15 of the London Plan (consolidated with alterations since 2011 and published March 2015), and Policies SP2 and SP3 of the Newham Core Strategy (adopted 26 January 2012).

26. Maximum Permitted Actual Aircraft Movement limit between 0630 and 0645 on

Mondays to Saturdays

Notwithstanding the restriction on Actual Aircraft Movements between 0630 and 0659 hours, as set out by Condition 25 above, the total number of Actual Aircraft Movements in the period between 0630 and 0645 on Mondays to Saturdays (excluding Bank Holidays and Public Holidays when the Airport shall be closed for the use or operation of aircraft between these times), shall not exceed 2 on any day.

Reason: In the interests of limiting the number of Aircraft Movements and to protect the amenity of current and future occupants and neighbours and with regard to saved Policy EQ47 of the London Borough of Newham Unitary Development Plan (adopted June 2001 and saved from 27 September 2007 by direction from the Secretary of State and not deleted on adoption of the Core Strategy on 26 January 2012), Policy 7.15 of the London Plan (consolidated with alterations since 2011 and published March 2015), and Policies SP2 and SP3 of the Newham Core Strategy (adopted 26 January 2012).

27. Christmas Day Closure

The Airport shall be closed on Christmas Day each year for the use or operation or maintenance of aircraft or for passengers, with no Aircraft Movements and no Ground Running by aircraft engines.

Reason: In the interests of limiting the number of Aircraft Movements to protect the amenity of current and future occupants and neighbours and with regard to saved Policy EQ47 of the London Borough of Newham Unitary Development Plan (adopted June 2001 and saved from 27 September 2007 by direction from the Secretary of State and not deleted on adoption of the Core Strategy on 26 January 2012), Policy 7.15 of the London Plan (consolidated with alterations since 2011 and published March 2015), and Policies SP2 and SP3 of the Newham Core Strategy (adopted 26 January 2012).

APPENDIX 2

NUMBER OF AIRCRAFT OPERATING AT LCA

Number of Aircraft Movements by Aircraft Type: October - December 2018

Aircraft Name	AC Type	Oct	Nov	Dec	Total	Factored Total⁽¹⁾
Airbus A318	A318	52	42	26	120	151
ATR-42	AT42	8	0	0	8	5
ATR-72	AT72	90	88	80	258	325
Beechcraft Super King Air 350	B350	0	0	0	0	0
BAe-146-100	B461	0	0	0	0	0
BAe-146-200	B462	0	34	8	42	53
BAe-146-300	B463	0	0	0	0	0
Bombardier CS-100	BCS1	182	222	260	664	837
Beechcraft Super King Air 200	BE20	0	0	0	0	0
Beechcraft Beechjet 400	BE40	0	0	0	0	0
Cessna Citation CJ2	C25A	14	20	14	48	60
Cessna Citation CJ3	C25B	4	2	6	12	15
Cessna Citation CJ4	C25C	2	0	4	6	8
Cessna Citation Mustang	C510	26	34	32	92	116
Cessna Citation CJ1	C525	2	2	0	4	5
Cessna Citation Bravo	C550	20	22	19	61	77
Cessna Citation V	C560	4	1	1	6	8
Cessna Citation Excel	C56X	92	106	58	256	323
Cessna Citation Sovereign	C680	32	26	20	78	98
Cessna Citation Latitude	C68A	46	38	30	114	144
Bombardier Challenger 350	CL30	0	0	0	0	0
Bombardier Challenger 600	CL60	8	4	0	12	15
Dornier 328	D328	0	0	0	0	0
Dash 8 Q400	DH8D	1124	1018	960	3102	1954
Embraer 135	E135	6	10	8	24	30
Embraer 170	E170	965	834	702	2501	3151
Embraer 190	E190	3728	3579	3028	10335	13022

Aircraft Name	AC Type	Oct	Nov	Dec	Total	Factored Total⁽¹⁾
Embraer 190-E2	E290	0	0	0	0	0
Embraer Legacy 450	E545	0	0	2	2	3
Embraer Legacy 500	E550	6	0	0	6	8
Embraer Phenom 300	E55P	28	10	28	66	83
Dassault Falcon 2000	F2TH	14	16	10	40	50
Fokker 50	F50	0	0	0	0	0
Dassault Falcon 900	F900	2	10	8	20	25
Dassault Falcon 10	FA10	0	0	0	0	0
Dassault Falcon 50	FA50	0	2	2	4	5
Dassault Falcon 7X	FA7X	34	42	32	108	136
Dassault Falcon 8X	FA8X	12	10	6	28	35
Gulfstream G150	G150	0	0	0	0	0
Gulfstream G280	G280	2	0	2	4	5
Bombardier Global Express	GLEX	14	0	14	28	35
Gulfstream G650	GLF6	0	0	0	0	0
Hawker 800	H25B	30	24	14	68	86
Dornier 328 Jet	J328	90	92	62	244	307
LearJet 45	LJ45	2	4	2	8	10
Piaggio 180 Avanti	P180	4	4	2	10	6
Piper PA-31	PA31	5	0	0	5	3
Pilatus PC-24	PC24	12	0	0	12	15
Avro RJ-100	RJ1H	0	0	0	0	0
Avro RJ-85	RJ85	340	324	294	958	1207
Saab 2000	SB20	236	234	208	678	427
Total		7236	6854	5942	20032	22844⁽²⁾

⁽¹⁾ Values rounded to nearest whole number

⁽²⁾ Total based on unrounded data

Date	Actual Aircraft Movements		Permitted Actual Aircraft Movements		Factored Aircraft Movements ^[1]		Permitted Factored Move-ments	Differences (Permitted - Actual)			Early Actual Movements		(Early Permitted - Actual)		Late Actual Movements ^[2]	
								Actual Movements		Factored Movements	Early Morning		Early Morning		Late Eve / Sat Afternoon	3 Month Running Total
	Day	Week-end	Day	Week-end	Day	Week	Week	Day	Week-end	Week	06:30-06:44	06:30-06:59	06:30-06:44	06:30-06:59	22:00-22:30 / 12:30-13:00	
01/10/2018	290	-	592	-	331	1,792	4,050	302	-	2,258	1	5	1	1	0	-
02/10/2018	298	-	592	-	340			294	-		2	4	0	2	0	-
03/10/2018	297	-	592	-	339			295	-		1	5	1	1	0	-
04/10/2018	250	-	592	-	287			342	-		0	2	2	4	1	-
05/10/2018	225	-	592	-	256			367	-		0	2	2	4	1	-
06/10/2018	68	214	100	280	76			32	66		0	1	2	5	2	-
07/10/2018	146		200		163			54			-	-	-	1	-	
08/10/2018	302	-	592	-	348	1,853	4,050	290	-	2,197	2	6	0	0	0	-
09/10/2018	287	-	592	-	328			305	-		1	6	1	0	0	-
10/10/2018	281	-	592	-	320			311	-		1	4	1	2	0	-
11/10/2018	287	-	592	-	328			305	-		2	6	0	0	0	-
12/10/2018	258	-	592	-	295			334	-		1	6	1	0	3	-
13/10/2018	71	209	100	280	79			29	71		1	4	1	2	1	-
14/10/2018	138		200		156			62			-	-	-	-	1	-
15/10/2018	238	-	592	-	272	1,758	4,050	354	-	2,292	1	5	1	1	2	-
16/10/2018	260	-	592	-	295			332	-		1	3	1	3	0	-
17/10/2018	284	-	592	-	324			308	-		2	5	0	1	0	-
18/10/2018	281	-	592	-	320			311	-		1	5	1	1	0	-
19/10/2018	281	-	592	-	320			311	-		2	6	0	0	0	-
20/10/2018	68	206	100	280	74			32	74		2	4	0	2	3	-
21/10/2018	138		200		152			62			-	-	-	-	1	-
22/10/2018	286	-	592	-	326	1,864	4,050	306	-	2,186	2	5	0	1	0	-
23/10/2018	294	-	592	-	338			298	-		2	5	0	1	0	-
24/10/2018	282	-	592	-	323			310	-		2	5	0	1	0	-
25/10/2018	281	-	592	-	319			311	-		2	4	0	2	0	-
26/10/2018	288	-	592	-	329			304	-		2	5	0	1	1	-
27/10/2018	67	206	100	280	74			33	74		1	2	1	4	2	-

Date	Actual Aircraft Movements		Permitted Actual Aircraft Movements		Factored Aircraft Movements ^[1]		Permitted Factored Move-ments	Differences (Permitted - Actual)			Early Actual Movements		(Early Permitted - Actual)		Late Actual Movements ^[2]	
								Actual Movements		Factored Movements	Early Morning		Early Morning		Late Eve / Sat Afternoon	3 Month Running Total
	Day	Week-end	Day	Week-end	Day	Week	Week	Day	Week-end	Week	06:30-06:44	06:30-06:59	06:30-06:44	06:30-06:59	22:00-22:30 / 12:30-13:00	
28/10/2018	139		200		154			61			-	-	-	-	0	-
29/10/2018	280	-	592	-	322			312	-		1	6	1	0	0	-
30/10/2018	299	-	592	-	347			293	-		2	5	0	1	0	-
31/10/2018	272	-	592	-	315			320	-		2	5	0	1	0	79
01/11/2018	273	-	592	-	316	1,821	4,050	319	-	2,229	1	5	1	1	0	-
02/11/2018	265	-	592	-	302			327	-		1	5	1	1	1	-
03/11/2018	62	199	100	280	68			38	81		1	5	1	1	0	-
04/11/2018	137		200		152			63			-	-	-	-	0	-
05/11/2018	286	-	592	-	328			306	-		1	4	1	2	0	-
06/11/2018	286	-	592	-	328			306	-		1	5	1	1	0	-
07/11/2018	283	-	592	-	324			309	-		2	6	0	0	0	-
08/11/2018	292	-	592	-	336	1,842	4,050	300	-	2,208	2	5	0	1	0	-
09/11/2018	265	-	592	-	301			327	-		1	6	1	0	2	-
10/11/2018	67	204	100	280	74			33	76		1	4	1	2	4	-
11/11/2018	137		200		151			63			-	-	-	-	0	-
12/11/2018	279	-	592	-	320			313	-		1	6	1	0	0	-
13/11/2018	290	-	592	-	333			302	-		1	4	1	2	0	-
14/11/2018	297	-	592	-	341			295	-		1	5	1	1	0	-
15/11/2018	285	-	592	-	330	1,741	4,050	307	-	2,309	1	6	1	0	1	-
16/11/2018	145	-	592	-	178			447	-		0	3	2	3	0	-
17/11/2018	73	214	100	280	82			27	66		2	4	0	2	3	-
18/11/2018	141		200		158			59			-	-	-	-	0	-
19/11/2018	283	-	592	-	324			309	-		1	5	1	1	1	-
20/11/2018	279	-	592	-	319			313	-		1	5	1	1	0	-
21/11/2018	282	-	592	-	324	1,841	4,050	310	-	2,209	0	4	2	2	0	-
22/11/2018	285	-	592	-	326			307	-		1	5	1	1	0	-
23/11/2018	283	-	592	-	324			309	-		0	3	2	3	0	-

Date	Actual Aircraft Movements		Permitted Actual Aircraft Movements		Factored Aircraft Movements ^[1]		Permitted Factored Move-ments	Differences (Permitted - Actual)			Early Actual Movements		(Early Permitted - Actual)		Late Actual Movements ^[2]	
								Actual Movements		Factored Movements	Early Morning		Early Morning		Late Eve / Sat Afternoon	3 Month Running Total
	Day	Week-end	Day	Week-end	Day	Week	Week	Day	Week-end	Week	06:30-06:44	06:30-06:59	06:30-06:44	06:30-06:59	22:00-22:30 / 12:30-13:00	
24/11/2018	64	202	100	280	71			36	78		1	4	1	2	2	-
25/11/2018	138		200		154			62			-	-	-	1	-	
26/11/2018	290	-	592	-	333	1,811	4,050	302	-	2,239	2	5	0	1	0	-
27/11/2018	223	-	592	-	257			369	-		1	4	1	2	1	-
28/11/2018	286	-	592	-	329			306	-		1	3	1	3	1	-
29/11/2018	290	-	592	-	335			302	-		1	5	1	1	2	-
30/11/2018	288	-	592	-	329			304	-		1	4	1	2	0	61
01/12/2018	69	206	100	280	77			31	74		2	5	0	1	1	-
02/12/2018	137		200		151			63			-	-	-	0	-	
03/12/2018	291	-	592	-	334	1,875	4,050	301	-	2,175	2	4	0	2	0	-
04/12/2018	291	-	592	-	334			301	-		1	6	1	0	0	-
05/12/2018	285	-	592	-	327			307	-		1	6	1	0	0	-
06/12/2018	292	-	592	-	335			300	-		1	5	1	1	0	-
07/12/2018	278	-	592	-	318			314	-		2	5	0	1	0	-
08/12/2018	63	203	100	280	72			37	77		1	3	1	3	1	-
09/12/2018	140		200		156			60			-	-	-	0	-	
10/12/2018	294	-	592	-	338	1,881	4,050	298	-	2,169	1	4	1	2	0	-
11/12/2018	289	-	592	-	331			303	-		1	5	1	1	0	-
12/12/2018	287	-	592	-	329			305	-		2	6	0	0	0	-
13/12/2018	285	-	592	-	326			307	-		2	4	0	2	0	-
14/12/2018	282	-	592	-	323			310	-		2	3	0	3	0	-
15/12/2018	73	208	100	280	82			27	72		1	4	1	2	5	-
16/12/2018	135		200		152			65			-	-	-	0	-	
17/12/2018	262	-	592	-	297	1,666	4,050	330	-	2,384	0	4	2	2	1	-
18/12/2018	252	-	592	-	285			340	-		1	4	1	2	0	-
19/12/2018	247	-	592	-	281			345	-		0	4	2	2	0	-
20/12/2018	261	-	592	-	296			331	-		1	4	1	2	1	-

Date	Actual Aircraft Movements		Permitted Actual Aircraft Movements		Factored Aircraft Movements ^[1]		Permitted Factored Move-ments	Differences (Permitted - Actual)			Early Actual Movements		(Early Permitted - Actual)		Late Actual Movements ^[2]		
								Actual Movements		Factored Movements	Early Morning		Early Morning		Late Eve / Sat Afternoon	3 Month Running Total	
	Day	Week-end	Day	Week-end	Day	Week	Week	Day	Week-end	Week	06:30-06:44	06:30-06:59	06:30-06:44	06:30-06:59	22:00-22:30 / 12:30-13:00		
21/12/2018	245	-	592	-	277			347	-		0	2	2	4	3	-	
22/12/2018	73	204	100	280	82			27	76		0	3	2	3	4	-	
23/12/2018	131		200		147			69			-	-	-	0	-		
24/12/2018	147	-	592	-	165	1,100	2,695	445	-	1,595	0	2	-	-	0	-	
25/12/2018	0	-	0	-	0			0	-		0	0	2	6	0	-	
26/12/2018	99	-	100	-	112			1	-		0	0	2	6	0	-	
27/12/2018	192	-	592	-	214			400	-		1	3	1	3	0	-	
28/12/2018	204	-	592	-	229			388	-		0	4	2	2	0	-	
29/12/2018	67	190	100	280	76			33	90		1	6	1	0	4	-	
30/12/2018	123		200		136			77			-	-	-	1	-		
31/12/2018	148	-	592	-	168	-	-	444	-	-	0	4	2	2	0	59	
01/01/2019	-	-	592	-	-			-	-		-	-	-	-	-	-	
02/01/2019	-	-	592	-	-			-	-		-	-	-	-	-	-	
03/01/2019	-	-	592	-	-			-	-		-	-	-	-	-	-	
04/01/2019	-	-	592	-	-			-	-		-	-	-	-	-	-	
05/01/2019	-	-	592	-	-			-	-		-	-	-	-	-	-	-
06/01/2019	-		100		-			-			-	-	-	-	-	-	-

APPENDIX 3

DERIVATION OF DEPARTURE AND ARRIVAL LEVEL FOR QUOTA COUNT ASSESSMENT

The basic principles of how to calculate the departure and arrival level as part of the Night Noise Quota Counts that are in place at Heathrow, Gatwick and Stansted Airports are described in a report prepared by the Civil Aviation Authority⁹.

These principles are adopted in the LCA Quota Count Scheme with some slight modifications and are as follows:-

- i) The noise classification of aircraft into 1 EPNdB wide QC categories or bands is based on certificated (for departure) and calculated (for approach) Effective Perceived Noise Level (EPNL, in units EPNdB).
- ii) The Departure Noise Level is determined from the aircraft's noise certification values (EPNLs) for sideline and flyover based on the following equation:
$$\text{Departure Noise Level} = (\text{Sideline EPNL} + \text{Flyover EPNL})/2$$
- iii) The Arrival Noise Level is determined from the approach noise level derived as described in Section 3.2 above and the equation:
$$\text{Arrival Noise Level} = \text{Approach Noise Level EPNL} - 9$$
- iv) For propeller aircraft with maximum take-off weight (MTOW) not exceeding 5700 kg (i.e. those not subject to such criteria) and older propeller aircraft also not subject to these criteria, aircraft are classified according to assumptions based on available noise data.
- v) The Departure Noise Level and (separately) the Arrival Noise Level are matched in Table 1 with the relevant noise band to determine the associated quota count (QC) classification for the specific aircraft type.

The terms "sideline" and "flyover" appear in this ANCS and also in LCA's Noise Management and Mitigation Scheme (NOMMS) but carry different meanings in each. Annex 1 attached to this appendix provides an explanation of these terms in the context of both the ANCS and the NOMMS.

⁹ ERCD Report 0204 Review of the Quota Count (QC) System: Re-Analysis of the Differences Between Arrivals and Departures

ANNEX 1

EXPLANATION OF “SIDELINE” AND “FLYOVER” POINTS IN THE NOMMS AND ANCS

The *terms* “sideline” and “flyover” are used in the NOMMS¹⁰ and ANCS¹¹ 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 annex 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 2000 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.

¹⁰ NOMMS – Noise Management and Mitigation Strategy

¹¹ ANCS – Aircraft Noise Categorisation Scheme

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 5 are used to measure noise levels during an aircraft departure. These measured noise levels are used to determine the Sideline Noise Level and Flyover Noise Level for comparison with limits set in relation to the airport's Penalties and Incentives scheme which forms part of the NOMMS. The Sideline Noise Level and the Flyover Noise Level are 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 the maximum noise level ($L_{Amax,S}$) measured at NMT 5. For aircraft departures on Runway 09, the Flyover Noise Level is the maximum noise level ($L_{Amax,S}$) measured at NMT 6.

The locations of NMTs 1 to 6 are shown in Figure 5.



Figure 5: 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. The QC system at LCA however applies during the daytime, not the night-time. LCA are the first airport to operate a daytime QC system in the UK. As is the case for the Night Noise Quota Count scheme, the LCA 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 conditions¹².

¹² Based on the certified operating weight or maximum permitted operating weight at LCA or on evidence presented to LBN 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 16¹³ 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 Regulations¹⁴
- they are reliable and independently verified indicators of aircraft noise performance;
- they are freely available for practically every relevant aircraft type¹⁵.

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

- For jet-powered aeroplanes, 450 metres sideline at noisiest point during an aircraft departure. For propeller aircraft, depending on when the aircraft was certified, the point on the extended centre line of the runway 650 metres vertically below the climb-out flight path at full take-off power (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).

Figure 6, reproduced from ERCD 0205¹⁶, illustrates these three noise certification points below.

¹³ Annex 16 to the Convention on International Civil Aviation, Environmental Protection, Volume 1, Aircraft Noise

¹⁴ Aerodrome (Noise Restrictions) (Rules and Procedures) Regulations 2003

¹⁵ 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].

¹⁶ ERCD Report 0205 Quota Count Validation Study: Noise Measurements and Analysis, Civil Aviation Authority

AIRCRAFT NOISE CERTIFICATION MEASUREMENT POINTS

in relation to illustrative footprints

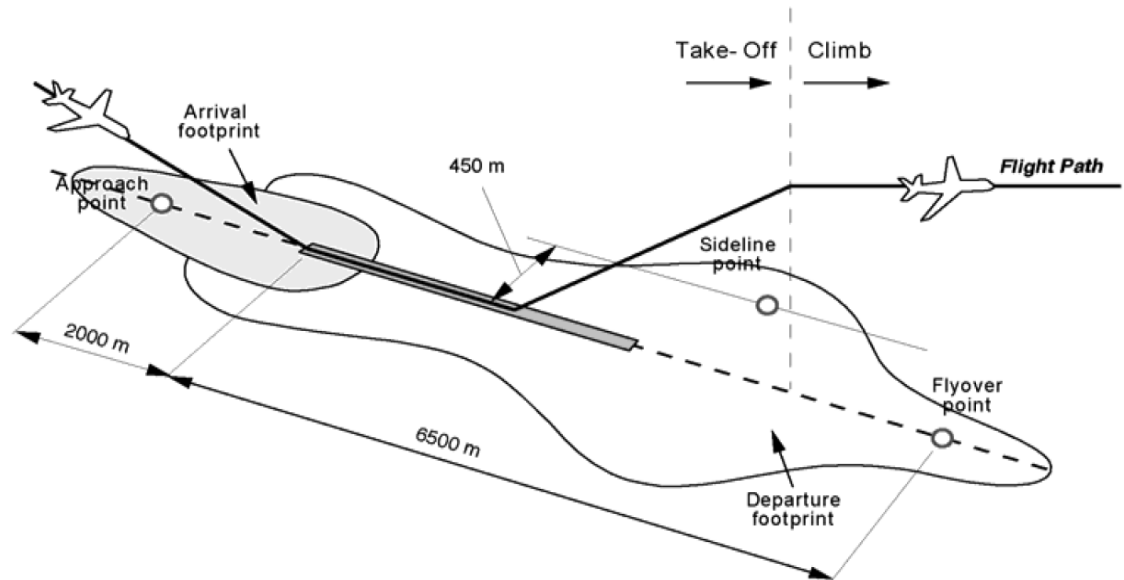


Figure 6: Aircraft noise certification measurement points

The Sideline point shown is for jet-powered aircraft. For propeller aircraft, depending on when the aircraft was certified, the sideline position may be the point on the extended centre line of the runway 650 metres vertically below the climb-out flight path at full take-off power. For reasons given in ERCD 0205, the use of a different measurement position for sideline noise from propeller aircraft is because of practical difficulties in measuring sideline noise at the 450 m sideline point required for jet-powered aircraft. ERCD found that the results obtained in the two locations are practically the same.

APPENDIX 4

QUOTA COUNT DAILY TOTALS

Date	Daily Quota Count	Weekly Total
01/10/2018	56	301
02/10/2018	57	
03/10/2018	56	
04/10/2018	48	
05/10/2018	45	
06/10/2018	13	
07/10/2018	28	
08/10/2018	57	312
09/10/2018	56	
10/10/2018	54	
11/10/2018	56	
12/10/2018	52	
13/10/2018	14	
14/10/2018	26	

Date	Daily Quota Count	Weekly Total
15/10/2018	48	302
16/10/2018	50	
17/10/2018	55	
18/10/2018	54	
19/10/2018	55	
20/10/2018	14	
21/10/2018	27	
22/10/2018	55	313
23/10/2018	56	
24/10/2018	54	
25/10/2018	55	
26/10/2018	55	
27/10/2018	13	
28/10/2018	26	
29/10/2018	54	305
30/10/2018	56	
31/10/2018	53	
01/11/2018	53	
02/11/2018	52	
03/11/2018	11	
04/11/2018	26	
05/11/2018	55	309
06/11/2018	55	
07/11/2018	54	
08/11/2018	55	
09/11/2018	52	
10/11/2018	12	
11/11/2018	26	

Date	Daily Quota Count	Weekly Total
12/11/2018	55	290
13/11/2018	56	
14/11/2018	56	
15/11/2018	55	
16/11/2018	30	
17/11/2018	13	
18/11/2018	25	
19/11/2018	55	310
20/11/2018	55	
21/11/2018	55	
22/11/2018	55	
23/11/2018	53	
24/11/2018	12	
25/11/2018	26	
26/11/2018	56	301
27/11/2018	43	
28/11/2018	55	
29/11/2018	55	
30/11/2018	55	
01/12/2018	13	
02/12/2018	25	
03/12/2018	55	311
04/12/2018	55	
05/12/2018	54	
06/12/2018	56	
07/12/2018	54	
08/12/2018	12	
09/12/2018	26	

Date	Daily Quota Count	Weekly Total
10/12/2018	56	313
11/12/2018	55	
12/12/2018	55	
13/12/2018	55	
14/12/2018	54	
15/12/2018	14	
16/12/2018	25	
17/12/2018	49	277
18/12/2018	48	
19/12/2018	47	
20/12/2018	50	
21/12/2018	47	
22/12/2018	13	
23/12/2018	25	
24/12/2018	29	185
25/12/2018	0	
26/12/2018	18	
27/12/2018	36	
28/12/2018	39	
29/12/2018	12	
30/12/2018	23	
31/12/2018	29	-
01/01/2019	-	
02/01/2019	-	
03/01/2019	-	
04/01/2019	-	
05/01/2019	-	
06/01/2019	-	

APPENDIX 5

NMT STATUS BY DATE

DATE	NMT1 Operational	NMT2 Operational	NMT3 Operational	NMT4 Operational	NMT5 Operational	NMT6 Operational
01/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
02/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
03/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
04/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
05/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
06/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
07/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
08/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
09/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
10/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
11/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
12/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
13/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
14/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
15/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
16/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
17/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
18/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
19/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
20/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
21/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
22/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
23/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
24/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
25/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
26/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
27/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
28/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
29/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
30/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
31/10/2018	Yes	Yes	Yes	Yes	Yes	Yes
01/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
02/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
03/11/2018	Yes	Yes	Yes	Yes	Yes	Yes

DATE	NMT1 Operational	NMT2 Operational	NMT3 Operational	NMT4 Operational	NMT5 Operational	NMT6 Operational
04/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
05/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
06/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
07/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
08/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
09/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
10/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
11/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
12/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
13/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
14/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
15/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
16/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
17/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
18/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
19/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
20/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
21/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
22/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
23/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
24/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
25/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
26/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
27/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
28/11/2018	Yes	No	Yes	Yes	Yes	Yes
29/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
30/11/2018	Yes	Yes	Yes	Yes	Yes	Yes
01/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
02/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
03/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
04/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
05/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
06/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
07/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
08/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
09/12/2018	Yes	Yes	Yes	Yes	Yes	Yes

DATE	NMT1 Operational	NMT2 Operational	NMT3 Operational	NMT4 Operational	NMT5 Operational	NMT6 Operational
10/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
11/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
12/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
13/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
14/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
15/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
16/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
17/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
18/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
19/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
20/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
21/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
22/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
23/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
24/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
25/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
26/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
27/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
28/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
29/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
30/12/2018	Yes	Yes	Yes	Yes	Yes	Yes
31/12/2018	Yes	Yes	Yes	Yes	Yes	Yes

APPENDIX 6

PENALTIES AND INCENTIVES

The following table summarises the number of flights that incurred fixed penalties, credit removals and credit awards in quarter 4 of 2018, by airline and aircraft type. Additionally, the total value of fixed penalties which were accrued and the residual number of credits are presented.

Airline Code	Aircraft Code	Fixed Penalties (# aircraft)	Fixed Penalties (total value)	# Credits Removed	# Credits Awarded	Residual Credits
3AM	FA7X	0	£0	0	1	1
AAB	C25C	0	£0	0	1	1
AAB	C56X	0	£0	0	1	1
ABP	E135	0	£0	0	10	10
ADN	LJ45	0	£0	0	2	2
AHO	C56X	0	£0	0	10	10
AOJ	C25A	0	£0	0	2	2
ASJ	C510	0	£0	0	1	1
ASJ	CNJ	0	£0	0	1	1
AWU	C25A	0	£0	0	2	2
AWU	C525	0	£0	0	3	3
AZA	E190	0	£0	0	62	62
BA9	B462	0	£0	0	1	1
BAW	A318	0	£0	0	16	16
BCI	AT75	0	£0	1	7	6
BCY	RJ85	0	£0	9	1	-8
BEE	DH8D	0	£0	9	11	2
BFD	F2TH	0	£0	0	1	1
CAZ	FA7X	0	£0	0	4	4
CAZ	H25B	0	£0	0	2	2
CFE	B462	0	£0	0	2	2
CFE	E170	0	£0	9	9	0
CFE	E190	0	£0	2	50	48
CFE	RJ85	0	£0	1	2	1
CFE	SB20	1	£600	3	5	2

Airline Code	Aircraft Code	Fixed Penalties (# aircraft)	Fixed Penalties (total value)	# Credits Removed	# Credits Awarded	Residual Credits
CLF	C25A	0	£0	0	2	2
DBE	F2TH	0	£0	0	2	2
DBO	F2TH	0	£0	0	1	1
DCA	C56X	0	£0	0	5	5
DCA	C680	0	£0	0	8	8
DCF	C56X	0	£0	0	1	1
DCH	C680	0	£0	0	1	1
DCS	C56X	0	£0	0	1	1
DLH	E190	0	£0	0	21	21
DSO	FA7X	0	£0	0	1	1
EFD	C25A	0	£0	0	4	4
EFD	C25C	0	£0	0	1	1
EFD	C680	0	£0	0	2	2
EIN	E190	0	£0	1	0	-1
EIN	RJ85	0	£0	25	0	-25
ELJ	C25A	0	£0	0	1	1
ELJ	C56X	0	£0	0	3	3
ETI	C56X	0	£0	0	2	2
EUW	C680	0	£0	0	1	1
EZE	SB20	0	£0	2	4	2
FPG	FA7X	0	£0	0	1	1
FYG	FA7X	0	£0	0	1	1
FYG	GLEX	0	£0	0	2	2
GAC	C510	0	£0	0	31	31
GXI	FA8X	0	£0	0	9	9
GXJ	C550	0	£0	0	1	1
HBJ	CL60	0	£0	0	4	4
HBJ	F2TH	0	£0	0	1	1
HBJ	FA7X	0	£0	0	4	4

Airline Code	Aircraft Code	Fixed Penalties (# aircraft)	Fixed Penalties (total value)	# Credits Removed	# Credits Awarded	Residual Credits
HBV	PC24	0	£0	0	5	5
HTM	C56X	0	£0	0	5	5
IJM	C56X	0	£0	0	1	1
JSY	C25A	0	£0	0	1	1
KBD	E55P	0	£0	0	1	1
KLM	E190	0	£0	2	14	12
KOC	FA8X	0	£0	0	1	1
LEA	C25B	0	£0	0	1	1
LGL	DH8D	0	£0	0	15	15
LNK	C56X	0	£0	0	2	2
LX7	BCS1	0	£0	0	1	1
MAS	CL60	0	£0	0	1	1
MDT	C680	0	£0	0	1	1
MIN	G280	0	£0	0	1	1
MIS	G280	0	£0	0	1	1
MMD	F2TH	0	£0	0	1	1
N10	GLEK	0	£0	0	1	1
N47	DA90	0	£0	0	1	1
N88	C680	0	£0	0	1	1
NJE	C56X	0	£0	0	70	70
NJE	C680	0	£0	0	12	12
NJE	C68A	0	£0	0	31	31
NJE	E55P	0	£0	0	26	26
NJE	GLEK	0	£0	0	9	9
NJE	H25B	0	£0	0	17	17
OEG	C550	0	£0	0	1	1
OEG	C56X	0	£0	0	1	1
OKJ	E135	0	£0	0	1	1
OOA	C25A	0	£0	0	1	1

Airline Code	Aircraft Code	Fixed Penalties (# aircraft)	Fixed Penalties (total value)	# Credits Removed	# Credits Awarded	Residual Credits
OOA	C525	0	£0	0	1	1
OOC	C25C	0	£0	0	1	1
OOG	F2TX	0	£0	0	3	3
OOK	C25A	0	£0	0	1	1
PHR	C680	0	£0	0	7	7
PHT	C510	0	£0	0	1	1
PHW	F2TH	0	£0	0	3	3
PNC	F2TH	0	£0	0	1	1
RBB	FA7X	0	£0	0	1	1
REN	C56X	0	£0	0	2	2
RRR	C130	0	£0	0	1	1
SHE	FA7X	0	£0	0	27	27
SNM	DA90	0	£0	0	1	1
SPG	C25A	0	£0	0	2	2
SUA	C56X	0	£0	0	1	1
SUI	C56X	0	£0	0	1	1
SUI	C680	0	£0	0	1	1
SUS	J328	0	£0	0	62	62
SWR	BCS1	0	£0	0	131	131
SWR	E190	0	£0	0	8	8
SXN	C510	0	£0	0	4	4
SXN	E550	0	£0	0	3	3
TAP	E190	0	£0	1	13	12
TVS	C680	0	£0	0	2	2
VOR	PA31	0	£0	1	1	0
XJC	C550	0	£0	0	20	20
XRO	DA90	0	£0	0	2	2
Total		2	£1,200	67	847	780

APPENDIX 7

SUMMARY OF REVERSE THRUST NOISE LEVELS

The following charts show the distribution of measured levels of arriving aircraft at NMT7 in the fourth quarter of 2018, separately for runway 09 and runway 27. The decibel values on the x-axis in each chart is the maximum value for events in that column, e.g. the column above “83” contains events that recorded a measurement of 82.1 to 83.0 dB L_{ASmax} .

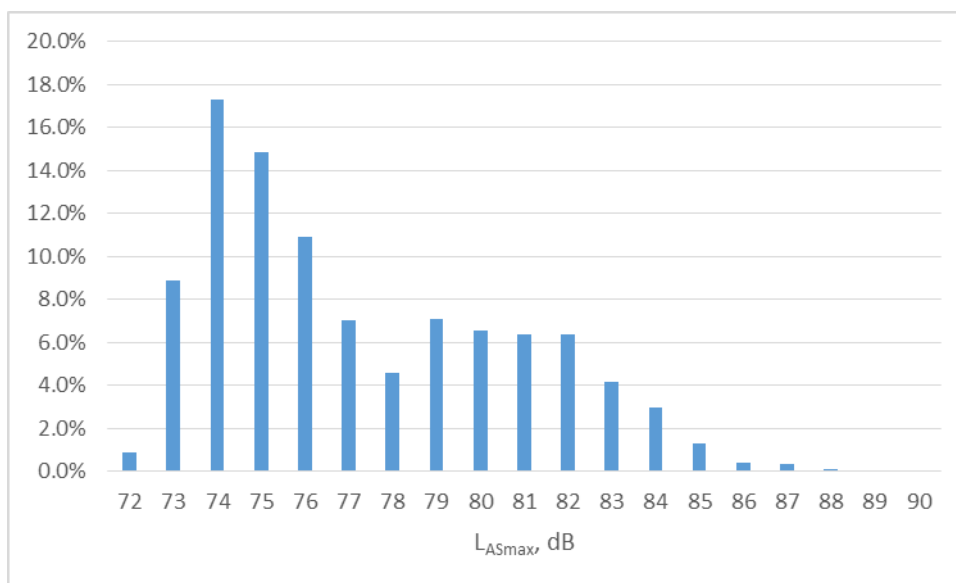


Figure 7: Runway 09 Distribution of NMT 7 Noise Levels, 2018 Q4 (1940 events)

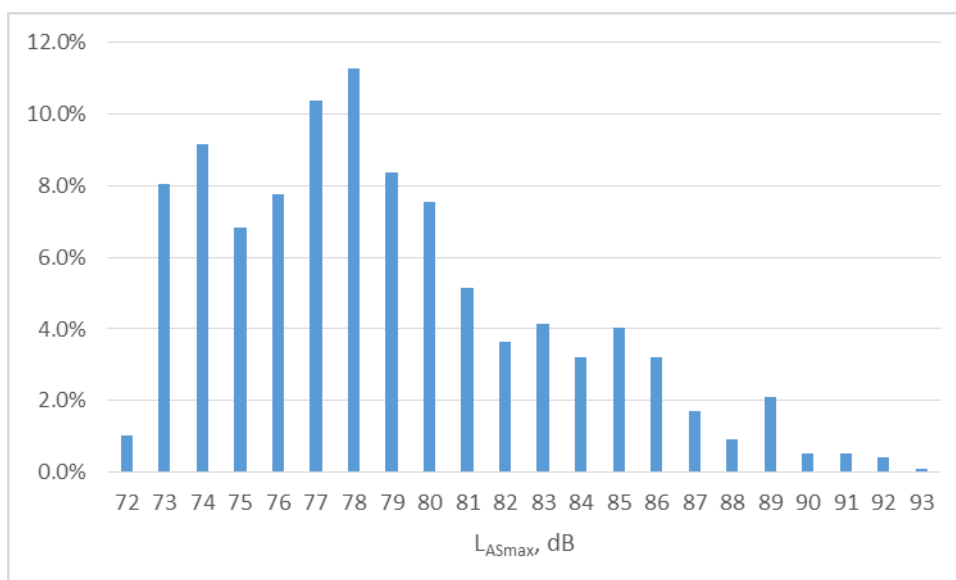


Figure 8: Runway 27 Distribution of NMT 7 Noise Levels, 2018 Q4 (993 events)

APPENDIX 8

SUMMARY OF EFPS DATA

The following table summarises the Engine Run on Stand (ERS), Taxi Time on Arrival (TTA), and Taxi Time on Departure (TTD) times for the fourth quarter of 2018, by airline and aircraft type. Airline and aircraft type combinations that operated less than once per week on average have been grouped in the “Other” category.

Aircraft Code	Airline	Count of TTA	Average of TTA (mm:ss)	Count of ERS	Average of ERS (mm:ss)	Count of TTD	Average of TTD (mm:ss)
A318	British Airways	60	04:41	60	04:21	60	07:18
AT72	Blue Islands	129	03:48	129	05:42	129	07:44
B462	BA CityFlyer	20	04:05	20	06:02	20	06:55
BCS1	Swiss International Air Lines	332	03:14	332	06:29	332	06:50
C510	Globe Air	38	03:03	38	07:39	38	07:51
C550	Xclusive Jet Charter Limited	24	03:02	24	09:59	24	08:42
C56X	NetJets Transportes Aereos	89	03:15	90	05:12	90	07:55
C68A	NetJets Transportes Aereos	55	03:01	55	06:20	55	08:28
DH8D	Flybe	1106	03:18	1106	04:28	1106	07:23
DH8D	Luxair	445	03:32	445	05:27	445	06:42
E170	BA CityFlyer	1246	03:40	1244	04:10	1244	07:53
E190	Alitalia	441	03:39	442	04:02	442	06:56
E190	BA CityFlyer	3373	03:45	3376	04:18	3376	07:51
E190	Lufthansa	227	03:42	227	04:47	227	07:56
E190	KLM Royal Dutch Airlines	605	03:50	605	03:48	605	07:39
E190	Aeropac	14	04:54	-	-	-	-
E190	Swiss International Air Lines	295	03:39	295	04:41	295	07:39
E190	TAP Portugal	216	04:17	216	04:13	216	07:03
E55P	NetJets Transportes Aereos	31	02:55	31	05:42	31	08:24
FA7X	Shell Aircraft	29	03:19	29	06:03	29	08:47
H25B	NetJets Transportes	29	03:18	29	03:57	29	08:08

Aircraft Code	Airline	Count of TTA	Average of TTA (mm:ss)	Count of ERS	Average of ERS (mm:ss)	Count of TTD	Average of TTD (mm:ss)
	Aereos						
J328	Sun Air of Scandinavia	122	03:36	122	04:20	122	08:41
RJ85	CityJet	134	02:58	135	04:41	135	07:10
RJ85	BA CityFlyer	26	02:52	25	05:55	25	07:20
RJ85	Aer Lingus	320	03:29	319	05:17	319	07:15
SB20	BA CityFlyer	218	03:17	220	04:27	220	07:42
SB20	Eastern Airways	119	03:51	119	03:54	119	07:11
Other		296	03:34	309	05:07	309	08:15
Overall		10039	03:38	10042	04:33	10042	07:38