

October 2018

Noise Action Plan 2019-2024





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Foreword

Bristol is the major airport serving the South West of the UK with more than eight million passengers a year passing through our terminal. We are the ninth busiest Airport in the country, and England's third largest regional airport¹.



We are an essential part of the region's transport network, providing national and international connections. Our airline partners fly to more than 120 destinations across 34 countries, including 18 capital cities to hubs like Amsterdam, Brussels, Dublin, Frankfurt, Munich and Paris offering onward connections to the rest of the world. New routes in 2017 included Athens, Cologne and Stockholm.

Our approach in achieving this success has been recognised by our industry. Whilst we have grown meeting passenger demand we have continued to invest in infrastructure, increase our public transport links and have stated our ambition for carbon neutrality. This approach has led to us becoming the best airport in the '5 – 10 million passengers' category at the 14th Annual ACI Europe Best Airport Awards in 2018. To put this in context, ACI Europe counts over 500 airports in 45 European countries among its membership.

Like most airports in England, Bristol Airport is required to produce a Noise Action Plan under the terms of the Environmental Noise (England) Regulations 2006. Our current Action Plan was adopted in 2014 after a public consultation exercise and review by the Department of Environment, Food and Rural Affairs (DEFRA). The adopted Action Plan has now been thoroughly reviewed taking into account the results of a fresh round of noise mapping completed in 2017 and the progress against the actions set out in the plan. As a result we are pleased to now present our revised and updated Noise Action Plan covering the period 2019 to 2024.

This updated Action Plan not only incorporates the various noise mitigation and control measures agreed as part of the planning permission to develop Bristol Airport granted by North Somerset Council in February 2011 but provides additional actions that we are seeking to undertake to manage, control and mitigate the effects of aircraft noise on the local community.

Bristol Airport continues to operate a noise and track monitoring system (which, in addition to recording noise levels at monitoring stations around the community, records the routes taken by aircraft and creates a graphic representation of flight paths relative to the ground) and

this continues to demonstrate our commitment to transparency on this issue. Other initiatives outlined in this plan show how, by working in partnership with airlines and NATS, our air traffic services provider, improvements have been made through changes to operating procedures. We have used the Sustainable Aviation Road-Map² to develop best practice management strategies and to set out the need for future actions as presented in this third Noise Action Plan.

This Noise Action Plan has been presented to the Bristol Airport Consultative Committee and for 12 weeks we sought views from all stakeholders, including members of public. We received 56 responses during this period ranging from organisations to individuals and we have provided a summary of comments and our responses to these in Annex C of this final Noise Action Plan.

We take consultation and the effects of noise on the local community very seriously and therefore we would like to thank you for your feedback and comments and for taking the time to consider this Noise Action Plan.

A handwritten signature in dark ink, appearing to read 'Dave Lees'.

Dave Lees
Chief Executive Officer
Bristol Airport

¹ As per 2017 CAA Passenger Statistics, <https://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-2017/>

² <http://www.sustainableaviation.co.uk/road-maps/>



Executive Summary

This Noise Action Plan has been updated to continue to comply with the requirements of the European Union (EU) Environmental Noise Directive 2002/49/EC (END) and, where applicable, other related UK government regulations. This is the main purpose of an airports Noise Action Plan to effectively plan, manage and where possible reduce the adverse effects of aviation noise associated to our operations. Bristol Airport, for the purposes of the creation and implementation of this Noise Action Plan, is deemed as the competent authority.

In fulfilling this requirement for airport operators to develop Noise Action Plans to manage noise issues, this document revises and refreshes the existing Bristol Airport Noise Action Plan (2014 – 2018) and sets out actions to manage and, where possible, reduce the effects of noise on surrounding communities.

Our first Noise Action Plan covered the period from 2010 to 2015, and our second from 2014 to 2018. This is our third Noise Action Plan covering the period 2019 to 2024 and where applicable, includes actions beyond this time period.

We are proposing to close 9 actions; continue with 26 actions and introduce 19 new actions as part of this Noise Action Plan. By doing this we hope this shows our ambitious approach to our on going commitment to noise management.



Aims and Framework of Our Noise Action Plan



The proposals set out in this Noise Action Plan aim to:

- Demonstrate our ongoing commitment to best practice in airport operations, with particular reference to noise reduction and mitigation.
- Provide clear and measurable indicators by which our performance can be judged.
- Engage with surrounding communities to better understand their concerns and priorities.
- Meet the requirements of the Environmental Noise Directive 2002/49/EC and The Environmental Noise (England) Regulations 2006 (as amended).

Section 3 of this document describes the purpose and scope of this process in detail. This Noise Action Plan has been prepared to show how Bristol Airport intends to manage noise issues and effects arising from airport operations and, where necessary, improve the noise climate around the airport during the period 2019 to 2024 and, where applicable, beyond this timeline.

This Noise Action Plan has been drawn up for places near the Airport which have been shown as affected by noise from airport operations by strategic noise mapping undertaken in 2016 and reported in 2017. This Noise Action Plan considers noise issues from aircraft landing and taking off.

We have also considered the effects of noise from aircraft whilst on the ground when producing this Noise Action Plan, although other noise sources are not required to be included we are following the guidance which suggests that this should not preclude such affects.

Section 4 provides a description of the Airport's location, history, plans for future development, and a summary of airport use.

Section 5 summarises the international, national and local regulatory framework governing airport operations, with specific reference to the effects of noise.

Section 6 describes our current framework for noise management. This includes measures to monitor and mitigate the effects of noise from airborne aircraft and noise from aircraft whilst on the ground.

These measures include limiting the use of Auxiliary Power Units, encouraging Continuous Descent Approaches and incentivising airlines to operate quieter aircraft. Night flying will continue to be controlled by a noise quota system and limits with the total number of take-offs and landings between the hours of 23:30 hours and 06:00 hours in the summer and winter seasons.

A dialogue with surrounding communities is maintained through reports to the Airport Consultative Committee and the operation of a noise management telephone line and email system through which all complaints are logged and associated environmental effects, including noise disturbance if raised, are investigated.

Section 7 sets out the results of the strategic noise mapping carried out in 2017.

This Noise Action Plan includes five maps indicating areas affected by aircraft taking off and landing at Bristol Airport, with separate calculations carried out for the average day, evening and night.

Under the guidance provided by DEFRA, the Action Plan is required to identify those places affected by noise from airport operations (within the published Lden and Lnigt noise contours).

In the case of Bristol Airport, this includes parts of the parishes of Yatton, Congresbury, Cleeve, Wrington, Backwell and Winford in North Somerset. The noise maps also include a small area of Bath and North East Somerset to the south of East Dundry.

Section 8 comprises an Action Plan, to be implemented on adoption of this latest Noise Action Plan. Where appropriate, actions are coupled with key performance indicators which will be used to monitor progress. Timescales for implementation are also indicated. Key actions are described and noted in the following categories:

- To manage and reduce the effects of noise from aircraft on the ground.
- To manage and reduce the effects of noise from airborne aircraft.
- Measures to mitigate the effects of aircraft noise.
- Arrangements for monitoring aircraft noise.

Section 9 confirms that our long-term strategy is to develop and enhance facilities in accordance with the 2011 planning permission to enable a passenger throughput of 10 million passengers per annum (mppa). We will also provide context in terms of future planning, for instance a planning application to allow Bristol Airport to serve 12 mppa and with regard to the Airports current Master Plan consultation which sets out our vision for growth to circa 20 mppa by the mid to late 2040's.

Section 10 is concerned with the cost of implementing the Noise Action Plan.

Section 11 sets out key performance indicators by which it is proposed the implementation of the Noise Action Plan will be measured.

Section 12 includes a glossary of terms.



Introduction

3.1. Purpose

This Noise Action Plan has been prepared to define and inform how Bristol Airport intends to manage noise issues and effects arising from airport operations and, where necessary, improve the noise climate around the airport during the period 2019 to 2024. It reflects our commitment to controlling the adverse effects of our operations and minimising their impact on the local community. In respect of noise this means implementing Government policy and industry best practice to limit and reduce, where possible, the number of people affected by noise arising from the Airport's operations.

This Noise Action Plan has been prepared in accordance with The Environmental Noise (England) Regulations 2006 (as amended) (referred to in this document as 'the Regulations'). Noise Action Plans are a legal requirement throughout the European Union under the EU Environmental Noise Directive (Directive 2002/49/EC) also known as the END. This Noise Action Plan will eventually replace the existing 2014 to 2018 Action Plan subject to public consultation, approval by DEFRA and adoption by the Secretary of State.

This Noise Action Plan is based on the results of strategic noise mapping produced under the terms of the Regulations and it reflects the Government's aims to limit and where possible reduce the number of people in the UK significantly affected by aircraft noise³.

The current Noise Action Plan (2014 – 2018) has been reviewed taking into account the progress made against the actions described within it and the results of the noise mapping completed in 2017. The plan has also been revised to include:

- Updated details about Bristol Airport;
- Updated information about relevant legislation and standards; and
- Updated relevant national policies and local policies.

Noise from aircraft operations continues to be a significant concern for some of our surrounding communities and this is consistent with other UK Airports. Through this revised Noise Action Plan, we are seeking to continue to enhance the noise management framework (detailed in Section 6) that we have been undertaking in recent years providing additional actions that will continue to help manage our noise impacts.

As previously noted, the Airport is currently in the process in bringing forward a planning application for 12 million passengers per annum (mppa) to the Local Planning Authority whilst also consulting publically on a revised Master Plan, taking Bristol Airport to 20 mppa by the mid 2040's. Details of both have been publically consulted and we aim to continue to proactively engage with our neighbours through this process. It is important to make clear that this Noise Action Plan only includes actions for which the airport has been granted planning permission for and intends to achieve

at the time of publication. Any additional noise management and mitigation strategies which come forward through the planning process during the life span of this Noise Action Plan will be incorporated at the appropriate time.

3.2. Scope

This Noise Action Plan has been drawn up for places near the airport affected by noise from the airport operations as shown by the results of the strategic noise mapping. Strategic mapping of Bristol Airport was undertaken in 2007, 2012, and most recently in 2017 (based on 2016 data). The results of the latest round of noise mapping are included in Annex A. This Noise Action Plan is required to consider noise issues and effects from aircraft taking off and landing within the area of the outer recorded contour line shown on the maps. In addition, we have considered the effects of noise from aircraft whilst on the ground at the airport, and included appropriate actions to manage these effects, where possible. In this respect, the Action Plan goes beyond the legal requirements of the Regulations.

This document therefore includes actions related to approaching and departing aircraft, and ground aircraft movements (taxiing, holding, aircraft turnaround, engine testing). However, it should be noted that the Action Plan does not consider noise associated with road traffic or construction activities. Government has made separate arrangements for the preparation of Action Plans for major roads, major railways and agglomerations⁴.

3 Aviation Policy Framework, 22nd March 2013, <https://www.gov.uk/government/publications/aviation-policy-framework>. Paragraph 17 of the Executive Summary states that 'Our overall objective on noise is to limit and where possible reduce the number of people in the UK significantly affected by aircraft noise.'

4 An agglomeration is defined in the Regulations as an area having a population in excess of 100,000 persons and a population density equal to or greater than 500 people per km². A first round agglomeration is an agglomeration with a population in excess of 250,000 persons and a population density equal to or greater than 500 people per km². In the local context, the Regulations identify the built-up area of Bristol as a first round agglomeration.



3.3. Process and Consultation

The Regulations identify the airport operator, Bristol Airport Ltd, as the competent authority to prepare the Action Plan for this airport. The Government has provided guidance on the scope, process and approach that is to be followed for those airports that already have a Noise Action Plan prepared under the terms of the Regulations⁵. The Regulations⁵ include specific requirements that the Action Plan should conform to.

Prior to formal consultation we have taken the opportunity to provide updates on the timetable for consultation on this Noise Action Plan to stakeholders. This has been achieved by attending local parish council annual committee meetings and associated forums in 2018 and informing members of the Bristol Airport Consultative Committee. This

was important due to the consecutive public consultations we have been holding with reference to our Master Plan and next major planning application.

During the formal consultation period for this Noise Action Plan, running from the 10th July 2018 until 2nd October 2018, for 12 weeks, the Airport will continue to engage with stakeholders including the Bristol Airport Consultative Committee on 25th July 2018 and the Airport's Environmental Effects Working Party (consisting of local nominated Councillors from the Consultative Committee) on the 10th July 2018 when the consultation launches.

Further to this the Airport holds every six months a Parish Council Review Event where all local parish councillors are invited to attend. This Noise Action Plan will be presented at this event on the 11th July 2018. We will also be updating North Somerset and Bath and North East Somerset

Councils, areas of which are included in the noise contour maps, during this consultation period directly. We will also consult the airlines operating at the airport and NATS, who manage air traffic control at the airport. This will be undertaken through our Flight Operations Sub Committee (FLOPSC) meeting on the 8th August 2018. Of course if further sessions with stakeholders are required we endeavour to accommodate. All stakeholders will be informed via email on the 10th July 2018 when the consultation launches and press releases to local media will occur in July 2018 and in September 2018 as the consultation approaches its end.

This Noise Action Plan is available online on our website for download. The website also provides a prescribed email address for responses (as detailed in Section 1 of this document) with a list of press releases in local media as they occur. After the consultation period elapses,

⁵ Guidance for Airport Operators to produce airport noise Action Plan under the terms of the Environmental Noise (England) Regulations (as amended) – Defra Update July 2013.

all responses will be analysed and reported as an appendix within the final Noise Action Plan. This will be completed by the end of October 2018. It should be noted this Noise Action Plan will be provided to DEFRA at the time of the start of the consultation.

Once the revised plan has been finalised, it will be sent to the Secretary of State for DEFRA who, in liaison with the Department for Transport, will form a view regarding whether or not the submitted revised plan meets the requirements of the Regulations and, therefore, whether or not the plan is appropriate for adoption.

3.4. General Requirements

The END requires that Member States should adopt Action Plans, based on the noise-mapping results, with a view to preventing and reducing environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and preserving environmental noise quality where it is good. This Noise Action Plan must therefore be designed to manage noise issues and effects, including noise reduction where necessary.

This Noise Action Plan must aim to protect quiet areas⁶, identified as such in the relevant agglomerations, against an increase in noise. To date no quiet areas have been identified in the vicinity of Bristol Airport.

The Government's overall objective on aviation noise is to limit and where possible reduce the number of people in the UK significantly affected by aircraft noise. This

Noise Action Plan process requires operators to consider whether there is scope for implementing additional noise management measures with this objective in mind.

When considering any new noise management measure within the Action Plan, Airport Operators should consider in a proportionate manner the following:

- The benefit that would be achieved from the measure;
- The impact of the measure on other environmental factors, such as local air quality and climate change;
- The costs of implementing the measure, both direct and indirect; and
- The implication of failing to implement a particular measure, both direct and indirect.

This has resulted in the establishment of Noise Preferential Routes (NPRs), which are described further in the context of Bristol Airport in Section 5. These routes are designed to minimise noise annoyance by concentrating aircraft departures along routes avoiding the more densely populated areas as far as practicable. It has also been established that where it is possible to avoid over-flights of National Parks and Areas of Outstanding Natural Beauty below 7000 feet, where it makes sense to do so, provided it does not add to environmental burdens on more densely populated areas. The NPRs in force at Bristol Airport have been designed to achieve these objectives. They were the subject of a detailed consultation exercise prior to their introduction in 2006. Constraints on the airspace require some overflying of the

Mendip Hills Area of Outstanding Natural Beauty below 7000 feet but our operational procedures includes a commitment to manage the flight paths so that the height of aircraft in this area is maximised.

Airport operators are advised to investigate opportunities for protecting quiet areas using ameliorative measures, such as sophisticated flight path management. This Noise Action Plan includes appropriate actions to this end. However, the guidance also highlights the importance of taking care to avoid adding environmental burdens on more densely populated areas. Government airspace policy places a high value on the legacy of planning decisions and the location of noise sensitive development. This includes the importance of long-term stability of aircraft route structures in the vicinity of airports, since people need to know where significant aircraft noise will be experienced.

For the duration of this Noise Action Plan there will not be alterations made to the airports existing flight paths or NPR's. However, as denoted in the actions accompanying this Noise Action Plan, the airport will begin the detailed review and assessment during the life span of this plan to ultimately change departure and arrival flight paths by 2026/27 to align with the wider UK Airspace Strategy, utilising improved existing aircraft navigational technology. It is hoped that such improvements in performance based navigation will have positive effects for the local community by reducing overflights in some areas.

⁶ A quiet area in an agglomeration is defined in the Regulations as an area which is identified as a quiet area in an agglomeration in accordance with the Regulations.



Airport Description

4.1. Location

Bristol Airport is the major airport serving the South West of the UK with more than eight million passengers a year passing through our terminal. We are the ninth busiest Airport in the country, and England's third largest regional airport.

We are an essential part of the region's transport network, providing national and international connections. Our airline partners fly to more than 120 destinations across 34 countries, including 18 capital cities to hubs like Amsterdam, Brussels, Dublin, Frankfurt, Munich and Paris offering onward connections to the rest of the world. New routes in 2017 included Athens, Cologne and Stockholm.

Bristol Airport is located approximately seven miles south west of Bristol city centre and within the local authority administrative area of North Somerset Council. Bristol Airport is situated immediately adjacent to the A38, Bristol to Bridgewater Road, with two roundabout junctions providing access to the airport site.

The northern roundabout provides access to the northern parts of the airport including the main terminal building, passenger pick up and drop off areas, current airport administration buildings, hotel and operational facilities, and both short and long-stay parking areas. This is also the main access for public transport links to Bristol Airport. The southern roundabout, meanwhile, provides access to (inter alia) Silver Zone long-stay car parking, aircraft maintenance areas, the Bristol and Wessex Aeroplane Club, Bristol Flying Centre and Western Power Distribution Helicopter Unit.

Bristol Airport is situated on a ridge of high ground called Broadfield Down, with the A370 Bristol to Weston-super-Mare road and M5 motorway situated 4km and 11km respectively to the north and west. The area surrounding Bristol Airport is predominately open, undulating countryside with extensive woodland areas to the east and open farmland and settlements to the north, east and south. To the north east is the settlement of Felton and associated Felton Common. Immediately to the north are properties along the A38 and extending along Downside Road, with the properties on the southern side of this road sharing a boundary with Bristol Airport.

The runway is aligned east/west. The westerly runway is designated as Runway 27 and the easterly runway as Runway 09. Aircraft generally take off and land into the wind which means that Runway 27 is the predominant runway, being used for 80% of aircraft movements in 2017 although this will vary from year to year. Since 2001, Runway 27 has been used for 78% of movements on average⁷.

The land surrounding the airport is predominantly rural, with much of the farm land being pasture. There is also common land (adjacent to the village of Felton), which lies to the east of the airport boundary by the A38. There are numerous settlements within the vicinity. These include Felton, located 2km to the northeast; Winford, which is situated 4km to the east; Cleve at 3km to the west; and Wrington, located to the south west of the airfield. The largest village in proximity to the airport is Yatton, the southern part of which is just north of the extended centreline 6.5km west

of the airport. Parts of Congresbury, to the south of Yatton, also lie within the noise contour maps. A number of small scattered communities and hamlets lie in close proximity to the airport, including Lulsgate Bottom, Downside, Potters Hill and Redhill.

4.2. History

The airport site was originally an RAF base during the Second World War and has operated as a civil airport since 1957 when Bristol (Lulsgate) Airport was officially opened for passenger and commercial movements. The airport steadily expanded in response to economic conditions throughout the 1960s and 1970s.

The 1980s saw renewed growth in the leisure market, which not only increased passenger numbers, but also allowed for expansion. A new fuel storage facility was built along with additional car parks and flight catering facilities. The last decade of the 20th century saw a planning submission and eventual approval for a new terminal building. The funding for this was delivered in 1997 through privatisation of the airport company.

The 21st century saw the new terminal open, and the old terminal converted for office use by airport and airline staff. In 2000, 2 million passengers passed through the airport. During the same year, the A38 was also relocated, which enabled an all-weather Category IIIB Instrument Landing System to be installed on runway 27. A new Air Traffic Control Tower was built in 2001. These developments attracted new airlines to the Airport, allowing passenger numbers to steadily increase year on year.



The Airport published its first Master Plan in 2006 setting out how the airport should develop and in 2011 planning permission was granted by North Somerset Council for a number of proposals to develop the Airport to support up to 10 million passengers. Two major terminal extensions have been completed as part of this development, with the second being opened in 2016. By 2017 passenger numbers were up to circa 8 million per year.

In 2017 and 2018, public consultations were held on plans to prepare a new Master Plan which sets out the development proposals for the airport through to 2040 and beyond. The initial phase of this development involves a planning application to permit up to 12 million passengers per annum which is expected to be submitted in the autumn of 2018.

4.3. Airport Development

In February 2011 North Somerset Council granted planning permission for the development of Bristol Airport to handle increased passenger numbers up to 10 million passengers per annum. The planning permission is subject to 70 planning conditions and a section 106 Agreement including planning obligations relating to the management of air and ground noise. The most recent strategic noise maps for Bristol Airport were prepared in 2017 and reflect the noise climate in 2016.



Noise and Regulation, Guidance and Reports

5.1. International Regulation

The International Civil Aviation Organisation (ICAO) is the inter-governmental body that oversees the worldwide civil aviation industry. ICAO has adopted a set of principles and guidance, constituting the 'balanced approach' to aircraft noise management, which encourages ICAO member states to address the following points.⁸

- Mitigate aviation noise through selection at a local level the optimum combination of four key measures:
 - o Reducing noise at source (from use of quieter aircraft);
 - o Making best use of land (plan and manage the land surrounding airports);
 - o Introducing operational noise abatement procedures (by using specific runways, routes or procedures); and
 - o Imposing noise-related operating restrictions (such as a night time operating ban or phasing out of noisier aircraft).
- Select the most cost-effective range of measures.
- Not introduce noise-related operating restrictions unless the authority is in a position, on the basis of studies and consultations, to determine whether a noise problem exists and having determined that an operating restriction is a cost-effective way of dealing with the problem.

ICAO has also set a number of standards for aircraft noise certification which are contained in Volume 1 of Annex 16 to the

Convention on Civil Aviation.

This document sets maximum acceptable noise levels for different aircraft during take-off and landing, categorised as Chapter 2, 3, 4 and 14.

- Chapter 2 aircraft have been prevented from operating within the EU since 2002, unless they are granted specific exemption, and therefore the vast majority of aircraft fall within Chapter 3, 4 and 14 parameters. These aircraft are quieter than Chapter 2 aircraft.
- Chapter 4 standards have applied to all new aircraft manufactured since 2006. These aircraft must meet a standard of being 10 dB quieter than Chapter 3 aircraft.
- Chapter 14 was adopted by the ICAO in 2014. This represents an increase in stringency of 7 dB compared with Chapter 4 and applies to new aircraft submitted for certification after 31st December 2017.

5.2. European Regulation

EU Member States must comply with published regulations and directives, those significant to this Noise Action Plan are as follows.

- Directive 2006/93/EC replaced Directive 92/14/EEC and banned the use of Chapter 2 aircraft in the EU from 1st April 2002.
- Regulation 598/2014 repealed Directive 2002/30/EC in 2014 and establishes rules and procedures for the introduction of noise-related operating restrictions. It maintains previous requirements such as the adoption of the ICAO balanced approach.

- Directive 2002/49/EC, the Environmental Noise Directive, requires noise maps to be produced for the purposes of producing action plans, which are further explained within the Environmental Noise (England) Regulations 2006 (as amended).

5.3. National Regulations, Policy and Guidance

Regulations

Aeroplane Noise Regulations 1999

The Aeroplane Noise Regulations 1999 require that all civil propeller and jet aeroplanes registered in the UK shall have a noise certificate. A similar requirement applies to any foreign registered aeroplane which cannot land or take off in the UK without a noise certificate granted by the competent authority in the state where it is registered.

Civil Aviation Act 2006

The Civil Aviation Act 2006 included a number of measures aimed at strengthening the powers available to control noise. These included provision for airport operators to fix charges in respect of an aircraft or a class of aircraft based on the noise caused by the aircraft or the amount of emissions it produces. The Act also gave airport operators statutory powers to introduce noise control schemes for the purpose of avoiding, limiting or mitigating the effect of noise connected with the taking off or landing of aircraft. These could include penalties for straying from agreed flight paths that minimise the number of people affected by noise, fines for aircraft that breach noise

⁸ ICAO Doc 9829 AN/451, 'Guidance on the Balanced Approach to Aircraft Noise Management 2nd Edition (2008).



controls and restrictions on aircraft of specified descriptions. Any income from penalty schemes would have to be put towards projects that benefit the local community.

Civil Aviation Act 2012

The Civil Aviation Act 2012 placed a new duty on the Civil Aviation Authority (CAA) to make information about the environmental performance of the aviation sector available to the general public and measures taken to limit adverse environmental effects. The CAA consulted on its proposed Statement of Policy for the use of its information powers in 2013.

The Environmental Noise (England) Regulations 2006 (as amended)

These regulations transpose the European Environmental Noise Directive (Directive 2002/49/EC) into English law. They require operators of non-designated major civil airports to make and submit strategic noise maps to the Secretary of State every

five years starting in 2007 which reflect the noise situation in the preceding calendar year. A major airport is defined as a civil airport that has more than 50,000 movements per year (a movement being a take-off or a landing). Regulation 18 places a duty on the operators of major airports, as the competent authority, to draw up a Noise Action Plan for places near the airport and submit this to the Secretary of State. There is then a continuing obligation on airport operators to review (and revise, if necessary) the Noise Action Plan every five years or sooner where a major development occurs.

The Regulations require the Secretary of State to identify a number of noise sources for the strategic noise mapping and Action Plans. The Environmental Noise (Identification of Noise Sources) (England) Regulations 2007 identified Bristol Airport as a major airport and Bristol as an agglomeration with the area of the agglomeration indicated on an accompanying map.

Policy and Guidance

Noise Policy Statement for England (2010)

The Noise Policy Statement for England (NPSE) sets out the long term vision of Government noise policy to promote good health and a good quality of life through the effective management of noise within the Government policy on sustainable development.

The stated aims of the NPSE are to:

- Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development;
- Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development; and

- Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

The NPSE introduces the concepts of NOEL (No Observed Effect Level), LOAEL (Lowest Observed Adverse Effect Level) and SOAEL (Significant Observed Adverse Effect level) however it doesn't define values for these.

National Planning Policy Framework (2012)⁹

The National Planning Policy Framework (NPPF), published in March 2012, sets out the Government's planning policies for England and how these are expected to be applied. It replaced 44 Planning Policy Statements, Guidance, Circulars and letters to Chief Planning Officers including Planning Policy Guidance 24 (PPG24) on Planning and Noise. With respect to noise the NPPF advises that planning policies and decisions should aim to:

- Avoid noise from giving rise to significant adverse impacts 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;
- 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 established; 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.

Further guidance on how planning authorities should take account of the acoustic environment and the mitigation strategies which should be applied is provided in the National Planning Practice Guidance 2014.

Aviation Policy Framework (2013)¹⁰

Current UK Government policy on aviation, including the management of noise, is set out in the Aviation Policy Framework (APF). The APF sets out the Government's high level objectives for the aviation sector and the policies to achieve these objectives. In respect of noise, the APF includes a policy objective to limit and, where possible, reduce the number of people in the UK significantly affected by noise and sets out the Government's expectations for measures to be considered by airports and the aviation industry to reduce and mitigate noise. This includes consideration of noise envelopes, airspace design, information and communication, night noise, noise insulation and compensation and general aviation and helicopters. These requirements have been considered in this Action Plan.

The APF considers the 57 dB $L_{Aeq,16h}$ ¹¹ contour as 'the average level of daytime aircraft noise marking the approximate onset of significant

community annoyance'. However, the government acknowledges that 'this does not mean that all people within this contour will experience significant adverse effects from aircraft noise. Nor does it mean that no-one outside of this contour will consider themselves annoyed by aircraft noise'. While recognising that average noise contours are a well-established measure of annoyance and are important to show historic trends in total noise around airports, the APF also encourages airport operators to use alternative measures which better reflect how aircraft noise is experienced in different localities.

In addition, the APF expects airport operators to:

- Offer households exposed to levels of noise of 69 dB $L_{Aeq,16h}$ or more assistance with the costs of moving; and
- Offer acoustic insulation to noise-sensitive buildings, such as schools and hospitals, exposed to levels of noise of 63 dB $L_{Aeq,16h}$ or more. Where acoustic insulation cannot provide an appropriate or cost-effective solution, alternative mitigation measures should be offered.

Where airport operators are considering developments which result in an increase in noise, the APF expects, as a minimum, airport operators to:

- Offer financial assistance towards acoustic insulation to residential properties which experience an increase in noise of 3 dB or more which leaves them exposed to levels of noise of 63 dB $L_{Aeq,16h}$ or more.

9 Ministry of Housing, Communities & Local Government, 2012. National Planning Policy Framework. Available online <https://www.gov.uk/government/publications/national-planning-policy-framework--2> [Checked 19/03/2018]

10 <https://www.gov.uk/government/publications/aviation-policy-framework>

11 The A-weighted average sound level over the 16 hour period of 07.00-23.00. This is based on an average summer day when producing noise contour maps at the designated airports.

Although the APF remains the current national aviation policy document, in October 2017 the Department for Transport reported on the outcome of consultations regarding changes to UK airspace (Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace) which included a review of criteria and metrics for assessing aircraft noise. This response states in paragraph 9:

‘The Government’s current aviation policy is set out in the Aviation Policy Framework (APF). The policies set out within this document provide an update to some of the policies on aviation noise contained within the APF, and should be viewed as the current government policy. The government also intends to develop aviation noise policy further through the Aviation Strategy consultation process. As part of the Aviation Strategy consultation on sustainable growth planned for 2018 the Government intends to consider the roles, structures and powers that currently exist and what, if any, new ones will be necessary to bring about the network wide, co-ordinated and complex changes needed for airspace modernisation.’ Based on this report, the Government will implement a range of proposals.

Limit values on the noise made by aircraft are established through the operating standards for aircraft noise certification set by ICAO.

The APF expects airport operators to offer households exposed to levels of noise of 69 dB $L_{Aeq,16h}$ or more assistance with the costs of relocating. There are no properties at Bristol Airport exposed to these noise levels. The Government also expects

airport operators to offer acoustic insulation to noise sensitive buildings, such as schools and hospitals, exposed to levels of noise of 63 dB $L_{Aeq,16h}$ or more.

UK Airspace Policy: A framework for balanced decisions on the design and use of airspace - (Consultation – February 2017)

Proposals to support airspace modernisation in order to deliver benefits for the UK economy, for passengers and for communities affected by aircraft noise. Views (via a Consultation) are requested on a range of proposals including, but not limited to, establishing an Independent Commission on Civil Aviation Noise, ways to assess noise impacts and choose between route options.

Alongside this Consultation Document, a range of supporting documents have been published: Draft air navigation guidance: guidance on airspace & Noise management and environmental objectives and Survey of Noise Attitudes. This also proposed 51 dB $L_{Aeq,16h}$ as the LOAEL for daytime noise and 45 dB L_{night} for night time noise.

Revised Draft Airports National Policy Statement: new runway capacity and infrastructure at airports in the South East of England (October 2017)

The Airports NPS provides the primary basis for decision making on development consent applications for a Northwest Runway at Heathrow Airport, and will be an important and relevant consideration in respect of applications for new runway capacity and other airport infrastructure in London and the South East of England.

Air Navigation Guidance (October 2017)

Guidance to the CAA on its environmental objectives when carrying out its air navigation functions, and to the CAA and wider industry on airspace and noise management.

To ensure a consistent and transparent assessment of the options within and across proposals, a single appraisal methodology should be followed. Options must follow WebTAG to aid objective decision making. ICCAN is mentioned as a source of best practice guidance on aviation noise for participants in the airspace change process.

Reports (including surveys)

Survey of Noise Attitudes [SoNA] (2014), CAP 1506 (February 2017)

SoNA (2014) is a continuation of SoNA (2013) except this survey considered civil aircraft noise attitudes, replacing entertainment noise from the earlier study. This largely replaces the last large scale survey (ANASE) which was published in 2007.

The study compared reported mean annoyance scores against average summer-day noise exposure defined using $L_{Aeq,16h}$, L_{den} , N70 and N65. Mean annoyance score correlated well with average summer day noise exposure, $L_{Aeq,16h}$. No evidence found to suggest any of the other indicators correlated better with annoyance than $L_{Aeq,16h}$.

This provided data to show that 54 dB $L_{Aeq,16h}$ is now the threshold of community annoyance rather than 57 dB $L_{Aeq,16h}$ which was based on the ANIS study (UK Aircraft Noise Index Study) reported in 1985.



Beyond the horizon. The future of UK aviation. Making best use of existing runways (June 2018)

The Aviation Strategy call for evidence was published in July 2017 which asked specifically for views on the government's proposal to support airports throughout the UK to make best use of their existing runways, subject to environmental issues being addressed. This report records the outcome of the consultation (346 responses received) and the Government recommendation.

It concludes that the Government is supportive of airports beyond Heathrow making best use of their existing runways. However, it is recognised that the development of airports can have negative as well as positive local impacts, including on noise levels. Any proposals should therefore be judged by the relevant planning authority, taking careful account of all relevant considerations, particularly economic and environmental impacts and proposed mitigations. It stresses that it leaves it up to local, rather than

national government, to consider each case on its merits.

Local Planning Framework

Bristol City Council's Local Plan

In February 2018, a consultation was held on a review of the Bristol Local Plan. While the airport is not mentioned specifically, policy DM35 – Noise Mitigation is proposed to be retained and includes a provision that in areas of existing noise, new development sensitive to the effects of that noise is unlikely to be permitted where the presence of that sensitive development could threaten the ongoing viability of existing uses that are considered desirable for reasons of wider economic or social need.

North Somerset Strategy Document (January 2017)

The fully re-adopted Core Strategy for North Somerset was approved on 10 January 2017. This sets out the broad long-term vision, objectives and strategic planning policies for North Somerset up to 2026.

The Strategy identifies Bristol Airport as a regionally important facility. It states as part of its vision that the future planning of Bristol Airport will be guided by the need to balance the advantages of economic growth with the need to control the impacts on those who live nearby and on the natural environment.

Policy CS23 states for Bristol Airport:

“Proposals for the development of Bristol Airport will be required to demonstrate the satisfactory resolution of environmental issues, including the impact of growth on surrounding communities and surface access infrastructure.”

Bristol Airport

Certain aspects of the airport's operations are controlled and regulated through conditions attached to planning consents for the development of the airport. Conditions relating to noise attached to the February 2011 planning permission for development to handle 10 million passengers per annum are summarised below:

- Planning conditions 4 and 5 – requirements for noise attenuation walls to be constructed in conjunction with the development of new aircraft parking aprons.
- Planning condition 30 – limit on the area of the 57dB LAeq 16 hour noise contour
- Planning condition 31 – provisions for noise insulation grants to properties within the 63dB LAeq 16 hour noise contour that did not qualify for a grant under the previous A38 Diversion scheme.
- Planning conditions 32 to 35 – requirements for the installation of fixed electrical ground power and restrictions on the use of mobile diesel ground power generators and aircraft auxiliary power units on new stands for Sites A (East Apron) and B (West Apron).
- Planning condition 36 and 37 – restrictions on night flying through the application of a night noise quota. Aircraft count against the noise quota according to their quota count (QC) classification. The quota count is related to the noise classification of aircraft as set out in a formal notice published by NATS on a regular basis. The current annual quota is 2160 points, with 1260 points for the summer season and 900 points for the winter season.

- Planning condition 38 – the number of take-offs and landings between the hours of 23:30 and 06:00 limited to 3000 in the summer season and 1000 in the winter season.
- Planning condition 39 – the total number of take-offs and landings between 06:00 and 07:00 and between 23:00 and 23:30 limited to 10,500 in any calendar year.
- Planning condition 69 – requirement for a timber fence to be constructed along the northern boundary of the north side car park.

The section 106 Agreement includes planning obligations relating to the management and control of air and ground noise through the implementation of a noise control scheme and adoption of operational procedures and practices aimed at achieving ongoing improvements in the levels of noise and minimising its impact. A planning obligation relating to community benefit requires the establishment of an Airport Environmental Improvement Fund, the purposes of which includes the funding of initiatives to mitigate the impact of aircraft and ground noise in the local community. Bristol Airport paid an initial sum of £100,000 into the fund in 2012 with further annual payments of £100,000 increased in line with the annual percentage increase in passenger numbers.

Since the publication of the previous Noise Action Plan in 2014 the Airport has contributed over £500,00 to 152 projects in the local area.

Ground Noise Management Strategy (2012)

Measures adopted to minimise the effects of ground noise are set out in a Ground Noise Management Strategy which is implemented in accordance with the section 106 Agreement which forms part of the 2011 planning permission.

Sustainable Growth Strategy (To be published in 2019)

The Airport is also in the process of drafting a Sustainable Growth Strategy which sets out our approach to ensuring sustainability is considered at all levels of our activities today and in the future. Defining a clear strategy will enable us to ensure best practice is common place and environmental excellence is aspired to, with the aim of establishing Bristol Airport as a leader in this context. This will be published available in 2019.

Aeronautical Information Package (AIP)

The Aeronautical Information Package (AIP)¹² contains information about the aerodrome. It includes relevant noise restrictions, such as those on the timing of engine ground runs and aircraft types and preferred runways for arrivals and departures. It also sets out the Airport's noise abatement procedures, such as directions in respect of Continuous Descent Approaches, the requirements of the night noise quota system and rules for light aircraft operations.

12 AIP, (December 2017). Available at http://www.nats-uk.ead-it.com/public/index.php%3Foption=com_content&task=blogcategory&id=36&Itemid=85.html



Noise Management Framework

As noted in Bristol Airport's previous Noise Action Plan (2014 - 2018) the framework for noise management includes the following measures:

- Procedures to manage the effects of noise from aircraft whilst on the ground;
- Procedures to manage the effects of noise from airborne aircraft;
- Measures to mitigate the effects of aircraft noise;
- Arrangements for monitoring aircraft noise; and
- Arrangements to engage and work with the local community on matters relating to aircraft noise.

6.1. Management of Aircraft Ground Noise

The primary sources of ground noise at Bristol Airport are aircraft taxiing and the aircraft parking apron. The layout of the aircraft parking apron, the main parallel taxiway and the runway ensures that aircraft arrive and depart Bristol quickly and efficiently, particularly for departures on the westerly runway and arrivals on the easterly runway. Pilots and air traffic control liaise closely to ensure that aircraft start up and departure are managed to achieve this.

Noise arising from aircraft on the aircraft parking apron is dominated by the use of the aircraft auxiliary power units (APU) and support equipment, particularly Mobile Ground Power Units (MGPU's). The primary purpose of the APU is to provide power to start the main engines. In addition, it also has several auxiliary functions such as providing power to run the heating,

cooling and ventilation systems on board the aircraft to make the cabin comfortable before boarding. The APU also provides power to the cabin for pre-flight checks prior to departure. MGPU's are mobile diesel generators that provide an alternative power source for some of these functions reducing the need for the APUs to run.

Procedures are in place to limit the use of APUs. These require Fixed Electrical Ground Power (FEGP) or MGPU's to be used in preference to APUs and the APU is to be shut down as soon as practicable on arrival on stand. APUs should not be restarted until 10 minutes before departure unless the temperature is below +10°C, or above +20°C. Between 23:30 and 06:00 APU running is restricted to essential maintenance, subject to approval by the Operations Department, immediate to departure only. Further restrictions on APU use apply to new aircraft stands where the use of FEGP is mandatory in accordance with the planning conditions attached to the 2011 planning permission. As stipulated in our 2011 planning application, FEGP has been installed on the new aircraft stands on the Western Apron and will be installed on new stands on the eastern apron.

The running of aircraft engines on the ground is an essential safety aspect of aircraft maintenance. Airline's line maintenance is undertaken away from Bristol Airport so ground engine running is a relatively infrequent activity. Ground engine running is strictly controlled and all runs are subject to approval

by the Bristol Airport Operations Department. In 2016 there were 396 engine runs, the vast majority of which were at low or idle power.

Engine ground running is not normally permitted between the hours of 22:30 and 06:00 unless essential to achieve an on-time departure before 08:00. In these circumstances the run up period and power settings are restricted. Aircraft are positioned to minimise the noise impact during engine runs at greater than idle power.

The development within the 2011 planning permission includes a number of buildings that serve to attenuate noise from the aircraft parking apron. In addition a number of noise attenuation barriers are required by planning conditions related to the construction of extensions of the aircraft parking apron and the passenger car parks. The installation of these noise attenuation buildings and barriers has now been completed to the West, the noise barriers will be completed when the East Apron stand construction is complete by Spring 2020.

Measures adopted to minimise the effects of ground noise are set out in a Ground Noise Management Strategy which is implemented in accordance with the section 106 Agreement which forms part of the 2011 planning permission.

6.2. Management of Noise from Airborne Aircraft

Bristol Airport operates within an area defined as Class D controlled airspace. These arrangements were approved by the Civil Aviation Authority, following an extensive consultation process with aviation users, environmental groups and numerous unitary, district and parish councils throughout the area and were implemented on the 31 August 2006.

The changes extended the area of controlled airspace and were designed to enhance the safety and efficiency of Air Traffic Control operations at both Bristol and Cardiff airports, and were also planned to bring a number of significant environmental benefits.

The total area under controlled airspace of both airports extends to cover an area reaching from the Exmoor coast, through the Welsh mountains, Gloucestershire and Wiltshire and returning through the Mendip hills. This extended area encompasses and formalises routes for inbound and outbound aircraft. The next sections indicate how noise from aircraft are practically managed.

6.2.1. Approach Procedures

There are standard arrival routes set out in the Aeronautical Information Package (AIP) indicating designated waypoints where aircraft are to leave the airways system inbound for Bristol. Air Traffic Control will then direct aircraft to adopt the most appropriate route until it is established on its final approach when it will intercept the instrument landing system at between seven

and ten miles from touchdown (with the exception of a small number of aircraft making visual approaches). The route taken may vary from aircraft to aircraft as Air Traffic Control integrates aircraft approaching from different directions or flying at varying speeds. It will also be dependent on other factors such as the weather and surrounding air traffic. The aim will always be to achieve a stable approach within the controlled airspace at a speed and height corresponding with the aircraft's distance from touchdown. Aircraft maintain as high an altitude as possible and adopt a continuous descent approach profile, when appropriate.

With a Continuous Descent Approach (CDA) an aircraft descends towards an airport in a gradual, continuous approach with the engine power cut back. By flying higher for longer and eliminating the need for the extra thrust required for the periods of level flight between steps of descent, CDAs will result in reduced fuel burn and emissions. Deferring the start of descent also means less noise exposure for communities under the early descent phase of the flight path. The noise benefits that a CDA offers are restricted to locations typically around 10 to 25 miles from the runway. There tends to be no difference between a CDA and a conventional approach once the aircraft using the latter joins the final three degree glide-path (which generally occurs between seven and ten miles from the runway). This type of procedure can result in noise reductions of up to 5 dB¹³. The use of CDAs is promoted in the AIP.

Aircraft approaching Bristol rarely need to enter a holding pattern. This

is only likely to happen in periods of poor visibility or if there is an incident on the runway. The normal holding procedure is for aircraft to be held above the airfield, at an altitude of at least 2500ft.

In 2013, Bristol Airport Limited carried out a consultation, seeking feedback from stakeholders on a proposal to replicate, implement and eventually replace the current approach routes from the south into Bristol Airport with more accurately defined routes utilising the improved capabilities of modern aircraft – namely Area Navigation (RNAV). An airspace change proposal has been approved by the CAA regarding the introduction of new RNAV Standard Arrival Routes (STARs) in accordance with this proposal and implementation of RNAV approaches from the south has been completed. These RNAV approaches from the south are being monitored and we are exploring opportunities to implement similar techniques from the north in the longer term. This is likely to involve a complex change to airspace which may not be achievable in the short term. To allow for aircraft which are not yet RNAV equipped, the current STAR will remain available until such time as the aircraft RNAV capability is close to 100%. Further detailed consideration of RNAV routes, to include departure routes, will be undertaken in 2019.

The use of RNAV has enhanced navigational accuracy and introduced a number of key benefits. These include a safer and more efficient Air Traffic Control (ATC) system requiring less controller intervention; more efficient operations leading to reduced cost, flying time and

¹³ Noise from Arriving Aircraft: An industry code of practice, DfT 2006 (<http://www.dft.gov.uk/pgr/aviation/environmentalissues/arrivalscodeofpractice/noisefromarrivingaircraft.pdf>)



emissions; and the ability to allow more predictable patterns of over-flight as well as stabilised arrivals and approaches which should generate less noise. Further airspace enhancements will continue to be investigated through the current Civil Aviation procedures¹⁴.

6.2.2. Departure Procedures

The AIP sets out noise abatement procedures for aircraft which may only be departed from if necessary to avoid immediate danger and under direction from air traffic control. The procedures include specific routes, known as noise preferential routes (NPRs) which must be followed by all departing jet aircraft and propeller driven aircraft of over 5700kg certificated weight. The NPRs require aircraft to climb straight ahead to 4.7 nautical miles on runway 09 and 4.5 nautical miles on runway 27. For both runways, the departing aircraft must be at an altitude of no lower than 3000ft before commencing a turn. Aircraft can be turned off the route by Air Traffic Control on to more

direct headings to their destination once an altitude of 4000ft has been reached.

Standard outbound routes are used by outbound aircraft prior to joining the airways system. Maps illustrating the departure routes are included at Annex B.

In addition to the noise abatement procedures set out in the AIP for Bristol, a noise control scheme has been implemented which includes the following requirements.

- Bristol Airport reserves the right to levy a surcharge against any Operator who on a persistent basis fails to operate along the prescribed Noise Preferential Routes as recorded by the noise and track keeping system.
- Every aircraft using the airport shall, after take-off or 'go around' be operated in the quietest possible manner. Aircraft exceeding 90 dB(A) (103PNdB) by day (0600 to 2330 local time) and 85 dB(A) (96PNdB) by night

(2331 to 0559 local time) at the noise monitoring points located 6.5km from the start of roll for runways 09 and 27 will be subject to a penalty as set out in the airport Fees and Charges.

6.2.3. Helicopters

Helicopter operations are governed by procedures set out in the UK Aeronautical Information Package. Helicopters arrive and depart using the runway in use and a noise sensitive area is identified to the north of the airfield in the vicinity of Downside Road which must not be overflown below 500 feet above ground level.

6.2.4. Encouraging the Use of Quieter Aircraft – Aeronautical Charges Price Differential

The fees and charges for aircraft using Bristol Airport include incentives for airlines to operate during day time hours and avoid flying at night. A surcharge of 200% of the Runway Fee and Air Traffic Control Fee applies to each turnaround (i.e.

¹⁴ CAP 1616: Airspace Design: Guidance on the regulatory process for changing airspace design including community engagement requirements.

an arrival or departure) in the period 22:00-07:00. Fees are also based on the environmental performance of aircraft with a surcharge being imposed on noisier types. A 50% surcharge to the runway fee applies to aircraft designated as Chapter 3 and a 200% surcharge applies to those not meeting Chapter 3. No chapter 3 high¹⁵ aircraft are currently operating at Bristol Airport.

6.2.5. Night Flying

Night time airborne noise is currently controlled by a noise quota count (QC) classification system, the provisions of which are regulated by planning condition (see section 5 for further details).

The underlying principle of the restrictions is to preserve a balance between the need to protect local communities from excessive aircraft noise at night and the operation of services where they provide social and economic benefits.

The noise quota system is based on the principles of that operated at the designated airports in the UK, such as Heathrow, Gatwick and Stansted. It was first introduced at these airports in 1993. Aircraft movements (arrivals or departures) count against an airport specific noise quota according to their QC classifications. The QC classification reflects the contribution made by an aircraft to the total noise impact around an airport, the latter being expressed by the total "Quota Count" – the sum of the QC classifications of all arrivals and departures.

QC classifications measure noise in relative terms: a QC/2 aircraft is deemed to have twice the impact of a QC/1 aircraft, a QC/4 aircraft

has four times the impact and so on. The QC classifications of aircraft are determined from their certificated noise levels, which are measured independently under prescribed procedures¹⁶, the results of which are contained within a certificate carried by each aircraft. The QC classification for each aircraft is published by the Civil Aviation Authority (CAA).

The night noise quota period extends from 23.30 to 06.00 hours.

Further controls on night flying can be found in Section 5.

6.3. Measures to Mitigate the Effects of Aircraft Noise

Noise insulation grants were previously provided to residential properties that regularly experienced noise levels above an LA_{eq} (also called SEL) of 90 dB, based upon the footprints of the Boeing 757-200 and the Boeing 737-300 aircraft. This scheme, which is now closed, was introduced in 1997 and approximately 80% of eligible properties received a grant.

In addition, the 2011 planning permission includes provisions for the 63dB L_{Aeq,16h} contour to be monitored on an annual basis and for noise insulation grants to be provided to any properties that fall within this contour which did not qualify under the previous scheme.

As mentioned in 5.2.2 above, there is also a night noise limit for departing aircraft of 85 dB(A), as recorded at the airport's centreline noise monitors, and a daytime noise limit of 90 dB(A).

The planning permission also establishes an Airport Environmental Improvement Fund to be used for the purposes of funding environmental improvement initiatives including initiatives to mitigate the impact of aircraft and ground noise on the local community. This includes the provision of a grant for the installation of noise insulation for double glazing or secondary glazing where applicable. The value of the grant per eligible property is based upon the contours (as detailed above). The breakdown of funding in relation to these contours are detailed below:

- 100% funding for 63dB (up to £5000);
- 50% for 60dB and 57dB (max of £2500)

Since the adoption of the previous Noise Action Plan in 2014 the airport has provided noise insulation grants in excess of £200,000 to over 70 properties in the local area.

6.4. Arrangements for Monitoring Aircraft Noise

Aircraft noise is continually monitored using monitors at each end of the runway, near Felton, Winford and Congresbury. The monitors are positioned in accordance with ICAO standards for monitoring noise from aircraft arriving and departing on runway 27 in accordance with a monitoring programme agreed with North Somerset Council as part of the A38 Diversion Section 106 Agreement. The Felton monitor is therefore located 2,289 metres from the touchdown point and the Congresbury monitor is 6,500 metres

¹⁵ Chapter 3 high applies to those Chapter 3 aircraft whose certified noise performance lies within SEPndB of Chapter 3 certification limits.

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

from the start of take-off roll. A further monitor is located at Littleton Hill, 6,500 metres from the start of take off roll from runway 09.

Data from the noise monitors is recorded and collated by Manchester Airport, on behalf of Bristol Airport (as part of a contractual agreement). The results are published in the annual Operations Monitoring report which provides a year by year comparison of noise results. The monitor system (ANOMS) also takes radar data from ATC enabling the aircraft track to be recorded and compared with the published routes (as shown at Annex B). The flight tracks are available as Google Earth files for download from the Bristol Airport website. The tracks are colour coded to show the heights of aircraft.

A portable noise monitor is used to record noise at specific locations in response to queries from the local community.

We record noise using a wide range of noise indicators including L_Amax and L_{eq}. It is used to monitor noise and track infringements, levy penalties and detail performance of our airline partners at achieving CDAs.

6.5. Arrangements for Communication with the Local Community on Matters Relating to Aircraft Noise

Bristol Airport Consultative Committee

Bristol Airport's Consultative Committee (ACC) was established in line with Section 35 of the Civil Aviation Act 1982 and follows Government guidelines for

Airport Consultative Committees. Membership of the independently chaired Committee comprises stakeholders from the local and business communities, as well as airport and airline representatives. The ACC provides a forum for consultation, communication and feedback on the Airport's operations and future developments. The ACC meets on a quarterly basis. This approach directly supports the Aviation Policy Framework principles by encouraging collaboration and providing transparency.

The terms of reference of the Committee are as follows:

- To consider aerodrome issues as they affect the communities represented or the amenities of the aerodrome;
- To make suggestions to the aerodrome where this might further the interests of the communities represented;
- To stimulate the interest of the local population in the development of the aerodrome;
- To monitor the environmental impact of all aspects of the operation of the aerodrome and to advise on operating procedures resulting from such monitoring with a view to minimising noise or other pollution from whatever source;
- To protect and enhance the interests of users of the aerodrome;
- To discuss with the aerodrome formal procedures for recording complaints about aircraft noise and other adverse effects of the aerodrome; and
- To consider the contribution of the aerodrome to the local, regional and national economy.

The Consultative Committee Environmental Effects Working Party (EEWP) considers particular issues relating to the environmental impact of airport operations including noise. The EEWP has driven a number of initiatives at the Airport including the promotion of the airport's Noise Insulation Scheme in various eligible local parishes, the need for tighter controls on aircraft track keeping and the ability to respond to local communities concerns through a dedicated forum.

Noise Complaints

Bristol Airport actively encourages community participation and feedback with respect to aircraft noise. We operate a formal mechanism for responding to noise queries from the local community, and for assessing the impact of actual noise values from aircraft in the area surrounding the airport. An online reporting and feedback service is available or alternatively queries can be raised by calling a dedicated telephone (01275 473 799) or by email (Sustainability@Bristolairport.com). Noise complaints are investigated and, if appropriate, follow up action will be taken with the operator of the aircraft concerned. A response will be provided to all complainants.

All complaints are logged and recorded each month, by location and by type of noise. Each month, the figures are displayed within the Operations Monitoring Report, in map format, and reported and discussed at the Airport Consultative Committee and at the EEWP.



Figure 1: Example of our 'Tracker Award' certificate provided to the airline who has achieved the highest rates for on track and CDA compliance in a given year.

Liaison with Airlines

Key performance indicators are shared with the airlines operating at Bristol Airport through the Flight Operations Committee (FLOPSC). Bristol Airport uses this forum to encourage operators of aircraft to adopt operational procedures and practices aimed at achieving ongoing improvements in the levels of aircraft noise and for sharing best practice. A key part of this process has been to improve the use of continuous descent approaches.

In addition, the Airline Operator's Committee (AOC) is held on a monthly basis, which provides a

further forum for all airlines to discuss any issues that they may have with the Airport's Senior Management Team and vice versa.

Above is an example of the certificate the Airport provides to the airline with highest performance in aircraft track keeping and CDA compliance.



Results of the 2016 Noise Mapping

7.1. Contour Methodology

The mapping used to prepare this action plan has been produced using 2016 aircraft movements. The Regulations designate the airport operator, Bristol Airport Ltd, as the competent authority to prepare the strategic noise maps and this was undertaken by consultants appointed by the Airport in accordance with a specification provided in guidance issued by the DEFRA. The noise contours and associated data were produced using the FAA AEDT (Aviation Environmental Design Tool) 2c SP1, which replaced the INM (Integrated Noise Model) 7.0d. The modelling used the aircraft type and movement data by runway and track. The standard arrival routes and standard instrument departure routes were established in the model with sub tracks to represent the dispersion of aircraft. The noise mapping results were provided to DEFRA in accordance with the Regulations for review and validation.

The noise maps have been derived from all the air movements occurring in 2016, including commercial and non-commercial (general aviation) movements. Separate calculations were carried out for the average day, evening and night of that year. The day, evening and night results are combined to produce a separate map using a relationship defined in the Regulations which weights the evening values by the addition of 5 dB(A) and the night values by the addition of 10 dB(A). The day and (unweighted) evening results are combined to produce an average 16 hour day map based on 07:00 to 23:00.

Five strategic maps have therefore been prepared for Bristol Airport in 2017. These are as follows:

- Day, evening and night (Lden) – the LAeq over the period 00:00 to 24:00, but with the evening values (19:00 to 23:00) weighted by the addition of 5 dB(A), and the night values (23:00 to 07:00) weighted by the addition of 10 dB(A);
- Night (Lnight) – the LAeq over the period 23:00 to 07:00 (an annual average);
- Day (Lday) – the LAeq over the period 07:00 to 19:00 (an annual average);
- Evening (Levening) – the LAeq over the period 19:00 to 23:00 (an annual average); and
- 16 hour day (LAeq, 16h) – the LAeq over the period 07:00 to 23:00 (an annual average).

The Regulations identify the LAeq, 16h, Lday, and Levening as supplementary noise indicators in relation to aircraft noise.

The noise maps have been published by DEFRA in the Airport Noise Action Planning Data Pack for Bristol and are included in Annex A. The following points should be noted:

- There are some significant differences between the noise contours that appear in this document and the noise contours that are published annually in the Bristol Airport Operations Monitoring Report in accordance with condition attached to the 2011 planning permission for development. The noise contours in Annex A have been specifically produced for the purpose of informing the Noise Action Plan

on the basis of an average day in the year. Noise contour maps published in the Operations Monitoring Report are based on an average summer's day (mid June to mid September) for the period 07:00 to 23:00 in accordance with the requirements of planning policy. The two sets of contour maps are therefore not directly comparable although the LAeq, 16h noise contours in Annex A, while being based on an annual average day of aircraft movements, are the most relevant to those referenced in the Aviation Policy Framework which use the same index but are based on an average summer day. The expectation is normally that the annual day contours are slightly smaller than the equivalent summer day contours which instead reflect the generally busier summer period of activity at an airport.

- The requirements for the Airport Noise Action Plan have been set out in guidance for airport operators published by DEFRA. This requires the Action Plan to be drawn up for places near the airport, which means those places affected by noise from the airport operations as shown by the results of the noise mapping. This means those places within the published Lden and Lnight contours. This area includes parts of the parishes of Yatton, Congresbury, Cleeve, Wrington, Backwell, and Winford. The noise maps also include a small area of Bath and North East Somerset to the south of East Dundry.

- The Regulations require that the Action Plan should aim to preserve quiet areas in agglomerations; however, no quiet areas have been formally identified within the Bristol agglomeration to date.

DEFRA have also prepared estimates of population and dwelling exposure statistics for various noise level indicators. These have been provided to us in an Airport Noise Action Planning Data Pack. The estimated total number of people and dwellings exposed above various noise levels from the strategic mapping of aircraft using this airport are shown in Table 1 to Table 5 below. It should be noted that population and dwelling counts have been rounded as follows:

- The number of dwellings has been rounded to the nearest 50, except when the number of dwellings is greater than zero but less than 50, in which case the total has been shown as "< 50"; and
- The associated population has been rounded to the nearest 100, except when the associated population is greater than zero but less than 100, in which case the total has been shown as "< 100".

The tables below include 2006 numbers in square brackets, 2011 numbers in round brackets and 2016 numbers without brackets.

7.2. 2016, 2011 and 2006 Contour results and comparison

Table 1: Estimated areas within contour bands by noise indicator (2011 contour areas in round brackets and 2006 in square brackets).

Contour	Area (km2) within Lden contour	Area (km2) within Lday contour	Area (km2) within Leve contour	Area (km2) within Lnight contour	Area (km2) within LAeq,16hr contour
45 dB	-	-	32.8 (30.0) [27.5]	-	
50 dB	54.5 (48.8) [47.2]	35.7 (30.1) [33.4]	24.5 (18.3) [25.6]	12.4 (11.3) [12.5]	33.0 (27.8) [31.6]
55 dB	21.9 (19.1) [21.5]	13.5 (11.7) [15.6]	9.1 (6.8) [11.7]	4.6 (4.3) [5.2]	12.4 (10.6) [14.7]
60 dB	8.4 (7.4) [9.7]	5.2 (4.5) [6.6]	3.2 (2.3) [4.7]	1.6 (1.4) [1.9]	4.7 (4.0) [6.2]
65 dB	2.9 (2.6) [3.8]	1.8 (1.5) [2.5]	1.1 (0.8) [1.8]	0.6 (0.6) [0.8]	1.6 (1.3) [2.3]
70 dB	1.1 (0.9) [1.4]	0.7 (0.6) [1.0]	0.4 (0.3) [0.7]	0.3 (0.3) [0.5]	0.6 (0.6) [0.9]
75 dB	0.5 (0.4) [0.7]	0.3 (0.3) [0.5]	0.2 (0.1) [0.3]	-	0.3 (0.3) [0.5]

Table 2: Estimated total number of people and dwellings above various noise levels 2017, Lden (2011 in round brackets and 2006 in square brackets).

Noise Level (dB)	Number of dwellings	Number of people
≥55	1,400 (900) [1,900]	3,000 (2,200) [4,700]
≥60	450 (350) [400]	1,000 (800) [1,000]
≥65	<50 (<50) [<50]	<100 (<100) [100]
≥70	0 (<50) [<50]	0 (<100) [<100]
≥75	0 (0) [0]	0 (0) [0]

Table 3: Estimated total number of people and dwellings above various noise levels 2017, Lday (2011 in round brackets and 2006 in square brackets).

Noise Level (dB)	Number of dwellings	Number of people
≥54	900 (700) [1,000]	2,000 (1,700) [2,400]
≥57	500 (350) [550]	1,100 (800) [1,300]
≥60	200 (100) [250]	400 (200) [600]
≥63	<50 (<50) [<50]	<100 (<100) [100]
≥66	0 (<50) [<50]	0 (<100) [<100]
≥69	0 (0) [0]	0 (0) [0]

Table 4: Estimated total number of people and dwellings above various noise levels 2017, Levening (2011 in round brackets and 2006 in square brackets).

Noise Level (dB)	Number of dwellings	Number of people
≥54	600 (400) [600]	1,400 (900) [1,400]
≥57	300 (150) [350]	700 (400) [800]
≥60	50 (<50) [150]	100 (<100) [400]
≥63	<50 (<50) [<50]	< 100 (<100) [<100]
≥66	0 (<50) [<50]	0 (<100) [<100]
≥69	0 (0) [0]	0 (0) [0]

Table 5: Estimated total number of people and dwellings above various noise levels 2017, LAeq,16h (2011 in round brackets and 2006 in square brackets).

Noise Level (dB)	Number of dwellings	Number of people
≥54	850 (650) [900]	1,900 (1,600) [2,100]
≥57	450 (300) [500]	1,000 (700) [1,100]
≥60	150 (50) [250]	300 (100) [600]
≥63	<50 (<50) [<50]	<100 (<100) [<100]
≥66	<50 (<50) [<50]	<100 (<100) [<100]
≥69	0 (0) [0]	0 (0) [0]

Table 6: Estimated total number of people and dwellings above various noise levels 2017, Lnight (2011 in round brackets and 2006 in square brackets).

Noise Level (dB)	Number of dwellings	Number of people
≥48	1,050 (800) [1,100]	2,300 (2,000) [2,600]
≥51	550 (450) [500]	1,200 (1,100) [1,200]
≥54	250 (200) [150]	500 (500) [400]
≥57	<50 (<50) [<50]	<100 (<100) [<100]
≥60	<50 (<50) [0]	<100 (<100) [0]
≥63	0 (<50) [<50]	0 (<100) [<100]
≥66	0 (0) [0]	0 (0) [0]

7.3. 2016 compared to 2011 noise mapping analysis

The tables show that no people lie within the highest noise bands assessed during the strategic mapping process in 2016 during the day, evening or night periods. This was also the case in 2011.

When considering the number of people experiencing the highest aircraft noise levels, during either the day, evening or night, this has reduced in 2016 compared to in 2011. This means that those most exposed to aircraft noise around Bristol Airport have reduced in number over the past 5 years.

For those exposed to the more moderate levels of noise, such as those within the annual daytime noise level of 63 dB LAeq,16h, the results show no change in the number of people affected between 2016 and 2011. A similar finding occurs at night for people contained within the 57 dB and 60 dB Lnight contour bands.

The above results arise despite the fact that since 2011, the number of aircraft movements operating in and out of Bristol Airport have increased from around 66,000 in 2011 to around 74,000 in 2016. The effect of this increase in activity is however evident when considering the lower noise exposure bands and results as a whole. These show more people are now exposed to aircraft noise within the lower noise bands in 2016 than they were in 2011, during the day, evening and night.

7.4. 2016 compared to 2006 noise mapping analysis

The tables show that no people lie within the highest noise bands assessed during the strategic mapping process in 2016 during the day, evening or night periods. This was also the case in 2006.

The number of people experiencing the highest aircraft noise levels, during either the day, evening or night, this has reduced in 2016 compared to in 2006. This means that those most exposed to aircraft noise around Bristol Airport have reduced in number over the past 10 years.

For those exposed to the more moderate levels of noise, such as those within the annual daytime noise level of 63 dB LAeq,16h, the results show no change in the number of people affected between 2016 and 2006. A similar finding occurs at night for people contained within the 57 dB Lnight contour band.

In 2016, 7.6 million passengers used Bristol Airport compared to 5.7 million in 2006. There were 73,536 movements in 2016 compared to 84,583 in 2006.

The analysis shows the level extent of the noise contour for Lden, Lday and LAeq, 16hr contour at the lowest contour area (50 dB) has increased in area compared to the previous years. To reduce this impact the actions bought forward in this iteration of our Noise Action Plan seek to address this. These include improving CDA performance and the provision of localised guidance on CDA's, the potential use of

alternative flight paths and a review of the aeronautical fee differentials based on aircraft noise certification to further enhance incentives for quieter aircraft to operate from Bristol Airport.

As a result of all measures undertaken to date, against a backdrop of increased movements (as previously noted under sections 7.3 and 7.4) the number of people affected by noise at the Lden 65 contour is now once again below 100. In addition, at 75 and 70 dB Lden has reduced to 0 from less 50 dwellings and less than 100 people respectively. This aligns with the airport banning Chapter 3 aircraft and extending further conditions for night movements.



Action Plan

The proposed Action Plan is set out below under the headings used in Section 4 to describe the existing Noise Management Framework. Actions either completed or on-going from the Plan adopted in 2014 are included with information about progress achieved.

Where appropriate each action is coupled with a key performance indicator (KPI), which will be used to monitor progress. All actions from the adopted Noise Action Plan carry over unless indicated otherwise. The actions below have been generated through collaboration with key internal stakeholders whilst the final actions will take into account feedback received from the public consultation.

To aid this review of progress, rather than listing each area the below table highlights progress in a simple Red, Amber, Green or RAG status. Red shows an action which has not been completed, Amber depicts an action which is ongoing with Green denoting its completion. All text highlighted in Blue shows a new action being introduced as part of this Noise Action Plan. As the airport grows in the future, to 2024 and beyond, the measures outlined in this Noise Action Plan will assist in keeping environmental noise levels to a minimum. The number of people predicted to be affected by aircraft noise in the future is expected to reduce during the daytime. During the night-time, primarily as a result of growth during the shoulder hours 23.00-23.30 and 06.00-07.00, a rise in numbers affected is expected of typically around 25 %.

All Key Performance Indicators (KPIs) including their priority, expected outcomes and people affected against each of these noise management framework measures are detailed in Section 9 of this Noise Action Plan.'

Action	Reported progress in 2014 - 2018 Noise Action Plan	Progress Today
Actions to manage and reduce the effects of noise from aircraft on the ground		
1.1 We will review procedures for managing the ground running of aircraft engines and the use of aircraft auxiliary power units.	Procedures revised, published and now incorporated into the Ground Noise Management Strategy (2012). KPI relating to ground engine running are incorporated into the annual Operations Monitoring Report. These will be reviewed annually.	Progress against KPI's to continue to be reported annually and reviewed.
1.2 We will review aircraft stand allocation at the beginning of each operational season.	The stand allocation is reviewed annually. Use of stands at Western Walkway is prioritised to make use of the building screening.	As the airport is now partially level 3 slot co-ordinated for the summer season, stand allocation is reviewed at the beginning of each operational season. Every contact stand on airport is prioritised as they have minimum noise impact.
1.3 We will ensure that ground equipment is well maintained and provide facilities to support the use of electric vehicles on the aircraft parking apron.	All ground equipment in use on the airfield is subject to an annual 'MOT-type' inspection by the Bristol Airport Motor Transport team. Provision has been made on the Western Walkway for electric vehicle charging. Charging points are also available on the Eastern Apron. The majority of the equipment associated with the baggage handling operation is electric powered.	Electric vehicle charging is provided at appropriate locations airside. The 'MOT-type' inspection continues to be an integral part of the assessment in maintaining the air side fleet, with the migration to Euro 5 and 6 vehicles where appropriate. Electric usage has increased since the previous Noise Action Plan in 2014.

Action	Reported progress in 2014 - 2018 Noise Action Plan	Progress Today
1.4 We will review the feasibility of installing fixed electrical ground power (FEGP) to selected existing stands.	Provision has been made for the installation of fixed electrical ground power on stands 1 to 5 in conjunction with the Central Walkway project. FEGP has been installed on the recently constructed new stands on the Western Apron and will be installed on all future new stands in accordance with the planning conditions attached to the 2011 planning permission.	FEGP has been installed and is in use, in accordance with the planning conditions. NEW ACTION – We will undertake and complete a feasibility study for the further installation of FEGP provision to service stands which currently rely on MGPU use by December 2020. Once completed any actions derived will be presented to the airports Consultative Committee.
1.5 Endeavour to minimise the noise from ancillary activities, such as reversing alarms and activities within the car parks within close proximity to residential areas.	Relevant staff have been made aware of this requirement.	Further to employees being made aware of this requirement a curfew has been imposed on activity in the multi storey car park in-conjunction with construction works as part of a dedicated construction environment management plan for such works.
1.6 Implement the Bristol Airport Ground Noise Management Strategy prepared in 2012 in compliance with the planning obligation in the Section 106 Agreement dated 16 February 2011. This includes the actions described above and in addition covers the installation of noise attenuation buildings and screens.	n/a - New Action	Installation of noise attenuation buildings and screens complete except for the East Apron where works will occur in 2018. NEW ACTION – We will review the Bristol Airport Ground Noise Management Strategy prepared in 2012 in 2019.
Actions to manage and reduce the effects of noise from airborne aircraft		
2.1 Incentivise airlines to use the most modern and quiet aircraft by imposing a surcharge on Chapter 3 high aircraft.	The Bristol Airport Fees and Charges include a 50% surcharge for Chapter 3 aircraft. No Chapter 3 high aircraft are currently operating at Bristol Airport.	Still no Chapter 3 high aircraft are currently operating at Bristol Airport. In addition, the Bristol Airport Fees and Charges also include a 200% surcharge for aircraft not meeting Chapter 3, and those operating at night.
2.2 We will review the aeronautical fee differentials for aircraft every two years to ensure that appropriate incentives are in place for airlines to use the quietest available aircraft on the basis of recognised and published operational noise characteristics.	The majority of aircraft operating at Bristol Airport comply with Chapter 4 noise standards. We have prioritised business with easyJet and Ryanair, both of whom operate modern aircraft fleets. We have worked with our full service airline carriers to encourage the modernisation of	We continue to prioritise business with commercial airlines who operate modern aircraft fleets. We have worked with our full service airline carriers to encourage the modernisation of their fleets and easyJet recently exhibited the new quieter Airbus A320neo at
	<i>continued</i>	<i>continued</i>

Action	Reported progress in 2014 - 2018 Noise Action Plan	Progress Today
	their fleets and 2012 has seen the introduction of Embraer 190 aircraft by KLM and Air France. BMI Regional operate quiet Embraer 135 and 145 aircraft which are quota count exempt.	the airport. In addition, TUI have introduced the Dreamliner 2017. NEW ACTION – By June 2020, the Airport will review the aeronautical fee differentials based on aircraft noise certification to further enhance incentives for quieter aircraft to operate from Bristol Airport. The resulting findings and actions will be published within our Annual Operations Report for the year 2021.
2.3 We will consult with airlines on the introduction and implementation of a departures noise limit at the runway 27 and 09 departures noise monitors and a penalty for infringement of the noise limit. The penalty system will be reviewed every two years to ensure that it continues to provide a strong financial incentive for airlines to use the quietest aircraft.	The penalty system was introduced through the noise control scheme put in place in 2012. Details of penalties levied will be reported annually in the Operations Monitoring Report.	The number of penalties levied continue to be reported in the Airport Annual Operations Report. The success of the scheme has meant zero infringements made since the last update. NEW ACTION – We will assess the mechanics of the Penalties Scheme and update, where applicable, in line with latest guidance and best practice in 2019. Reviews of the application of the scheme and if required alterations applied, every two years thereafter.
2.4 Through our partnership with Sustainable Aviation we shall continue to seek technological and operational improvements towards the ACARE (Advisory Council for Aeronautics Research in Europe) goal of 50 % reduction in perceived external noise by 2020 based on new aircraft relative to equivalent aircraft of 2000.	The Sustainable Aviation Road-Map published in April 2013 considers the potential for noise reduction through technological improvements.	On going
2.5 We will consult with the airlines regarding the introduction of a penalty system for flagrant disregard of noise preferential routes and introduce the agreed penalty system.	This was introduced in 2012 as part of the Noise Control Scheme referred to above.	NEW ACTION - In conjunction with point 2.3 above, in association with a successful planning application, the penalty system will be reviewed.

Action	Reported progress in 2014 - 2018 Noise Action Plan	Progress Today
2.6 We will review approach and departures procedures with a view to identifying measures to reduce noise impacts through flight path management on an annual basis with ATC and the airlines. We will report progress on an annual basis to the Airport Consultative Committee and make the information publicly available on the Bristol Airport website.	We have been working with the airlines through the Bristol Airport Flight Operations Safety Committee to promote the use of continuous descent approaches (CDAs) and other operational improvements. The AIP has been amended to reflect our approach. The use of CDAs is monitored and reported to the Committee in the form of a 'league table'. The percentage of approaches using the CDA technique has improved from 79% in 2012 to 83% in 2013 to date. We are progressing the implementation of RNAV approaches from the south and this should deliver further improvements in performance. CDA performance is included in the annual Operations Monitoring Report.	The implementation of RNAV approaches from the south has been completed. CDA performance continues to report to the Airport Consultative Committee and is detailed within our Annual Operations Monitoring Report. NEW ACTION – We will seek to achieve a 85% CDA compliance rate (an increase of almost 10% in performance) by 2023. NEW ACTION - We will begin looking at alternative flight paths for respite purposes with a view for implementation by 2026/27.
2.7 We will ensure that adherence to the night noise quota system is maintained and report night quota usage and night movements on a seasonal basis to the Airport Consultative Committee and North Somerset Council.	Ongoing. Night flying activity is in full compliance with the refreshed restrictions on night flying in the 2011 planning permission. Night flying during the 2012/13 summer and winter seasons was at an all-time low.	The Airport remains compliant with these restrictions for night flying and reports publicly on performance annually. NEW ACTION - In association with a successful planning application the quota count system will be reviewed.
2.8 We will review the procedures for light aircraft operations regularly with representatives of the general aviation community and work with them to limit the noise effects of their operations.	Ongoing.	This is raised at regular MASIG and Flight Operations Sub Committee (FLOPSC) meetings to ensure the correct procedures are adhered to and will continue to do so. NEW ACTION – We will review our approach with the General Aviation (GA) community and how best to deliver best practice in conjunction with future airspace change work.

Action	Reported progress in 2014 - 2018 Noise Action Plan	Progress Today
2.9 We will promote adherence to the Arrivals Code of Practice issued by the Department for Transport relating to continuous descent approaches. We will investigate and adopt, where appropriate, the best practice guide for environmentally optimum departure procedures under preparation by Sustainable Aviation.	Ongoing.	A Guide to continuous decent approaches has been published by Sustainable Aviation and this has been issued to our Airline partners. The Airport also address CDA's with our Flight Operations Safety Committee (FLOPSC) on a quarterly basis in addition to the governance of a league table where the highest performance rated airline is identified. NEW ACTION – The Airport will provide localised guidance to CDA's and will issue to airlines by 2020.
2.10 We will work with Bristol City Council, its neighbouring authorities and Defra to protect quiet areas within the Bristol agglomeration, as far as practicably possible, from noise from aircraft using Bristol Airport. We will work with NATS and the airlines using Bristol Airport to adopt flight path management procedures that ensure that aircraft overflying the Mendip Hills Area of Outstanding Natural Beauty (AONB) do so at as high an altitude as is practically possible, given the constraints of air safety and the need to avoid other adverse environmental impacts.	No quiet areas have been identified within the Bristol agglomeration. The implementation of RNAV approaches from the south is expected to result in an increase in the average height of aircraft flying over the Mendip Hills AONB.	No further areas have been identified in the Bristol agglomeration. The implementation of RNAV approaches from the south has been completed. Complete and to be removed unless new areas are identified.
2.11 We will liaise with NATS to ensure that consideration of noise effects from aircraft using Bristol Airport is considered in proposals for airspace redesign.	Ongoing. The RNAV proposal has been prepared in conjunction with NATS.	The implementation of RNAV approaches from the south has been completed in conjunction with NATS. NEW ACTION – The Airport will seek to introduce RNAV routes for arrivals and departures by 2026/27 (subject to consultation).

Action	Reported progress in 2014 - 2018 Noise Action Plan	Progress Today
2.12 We will monitor the implementation of RNAV approaches from the south and explore opportunities for implementing similar techniques from the north in the longer term. This is likely to involve a complex change to airspace which may not be achievable in the short term.	n/a - New Action	The implementation of RNAV approaches from the south has been completed. NEW ACTION – The Airport will seek to introduce RNAV routes for arrivals and departures by 2026/27 (as per 2.11)
2.13 We will monitor ongoing work by the UK aviation industry and the CAA exploring the adoption of steeper approaches. An approach at 3.25° instead of the standard 3° is understood to result in a 9% reduction in the noise footprint of the Boeing 737-800. The majority of aircraft operating at Bristol are thought to be capable of undertaking approaches at this angle but at present instrument landings at angles steeper than 3° are prevented by international regulation. Even if this regulation is relaxed current technology is likely to require a dual angle instrument landing system, which may give rise to a cost that is disproportionate to the benefit. There may be potential for steeper angles for the intermediate approach. We will monitor research and development on this subject.	n/a - New Action	On going
2.14 Low Power Low Drag is a noise abatement technique for arriving aircraft in which the pilot delays the extension of wing flaps and undercarriage until the final stages of the approach, subject to compliance with ATC speed control requirements and the safe operation of aircraft. Such techniques may be able to offer noise reductions of between 1 and 3 dBA SEL in the initial and intermediate approach phases. We will explore the implementation of these techniques in conjunction with the implementation of RNAV approaches from the south.	n/a - New Action	The implementation of RNAV approaches from the south has been completed. Such techniques are discussed at our Flight Operations Sub Committee (FLOPSC) and where possible introduced. This action will remain open and progress will be provided in our Annual Operations Monitoring Report accordingly. NEW ACTION - The Airport will seek to introduce RNAV routes for arrivals and departures by 2026/27 (subject to consultation) - as per 2.11.

Action	Reported progress in 2014 - 2018 Noise Action Plan	Progress Today
2.15 We will explore opportunities for introducing RNAV departure routes at Bristol Airport.	n/a - New Action	This is covered in previous Actions 2.11, 2.12 and 2.14.
Measures to mitigate the effects of aircraft noise		
3.1 We will keep the noise climate under review and reassess the need for changes to the previous noise insulation grant in the event that the noise climate alters significantly (an increase of 3 dB on the 16 hour LAeq measured using the noise monitors over a summer season).	Noise monitoring and noise mapping undertaken to date indicates that the noise climate has not altered significantly.	Noise monitoring and noise mapping undertaken to date indicates that the noise climate has not altered significantly.
3.2 We will use a portable noise monitor for ad hoc noise monitoring where hot spots are identified through the noise inquiry system.	The portable noise monitor is in regular use and has been useful in identifying areas for noise insulation.	The noise monitor in 2018 alone has been set up and indeed planned for 6 residential locations, for a minimum of 2 weeks at each location. NEW ACTION – We will, based on the findings of the noise climate generated from the monitor data, consider suitable noise mitigation measures, as per the current Noise Insulation Scheme, on a case by case basis. This will be introduced from 2019.
3.3 We will engage with North Somerset Council to ensure that awareness of aircraft operations is considered in the preparation of local planning policy as set out in the Local Development Framework.	Policies concerned with airport safeguarding are incorporated in the North Somerset Council Replacement Local Plan and the Consultation Draft Sites and Policies Development Plan Document.	The North Somerset Council Replacement Local Plan incorporates policies concerned with airport safeguarding. NEW ACTION – The Airport will continue to engage with North Somerset Council as and when local planning policy is developed.
3.4 The 2011 planning permission introduced a new requirement to monitor the footprint of the 63dB LAeq,16h noise contour in relation to the area of previous A38 Diversion noise insulation grant scheme and provide grants for noise insulation to any properties within this contour that did not previously qualify for noise insulation. The Section 106 Agreement also establishes an Airport Environmental Improvement Fund, one of the purposes of which is to fund noise mitigation measures. We are implementing a programme of noise insulation for local residents through this fund.	n/a - New Action	Noise insulation Grants totalling around £170,000 made, including to any properties qualifying as a result of the A38 diversion. NEW ACTION – In 2019, will be updating our noise insulation scheme guidance to allow for two opportunities to apply and enhancements to treatments it can cover.

Action	Reported progress in 2014 - 2018 Noise Action Plan	Progress Today
Arrangements for monitoring aircraft noise		
4.1 We will complete the commissioning of the new runway 09 noise monitor at Littleton Hill, continue with the monitoring of noise at Felton and Congresbury and use the new monitor system in conjunction with a feed from the radar system to record the tracks taken by aircraft. Noise monitor results will be assessed on a month by month basis and the results of the monitoring will be reported to the Airport Consultative Committee on an annual basis.	This installation of the new noise monitor has been completed. A range of noise indicators are reported to the Airport Consultative Committee, including Leq, SEL, Lmax, average departure noise levels and number of flights. The Tracker system provides flight tracks for use in responding to noise complaints and these can be downloaded from the Bristol Airport website as Google Earth files.	A range of noise indicators will continue to be reported to the Airport Consultative Committee, including Leq, SEL, Lmax, average departure noise levels and number of flights. The Tracker system provides flight tracks for use in responding to noise complaints and these can be downloaded from the Bristol Airport website as Google Earth files. NEW ACTION – By 2020, we will review our current noise and track keeping system and upgrade where necessary. NEW ACTION – By 2020, we will introduce a new interactive online tracker tool presenting, with a minimal delay where possible, of live information to aid members of the public to understand the proximity of aircraft to their location and enhance the ability of improvements of track keeping to be made.
4.2 We will undertake an annual review of airline track keeping and establish a 'league table' of performance with an annual awards ceremony to recognise the best performing airlines. Performance data and penalties imposed will be included in the annual Operations Monitoring Report provided to the Airport Consultative Committee.	Track keeping and CDA performance is recorded in the annual Operations Monitoring Report presented to the Airport Consultative Committee. A 'league table' has been established and Ryanair received the first 'Tracker' award in 2013.	Track keeping and CDA performance is recorded in the annual Operations Monitoring Report presented to the Airport Consultative Committee. The 'league table' is updated annually and Ryanair received the latest 'Tracker' award in 2017.
4.3 To maintain and improve the systems described above, as appropriate.	n/a - New Action	NEW ACTION – By 2020, we will introduce a new interactive online tracker tool presenting, with a minimal delay where possible, of live information to aid members of the public to understand the proximity of aircraft to their location and enhance the ability of improvements of track keeping to be made.

Action	Reported progress in 2014 - 2018 Noise Action Plan	Progress Today
Actions to engage and work with the local community on matters relating to aircraft noise		
5.1 We will record and make available, on request, flight tracks of aircraft recorded by the 'Tracker' system within our controlled airspace. We will respond to all queries from the local community, providing them with details of the location of the aircraft in question.	Flight tracks are provided in response to noise queries where appropriate. Tracks, showing aircraft altitude by height band, are also available for download from the Bristol Airport website for viewing using Google Earth.	NEW ACTION – By 2020, we will introduce a new interactive online tracker tool presenting, with a minimal delay where possible, of live information to aid members of the public to understand the proximity of aircraft to their location and enhance the ability of improvements of track keeping to be made.
5.2 We will set a target to respond to all reasonable noise inquiries from the local community within ten working days of receiving the inquiry and to complete any detailed follow up investigations within 20 working days. We will provide a quarterly report on noise inquiries to the Airport Consultative Committee.	Achieved and ongoing.	Achieved and ongoing.
5.3 We will provide an annual report on aircraft track keeping to the Airport Consultative Committee. NPR violations and noise infringements will be reported quarterly.	Detailed information is reported through the Environmental Effects Working Party sub-group. Track performance is reported annually to allow for full investigation. Ongoing.	Detailed information continues to be reported through the Environmental Effects Working Party sub-group. Track performance is reported annually to allow for full investigation. NEW ACTION – In 2019, we will refresh how this information is presented and reported i.e. citing particular instances and associated improvements where relevant.
5.4 We will continue to engage with the local community through the Consultative Committee on noise management and future noise implications. Our Community Relations Manager will hold regular surgeries in the local community providing members of the public an opportunity to discuss noise related matters directly with airport management.	Liaison is ongoing.	Liaison is ongoing. A round of consultation was undertaken in late 2017/early 2018 with regard to the update of the Airport's Master Plan and during the spring/summer 2018. This was utilised to understand current impacts from residents regarding various operations resulting from airport activity including airborne noise. NEW ACTION – From 2019, the Airport will host every 6 months a community feedback session at the airport to update residents directly on airport matters including noise abatement measures and in order to receive feedback on how these are perceived.

Action	Reported progress in 2014 - 2018 Noise Action Plan	Progress Today
5.5 We will publish an annual Operations Monitoring Report which will include key performance indicators relating to noise management including aircraft movements, aircraft movements by key periods of the day, night quota usage, track keeping, noise monitor results and noise complaint statistics.	The Operations Monitoring Report has been published annually.	The Operations Monitoring Report has been published annually and will continue to do so. NEW ACTION – In 2019, we will review the Annual Operations Monitoring Report content and presentation to make it even more accessible.
5.6 We will undertake a public attitude survey (by telephone survey), every two years, to assess the local community views on aircraft noise.	In the light of a significant reduction in noise complaints and the comments made in the consultation on the 2009 planning application this has not been undertaken. To be kept under review but experience elsewhere suggests that this is a complex task and it will be difficult to get meaningful results. The Airports Commission have recommended that an Independent Noise Authority undertakes this work.	A round of consultation was undertaken in late 2017/early 2018 with regard to the update of the Airport's Master Plan and during the spring/summer 2018. This was utilised to understand current impacts from residents regarding various operations resulting from airport activity including airborne noise. NEW ACTION – From 2019, the Airport will host every 6 months a community feedback session at the airport to update residents directly on airport matters including noise abatement measures and in order to receive on how these are perceived.
5.7 We will publish an annual progress report on the actions within the Action Plan, the performance achieved and the benefits obtained. All monies raised from noise and track keeping penalties will be added to the Bristol Airport Community Fund. All aircraft have operated within the noise limits and no penalties have been levied to date.	To be carried forward.	The Operations Monitoring Report to include a dedicated progress report on the actions within the Action Plan. NEW ACTION – In 2019, we will refresh how this information is presented and reported i.e. citing particular instants and associated improvements where relevant.



Evaluating Implementation

We will provide an annual update on the implementation of the Noise Action Plan in the form of a report (the Operations Monitoring Report) to the Airport Consultative Committee. This report will also be available to members of the public through our website, www.bristolairport.co.uk, and in hard copy form on request.

This will take into account any changes in local circumstances that might apply. The following key performance indicators will be used to monitor performance.

- The LAeq at the runway 09 and 27 noise monitors;
- The LMax noise levels at the runway 09 and 27 noise monitors;
- The average departure noise level;
- Number of infringements of the departure noise limit;
- Percentage of aircraft (and numbers involved) achieving a CDA (24 hour period);
- Percentage of aircraft (and numbers involved) on track;
- Number of noise complaints, nature and origin of complaints;
- Night quota points used and aircraft movements in the night quota period by winter and summer seasons;
- Annual aircraft movements;
- Aircraft movements in the 'shoulder periods', 23:00 to 23:30 and 06:00 to 07:00;
- Area of the summer 57dB LAeq noise contour;
- Area of the summer 54dB LAeq noise contour.

Further to the above the following criteria below have been assigned to the Action Areas denoted in Section 8. Action Plan.

Criteria	Actions to manage and reduce the effects of noise from aircraft on the ground	Actions to manage and reduce the effects of noise from airborne aircraft	Measures to mitigate the effects of aircraft noise	Arrangements for monitoring aircraft noise	Actions to engage and work with the local community on matters relating to aircraft noise
Performance Indicator	Number of aircraft using APUs, number of engine ground runs, number of our electric vehicles, number of noise complaints concerning ground noise	Noise infringements, NPR violations, noise monitoring results, noise quota by season, noise complaints, noise contour area, number of CDA approaches, number of RNAV approaches, and progress on RNAV adoption on other arrivals/ departures.	Noise monitoring results, number of grants for noise insulation, uptake of mobile noise monitor.	Noise monitor results, LAMAX, Leq noise levels.	Noise complaint statistics, number of complaints, number of complainants, complaints by type of aircraft and airline where known.
Expected Outcome	Effective management of ground noise and reduction where possible.	Continuous improvements in aircraft performance and operational procedures. Avoidance of increases in noise and reductions in noise where possible.	Effective management of the noise climate	Effective communication of noise performance and airline incentives for improvement i.e. operating quieter aircraft and/or enhanced adherence to noise controls.	Effective communication of noise performance and outcomes.
People Affected	Residents within the 55db Lden noise contour however the effects of ground noise were not considered in the strategic mapping in 2017.	Residents within the 55db Lden noise contour and up to 25 miles from the Airport for measures such as CDA and track keeping performance.	Residents within the 55db Lden noise contour and elsewhere in relation to deviations from recommended flight paths.	Residents within the 55db Lden noise contour and elsewhere in relation to deviations from recommended flight paths.	Residents within the 55db Lden noise contour and beyond.
Priorities	High	High	Medium	Medium	High



Long Term Strategy

A Master Plan for Bristol Airport was last published in 2006 and at that time, it was envisaged that the airport would grow to between 10 and 12 million passengers a year by 2030. Current forecasts indicate that the higher threshold is likely to be surpassed slightly ahead of schedule and, looking ahead to 2050, there is now a need to consider the potential for annual demand to reach around 20 million passengers in the future.

Providing an airport fit for 2050 could involve enhancing and extending the existing terminal, with phased delivery to take account of future passenger forecasts. Alternatively, to provide a more sustainable approach, a second or even a replacement terminal could be provided, either north or south of the runway.

Bristol Airport are currently preparing a new Master Plan. Two stages of consultation have taken place to help inform the preparation of a draft Master Plan. It will be accompanied by a new, ambitious Sustainable Growth Strategy for Bristol Airport.

These documents will be published in Winter 2018/Spring 2019 in draft for consultation.



Financial Information

The costs associated with the implementation of the Noise Action Plan are commercially confidential.



Glossary

ACC	Airport Consultative Committee
APU	Auxiliary Power Unit; aircraft on-board generator
ATC	Air Traffic Control
ATWP	Future of Air Transport White Paper, published December 2003
CDA	Continuous Descent Approach
decibel (dB)	A scale based on logarithms used in noise level measurement extending from 0 to 140 dB corresponding to the intensity of the sound pressure level
dB(A)	The noise level corrected to correspond more closely to the frequency response of the ear. The correction factor is called 'A Weighting' and the measurements are written as dB(A). The dB(A) unit is internationally accepted and has been found to correspond well with peoples' subjective reaction to noise.
Defra	Department for the Environment, Food and Rural Affairs (UK Government)
DfT	Department for Transport (UK Government)
END	The EU Environmental Noise Directive (Directive 2002/49/EC)
EPNdB	Effective Perceived Noise Decibels, the measurement used in aircraft noise certification. Its measurement involves analysis of the frequency spectra of noise events as well as the maximum noise level.
FEGP	Fixed electrical ground power
ICAO	International Civil Aviation Organisation
L _{Aeq}	The equivalent continuous sound level, the sound level of a steady sound having the same energy as a fluctuating sound over the same period.
L _{Aeq} 16hr	The equivalent continuous sound level over the 16 hour day (0700 to 2300)
L _{day}	The equivalent continuous sound level over the 12 hour annual day (0700 to 1900)
L _{den}	The 'day evening night' noise level that is the standard European index for environmental noise, based on an annual average day with 5dB and 10dB weightings added to the evening and night periods respectively
L _{evening}	The equivalent continuous sound level over the 4 hour annual evening (1900 to 2300)
L _{night}	The equivalent continuous sound level over the 8 hour annual night (2300 to 0700)
L _{Amax}	The maximum value that the A weighted noise level reaches during a measurement period
NATS	NATS, who provide the air traffic control service at Bristol Airport
NPR	Noise Preferential Route, the route for departing aircraft
QC	Quota Count; a noise ranking system
RNAV	Area Navigation.
SEL	The Sound Exposure Level, or LAE, is a measure of sound energy, and is the sound pressure level which, if occurring over a period of one second would contain the same amount of energy as the sound event in question

Annex A: Noise Maps

These maps can be found in the following pdf uploaded on our website (<https://www.bristolairport.co.uk/about-us/environment/noise-management>):

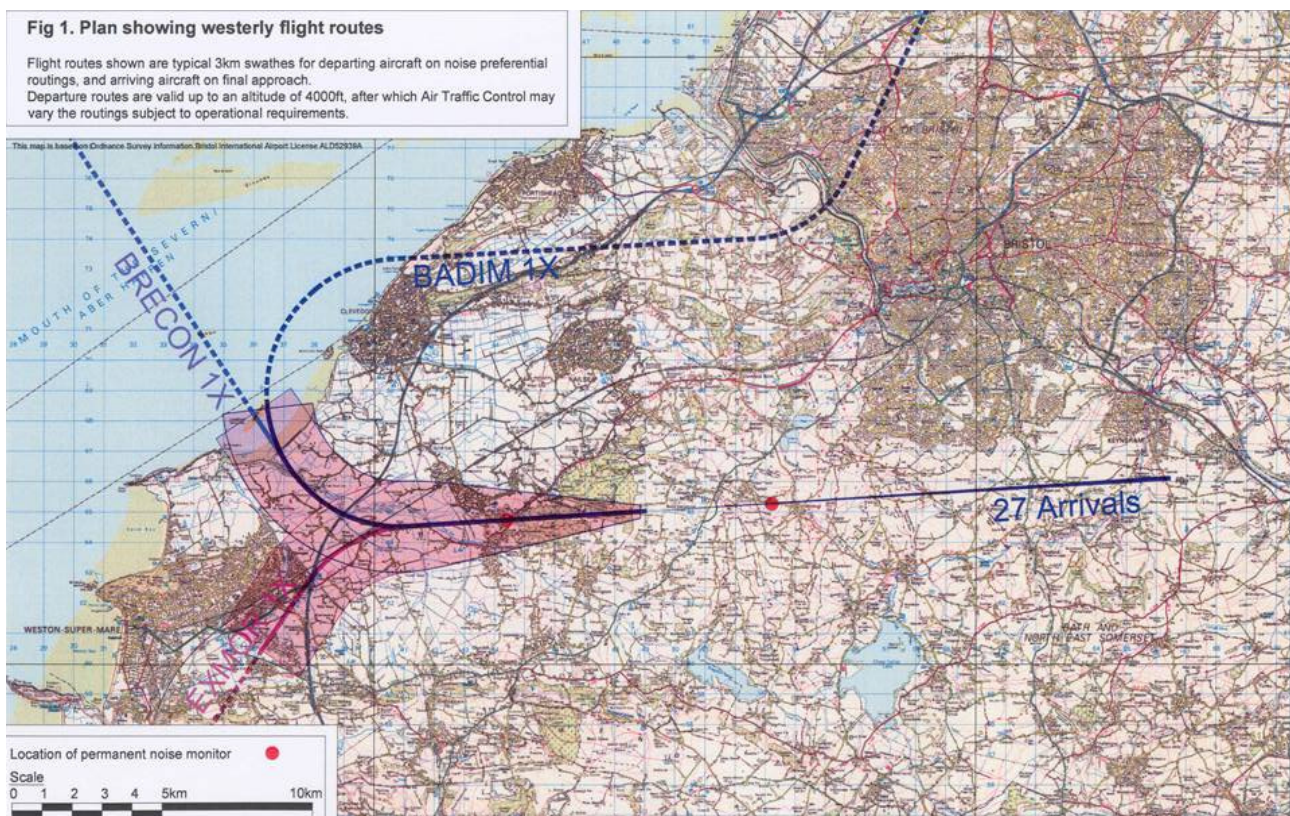
R3_Airport_Datapack_2017_Bristol International_EGGD_V3.pdf

Annex B: Departure Routes



Fig 1. Plan showing westerly flight routes

Flight routes shown are typical 3km swathes for departing aircraft on noise preferential routings, and arriving aircraft on final approach. Departure routes are valid up to an altitude of 4000ft, after which Air Traffic Control may vary the routings subject to operational requirements.



Annex C: Summary of Responses

Introduction

Bristol Airport sought views on its Noise Action Plan (2019-2023) which was prepared to meet the terms of the Environmental Noise (England) Regulations 2006, as amended, which transpose the Environmental Noise Directive in England. As this Noise Action Plan is a revision from a previous iteration, DEFRA guidance details consultation with an airports Consultative Committee is only required. However, since the first Noise Action Plan was introduced 10 years ago, we felt it was appropriate to consult more widely. This annex provides a summary of the responses to that consultation and the Airport's responses to the key points raised. We consulted on our Noise Action Plan for 12 weeks between 10th July and 2nd October 2018.

The Environmental Noise Directive (Directive 2002/49/EC) (END) requires, on a five-year cycle, the production of strategic noise maps, the presentation of information to the public, the preparation of Action Plans based on the results of the noise mapping, and consultation with the public on the contents of these Action Plans.

The Noise Action Plan is designed to manage environmental noise and its effects, including noise reduction, if necessary, and preserve existing areas of quiet. All responses have been considered and, where applicable, any changes to the consulted draft will be reflected in this summary of responses accordingly.

Summary of Responses

Overall Bristol Airport received 56 responses to its Noise Action Plan. Of these 11 were from organisations and 45 were from individuals. The Airport promoted its 12-week consultation in local media, online and with two drop in consultation events - one for local residents and another for aviation related stakeholders.

The following is a summary of the comments received and our responses. Where we have made changes based on comments, we have highlighted the section of the Noise Action Plan correlating to these points.

Has the Airport introduced the flight paths which meant fewer flights will be over North Somerset?

In 2013, Bristol Airport Limited carried out a consultation, seeking feedback from stakeholders on a proposal to replicate, implement and eventually replace the current approach routes from the south into Bristol Airport with more accurately defined routes utilising the improved capabilities of modern aircraft – namely Area Navigation (RNAV). An airspace change proposal has been approved by the CAA regarding the introduction of a new RNAV Standard Arrival Route (STAR) in accordance with this proposal and implementation of RNAV approaches from the south completed. This RNAV arrival route from the south is being monitored and we are exploring opportunities to implement similar techniques from the north in the longer term.

Is it possible, for example, to publish night time flight arrivals on your website for the previous month? You could give clear and honest information to residents about the volumes of sound from different types of aircraft and their frequency on a monthly basis.

We currently provide several factsheets on night flights on our website and we will publish night time flight arrivals online from April 2019. Details will also be included in our Annual Operations Monitoring Report.

The plan is lengthy, and I suspect the majority of the general public have not got time to read it. If the Airport wants to gain feedback, then a shorter/more user-friendly document should be produced. In addition, the consultation has not been well advertised.

The Noise Action Plan contains an Executive Summary at the beginning of the report. In addition, we will be providing a separate Summary document for the final, approved, version.

The plan states that the Airport actively encourages feedback and noise complaints. I have lived in the area for 25 years and I have seen very little 'active encouragement'. If local people thought that noise complaints would help reduce noise levels or number of flights, then I'm sure more people would submit noise complaints. We are often woken in the night/early morning by aircraft but see little point in reporting it.

We take the feedback we receive, especially concerning noise disturbance, extremely seriously and we have deliberately advertised the consultation for our Noise Action Plan

through press releases in local media, in order to encourage participation. Furthermore, we ensured the consultation timeframe mirrored a typical statutory consultation period (12 weeks). We took this decision due to the importance of the document and its technical nature.

If the Airport is serious in managing and reducing noise, then it would not be pursuing the 10-12 million passenger target by 2030. These numbers will undoubtedly increase the number of flights and hence noise.

The Airport received several comments like this which do not directly relate to the Noise Action Plan. Any planning application seeking to increase the Airport's current cap of 10 million passengers per annum to 12 million passengers per annum will be accompanied by a full environmental assessment which is subject to a separate planning process. The Noise Action Plan, as per DEFRA guidance, will have to be reviewed in light of any significant development which, if the planning application is approved, will occur.

Why is the engine ground running time of 22:30 - 06:00 different to the night noise quota of 23.30 – 6:00 hours? Shouldn't these times be the same?

The night noise quota period is based on the quota count scheme which has been established at London's designated Airports including Heathrow, Stansted and Gatwick Airports for many years and the timing of the night period of 23:30 – 06:00 hours mirrors this.

I would like to see a copy of the noise modelling report that informs the Noise Action Plan please.

The noise modelling report was produced by DEFRA in 2017 with data provided by the Airport to inform the report or data pack. The report or data pack produced by DEFRA is an appendix to the Noise Action Plan and is available on our website.

Twenty-six actions remain outstanding from the 2014-2018, which indicates a lack of serious engagement and action by Bristol Airport in really addressing noise issues for people who live around the Airport.

From the previous edition of the Noise Action Plan there were 35 actions. Of these actions nine were completed. However, the majority of the remaining 'Amber' actions are ongoing in nature i.e. they will pass from the previous Noise Action Plan to this recent iteration. Examples of these are:

- to publish an annual progress report on the Noise Action Plan, which is completed through our Annual Operations Monitoring Report,
- continue engagement with local community,
- operating a Noise and Track Keeping system to monitor track keeping and CDA performance,
- continue with a track keeping league table with airlines,
- portable noise monitoring,
- reviews of the Airport's Noise Insulation Scheme if the noise climate changes and exploring new navigational methods.

The latest Noise Action Plan provides 19 new actions with 18 of them having completion dates to ensure, where possible, when these actions will be completed. Any ongoing actions in the future will be deemed 'business as usual' and will be closed.

I note my village is not one of those listed on page 8 as an area affected by noise from aircraft entering and exiting the Airport. Could you explain to me why you interpret the DEFRA guidance as not including my village which is clearly so affected by noise which has been steadily increasing over the last 5 years, to now completely intolerable levels.

The areas detailed on page 8 are based on the noise contours provided by DEFRA. We are keen to talk to all areas of the community which may be affected by noise, hence the Airport creating a new action to have a community feedback session at the Airport every 6 months. Details of which will be provided in the first quarter of 2019.

My local Parish Council is not invited to attend the sessions referred to in the report which is clearly now an omission given the rapid expansion of the Airport and the consequent increase in aircraft over the village.

The Airport Consultative Committee (ACC) includes representatives from North Somerset Council, Bristol City Council and Bath & North East Somerset Council as well as a number of local parish councils. Full details of membership are available on our website.

I do not understand the reference on page 12 to potential changes in flight paths and how this could improve the situation of some areas. Could you please explain this since the way the plan is drafted assumes great knowledge of other plans and

strategies which the ordinary person would have no knowledge or understanding of.

As detailed on page 12:

'...the Airport will begin the detailed review and assessment during the life span of this plan to ultimately change departure and arrival flight paths by 2026/27 to align with the wider UK Airspace Strategy, utilising improved existing aircraft navigational technology. It is hoped that such improvements in performance-based navigation will have positive effects for the local community by reducing overflights in some areas.'

As described above and through a new action set out in the Noise Action Plan, the Airport will begin a process to review its departure and arrival flight paths with any new flight paths being introduced to be implemented by 2026/27 at the latest. This process is commonly known as an Airspace Change Process (ACP) and is governed by the Civil Aviation Authority (CAA). Any ACP will require a full public consultation which will detail possible changes and give local residents the opportunity to comment on the effects any change will have. This will need to be in accordance with the CAA CAP1616 procedure ¹.

With the planned further expansion, you must take far more effective measures to reduce noise in line with expanded levels so your impact on people is neutral. There is nothing in the plan that comes anywhere close to this desired goal.

Any planning application seeking to increase the Airport's currently permitted 10 million passengers will be accompanied by a full environmental assessment which is subject to a separate planning process. As per government policy this will 'mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life' ²

The Noise Action Plan, as per DEFRA guidance, will have to be reviewed considering any significant development which, if the planning application is approved, will occur.

At page 43, point 3.1, you say "Noise monitoring and noise mapping undertaken to date indicates that the noise climate has not altered significantly". This is clearly incorrect since you have previously admitted that many more people are now impacted by aircraft noise. Please could you clarify this discrepancy.

As per point 3.1 we state:

'We will keep the noise climate under review and reassess the need for changes to the previous noise insulation grant in the event that the noise climate alters significantly (an increase of 3 dB on the 16-hour LAeq measured using the noise monitors over a summer season).'

To date an increase of 3 dB on the 16-hour L_{Aeq} measured using the noise monitors over a summer season has not occurred.

¹ CAP1616 can be downloaded from the CAA website: <https://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=8127>

² National Planning Policy Framework, p52, July 2018 (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740441/National_Planning_Policy_Framework_web_accessible_version.pdf)

At page 44 you say, “NEW ACTION – By 2020, we will introduce a new interactive online tracker tool presenting, with a minimal delay where possible, of live information to aid members of the public to understand the proximity of aircraft to their location and enhance the ability of improvements of track keeping to be made.” What is the point of enabling people to understand the proximity of aircraft to them in relation to managing noise? I cannot see how this benefits anyone in any meaningful way. It appears to be a point made for the sake of it.

Access to information is important for local residents. The online tracker tool is something Bristol Airport feels can help individuals with an interest in our operations to obtain reliable information. It can also help to provide an initial indication as to whether a property is eligible for a noise insulation grant. Similar systems are successfully used at other Airports.

At page 45 you mention a community feedback session at the Airport every 6 months. Will people from my village will be invited to attend, at times which are suitable for the majority of people?

We will be publicising the event in the 1st quarter of 2019 and of course a community feedback session is open to individuals who wish to attend. During 2018, the Airport has also begun to hold regular drop in sessions for local residents. These give individuals the opportunity to meet with members of the team to discuss any issues or concerns. The first sessions have been held at the Hampton by Hilton hotel at the

Airport with more planned across the local villages. Full details of these sessions will be advertised on the community section of our website.

Could you explain what the costs associated with the noise plan are commercially confidential?

The costs associated to the production and implementation of the Noise Action Plan are commercially confidential. In total other costs are in region of £200k per annum which includes but is not limited to, Noise Insulation grants, publications, the operation of our noise and track keeping system and employee costs.

The plan lacks ambition from an organisation stating sustainability is a key pillar. Many of the actions are to “review” or “consult” over extensive time periods with little commitment to deliver tangible improvements.

We feel this Noise Action Plan provides the framework to deliver tangible improvements by having a series of actions to develop and implement various initiatives such as new airspace infrastructure, fixed electrical ground power and reliable processes and procedures.

Action 2.2 to review fee differentials by 2021. Presumably this wouldn’t have an impact for some years after that. Considering that quieter aircraft are available and flying today I believe the Airport should do more to hasten their introduction.

We indicate this will be completed by 2021. However, noting the above comment we will bring this forward to be completed by June 2020.

Action 2.6 to introduce alternative flight paths for respite by 2026/27. I welcome this action, but it is disappointing that it could only make a difference in 10 Years’ time. Significant projects in the UK are delivered in a fraction of the time and despite the technical challenges I am sure Bristol Airport could introduce this improvement sooner.

This timescale considers the process and assessment required for a large-scale airspace change. Once again this is detailed by 2026/27. However, initial implementation prior to review could be earlier.

The effects on health for those living in the flight path.

Health effects of living on the flight path are covered in the policy section of our Noise Action Plan.

Noise insulation does not work when you are outside, or the windows are open. I’m happy for Bristol Airport representatives to visit my home to understand that when the noise is at its worst, insulation isn’t going to help.

Noise Insulation, through new windows via primary or secondary glazing does improve noise abatement in homes. It is acknowledged when windows are open this abatement lessens and this is why we are reviewing the scheme with a view to include high spec mechanical ventilation. We are happy to visit any home and indeed undertake noise monitoring to assess the potential eligibility for a property to benefit from our Noise Insulation grant scheme.

The effect on the value of property in the flight path with the increase in frequency of aircraft.

The value of properties in England are subject to various factors which can improve or devalue a property. The Noise Action Plan is not established to comment on the housing market but rather to introduce and monitor ways in which the Airport can minimise the adverse effects of aircraft.

I have noticed a marked increase in direct overhead daytime and night time flights over Weston super Mare. Fines should be in place for deliberate use of the town for this purpose unless directed to by either your control tower or national air traffic control for reasons of safety as the Airport grows in the future to stop disturbance.

Arrivals from the south west do fly over the town of Weston super Mare and the implementation of an RNAV arrival route was the means to reduce such overflights by focusing aircraft to fly over the Severn Estuary. However, the utilisation of this route has been intermittent due to overall airspace demand. Therefore, with the new action to introduce alternative flight paths by 2026/27 this will hopefully see the utilisation of the route increase as wider airspace will also have been upgraded to Area Navigation (RNAV) routings. We will also continue to ensure that, for departures, the track keeping league table is utilised as this has shown continued improve in track keeping since introduced with over 98 % of flights in 2017 being on 'track' with our Noise Preferential Routes (NPRs).

Please confirm the exact terms of your planning permission regarding the number of aircraft movements during the day and at night.

The Bristol Airport Section 106 Agreement states: "The total number of take-offs and landings between the hours of 23:30 hours and 06:00 hours in the summer season shall not exceed 3000. The total numbers of take offs and landings between the hours of 23:30 hours and 06:00 hours in the winter season shall not exceed 1000."

Is "night" defined as 23:00 to 06:00?

The night period for this Noise Action Plan is defined as 23:00 to 07:00 hours however, for the airports Quota Count (QC) scheme it is from 23:30 – 06:00 hours.

Are those movement numbers expressed only in annual, not weekly or monthly figures?

Only in annual as it is established and approved with the previous iteration of the airports Noise Action Plan.

Do you contend that you do and have always complied with the limitations in place?

Bristol Airport have and do operate within the planning permission limitations set and approved by North Somerset Council.

Do you still permit high-noise aircraft to use the Airport, on condition that they pay you a higher fee? That makes more money for you but does not address the noise pollution problem.

Bristol Airport deters noisier aircraft through increased landing fees for older chapter aircraft. In addition, Bristol Airport bans certain types of aircraft based on the Quota Count (QC) system to manage night noise.

What extra charge is currently made for high-noise aircraft?

As publicised in the airport Fees and Charges from 1st April 2018 to 31st March 2019 ³

Chapter 3 High Aircraft

Aircraft deemed to be Chapter 3 high will be subject to a surcharge of 50 % of the Runway Fee. Chapter 3 high applies to those Chapter 3 aircraft whose certified noise performance lies within 5 EPNdB of Chapter 3 certification limits.

Non-Chapter 3 Aircraft

Aircraft failing to meet the requirements of ICAO Annex 16 Chapter 3 will be subject to a surcharge of 200 % of the Runway Fee.

Noisy Jet Surcharge

The noise monitoring points are located 6.5km from the start of roll for runways 09 and 27. Aircraft will be subject to a surcharge of £500 for the first 3dB exceeded, plus an extra £1,000 for each 3dB above the following limits:

90 dB (A) (103 PNdB)
06:00 - 23:29 hrs (local)

85 dB (A) (96 PNdB)
23:30 - 05:59 hrs (local)

The PNdB limits are regularly reviewed. The above times are local and based on the actual departure times.

You seem to have a disproportionately high number of movements at around 06:00. Obviously, this causes greater disturbance, particularly at weekends, than if movements were spread throughout the day and the hours before, say, 08:00 avoided. Why is activity concentrated at around this time?

The majority of aircraft which operate from Bristol Airport are based at the airport meaning that they will depart from Bristol Airport in the morning and arrive on their final journey in the evening to be based overnight. There are limits in place for the number of aircraft movements permitted within the 'shoulder periods' around the night period. The Bristol Airport Section 106 Agreement states: The total number of take-offs and landings between the hours of 0600 & 0700 and between 23:00 hours & 2330 hours shall not exceed 10,500 in any calendar year.

Consideration is given to detailed noise monitoring under the flight path - the contours you have provided do not have face validity for those of us who live directly under the flight path and the exposed population is much greater than your figures suggest. There is evidence that living with this noise has an impact on health.

The L_{Aeq} 16-hour contour has been established and recognised as the means to measure the onset of individuals to be 'highly annoyed' by aircraft noise exposure. This was recently reaffirmed as published in a CAA report: *Survey of Noise*

Attitudes 2014 and published in 2017 as CAP1506.⁴ Health Impacts associated to aircraft have been reviewed by the World Health Organisation with a report published in September 2018 entitled "Environmental Noise Guidelines for the European Region (2018)". This document details the effects of aircraft (air) noise as well as other sources and provides guideline noise levels to be considered by EU countries. Due to its recent publication these guidelines are still to be considered by Government however any new iteration of Bristol Airport's Noise Action Plan in subsequent years will seek to include any firm developments.

The penalties for level 3 and 4 airlines should be increased so all night flights are Chapter 14 airline only.

As per our new action:

"NEW ACTION – We will assess the mechanics of the Penalties Scheme and update, where applicable, in line with latest guidance and best practice in 2019. Reviews of the application of the scheme and if required alterations applied, every two years thereafter."

This will be reviewed as part of this.

I live under the flight path of Bristol Airport in Bath and I can confidently state that the aircraft noise does not disturb me in any way. I sleep with the windows open and have never been disturbed by night flights.

Here in Bath the aircraft are still high and so cause no disturbance.

Feedback received and noted.

The Parish Council feels that this is a vital document and should be taken into account when considering the future expansion of Bristol Airport.

Feedback received and noted.

The Parish Council objects to any plans to expand the number of flights over [Parish Council] without very positive actions by Bristol Airport to move inbound flight paths from flying over residential areas to over green fields. One of the Pillars of the Bristol Airport consultation must be to show their active management of measures to mitigate the nuisance to their neighbours of aircraft over flying their neighbours' properties.

Representatives from Bristol Airport visited attended a Parish Council meeting for the responder during the consultation period to answer questions on the Noise Action Plan. As previously stated, the Noise Action Plan is not a means to increase the number of flights and with the actions detailed the Airport wishes to continue to find ways in which noise disturbance is minimised by precisely the means put forward by the Parish Council by way of the introduction of new, measurable actions as those documented in the noise action plan.

The conclusions within the Noise Plan, section 7, are based on noise contour maps. These maps are not produced by taking actual sound measurements but on a statistical model based on historic aircraft movements during 2016. It is purely a desktop exercise that takes no account of the physical topology of North Somerset.

³ Bristol Airport Fees and Charges from 1st April 2018 to 31st March 2019, Page 2, (<https://www.bristolairport.co.uk/about-us/doing-business-with-us/fees-and-charges>)

⁴ CAA; Survey of noise attitudes 2014: Aircraft; 2017 <http://publicapps.caa.co.uk/docs/33/CAP%201506%20FEB17.pdf>

The results of the noise mapping suggest that the noise levels produced by Bristol Airport have remained the same or in some cases declined over the past ten years, despite an increase in passenger numbers. This conclusion is in direct contrast to the experience of the residents of the Parish Council who have experienced an increase in aircraft noise, particularly in the early mornings and evenings.

We propose that any noise plan should be based on 'actual' measurement of aircraft movements in the landscape of North Somerset. These measurements and the resultant noise contour maps should be produced by an organisation independent of the Airport.

It is only with actual measurements at a variety of locations throughout North Somerset, can the true impact of the noise generated by the Airport and associated aircraft movements be evaluated and plans for mitigation proposed.

We note the feedback detailed and the Airport will produce actual, as well as the forecasted, annual daytime 16hr L_{Aeq} noise contours accordingly as part of its Annual Operations Monitoring Report. These will be completed by independent consultants.

Section 4 neglects to provide information on the average number of flights per day in the summer and winter of 2017 and yearly air transport movements (atm's).

In 2012 there were a 190 flights per day in the summer which equates to over 12 an hour within a 16-hour day and in the winter, there were 140 flights per day which equates to almost 9 an hour. (Ref: Noise Action Plan 2013 -2018).

To clarify this, during the summer of 2016 (the data used by DEFRA to create the noise contours) there were 53,860 total movements during the summer season from 27th March to 29th October 2016 (used full months for this purpose). This equates to an average of 235 atms a day, this divided by a 24-hour period, equates to approx. 10 movements per hour. If averaged by 16 hours for daytime this is 15 movements per hour.

In the Winter of 2016/17 a total of 25,978 total movements occurred. This equates to an average of 166 movements per day, 7 movements per hour over 24 hours and 10 movements per hour over 16 hours. It should be noted for the 16hr daytime actual values will be lower as a proportion of movements would have occurred during the night period (11:30 – 06:00 hours) and because this is a broad averaging example.

No comparison of flight numbers is given for anticipated future growth although the document covers the period from 2019 to 2024. A level of 10mppa is expected as soon as 2021 with a flight expected approximately every three minutes in a 16-hr day. There is no mention of the peak periods within a day. For instance, 06.00 – 08.00 hrs is near capacity. Peak for arrivals is 11.00 – 13.00 hrs and departures 12.00 – 14.00 and again there is peak

in the early evening period for both arrivals and departures. Our concern is that as the frequency of flights increases, the few quiet periods are taken away as flights will spill over into the only periods with little airborne noise.

The purpose of the Noise Action Plan review is to analyse the impacts based on the contour analysis produced by DEFRA in its 5-year cycle which have been included. Future forecasts in movements have not appeared in previous iterations of the Noise Action Plan because of this. In terms of peak capacity, the Airport can only operate to the capacity available for safe airfield and airspace operations and this is reflected in the schedules the airport operates to. These accord with the requirements of the Airports existing planning permission.

This document limits itself only to a possible expansion from the present (ca. 8 mppa) to 10 mppa (section 2). It is candid in making clear the owners' aspirations to seek permission to expand to 12 mppa and onward to 20 mppa. Certainly, growth of the Airport, if granted consent, will be beyond 10 mppa and the implications of this should be considered within this document.

If there is any significant development at the Airport the Noise Action Plan is required to be updated in accordance with DEFRA guidance.

Although the Noise Policy Statement for England (2010), the National Planning Policy Framework 2012 and the Aviation Policy Statement 2013 recognise that noise gives rise to significant adverse impacts on

health and quality of life, there has been no discussion of these impacts in this document. There is growing bank of evidence on health-related illness due to noise disturbance, particularly at night. A Green Paper is expected this autumn following the 'Beyond the Horizon' consultation of April 2018 in which the Government is expected to state how environmental issues such as noise will be resolved in the future. The Government stresses that it leaves the issue of noise and the mitigation of noise as a local matter to be considered by the Local Authority, North Somerset Council (NSC). The Airport and NSC should both commit to implementing any new, recommended safeguards at the earliest opportunity and this should be identified in this plan.

During the drafting our Noise Action Plan, we have been acutely aware of. Therefore, the new actions demonstrate specific and measured deliverables such as a review of the aircraft penalties scheme, the delivery of airspace change based on sound noise analysis and public consultation and better ways to produce information sort by various stakeholders. In this way we are committed to continuing to manage the impact on a local scale in line with government guidance.

To date the Eastern Apron is not operational and impacts from the use of these aircraft stands have been neglected in this document. These stands will take growth beyond 9 mppa and, as suggested in the 2006 Master Plan, this will have severe noise implications for residents close to Downside,

Felton Common and beyond such as Dundry, Felton and Winford. In addition to air transport movements it is anticipated that ground noise will increase from both the Western and Eastern Apron from the running of engines, taxiing to the runway and waiting for take-off. We note that this document is informed by the most recent strategic noise maps which were prepared in 2017 but reflect the noise climate in 2016. Since 2016 the air transport movements have increased by 3 per cent. This document assesses the noise climate of the past, not the present or the future which is what parishes wish to know and they should at least be provided with provisional information for the period up to 2024 in order to make an informed comment.

The East stands will be utilised in phases once built. In addition, as soon as the first stand is in use there will be an acoustic fence surrounding all stands to limit such impacts. Once these stands are in operation, we will liaise with the regulator to see if such a change will need an amendment to this Noise Action Plan.

The Operations Monitoring Report 2017 on p18 states 'as noted in section 11 there was no specific complaint about ground noise in 2017' but we would argue that background noise complaints were many and growing and that there was an increase from 2016 to 2017. A definition needs to be given of what is considered background noise and what is considered ground noise. In our view the running of engines, taxiing and noise from Auxiliary Power Units etc should be

considered as background noise as well as ground noise. This point needs clarification. Ground noise, when finally measured, should take account of inverse temperature gradients and down winds' as these can heavily affect the noise residents will hear in reality.

To clarify background noise is the sound level at a given location and time, measured in the absence of intermittent noises, any other extraneous or alleged noise nuisance sources. It is also referred to as the Ambient or Residual Noise.

Ground Noise considers equipment and operations on airfield i.e. for instance taxiing of aircraft, use of ground handling equipment such as power generators, vehicles etc.

When ground noise is modelled various factors are considered including metrological data, topographical data and specific stand use data. It is also benchmarked against actual monitoring to ensure the model is accurate. Such modelling isn't involved in noise action planning as set out by DEFRA however, notwithstanding this, the Airport has introduced an action to re-look at ground noise as it is of particular importance to us:

"NEW ACTION – We will review the Bristol Airport Ground Noise Management Strategy prepared in 2012 in 2019."

In response to the Noise Action Plan we have strong reservations on the use of noise envelopes as this will concentrate the noise over the same residents and allows no dispersal of noise. No account of the air transport movements has been provided. The Operations Monitoring report 2017 shows, from the noise monitor at Congresbury, that the noise climate has deteriorated in several months by over 3dB(A). We also note that the area of the 57dB(A) L_{Aeq} 16 hr noise contour for summer months is growing even though it remains within the limit of the permitted noise envelope of 12.42 sq. km. The area predicted for 2018 is 10.9 sq. km whilst in 2015 it was predicted to be 9.6 sq. km.

The fixed noise monitor in Congresbury as noted, recorded higher noise levels at certain times of

the year when compared to previous years. This is due to construction work occurring within its vicinity (see Figure 1 below). Unfortunately, we are not able to decouple all noise events from those associated to aircraft noise events so this provided a clouded view for 2017.

As indicated, the contour analysis produced on an annual basis published as part of our Annual Operations Monitoring Report remains within the contour limits applied by North Somerset Council. In addition, if the noise modelling used was to include topographical information the contour would reduce by a further 1 sq. km. We haven't included this addition of topographical information deliberately as we did not want to disadvantage individuals who may want to take advantage of our Noise Insulation Scheme.

There is little attention given to improving the noise environment from movements of helicopters other than Downside Road being protected from flights below 500 ft above ground level. Could this be widened to all areas outside the Airport boundary?

This will be considered as part of the airspace new action as flightpath and associated controls are developed.

From discussions held on quieter planes within the Bristol Airport Consultative Committee in July 2018, it is apparent that Bristol Airport is powerless to incentivise the introduction of new planes such as the A320 neo and the Boeing 737 Max. It is the decision of the airline when new aircraft are introduced. Bristol Airport states that most aircraft are using the latest technology to reduce noise and are modern aircraft. This is reflected in that no noise penalties have been served on airlines at Bristol Airport. Secondly, limits set for penalties such as the day time noise limit of 90 dB(A) and the 85 dB(A) night noise limit for departing aircraft are out dated for modern aircraft and the limit should be lowered. Any increase in frequency of air transport movements negates any saving to the noise climate from quieter aircraft. Thus, we are not confident that modern technology will reduce the noise climate in the next decade.

The incentivising of modern aircraft comes from the ability to levy penalties for the use of older aircraft or to reward the use of newer aircraft types. Bristol Airport can currently utilise both options through maximum departure noise level via our noise violation limits as depicted for day and night and through our Quota Count (QC) Scheme by

Figure 1: Congresbury Noise Monitor – July 2018



regulating movements during the night period (23:30 – 06:00 hours) by rewarding the use of quieter aircraft in the form of movement multiplication.

The noise violation levels for day time is 90 dB(A) and 85 dB(A) for night time for departing aircraft. These levels continue to be the lowest noise thresholds being utilised by an Airport in the UK. With zero noise infringements in recent years this would suggest that the performance of aircraft is improving.

The recent BA Operations Monitoring Report on the Noise Quota system showed that for 2012 the night air transport movements were at their lowest since 1997/1998. This shows it is feasible for Bristol Airport to operate avoiding the hours of 11.30 pm – 6.00 am. In 2013 it was requested that Bristol Airport work towards lowering the number of flights at night further and steadily reducing the night flight quota points, moving towards a ban on night time flying. Unfortunately, since 2012 there has been a considerable increase, with summer night flights up by over 60%. The summer quota count usage has increased by almost the same proportion showing that the aircraft are (on average) no less noisy. This appears to show that the Airport 's aspirations expressed in the previous Noise Action Plan to "reduce the effects of noise from airborne aircraft" have not been successful in this respect.

The points above are of interest and have been fully considered. Since 2012 the Airport has grown and has publicly reported growth each year. This is similar to other Airports in the UK and indeed in the region,

to varying degrees. The night time movement limits are aligned to the same hours as the adopted Quota Count Scheme. The Noise Action Plan provides two new actions to assess the ability to improve the operation of quieter aircraft and the performance of such aircraft.

These are as follows:

"NEW ACTION – By 2021, the Airport will review the aeronautical fee differentials based on aircraft noise certification to further enhance incentives for quieter aircraft to operate from Bristol Airport. The resulting findings and actions will be published within our Annual Operations Report for the year 2021."

"NEW ACTION – We will assess the mechanics of the Penalties Scheme and update, where applicable, in line with latest guidance and best practice in 2019. Reviews of the application of the scheme and if required alterations applied, every two years thereafter."

Furthermore, against the backdrop of increased movements it is important to note the Airport remains within the conditions as set out by the local planning authority when permission was granted to the Airport to grow to 10 million passengers per annum (mppa) - including night noise movement limits, QC budget allowances for summer and winter and finally the 16hr L_{Aeq} day time noise contour area restriction amongst others.

A modest and reasonable suggestion would be that the Airport recognise the WHO Night Noise Guidelines for Europe: we are disappointed that the new Noise Action Plan makes no mention whatever of the World Health Organisation's important work in this area.

The WHO Noise Guidelines for the European Region (2018) have been considered as part of this Noise Action Plan. It is important to note; such guidelines are not government policy and therefore at this present time no amendments are required.

Only average noise levels (equivalent continuous sound levels L_{Aeq}) are considered. It is well known that such average noise levels alone are inadequate as criteria to judge damaging effects of aircraft noise. Large numbers of seriously intrusive aircraft can pass over before the L_{Aeq} levels discussed in the consultation document are reached. Such supplementary noise indicators as L_{Amax} , and SEL, are seen by the European Union Noise Directive as particularly appropriate for use at night, in relatively quiet areas and for passing aircraft. A similar approach is supported by the World Health Organisation and the British Government's ANASE study and Policy Planning Guidance PPG24. Together with L_{Aeq} contours these should be independently measured and reported so as to help give a more complete picture of how noise is changing over time. Measurements reported should be sufficiently comprehensive to enable progress to be judged against WHO criteria.

The L_{Aeq} 16 hr contours referenced in this noise action plan have been adopted as per DEFRA guidance. As noted in the Noise Action Plan the Survey of Noise Attitudes [SoNA] (2014), CAP 1506 (February 2017) study compared reported mean annoyance scores against average summer-day noise exposure defined using $L_{Aeq,16h}$, L_{den} , N70 and N65. Mean annoyance score correlated

well with average summer day noise exposure, $L_{Aeq,16h}$. No evidence found to suggest any of the other indicators correlated better with annoyance than $L_{Aeq,16h}$.

The WHO recommends that: “For the primary prevention of subclinical adverse health effects related to night noise in the population, it is recommended that the population should not be exposed to night noise levels greater than 40 dB of L_{night} outside during the part of the night when most people are in bed. The low adverse effect level of night noise, 40 dB L_{night} outside can be considered a health-based limit value of the night noise guidelines necessary to protect the public, including most of the vulnerable groups such as children, the chronically ill and the elderly, from the adverse health effects of night noise.” The Airport’s consultation document does not even consider L_{night} levels below 48dB.

The Airport is following the guidelines as provided by DEFRA and is basing its Noise Action Plan actions and findings on those contours produced. The noise levels indicated as per the WHO guidelines are guidelines and government policy has continued to use the $L_{Aeq,16h}$ as the main indicator for annoyance as provided for in the recent CAA Survey of Noise Attitudes, 2017 report.

Most local residents are reluctant to use the Airport’s “noise complaints” service for a variety of reasons, “it’s a bother”, “I’d much rather try to get back to sleep than to log the time and flight details of the aircraft which has now flown away”, “no notice

is taken of complaints”, The noise complaints recorded in the Airport’s Operations Monitoring Reports must reflect a small fraction of the “noise annoyance events” experienced by residents over a large area under the flight paths.

The claim that ‘No notice is taken of complaints’ should be investigated further. Complaints are reported to the Bristol Airport Consultative Committee - it is at this point they are noted but no action is taken. For instance, the early departing flights between 04.00 and 06.00 hrs caused a spike of night noise complaints and they were discussed at the Committee in 2016. There was recognition that there was a noise problem but, after discussion with airlines, no action was taken. This reflects that monitoring noise complaints has no beneficial effect without action which in this case would require operational change. It also suggests that the Airport is only, at best, managing noise not reducing noise.

The airport has several established ways in which residents and other stakeholders can contact the airport, through our website, directly by phone and indeed via email. Furthermore, through the airports consultative committee local councillors can raise questions made by constituents too. In addition, where it has been requested, we have visited residents to listen to concerns and to help solve them where possible. We pride ourselves on being very much involved in the community and therefore would like to make it clear that our door is always open and welcome individuals to make contact through these channels.

Although the noise insulation grant is welcome it does not compensate for the loss of tranquillity in the use of one’s garden, enjoyment of the local area and being able to sleep at night with the window open. The noise insulation grant is £5,000 funding for 63dB and £2,500 for 60 dB and 57dB which is a tiny amount to pay a household for a substantial damage to their noise environment. In many cases it is simply insufficient funding for noise insulation with the householder having to pay a substantial amount of the costs. The onset of community annoyance of noise extends beyond the 57 LAeq and funding for insulation should be widened.

We will review the level of funding provided in due course.

We would like to see the aircraft stand allocation published in order to comment and help prevent ground noise impacting on residents.

The stand allocation can be found on the NATS AIP website: http://www.nats-uk.ead-it.com/public/index.php?option=com_content&task=blogcategory&id=36&Itemid=85.html

There is no mention of one of the consequences of the Airport now being ‘partially level 3 slot co-ordinated’ for the summer season which is a cluster of flights arriving in the shoulder period between 23.00 - 23.30 hrs. This bunching of arrivals obviously has an impact on residents’ ability to sleep.

The reason for being partially level 3 slot co-ordinated is to ensure the Airport remains compliant to the night movement limits stipulated. Bunching of aircraft movements is not a by-product of such controls being introduced. The number of movements occurring in the shoulder periods described are within permissible limits.

There should also be monitoring and reporting of the number of flights delayed from the planned day-time arrivals into the shoulder period and into the night movement limit period after 23.30 hrs.

The Airport will begin reporting this annually within the 2018 Annual Operations Monitoring Report.

We welcome electric vehicles on site and would like to see a timetable of all vehicles being electric to ensure progress continues.

Thank you and this will be included as part of a climate change action plan in due course.

It is disappointing that a feasibility study for the further installation of fixed electrical ground power (FEGP) will not be completed before December 2020. There is no fast action here to reduce the noise climate from mobile ground power units (MGPU).

Unfortunately, a robust feasibility study is required due to nature of Fixed Electrical Ground Power (FEGP) being high capital costs and the need to retrofit to stands, whilst understanding potential electrical capacity limitations. Of course, if we are able to provide this earlier, we will.

It is disappointing that only in 2019 is a review being undertaken of the BA Ground Noise Management Strategy when there are so many complaints on background noise. Mapping of ground noise needs to be carried out and mitigation for residents considered at the earliest opportunity.

As already explained, complaints relating to background noise or ground noise are limited. The Airport has already undertaken independent ground noise monitoring in 2018 and this will provide the data required to review the Ground Noise Management Strategy next year in 2019.

Page 38 says “Still no Chapter 3 high aircraft are currently operating at Bristol Airport. In addition, the Bristol Airport Fees and Charges also include a 200% surcharge for aircraft not meeting Chapter 3, and those operating at night.” This is shaded green indicating that the Airport is satisfied with what it has done to “incentivise airlines to use the most modern and quiet aircraft”.

This has been shaded green because the Airport's original action was to 'Incentivise airlines to use the most modern and quiet aircraft by imposing a surcharge on chapter 3 high aircraft'. This has been completed however we have committed to:

“NEW ACTION – By 2021, the Airport will review the aeronautical fee differentials based on aircraft noise certification to further enhance incentives for quieter aircraft to operate from Bristol Airport. The resulting findings and actions will be published within our Annual Operations Report for the year 2021.”

This is to enable further progression on the topic.

There appears to be no published information about numbers of aircraft of different noise classifications using Bristol. Such information is available for other Airports. We suggest that too unexacting a target has been set by Bristol where “a surcharge is applied to ‘Chapter 3 high’ aircraft”. We urge that differential surcharges favouring quieter aircraft should be set on other noise classifications such as Chapter 3 base, Chapter 4 high, Chapter 4 base, Chapter 4 minus, as is done at other Airports.

This would be a more serious attempt to “incentivise airlines to use the most modern and quiet aircraft” such as the new A320e and Boeing 737Max

See previous comment.

An explanation needs to be given of ‘a goal of 50% reduction in perceived external noise by 2020 based on new aircraft relative to equivalent aircraft of 2000’. Unless frequency of increased air transport movements is included it will be meaningless. Residents hear an event not a perceived noise.

ACARE has developed a strategic research and innovation agenda (SRIA) to meet such challenging goals. Research and innovation in aviation is the key to tomorrow's mobility and prosperity as well as environmental and energy challenges. In the SRIA 2017 update the following is detailed:

“Similarly, technical solutions showed a potential reduction of 37% in perceived noise has been achieved against a goal of 50%, also by 2020.

New generations of aircraft under development integrate many technologies that contribute very significantly to the ACARE goals: new aerodynamics, weight savings, new engines, computing capacity, air traffic management and operational benefits, and so on. Monitoring of progress in implementation is ongoing, and in the mid-term will continue to focus on technological developments, including RPAS (remotely-piloted aircraft systems), as well as broader collaboration with European Technology Platforms and other key organisations.”⁵

Is an action highlighted in green mean that the action is completed?

Yes, it means it has been completed. However, where applicable, a new action has been introduced to continue to improve in areas. If an action is continual i.e. (2.3) levying penalties for noise incursions it would remain in amber as it is continual however a new action has been established to further progress in this area. For instance, for 2.3 the following was a new action:

“NEW ACTION – We will assess the mechanics of the Penalties Scheme and update, where applicable, in line with latest guidance and best practice in 2019. Reviews of the application of the scheme and if required alterations applied, every two years thereafter.”

This section is the first and only time the word ‘respite’ is used in this document. ‘We will begin looking at alternative flight paths for respite purposes with a view for implementation by 2026/27’.

First of all, we would like a definition of respite from Bristol Airport. Does this mean a period of relief from noise each day? Secondly, this statement is an acknowledgement that there has been a change in the noise environment from one where there is respite to one where there is none.

As per CAP1616 (within the Glossary) respite is defined as “*Planned and notified periods where overflight or noise impact are reduced or halted to allow communities undisturbed time.*” The statement is not designed to insinuate that respite isn’t available. As already mentioned, the Airport does have predictable quiet times with differing levels of activity throughout the day and night. Through this new action the Airport is seeking to introduce scheduled respite where possible thereby offering wider relief.

There is a suggestion that from 2027 respite may be considered for residents. We request that this is brought forward to when residents are receiving a flight approximately every three minutes, at 10 mppa.

As previously detailed, this timescale considers the process and assessment required for a large-scale airspace change. Once again this is by 2026/27. However initial implementation could be achieved, subject to consultation and approval.

An explanation is required of whether respite is for all residents situated close to the Airport such as the parishes of Brockley, Cleeve, Congresbury, Dundry, Felton, Winford and Wrington or is it just

for parishes on the outer edge of the flight paths such Timsbury, Pensford, Kingston Seymour etc?

Providing any form of respite to locations in close proximity to the Airport is difficult as some locations are in close proximity to the start of an aircraft’s departure and/or the final approach for an arriving aircraft. Relief can be more controlled from 3,000ft upwards as aircraft have more room to manoeuvre. The Airport will work with communities as part of a given Airspace Change Process (ACP) in order to inform design and ultimately provide relief from noise where possible. Such objectives and principles will need to be agreed as part of an ACP.

The new action of allowing two opportunities per annum to apply for funding for noise insulation instead once per annum is not adequate. Residents should be able to apply for funding whenever. Funding of noise insulation should cover the whole cost of noise insulation with no requirement for the homeowner to contribute to something that is caused entirely by the Airport.

Applications for noise insulation are screened and agreed by the Local Community Fund Committee who meet on a quarterly basis. This has led to two opportunities for residents to apply to coincide with such committee meetings. The Local Community Fund Committee is made up of representatives from the Airport and local North Somerset Councillors. Any changes to the long-standing Noise insulation Scheme will be brought about through a new planning application as required.

⁵ SRIA 2017 Update, Executive Summary, p6 (https://www.acare4europe.org/sites/acare4europe.org/files/attachment/acare-strategic-research-innovation-summary-2-interactive-fin_0.pdf)

We welcome improvements to the tracker system. This document does not comment on the telephone noise complaint line available to residents. Is there a commitment in this Noise Action Plan to the retention of this service?

Yes, we can confirm that the telephone complaint line will remain in service as will the other existing methods of contacting the Airport.

We are pleased to read of your actions to reduce noise but find them perhaps over-simplistic. We encourage you to consider a tiered approach to actions with targets set at progressively more challenging levels as time progresses to encourage continual improvement.

Thank you for the feedback and prioritising the actions is a good point. The actions detailed have been prioritised in terms of importance and this reflects the target date for when they will be implemented. This is especially the case with the new actions being brought to effect through this Noise Action Plan.

Section 2 – Aims and Framework of Our Noise Action Plan is very helpful to the novice reader as it identifies key points and sets out clearly in simple terms what is to be expected. We would encourage you to continue this approach with all your consultation documents.

While in words Section 10 – Long Term Strategy is true we see no relevance to noise. We believe this section must set out what the long-term strategy for noise reduction is. The next noise action plan 2025-2030 will then be able to address its implementation.

This section is to provide the overall Long-Term Strategy of the Airport. However, we are committed to mitigating noise impacts where possible and we will seek to enhance this during the next 5 years.

New actions. We find the layout difficult with new actions interspersed within existing part and fully complete actions. We suggest new actions are placed at the end of each section to highlight them. We believe many of the actions should be marked as closed as they are now part of the airport's "business as usual". If not closed now, they will never be closed. The actions relate to procedures which in an effective management system should be regularly reviewed.

A list of new actions has been added as Annex D: Summary of New Actions. We have kept open the previous actions if they are continual in nature. We recognise the position as business as usual and we will take this approach in the next iteration of the Noise Action Plan.

Action 1.4. We welcome completion of this action. We welcome the new action but as this is a five-year plan believe it should be expanded to include implementation of the study recommendations.

This action has been updated to allow for any resulting actions generated from the FEGP feasibility study to be presented to the airports Consultative Committee.

Action 1.5. We believe this action to be imprecise with no measurable indicators to determine when it is complete. We wish to see this reworded noting it comes from an earlier plan.

This action does derive from an earlier plan and will part of the new action to review the Bristol Airport Ground Noise Strategy in 2019.

Action 1.6. As an action we believe this should be marked as closed as the work is complete. We welcome the new action but as this is a five-year plan believe it should be expanded to include implementation of the review work.

The Ground Noise Management Strategy will be completed in 2019 and therefore it will sit alongside as a sister document to the Noise Action Plan. Actions delivered through this strategy will be detailed in our Annual Operations Monitoring Report.

Action 3.2 & Action 34. We fail to understand the introduction date of the new action. As the plan is for 2019-2024 why is there a date of 2018?

This is typographical error and has been updated accordingly to 2019.

Action 5.1. We note the action which is now part of the airport's "business as usual"; however, we were unaware of this activity and believe much more needs to be done by the airport to publicize such laudable initiatives. We welcome the new action. We would like to see an area on the airport website dedicated to the local community which is clearly accessible from the Home Page from where the new tool can easily be accessed.

Noted.

General enquiries in the village of Wrington and wider afield has revealed that there has not been sufficient nor effective publicity about the Noise Action Plan 2019 – 24. Crucially, as the Noise Action Plan has to be considered by DEFRA and the Local Authority before planning can be granted for expansion, the question must be asked, has consultation process been adequately exercised to make this clear.

The Consultation for the Noise Action Plan and any potential planning application submission for the Airport are not interlinked. The duration of the consultation provided for the Noise Action Plan was longer than many provided at other Airports as we decided to have a 12 week consultation. The need for a consultation was not required as part of the DEFRA guidance however we felt it was important since it has been 10 years since the introduction of our first Noise Action Plan. The consultation was promoted through the local media, on our social media platforms, on our website and emails were sent to all local Parish Councils to notify them of the consultation. The consultation was also promoted through the Airport Consultative Committee.

Has the Noise Action Plan promised a restriction of operations to mitigate noise impacts?

Any restrictions indicated are those currently in place, such as those applied against night movements and Quota Count (QC) budgets. Rather than imposing further restrictions the Airport has targeted new actions to drive noise mitigation with revised penalty schemes and the application of noise thresholds amongst other items.

Nowhere in the Noise Action Plan does it address mitigation of annoyance due to lack of respite from airplane noise i.e. frequency of noise events with no indications of impact of increased flight frequency of take offs and landings and changes to routing day or night (should the latter increase). This is not adequate.

This comment has been noted. As already discussed through the new action to update airspace by 2026/27 we can investigate respite.

Overall, the Noise Action Plan is well written and puts noise from the Airport, the legislative framework and measures implemented by the Airport to mitigate the noise impact in context. It is also welcomed that additional actions are being put in place to mitigate the noise impact further.

Where progress is reported against KPI's it would be useful to include that data in the action plan, which would help to show the progress being made.

This is being included as part of the Annual Operations Monitoring Report from 2018.

We welcome the action to review the Ground Noise Management Strategy.

It would be useful to include a separate table which summarises all of the new actions. It would also be useful to prioritise all of the actions to those which Bristol Airport consider to be high, medium and low priority.

This has been included in Appendix D. The high, medium and low priority of these have been stipulated by the timescale to delivery.

In the Progress Today, column of action 3.1 it should read Bath & North East Somerset.

Thank you this has been edited accordingly however to North Somerset Council.

I just wanted to make a comment that I have observed the A320 Neo going over and listened to its noise and I can confirm that it is significantly quieter and from inside the house is no more noticeable than a passing car. I believe the manufacturer has stated that it is 50% quieter on take-off and landing. I would suggest this is probably quite accurate. I think that the Airport really does need to put restrictions on the age of the aircraft taking off and landing late at night or early in the morning. For example, looking on flight tracker, you can see that some of the charter airlines are using aircraft that have an average age of 28 years old and this has a significant impact on the noise they produce.

Thank you for your comments.

To note, we received two petitions concerning changes to flight paths with particular reference to early morning flights from residents in Wick st Lawrence, St Georges and Weston super Mare, both of these petitions amounted to 12 signatures.

The airport hasn't changed its flight paths and the actions contained will provide the opportunity to review flight paths as part of wider airspace change.

Annex D: Summary of New Actions

1. Complete a feasibility study for the further installation of FEGP provision to service stands which currently rely on MGPU use by December 2020. Once completed any actions derived will be presented to the airports Consultative Committee.
2. We will review the Bristol Airport Ground Noise Management Strategy prepared in 2012 in 2019.
3. By June 2020, the Airport will review the aeronautical fee differentials based on aircraft noise certification to further enhance incentives for quieter aircraft to operate from Bristol Airport. The resulting findings and actions will be published within our Annual Operations Report for the year 2021.
4. We will assess the mechanics of the Penalties Scheme and update, where applicable, in line with latest guidance and best practice in 2019. Reviews of the application of the scheme and if required alterations applied, every two years thereafter.
5. In conjunction with the above, in association with a successful planning application, the penalty system will be reviewed.
6. We will seek to achieve an 85 % CDA compliance rate by 2023.
7. We will begin looking at alternative flight paths for respite purposes with a view for implementation by 2026/27.
8. In association with a successful planning application the [night] quota count system will be reviewed.
9. We will review our approach with the General Aviation (GA) community and how best to deliver best practice in conjunction with future airspace change work.
10. The Airport will provide localised guidance to CDA's and will issue to airlines by 2020.
11. The Airport will seek to introduce RNAV routes for arrivals and departures by 2026/27 (subject to consultation).
12. We will, based on the findings of the noise climate generated from the monitor data, consider suitable noise mitigation measures, as per the current Noise Insulation Scheme, on a case by case basis. This will be introduced from 2019.
13. The Airport will continue to engage with North Somerset Council as and when local planning policy is developed.
14. In 2019, we will be updating our noise insulation scheme guidance to allow for two opportunities to apply and enhancements to treatments it can cover.
15. By 2020, we will review our current noise and track keeping system and upgrade where necessary.
16. By 2020, we will introduce a new interactive online tracker tool presenting, with a minimal delay where possible, of live information to aid members of the public to understand the proximity of aircraft to their location and enhance the ability of improvements of track keeping to be made.
17. In 2019, we will refresh how this information [aircraft and airline track keeping] is presented and reported i.e. citing particular instances and associated improvements where relevant.
18. From 2019, the Airport will host every 6 months a community feedback session at the airport to update residents directly on airport matters including noise abatement measures in order to receive feedback on how these are perceived.
19. In 2019, we will review the Annual Operations Monitoring Report content and presentation to make it even more accessible.

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