



**TAG FARNBOROUGH AIRPORT
NOISE ACTION PLAN 2012**

September 2012

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EXECUTIVE SUMMARY

This Noise Action Plan (NAP) has been prepared by TAG Farnborough Airport to comply with the Section 106 Agreement put in place as a result of the granting of the application to increase the annual movement limit in 2011.

This NAP has been prepared in line with the requirements of Section 18 of the Environmental Noise (England) Regulations 2006 (as amended). These regulations transposed the EU Environmental Noise Directive (2002/49/EC), known as END, into UK legislation. Noise Action Plans are a legal requirement for major airports and are supplemented by Guidance produced by Defra. Farnborough Airport is not required legally to produce a NAP, however

NAPs are designed to manage noise issues and effects arising from aircraft departing from and arriving at an airport, as shown in the Strategic Noise Mapping (maps produced in accordance with earlier Defra guidance, which will be explained later) including noise reduction where necessary. NAPs support the Government's aim – set out in the White Paper, the Future of Air Transport, December 2003, commonly known as the Air Transport White Paper (ATWP) – to limit and where possible reduce the number of people in the UK significantly affected by aircraft noise. The current Government have advised they propose to retain this objective in the July 2012 Draft Aviation Policy Framework.

The Noise Action Planning process involves airports considering the noise impact of their operations as shown by the Strategic Noise Mapping exercise together with the current control measures they have in place, and then coming to a view as to whether or not the noise impact is acceptable. If it is considered acceptable, then it can be assumed that the current control measures are adequate, if not, then further action is required.

The Airport has in recent years developed an increasingly wide ranging package of measures designed to mitigate its impact on its neighbours whilst at the same time seeking to make the most of its economic benefit to the region. The package of measures was initially delineated following extensive public consultation which informed the Airport Master Plan, published in early 2009, and developed at the public local inquiry between 26 May 2010 and 30 June 2010 over the increase in annual movements.

The Airport has from its outset as a specialised business aviation airport monitored noise from aircraft operations and publishes noise contours each year which are available from the RBC website. It is clear that the noise contours on the maps produced as a result of the Strategic Noise Mapping exercise are the same shape as those which have been regularly produced and published by the Airport. The Noise Maps do not identify areas of noise exposure which have not already been considered in formulating the current noise amelioration programme.

Against this background, the Airport's initial view is that the new Strategic Noise Maps do not suggest the need for any substantive changes to the existing, comprehensive range of measures.

The NAP accepts, however, that in time further incremental improvements may be possible and the Airport would use the consultation to consider, in an open and constructive way, further amendments or additions to the measures which are currently enforced. In doing so, the guiding objectives set out in the Guidance would form the context for considering any new or amended control measures, particularly the requirement that *“Any new noise control measure that is considered for inclusion as part of the Action Plan must take into account the cost of implementation and the likely benefit to be accrued.”*

The Airport wishes to put on record its thanks to members of our independent Consultative Committee who have been involved at all stages of the process, and the officers of Rushmoor Borough Council.

Responses to Consultation were received from various members of the Farnborough Aerodrome Consultative Committee during May 2012 following a presentation at the March 2012 meeting, giving members 3 months to formulate their responses.

TAG have incorporated these responses into the this plan and will present the final version to Rushmoor Borough Council in October 2012 in line with the obligations of the Section 106 Agreement.

1.0 INTRODUCTION

1.1 Statutory Framework

1.1.1 This voluntary NAP has been prepared in line with the requirements of Section 18 of the Environmental Noise (England) Regulations 2006 (as amended). These regulations transposed the EU Environmental Noise Directive (2002/49/EC), known as END, into UK legislation. TAG Farnborough welcome the opportunity that this has provided to review the existing package of mitigation measures developed during the Master Plan preparation process, and at the recent Public Inquiry (May/June 2010). In the Section 106 of February 2011, obligation 12.3 was that prior to January 2013 to produce a voluntary Noise Action Plan and submit it to the Council.

1.1.2 The Guidance, which is available on the Defra website, is detailed and airport operators must have regard to it when drawing up NAPs. Accordingly, TAG Farnborough took full account of the Guidance when preparing this Noise Action Plan. They were also able, due to publication of NAPs by other U.K. airports, to consider the measures used elsewhere in the U.K.

1.2 Public Consultation

1.2.1 As this is not an official NAP, and in light of the extensive consultation over the noise at the Airport in 2008/2009 related to the Airport Master Plan, extensive consultation and public hearing in 2010, consultation for this voluntary NAP has been concentrated on the independent Farnborough Aerodrome Consultative Committee (FACC) and Rushmoor Borough Council.

1.3 Terminology

1.3.1 The scientific terminology for the measurement of noise is complex in addition to which the Guidance also introduces a number of technical terms which are critical to the process. In this NAP, we have sought to minimise the use of jargon wherever we can and where technical terms have to be used we have tried to explain them clearly in the text as well as in the Glossary which can be found at Appendix A.

1.4 Purpose of Noise Action Plans (NAP)

1.4.1 NAPs are designed to manage noise issues and effects arising from aircraft departing from and arriving at their airport, as shown by the results of Strategic Noise Mapping (maps produced in accordance with earlier Defra guidance, which will be explained later). NAPs must include a description and assessment of the existing framework of control relating to noise from the airport. They support the Government's aim – set out in the White Paper, the Future of Air Transport, December 2003, commonly known as the Air Transport White Paper (ATWP) – to limit and where possible reduce the number of people in the UK significantly affected by aircraft noise.

1.4.2 The Noise Action Planning process involves airports considering the noise impact of their operations as shown by the Strategic Noise Mapping exercise together with the

current control measures they have in place, and then coming to a view as to whether or not the current noise impact is acceptable. If it is considered acceptable, then it can be assumed that the current control measures are adequate, if not, then further action is required.

Strategic Noise Mapping Exercise

- 1.4.3 The first stage in this process was for major airports, which Farnborough is not one, to prepare Strategic Noise Maps in 2007, based on aircraft movements in 2006. As required, these were submitted to the Secretary of State. (Noise Maps for all relevant UK airports are available on the Defra web site, and a copy of this NAP will be put on the Airport's website). In this voluntary NAP the strategic noise maps have been prepared for 2011.
- 1.4.4 These maps can be regarded as the evidence-base which underpins the Noise Action Planning process. Farnborough has, for many years, produced noise contours or maps annually. These are made available to everyone by being placed on the Council's website. The Strategic Noise Mapping exercise carried out to support the NAP planning process uses the same computerized noise model, the Federal Aviation Authority's Integrated Noise Model, and the modelling exercise is very similar to the annual exercise carried out by the Airport.
- 1.4.5 However, there are two differences. These are the assessment period, which for the NAP is required to be the full calendar year whereas the Airport has traditionally assessed the noise annually and for the first and second 6 months of each year. The other difference is the presentation of the results using a new measure known as the "L_{den}" (for Day, Evening and Night). Defra also required major airports to produce the supplemented indicators L_{day}, L_{evening} and L_{Aeq,16h}.
- 1.4.6 The Guidance makes it clear that the NAP must be drawn up for places near the Airport, which it goes on to explain means those places affected by the noise from Airport operations, as shown by the results of the Strategic Noise Mapping. Note that for the purposes of the NAP no other sources (such as ground noise from aircraft activities) are to be taken into account, only the noise from aircraft departing and arriving at the Airport. Once again this approach has been followed by the Airport.
- 1.4.7 NAPs must also include "a description and assessment of the existing national and local framework of control directly or indirectly relating to the management of noise from the airport e.g. current government policies, noise preferential routes, Airport Master Plans, any local planning agreements and restrictions, and local voluntary agreements etc." Again this approach has been followed by the Airport having regard in particular to the current Master Plan (published in early 2009), which sets out the current noise mitigation programme, and the Aerodromes (Noise Restrictions) (Rules and Procedures) Regulations 2003, commonly referred to as "The Balanced

Approach”, which dictate the process which the Airport must adopt in formulating noise controls.

- 1.4.8 There is a specific requirement that NAPs must make special provisions for “quiet areas” located in large towns and cities (defined in the END and referred to as agglomerations) and where possible to avoid over flights of National Parks and Areas of Outstanding Natural Beauty below 7,000 feet. However, these provisions are not relevant to TAG Farnborough, as the Airport Noise Maps do not impact upon any agglomeration and aircraft operating to or from the Airport do not usually fly over National Parks or areas of Outstanding Natural Beauty below 7,000 feet.
- 1.4.9 In addition to considering the special requirements of quiet areas within agglomerations, the Guidance suggests that airports investigate opportunities for protecting quiet areas in general, using “ameliorative measures such as sophisticated flight path management”. The Airport makes use of a number of flight path management techniques and other procedures, as set out in Section 3.
- 1.4.10 The format must also conform to a number of detailed requirements. The Airport has followed these requirements.

1.5 Legislative Structure for Noise Control

- 1.5.1 This section of the NAP describes and assesses the existing legislative structure for the control of environmental noise from Farnborough aerodrome.

European Regulations

1996 European Commission Green Paper

- 1.5.2 In 1996, the European Commission issued a Green Paper¹ which stated that an estimated 20% of EU citizen were exposed to levels of noise that scientists and health experts considered unacceptable, at which most people became annoyed, sleep was disturbed and adverse health effects were feared.
- 1.5.3 There were already a number of EU Directives which control noise from mechanical sources such as vehicles and outdoor machinery, however the Green Paper proposed a much more general approach to controlling environmental noise by focusing on those exposed, rather than the specific source.

2002 Environmental Noise Directive (END)

- 1.5.4 In July 2000, the EU proposed an Environmental Noise Directive (END) relating to the assessment and management of environmental noise. This was subsequently enacted². It considers noise from road, rail, air traffic and industry. It looks at the impact of noise on individuals, and supports existing EU regulations for noise levels from specific sources.

¹ Commission of the European Communities: *Future Noise Policy*, 4th November 1996

² Directive 2002/49/EC of the European Parliament and of the Council *relating to the assessment and management noise* 25th June 2002

- 1.5.5 The END requires members of the EU to create Strategic Noise Maps for agglomerations for major roads, railways and airports. NAPs also have to be produced, with the aim of managing environmental noise.

National Regulations

2006 The Environmental Noise (England) Regulations

- 1.5.6 The 2006 Environmental Noise (England) Regulations are a direct result of the Directive made in June 2002 (END). The Regulations were put before Parliament on the 7th September 2006 and came in to force on the 1st October 2006. All major airports, of which Farnborough is not one, are listed in the 2007 Environmental Noise (Identification of Noise Sources) (England) Regulations.

2003 White Paper: The Future of Air Transport (ATWP)

- 1.5.7 The Department for Transport (DfT), in their White Paper *The Future of Air Transport* (ATWP), set out the previous Government's plan for the development of air travel over the next 30 years. It stressed the importance of making the best use of existing airport capacity, and encourages growth at regional airports.
- 1.5.8 The current Government whilst advising on the rejection of second runways at Heathrow, Stansted and Gatwick Airport, have retained the policy advice in the White Paper. That, it is planned, will be considered as a new Aviation Framework developed for issue in 2013.
- 1.5.9 In particular it states that small airports in the South East, such as Farnborough, have an important part to play in the future provision of airport capacity in the area, while also recognising a commitment to limit, and where possible reduce, the number of people in the UK significantly affected by aircraft noise.
- 1.5.10 In line with the ATWP's commitments, the Government has strengthened and clarified powers to control aircraft noise. In particular, airport operators have been given statutory powers to introduce noise control schemes and fine aircraft operators for any departures that breach noise limits.

July 2012 Draft Aviation Policy Framework

- 1.5.11 The coalition Government produced its draft Aviation Policy Framework in July 2012. Consultation on this document is in progress and continues to 31st October 2012. This draft, whilst side-stepping the main issue of contention [airport/runway capacity] did consider the benefits of aviation and managing aviation's environmental impacts.
- 1.5.12 In Chapter 4 of the document, Noise is considered and the policy objective on noise proposed. The proposal is to retain the existing policy delineated in the ATWP as it is consistent with the Government's Noise Policy Statement for England (NPSE), March 2010. The draft Aviation Policy Framework, in essence, does not alter the advice on noise matters given in the ATWP.

1.5.13 On 7th September 2012, the new Secretary of State for Transport advised that the final Aviation Policy Framework will be adopted by the end of March 2013. He also confirmed that the Government has asked Sir Howard Davies to chair an independent Commission tasked with identifying and recommending to Government options for maintaining this country's status as an international hub for aviation. The Commission are to provide an interim report in the summer of 2015. The current Government advice is that a decision on whether to support any of the recommendations contained in the final report will be taken by the next Government.

Local Regulations

1.5.14 The Airport is located within RBC, and aircraft using the airport fly over areas of Farnborough at low altitude. The local regulations are delineated in Section 4 of this NAP.

2.0 AIRPORT OPERATIONS

- 2.1 Farnborough Airport, the UK's first airfield, was established in 1905. The Airport's aviation history predates even the UK's first officially recorded powered flight conducted there in 1908 by Samuel Cody. The first flight in the UK of a jet-powered aircraft was made there, as was the World's first flight of a commuter jet airliner.
- 2.2 From its early days, the Airport was used as a centre of military and civil aviation research.
- 2.3 The Ministry of Defence (MoD) commenced a strategic review of its aviation research and development operations in the mid-1980s. By this time, the volume of military research and development activity at the site had begun to decline. Other sites, particularly Boscombe Down, expanded their operations and eventually took all the research flying from Farnborough.
- 2.4 The review of infrastructure assets by the MoD coincided with a broader review of the need and demand for Business Aviation facilities in the South East. The Business Aviation Working Group, comprising representatives of the Department of Transport, industry representatives, the CAA, NATS, Department of the Environment and the South East Regional Planning Standing Conference, was established in 1984 to evaluate the available capacity for Business Aviation in the South East.
- 2.5 The Working Group concluded that Farnborough would be a suitable location for Business Aviation activity on the basis that; there was available capacity; the runway was long enough for trans-Atlantic flights; and the site was well located in relation to London and the South-East. Its conclusions were embodied in the 1985 White Paper; Airports Policy (Cmnd 9542).
- 2.6 The 1985 White Paper stated:

“The [Business Aviation] Working Group recommended the development of Farnborough for Business Aviation. The Ministry of Defence have recently confirmed that they will be inviting tenders for the development of a Business Aviation enclave with associated light industry at Farnborough.” (paragraph 7.7)
- 2.7 A civil enclave was opened in January 1989 under a licence arrangement between the MoD and Carroll Aviation.
- 2.8 From 1998, the MoD began to transfer control of Farnborough Aerodrome to TAG, with the understanding that the facility would be used solely for Business Aviation and the Farnborough International Air Show (the Airshow). TAG Farnborough Airport Limited took full control of the Airport under a long lease in 2003, and acquired the freehold from the MoD at the end of 2007.
- 2.9 On 11 October 2000, RBC granted outline planning permission for erection of new buildings and associated structures and use of the aerodrome for Business Aviation

and related activities at the Airport. Together with a planning agreement, this permission contains the planning parameters within which the Airport must operate.

- 2.10 In April 2009 TAG published the Farnborough Airport Masterplan which provided an overview of infrastructure, facilities and operations and set out the potential opportunities for improvement and development that could take place up to 2019 and, indicatively, up to 2030. The Executive Summary can be found at Appendix F.
- 2.11 The Airport is the most modern Business Aviation airport in Europe and has some of the best facilities for this market in the World.
- 2.12 Current facilities at the Airport include:
- A bi-directional runway with Instrument Landing System and sophisticated lighting, including a 170 metre starter strip and a 40 metre full-width runway extension. The runway has a landing distance of 1,800 metres and a take off distance of 2,000 metres. This is capable of serving all types of Business Aviation aircraft up to and including the Boeing Business Jet. The runway is aligned approximately north-east to south-west (060 degrees or 240 degrees).
 - A terminal facility of an exceptionally high and award-winning standard. It comprises business lounges, a small café, security areas and meeting rooms and offices and covers an area of 4,620 square metres. The building materials used include curtain walling and structural glass to the elevations, interspaced with flat metal cladding to match the hangar buildings and control tower, and are in keeping with the high quality image of the Airport. The terminal is set in a landscaped area and serves as a passenger facility. It also provides the operational and administrative offices of TAG and other aviation associated companies.
 - A modern, 34 metre high Air Traffic Control (ATC) tower was completed in 2002, providing radar and ATC services. NATS' employees staff the tower and the unit also provides a Lower Airspace Radar Service for a number of smaller airports around Farnborough and to aircraft at lower levels within the whole of the London Terminal Manoeuvring Area.
 - 120,000 square metres of aircraft parking and taxiing aprons at the centre of the site.
 - A triple bay, wave-form hangar of 15,600 square metres for aircraft parking which was completed in 2003. In addition, four ex-military hangars are utilised for aircraft maintenance, ground equipment storage and general storage.

- A further triple bay, wave-form hangar of 15,600 square metres for aircraft parking and ancillary offices, broadly similar to the first triple bay hangar.

2.13 Recent operations, 2011, are summarized in Table A, which indicates annual aircraft movements total about 25,000. These are mainly carried out by turbo-fan small business aircraft.

2.14 The Airport has operated in accordance with a noise contour budget since 1st January 2003 when the CAA Licence commenced, see Table B.

2.15 The Airport records all community concerns, Table C indicates the complaints received in 2011, which are mainly related to track/altitude matters.

Table A Farnborough Aerodrome Aircraft Movements 2011

Month	Aircraft Movements			
	Business	Helicopter	Sub-total*	Total
January	1,532	74	1,606	1,733
February	1,714	56	1,770	1,904
March	1,856	64	1,920	2,153
April	1,581	58	1,639	1,840
May	2,221	112	2,333	2,518
June	2,420	130	2,550	2,739
First Six Months	11,324	494	11,818	12,887
July	2,315	92	2,407	2,677
August	1,615	48	1,663	1,815
September	1,970	101	2,071	2,296
October	1,705	86	1,791	1,935
November	1,671	77	1,748	1,842
December	1,417	62	1,479	1,574
Second Six Months	10,693	466	11,159	12,139
Total 2011	22,017	960	22,977	25,027

* Sub-total relates to movements covered by the original Planning agreement.

Table B Farnborough Aerodrome Noise Contour Areas

Contours	Area of dB L _{Aeq,16h} contours at values	
	55	60
<u>Control</u>		
Original ⁽¹⁾	9.09	4.01
New, from 1 st January 2013 ⁽¹⁾	6.60	2.40
<u>Actual</u>		
January – December 2010 [Predicted January – December 2011]	2.04 [2.16]	0.93 [0.97]
January – December 2011 [Predicted January – December 2012]	1.75 [1.83]	0.81 [0.83]
[Predicted for full future use of allowed movements]	[6.0]	[2.22]

(1) Specified in Section 106 Agreement, 29 June 2010.

Table C Farnborough Aerodrome Complaints, Baseline 2011

Month	Complaints Statistics				
	Complaints	Complainants	Flight Specific		
			Noise	Track/Altitude	Other
January	8	7	4	2	2
February	5	4	0	4	1
March	10	9	1	7	2
April	29	13	7	22	0
May	26	22	9	13	4
June	30	23	10	14	6
July	38	20	8	26	4
August	26	13	6	17	3
September	24	14	5	18	1
October	53	24	4	46	3
November	10	8	4	4	2
December	5	5	2	3	0
Total	264	110	60	176	28

2.16 The Airport received planning permission in 2011 to expand aviation activities specifically to accommodate no more than a total of 50,000 aircraft movements per annum, of which no more than 8,900 movements should be at weekends and Bank Holidays.

2.17 The Airport agreed to a phased increase in the maximum number of movements e.g. see Table D below from Section 106 Agreement.

Table D Phased A/C Movements

Year	Total Movements	Weekend Movements
2010	28,000	5,000
2011	31,000	5,500
2012	37,000	6,600
2013	41,000	7,300
2014	43,000	7,600
2015	45,000	8,000
2016	47,000	8,250
2017	48,000	8,500
2018	49,000	8,750
2019	50,000	8,900

3. NOISE MAPS AND EVALUATION

END Noise Maps

- 3.1 TAG Farnborough has prepared Noise Maps under the Environmental Noise (England) Regulations 2006, Appendix B.
- 3.2 Noise Maps were created based on 22,977 actual business and helicopter aircraft movements covered by the original Planning agreement during the calendar year of 2011, and utilised the prediction methodology Integrated Noise Model (INM) Version 7.0b. The maps were presented as noise contours, and were assessed for a number of noise parameters relating to the average annual noise level in decibels over specific periods of time.
- 3.3 Farnborough's operational hours are between 07.00 and 22.00 for weekdays and between 08.00 and 20.00 hours at weekends, the assessment criteria within the 2006 Environmental Noise (England) Regulations dictated that the following parameters given in Table E were used. As there is no night-time activity L_{night} contours have not been produced for Farnborough.

Table E **END Noise Map Parameters**

Parameter	Time Period (hh:mm)	Number of Hours
L_{den}	00.00 – 24.00	24
L_{day}	07.00 – 19.00	12
L_{evening}	19.00 – 23.00	4
$L_{\text{Aeq,16hr}}$	07.00 – 23.00	16
L_{night}	23.00 – 07.00	8

Effects of Noise Exposure

- 3.4 The effects of aircraft noise on a community area are normally assessed in terms of the $L_{\text{Aeq,16h}}$ parameter, calculated using the number of aircraft movements over an average summer day (summer typically being more noisy than winter).
- 3.5 The END dictated that Strategic Noise Maps include noise contours for the $L_{\text{Aeq,16h}}$ parameter calculated from the number of aircraft movements on an average annual day, rather than a summer day. While this is not the usual UK period, it did not affect the shape or size of the contours to any significant degree.
- 3.6 Similar to the $L_{\text{Aeq,16h}}$ parameter is the L_{den} parameter. The key difference however is that the L_{den} parameter gives more significance to noise events that occur during the evening (19.00 – 23.00) and night-time (23.00 – 07.00) periods. Note that Farnborough does not operate during the night-time period, or during all the evening assessment period.
- 3.7 The Government has not yet published any guidance on how to interpret noise contours created in terms of L_{den} , however the European Commission are working to

produce a relationship between the L_{den} parameter and community guidance. The 2010 report by the European Union Environment Agency provides some guidance, see Appendix C for extracts relating to impacts related to L_{den} levels.

1985 UK Aircraft Noise Index Study (ANIS)

3.8 Current Government guidance regarding the assessment of exposure to aircraft noise is based on published research relating to the onset of community annoyance from aircraft noise levels, the Aircraft Noise Index Study (ANIS).

3.9 While the Government recognises that the relationship between the level of noise and the resulting annoyance is not exact and varies according to individual people and locations, it gives the following definitions:

57 dB $L_{Aeq,16h}$ - the level which marks the onset of significant community annoyance.

2003 White Paper: The Future of Air Transport (ATWP)

3.10 The ATWP requires airport operators to:

- i) Offer households subject to high levels of noise (69 dB $L_{Aeq,16h}$ or more), assistance with the cost of relocating

And following airport growth:

- ii) Offer to purchase those properties suffering from both a high level of noise (69 dB $L_{Aeq,16h}$ or more) and a large increase in noise (3 dB L_{Aeq} or more)

National Planning Policy Framework (NPPF)

3.11 On 27th March 2012, the coalition Government published the NPPF which set out the Government's planning policies for England and how these are expected to be applied. This replaced the heavily used Planning and Noise Guidance Note PPG 24.

3.12 With respect to noise policy, that is delineated in paragraph 109, where it is stated that the planning system should contribute to and enhance the natural and local environment by:

“preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability;. And...”

3.13 The aim of planning policies and decisions with respect to noise is also addressed in paragraph 123,

- *“avoid noise from giving rise to significant adverse impacts³ on health and quality of life as a result of new development;*
- *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*

³ See Explanatory Note to Noise Policy Statement for England (Defra)

- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established⁴; and*
- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”*

Noise Policy Statement for England (NPSE)

3.14 On 15th March 2010 Defra published its *Noise Policy Statement for England* (NPSE). This sought to make explicit the underlying principles and aims regarding noise management and control that are to be found in existing policy documents, legislation and guidance. In particular it stresses the need to integrate noise management policy with the Government’s sustainable development strategy. It introduces a new concept SOAEL – Significant Observed Adverse Effect Level, but clarifies that no numerical values have yet been determined by Defra, and advises that the lack of values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available. Defra has commissioned a research contract to investigate and advise on numerical values for SOAEL.

3.15 The NPSE delineates the Noise Policy Aims as;

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life.*

3.16 As discussed above, the July 2012 draft Aviation Policy Framework retains the noise advice given in the ATWP as it has been found consistent with that given in the NPSE.

3.17 In light of the non-numerical advice from DCLG and Defra, this development has been assessed using the current numerical policies given in the ATWP, and the principles delineated in the NPPF and NPSE.

⁴ Subject to the provisions of the Environmental Protection Act 1990 and other relevant law.

Noise Mapping Results

3.18 This section sets out the results of the Strategic Noise Maps produced by Farnborough. The results include estimates of the area, number of dwellings and population covered the noise contour bands for each parameter.

Area Contained in Each Noise Contour Band

Table G1 Area within Noise Contour Bands

Contour Level (dB)	Area of L_{den} ($L_{Aeq,24h}$) Air Noise Contours (km ²)	Area of L_{day} ($L_{Aeq,12h}$) Air Noise Contours (km ²)	Area of $L_{evening}$ ($L_{Aeq,4h}$) Air Noise Contours (km ²)	Area of $L_{Aeq,16h}$ Air Noise Contours (km ²)
55	1.50	2.01	0.97	1.60
60	0.72	0.89	0.49	0.75
65	0.35	0.44	0.21	0.37
70	0.13	0.18	0.05	0.14
75	0.02	0.04	0.01	0.03

Dwellings and Population in Each Noise Contour Band

3.19 Tables G2 to G5 give estimates of the number of dwellings and people exposed to different noise levels for each parameter. The dwelling counts have been obtained from inspection of detailed Ordnance Survey maps. The populations are estimated based on an average occupancy of 2.3 persons per dwellings.

Table G2 L_{den} , estimated total number of dwellings and population above various noise levels

Contour Level (dB L_{den})	Number of dwellings	Population count
≥ 55	0	0
≥ 60	0	0
≥ 65	0	0
≥ 70	0	0

3.20 Appendix D indicates the Defra estimated populations at other U.K Airports. Other London area airports with significant business aviation of the type that use Farnborough have much larger population exposed to 55 L_{den} and above, e.g. Luton 6500, London City 10,500.

Table G3 L_{day} , estimated total number of dwellings and population above various noise levels

Contour Level (dB L_{day})	Number of dwellings	Population count
≥ 54	133	306
≥ 57	0	0
≥ 60	0	0
≥ 63	0	0
≥ 66	0	0

Table G4 L_{evening} , estimated total number of dwellings and population above various noise levels

Contour Level (dB L_{evening})	Number of dwellings	Population count
≥ 54	0	0
≥ 57	0	0
≥ 60	0	0
≥ 63	0	0
≥ 66	0	0

Table G5 $L_{\text{Aeq,16h}}$, estimated total number of dwellings and population above various noise levels

Contour Level (dB $L_{\text{Aeq,16h}}$)	Number of dwellings	Population count
≥ 54	40	92
≥ 57	0	0
≥ 60	0	0
≥ 63	0	0
≥ 66	0	0

Summary of END Strategic Noise Mapping

- 3.21 Guidance on how to determine the acceptability of noise levels has been provided to airport operators by DEFRA⁵ which states that account should be taken of current legislation and guidance as well as any relevant local planning conditions. These are normally given in terms of dB $L_{\text{Aeq,16h}}$ for the assessment of aviation noise impact.
- 3.22 The 57 dB $L_{\text{Aeq,16h}}$ is the level which Government legislation marks as the point at which there is an onset of significant community annoyance. The 57 dB $L_{\text{Aeq,16h}}$ noise contour for operations at Farnborough extends in to Farnborough and the MoD land to the west.
- 3.23 There are no dwellings located within the 63 or 69 dB $L_{\text{Aeq,16h}}$ contour.
- 3.24 The Guidance sets out the crucial test which formed the basis of what the NAP had to consider in order to establish whether or not further action is required. It specifies that airport operators will primarily have two pieces of information available to them for action planning. These are: -
- The current noise impact of their operations as shown by the results of the noise mapping; and the current noise control measures they have in place.
- 3.25 The Action Plan process requires consideration to be given regarding the following: -
- Is the current noise impact acceptable? If the answer is 'Yes', then it can be assumed that the current noise control measures are adequate. If the answer is

⁵ Defra document Directive 2002/49/EC "Guidance for Airport Operators to produce airport noise action plans under the terms of the Environmental Noise (England) Regulations 2006" March 2009

'No' then further action is required and this action will be proposed as part of the Action Plan under the terms of the Regulations.

4. NOISE CONTROL MEASURES/MONITORING AND REVIEW

- 4.1 The existing noise controls and noise minimisation measures in place at the Airport will continue to apply to the operations at the Airport in the future. The Airport operates a sophisticated noise and track keeping system, with reporting on a regular cycle to RBC and the Airport's consultative committee (FACC).

Planning Noise Controls at Farnborough

- 4.2 The planning consents of 11th October 2000 and 27th June 2007 and the Section 106 Agreement of 10th October 2000 embodied a number of environmental noise control measures at the Airport. The recent planning consent of 10 February 2011 retained many of the earlier noise controls, with modifications and additions.

Farnborough Noise Budget

- 4.3 In 2000, Acoustic Technology Ltd (ATL), now trading as Bureau Veritas, were retained by RBC to provide advice on a number of environmental noise issues associated with Farnborough Aerodrome. They presented noise contours (Ref AT 4769/1 Rev.0, May 2000) to assist RBC in their deliberations on what constraints might be regarded as 'reasonable' on the civilian airport following transfer from military use. The contours related to the Local Plan Inquiry Inspector's recommendation in 1998 that the continued operation of the Airport for Business Aviation use should not result in levels of noise exceeding those that would be generated by 20,000 movements per annum of a mix of aircraft similar to that recorded at Farnborough Aerodrome in 1997.
- 4.4 RBC subsequently adopted the contours prepared by ATL identified as Figure 8 of the ATL report in the 2000 Deed relating to the TAG planning permission, obligation 2a. The obligation is not to exceed the annual noise budget (defined by the position of and total land within both the 55 dB and 60 dB $L_{Aeq,16h}$ contours). In practice the monitoring has included the monitoring of the contour area at those two values. The limit contour areas are provided in Table H below.

Table H Farnborough Noise Budget Contour Areas

Contour Value dB $L_{Aeq,16h}$	Maximum Allowed Area 2000 Deed (km^2)	Maximum Allowed Area Current Section 106 (km^2)
55	9.09	6.6
60	4.01	2.4

- 4.5 The current Section 106 retains this obligation in an updated obligation 2.1 (a). It also contains a new obligation 12.1 that specifies more restrictive noise limits, see Table H above.

- 4.6 This noise impact exposure was taken by RBC as the threshold of acceptability with respect to the balanced judgement on the planned use and environmental disbenefit.
- 4.7 The Airport also has to operate within conditions set as part of the planning approvals, as described below. Appendix E provides the operation and noise related restrictions from the UK AIP.

Number of Aircraft Movements: Planning Condition 7

- 4.8 No more than a total of 50,000 aircraft movements per annum shall take place, of which no more than 8,900 movements shall be at weekends and Bank Holidays. Furthermore, no more than 270 aircraft of the 1,500 movements per annum between 50,000 and 80,000kg, permitted by condition 11, shall take-off or land at weekends and Bank Holidays. Table I summarizes activity at the airport since 2003.

Table I Aircraft Movements at Farnborough

Year	Annual Aircraft Movements			
	Total	Weekends & Bank Holidays	Heavier Aircraft	Helicopters
2004	19,600	2,495 ⁽¹⁾	438	1,011
2005	20,506	2,498 ⁽¹⁾	399	920
2006	25,083	2,497 ⁽¹⁾	317	1,186
2007	29,368	2,491 ⁽¹⁾	398	1,406
2008	27,946	3,972 ⁽²⁾	478	1,309
2009	24,262	4,958 ⁽³⁾	500	952
2010	25,835	4,995 ⁽³⁾	585	962
2011	25,027	5,323 ⁽⁴⁾	600	960

⁽¹⁾ Against a limit of 2,500 movements

⁽²⁾ Against a limit of 4,200 movements

⁽³⁾ Against a limit of 5,000 movements

⁽⁴⁾ Against a limit of 5,500 movements

Operating Hours (Flying Operation): Planning Condition 8

- 4.9 All flying pursuant to this permission shall only take place between 07.00-22.00 hours on weekdays and between 08.00-20.00 hours on Saturdays, Sundays and Bank Holidays, except in an emergency. No flying pursuant to this permission shall take place on Christmas Day and Boxing Day.

Operating Hours (Maintenance): Planning Condition 9

- 4.10 The maintenance of business aviation aircraft shall only take place between 07.00-22.00 hours on weekdays and between 08.00-20.00 hours on Saturdays, Sundays and Bank Holidays, except in an emergency. No maintenance shall take place on Christmas Day and Boxing Day.

Aircraft Type Restrictions: Planning Condition 11

- 4.11 With exception of up to 1,500 movements per annum by aircraft up to 80,000kg maximum take-off weight (MTOW), no aircraft exceeding 50,000kg MTOW and no helicopters exceeding 10,000kg MTOW shall take-off or land at the Aerodrome pursuant to this permission.
- 4.12 The planning conditions noted above were resolved by the Secretaries of State, and recorded in their decision letter of 10th February 2011.
- 4.13 The Airport also has to operate within the Section 106 of February 2011. The relevant extract from this document is contained in Appendix G of this Plan.
- 4.14 The Airport has voluntarily developed a Quiet Flying Programme, QFP, and works with the local community to reduce noise to as low as technically possible. The supervising committee has met regularly between 2007 & 2011, and in particular has worked on the westerly departures from the Airport and routes for rotary wing aircraft. The Report to the FACC reviewing the work of the QFP can be found at Appendix H.
- 4.15 Table J now summarizes the extensive existing noise control measures at Farnborough. Table K gives some extra noise control measures that are proposed.

TABLE J NOISE CONTROL MEASURES AT FARNBOROUGH AIRPORT

	ACTION	TIMEING
	MONITOR AND MANAGE	
1	Operate and maintain a noise and track-keeping system to monitor aircraft operations.	2003 - Ongoing
2	Produce noise contours, based on 6 month activity and annual activity.	2003 - Ongoing
3	Undertake regular reviews of procedures to minimize noise disturbance with FACC.	2004 - Ongoing
4	Undertake community noise surveys using the portable precision noise monitor.	2004 - Ongoing
5a	Investigate, log and respond to all complaints relating to Farnborough Airport, reporting details to RBC on a monthly basis.	2003 – 2010
5b	Investigate, log and respond to all complaints relating to Farnborough Airport, reporting details to RBC on a quarterly basis.	2011 - Ongoing
6	Calibrate noise and track-keeping system and noise contour methodology on an annual basis.	Annual
7	Monitor the track-keeping compliance and discuss with operators, as necessary.	2003 - Ongoing
8	Monitor the performance of the Airport with respect to objectives set out in the Section 106 Agreement and report annually to the Council.	2003 - Ongoing
9	Monitor the aircraft movements comprising details of movement numbers in each hour each day, and runway use.	2003 - Ongoing
10	Monitor operations relevant to ground noise emissions from the Airport, such as those to minimize use of APU's, prolonged engine ground runs.	2011 - Ongoing
11	Operate controls on requested aircraft operations to contain movements to those specified annual, weekend, aircraft greater than 50,000 Kgs.	2003 - Ongoing
12	Operate controls on requested aircraft operations to limit operating hours for 07.00-22.00 on weekdays, and 08.00-20.00 on Saturdays, Sundays, and Bank Holidays, except in emergencies, and no flying or aircraft maintenance on Christmas Day and Boxing Day.	2003 - Ongoing
13a	Operate the Airport to ensure that the resultant noise, expressed in the form of noise contour areas do not exceed those specified, namely 55 dB $L_{Aeq,16h}$ 9.09 km ² 60 dB $L_{Aeq,16h}$ 4.01 km ²	2003 - 2010
13b	Operate the Airport to ensure that the resultant noise, expressed in the form of noise contour areas do not exceed those specified, namely 55 dB $L_{Aeq,16h}$ 6.6 km ² post 01/01/13 60 dB $L_{Aeq,16h}$ 2.4 km ² post 01/01/13	2011 - Ongoing
14	From 1 st January 2013 operate a ban on fixed wing aircraft which are not compliant with ICAO Chapter 4 or above noise certification numerical standards.	2013
15	Enforce compliance with the preferred noise routes and tolerance limits.	2003 - Ongoing
16	Operate the Airport in accordance with the noise abatement procedures delineated in the UK AIP.	2003 - Ongoing
17	Discourage the use of aircraft reverse thrust except where its use is required for safety reasons.	2003 - Ongoing
18	Implement a scheme in line with other UK airports for sound insulation for residential academic or	2003 - Ongoing

	ACTION	TIMEING
	healthcare premises which are subject to noise levels of 60 dB L _{Aeq,16h} or above directly attributable to aviation noise from the Airport other than that relating to the bi-annual Airshow or large scale military activity in the event of a national emergency.	
19	Provide information and services to the Farnborough Airport Consultative Committee (FACC).	2003 - Ongoing
20	The Quiet Flying Programme was established as a working group of the FACC. The primary objective was to reduce the impact of the airport operation on those communities most affected at each end of the runway. Working with the resident associations a fundamental change in arrival and departure routes was successfully introduced alongside procedures to reduce noise from aircraft whilst on the ground.	2007 - 2011
21	Following feedback from the Masterplan consultation process, a review of helicopter operations was undertaken and new arrival and departure routes successfully introduced.	2010 - 2011
	RESEARCH AND REPORTING	
22	Carry out an annual review of arrival and departure routes, based on the results trial any new procedure with the aim of reducing further the over flight of residential areas.	2007 - Ongoing
23	Use reasonable endeavours to promote and support airspace changes in order to benefit local residents through the creation of greater amount of controlled airspace.	2013
24a	Prepare and issue a monthly complaints report.	2003 – 2010
24b	Prepare and issue a quarterly complaints report.	2011 - Ongoing
25a	Prepare and issue a quarterly Environment report.	2003 - 2010
25b	Prepare and issue 6 monthly Environment report.	2011 - Ongoing
26	Prepare and issue twice yearly Integrated Noise Monitoring (INM) report.	2003 - Ongoing
27	Prepare and issue TAG information report to FACC.	2003 - Ongoing
28	Prepare and issue annual performance monitoring report.	2003 - Ongoing
29	As part of the consultation process carried out during the development of the Airport Masterplan, TAG carried at 12 public exhibitions in all of the surrounding neighbourhoods to get a better understanding the communities views on the noise generated as a result of the airport.	2009

TABLE K EXTRA NOISE CONTROL MEASURES AT FARNBOROUGH AIRPORT

	ACTION	TIMEING
	MONITOR AND MANAGE	
(i)	Monitor and report progress against Noise Action Plan actions to FACC, provide statistics annually in the Performance Monitoring Report.	2013 - Ongoing
(ii)	Engage with local planning authorities to ensure awareness of aircraft operations is considered in land use development, for instance with RBC over future work on the local plan.	2012 -
(iii)	Work with the newly appointed RBC Airport Monitoring Officer to raise awareness of airport operations amongst the community.	2012
(iv)	Provide an information pack to local Estate Agents, and to those seeking information on local conditions prior to relocating to near the Airport or its departure and arrival tracks.	2014
	RESEARCH AND REPORTING	
(v)	Investigate the potential and benefit that might arise from introducing a departure noise preferential route track performance target, with penalties for recurrent failures to meet target.	2014
(vi)	Investigate the potential and benefit that might arise from introducing a Farnborough specific Code of Practice for Arriving Aircraft.	2016
(vii)	Investigate the potential and benefit that might arise from introducing a Farnborough specific Code of Practice for Departing Aircraft.	2014
(viii)	Investigate the potential and benefit that might arise from development of the Farnborough noise and track system to include a publically accessible web-based radar track display system, e.g. as Web track at Heathrow, TraVis at Luton.	2014
(ix)	Dependant on the related work with NATS investigate the potential and benefit that might arise from introducing a continuous descent arrival (CDA) and continuous climb departure (CCD) performance targets at Farnborough.	2014
(x)	Explore the development of the Airport's noise and track keeping system installed in 2003.	2013 - 2014
(xi)	Investigate the potential benefits from an Airspace Change Proposal.	2012
(xii)	Develop an Airspace Change Proposal for submission to the CAA.	2013 - 2014
(xiii)	Investigate the potential benefits to arriving and departing aircraft from technological advances such PRNAV and GNSS.	2012 - 2013

5. CONCLUSIONS

- 5.1 Having taken account of all relevant factors, including the findings of the ATWP, subsequent developments, NPPF, NPSE, the draft Aviation Policy Framework, the Guidance including the Strategic Noise Mapping exercise, the results of public consultation, our Master Plan and detailed control measures, it can be concluded that Farnborough has stringent noise controls in place, that these controls are responsive to forecast growth in traffic levels and remain fit for purpose.
- 5.2 Farnborough's noise controls were established as a result of an ongoing process of engagement and listening and the current controls came in after a comprehensive public consultation over the Master Plan and the planning application to 50,000 annual movements followed by careful consideration of all responses. They are being implemented successfully, monitored and fine-tuned to respond to changing circumstances. They seek to provide a balance between the benefits provided by the legitimate operation of aircraft at the Airport and the environmental impact which results. The Guidance endorses this approach noting that noise...*"is an inevitable consequence of a mature and vibrant society. People enjoy and benefit from air transport and this benefit manifests itself in terms of business, leisure, the movement of goods and employment. When managing the environmental noise that arises from aircraft, a balance needs to be struck."*
- 5.3 We therefore conclude that the current noise impact at Farnborough is acceptable.

APPENDIX A

GLOSSARY OF ACOUSTIC TERMS

Sound

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

The Decibel, dB

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

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

Frequency, Hz

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

A-Weighting

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

Environmental Noise Descriptors

Where noise levels vary with time, it is necessary to express the results of a measurement over a period of time in statistical terms. Some commonly used descriptors follow.

$L_{Aeq,T}$ The most widely applicable unit is the equivalent continuous A-weighted sound pressure level ($L_{Aeq,T}$). It is an energy average and is defined as the level of a notional sound which (over a defined period of time, T) would deliver the same A-weighted sound energy as the actual fluctuating sound.

Ambient Noise

Usually expressed using $L_{Aeq,T}$ unit, commonly understood to include all sound sources present at any particular site, regardless of whether they are actually defined as noise.

Background Noise

This is the steady noise attributable to less prominent and mostly distant sound sources above which identifiable specific noise sources intrude.

Sound Transmission In The Open Air

Most sources of sound can be characterised as a single point in space. The sound energy radiated is proportional to the surface area of a sphere centred on the point. The area of a sphere is proportional to the square of the radius, so the sound energy is inversely proportional to the square of the radius. This is the inverse square law. In decibel terms, every time the distance from a point source is doubled, the sound pressure level is reduced by 6 dB.

Road traffic noise is a notable exception to this rule, as it approximates to a line source, which is represented by the line of the road. The sound energy radiated is inversely proportional to the area of a cylinder centred on the line. In decibel terms, every time the distance from a line source is doubled, the sound pressure level is reduced by 3 dB.

Factors Affecting Sound Transmission In The Open Air

Reflection

When sound waves encounter a hard surface, such as concrete, brickwork, glass, timber or plasterboard, it is reflected from it. As a result, the sound pressure level measured immediately in front of a building façade is approximately 3 dB higher than it would be in the absence of the façade.

Screening And Diffraction

If a solid screen is introduced between a source and receiver, interrupting the sound path, a reduction in sound level is experienced. This reduction is limited, however, by diffraction of the sound energy at the edges of the screen. Screens can provide valuable noise attenuation, however. For example, a timber boarded fence built next to a motorway can reduce noise levels on the land beyond, typically by around 10 dB(A). The best results are obtained when a screen is situated close to the source or close to the receiver.

Meteorological Effects

Temperature and wind gradients affect noise transmission, especially over large distances. The wind effects range from increasing the level by typically 2 dB downwind, to reducing it by typically 10 dB upwind – or even more in extreme conditions. Temperature and wind gradients are variable and difficult to predict.

APPENDIX B
NOISE CONTOUR MAPS (2011)

Figures:

1 – Annual L_{den} Noise Contours 2011:

55, 60, 65, 70 & 75 dB L_{den}

2 – Annual Daytime (0700-1900) Noise Contours 2011:

54, 57, 60, 63, 66 & 69 dB L_{day}

3 – Annual Evening (1900-2300) Noise Contours 2011:

54, 57, 60, 63, 66 & 69 dB L_{eve}

4 – Annual Daytime (0700-2300) Noise Contours 2011:

54, 57, 60, 63, 66 & 69 dB $L_{Aeq,16h}$

APPENDIX C

Extracts for European Environment Agency Technical Report No 11/2010

Good Practice Guide on Noise Exposure and Potential Health Effects

- Preface
- Annex 111. Exposure – response relations between aircraft noise and annoyance due to aircraft noise, average of post 1996 studies.

Preface

The Expert Panel on Noise (EPoN) is a working group that supports the European Environment Agency and European Commission with the implementation and development of an effective noise policy for Europe.

The group aims to build upon tasks delivered by previous working groups, particularly regarding Directive 2002/49/EC relating to the assessment and management of environmental noise.

This good practice guide is intended to assist policymakers, competent authorities and any other interested parties in understanding and fulfilling the requirements of the directive by making recommendations on linking action planning to recent evidence relating to the health impacts of environmental noise and, among others, the Night Noise Guidelines for Europe as recently presented by the World Health Organisation.

The contents should not be considered as an official position statement of the European Commission. Only the text of the directive is applicable in law at Community level. If in any circumstance, the guidance contained in this good practice guide seems to be at variance with the directive, then the text of the directive should be applied.

Annex III. Exposure-response relations between aircraft noise and annoyance due to aircraft noise, average of post 1996 studies

Studies 1996 and later: % LA, A %, % HA and their 95 % confidence limits for L_{den} values 45–75 dB

Lden	% LA			% A			% HA		
	Function	Lower	Upper	Function	Lower	Upper	Function	Lower	Upper
45	46.04	39.09	53.11	24.46	19.24	30.36	9.96	7.19	13.43
46	48.84	41.83	55.88	26.72	21.23	32.84	11.25	8.22	15.00
47	51.65	44.61	58.63	29.08	23.34	35.41	12.65	9.34	16.69
48	54.44	47.42	61.33	31.54	25.56	38.05	14.17	10.58	18.50
49	57.22	50.24	63.98	34.08	27.88	40.74	15.80	11.93	20.43
50	59.96	53.05	66.57	36.70	30.30	43.48	17.56	13.39	22.47
51	62.65	55.85	69.08	39.37	32.81	46.25	19.44	14.98	24.63
52	65.29	58.61	71.51	42.10	35.40	49.05	21.43	16.68	26.89
53	67.85	61.34	73.85	44.87	38.05	51.85	23.54	18.50	29.26
54	70.32	64.00	76.08	47.67	40.76	54.65	25.76	20.44	31.72
55	72.71	66.60	78.21	50.47	43.51	57.42	28.08	22.49	34.27
56	75.00	69.12	80.23	53.28	46.29	60.16	30.50	24.66	36.89
57	77.18	71.55	82.12	56.06	49.09	62.85	33.01	26.93	39.58
58	79.25	73.88	83.91	58.82	51.89	65.48	35.59	29.29	42.31
59	81.21	76.11	85.57	61.53	54.68	68.04	38.25	31.75	45.09
60	83.04	78.23	87.11	64.19	57.44	70.52	40.96	34.29	47.90
61	84.76	80.23	88.54	66.78	60.17	72.91	43.71	36.90	50.72
62	86.36	82.12	89.85	69.30	62.84	75.20	46.50	39.57	53.53
63	87.84	83.89	91.05	71.72	65.46	77.39	49.30	42.29	56.33
64	89.20	85.54	92.14	74.05	68.00	79.46	52.10	45.04	59.10
65	90.45	87.07	93.13	76.28	70.45	81.41	54.90	47.82	61.83
66	91.59	88.48	94.02	78.40	72.82	83.25	57.67	50.60	64.50
67	92.62	89.78	94.82	80.40	75.08	84.97	60.40	53.38	67.11
68	93.56	90.97	95.53	82.29	77.24	86.57	63.09	56.14	69.63
69	94.40	92.05	96.16	84.06	79.29	88.04	65.71	58.87	72.07
70	95.15	93.03	96.71	85.70	81.22	89.40	68.26	61.55	74.41
71	95.82	93.92	97.20	87.23	83.04	90.65	70.72	64.18	76.64
72	96.41	94.71	97.63	88.64	84.74	91.78	73.09	66.75	78.76
73	96.93	95.42	98.00	89.94	86.32	92.81	75.36	69.23	80.77
74	97.39	96.05	98.32	91.13	87.78	93.74	77.53	71.63	82.66
75	97.78	96.61	98.60	92.20	89.13	94.57	79.58	73.93	84.42

APPENDIX D

Populations Exposed to Aircraft Noise from English Airports

Airport	L _{den} pop ⁿ exposure (55-59 dB (A))
East Midlands Airport	8,000
Birmingham International	32,400
Blackpool	400
Bournemouth	3,300
Bristol	3,800
Coventry	3,300
Leeds Bradford	7,400
Liverpool	3,500
London City	10,500
London Gatwick	9,300
London Heathrow	561,500
London Luton	6,500
London Stansted	7,800
Manchester	63,100
Newcastle	4,400
Shoreham	1,100
Southampton	10,100
Southend	4,400
Source: Defra Noise Mapping for 2006	
Farnborough	0
Source: BAP	

APPENDIX E

Noise Abatement Procedures from U.K. A.I.P.

EGLF AD 2.21 — Noise Abatement Procedures

1 General

- 1.1. Farnborough is located within a noise sensitive area and is subject to Local Authority Planning Requirements which impose a number of environmental constraints. Pilots are to ensure that their aircraft are operated in a manner likely to cause the least disturbance in the areas surrounding the aerodrome. A noise track monitoring system is in operation.
- 1.2. Chapter II/Stage II aircraft are not accepted. Prior sight of an ICAO noise certificate is required for any aircraft not manufactured as Chapter III/Stage III compliant wishing to land at Farnborough.
- 1.3. From 1 January 2013, only those aircraft meeting ICAO Chapter 4 criteria will be accepted. Contact Airport Director on +44 (0)1252-379007.
- 1.4. Pilots are to adhere to the published noise abatement procedures at all times unless deviation is required to the extent necessary for avoiding immediate danger or to comply with ATC instructions.

2 Ground Running of Engines

- 2.1 The operation of APUs is not permitted between the hours of 2230 and 0630 (one hour earlier in Summer).
- 2.2 Ground running of engines may only take place between the hours of 0800-2000 Mon-Fri (one hour earlier in Summer) excluding public holidays and is to be notified to ATC at the commencement and cessation of each run. All engine runs by jet aircraft, other than runs at ground idle power setting, are to be carried out on the South 2 apron. Ground running during weekends and public holidays is restricted to essential maintenance work only.

3 Departures

3.1 General

- 3.1.1 All departures are to use best rate of climb until at or above 3000 ft QNH. If the initial departure clearance involves levelling off below 3000 ft QNH, power settings used must not result in excessive noise levels at points on the ground underneath the flight path, especially when climb is recommenced;
- 3.1.2 Noise preferential routings are compatible with ATC requirements and shall apply in both VMC and IMC. The tracks are to be flown by all departing jet

aircraft, and by all other aircraft of more than 2730 kg MTWA, unless otherwise instructed by ATC or unless deviations are required in the interests of safety.

3.1.3 Noise preferential routings may be cancelled by ATC using the phrase 'cancel noise abatement'.

3.2 Noise Preferential Routings (NPRs) – Runway 06.

3.2.1 (All directions) Climb straight ahead to 2 DME, then turn on track or as instructed by ATC.

3.2.2 Climb straight ahead to 2 DME then as instructed by ATC.

3.3 Noise Preferential Routings (NPRs) – Runway 24

3.3.1 North (CPT or as directed) Climb straight ahead to 2 DME, then turn as directed by ATC.

3.3.2 South (GWC, HAZEL or as directed) Climb straight ahead; after passing 1200 ft QNH turn left onto track 220° M; at 2 DME turn on track or as instructed by ATC. This is referred to by ATC as 'Noise Preferential Route South'. Crews should note that a prompt turn at 1200 ft QNH is essential in order to remain outside the Odiham ATZ and areas of gliding activity. If departing aircraft experience RTF failure crews are to remain outside of controlled airspace and resume own navigation to carry out the prescribed RTF failure procedure.

4 Arrivals

4.1 ILS approaches are mandatory except when a non-precision or visual approach is provided or authorised by ATC. Visual approaches to Runway 24 at night are not permitted when an ILS or surveillance radar approach is available. The use of the ILS glide path, if radiating, is recommended for all approaches.

4.2 All aircraft approaching to land or go-around from a visual or non-precision approach shall establish on final approach not below 1250 ft QNH (1000 ft aal) and at not less than 3 nm from touchdown; thereafter aircraft shall follow a descent path which will not result in the aircraft being at any time lower than a 3.5° glide path as indicated by the PAPIs or ILS.

4.3 Aircraft commanders are requested to minimise noise disturbance in the areas overflown during final approach by conforming to low power, low rag procedures at all times. Additionally the requirements in AD 2.22 Flight Procedures, paragraph 1(a) must be complied with.

To minimise disturbance in areas adjacent to the aerodrome, commanders of aircraft are requested to avoid the use of reverse thrust at all times, consistent with the safe operation of the aircraft. Where the use of reverse thrust is essential, the use of idle reverse thrust should be used in preference.

APPENDIX F

TAG Farnborough Airport Masterplan

April 2009

Executive Summary

Introduction

Airport master plans are intended to inform the planning process and the preparation of them provides an opportunity for local communities to engage with airports on future development.

TAG Farnborough Airport ('the Airport') is not currently required by the Government to produce a master plan. However, TAG Aviation ('TAG'), the owner and operator, has decided to prepare a voluntary master plan, in order to better inform the local community about the Airport and its operation, and to assist in providing background information for the preparation by Rushmoor Borough Council of a Local Development Framework and deal with any application for planning permission.

The Master Plan does not seek to determine planning policies for the Airport, or to decide on restrictions that may be imposed on use of the Airport. These are matters that will be dealt with by the Council as part of its public consultation for the Local Development Framework.

In preparing the Master Plan, TAG has taken account of the Future of Air Transport White Paper (2003), the Weekend Movements Appeal (March 2008), and the results of the Preliminary Consultation for the Airport (July 2008) and of the Master Plan (Draft for Consultation) (March 2009).

The key objectives of the Master Plan are to:

- provide a voluntary Master Plan in accordance with the White Paper;
- identify physical changes and operational improvements required to make best use of existing facilities to 2019 and, indicatively, to 2030;
- identify how sustainability and climate change is addressed by the Airport's operation;
- secure future growth of the Airport while minimising the effect on the local community and environment;
- inform the Rushmoor Local Development Framework; and
- engage with local residents and other stakeholders.

In relation to the future growth of the Airport, the most significant factors are:

- Planning and Aviation Framework
- About TAG Farnborough Airport
- Economics and Forecasts
- Making Best Use of Infrastructure
- Public Safety

- Environmental Monitoring and Reporting
- Surface Access
- Sustainability and Climate Change
- Community Engagement.

The Master Plan provides an overview of the infrastructure, facilities and operation of the Airport, and sets out the potential opportunities for operational improvements and airport related development that could take place up to 2019 and, indicatively, to 2030.

Following publication of this Master Plan, TAG is now going to seek planning permission to operate the Airport within approximately 50,000 annual Business Aviation Air Traffic Movements (ATM) increasing the current limit from 28,000 ATM. This will ensure best use will be made of the Airport's existing infrastructure in line with the White Paper policy. This proposal will be within limitations imposed by environmental and safety constraints current and at that time. It will also assist in meeting clear and increasingly unmet demand for Business Aviation both at Farnborough and in the South East.

Planning and Aviation Framework

The key national policy in relation to aviation is the White Paper: The Future of Air Transport (December 2003) (the 'White Paper') which was subject to a progress report in December 2006 reaffirming this aviation policy.

The Future of Transport White Paper (July 2004) which covers transportation in general, also includes the themes of the White Paper.

In the White Paper, the Government recognises the important role that smaller airports play in providing capacity for Business Aviation. In the South East, it is clear that some further development could be possible at any of the smaller airports that have been assessed without insurmountable environmental constraints. Farnborough Airport is referred to as one of the airports within this category. It also supports the adoption of policies that encourage the continued provision of services to support Business Aviation.

Under the provisions of the Planning and Compulsory Purchase Act 2004, the Regional Spatial Strategy, which is known as the 'South East Plan', will form part of the Development Plan Documents. Until the South East Plan has been adopted, at the strategic level, the Regional Planning Guidance for the South East (RPG9) will form part of the Development Plan Documents, together with the saved policies of the Hampshire Structure Plan.

Until the emerging Rushmoor Local Development Framework is adopted, the Development Plan Documents will comprise, at the local level, the Rushmoor Local Plan (Saved Policies).

The new Local Development Framework will include an overall vision and strategy for the Borough (known as the Core Strategy) and a specific document for the Airport (known as the Airport Area Action Plan). The Council is responsible for preparing and consulting on both these documents.

The Airport is required to operate under a CAA Aerodrome Licence, the policy of which is stated in Civil Aviation Publication 168 – Licensing of Aerodromes.

The Airport is regulated under the National Aviation Security Programme by the Department

for Transport and is therefore subject to regular formal inspection.

Public Safety Zone policy is outlined within DfT Circular 1/2002: "*Control of Development in Airport Public Safety Zones*". This states that the areas of the published PSZ correspond to the 1 in 100,000 Third Party Individual Risk Contour as calculated for each airport, based on forecasts about the numbers and types of aircraft movements.

The current planning permission for the operation of the Airport granted in 2002 requires that the 1 in 10,000 Third Party Individual Risk Contour remains within the eastern (Farnborough end) Airport boundary.

To operate an airport safely, it is necessary to protect the airspace around the runway which is achieved through 'obstacle limitation surfaces' (effectively lines in the sky which define, relative to the runway, maximum acceptable heights for buildings and other structures).

Safeguarding of aerodromes occurs through the planning system by a process of consultation between the airport operator, the applicant of any proposed development and the local planning authority.

Rushmoor Borough Council, under the planning agreement entered into in 2000, stipulated that the noise budget set in 1998 will not be exceeded. The noise budget was expressed in terms of an area of 9.09 km² based on a 55 decibel noise contour.

The White Paper states that the Government will press for the adoption by airports, airlines and air traffic controllers of operational practices that minimise the impact of their activities on climate change as well as voluntary action to control greenhouse gas emissions and develop sustainability strategies.

The European Commission has recently confirmed that all flights arriving at or departing from an EU airport will be included in the EU emissions trading scheme from 1 January 2012.

The Airport operates under environmental restrictions specifically imposed by the planning permissions for the operation of the Airport and generally imposed by the statutory and regulatory framework of environmental control.

About TAG Farnborough Airport

In 2008, Farnborough Airport celebrated its first 100 years of continuous operation. It was originally a Government airfield and declared surplus to requirements by the Ministry of Defence in April 1991.

In December 1994, the Government decided that the airfield should be redeveloped as a Business Aviation centre. In 1998, TAG Aviation became the preferred operator of Farnborough Airport, following a competitive process. A CAA Aerodrome Licence was granted in 2003 and in 2007 TAG became the freehold owner of the Airport.

TAG has made substantial investments in award-winning, world-class infrastructure and state-of-the-art technology.

The current use of the Airport is legally restricted to Business Aviation and use for bulk freight services, scheduled passenger services and 'inclusive tour' charter flying is specifically prohibited. TAG has no intention to seek to vary this position.

The hours of operation at the Airport are legally restricted to 07.00-22.00 hours on weekdays and 08.00-20.00 hours on Saturdays, Sundays and Bank Holidays. TAG will not seek to increase the hours of operation.

TAG lets premises to over fifty tenants on the site. These include major Business Aviation manufacturing companies, such as Cessna and Bombardier, as well as companies that manage, maintain and refurbish Business Aviation aircraft.

TAG remains committed, now and in the future, to supporting the biennial Farnborough International Airshow, a showcase for global aviation and aerospace. In 2008, the 60th anniversary Farnborough International Airshow attracted record orders of £44.35 billion.

TAG Farnborough Airport is now one of the most modern, high quality and efficient Business Aviation centres in Europe. It is the pre-eminent Business Aviation airport in the UK and rivals the best in the World.

The Airport is a significant local employer.

Economics and Forecasts

In a House of Commons debate on 11 November 2008, Geoff Hoon, Secretary of State for Transport said:

“Aviation in general continues to make a significant contribution to the UK economy. It brings in around £11 billion a year, and it supports 200,000 jobs directly, and many more indirectly.”

Business Aviation is a distinct and important segment of the air transport market. It is a sector that has been growing strongly and the importance of which is recognised in the White Paper.

The White Paper states that *“the Government recognises the important contribution made by small airports in the South East in providing capacity for Business Aviation. We support the adoption of policies which encourage the continued provision of these services.”*

The Inspector at the Weekend Movements Appeal found no suitable alternatives to the Airport for meeting Business Aviation demand in the South East of England. This view was shared by the Secretaries of State for Transport and for Communities and Local Government who agreed with the Inspector's opinion that none of the equivalent alternatives has airfield and terminal facilities that can match those of the Airport.

The Airport is specifically chosen by those seeking the highest quality of Business Aviation services and easy access to London and the South East. These businesses and individuals are responsible for substantial inward investment in the UK as well as overseas trade.

The Airport is the premier Business Aviation gateway for the UK and, as such, is of significant importance to the national economy.

From a comparison of airport capacity available in the South East and projected demand at 2019, TAG's consultant, Mott MacDonald, assesses that there will be unmet demand of some 292,000 Commercial Air Transport Movements in the London area, and a further unmet demand of 136,000 ATM.

If the Airport is permitted to raise its annual number of ATM from the current 28,000 to approximately 50,000, this will accommodate 22,000 ATM of the unmet demand and help alleviate part of the shortfall in the South East.

According to the European Business Aviation Association (EBAA), the Business Aviation industry generates over 4.2 billion Euros of the Gross Value Added in the UK, representing slightly over 0.2% of the country's economy. There are almost 50,000 UK jobs linked to the industry and together they generate approximately 1.5 billion Euros in wages and salaries, (*"The economic impact of business aviation in Europe"* – PwC Economics Macro Consulting 2008).

Further growth in the Airport's ATM will have a positive benefit on employment in the local area.

The Inspector at the Weekend Movement Appeal reached the conclusion, with which the Secretaries of State agreed, *"that Farnborough airport is of very substantial economic benefit to the Farnborough area and to Rushmoor"*.

A survey in September 2008 by TAG's consultant, RPS, established that some 1,107 people were working full-time at the Airport plus a further 64 part-time posts, representing a Full-Time Equivalent (FTE) of 1,139 direct employees.

It is assessed that increasing the number of ATM from 28,000 to 50,000 by 2019 could lead to an increase in the number of direct, indirect and induced employees by approximately 35%. This would therefore increase employment in the area by some 1,500 jobs which (at an average 2008 value of £51,400 Gross Domestic Product impact) would increase GDP in the local area by a further £76.3m.

Making Best Use of Infrastructure – Proposals to 2019

TAG Farnborough Airport has been designed and constructed with the highest standards of infrastructure to meet the very demanding expectations of its customers.

At the Airport's current level of operation, the infrastructure is significantly under utilised. Whilst the physical capacity of the Airport could accommodate up to approximately 100,000 ATM, approximately 50,000 ATM to 2019 is being considered in light of current safety and environmental constraints.

TAG is confident that the current runway, taxiways, aprons, passenger terminal, hangars and car parking facilities are entirely sufficient to meet this level of future growth.

Public Safety

Public safety is paramount.

To protect the public, the DfT has declared formal Public Safety Zones (PSZ) at each end of airports' runways, which are areas of land within which development is restricted in order to control the number of people on the ground at risk in the event of an aircraft accident on take-off or landing.

The PSZ under which the Airport currently operates was prepared by NATS on behalf of the DfT in 2003 and was confirmed to Rushmoor Borough Council in January 2004.

On behalf of TAG, NATS, using the latest approved DfT model for calculating PSZ, has demonstrated that approximately 50,000 ATM could be accommodated within the constraint that the 1 in 10,000 Third Party Individual Risk Contour is required to remain within the

boundary at the eastern (Farnborough)
end of the Airport.

Environmental Monitoring and Reporting

TAG is committed to the highest standards of environmental management and has a dedicated Environment Manager to coordinate, monitor and implement environmental enhancement initiatives and controls at the Airport.

The Airport undertakes extensive environmental monitoring and publishes the data in a series of reports which are made available to Rushmoor Borough Council and the Farnborough Aerodrome Consultative Committee, and published on their respective websites.

Noise

Aircraft operating at the Airport are required to comply with noise abatement procedures as published in the UK Aeronautical Information Publication (AIP).

NATS Air Traffic Controllers, operating from the Airport control tower, instruct aircraft to follow these noise abatement procedures.

A real-time radar data feed is continuously fed into the noise monitoring system. This provides information from equipment on board aircraft in the Farnborough radar zone. The noise and track system records a plot of each aircraft's movement relative to its location, direction, speed and altitude. The aircraft radar tracks for Farnborough aircraft are reviewed continuously. Each movement is checked for compliance with the published noise abatement procedures.

The aircraft that operate at the Airport are generally of the most modern design and manufacture. These include extensive noise control features.

Rushmoor Borough Council, under the planning agreement entered into in 2000, stipulated that the noise budget set in 1998 will not be exceeded. The noise budget was expressed in terms of an area of 9.09 km² based on a 55 decibel noise contour. TAG intends that the level of growth at the Airport will produce a noise budget area smaller than 9.09 km².

The Airport will continue to develop its Quiet Flying Programme so as to ensure that aircraft operating at Farnborough do so as quietly as possible.

TAG has already banned all aircraft not meeting ICAO Chapter III noise standards from the Airport.

TAG will take an industry-leading approach to phase out all but the most modern and quietest categories of aircraft. Within five years, the only fixed-wing Business Aviation aircraft permitted will be those meeting ICAO Chapter IV noise standards, the current highest accepted standard.

Projected future growth of the Airport to approximately 50,000 ATM per annum could be

accommodated well within the area of the current noise budget under the planning agreement.

Air Quality

The European Commission and UK Government have a range of measures to limit levels of air pollution. EU Directive 2008/50/EC on ambient air quality requires all member states to stay within set limits for a range of pollutants. Department of Environment, Food and Rural Affairs' Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007) sets policy targets for pollutants, known as air quality objectives.

The most challenging objective for much of the UK is in respect of nitrogen dioxide (NO₂). Fuel combustion creates nitrogen oxides (NO_x) which combine with oxygen in the air to form NO₂.

In the UK, road transport is by far the main source of NO_x.

TAG has placed numerous air quality monitors around the Airport. Current measurements show that NO₂ levels are well within national objectives

At the Airport the level of NO_x emissions is not likely to exceed levels set by relevant standards and objectives. This would remain the case even with growth to 100,000 ATM.

TAG is considering the introduction of an emissions charging scheme to include a charge for NO_x emissions. By introducing such a charging system, the Airport would be an industry leader in the UK and provide best practice for Business Aviation elsewhere.

Improvements in aviation technology are likely to bring about reductions in hydrocarbon emissions from aircraft in future, such that odour from un-burnt aviation fuel from aircraft will be reduced.

Ecology

The Airport is bounded by a number of ecologically important sites. These include the Thames Basin Heath Special Protection Area, the Bourley and Long Valley Site of Special Scientific Interest (SSSI), the Eelmoor Marsh SSSI, the Basingstoke Canal SSSI and also within the Airport boundary a Site of Importance for Nature Conservation.

An increase in the annual number of ATM will not result in any loss of natural habitat, because it will not require the construction of any additional infrastructure.

TAG intends to prepare a Biodiversity Action Plan (BAP) which will describe how the existing wildlife interest will be conserved and identify opportunities for enhancing areas of ecological value within the Airport boundary. During preparation of the BAP, TAG will discuss its objectives with relevant stakeholders.

Surface Access

The Airport is well served by major road and mainline rail connections.

TAG will commission a transport assessment to assess the effect of the Airport and proposed future growth, on the road network, in consultation with the local highway authority.

TAG is in the process of preparing a Travel Plan suitable for everyone travelling to and from the Airport with the aim of reducing single occupancy car journeys and encouraging a shift towards more sustainable patterns of travel.

Sustainability and Climate Change

TAG is committed to adopting a sustainable approach to the future management and development of the Airport and has set the objective of becoming a leader in sustainability within the airport industry.

A key element of the Airport's sustainability strategy is to become a low carbon airport and to achieve carbon neutrality as soon as reasonably possible.

TAG is considering the introduction of a NO_x emissions charge for aircraft in the future on a 'polluter pays' principle, to contribute to offsetting emissions by donating to local ecological, environmental, biodiversity and other enhancement projects.

A sustainable approach is central to proposals for growth of the Airport and TAG will therefore develop its own 20 point Sustainability & Climate Change Charter.

TAG will develop an Energy & Emissions Strategy towards achieving the goal of carbon neutrality. Specific measures will include:

- existing buildings;
- upgrading and improving energy supply and efficiency within
- onsite generation of renewable energy;
- working with aircraft operators to lower their carbon emissions;
- reviewing the efficiency of Airport vehicles; and
- working with the Airport staff to raise energy awareness.

Community Engagement

TAG is committed to continuing and increasing its involvement with the local community. At present, this takes place at a number of levels including:

- Farnborough Aerodrome Consultative Committee;
- local business;
- involvement in local education;
- media; and
- sponsorship of local events and charities.

It has also consulted extensively with the local community and key stakeholders both on the Preliminary Consultation and the Master Plan (Draft for Consultation).

The process of consultation, the responses and how they have informed the finalisation of the Master Plan are summarised in the Statement of Community Involvement at Appendix 2.

Indicative Proposals 2020 to 2030

For the period 2020 to 2030, it is likely that the Airport will continue to strengthen its role as the leading European Business Aviation airport. Given the forecast growth of Business Aviation and the Airport's unique position as a dedicated Business Aviation airport, it is possible that further expansion of the use of the Airport may be sought in the period 2020 to 2030.

Conclusion

Following publication of this Master Plan, TAG is now going to seek planning permission to operate the Airport within approximately 50,000 annual Business Aviation Air Traffic Movements (ATM) increasing the current limit from 28,000 ATM. This will ensure best use will be made of the Airport's existing infrastructure in line with the White Paper policy. This proposal will be within limitations imposed by environmental and safety constraints current and at that time. It will also assist in meeting clear and increasingly unmet demand for Business Aviation both at Farnborough and in the South East.

TAG is committed to adopting a sustainable approach to the future management and development of the Airport and has set the objective of becoming a leader in sustainability within the airport industry.

A key element of the Airport's sustainability strategy is to become a low carbon airport and to achieve carbon neutrality as soon as reasonably possible.

APPENDIX G

Extract from Section 106 Schedule 1

THE OWNER AND THE COMPANY'S OBLIGATIONS TO THE COUNCIL

Part 1: Obligations updated from the Original Planning Obligations

2. Noise Control

2.1 Specific noise limits

- (a) Aircraft Movements other than Other Aviation Activity shall not exceed the areas within the annual noise budget, defined by the total land within both the 55dB(A) Leq contour (being 9.09 km²) and the total land within the 60dB(A) Leq contour (being 4.01 km²). It is further agreed that spare capacity within one year's budget shall not be carried forward to a future year.
- (b) Where a noise benefit can be demonstrated then, subject to reaching prior agreement in writing with the Council (all parties acting reasonably), the Site can be operated within a noise budget defined by noise contours of differing land area or position from the contours defined in paragraph 2.1(a).

2.2 Operational Measures

- (a) The use of aircraft reverse thrust shall be discouraged except where its use is required for safety reasons. It is further agreed that this control will be published in the UK-AIP and the Company's Conditions of Use.
- (b) Chapter 2 aircraft shall not be permitted to be used to and from the Site.

2.3 Other Amelioration Measures

- (a) Reasonable endeavours shall be used to ensure that pilots operate their aircraft in such a way as to minimise noise disturbance to the areas surrounding the Site. Pilots will have particular regard to the use of reverse thrust (paragraph 2.2(a)), track keeping (paragraph 1.4), engine ground running (paragraph 2.3(b)), the use of APU's (paragraph 2.3(c)) and helicopters 2.3(d). Any controls will be agreed with the Council prior to it being published in the UK-AIP and the Company's Conditions of Use.
- (b) Engine ground running/testing other than routine pre-flight checks will be avoided as far as reasonably practical, engine ground running/testing may only take place between 08:00 and 20:00 Monday to Friday. In addition engine ground runs may take place on Saturday, Sunday or Bank Holidays

between 09:00 and 20:00 but only if there is an essential operational or safety reason, that is, the aircraft is required for flight over the weekend or Bank Holiday period in question. Any high powered engine ground running/testing may only take place on land south of the runway at the same times and days and under the same circumstances.

- (c) APUs will not be operated between the hours of 22:30 and 06:30.
- (d) An entry shall be inserted and maintained on an ongoing basis in the UK-AIP requiring helicopter pilots to operate in accordance with minimum noise procedures.

2.4 **Sound Insulation Grant Scheme**

Sound insulation of a type extent and under terms to be agreed with the Council by the Deadline Date acting reasonably and in line with the schemes of other UK airports shall be offered to the owners of residential academic or health care premises which are predicted in any forthcoming period in the annual predictive modelling exercise as set out in paragraph 2.5(a) to be subject to noise levels of 60dB(A) Leq (16 hour, annual average) or above directly attributable to aviation noise from the use of the Site other than those resulting from the Airshow or large scale military activity in the event of a national emergency.

2.5 **Predictive Modelling**

- (a) At the end of the 2nd Quarter in each Year the INM model will be used to produce noise contours based on the preceding 6 months' actual movements and a second set of theoretical contours for the next 6 months.
- (b) At the end of the 4th Quarter in each Year the INM model will be used to produce noise contours based on the actual movements in the past Year and a second set of theoretical contours for the Year ahead.
- (c) These sets of contours shall be supplied to the Council not later than 6 weeks after the model has been used.
- (d) For paragraphs 2.5(a)-(c) the INM model shall use a simplified departure track representation and such simplified departure track representations shall be made after inspection of the spread of actual aircraft tracks at the Site.
- (e) For paragraphs 2.5(a)-(c) the INM model shall include terrain information and at the end of each Year the results shall be compared between the individual INM predicted levels with the measured levels determined by the fixed and mobile monitoring points in and around the Site.

2.6 **Noise and Track Monitoring**

For the lifetime of the Development the noise and track monitoring scheme attached shall be complied with. The noise monitoring scheme can be amended with agreement from the Council in writing and such agreement is not to be unreasonably withheld.

2.7 **Validation of Modelling and Measurement**

The Company will on an annual basis employ suitably qualified noise consultants to audit the modelling and monitoring work required by paragraphs 2.5 and 2.6 in a manner to be agreed with the Council. The Company will ensure that the audit is completed in time for the inclusion in the performance monitoring report required by paragraph 2.8(b).

2.8 **Modelling and Monitoring - Reporting**

- (a) The Company shall provide to the relevant officer of the Council real-time computer access to the data from fixed noise monitors provided in accordance with paragraph 2.6 and a half-yearly summary shall be provided within 4 weeks after each Reporting Date. This information will be made available to supplement the information on individual movements required by paragraph 1.1.
- (b) The Company shall provide within 4 weeks after each Reporting Date the Council with data from mobile monitoring points in accordance with paragraph 2.7 on a quarterly basis.
- (c) The frequency nature and extent of all noise reporting shall be reviewed in consultation with the Council annually.

APPENDIX H

The Quiet Flying Programme Review including the Evaluation of the Farnborough Airport Noise Abatement Trials 2007/8

Conclusions & Recommendations Summary

The work of the Quiet Flying Programme can be broadly split into two sections; ground mitigation and flying mitigation.

It is the group's belief that many of the initial concerns around ground noise have now been effectively addressed so that ground operations at the airport in terms of noise are better policed since the beginning of the trial.

Noise generated by flight operations was the main concern of the community and the group believes that some degree of success has been achieved.

The QFP residents' representatives believe that they are not in a position to make any serious recommendations from the results, apart from requesting further analysis on the collected noise data.

This collaborative work is continuing to ensure that residents receive full benefit from this working group in terms of information provided.

The fundamental difficulty in tackling this issue is the airspace environment surrounding the Airport.

Air Traffic Control at Farnborough are legally required to maintain safety distances, both vertically and horizontally, between 'known' traffic (i.e. aircraft they are talking to) and 'unknown' traffic, which accounts for the vast majority of 'noise cancelled' flights at Farnborough.

The other issue surrounding airspace is the inability to design and implement standard approach and departure routes. At all the larger commercial airports, certainty of aircraft tracks is achieved due to the class of controlled airspace that surrounds these airports. This allows the CAA to approve the use of standard routes that will be followed every time.

One long term objective might be to apply to the CAA for an Airspace Change Proposal. This is a formidable piece of work that may result in an area of controlled airspace, bigger than the existing ATZ that would allow standard approach and departure routes to be implemented. Best estimate for this is a 4 year project which would require consultation of all airspace users in the area, including the military and which has no guarantee of being approved.

For arriving aircraft, the legal requirement for aircraft to be established on the ILS is not less than 5 Nm (CAP 493, Manual of Air Traffic Services Part 1) which is a mandatory document and has always been in use at Farnborough. However, the procedure that required aircraft flying visually to establish at not less than 3 nm was introduced in Phase 1 at both ends of the runway and has removed the visual impact of a manoeuvring, tightly turning aircraft particularly for runway 24 arrivals.

For departing aircraft, the implementation of the procedure for runway 06 to stop any turns before 2 Nm after take-off has led to the majority of aircraft being higher as they pass over residential Farnborough. Aircraft that are flying straight can generally be said to be less noisy than an aircraft carrying out a turn and certainly the visual impact is less.

The issues of runway 24 departures has been the subject that has been most challenging the working group and led to extensive discussion and further review of the data. To date the analyses on the noise measurements have not been able to demonstrate the benefit the trials have had on reducing noise.

There were some operational difficulties affecting the trial plan:

- a) The number of aircraft registered on the noise equipment during the trial was less than expected leading to a feeling amongst the residents representatives that insufficient data was available.
- b) Some aircraft were unable to fly the southerly route due to various factors such as take off weight and weather conditions.
- c) Noise abatement procedures were cancelled. This is considered to be the other major issue for local people and that it is the number of permitted noise abatement cancellations which seems to allow flights to disturb residents at some of the most sensitive times of the week.
- d) A proportion of the trial period involved easterly aircraft take- offs.

The data analyses show that the trial aims and objectives to reduce noise nuisance for residents by introducing an alternative route for 50% of the flights did not prove entirely successful.

The results confirmed that sites closer to the centre line have more noise on the northern route and the trial southerly route causes more noise along that route when it operates.

There was an increase overall in subjective noise complaints during the period of the trial.

With regard to runway 24 departures we now believe there are only 5 options (not withstanding any noise abatement cancellations);

- A. Return to a revised version of the original procedures that would require aircraft to reach 1800ft before turning right and leave the left turn to the pilots discretion or ATC instruction.
- B. Return to a revised version of the original procedures that would require aircraft to reach 2 Nm DME before turning right and leave the left turn to the pilots discretion or ATC instruction.
- C. Return to Phase 1 of the trial that would send all aircraft straight ahead to 2 DME before turning right or left.
- D. Instruct all aircraft to turn to 220° when at a height safe to do so and continue on track to 2 DME before turning.
- E. Continue with Phase 2 of the trial with split departures decided by onward routing.

TAG believe that option A would be operationally difficult for ATC and could lead to a return to more aircraft turning right over residential Fleet & Pondtail and that option D would increase workload dramatically for pilots & ATC (northbound aircraft would have to manoeuvre to the west of RAF Odiham) and should therefore be discounted.

The reaction from the community to Option C was the reason that Phase 2 was initiated but gives the greatest degree of certainty.

Option B and E are of a similar nature with option E giving slightly more certainty that result in the broad corridor of tracks over Caesars Camp.

In conclusion, it has been found that noise abatement options for the residential areas close to the airport are limited due to the nature of the airspace, the legal requirements of the CAA and the unscheduled nature of business aviation.

TAG is conscious of trial fatigue and the additional workload it imposes on both ATC and pilots. To change to option B would require another change to publications and would therefore recommend continuing with the Phase 2 procedures for runway 24 departure.