

WESTMINSTER CITY COUNCIL

AIRCRAFT NOISE STUDY

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Executive Summary



- I. This is a study of aircraft noise as it impacts residencies, visitors and businesses in the City of Westminster. The study is in support of the City Council's commitment to produce its first ever comprehensive Noise Strategy. The study covered both fixed wing aircraft and helicopters. Of relevance to this study is the recent measurement survey commissioned by the City Council (Westminster Noise Measurement Survey 2008 – December 2008) which showed that aircraft noise was audible at locations in each ward of the City Council area.
- II. Several initiatives are in common use to reduce environmental noise levels of aircraft including; noise certification – an international agreement that imposes noise limits on new aircraft types; Continuous Descent Approach – a commonly applied fixed wing aircraft approach technique; night noise controls – for example a night noise quota system to limit the number of noisy aircraft operating at night; aircraft type restrictions; and night closure of an airport – as is the case at London City Airport.
- III. At London Heathrow Airport, aircraft land over London for approximately 70% of the time, due to prevailing wind conditions. Approach routes require aircraft to align themselves with the runway some considerable distance from the airport. Aircraft approaching the southern runway at Heathrow will not generally affect the area, however those landing on the northern runway will fly close to the southern boundary of the City Council area. Aircraft departing Heathrow Airport over London will follow one of a series of well defined departure routes but will not generally fly over the City Council boundary. Aircraft heading to the north, a somewhat infrequent manoeuvre, may use a route that passes relatively close to the north westerly boundary of the City Council. Despite there being specified routes there will be occasions when, for air traffic control reasons aircraft are directed to fly over the Westminster area. Using the annoyance relationship suggested by the recent ANASE study some 8 to 10% of those living in the south of the City of Westminster might be highly annoyed by aircraft noise.
- IV. Westminster City Council commissioned a survey (Westminster Noise Attitudes Survey 2008) of a representative sample of residents of the City to determine their attitude to various noise sources. Not surprisingly road traffic noise was the most commonly mentioned annoying noise source (22%), but aircraft noise was mentioned as the most annoying noise by some 8% of those surveyed. Of those who mentioned aircraft noise just over a quarter said that it was helicopter noise that bothered them most.
- V. Plans have been unveiled to expand Heathrow Airport by the provision of a third runway and a 6th terminal. A precursor to this development will be the abandonment of the Cranford Agreement which currently prevents, on environmental grounds, aircraft taking off on the northern runway when on easterly operations. Whilst there is insufficient information to carry out a full assessment in relation to the Westminster area, some noise level predictions have been made using a noise prediction computer model for a new 250 seat aircraft and maximum noise levels for a single flight are less than 60 dB(A) at the Westminster City boundary, which is the external limit value recommended by the World Health Organization (WHO) to minimise sleep disturbance to people in bedrooms.
- VI. London City Airport is situated to the east of London and caters for relatively small aircraft. It too has unveiled plans for expansion which have recently been granted approval. Whilst the noise contours do not affect Westminster it is acknowledged that aircraft operating to or from the airport do fly over the Westminster City area occasionally.
- VII. Awareness of helicopter activity over London was raised by a recent Greater London Authority (GLA) report London in a Spin. One of the recommendations of that report was that as there was a lack of information on helicopter movements in the London area centralised statistics should be collated. This has now been taken on board by the Civil Aviation Authority (CAA). A further recommendation that has been addressed by the CAA is that it was unclear to whom members of the public could complain to in connection with aircraft noise, in that particular context helicopter noise. The CAA now operate a Focal Point for Aviation-Related

Complaints unit and details of how to contact the unit are available on the CAA web site and are reproduced in the body of this report.

- VIII. Whilst there is a well defined helicopter route system in the London area, mostly following the river Thames through central London, twin engine helicopters are allowed to seek air traffic control approval to deviate from the route structure and to fly direct. The statistics being collated by the CAA show that a large percentage of twin engine helicopters do indeed fly direct rather than use the route structure. Without a route structure it is extremely difficult to attempt to predict noise contours of average exposure, however, using a computerised noise prediction model it has been possible to predict likely maximum noise levels on the ground and these predictions have shown that, not surprisingly, some degree of interference would be caused to people outside, for example people using mobile phones. This disturbance would, however, be relatively short lived as the helicopter would soon pass over unless the helicopter is hovering.
- IX. Military helicopter movements do fly over London but they are not logged separately in the CAA statistics. They are reported to follow the same flight procedures as civilian helicopters and any members of the public who wish to express concern can contact the Ministry of Defence and contact details are again reproduced in the body of this report.
- X. The helicopter industry is well aware of the importance of minimising noise disturbance and the representative body for the industry, the British Helicopter Association, has produced a series of codes to remind helicopter pilots and operators of the need to minimise disturbance.
- XI. Various proposals for a new estuary airport have been developed over the last 30 years or so and they have been given a new impetus recently by gaining the support of the Mayor of London. Whilst there are many arguments in favour of such proposals, in particular relieving Heathrow airport, there are many arguments against them as well, including the infrastructure costs and the ecological implications of constructing an airport in or near to protected sites designated as Ramsar¹, SSSI² and EU Special Area for Conservation sites.
- XII. The City of Westminster is materially affected by aircraft noise although the absolute levels are not high. However they are such that people will be aware of aircraft flyovers and from time to time they will find the noise annoying. As movements increase in the future so this effect is likely to increase. There is continued expectation that over time aircraft noise from individual movements will reduce but probably not to an extent that aircraft noise no longer becomes an issue for the authority.
- XIII. It is recommended that the authority maintain its interest in the area of aircraft noise and actively participates in related consultations and organisations such as the Local Authorities (Heathrow) Air Noise Working Group (ANWG).

1. Ramsar -The Convention on Wetlands intergovernmental treaty providing the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

2. SSSI – Sites of Special Scientific Interest

Table of Contents

	PAGE
1 INTRODUCTION	1
2 GENERAL ISSUES	1
3 HEATHROW AIRPORT – CURRENT SITUATION	5
4 HEATHROW AIRPORT – FUTURE SITUATION	12
5 LONDON CITY AIRPORT – CURRENT SITUATION	15
6 LONDON CITY AIRPORT – FUTURE SITUATION	15
7 HELICOPTERS – CURRENT SITUATION	16
8 HELICOPTER – FUTURE SITUATION	20
9 OTHER ISSUES	20
10 DISCUSSION AND CONCLUSIONS	22
APPENDIX A – GLOSSARY OF ACOUSTIC TERMINOLOGY	26
APPENDIX B – FIGURES B.1 TO B.12	28





1 Introduction

- 1.1 Bureau Veritas UK Limited has been commissioned to carry out a study of aircraft noise as it impacts residents, visitors and businesses in the City of Westminster. This is in support of the City Council's commitment to produce its first ever comprehensive Noise Strategy. This aircraft noise study is intended to feed into that strategy and with the aim of determining, from existing available data, both the current and the likely future impacts of aircraft noise on the City of Westminster.
- 1.2 This study addresses impacts from both fixed wing aircraft and helicopters, and the areas this study has concentrated on are arrivals to London Heathrow airport when on westerly operations, operations at London City Airport and helicopter movements.
- 1.3 In 2008 Westminster City Council commissioned a noise measurement survey consisting of measurements at some 35 locations across the Westminster area. The conclusions were that levels were similar, if slightly lower than the previous survey in 2003. However, of relevance to this report is section 5 headed Audible Noise Sources. Information is provided on those sources of noise audible at each of the 35 locations. At all 35 locations both Road Traffic and Aircraft noise were audible at some point within the 24 hour monitoring period. This demonstrates how widespread these noise sources are. The full report is available for download at http://www3.westminster.gov.uk/publications/publications_detail.cfm?ID=3675
- 1.4 A Glossary of Acoustic Terms is provided in Appendix A.

2 General issues

Aircraft noise certification

- 2.1 All aircraft built today are required to meet certain noise certification limits. These are set by certificating authorities and follow the limits contained in Annex 16 Environmental Protection, Volume 1 Aircraft Noise to the Convention on International Civil Aviation. As this is a type testing limit the manufacturer is required to demonstrate compliance for new types of aircraft with all subsequent aircraft built according to that type being deemed to satisfy the limit.
- 2.2 The annex contains several Chapters which refer to different aircraft types and weights as follows

Table 1
ICAO Annex 16 Chapters

Chapter	Aircraft	Date
2	Subsonic jet	until 1977
3	Subsonic jet and large* propeller-driven	1977 to 2005
4	Subsonic jet and large* propeller-driven	from 2006
5	large* propeller-driven	from 1977 to 1985
6	small** propeller-driven	from 1975 to 1988
8	helicopters	from 1985
10	small** propeller-driven	from 1988
11	small*** helicopters	from 1993
12	supersonic	---

*max take off weight greater than 5700 kg(1985 -88) or 9,000 kg (after 1988)

** max take off weight less than or equal to 8618 kg

*** max take off weight less than or equal to 3175 kg

- 2.3 Specific noise limits are set for various modes of flight including approach, take off and fly over and in most cases the limits are weight related meaning that heavier aircraft are allowed to make more noise, although there is an upper limit. Chapter 2 aircraft, the earlier, noisier aircraft, were phased out in 2002 and no longer fly in EU countries.

Continuous Descent Approach (CDA)

- 2.4 Continuous Descent Approach (CDA) is a technique that avoids periods of level flight and as a result keeps approaching aircraft higher than would be the case for a traditional approach. For a traditional approach aircraft would reduce height rapidly to about 3,000ft then fly at a level altitude until meeting the standard 3 degree glide slope. CDA requires the aircraft to make a gradual descent without a period of level flight until intercepting the glide slope from above. This method has 2 benefits, firstly it avoids transition periods of flight from descending to level and from level to descending, and secondly the aircraft is higher until the point of reaching the glide path. Both of these aspects reduce noise on the ground. Once the aircraft is fully established on the glide slope, however, there are no additional noise benefits.
- 2.5 Approximately 80% of night approaches to London Heathrow comply with CDA procedures, however, with reference to the Westminster area aircraft approaching London Heathrow are likely to be established on the glide slope at this point and hence there are not likely to be any noise benefits from this technique. For daytime flights the use of CDA is generally a few percent lower.
- 2.6 In the consultation document regarding the potential expansion of Heathrow it states that were the airport to move to mixed mode operation, it would not be possible to operate CDA in all cases. The limitation would be in the form of a period of level flight during the approach which is required to maintain the necessary vertical separation between aircraft for flight safety. The consultation document indicates that this would primarily affect arrivals on the southern runway and, hence, should not much affect the impact on Westminster.

Night Noise Controls

- 2.7 Most airports operate a night flying policy with a variety of restrictions. The main points of the **London Heathrow**, airport controls, which have been in place since 1993, are as follows. There is no night ban, but there is a limit on the number and type of flights that can operate in the Night Quota period that extends from 23.30 – 06.00 hours. In that period, there are typically around 15 movements, mainly arrivals in the early morning. The total number of movements allowed for the current year is 3250 with a quota count budget of 5460. Over the 8 hour night period, between 23.00 and 07.00 hours there are no overall controls other than some restrictions on the scheduled use of particularly noisy aircraft. That means that the shoulder periods, i.e. 23.00 – 23.30 and 06.00 to 07.00 have no material controls other than the capacity of the airport.
- 2.8 Within the night quota period, a noise quota system operates with restrictions on the number of movements, but also the noise quota. Each aircraft type is allocated a quota count, QC, which relates to its noise certification levels. The greater the noise made by an aircraft the larger the QC number. A budget is set for both the winter and summer season in terms of a maximum number of movements and a maximum quota. Each time an aircraft lands or takes off the QC number is then subtracted from the quota budget allowed for the season. This allows overall control of the noise emission, but allows flexibility to the airport operator to have a greater number of less noisy planes or a lower number of noisier planes. The Heathrow night noise control system was reviewed by the government in 2006/07 and is due for review again in 2012.
- 2.9 The following table, Table 2, shows the quota and the movement limits for the current review period, which is 2006 up to 2012. Whilst the number of movements remains constant the quota budget reduces to encourage the use of quieter aircraft.

Table 2
Heathrow Airport Quota Count

Winter	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12
Quota	4140	4140	4110	4110	4110	4080
Movements	2550	2550	2550	2550	2550	2550
Summer	2007	2008	2009	2010	2011	2012
Quota	5610	5460	5460	5360	5220	5100
Movements	3250	3250	3250	3250	3250	3250

- 2.10 The quota system does allow for exceptions including late or early arrivals as long haul incoming flights can be subject to headwinds or tail winds which can alter the expected arrival time. It is understood that data on these may be available through the Heathrow Airport Consultative Committee or possibly directly from the Department for Transport (DfT).
- 2.11 The result of the above policy is that the shoulder periods at Heathrow are often busy periods as airline operators avoid the core night period. For example a full night period 23.00 to 07.00 would typically have about 35 flights with only about 15 in the core night period. Of the remaining 20 flights almost all would be in the morning shoulder period.

2.12 At **London City Airport** night flying is severely limited to reduce night time noise impact. The airport is open only between 6.30pm and 22.00pm on weekdays, 06.30am and 12.30pm on Saturdays and from 12.30pm until 22.00pm on Sundays. Only aircraft meeting certain noise requirements are permitted to use the airport. These are classified into 5 groups within a similar quota count system to that at Heathrow, however the airport is restricted to smaller aircraft, generally turbo prop aircraft, although the BAe146 and Avro RJ85 jet aircraft can operate at the airport. With the expansion of the airport, the A318 is also expected to operate, but it is anticipated that it will demonstrate similar noise characteristics to these other jet aircraft. The airport has a comparatively short runway of approximately 1508 m, hence larger aircraft are unable to use the airport. An unusual operating feature of the airport is that it operates with a 5.5 degree landing glide slope, which means that aircraft are higher under the entire approach path.

The Westminster Noise Attitudes Survey 2008

- 2.13 As part of Westminster City Council's development of a noise strategy, GfK NOP Social Research was commissioned to undertake a survey of residents of the City to gain an understanding of how bothered residents are by noise and by what particular noises. The research involved a telephone survey of a representative sample of 2009 people across Westminster. The survey explored various aspects of residents' experiences of noise both in their local area and specifically in their home. The following is a summary of their attitudes to noise and the information is drawn from the Westminster Noise Attitudes Survey 2008. A full version of the report is available on the Westminster City Council website at: <http://www.westminster.gov.uk/environment/pollution/noisepollution/noisestrategy.cfm>
- 2.14 In response to the questionnaire the most frequently mentioned sources of noise that had bothered people at home in the last 12 months were road traffic noise (37%), noise from building and construction work (36%), road works (30%), neighbour's activities either inside or outside their home (25%) and aircraft noise including helicopters (21%).
- 2.15 Residents were also able to specify every source of noise that had bothered them in the last year. The questionnaire then went on to establish which noise source bothered each respondent the most. The table below shows, road traffic noise was considered the most annoying noise for 22% of residents. One in five (19%) felt that building and construction was the most annoying noise for them, 14% felt that neighbours' activities inside or outside their home was the most annoying noise and 11% felt that road works were the most annoying noise source. Aircraft was the fifth most annoying noise; 8% of the residents questioned said that they had been bothered by aircraft noise in the last year.

Table 3
The most annoying noises for Westminster residents

	Total
Base: All respondents who have been bothered by a noise in the last year	(1,554)
	%
Road traffic noise	22
Building and construction	19
Neighbour's activities inside or outside their homes	14
Road works	11
Aircraft, including helicopters	8
Recycling or waste collection	6
Pubs, bars, night clubs or restaurants	6
Other	4
Schools, health or Community buildings	3
Railways or the underground	2
Other outdoor events (not in parks)	2
Outdoor events in parks	2
Other businesses (shops, offices or workspaces)	1

- 2.16 Just over a quarter (27%) of those who selected aircraft noise as their most annoying noise source said that it was 'helicopters, police helicopters and hovering noises' that most bothered them, while 21% felt it was 'aeroplanes landing and taking off' that they were most bothered by.
- 2.17 Analysis by ward is particularly interesting as it indicates that certain noises are more prevalent in certain areas. 37% of residents in Tachbrook and 33% of residents in St James's mentioned aircraft noise as a source of noise, while only 12% of residents in Little Venice were affected.
- 2.18 In summary this survey has shown that in terms of the most annoying noises for Westminster Aircraft noise rates as most annoying for some 8% of respondents and out of those respondents just over a quarter thought helicopters to be more annoying than fixed wing aircraft.

3 Heathrow Airport – Current situation

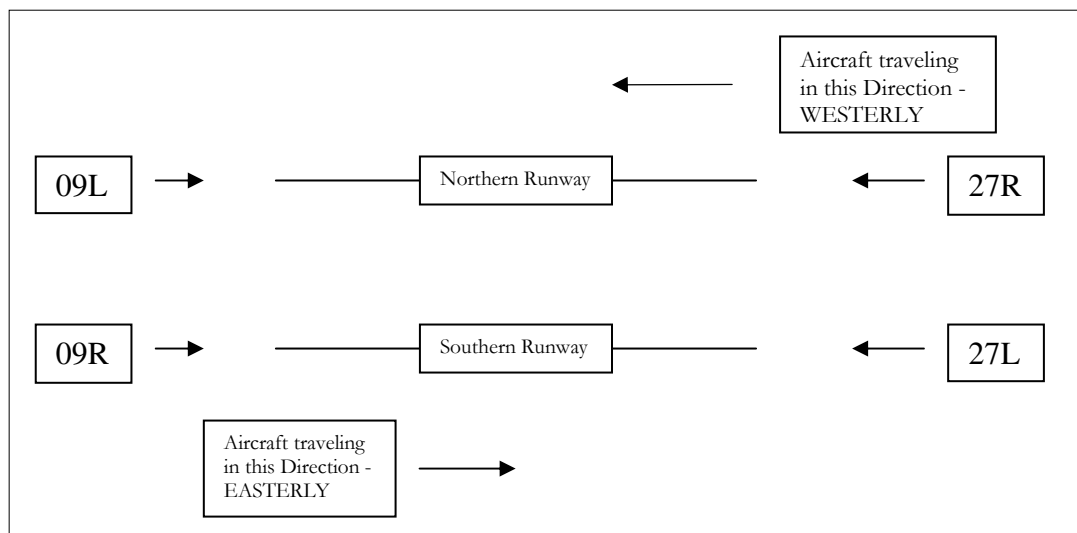
Modes of Operation

- 3.1 Aircraft usually take-off and land into the prevailing wind. If the wind is coming from the west, this mode of operation is called westerlies; if from the east – easterlies¹.
- 3.2 As there are two parallel runways at Heathrow, there is a choice over which can be used.

¹ Heathrow operates during the daytime what is known as Westerly Preference, whereby in still conditions and even with a slight easterly wind, westerly operations occur. The original intent of this approach was to limit the number of departures occurring over West London.

- 3.3 On westerlies, the system of alternation means that during the daytime, one runway is used exclusively for arrivals, whilst the other is used for departures. At 15.00 hours, this arrangement alternates so where there were arrivals, there are departures and vice versa. This is referred to as segregated mode.
- 3.4 On easterlies, the Cranford agreement currently prevents departures from occurring from the northern runway. Thus at present on easterly days, all departures occur from the southern runway and all arrivals occur on the northern runway.²
- 3.5 The identifier for each runway depends on the mode of operation. So on westerlies, the northern runway is known as 27R, but on easterlies it is 09L. Figure 1 below shows schematically the Airport and the runway identifiers.

Figure 1



- 3.6 The current modes of operation are shown pictorially in Figures 2 – 4

² On both westerlies and easterlies, what is known as Tactically Enhanced Arrival management (TEAM) can occur when there is a backlog of arriving aircraft. When TEAM is implemented, arrivals occur concurrently on both runways.

Figure 2
Westerly day with departures in the morning on 27R

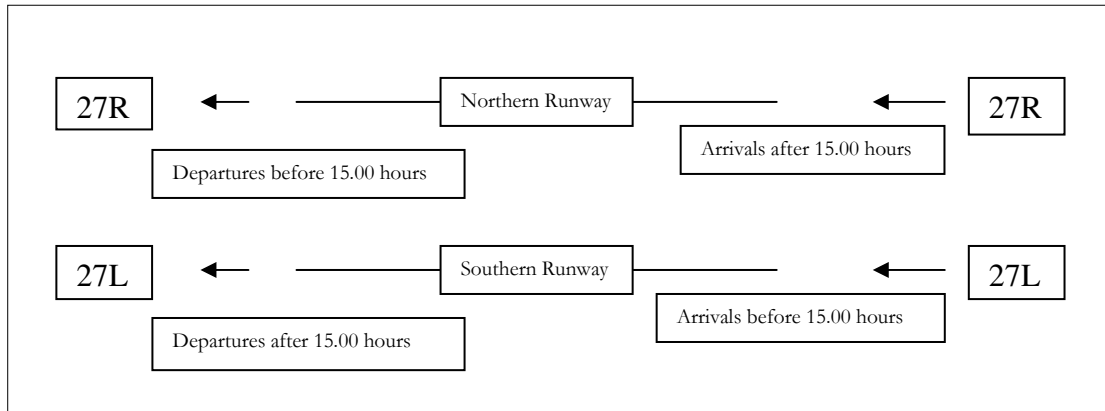


Figure 3
Westerly day with departures in the morning on 27L

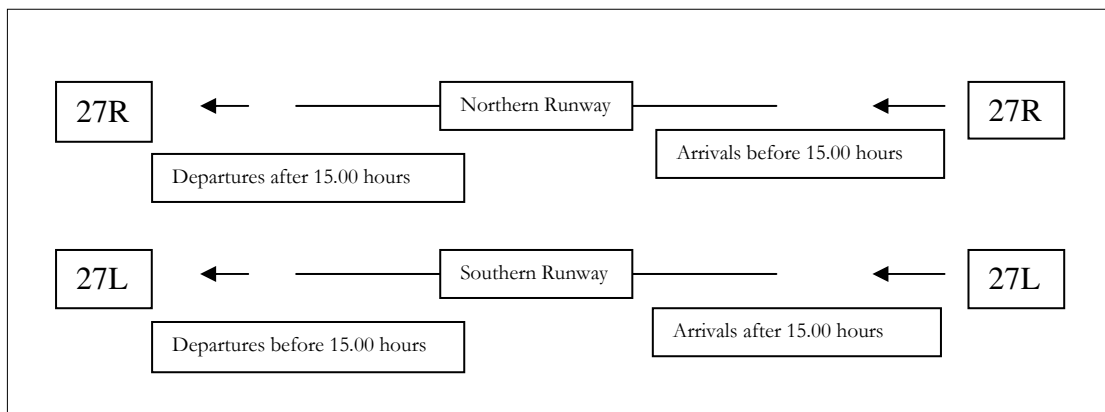
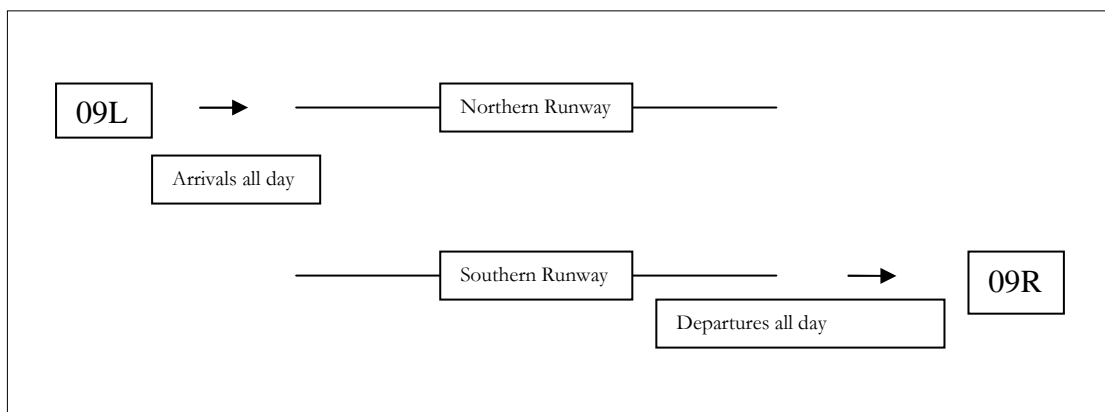


Figure 4
Easterly day with arrivals all day on 09L



- 3.7 Typically westerly operations occur for about 70% of the time, although in recent years there have been extended periods of easterly operations from time to time.
- 3.8 Departure routes over London (easterly operations) follow a series of Standard Instrument Departure routes (SIDS). These consist of 4 well defined routes departing from the runway end and none of the routes depart over the Westminster City Council boundary. This means that departing aircraft will not generally fly over the borough, however, an aircraft on an easterly departure heading to the north, a relatively infrequent manoeuvre (approximately 13% of departures), may use a route that passes within 1.5 km of the most north westerly edge of the borough boundary, where, at this position, aircraft will be at an altitude of about 3,500m. Departure routes are generally regarded as a swathe of routes within 1.5 km of the centre line.
- 3.9 Approach routes require aircraft to align themselves on a path directly in line with the runway at some considerable distance from landing. This means that aircraft landing on the southern runway will not overfly the borough, however an extended centre line of the northern runway passes close to the southern boundary of the borough and could expose the borough to a degree of aircraft noise. The extended centre line of the runway is a notional straight line extending from the runway on which approaching aircraft will line up for final approach.
- 3.10 The description of the overall noise impact of an airport's operations uses the noise indicator $L_{Aeq,T}$ – the equivalent continuous noise level. This indicator gives a single noise level value that is equivalent to the same sound energy that is contained in the actual noise over the time period, T. It is effectively the average sound energy. The "A" in the symbol indicates that the sound has been weighted to reflect the way the human ear responds to sounds of different frequencies (pitches). The indicator is expressed in decibels (dB).
- 3.11 The main measure of the noise from an airport is the $L_{Aeq,16h}$ which averages the total sound energy that occurs over the 16 hour period between 07.00 and 23.00 hours on an average day. In particular, because airports are generally busier during the summer, it is the $L_{Aeq,16h}$ for an average summer day between mid June and mid September. This principle has existed for around 40 years.
- 3.12 More recently, Directive 2002/49/EC, the Environmental Noise Directive (END), requires noise mapping of airports in terms of an annual average day, i.e. taking account of what occurs at an airport each day of the year and not just during the summer. The noise maps for Heathrow were produced in this way.
- 3.13 The noise impact at Heathrow is published annually in the form of noise contours showing, on a base map, lines of equal noise exposure in terms of the $L_{Aeq,16h}$. They are generally shown in 3 dB(A) steps starting at 57 dB(A).
- 3.14 One measure of the noise impact of the airport is the area and population contained within the 57 dB(A) contour.
- 3.15 As aircraft generally need to take off and land into any prevailing wind, at any one time, Heathrow will operate on westerlies or easterlies. The proportion of the time that westerly and easterly operations occur is known as the modal split.

- 3.16 The description of the noise impact of the airport on an average day has to take account of the modal split. At Heathrow, in the summer of 2007, the modal split was 87% westerly and 13% easterly. The previous year (2006) it was 70%W/30%E.
- 3.17 For a given set of airport operations, the size of the noise contours and their shape can vary depending on the modal split. Consequently, at Heathrow, information is routinely provided about the noise impact based on a so-called 'standard' modal split, which is the rolling average modal split for the previous 20 years. In 2007, that modal split was 76%W/24%E.
- 3.18 The noise contours are produced annually by the CAA Environmental Research and Consultancy Department (ERCD) and are published on the DfT web site. The latest contours (2007) can be found in the CAA ERCD report 0801 which is available at the following link. The contours are shown from 72 dB to 57 dB.
<http://www.dft.gov.uk/pgr/aviation/environmentalissues/nec/secnoise07/noiseheath07.pdf>.
- 3.19 Figure 1 of that report shows the departure routes and figure 3 shows the day time $L_{Aeq,T}$ noise contours. The report shows that despite the area of the 57 dB(A) contour increasing by 1.9% when compared to 2006, the contour is still some 5 km from the nearest point of the Westminster City Council boundary.
- 3.20 Night noise contours are not routinely produced for Heathrow. However, as a result of the implementation of Directive 2002/49/EC, contours based on an annual average day have been produced. These included results for the 8 hour night period and are to be found in ERCD report 0706. The route structure is reproduced in Appendix B as Figure B.1 (page 29) together with the L_{night} contours as Figure B.2 (page 30).
- 3.21 It can be seen that the 50 dB(A) contour falls well short of the City of Westminster. It is also worth noting that the shape of the contours show how, even in the 8 hour night, the dominant activity is arriving aircraft.
- 3.22 To assess further the impact of night time noise on the City of Westminster, a noise prediction model has been run to provide an estimate of noise levels that may occur within the City. A typical night was selected from the summer 2008 period when aircraft were arriving during the night on runway 27R, which is the runway usage that would impact on the City of Westminster the most.
- 3.23 A breakdown of aircraft types and numbers was collated from the Heathrow Airport webtrack site and a computer prediction model was developed to estimate noise levels for the 8 hour night period, the 6.5 hour core night period and the night shoulder period of 06.00 to 07.00 hours. These figures are shown in Appendix B as Figures B.3, B.4 and B.5 (pages 31 to 33).
- 3.24 Figure B.3 (page 31) shows a typical worst case night noise exposure over the full 8 hour period during westerly operations. The 48 dB contour is normally the lowest contour reliably produced for night time noise and it can be seen that the contour does not encroach on the City of Westminster boundary, being approximately 1 km from it.

- 3.25 Figure B.4 (page 32) shows the noise exposure for the 6.5 hour core night period for the same typical worst case night period again during westerly operations. The exposure is considerably less falling some 3 to 4 km from the Westminster boundary.
- 3.26 The morning shoulder period is a relatively busy period for arrivals and Figure B.5 (page 33) shows the anticipated exposure on westerly operations. The 51 dB contour just crosses the Westminster boundary.

Environmental Noise Directive

- 3.27 In 2002 the European Commission (EC) published Directive 2002/49/EC relating to the Assessment and Management of Environmental Noise (the Environmental Noise Directive or END). It concerns noise from transportation sources, road, rail and air traffic, as well as industry and it focuses on the impacts of noise on individuals. The END requires Member States to make Strategic Noise Maps for major agglomerations along major roads, major railways and major airports within their territories. The main indicator used for the strategic noise maps is the L_{den} , which is the $L_{Aeq,24h}$ value but with a +5 dB weighting for noise occurring during the evening period (19.00 to 23.00) and a +10 dB weighting for noise occurring during the night period (23.00 to 07.00). These maps have been drawn up and the results have been submitted to the EC and as mentioned above, these have been published in ERCD Report 0706 (Dec 2007). Reproduced in Appendix B as Figure B.6 (page 34) are the L_{den} contours.
- 3.28 It can be seen that the outermost boundary is represented by the 55 dB(A), L_{den} contour and that this contour does not quite extend to the Borough boundary.
- 3.29 In the reports that supported the possible expansion of Heathrow (see below) the 54 dB(A) summer average day contour was published. This is to be found in Figure 3.14 of ERCD report 0705 and is reproduced in Appendix B as Figure B.7 (page 35).
- 3.30 It can be seen that in 2002 the 54 dB(A) contour came very close (less than a kilometre) to the boundary of the City of Westminster. Since then, primarily due to the removal of Concorde from the fleet, the contours have reduced in size. However, it is estimated the southern boundary of the City is probably exposed to aircraft noise levels from Heathrow of around 52 – 53 dB(A), $L_{Aeq,16h}$.

Percentage of Persons Highly Annoyed

- 3.31 A document published by the Civil Aviation Authority³ provided information on the number of people likely to be highly annoyed within the various daytime contour bands. This information is based on the results of the Aircraft Noise Index Study (ANIS) carried out in the early 1980s. These data are presented in table 4 below:

³ CAP 725 Part B, CAA, 30 March 2007

Table 4
Percentage of People Highly Annoyed
(from CAP 725 Part B)

Contour Band	% Highly Annoyed
54 – 57	6.6
57 – 60	11.1
60 – 63	18.0
63 – 66	28.0
66 – 69	40.7
69 – 72	54.9
72 – 75	68.2

- 3.32 From this it can be estimated that around 3% of the population affected by levels of around 52/53 dB(A) are likely to feel highly annoyed by the aircraft noise.

ANASE

- 3.33 The results of DfT study entitled Attitudes to Noise from Aircraft Sources in England (ANASE) were published in November 2007. One of the objectives of this study was to update the ANIS work. Unfortunately there were concerns expressed about the robustness of the study, with peer reviewers advising against

... using the detailed results and conclusions from ANASE in the development of Government policy.⁴

- 3.34 Nevertheless, the DfT concluded that

... people are more annoyed by all levels of aircraft noise than they were in 1985, when the last major study in this field was carried out.⁵

- 3.35 But, apparently following the advice of the reviewers, no detailed information was provided on the extent to which annoyance has changed. However, in Appendix A9 of the study, a relationship between annoyance and noise exposure is given that addresses in part the concerns that had been raised about the robustness of this study. The results are reproduced in Appendix B as Figure B.8 (page 36).

- 3.36 The blue line shows the ANIS results and the red line shows the headline ANASE results. The dotted red line shows the results once some of the concerns raised about the robustness of the study had been taken into account. It can be seen that comparing the dotted red line

⁴ ANASE – Non-SP Peer review – CAA and Bureau Veritas, October 2007

⁵ DfT Press Release 2nd November 2007

with the blue line shows that a given level of annoyance is occurring at noise levels approximately 3 dB(A) lower than with ANIS.

- 3.37 Based on this conclusion, the relationship shown in Table 4 above should become that shown in Table 5 below:

Table 5
Percentage of People Highly Annoyed
adjusted to take account of the ANASE results
(Figure A9.5 of ANASE)

Contour Band	% Highly Annoyed
54 – 57	11.1
57 – 60	18.0
60 – 63	28.0
63 – 66	40.7
66 – 69	54.9
69 – 72	68.2
72 - 75	79.2

- 3.38 From this table it could be concluded that around 8-10% of those living to the south of the City of Westminster might be highly annoyed by aircraft noise.

4 Heathrow Airport – Future situation

- 4.1 Currently Heathrow Airport is operating with a passenger throughput of about 67 mppa (million passengers per annum) associated with just over 470,000 thousand Air Transport Movements (ATM) (2006 data). It is stated that T5 would allow up to 95 mppa to use the airport by 2030. However, with the opening of Terminal 5 there is a limit on the total number of air transport movements of 480,000.
- 4.2 The various proposals for Heathrow are looking to achieve 702,000 ATMs by 2030 with a passenger throughput of 122 mppa. In 2020, the capacity would be constrained by the Government's proposed noise contour limit to between 605,000 and 670,000 movements
- 4.3 One of the proposals for adding future capacity to Heathrow airport involves a possible move from segregated mode to mixed mode operation. Figures 5 and 6 show diagrammatically how that could operate.

Figure 5
Westerly day in mixed mode

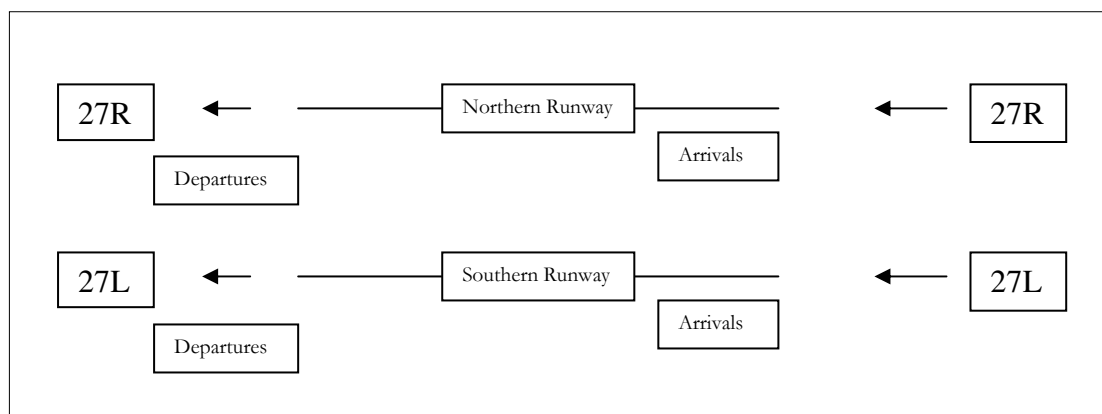
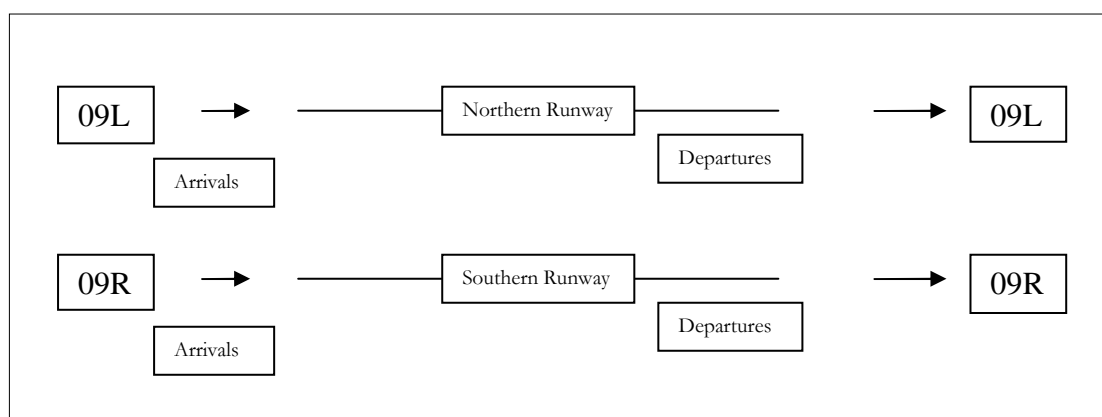


Figure 6
Easterly day in mixed mode



- 4.4 During westerly arrivals it is only those on 27R that impact on Westminster. At the moment, under segregated mode, there is a period of respite from noise either before or after the 15.00 hour runway change. Under a mixed mode operation the same number of aircraft are likely to fly on that approach route but less intensively, i.e. spread over the whole day period. There is an obvious trade off here between a half day of more intensive activity or a whole day of less intensive activity, but with the same overall number of aircraft. It should be noted that as day time $L_{Aeq,T}$ noise contours represent an average exposure there will be no difference in the contours for the two modes of operation.
- 4.5 A second option being considered for adding future capacity to Heathrow Airport is the addition of a 3rd runway to the north of the existing runways. This would see the new runway being designated 27R on westerly operations and 09L on easterly operations. The old 27R/09L would become the central runway would be designated 27C or 09C. The significance of such an option is that whereas the arrivals path for 27R currently passes close

but not over the borough an arrival path for the 3rd runway would pass over the southern part of the borough.

- 4.6 There could be various modes of operation for the use of the 3 runways including mixed use on the northern (new) runway with arrivals only on the southern runway and departures only on the central runway and or possibly with an alternation pattern on the southern and central runways. At the moment, the Government seem to be favouring the R3 alternating option.
- 4.7 There is insufficient information available to fully assess the potential impact of a future 3rd runway particularly during the night period which has been the one of the focuses of this study. Instead we have estimated the likely noise levels from the largest of the three main aircraft types expected to use the 3rd runway.
- 4.8 Using our model the SEL and L_{Amax} footprints for arriving aircraft using R3 have been produced. Figures B.9 (page 37) and B.10 (page 38) of Appendix B show the results for the new 250 LH (250 seat Long Haul).
- 4.9 It can be seen from Figure B.9 (page 37) that the 70 dB(A) SEL footprint from the proposed 3rd runway would just impinge on the southern portion of the City of Westminster. Figure B.10 (page 38) shows that the L_{Amax} levels in the City of Westminster will be less than 60 dB. Assuming a reduction of 15 dB for an open window this would relate to less than 45 dB as an internal L_{Amax} which is below the recommended World Health Organization (WHO) maximum level to minimise disturbance to sleep.

DfT Consultation on “Adding Capacity at Heathrow

- 4.10 DfT held a major consultation exercise from around November 2007 to February 2008 on the various options for expanding Heathrow Airport. It was accompanied by a series of public exhibitions and preceded by briefings for local authority officers regarding the process. It is understood that many thousands of comments were received including one from Westminster City Council.
- 4.11 Subsequently, it was realised that DfT had not properly addressed equality issues in the original consultation. Consequently a further consultation considering this question in the context of the potential expansion was held. That consultation finished in November 2008.
- 4.12 There appeared to have been some disagreement at Government level over the final decision with primarily concern being expressed about the challenge of meeting EC air quality limits. A decision was made in January 2009, and the policy principle of a 3rd runway and 6th terminal was approved. Rather to the surprise of some, the Government rejected any use of mixed mode as an interim measure ahead of the construction of a 3rd runway. The environmental limits mentioned in the consultation would have to be met, but would be given legal force, with the CAA being empowered to release additional capacity only when it could be certain that the environmental constraints would be met.
- 4.13 The Government also decided to abandon the Cranford agreement and it is expected that the next step will be the formal promulgation of that decision. After that BAA have to bring forward a planning application for the 3rd runway and associated infrastructure. That

application is likely to be heard under the new regime involving the Infrastructure Planning Commission.

5 London City Airport - Current situation

- 5.1 London City Airport is referred to as a city airport situated in the East End of London about 6 miles from the City of London in the area of the Royal Docks. The airport is about 3 miles from the location of the Olympic Stadium for the London 2012 Games. The airport is relatively small with a runway of 1,508 metres and 71,000 aircraft movements (2005 figures). Only certain aircraft types are allowed to use the airport, up to the size of a BAe 146 Regional Jet, and all helicopters are banned. There is no parallel taxiway so all aircraft have to double back on the runway which is a natural limitation on runway capacity.
- 5.2 There are restrictions that operate at London City Airport including a ban on all night flights, restrictions on the type of aircraft allowed to operate, preferential departure routes, an approach glide slope of 5.5 and implementation of a sound insulation grant scheme.
- 5.3 For the majority of the time aircraft will land from the east and take off to the west, however when on easterlies, generally about 30% of the time, aircraft will land in a direct line with the runway from the west. Even so approaching aircraft will not generally overfly the Westminster City Council area, lining up for their final approach at the City of London / Tower Hamlets boundary. As they approach at an angle of 5.5 degrees this means they will be at an altitude of about 1000 ft at the point of joining the approach path.
- 5.4 All aircraft departing to the west make a sharp right turn very soon after take off, at the River Lea and as a general rule will not fly near the Westminster City boundary.
- 5.5 There may well be occasions when, for operational reasons, air traffic control instruct aircraft to follow a different route, however, this is likely to be an unusual occurrence. The vast majority of flights in connection with London City Airport will not overfly the Westminster area, however, a few will and indeed it is reliably reported that on most days some aircraft do overfly the area.
- 5.6 Noise contours in terms of $L_{Aeq,16h}$ are produced annually by the airport and they can be found at www.lcacc.org/noise7f.pdf. Whilst the 57 dB $L_{Aeq,16h}$ contour extends to the east over Thamesmead, to the west it does not even extend beyond the River Thames.

6 London City Airport - Future situation

- 6.1 London City Airport submitted a planning application to enable the growth of the airport up to 2010. Following the Government's Aviation White Paper which requires airports to make most use of existing runways, and the publication of London City Airport's Master Plan in 2006, the application seeks to deliver the next phase of the airport's development.
- 6.2 The planning application was for an increase in flight movements to 120,000 from the current level of 80,000, with London City Airport forecasting that it will handle up to 3.9 million passengers by 2010. The proposed increase in movements will not change any of the

opening hours of the airport, and there are no plans to introduce night flights at London City Airport.

- 6.3 Bureau Veritas, working for the London Borough of Newham, reviewed the original environmental statement supplied by London City Airport. We found several shortcomings and advised that the Council should seek a range of further information. This was duly supplied by the airport.
- 6.4 Bureau Veritas subsequently disagreed with the airport's assertion that the air noise impact was "at worst, of a minor adverse nature". Instead we advised that, in our view, the air noise impact was "at least a moderate [adverse] impact" and that the Council should not underestimate the air noise impact when weighing the overall merits of the proposal.
- 6.5 Consequently, the Council sought to increase the mitigation being offered by the airport and this resulted in securing various additional measures including a two tier sound insulation scheme, a reduction in the permitted number of noise factored movements and a reduction in the level of activity in the period 06.30 – 07.00.
- 6.6 Planning consent was granted at the end of September 2008.
- 6.7 Figure B.11 (page 39) of Appendix B shows the predicted future $L_{Aeq,16h}$ contours assuming the expansion occurs.
- 6.8 It can be seen that the 57 dB(A) contour falls well short of the City of Westminster. Since undertaking this study, informal observations have been made regarding the impact of London City Airport movements on the City of Westminster. What has been noticed is that on most days there is an easterly arrival that overflies the south of the Borough, but this seems to be the exception.

7 Helicopters – Current situation

- 7.1 Helicopter noise in London has been the subject of control for some 30 or so years. At one time the Greater London Council had responsibility for noise control at Battersea Heliport and although it had no control over noise from helicopters in the air it introduced controls over the type of helicopters allowed to use the helipad facility at Battersea. It did, therefore, exercise control over a proportion of helicopters flying over London by exercising control over those helicopters using the landing facility.
- 7.2 It did this by introducing a list of "quiet" helicopters designated List A helicopters which were shown to meet a noise limit criterion. All other helicopters were by default on List B. Limits on numbers were then applied for each list with a much reduced quota being allowed for the noisier List B helicopters. A similar control is in existence today by way of a section 106 agreement with Wandsworth Borough Council which states that 12,000 annual movements are allowed at Battersea Heliport, of which no more than 1,500 movements can be of the noisier types.

- 7.3 There are no specific figures on the increase or otherwise of helicopters operating in the London area, but the number of helicopters on the UK register has now reached 1481. This figure has been increasing at a rate of approximately 6% per year over that past 4 years.
- 7.4 As part of Air Worthiness requirements since 1981 all helicopters have to be noise certificated. This is a type testing procedure similar to noise certification for fixed wing aircraft. The test procedures are contained within chapters of the International Civil Aviation Organisation (ICAO) Annex 16 to the Chicago Convention. Chapters 8 and 11 relate to helicopters; 8 being for heavy helicopters (>3175 kg) and Chapter 11 for light helicopters. Chapter 8 specifies 3 flight procedures, take off, overflight and approach. The noise measurements are repeated several times for each flight procedure to ensure a statistically significant average is obtained. In order to pass the certification requirements the measurements must be less than the reference limit for each procedure, however, a trade off arrangement exists whereby the limit can be exceeded by up to 3 dB for one procedure or by 4 dB for 2 procedures providing those exceedances are fully compensated for at the other measurement. Chapter 11 is a simpler procedure whereby only 1 flight procedure is measured under the take off path under maximum power.
- 7.5 The London Control Zone, designated CTR, is the area established around the Heathrow Airport area to prevent any conflict with aircraft approaching Heathrow Airport. The zone extends from the ground up to and altitude of 2,500 ft. Within the London CTR specific helicopter routes have been established to ensure helicopters can operate safely within the area. The helicopter routes within the CTR are shown in Figure B.12 (page 40) of Appendix B. These routes have been established for many years and were developed to avoid flying over built up areas as much as possible. There are no limitations on hours of use for the helicopter network.
- 7.6 All helicopters operating within the zone must have Air Traffic Control, ATC, clearance and, in the main, pilots fly using visual ground features. Maximum heights are specified for each route or section of route designed to ensure a safe separation between helicopters and Heathrow fixed wing traffic. There is a general “rule of the air regulation” which requires pilots to maintain at least a 500ft separation from any person, vessel, vehicle or structure.
- 7.7 Despite the existence of the helicopter routes, any twin engine helicopter can seek ATC clearance to fly any route through or across London. According to the CAA statistics 90 to 95% of helicopters operating in the London Heathrow and London City CTRs at some point route direct, i.e. off the designated routes. Although very variable a typical busy day could see over 100 flights in the area.
- 7.8 Of relevance to Westminster City Council is the H4 route which follows the river Thames. At this location the maximum altitude is 2000 ft.
- 7.9 In October of 2006 the Environment Committee of the Greater London Authority published a comprehensive report entitled London in a Spin – a review of helicopter noise. This was based on evidence collected from many sources and was in response to anecdotal evidence of growing public concern about helicopter noise in London. The report made 14 recommendations including that data on helicopter movements should be collated centrally and made available to the public. These data are now available on the CAA web site and a

few salient points have been drawn from the data. The following is not a rigorous analysis of the data but provides a very general overview.

- 7.10 The statistics seem to show that June is the busiest month with some 3974 movements in 2007 and 3896 movements in 2008 in the London Heathrow and London City CTRs. This relates to an average of about 130 movements per day. Other months are typically of the order of 2,000 to 3,000 movements, about 65 to 100 movements per day. There are very few flights between the hours of midnight and 07.00 hours with typically 1 flight per night and on a few occasions up to 4 flights.
- 7.11 The data indicate about 20% of helicopter movements are by single engine helicopters and confirm that virtually all single engine helicopter movements adhere to the route network.
- 7.12 The data show that of the helicopters using the route network some 45% use the H4 route along the river Thames, however a high percentage of twin engine movements (of the order of 90%) are direct routed by ATC and do not adhere to the route structure.
- 7.13 In terms of specific flights, again taking the month of June 2008 as a worst case example, some 10% of movements were by police helicopters and a further 9% were by the London Air Ambulance. The police Air Support Unit in London operate three Eurocopter EC145 helicopters on a 24-hour basis flying an average of over 275 hours per month throughout London. The Air Ambulance service operates an MD 900 Explorer which is a type that does not have a tail rotor. A function of the tail rotor is to prevent the helicopter contra rotating against the main rotor, however in this helicopter jets are employed to control contra rotation. This means that the helicopter rates as one of the quieter machines in common use.
- 7.14 The British Helicopter Association (previously the British Helicopter Advisory Board) acts as the authoritative voice of the helicopter industry in the UK. They issue several guidance notes and a Code of Conduct for pilots aimed at showing an environmentally conscious public that helicopter operators are also aware of the need to avoid unnecessary noise intrusion. The code is reproduced below in its entirety.

Pilot's Code of Conduct

- 1. Always fly as high as possible consistent with the weather and other factors. This will reduce your projected noise at ground level, and also give you more scope to find a suitable landing site in the event of an emergency.*
- 2. Always avoid populated areas if possible. You owe it to the public to help to preserve the environment. You will also find more landing sites out in the open in the event of an emergency.*
- 3. Never bank sharply if you can avoid it. The sharp deflection from level flight will cause a rise in your aircraft's noise signature.*
- 4. Always get airborne to height as quickly as possible consistent with a safe climb speed. This will reduce your noise footprint and increase your safety.*
- 5. Always land as quickly as possible once you know your landing area is clear. Again this will limit your noise footprint and please both your passengers and air traffic control.*



6. *Never stray from acknowledged routes or you are sure to be spotted and risk complaint. Short cuts could prove to be an aggravation to you as well as those on the ground.*
7. *Always warn people of your arrival if possible if you want to be welcomed.*
8. *Always take time to talk to interested parties about helicopters: the Public's interest in all forms of aviation, especially helicopters, provides a great opportunity to extol the virtues of rotorcraft.*
9. *Lower your cruise speed by 5-10 knots over noise sensitive areas.*
10. *Follow high ambient noise routes wherever possible.*

This Code of Conduct is applicable to all civil pilots, commercial or private, and is aimed at showing an environmentally conscious public that helicopter operators are also aware of the need to preserve the environment from unnecessary noise intrusion. The whole helicopter industry must demonstrate a responsible and co-operative attitude to this situation, and it can best be done by observing the Code of Conduct at all times, but particularly in congested urban areas.

PILOT'S CREDO

"I will do everything reasonably possible within the parameters of safety, to incorporate noise abatement in the routine operation of my helicopter."

- 7.15 There are no noise contours in existence for helicopter noise in the London area as a high percentage of helicopter movements, at some point, route direct and do not follow the helicopter route structure. This situation does not lend itself to modelling helicopter noise contours. Instead, in order to estimate the impact from helicopter flights, a notional situation has been set up with the commonest helicopter type for a single and a twin engine helicopter flying on the H4 River Thames route with a receiver position almost directly underneath in Victoria Tower Gardens adjacent to the river. The selected helicopter types are the Bell 206 Long Ranger (single engine) and the Eurocopter AS 355 Twin Squirrel (twin engine). Each helicopter type has been modelled flying at both 2000 ft and at 1000 ft.
- 7.16 Although this situation has been set up for a specific location the twin helicopter results will, in fact, apply to any overflight situation in the Borough. The L_{Amax} and SEL results are shown in table 6 below.

Table 6
 L_{Amax} and SEL helicopter noise levels

		Noise metric (dBA)	
		L_{AMAX}	SEL
Bell 206	1000ft	70.6	77.7
	2000ft	63.4	72.8
AS355F	1000ft	71.1	78.1
	2000ft	64.2	73.5

- 7.17 At these levels it would be expected that some degree of interference would be caused to people outside, for example people using mobile phones, however as these are maximum levels, interferences would be fairly short lived for each event.

8 Helicopters – Future situation

- 8.1 Despite the London Olympic Games being less than 4 years away there is only scant information available on the potential for the use of helicopters in connection with the Games. There is a general perception that helicopter traffic in London may increase due to the Games but there appear to be no hard and fast facts available or planned proposals.
- 8.2 Helicopter movements are not permitted at London City Airport, the nearest aircraft facility to the Olympic Games site, however it has been reported that Regional Airports Ltd has informed the GLA that it wishes to be able to shuttle people to and from the London Olympics by helicopter from Biggin Hill airport in Kent. This seems to presume that there will be a helicopter landing facility to serve the Olympic site, however, there is no information on any existing or proposed plans. From an environmental point of view it would be preferable to have a regulated facility rather than ad hoc use of helicopters in connection with the Games.

9 Other Issues

Unmanned observation aircraft

- 9.1 There is very little information available on the civilian use of unmanned aircraft, however, an American report states that interest has been expressed in Europe for observation purposes such as for information gathering, aerial crime scene investigation, special anti terrorist operations, urban riot control, crop monitoring, terrain mapping and aerial photography. There is no evidence that flights are occurring, except for scientific survey purposes.

Airships

- 9.2 During the Summer of 2008 a sight-seeing airship became operational, with 5 trips per day for the summer 6 week period. The craft operates from Damyns Hall airfield in Upminster, east London and travels over London at 2000ft. The flights use a Zeppelin NT07 which is capable of carrying 12 passengers. Although there is no noise data available the craft should be at 2000 ft when over flying the borough and is unlikely to cause a significant noise issue.

Flying Eye

- 9.3 A “Flying Eye” service is provided by Capital Radio using a twin engine light aircraft which normally flies, weather permitting, during the morning and evening rush hours. This service will sometimes involve circling whilst the observer reports on local traffic situations.

Military Movements

- 9.4 There appears to be little or no information in the public domain in connection with military movements of helicopters. It is known that military helicopters do fly over London but they are

not logged as a separate entity in the CAA published figures for helicopter movements over London. It is reported that Chinook helicopters are seen most weeks flying on the H4 route along the Thames.

- 9.5 In a report to the GLA (London in A Spin – A review of helicopter noise, October 2006) it was stated that there are an average over 900 military helicopter movements per year at Battersea Heliport. There is no information on routeing. It is also noted in the report that although detailed figures may not be available due to security reasons, most people accept that certain military movements are necessary.
- 9.6 In answer to a recent question in Parliament the Secretary of State for Defence answered that military helicopters (including RAF Chinook) operating in the London area use the same fixed helicopter routes as civilian helicopters, and operate at such height as they are instructed to by air traffic control. He also pointed out that members of the public wishing to express concern may contact the Directorate of Air Staff Complaints and Enquiries Unit on 0207 218 6020, or by e-mail at: lowflying@mod.uk.

Estuary airport proposals

- 9.7 Over a period of some 30 years or more there have been proposals to build an airport in the River Thames Estuary, for example Maplin Sands. Many arguments have been put forward supporting such a proposal, the main one being to relieve the impact of an expanding Heathrow airport, and many arguments have been put forward against such a proposal for example transport infrastructure to and from the airport, cost and ecological implications.
- 9.8 The ecological implications should not be underestimated as the Thames Estuary and Marshes are a RAMSAR site, which is the highest international level of biodiversity protection for wetlands, under a UN Convention. In addition the area includes designations as an EU Special Protection Area (for birds), an EU Special Area for Conservation and the Inner Thames Marshes is a SSSI as are other sites around the estuary edges. The scale of the designations reflect the European and international importance of the Thames Estuary for birds and other wildlife.
- 9.9 As recently as 2003 a report was produced on behalf of the Department for Transport entitled Development of Airport Capacity in the Thames Estuary. The report summarised the principal issues raised during the SERAS (South East Regional Airport Study). The report looked at 4 proposals
- Goodwin Sands – a new island airport east of Deal in Kent with 2 sites and a runway on each
 - Marinair – a new 4 runway island airport in the Thames Estuary north east of the Isle of Sheppey
 - Sheppey - a new 2 runway airport on the Isle of Sheppey in Kent with potential to expand to 4 runways
 - Thames Reach – a new 4 runway airport on the Hoo Peninsular in Kent.
- 9.10 That report fell short of recommending any specific option but concluded that “The development of a major airport offshore is entirely feasible and offers advantages of high capacity and much-reduced overall environmental impact”. It also warned that there could be an increase in the risk of bird strikes and that costs for such a development could not be

predicted with the same level of certainty as for onshore airports. In 2005 the Government rejected plans for an estuary airport in favour of expansion at the existing London Airports.

- 9.11 In February 2008, some 5 years after the DfT report, and following building opposition to expansion at Heathrow, the Mayor of London gave his support to an estuary airport and called for the government to re-examine the plans. This was also supported by the President of the Town and Country Planning Association although the government reiterated that it had no plans to reassess the proposals.
- 9.12 The Greater London Authority (GLA) has recently agreed (November 2008) to fund a preliminary feasibility study of the proposals, the results of which are due to be made known early in 2009 and will feed into a decision as to whether to commission a full-scale appraisal. Latest information is that the Mayor of London is supporting an estuary airport and will oppose a third runway at London Heathrow. It has been reported that the GLA has pledged financial support to a legal challenge to expansion of Heathrow by the addition of a third runway.
- 9.13 In addition there have been recent reports that a cross party group of MPs has been formed to lend support to a re-examination of the proposals.

10 Discussion and Conclusions

- 10.1 This study has investigated the impact of aircraft noise on the City of Westminster. It has focussed on London Heathrow Airport, in particular night flights, helicopter noise and aircraft noise from flights using London City Airport. Where information is available the impact of future developments has been assessed.
- 10.2 A brief explanation has been provided of various operational techniques such as approach and departure patterns, Continuous Descent Approach (CDA) and night noise controls.
- 10.3 In respect of Heathrow Airport, there will always be some flights that will overfly the Westminster City area due to specific air traffic control requirements, however the established approach and departure routes do not overfly the Westminster area. Approaches on runway 27R fly to the south of the Westminster City boundary and departures to the north fly to the north west of the Westminster City boundary. All other Heathrow routes fly away from the area. The study has concluded that currently those residents living in the south of the Westminster City area will be exposed to approximately 52 to 53 dB as a daytime $L_{Aeq,16h}$ and using historical data from the ANIS it is estimated that 3% of the population exposed to this noise will be Highly Annoyed. Using the later ANASE study this percentage could increase to 8 to 10 %.
- 10.4 There is insufficient information to reliably predict noise exposure in the future for Heathrow airport, however, estimates have been made of the likely impact of single flights from a new 250 seat long haul aircraft on approach to a 3rd runway as currently proposed. Such an event is unlikely to cause sleep disturbance, but further estimates should be carried out when further detailed information is available.
- 10.5 London City Airport is situated to the east of London and although some approaches from the west, easterly operations, may overfly the Westminster City area, this is not a regular event,

only occurring during easterly operations which prevail for approximately 30% of the time. On Westerly departures aircraft make a right turn to the north very soon after take off and do not overfly the Westminster area. It can be concluded that London City Airport does not have a significant noise impact on the City of Westminster and although permission has been granted for an expansion the route structure will not change and hence there will be no significant noise impact in the future.

- 10.6 Helicopter noise is a more difficult area to assess as, although there are fixed helicopter routes in the London area, twin engine helicopters are not required to adhere to the routes and many flights request, and are granted, Air Traffic Control (ATC) permission to direct route and deviate from the route structure. However, calculations have been made using a noise prediction model to show the likely effect of a single engine and a twin engine helicopter overflying. It has been concluded that for short periods of time when a helicopter is flying over head there could be interference to activities such as the use of mobile phones.
- 10.7 There is limited information on helicopter flights in the London area, but following a recommendation of a recent GLA report (London in a Spin) the CAA have been collating movement statistics of helicopters in the London area, and this will build a useful database for future assessments.
- 10.8 There is little information on future developments in helicopter facilities but it is considered possible that the London Olympic Games may increase demand for helicopter use, however there are no details of any proposals to provide a helicopter landing facility for the Games.
- 10.9 It has been reported that some 900 military movements are recorded at Battersea Heliport each year, however no information is available on their flight routes. The Secretary of State for Defence has stated that they will generally follow instructions from ATC and adhere to the helicopter routes.
- 10.10 Proposals for a River Thames estuary airport have been discussed on many occasions over the past 30 years and they have been given new impetus recently as the GLA have commissioned a preliminary feasibility study on such proposals. If such a proposal were to be constructed then it is possible that further expansion at Heathrow could be limited.
- 10.11 An issue that has caused concern in the past is the confusion over where members of the public can lodge a complaint about aircraft noise. This was an issue raised by the GLA report London in a Spin in relation to helicopter noise. They recommended that the Department for Transport should take a lead to make the public complaints procedure clearer including making any telephone number universally known. The Civil Aviation Authority has taken on that lead and any noise related complaints that cannot be directed to a specific airport can be sent to the following unit:

Focal Point for Aviation-Related Environmental Complaints,
Directorate of Airspace Policy,
K6, CAA House,
45-59 Kingsway,
London, WC2B 6TE

Tel: 020 7453 6524 or 020 7453 6525
E-mail: ian.wrathall@caa.co.uk or james.walker@caa.co.uk

- 10.12 The current impact of noise in the City of Westminster from aircraft, including helicopters, is limited at the moment. There is an impact in the south of the Westminster area due to current Heathrow approaches on runway 27R and there will be occasional flyovers as a result of ATC routing.
- 10.13 However future developments could adversely affect the area and it is recommended that Westminster City Council retain an active interest in aircraft noise issues, particularly future developments at Heathrow Airport and the statistics now being collated on helicopter operations in London.
- 10.14 The government has recently supported the development of Heathrow and the next likely move will be British Airports Authority (BAA) bringing forward a planning application, although the timescale for this is unknown. What is expected is a full application for the 3rd runway and 6th terminal. However, there will be an interim stage that arises from the decision to remove the Cranford agreement "as soon as possible". Firstly it is understood that there may be a consultation document associated with the removal of this agreement. It is thought that some information would have to be given regarding the noise impact etc., although it is unclear at the moment just what form this may take. More importantly, there is some concern that the removal of this agreement might liberate some more capacity in segregated mode on easterlies, so that there could be an interim planning application to remove the 480,000 movement planning cap to liberate that extra capacity before the 3rd runway application. It is recommended that this possible development is monitored.
- 10.15 The implementation of Directive 2002/49/EC will mean that Heathrow Airport Limited (or BAA) will have to consult on their draft action plan. This is likely to occur during 2009. There will also be the consultation on the action plan for the London agglomeration, also expected some time this year. There should be a mention of aviation in that document and again it is recommended that this is monitored.
- 10.16 Finally, although not consultation documents, it is anticipated that there are 2 documents expected from the World Health Organization: Night Noise Guidelines; and Aircraft Noise and Health, both of which are expected to be published in 2009. There are apparently no interim reports available, although there is a research report on the night noise guidelines that is probably going to foreshadow, to some extent, what might be in the guideline document itself. That can be found at:
- http://ec.europa.eu/health/ph_projects/2003/action3/docs/2003_08_frep_en.pdf.
- 10.17 Through organisations such as the Local Authorities (Heathrow) Air Noise Working Group (ANWG) and the co-ordinating role being adopted by the GLA, there already exists a means by which Westminster can monitor developments in this area, obtain a greater understanding of what is or might be occurring and participate in co-ordinated action to address issues. Given the impact of aircraft noise on the Westminster area, it is recommended, that the City of Westminster consider increasing their involvement with such organisations.
- 10.18 To conclude, the City of Westminster is materially affected by aircraft noise. The absolute levels are not that high, but are such that people will be aware of the aircraft flyovers from time to time and some will find the noise annoying or disturbing. As movements increase so



this effect is likely to increase. There is a continued expectation that over time noise from individual aircraft movements will reduce but probably not to an extent that aircraft noise no longer becomes an issue for the authority.



Appendix A

Glossary of Acoustic Terminology

ANASE	Attitudes to Noise from Aircraft Sources in England, DfT, November 2007
ANIS	Aircraft Noise Index Study, CAA DR Report 8402, January 1985
CAA	Civil Aviation Authority
dB	The unit of sound pressure level.
dB(A)	The unit of sound pressure level, weighted according to the A scale, which takes into account the increased sensitivity of the human ear at some frequencies.
DfT	Department for Transport
END	Environmental Noise Directive, Directive 2002/49/EC
ERCD	Environmental Research and Consultancy Department of the CAA
Free-field	Far from the presence of any sound reflecting objects other than the ground, usually taken to mean at least 3.5m away.
Facade	At 1.0m away from a reflecting surface such as the facade of a building. Facade noise levels are 3 dB(A) higher than the free-field noise level would be if the reflecting surface or building were not there.
Frequency	The number of cycles per second that the sound pressure fluctuates about the ambient static air pressure. High frequency noises are often described as having a high pitch and low frequency noises as having a low pitch. Frequency is measured in Hertz (Hz).
$L_{A10,T}$	The A-weighted sound level exceeded for 10% of the stated measurement period T. This is the accepted parameter for measuring road traffic noise.
$L_{A90,T}$	The A-weighted sound level exceeded for 90% of the stated measurement period T. This is the accepted parameter for measuring background noise.
$L_{Aeq,T}$	The A weighted equivalent continuous sound pressure level, measured over a given period T. This is a notional steady sound level which would contain the same amount of sound energy as the actual, possibly time varying, sound level that was actually recorded.
Lden	Lden is the 24-hr L_{Aeq} calculated for an annual period, but with a 5 dB weighting for evening and a 10 dB weighting for night as defined by Directive 2002/49/EC of the European Union.
L_{Amax}	The maximum noise level for a discrete event.
SEL	Sound Exposure Level is the total acoustic energy of an event compressed into a 1 second period.

Appendix B

FIGURES	PAGE
B.1 Extract from ERCD 0706, Heathrow Departure Routes	29
B.2 Extract from ERCD 0706, Heathrow L_{night} contours	30
B.3 Heathrow Typical night period $L_{\text{Aeq},8\text{h}}$	31
B.4 Heathrow Typical core night period $L_{\text{Aeq},6.5\text{h}}$	32
B.5 Heathrow Typical morning night shoulder period $L_{\text{Aeq},1\text{h}}$	33
B.6 Extract from ERCD 0706, Heathrow 24 hour L_{den}	34
B.7 Extract from ERCD 0705, Heathrow 54 $L_{\text{Aeq},16\text{h}}$ contour	35
B.8 Annoyance relationship reproduced from Figure A9.5 of ANASE	36
B.9 SEL New 250 LH arrival on Heathrow R3	37
B.10 L_{Amax} New 250 LH arrival on Heathrow R3	38
B.11 Noise contours, Extract from the London City Airport ES Addendum	39
B.12 London Helicopter routes	40

Figure B.1
Extract from ERCD 0706

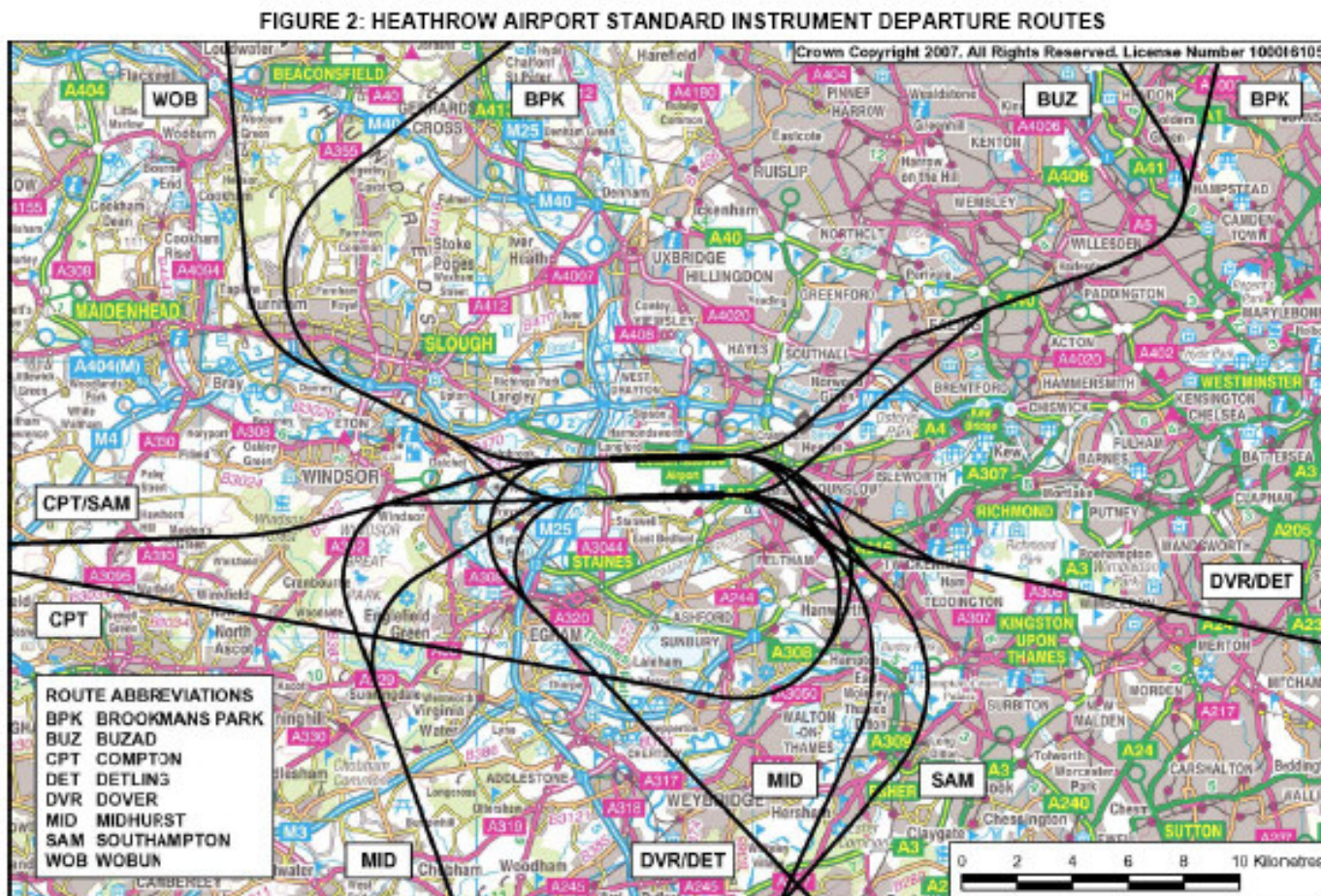


Figure B.2
Extract from ERCD 0706

FIGURE 5: HEATHROW AIRPORT
Year 2006 annual 8 hour L_{night} terrain adjusted noise contours (2300-0700 LT)
actual modal split 72% west / 28% east

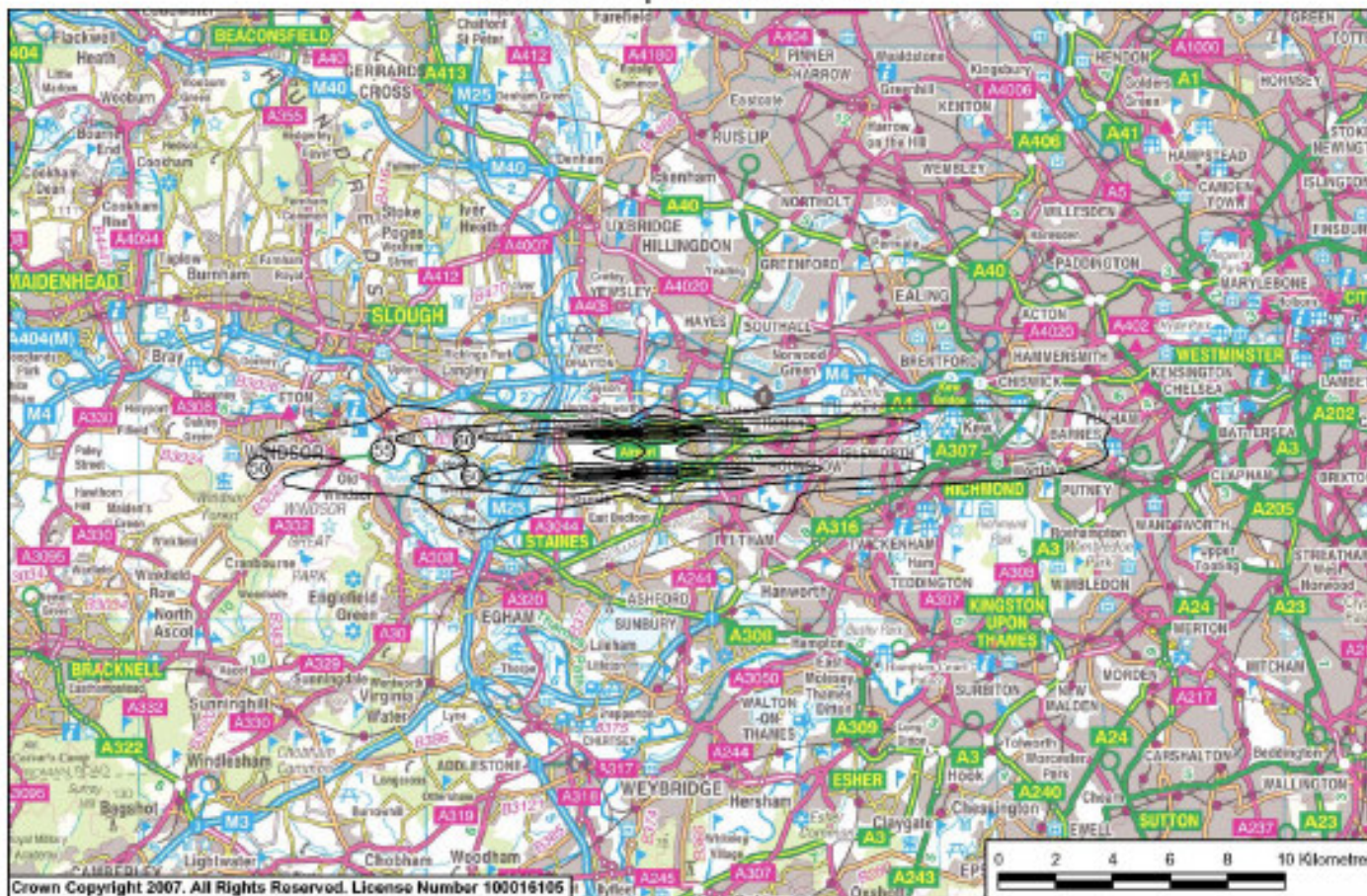


Figure B.3
Typical night period $L_{Aeq,8h}$

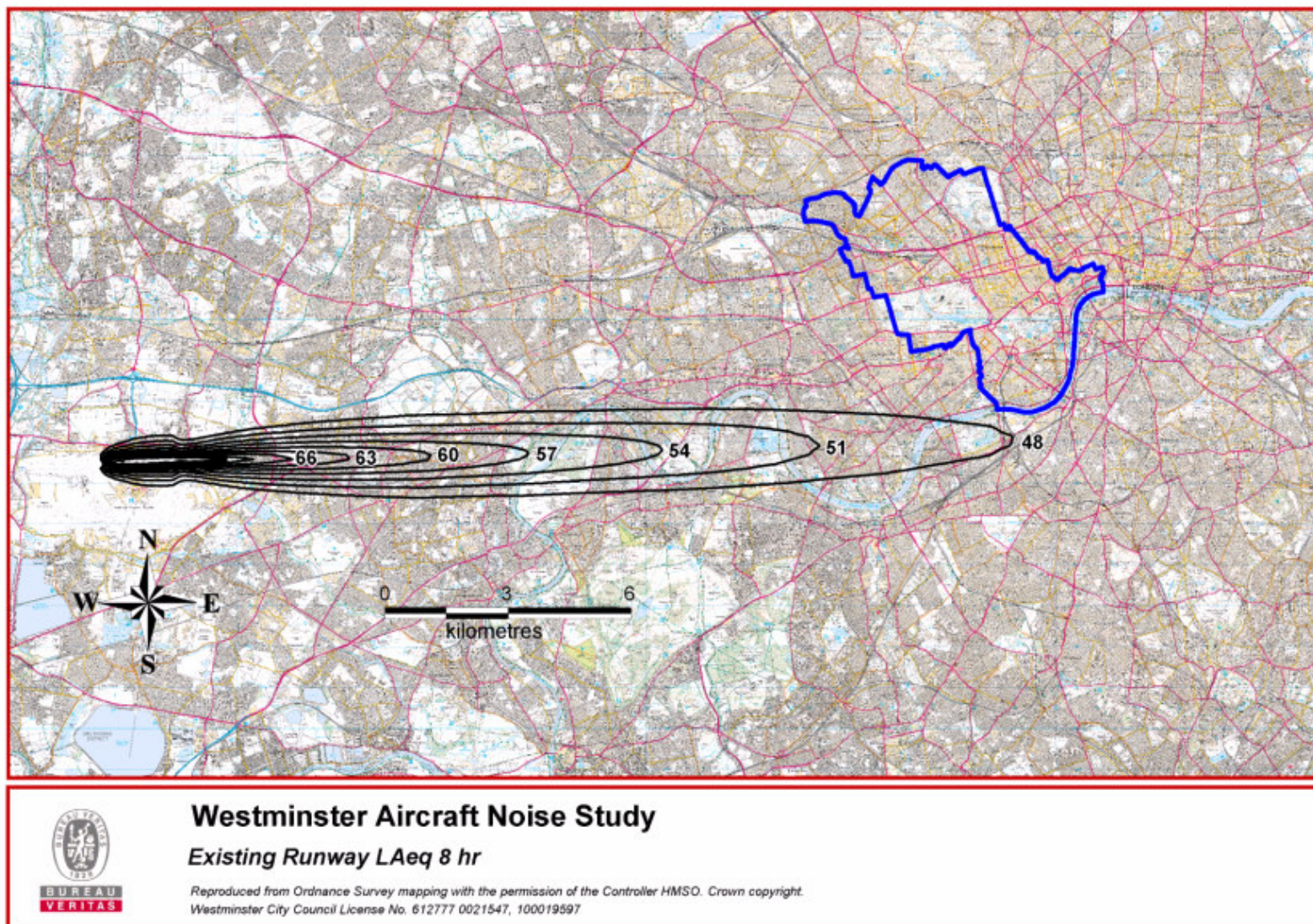


Figure B.4
Typical core night period $L_{Aeq,6.5h}$

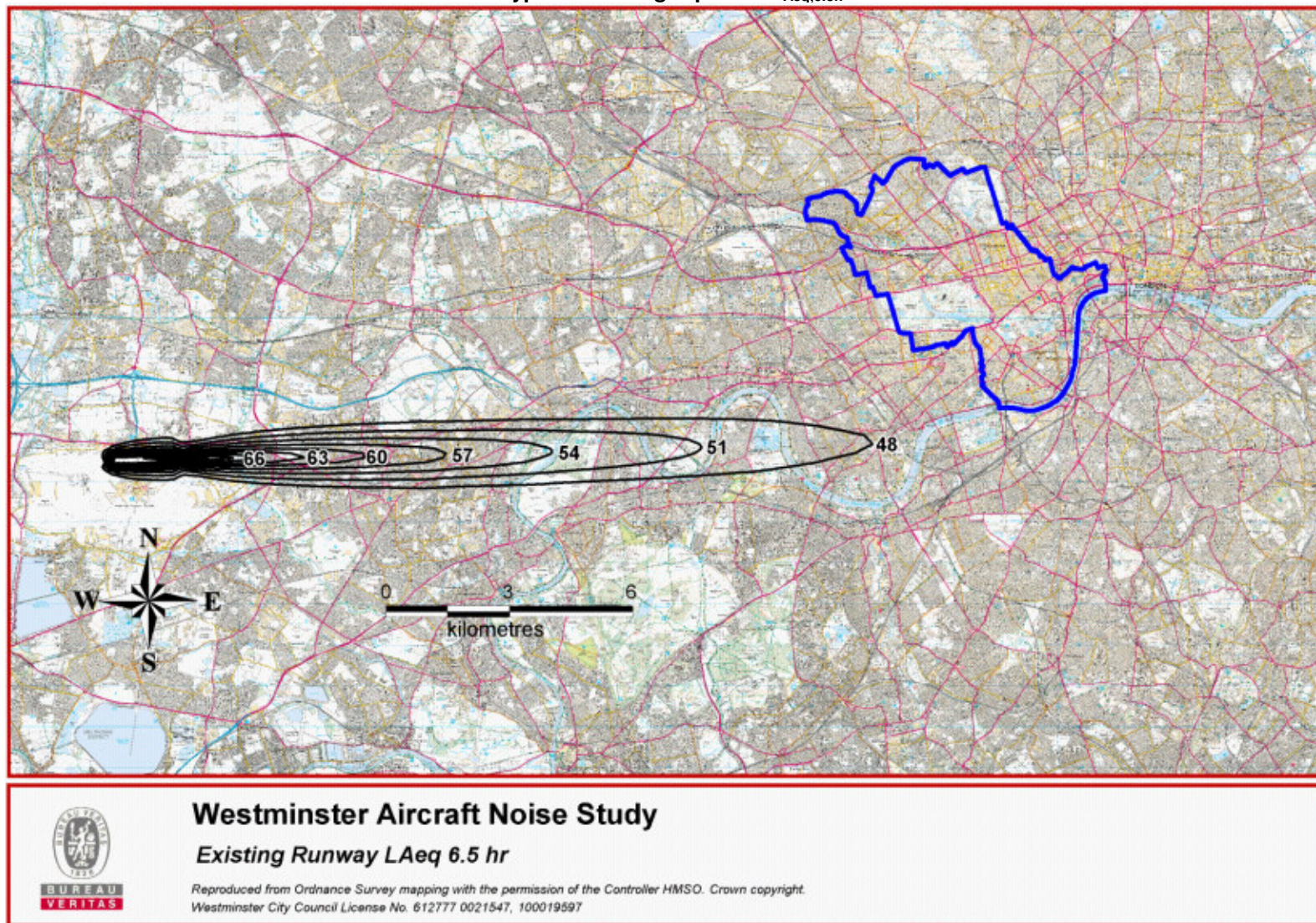


Figure B.5
Typical morning night shoulder period $L_{Aeq,1h}$

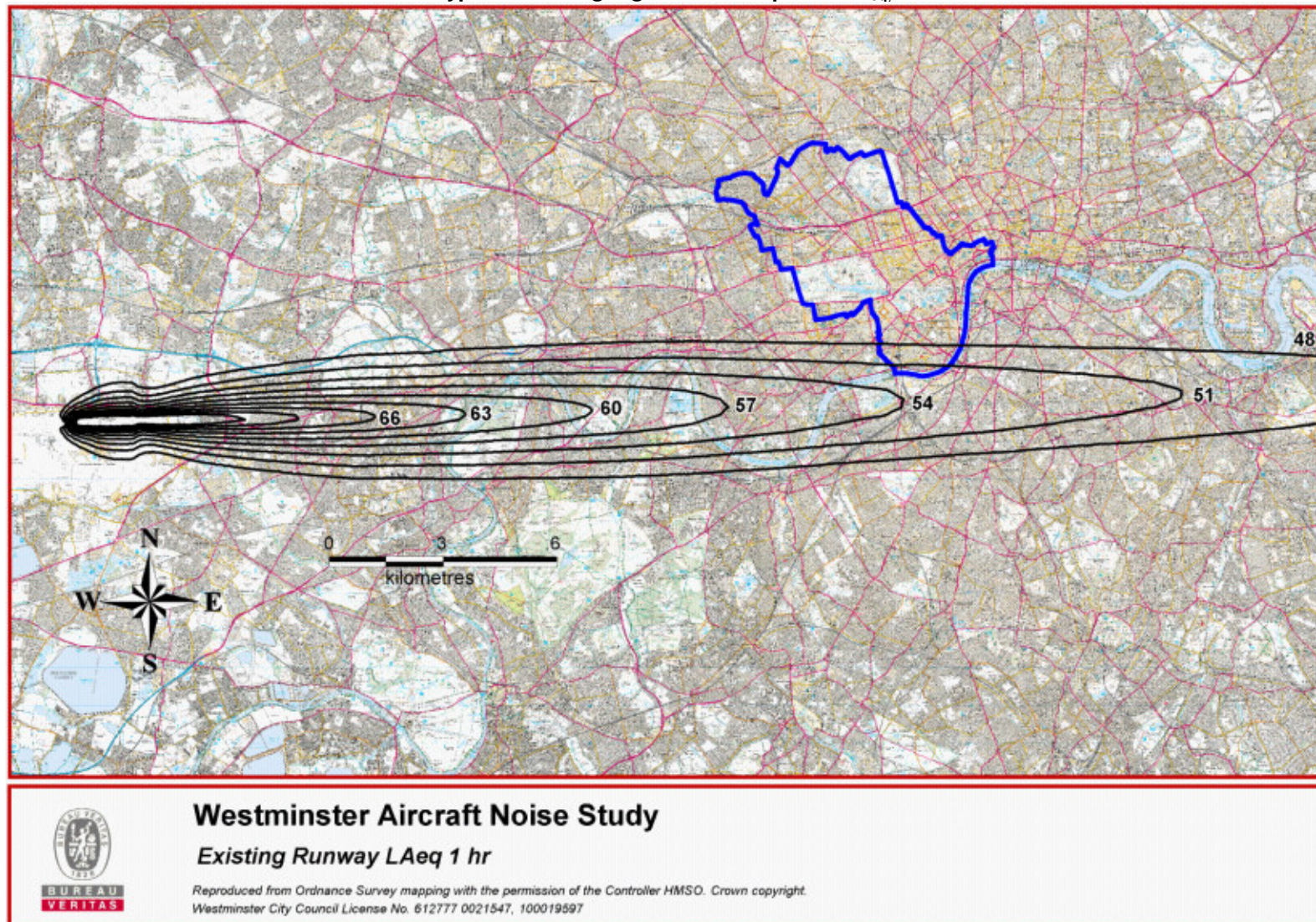


Figure B.6
Extract from ERCD 0706

FIGURE 7: HEATHROW AIRPORT
Year 2006 annual 24 hour L_{den} terrain adjusted noise contours
actual modal split 70% west / 30% east

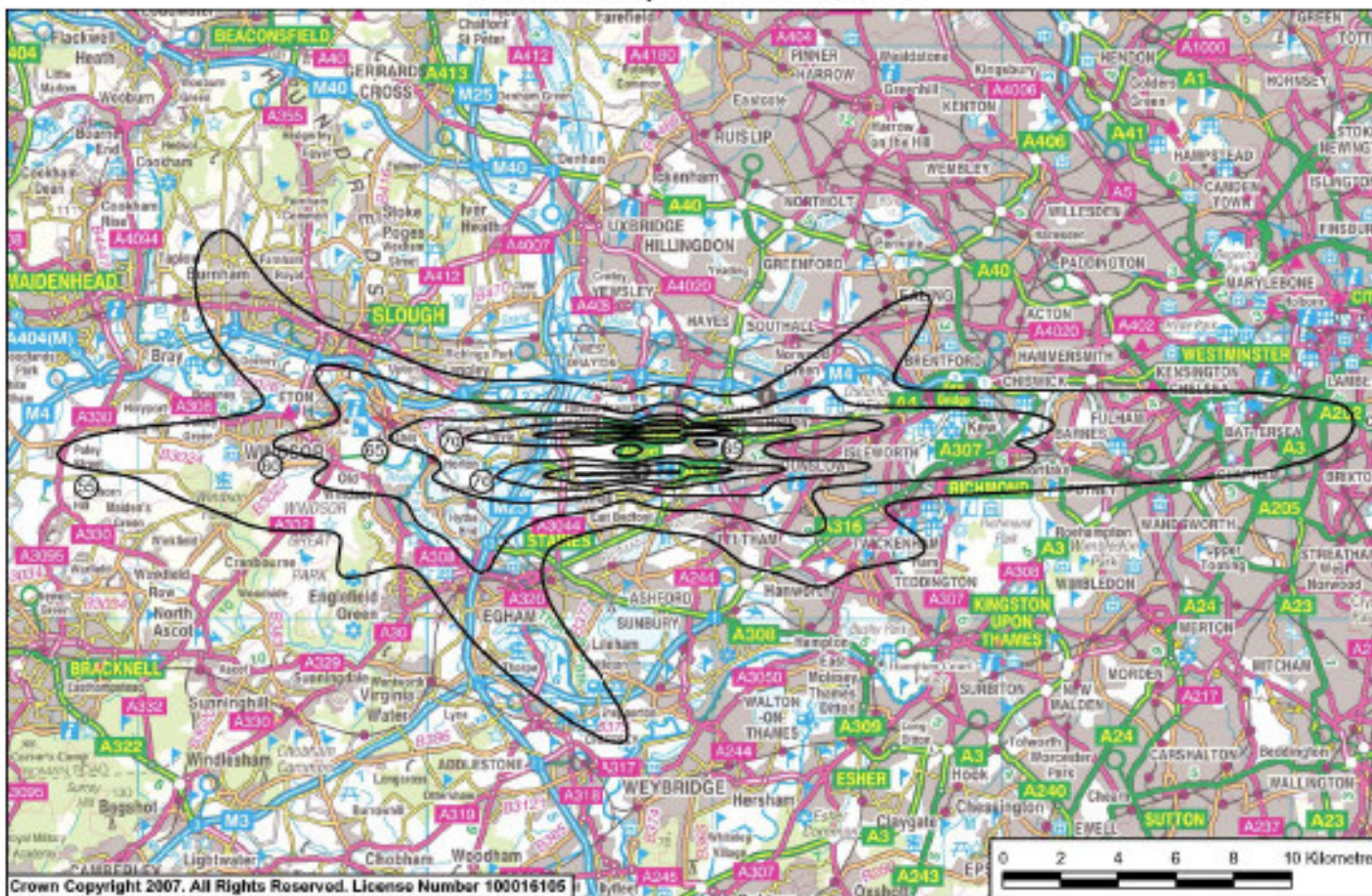
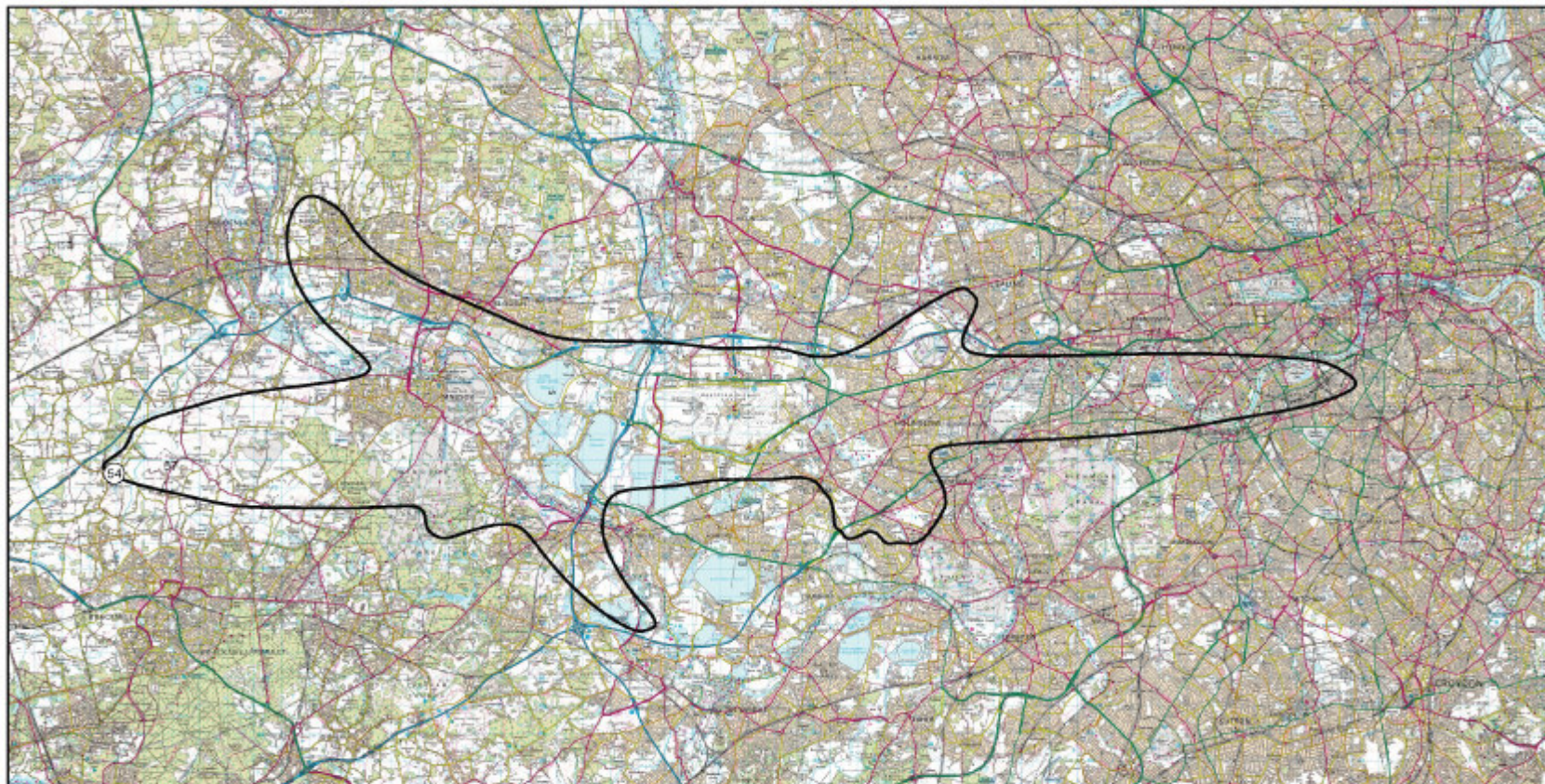


Figure B.7
Extract from ERCD 0705

Figure 3.14: Heathrow Summer 2002 16 hour average summer day - 54dBA Leq noise contour



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Figure B.8
Reproduction of Figure A9.5 from ANASE

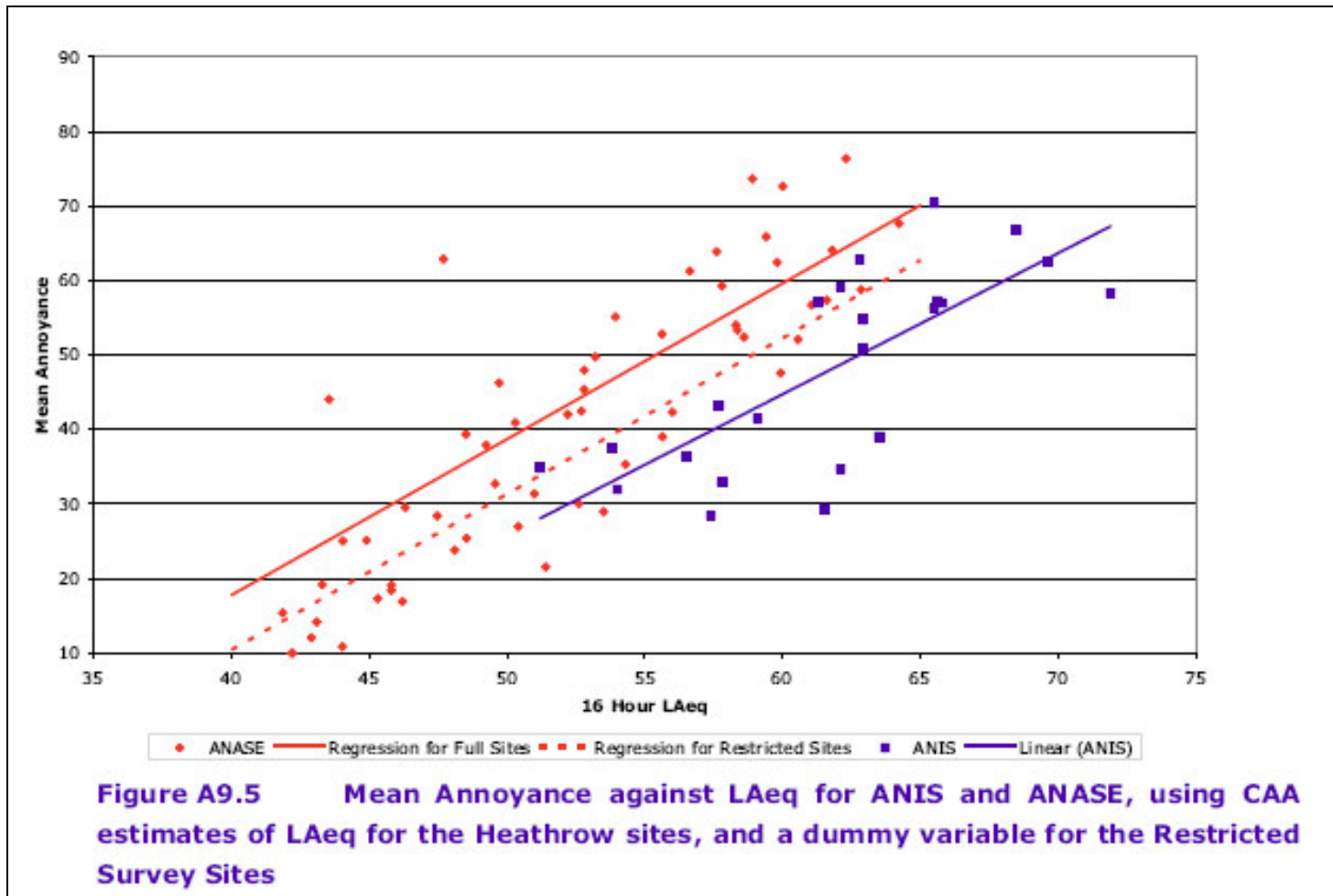
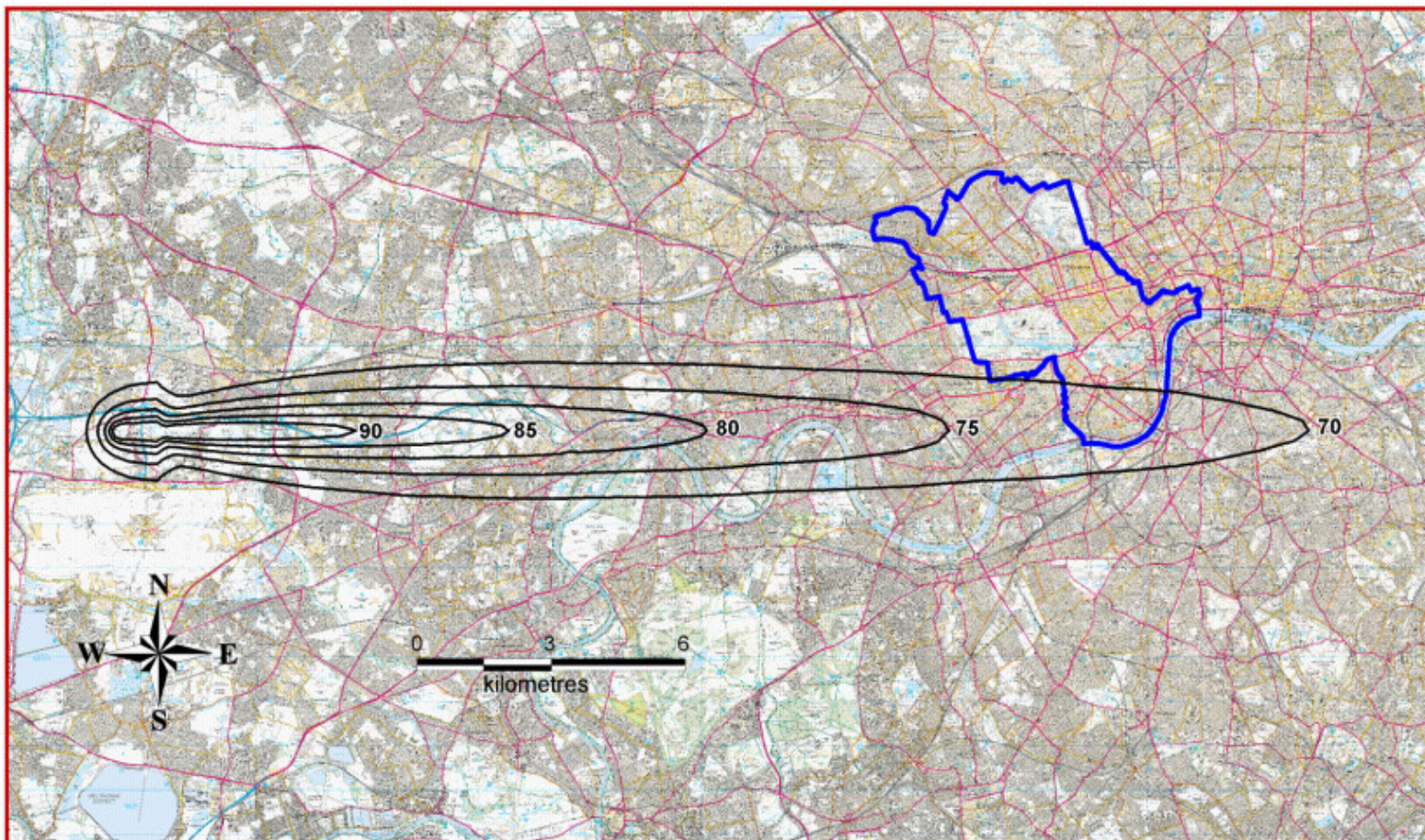


Figure B.9
SEL New 250 LH arrival on Heathrow R3




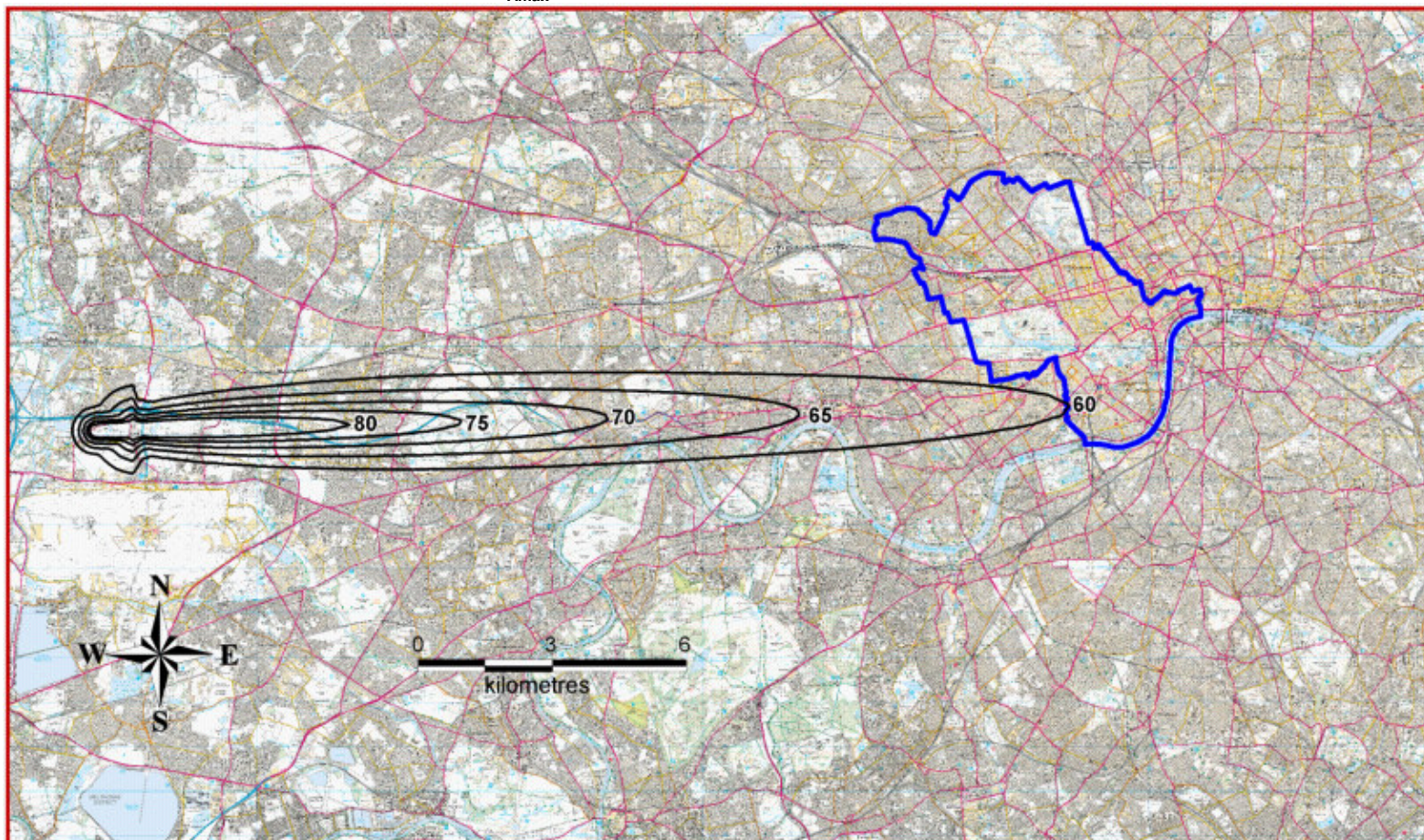
 **Westminster Aircraft Noise Study**
3rd Runway SEL Footprint Westerly Arrival - N250LH
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Figure B.10
L_{Amax} New 250 LH arrival on Heathrow R3



Westminster Aircraft Noise Study

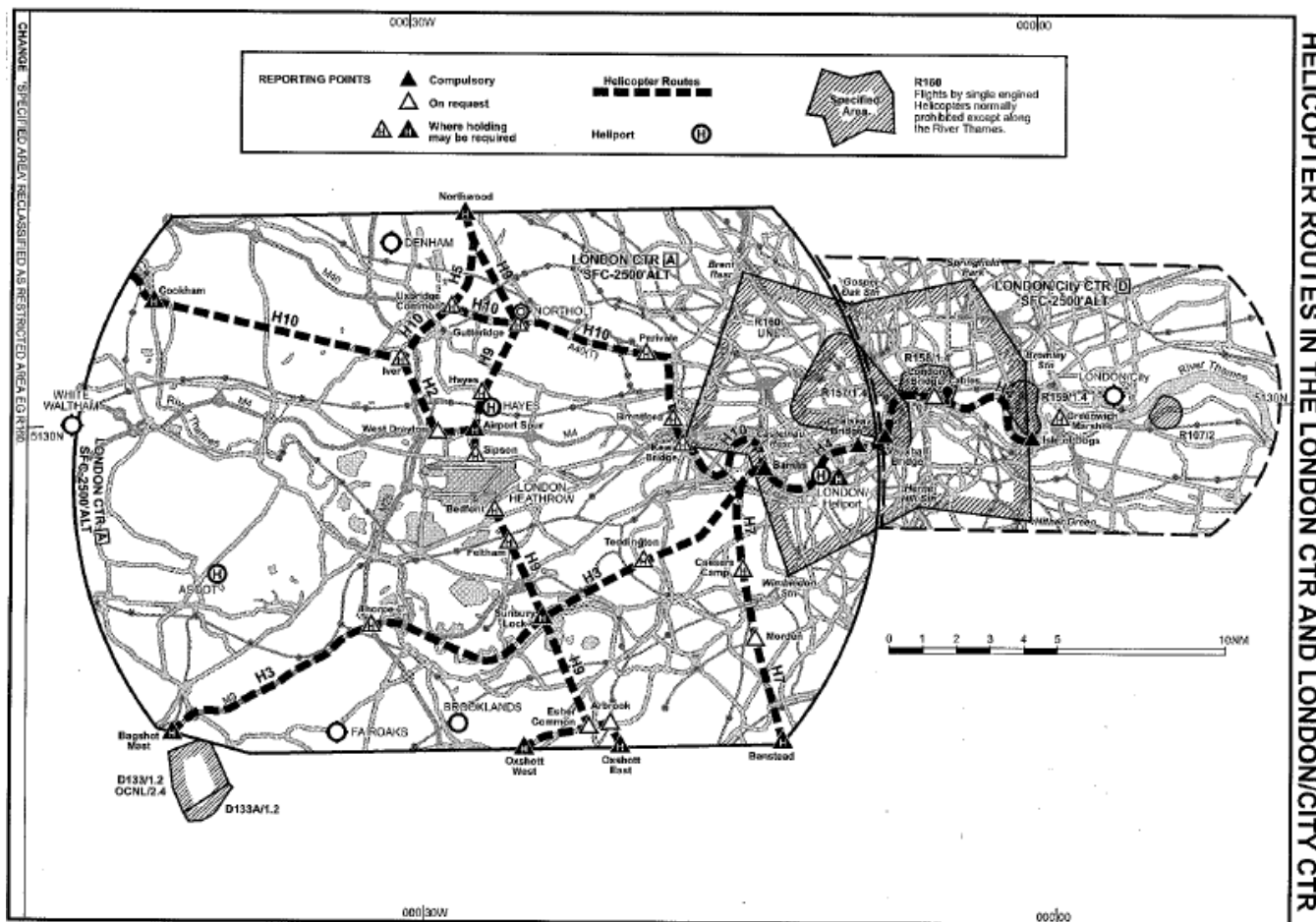
3rd Runway L_{Amax} - N250LH

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Figure B.11
Extract from the London City Airport ES Addendum



Figure B.12
 London Helicopter routes



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