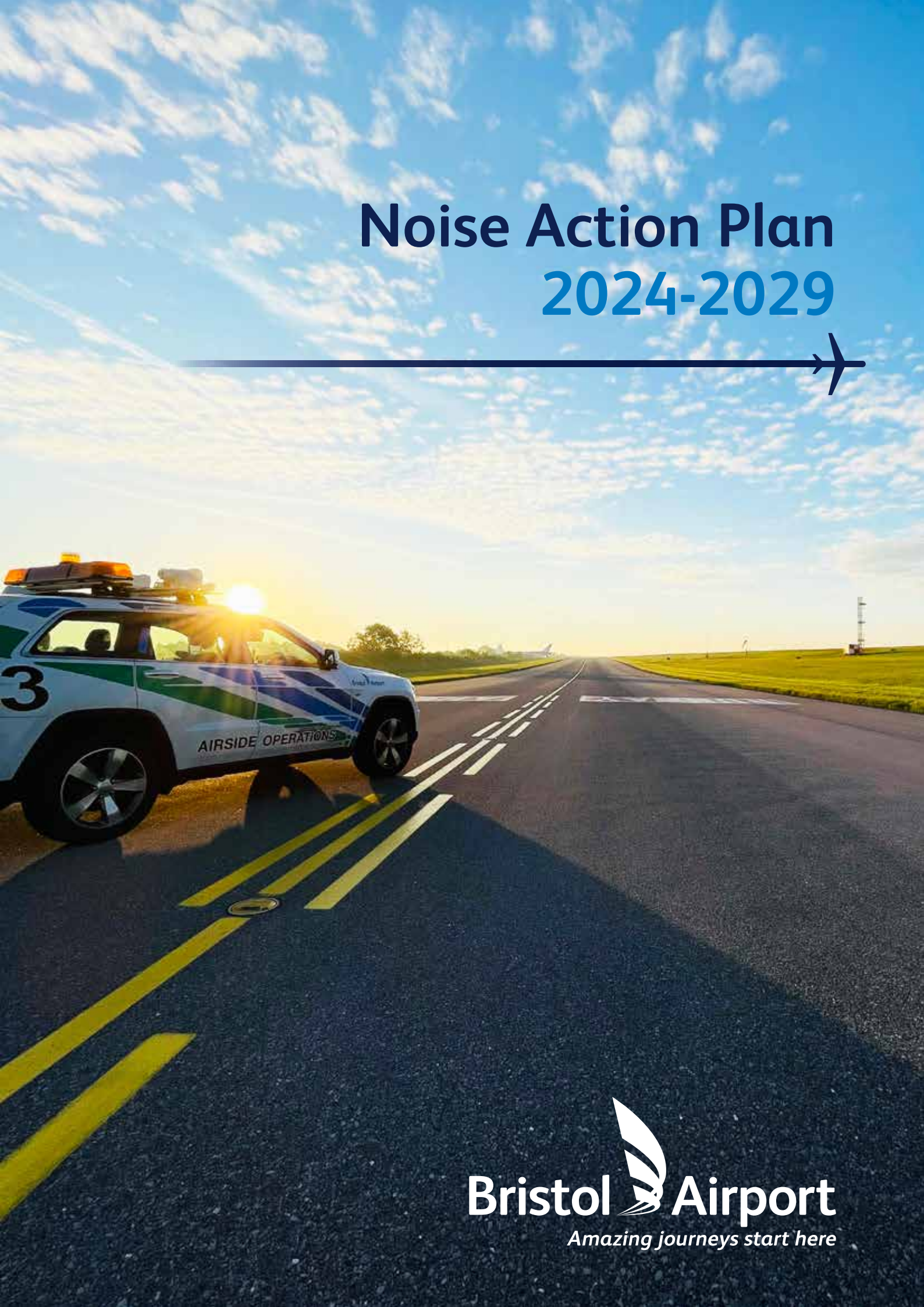
Noise Action Plan
2024-2029



Bristol Airport

Amazing journeys start here

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Foreword

Bristol Airport is the South West's gateway. We are critical to the success of our regional economy, providing links to over 120 destinations, including major European capitals and financial hubs.

With permission to grow to 12 million passengers per annum, this is an exciting time for both Bristol Airport and the region. As part of this permission, we have made new commitments on noise that recognise the need to minimise the impact of Airport operations on our local communities. We will be working closely with our airlines, NATS, and the Civil Aviation Authority to deliver on these commitments.

Our Noise Action Plan provides an opportunity to set out a new strategic direction for noise management over the next five years. It aims to limit and, where possible, reduce the impact of aircraft noise on our communities.

This Plan sets out our thinking so that comments can be sought ahead of the publication of a final version. We take consultation and the impacts of noise on the local community seriously and thank you in advance for your feedback.

Aviation continues to make real progress on noise and Bristol Airport is taking advantage of technological developments. The most modern aircraft, such as A320neo and Boeing 737MAX are noticeably quieter than the models they replace. These modern aircraft make up an increasing percentage of commercial flights taking off from the Airport. We are putting in place additional incentives for airlines to use these quieter aircraft at Bristol Airport.

To reduce the impact of arriving aircraft, Bristol Airport works with our airlines and national air traffic control to implement a system of Continuous Descent Approaches (CDAs), which minimises noise and fuel burn from aircraft. For 2023, we have introduced a new and highly ambitious target of 95% of our major airlines' planes achieving CDAs.

We will continue to meet with our airlines on a monthly basis to assess their performance on noise, clearly identify if targets are not being met, and agree how improvements will be made.

Over the next five years, we expect our local airspace to be modernised as part of UK-wide reforms, with the overall aim to make journeys quicker, quieter, and cleaner. Airspace modernisation is critical to the UK aviation's efforts to reach net zero and is expected to be responsible for around 10% of the emissions savings required. There will be thorough consultation with both our community and stakeholders ahead of the reforms.

Bristol Airport will continue to open itself up as a test bed for technological developments. Through the UK Government Future Flight programme, we are working with partners to explore the feasibility of electrical Vertical Take Off and Landing (eVTOL). We also continue to collaborate on the development of zero emissions hydrogen-powered flights through our partnerships with Airbus, Hynamics, and easyJet,as well as through the Hydrogen South West ecosystem.

By working in partnership with our airlines, business partners, regulators and communities, I am confident that we can achieve the actions contained in this Noise Action Plan.

Dave Lees
Chief Executive Officer
Bristol Airport


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Consultation

This Noise Action Plan covers the period 2024 to 2029, and where applicable, includes actions beyond this time period.

The version of this document was subject to public consultation and amendments to this plan have been made as a result of public feedback.

More information on the consultation period and responses can be found in Annex C.

Summary of the Noise Action Plan

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 during the period 2024 to 2029. It reflects our commitment to controlling the adverse effects of our operations and minimising their impact on the local community. This section presents a summary of the action plan.

Airport Description

Bristol Airport is England's third largest airport outside of London, handling an average of over 30,000 customers per day during the summer season. Located approximately seven miles southwest of Bristol city centre, it falls within the local authority administrative area of North Somerset Council (NSC). The airport is immediately adjacent to the A38 Bristol to Bridgwater Road, with two roundabout junctions providing access to the site.

Situated on a ridge of high ground known as Broadfield Down, Bristol Airport is flanked by the A370 Bristol to Weston-super-Mare Road and the M5 motorway, which are 4km and 11km away, respectively, to the north and west. The surrounding area is predominantly open, undulating countryside, featuring extensive woodland areas to the east and open farmland and settlements to the north, east, and south. To the northeast lies the settlement of Felton and associated Felton Common, with properties along the A38 and Downside Road immediately to the north, the latter's properties on the southern side sharing a boundary with the airport.

The airport's runway is aligned east-west, with the westerly runway designated as Runway 27 and the easterly as Runway 09. Aircraft generally take off and land into the wind, making Runway 27 the predominant runway. Since 2002, 76% of take-offs have been from Runway 27, although this varies annually.

The land surrounding the airport is predominantly rural, characterized largely by pasture farmland and common land adjacent to the village of Felton to the east of the airport boundary by the A38. Numerous villages are within the vicinity, including Felton (2km to the northeast), Winford (4km to the east), Cleeve (3km to the west), Wrington (to the southwest of the airfield), and Yatton (the largest village nearby, located 6.5km west of the airport on the southern part of its extended centreline). Parts of Congresbury, south of Yatton, also fall within the airport's noise contour maps. Additionally, several small, scattered communities and hamlets, such as Lulsgate Bottom, Downside, Potters Hill, and Redhill, lie in close proximity to the airport.

Authority responsible

Noise Action Plans and Strategic Noise Maps must be prepared to comply with The Environmental Noise (England) Regulations 2006. The Regulations define airport operators as the competent authority for non-designated[1] airports. Bristol Airport is the authority responsible.

Legal Context

The Environmental Noise (England) Regulations 2006 apply to environmental noise to which humans are exposed in particular in built-up areas, in public parks or other quiet areas in an agglomeration, near schools, hospitals and other noise-sensitive buildings and areas. These Regulations require strategic noise maps and noise action plans to be produced for many sources including major airports every five years. These Regulations implement Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise.

1 designated" when used in relation to any airport means designated under section 80 for the purposes of section 78 of the Civil Aviation Act 1982. This is Heathrow, Gatwick and Stansted.

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, 2017, and, most recently, in 2022 (based on 2021 data). 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. In this respect, the Noise Action Plan goes beyond the legal requirements of the Regulations.

There are many other legal requirements as well as local and national policy requirements which influence noise management at Bristol airport. Further details of these are provided in the main body of this Noise Action Plan.

Noise limits

Article V of the Directive allows Member States to inform the European Commission of any relevant limit values in force within their territories or under preparation, expressed in terms of Lden and Lnight and where appropriate, Lday and Levening, for road-traffic noise, rail-traffic noise, aircraft noise around airports and noise on industrial activity sites. The Secretary of State for DEFRA publishes guidance to Airport Operators on limit values. The current guidance states that "Reference should be made to any planning conditions or other agreements that set a constraint on the airports operations that could affect the level of noise generated. These might include any contour area limits, noise limits on departure, or aircraft movement limits etc."

The following limit values are already in place at Bristol in relation to the recent planning application for 12 million passengers per annum.

Contour limit - 10mppa – Day	Upon commencement of development, up to the passenger throughput at Bristol Airport exceeding 10 million passengers in any 12-month period, the area enclosed by the 57dB $L_{Aeq\ 16h}$ daytime noise contour shall not exceed 12.42 km^2.
Contour limit -11mppa – Day	Upon the passenger throughput at Bristol Airport exceeding 11 million passengers in any 12-month period the area enclosed by the 57dB $L_{Aeq\ 16h}$ daytime noise contour shall not exceed 11.56 km^2
Contour limits 12mppa – Day	The area enclosed by the 57 dB L_{Aeq} 16h daytime noise contour shall not exceed 10.70 km^2 from when passenger throughput at Bristol Airport reaches 12 mppa in any 12-month period.
Contour limits 12mppa – Night	The area enclosed by the 55 dB $L_{Aeq,8h}$ night- time noise contour shall not exceed 6.8km^2 from when passenger throughput at Bristol Airport reaches 12 mppa in any 12-month period.

Strategic noise mapping summary

A summary of the noise mapping is provided below.

Contour	Area (km²) within L_{den} contour	Area (km²) within L_{day} contour	Area (km²) within L_{eve} contour	Area (km²) within L_{night} contour	Area (km²) within $L_{Aeq,16hr}$ contour
45 dB	-	-	-	14.0 (32.8) [30.0]	-
50 dB	25.8 (54.5) [48.8]	18.3 (35.7) [30.1]	9.4 (24.5) [18.3]	5.6 (12.4) [11.3]	16.2 (33.0) [27.8]
55 dB	10.0 (21.9) [19.1]	7.2 (13.5) [11.7]	3.3 (9.1) [6.8]	1.9 (4.6) [4.3]	6.3 (12.4) [10.6]
60 dB	3.7 (8.4) [7.4]	2.6 (5.2) [4.5]	1.1 (3.2) [2.3]	0.7 (1.6) [1.4]	2.2 (4.7) [4.0]
65 dB	1.3 (2.9) [2.6]	1.0 (1.8) [1.5]	0.5 (1.1) [0.8]	0.4 (0.6) [0.6]	0.8 (1.6) [1.3]
70 dB	0.6 (1.1) [0.9]	0.5 (0.7) [0.6]	0.2 (0.4) [0.3]	0.2 (0.3) [0.3]	0.4 (0.6) [0.6]
75 dB	0.3 (0.5) [0.4]	0.2 (0.3) [0.3]	0.1 (0.2) [0.1]	-	0.2 (0.3) [0.3]

Noise Level (dB)	Number of dwellings	Number of people
≥55	500 (1,400) [900]	1,100 (3,000) [2,200]
≥60	50 (550) [350]	<100 (1,000) [800]
≥65	0 (<50) [<50]	0 (<100) [<100]
≥70	0 (0) [<50]	0 (0 [<100]
≥75	0 (0) [0]	0 (0) [0]

Noise Level (dB)	Number of dwellings	Number of people
≥48	350 (1,050) [800]	800 (2,300) [2,000]
≥51	100 (550) [450]	200 (1,200) [1,100]
≥54	<50 (250) [200]	<100 (500) [500]
≥57	0 (<50) [<50]	0 (<100) [<100]
≥60	0 (<50) [<50]	0 (<100) [<100]
≥63	0 (0) [<50]	0 (0) [<100]
≥66	0 (0) [0]	0 (0) [0]

UK Government guidance has required airport operators to *"More generally, examine the day, evening, and night results produced from the noise mapping and consider whether there are any features of the noise impact from departing or arriving aircraft that might be managed further."* This has historically resulted in a comparison of strategic noise mapping data over the most recent reporting periods.

This approach is not appropriate for 2021 due to the impacts of the pandemic on air traffic movements. This is acknowledged in recent guidance from DEFRA which states *"The Noise Action Plan process uses the mapping results and is designed to manage noise issues and effects arising from aircraft departing from and arriving at those airports. Airport Noise Action Plans need to be published by February 2024. Due to Covid travel restrictions, however, mapping for 2021 is likely to show a highly anomalous situation for most airports, and Noise Action Plans drawn up solely on the basis of 2021 data may not result in effective actions within the current and future context of Round 4. It is in the interests of airports and communities for Noise Action Plans to draw on information which best reflects the situation for the Round 4 Noise Action Plan period as appropriate. As a result, airports may supplement the 2021 data with information from a more representative period when drawing up Noise Action Plans. This information is likely to vary from airport to airport, but, if relevant, may include (but is not restricted to) noise contours from the most recent previous round; contours produced to meet other requirements; measured noise data or projections. Decisions as to what data to use should be discussed with the relevant consultative committee or other community groups as appropriate."*

In addition to strategic noise mapping, noise contours are now produced on an annual basis to track compliance with noise contour limits and assess eligibility for the Noise Insulation Grant scheme. The most recent annual contours were produced in January 2023. These annual contours are produced for the 92 day summer period and not the 365 day average required for strategic noise maps. Like for like comparisons cannot be made as for seasonal airports the summer period is busier and therefore noise levels are higher compared to an annual average.

The total number of annual movements for the last round of strategic noise maps in 2016 was around 74,000 movements, compared to approximately 30,000 in the 2021 scenario. The most recent annual data from the CAA was a total of 66,000 for 2022. The 2021 strategic noise maps should therefore be considered only to represent a snapshot in time and should not be compared to previous years.

Public consultation

Following public consultation with the Airport's Environmental Effects Working Party, a sub-group to the ACC, feedback was received on the Noise Action Plan. Chapters of aircraft, national policy guidance and regulations, noise monitoring and night flights were key topics of discussion. More information on the feedback received during public consultation can be found in Annex C of the Noise Action Plan.

Noise-reduction measures already in force and any projects in preperation

In February 2022, planning permission was allowed for the development of Bristol Airport to handle increased passenger numbers of up to 12 million passengers per annum. Bristol Airport put forward a range of new controls in relation to aircraft noise through this planning application process. This means that certain aspects of the airport's operations, including commitments in this Noise Action Plan, are controlled and regulated through planning conditions. These include:

Planning condition 5 and 13 – restricts passenger movements to 12 million passengers per annum and Air Transport Movements to 85,990.

Planning conditions 14, 15 & 37 – limit on the area of the daytime 57dB LAeq,16hour noise contour (≤10.7 km2 for 12mppa) & limit on the area of the nighttime contour (≤6.8 km2 for 12mppa). These contours are summer average contours not annual average contours used for strategic noise mapping. Forecast aircraft movements and consequential forecast and actual noise contours for the forthcoming year must be reported to the Local Planning Authority annually within the Annual Operations Monitoring

Report. The annual reports must include contour areas and a comparison of predicted summer levels against measured noise levels at the noise monitoring terminals.

Planning condition 16 - 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 17 - the number of aircraft movements for 12 months (for the avoidance of doubt this will be two adjoining seasons of Summer and Winter) between the hours of 23:30 and 06:00 limited to 4000.

Planning condition 18 limits the total number of take-offs and landings during the shoulder periods (06:00 and 07:00 and between 23:00 and 23:30) to 9,500 in any calendar year.

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 (NCS) and the adoption of operational procedures and practices aimed at achieving ongoing improvements in the levels of noise and minimising its impact. This includes mechanisms to impose penalties for the breach of noise limits, the publication of an airline performance league table, and to provide incentives for the use of quieter aircraft, as well as further measures to encourage operators of aircraft to adopt operational procedures and practices aimed at achieving ongoing improvements in levels of noise including:

- The use of continuous descent approaches where practicable;
- The avoidance of reverse thrust between 23:00 and 07:00;
- The application of best practice flight management procedures which might reasonably be expected to reduce noise and fuel burn.

The Section 106 includes a requirement for the airport to provide at regular (3 year) intervals verification reports which shall identify input data, methodology, and output data used for the calculation of noise contours.

A planning obligation relating to community benefit requires the establishment of an Airport Environmental Improvement Fund, the purposes of which include funding 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. An enhanced sound insulation scheme was agreed within the Unilateral Undertaking which accompanied the 2022 planning permission. Further details are below.

Ground Noise Management Strategy: 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 that forms part of the 2011 planning permission. The current 2023 planning permission requires an updated ground noise management strategy to be submitted and approved by the local planning authority. This should identify measures to reduce noise from pre-flight servicing, measures to reduce and phase out mobile diesel generators, and measures to reduce engine noise while taxiing. The 2023 strategy will also include the installation of a new permanent ground noise monitor.

Actions which the competent authorities intend to take in the next five years, including any measures to preserve quiet areas

This action plan provides details of on-going and new actions which will be implemented over the next five years and beyond. These are new in the context Round 4 of the Noise Action Plan process. These actions were not included in the Round 3 Noise Action Plan. These are however actions already in force as compliance with these actions is required by planning conditions.

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 serve between 10 and 12 million passengers per annum by 2030.

In 2017/18, Bristol Airport held an initial consultation on a draft updated Master Plan, including options for phased growth to circa 20 million passengers per annum by 2050. This draft Master Plan also set out the proposals for development to 12 million passengers per annum, which were subsequently approved through the planning process.

Following a pronounced recovery from the COVID pandemic, Bristol Airport intends to review its long term plans, taking into account future demand and technology, with an updated Master Plan to be developed and consulted upon in due course.

Financial Information

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

Provisions envisaged for evaluating the implementation and the results of the action plan

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 LAmax 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.

Estimates in terms of number of people affected above various dB L_{den} and L_{night} noise levels for 2026 under a 12 million passenger per annum scenario.

Contour	No. of people 12 mppa 2026 L_{den}	No. of people 12 mppa 2026 L_{night}
45	-	9,800
50	16,050	2,050
55	6,400	550
60	1,400	3
65	150	0
70	3	0
75	0	0

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, L_{AMAX}, 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 L_{den} noise contour however the effects of ground noise were not considered in the strategic mapping in 2017.	Residents within the 55db L_{den} noise contour and up to 25 miles from the Airport for measures such as CDA and track keeping performance.	Residents within the 55db L_{den} noise contour and elsewhere in relation to deviations from recommended flight paths.	Residents within the 55db L_{den} noise contour and elsewhere in relation to deviations from recommended flight paths.	Residents within the 55db L_{den} noise contour and beyond.
Priorities	High	High	Medium	Medium	High

Introduction

2.1. Purpose

The Noise Action Plan aims 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 (as adopted into UK law) and The Environmental Noise (England) Regulations 2006 (as amended).

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 2024 to 2029. It reflects our commitment to controlling the adverse effects of our operations and minimising their impact on the local community.

This Noise Action Plan is based on the results of strategic noise mapping produced under the terms of the Regulations and it reflects the UK Government's refreshed aim to limit and where possible reduce the impact of aircraft noise[1].

Noise from aircraft operations continues to be a significant concern for our surrounding communities and this is consistent with other UK airports. Through the revised Noise Action Plan, we are seeking to continue to enhance our existing noise management programme and take account of new commitments agreed as part of our latest planning permission.

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, 2017, and, most recently, in 2022 (based on 2021 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. In this respect, the Noise 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 this Noise Action Plan does not consider noise associated with road traffic or construction activities. The UK Government has made separate arrangements for the preparation of Action Plans for major roads, major railways and agglomerations[2].

2.2. 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 UK 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 Regulations[3]. The Regulations include specific requirements that the Action Plan should conform to.

A consultation period was held for this Noise Action Plan in Summer 2023 for nine weeks. Stakeholders engaged with include our Airport Consultative Committee and Environment Effects Working Group, North Somerset Council, and parish councils, prior to submission to the Department for Environment, Food, and Rural Affairs (DEFRA).

1 Overarching aviation noise policy, 27/03/2023 https://www.gov.uk/government/publications/aviation-noise-policy-statement/overarching-aviation-noise-policy

2 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 Guidance for Airport Operators on how to revise Noise Action Plans under the Environmental Noise (England) Regulations 2006 (as amended) – September 2022

2.3. General Requirements

This Noise Action Plan must aim to protect 'quiet areas' 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 previously resulted in the establishment of Noise Preferential Routes (NPRs), which are described further in the context of Bristol Airport in Section 6. These routes are designed to minimise noise annoyance by concentrating aircraft departures along routes avoiding the more densely populated areas as far as practicable. The NPRs will be maintained in the future.

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 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 the Action Plan includes an already existing commitment to manage the flight paths so that the height of aircraft in this area is maximised.

UK 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. Details of forthcoming national and local airspace modernisation is covered in Section 10.


Roof Terrace

Airport Description

3.1. Location

Bristol Airport is England's third largest airport outside of London, handling an average of over 30,000 customers per day in the summer season.

We are an essential part of the region's transport network, providing direct connections to over 120 destinations.

Bristol Airport is located approximately seven miles south west of Bristol city centre and within the local authority administrative area of North Somerset Council (NSC). 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, 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, car hire, 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. Since 2002, 76% of take-offs have been from Runway 27, but this varies from year to year.

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 villages within the vicinity. These include Felton, located 2km to the northeast; Winford, which is situated 4km to the east; Cleeve 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.

3.2. 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 8 million per year. Following the COVID pandemic, in 2022 Bristol Airport recovered strongly, with this continuing into 2023.

In 2018, an initial public consultation was held on plans to prepare a new Master Plan, with draft proposals including development proposals for the airport through to 2040 and beyond. In due course, Bristol Airport will produce a Master Plan to be developed and consulted upon.

3.3. Airport Development

In February 2022, planning permission was allowed for the development of Bristol Airport to handle increased passenger numbers of up to 12 million passengers per annum. The planning permission is subject to 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 2022 and reflect the noise climate in 2021.


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Noise and Regulation, Guidance and Reports

4.1. 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:.[4]

- Mitigate aviation noise through selection at a local level the optimum combination of four key measures:
  - Reducing noise at source (from use of quieter aircraft);
  - Making best use of land (plan and manage the land surrounding airports);
  - Introducing operational noise abatement procedures (by using specific runways, routes or procedures); and
  - 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.

4.2. National Regulations, Guidance and Reports

European Regulations

As adapted into UK law by the European Union (Withdrawal) Act 2018:

- 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).

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

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

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 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 (2021)[5]

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. 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 (last updated 22 July 2019).

5 Ministry of Housing, Communities & Local Government, 2021. National Planning Policy Framework. Available online https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf [Checked 02/05/2023]

Overarching Aviation Noise Policy (March 2023)[6]

In March 2023 the government published their revised overarching aviation noise policy statement with the intention to *"provide clarity for airports and their stakeholders preparing or responding to noise action plan consultations"*. The revised overarching aviation noise policy statement is:

"The government's overall policy on aviation noise is to balance the economic and consumer benefits of aviation against their social and health implications in line with the International Civil Aviation Organisation's Balanced Approach to Aircraft Noise Management. This should take into account the local and national context of both passenger and freight operations, and recognise the additional health impacts of night flights.

The impact of aviation noise must be mitigated as much as is practicable and realistic to do so, limiting, and where possible reducing, the total adverse impacts on health and quality of life from aviation noise."

The above text is the policy statement. Additional contextual information is reproduced below

"In Aviation 2050 we consulted on setting a new objective "to limit, and where possible, reduce total adverse effects on health and quality of life from aviation noise." This was to bring national aviation noise policy in line with airspace policy updated in 2017.

Consultation responses had general support for focus on the total adverse effects, although some respondents highlighted the potential ambiguity of "limit, and where possible, reduce", with some suggestions that policy should be to reduce aviation noise.

We consider that "limit, and where possible reduce" remains appropriate wording. An overall reduction in total adverse effects is desirable, but in the context of sustainable growth an increase in total adverse effects may be offset by an increase in economic and consumer benefits. In circumstances where there is an increase in total adverse effects, "limit" would mean to mitigate and minimise adverse effects, in line with the Noise Policy Statement for England."

Flightpath to the Future (May 2022)[7]

Flightpath to the Future (FttF) advised that:

"given the unprecedented challenges that the aviation sector has faced as a result of the coronavirus (COVID-19) pandemic, we have decided we will not publish a further formal response to the remaining parts of this consultation.

Instead, in May 2022, the government published Flightpath to the future, a strategic framework that builds upon the consultation responses received. It establishes our ambitions and commitments for aviation over the next 10 years."

FttF contains a ten point plan for the future of UK aviation. Point 4 includes that the Government will *"continue to work with the sector to reduce the localised impacts of aviation from noise and air pollution".*

FttF also details how the CAA has assumed most of the functions previously performed by ICCAN and that the Government will work closely with the CAA on these issues. *"This will include collaboration on the CAA's plans to create a new Sustainability Panel, designed to provide independent expert advice on a range of environmental issues including carbon, noise and air quality."*

It is also stated that:

"the Government set out new policy proposals to tackle these localised impacts through the Aviation 2050 consultation (2018). These included a clearer noise policy framework alongside measures to incentivise best operational practice to reduce noise and measures to improve airport noise insulation schemes. As the sector recovers, and air travel volumes increase again, these aims remain very relevant and we will set out next steps in 2022/23".

Aviation 2050: The Future of UK Aviation (December 2018)

Aviation 2050 outlines proposals for a new aviation strategy and addresses a wide range of associated issues. The Strategy sets out that the Government intends to put in place a stronger and clearer framework in order to ensure the sector is sufficiently incentivised to reduce noise, or to put mitigation measures in place where reductions are not possible.

6 https://www.gov.uk/government/publications/aviation-noise-policy-statement (checked 02/05/2023)
7 https://www.gov.uk/government/publications/flightpath-to-the-future-a-strategic-framework-for-the-aviation-sector (checked 02/05/2023)

Aviation 2050 also set out in paragraph 3.122 that the Government proposes the noise insulation measures including:

- "To extend the noise insulation policy threshold beyond the current 63 dB $L_{Aeq,16h}$ contour to 60 dB $L_{Aeq,16h}$".
- "To require all airports to review the effectiveness of existing schemes. This should include how effective the insulation is and whether other factors (such as ventilation) need to be considered, and also whether levels of contributions are affecting take-up";
- "The Government or the Independent Commission on Civil Aviation Noise (ICCAN) to issue new guidance to airports on best practice for noise insulation schemes, to improve consistency".

Aviation Policy Framework (2013)[8]

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 $L_{Aeq,16h}$[9] 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.

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

8 https://www.gov.uk/government/publications/aviation-policy-framework (checked 02/05/2023)

9 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.

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.

Where airport operators are considering developments which result in an increase in noise, as a minimum the Government expects airport operators to offer financial assistance towards acoustic insulation to residential properties which are exposed to levels of noise of 63 dB $L_{Aeq,16h}$ or more. The 3 dB minimum change requirement for properties newly exposed to these levels will no longer apply.

The APF currently sets a level of 57 dB $L_{Aeq,16h}$ as the average level of daytime noise marking the approximate onset of significant community annoyance, however the Government currently acknowledges a lower level of 54 dB $L_{Aeq,16h}$ as corresponding to this.

This approach leads to the production of noise contours, as evidenced by Heathrow Airport's annual noise contour report[10], in 3 dB steps down to 54 dB $L_{Aeq,16h}$ for daytime noise and 48 dB $L_{Aeq,8h}$ for night-time noise.

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

10 Heathrow Airport 2016 Summer Noise Contours and Noise Action Plan Contours, ERCD Report 1701, Civil Aviation Authority.

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.

Airport National Policy Statement: new runway capacity and infrastructure at airports in the South East of England (June 2018)

Following a consideration of responses to both the February and October consultations, and the report published by the Transport Committee on 23 March 2018, this final Airports NPS includes some further changes, principally to provide greater clarity and reflect updates to wider Government policies.

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.

The Airports NPS sets out the Government's policy on the need for new airport capacity in the South East of England. The Government recognises noise related action will need to be taken. Such action should strike a fair balance between the negative impacts of noise and positive impacts of flights.

Sustainable Aviation's Noise Road Map

Bristol Airport is a member of Sustainable Aviation which has a long term strategy setting out the collective approach of UK aviation to tackle the challenge of ensuring a sustainable future for our industry. As a result Sustainable Aviation is committed to a range of goals. One of these goals is to limit and, where possible, reduce the impact of aircraft noise. Through the publication of Sustainable Aviation's Noise Road Map, Sustainable Aviation are working to ensure the identified opportunities and industry commitments are realised[11].

Reports (including surveys)

Final Report of the Airports Commission (July 2015)

Concludes that to provide a new runway in the South East by 2030, it is best to expand Heathrow's runway capacity. The favoured option (out of two Heathrow options and one Gatwick option) is the new Northwest Runway Heathrow option. The Commission recommended a significant package of measures to address environmental and community impacts. Such measures include, but not limited to, ban on all scheduled night flights in the period 11.30pm to 6.00am, a clear 'noise envelope' should be agreed, allow periods of predicable respite to be more reliably maintained, an independent aviation noise authority should be established with a statutory right to be consulted on flight paths and other operating procedures.

The Commission noted in its final report that a new runway will not open for at least 10 years. It therefore considered it imperative that the UK continues to grow its domestic and international connectivity in this period, which it considered would require more intensive use of existing airports other than Heathrow and Gatwick.

Survey of Noise Attitudes [SoNA] (2014), CAP 1506 (February 2017 & July 2021)

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 $L_{Aeq,16h}$, Lden, 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.

11 http://www.sustainableaviation.co.uk/

Survey of Noise Attitudes 2014: Aircraft Noise and Sleep Disturbance CAP 2161 (July 2021)

This report describes results within a research study to obtain new and updated evidence on attitudes to aviation noise around airports in England (SoNA 2014). The study was commissioned by the Department for Transport, and this report focused on self-reported attitudes to sleep disturbance from aircraft noise, taken from responses to questions from within the larger SoNA 2014 study.

The study compared reported mean night-time disturbance scores against average night noise exposure defined using three different noise indicators: average summer night $L_{Aeq,8h}$, annual average night L_{night}, and average summer night N60. While all three metrics were highly correlated with self-reported sleep disturbance there is insufficient evidence to change from the current practice of using average summer night $L_{Aeq,8h}$ noise exposure for UK assessments.

The study also considered whether summer night, average mode, was still the best time period to use as opposed to single-mode. There was no compelling evidence to move away from the standard practice of using an average summer night. However, it was recommended that future studies investigate associations with the highest noise level of either westerly or easterly mode.

For a given noise exposure, a higher proportion of respondents was found to be highly sleep disturbed compared with the Miedema pre-1990 dose-response function. This was similar to the daytime conclusion of the SoNA 2014 study into daytime annoyance.

Local Planning Framework

Bristol City Council's Local Plan

In March 2019, 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 Local Plan 2038 (March 2022)

North Somerset are consulting on their preferred options Local Plan. This new Preferred Options document identifies where development can and cannot take place in North Somerset and guides investment and funding for new housing, jobs, transport and community facilities until 2038.

Policy LP11 states for Bristol Airport:

"Within the Bristol Airport Green Belt inset as defined on the Policies Map, the development of facilities which contribute to sustainable improvements to operational efficiency and passenger safety at the airport may be acceptable provided that:

- *The proposed use requires an airport location and is considered appropriate within the Green Belt inset;*
- *The impacts of the operation of the airport on the living conditions of residents and the environment, including noise, air quality, visual and landscape impact, biodiversity and climate change, are not unacceptable.*
- *Appropriate surface access improvements including major public transport infrastructure (such as Mass Transit) are provided in step with development to mitigate the adverse impact of airport traffic on local communities and the highway network and facilitate a sustained modal shift to public transport.*
- *Proposals must be accompanied by an agreed surface access strategy with identified funding and trigger points;*
- *Improvements are made to the local highway network serving the airport including junction capacity, highway safety, footways and cycleways to mitigate the adverse impacts of airport operations; and*
- *Benefits to the local economy and community are maximised.*

Detailed guidance will be provided through the preparation of an airport SPD."

Bristol Airport

Following a planning appeal[12], the airport was granted planning consent (February 2022) for the development of the airport to enable 12 million passengers per annum.

Bristol Airport put forward a range of new controls in relation to aircraft noise through this process. This means that certain aspects of the airport's operations, including commitments in this Noise Action Plan, are controlled and regulated through planning conditions. These include:

12 Appeal Decision APP/D0121/W/20/3259234

- Planning condition 5 and 13 – restricts passenger movements to 12 million passengers per annum and 85,990 Air Transport Movements.
- Planning conditions 14, 15 & 37 – limit on the area of the daytime 57dB $L_{Aeq,16hour}$ noise contour (≤10.7 km^2 for 12mppa) & limit on the area of the night-time contour (≤6.8 km^2 for 12mppa). These contours are summer average contours not annual average contours used for strategic noise mapping. Forecast aircraft movements and consequential forecast and actual noise contours for the forthcoming year must be reported to the Local Planning Authority annually within the Annual Operations Monitoring Report. The annual reports must inlcude contour areas and a comparison of predicted summer levels against measured noise levels at the noise monitoring terminals.
- Planning condition 16 - 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 17 - the number of aircraft movements for 12 months (for the avoidance of doubt this will be two adjoining seasons of Summer and Winter) between the hours of 23:30 and 06:00 limited to 4000.
- Planning condition 18 - the total number of take-offs and landings between the shoulder periods (06:00 and 07:00 and between 23:00 and 23:30) limited to 9,500 in any calendar year.
- 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 (NCS) and adoption of operational procedures and practices aimed at achieving ongoing improvements in the levels of noise and minimising its impact. This includes a mechanism to impose penalties for the breach of noise limits, the publication of an airline performance league table, and provide incentives for the use of quieter aircraft as well as further measures to encourage operators of aircraft to adopt operational procedures and practices aimed at achieving ongoing improvements in levels of noise including:
- The use of continuous decent approaches where practicable;
- The avoidance of reverse thrust between 23:00 and 07:00;
- The application of best practice flight management procedures which might reasonably be expected to reduce noise and fuel burn.

The Section 106 includes a requirement for the airport to provide at regular (3 year) intervals verification reports which shall identify input data, methodology and output data used for the calculation of noise contours.

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.

An enhanced sound insulation scheme was agreed within the Unilateral Undertaking which accompanied the 2022 planning permission. Further details are below.

Ground Noise Management Strategy

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.

The current 2023 planning permission requires an updated ground noise management strategy to be submitted and approved by the local planning authority. This should identify measures to reduce noise from pre-flight servicing, measures to reduce and phase out mobile diesel generators and measures to reduce engine noise while taxiing. The 2023 strategy will also include the installation of a new permanent ground noise monitor.

Sustainability Strategy

The Airport is also in the process of drafting a new Sustainable 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 later in 2023.

Noise Mitigation Scheme

The requirements of the sound insulation package offered by the airport are defined within the Unilateral Undertaking which accompanied the 2022 planning permission. This new scheme will apply on the commencement of the development. Grants will be made available to residents towards the cost of sound insulation improvement works designed to achieve recommended (BS8233/ World Health Organisation) internal noise levels.

The following grants will be available.

- ≥ 57 dB $L_{Aeq,16h}$ daytime - £5,000
- ≥ 60 dB $L_{Aeq,16h}$ daytime - £8,000
- ≥ 55 dB $L_{Aeq,8h}$ night time - £5,500

Aeronautical Information Publication (AIP)

The Aeronautical Information Publication (AIP)[13] 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.

13 AIP, (April 2023). Available at https://www.aurora.nats.co.uk/htmlAIP/Publications/2023-04-20-AIRAC/html/index-en-GB.html


easyJet
easyJet

Noise Management Framework

As noted in Bristol Airport's previous Noise Management Plan 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.
- To incentivise the increased use of quieter aircraft at the Airport.

5.1. 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. MPGU'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 all further new stands on the western and eastern aprons moving forward. 8 stands currently have FEGP and it was used by 408 aircraft in turnarounds in 2021.

The running of aircraft engines on the ground is an essential safety aspect of aircraft maintenance. However, it is also one of the noisier activities at the Airport. 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 2022 there were 416 engine runs, the vast majority were at 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.

A noise barrier has been installed adjacent to the A38/Downside Road to reduce ground noise.

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 formed part of the 2011 planning permission. The 2022 planning permission (S106) requires an updated Ground Noise Management Strategy to be submitted within six months of commencement of the development.

5.2. 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 Airport is in the early stages of airspace modernisation, which is part of UK-wide reforms, which aim to reduce emissions and provide an opportunity to minimise noise impacts. Details of these reforms and timescales are detailed in Section 10.

5.2.1. Approach Procedures

There are standard arrival routes set out in the 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 expeditious 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 dB[14]. 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 undertake a racetrack procedure 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 during quarterly Flight Operations Sub Committee meetings and we are exploring opportunities to implement similar techniques from the north in the longer term. RNAVs are more likely to be a consideration for forthcoming airspace modernisation. 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 equipage rate is close to 100%.

Further detailed consideration of RNAV routes, to include departure routes, are expected to be included in the forthcoming airspace modernisation (see Section 10). 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 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 procedures[15] with the aim of introducing them within the latter part of the next decade.

5.2.2. 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

14 CAP 1554 Review of Arrival Noise Controls
15 CAP 1616: Airspace Design: Guidance on the regulatory process for changing airspace design including community engagement requirements.

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 UK Aeronautical Information Publication (UK 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.

5.2.3. 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.

5.2.4. 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 75% of the Runway Fee and Air Traffic Control Fee applies to each turnaround (i.e. 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.

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 5EPNdB of Chapter 3 certification limits.

A 200% surcharge applies to those not meeting Chapter 3. No chapter 3 high[16] aircraft are currently operating at Bristol Airport.

5.2.5. Night Flying

Night time airborne noise is currently controlled by a noise quota system, the provisions of which are regulated by planning condition 16.

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 procedures[17], 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.

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

The number of aircraft movements in the 'shoulder periods' of the night, from 06:00 to 07:00 and from 23:00 to 23:30, is limited to no more than 9,500 a year.

16 Chapter 3 high applies to those Chapter 3 aircraft whose certified noise performance lies within 5EPNdB of Chapter 3 certification limits.
17 Annex 16 to the Convention on International Civil Aviation, Environmental Protection, Volume 1, Aircraft Noise

5.3. Measures to Mitigate the Effects of Aircraft Noise

Noise insulation grants were previously provided to residential properties that regularly experienced noise levels above an L_{Ae} (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.

The 2011 planning permission included 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. This is consistent with UK Government policy for providing acoustic insulation to residential dwellings affected by aviation noise.

The 2022 planning permission introduces a new grant scheme. The requirements of the sound insulation package offered by the airport are defined within the Unilateral Undertaking which accompanied the 2022 planning permission.

Grants will be made available to residents towards the cost of sound insulation improvement works designed to achieve recommended (BS8233/World Health Organisation) internal noise levels.

The following grants will be available.

- ≥ 57 dB $L_{Aeq,16h}$ daytime - £5,000
- ≥ 60 dB $L_{Aeq,16h}$ daytime - £8,000
- ≥ 55 dB $L_{Aeq,8h}$ night time - £5,500

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).

5.4. 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 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 independently of Bristol Airport. 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 air traffic control enabling the aircraft track to be recorded and compared with the published routes (as shown at Annex B). Google Earth files have been replaced by Webtrak, a flight track keeping system by Envirosuite with

a friendly user interface. The tracks are colour coded for departures and arrivals. Webtrak also shows other relevant information such as weather.

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

The noise monitoring programme records noise using a wide range of noise indicators including L_{Amax} and L_{eq}. It is used to monitor noise and track infringements and performance by airlines at achieving CDAs.

5.5. 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 inciting 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 airports 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[18] or alternatively queries can be raised by email (Sustainability@Bristolairport.com) or you can write to: Sustainability, Bristol Airport, Lulsgate House, Bristol, BS48 3DW. 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.

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.

18 Visit: https://www.bristolairport.co.uk/about-us/environment/noise-management


easyJet

Results of the 2021 Noise Mapping

6.1. Contour Methodology

The mapping used to prepare this action plan has been produced using 2021 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 Department for Environment, Food and Rural Affairs (Defra). The noise contours and associated data were produced using the FAA AEDT (Aviation Environmental Design Tool) 3d. 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 2021, 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 2022. These are as follows:

- Day, evening and night (L_{den}) – the L_{Aeq} over the period 00:00 to 23:59, 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 (L_{night}) – the L_{Aeq} over the period 23:00 to 07:00 (an annual average);
- Day (L_{day}) – the L_{Aeq} over the period 07:00 to 19:00 (an annual average);
- Evening ($L_{evening}$) – the L_{Aeq} over the period 19:00 to 23:00 (an annual average); and
- 16 hour day ($L_{Aeq, 16h}$) – the L_{Aeq} over the period 07:00 to 23:00 (an annual average).

The Regulations identify the $L_{Aeq, 16h}$, L_{day}, and $L_{evening}$ 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. 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 $L_{Aeq,16h}$ 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 L_{den} and L_{night} 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 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 2011 numbers in square brackets, 2016 numbers in round brackets and 2021 numbers without brackets.

2021, 2016 and 2011 Contour results and comparison

Table 1: Estimated areas within contour bands by noise indicator (2011 numbers in square brackets, 2016 numbers in round brackets and 2021 numbers without brackets.

Contour	Area (km²) within L_{den} contour	Area (km²) within L_{day} contour	Area (km²) within L_{eve} contour	Area (km²) within L_{night} contour	Area (km²) within $L_{Aeq,16hr}$ contour
45 dB	-	-	-	14.0 (32.8) [30.0]	-
50 dB	25.8 (54.5) [48.8]	18.3 (35.7) [30.1]	9.4 (24.5) [18.3]	5.6 (12.4) [11.3]	16.2 (33.0) [27.8]
55 dB	10.0 (21.9) [19.1]	7.2 (13.5) [11.7]	3.3 (9.1) [6.8]	1.9 (4.6) [4.3]	6.3 (12.4) [10.6]
60 dB	3.7 (8.4) [7.4]	2.6 (5.2) [4.5]	1.1 (3.2) [2.3]	0.7 (1.6) [1.4]	2.2 (4.7) [4.0]
65 dB	1.3 (2.9) [2.6]	1.0 (1.8) [1.5]	0.5 (1.1) [0.8]	0.4 (0.6) [0.6]	0.8 (1.6) [1.3]
70 dB	0.6 (1.1) [0.9]	0.5 (0.7) [0.6]	0.2 (0.4) [0.3]	0.2 (0.3) [0.3]	0.4 (0.6) [0.6]
75 dB	0.3 (0.5) [0.4]	0.2 (0.3) [0.3]	0.1 (0.2) [0.1]	-	0.2 (0.3) [0.3]

Table 2: Estimated total number of people and dwellings above various dB L_{den} noise levels 2011 numbers in square brackets, 2016 numbers in round brackets and 2021 numbers without brackets.

Noise Level (dB)	Number of dwellings	Number of people
≥55	500 (1,400) [900]	1,100 (3,000) [2,200]
≥60	50 (550) [350]	<100 (1,000) [800]
≥65	0 (<50) [<50]	0 (<100) [<100]
≥70	0 (0) [<50]	0 (0 [<100]
≥75	0 (0) [0]	0 (0) [0]

Table 3: Estimated total number of people and dwellings above various noise levels, L_{day} (2011 numbers in square brackets, 2016 numbers in round brackets and 2021 numbers without brackets.).

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

Table 4: Estimated total number of people and dwellings above various noise levels, $L_{evening}$ (2011 numbers in square brackets, 2016 numbers in round brackets and 2021 numbers without brackets.).

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

Table 5: Estimated total number of people and dwellings above various noise levels, $L_{Aeq,16h}$ (2011 numbers in square brackets, 2016 numbers in round brackets and 2021 numbers without brackets.).

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

Table 6: Estimated total number of people and dwellings above various noise levels, L_{night} (2011 numbers in square brackets, 2016 numbers in round brackets and 2021 numbers without brackets.).

Noise Level (dB)	Number of dwellings	Number of people
≥48	350 (1,050) [800]	800 (2,300) [2,000]
≥51	100 (550) [450]	200 (1,200) [1,100]
≥54	<50 (250) [200]	<100 (500) [500]
≥57	0 (<50) [<50]	0 (<100) [<100]
≥60	0 (<50) [<50]	0 (<100) [<100]
≥63	0 (0) [<50]	0 (0) [<100]
≥66	0 (0) [0]	0 (0) [0]

6.2. 2021 compared to 2016 & 2011 noise mapping analysis

UK Government guidance has required airport operators to *"More generally, examine the day, evening and night results produced from the noise mapping and consider whether there are any features of the noise impact from departing or arriving aircraft that might be managed further"* This has historically resulted in a comparison of strategic noise mapping data over the most recent reporting periods.

This approach is not appropriate for 2021 due to the impacts of the pandemic on air traffic movements. This is acknowledged in recent guidance from DEFRA which states: *"The Noise Action Plan process uses the mapping results and is designed to manage noise issues and effects arising from aircraft departing from and arriving at those airports. Airport Noise Action Plans need to be published by February 2024. Due to Covid travel restrictions, however, mapping for 2021 is likely to show a highly anomalous situation for most airports, and Noise Action Plans drawn up solely on the basis of 2021 data may not result in effective actions within the current and future context of Round 4. It is in the interests of airports and communities for Noise Action Plans to draw on information which best reflects the situation for the Round 4 Noise Action Plan period as appropriate. As a result, airports may supplement the 2021 data with information from a more representative period when drawing up Noise Action Plans. This information is likely to vary from airport to airport, but, if relevant, may include (but is not restricted to) noise contours from the most recent previous round; contours produced to meet other requirements; measured noise data or projections. Decisions as to what data to use should be discussed with the relevant consultative committee or other community groups as appropriate."*

In addition to strategic noise mapping, noise contours are now produced on an annual basis to track compliance with noise contour limits and assess eligibility for the Noise Insulation Grant scheme. The most recent annual contours were produced in January 2023. These annual contours are produced for the 92 day summer period and not the 365 day average required for strategic noise maps. Like for like comparisons cannot be made as for seasonal airports the summer period is busier and therefore noise levels are higher compared to an annual average.

The total number of annual movements for the last round of strategic noise maps in 2016 was around 74,000 movements, compared to approximately 30,000 in the 2021 scenario. The most recent annual data from the CAA was a total of 66,000 for 2022. The 2021 strategic noise maps should therefore be considered only to represent a snapshot in time and should not be compared to previous years.


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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 ongoing 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 tables below highlight 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. New actions are shown in Blue. These have been introduced as part of the 12 mppa consent and are new to this Noise Action Plan.

Complete

Action	Progress - 2019	Progress - 2023
Actions to manage and reduce the effects of noise from aircraft on the ground		
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. Each vehicle that goes airside receives an airside MOT and an airside vehicle inspection. EV charging hubs are located behind ATC for the west side and there is a hub outside Northgate house for east side. All BPs use various versions of electric baggage handling equipment. In 2014 BRS had one EV van, now we have 16 EV vehicles on site. Jet 2 ground operating fleet and ground equipment all electric.
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. Eight stands have now been equipped with FEGP and usage is mandatory where provided.

Complete continued

Action	Progress - 2019	Progress - 2023
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. Bristol Airport successfully completed an electric turnaround trial in 2022 for 6 months. Review complete and no further FEGP planned at this time.	New Action.	The 12mppa S106 commits us to producing a Ground Noise Management Plan which will include measures to reduce and phase out the use of mobile diesel generators, through FEGP and any transitional arrangements towards FEGP at all aircraft stands. Our Emissions and Climate Change Action Plan (ECCAP) also includes a commitment to developing new airside power and distribution methods.
We will review the Bristol Airport Ground Noise Management Strategies prepared in 2012 and 2019.	This has been achieved. The review of the Ground Noise Study was completed as part of the Airports Planning Application. The main revision was the ability to provide FEGP to the East Stands in 2019.	Review complete.
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 (2011). KPI's relating to ground engine running are incorporated into the annual Operations Monitoring Report. These will be reviewed annually.	Complete. Will be updated by revised Ground Noise Management Strategy.
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.	Installation of noise attenuation buildings and screens complete. East Apron works complete.	Installation of noise attenuation buildings and screens complete.
Actions to manage and reduce the effects of noise from airborne aircraft		
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.	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 Chapter 3 aircraft operating at night.

Complete continued

Action	Progress - 2019	Progress - 2023
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.	The airport continues to track flight routes against the noise preferential routes and impose fines where necessary.
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.	The Airport continues to adhere to the night quota usage. Night flying activity is in full compliance with the refreshed restrictions on night flying in the 2011 planning permission.	The Airport remains compliant with these restrictions for night flying and reports publicly on performance annually. New enhanced quota count system to be introduced for 12mppa consent.
We will promote adherence to the Arrivals Code of Practice issued by the Department for Transport relating to continuous descent approaches (CDA). We will investigate and adopt, where appropriate, the best practice guide for environmentally optimum departure procedures under preparation by Sustainable Aviation.	New Action	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.
The Airport will provide localised guidance to CDA's and will issue to airlines by 2020.	This has been made clear within the updated Aeronautical Information Publication (AIP) for Bristol Airport available online within a specific section for Noise Abatement Controls. The Airport will also produce a localised booklet to pilots during the life of this iteration of the Noise Action Plan.	Regular dialogue takes place at FLOPSC. Guidance Complete
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.	No quiet areas have been identified within the Bristol agglomeration. The implementation of RNAV (area navigation) 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.

Complete continued

Action	Progress - 2019	Progress - 2023
Measures to mitigate the effects of aircraft noise		
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.
The 2011 planning permission introduced a new requirement to monitor the footprint of the 63dB $L_{Aeq,16h}$ 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.	New Action	Noise insulation Grants totalling around £170,000 made between 2018 and 2022, including to any properties qualifying as a result of the A38 diversion. The current Noise Insulation Scheme covers the provision of new glazing, secondary glazing, ventilation and loft insulation.
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.	New Action	New enhanced scheme for 2022 planning permission. From 2021 onwards a weighted application hierarchy system has been used so households can reapply each year for funding. If over subscribed, having previously approved applications would reduce the chance of success. Treatment enhancements refer to the change from covering only windows to a noise insulation scheme where we now offer more than just window replacements to also include doors and loft insulation.
In association with a successful planning application the quota count system will be reviewed.	Complete. The Quota Count system was reviewed and new system in place for 2022 planning permission.	Information on Quota Count to continue to be issued within Annual Operations Monitoring Report.

Complete continued

Action	Progress - 2019	Progress - 2023
Arrangements for monitoring aircraft noise		
In 2019 we will review our current noise and track keeping system and upgrade where necessary.	New Action	Current system has been reviewed and deemed appropriate for track keeping. No upgrades have been necessary to date.
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.	Complete Tool available here - https://webtrak.emsbk.com/brs2	System live
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. We will monitor ongoing research into the effects of noise on health.	The (ACARE) provides strategic, technical, and institutional guidance to the European Commission, Member States and its stakeholders. In their 2001 document 'A Vision for 2020', ACARE set numerous goals for the sector, including "a reduction in perceived noise to one half of current average levels." The newest aircraft on the market have, on average, a noise footprint that is 30-50% that of the aircraft they are replacing thanks to new engine and airframe design and technology. Additional reductions in noise are delivered through Continuous Descent Approaches and other operational changes.	ACARE have published goals to 2050, which include operational improvements and noise abatement procedures to reduce the perceived noise emission of flying aircraft by 65% per operation relative to the 2000 baseline. Bristol Airport will update this target in the final Noise Action Plan to reflect that the UK has left the European Union and to be in line with Sustainable Aviation's forthcoming updated noise action plan.
Actions to engage and work with the local community on matters relating to aircraft noise		
We will undertake a public attitude survey (by telephone survey), every two years, to assess the local community views on aircraft noise.	To be kept under review but experience elsewhere suggests that this is a complex task and it will be difficult to get meaningful results. 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.	Consultation on the new Master plan will be carried out. Community feedback from is also obtained from the regular community feedback sessions described above.

In –Progress.

It is proposed these will be refined and consolidated into roll-over actions in the 2024 - 2028 Noise Action Plan

Action	Progress - 2019	Progress - 2023
Actions to manage and reduce the effects of noise from aircraft on the ground		
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.	Stand allocation is reviewed daily with a goal of 80% of flights allocated to contact stands over the course of a year.
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.
Actions to manage and reduce the effects of noise from airborne aircraft		
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.	Chapter 3 aircraft are being phased out of operations at the Airport. The majority of aircraft operating at Bristol Airport comply with Chapter 4 noise standards.	We continue to prioritise business with commercial airlines who operate modern aircraft fleets. The majority of aircraft operating at Bristol Airport comply with Chapter 4 noise standards. For Summer 2023, we expect significant improvement in the number of flights operated by the quietest and most environmentally friendly aircraft. Ryanair will replace 2 of their previous generation Boeing 737 with 2 new Boeing Max aircraft and Easyjet will increase the number of flights operated by Airbus NEO aircraft. The vast majority of Tui's services will be operated by Boeing Dreamliner or Boeing Max models. New airlines such as Swiss, Sunexpress, Corendon and Aegean all have Airbus NEO and Boeing Max models and BAL is working with these airlines to deploy these aircraft at BAL as a priority.
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 pending due to the impact of COVID19 on the industry.	We will seek to complete the review by through contract renewals in 2023.

In –Progress continued

Action	Progress - 2019	Progress - 2023
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. Penalty system review has been carried out and changes implemented with revised penalty charges.	The number of penalties levied continue to be reported in the Airport Annual Operations Report. The success of the scheme has meant zero infringements were made since the last update.
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.	The mechanics of the Penalties Scheme using daytime and night-time Lmax levels continues to be best practice as emulated by other airports. This will be reviewed as further guidance provided by industry bodies to highlight best practice in this area as and when available.	Ongoing
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. Introduced a league table to compare and analyse the CDA performance of major airlines.	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.
We will seek to achieve a 85% CDA compliance rate (an increase of almost 10% in performance) by 2023.	CDA performance was 74% for all airlines and 91% for major airlines in 2019.	2022 CDA performance for major airlines was 94% and all airlines was 84%.
We will begin looking at alternative flight paths for respite purposes with a view for implementation by 2026/27.	New Action	Public consultation expected in 2024.
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 Monthly Airside Safety Information Group (MASIG) and Flight Operations Sub Committee (FLOPSC) meetings to ensure the correct procedures are adhered to and will continue to do so.

In –Progress continued

Action	Progress - 2019	Progress - 2023
We will review our approach with the GA community and how best to deliver best practice in conjunction with future airspace change work.	Ongoing	Currently reviewed on a regular basis at quarterly FLOPSC meetings.
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.	Early discussions with NATS	Consideration for 2024 airspace change public consultation.
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.
The Airport will introduce RNAV routes for arrivals and departures by 2026/27.	New Action	Timescale: 2027 on track. Essential area of airspace change which Bristol Airport consulted extensively in 2019, albeit, due to covid19 the entire FASI south programme is paused.
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.	Ongoing	The implementation of RNAV approaches from the south has been completed.

In –Progress continued

Action	Progress - 2019	Progress - 2023
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.	Ongoing	Ongoing
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.	New Action	Such techniques are discussed at our Flight Operations Sub Committee (FLOPSC) and where possible are introduced. This action will remain open as the Civil Aviation Authority explores this further.

In –Progress continued

Action	Progress - 2019	Progress - 2023
Measures to mitigate the effects of aircraft noise		
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. The scheme has been updated and this is captured in a new action.
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 monitors are currently being regularly used, setting up between 4 and 6 each year. Currently installed for 2 week periods during the summer months when the most movements occur, installed between June and August.
Based on the findings of the noise climate generated from monitor data, we will consider any noise mitigation measures on a case by case basis. This will be introduced from 2018.	These monitors are used to consider noise mitigation on a case by case basis.	Ongoing. The Noise Insulation Scheme has been updated and included as new action.
Arrangements for monitoring aircraft noise		
We will complete the commissioning of the new runway 09 noise monitor at Littleton Hill ('Tracker'), 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, L_{max}, 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.	Ongoing Publicly available tracker system is now through Webtrak (a software provided by Envirosuite) which offers a user-friendly interface to track flights and see conditions affecting flight paths such as weather.

In –Progress continued

Action	Progress - 2019	Progress - 2023
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.
To maintain and improve the systems described above, as appropriate.	New Action	Track keeping and CDA performance is recorded in the annual Operations Monitoring Report presented to the Airport Consultative Committee.
Actions to engage and work with the local community on matters relating to aircraft noise		
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.	Achieved and ongoing.
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.
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.
In 2019, we will refresh how this information is presented and reported i.e. citing particular instants and associated improvements where relevant.	Achieved in 2019.	As part of the Environment Effects Working Group, close views of tracks to highlight flight profiles in the local community are now reported on a quarterly basis. This will continue to be worked on and refreshed with the group.

In –Progress continued

Action	Progress - 2019	Progress - 2023
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.
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.	New Action	We hold three events a year for 79 parish councillors and clerks. Hosted by CEO.
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.
In 2019, we will review the Annual Operations Monitoring Report content and presentation to make it even more accessible.	The Annual Monitoring Report for 2019 was published with fresh artwork and included more data than previous reports, in particular regarding complaints analysis as requested by local community representatives. In the 2021 Annual Monitoring Report, we have expanded it further with Ground Water Monitoring being included for the first time.	Continue to receive feedback from receive feedback from the Airport Consultative Committee and Environmental Effects Working Party.
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. Any funds from noise penalties will continue to be added to the Community Fund.

New

Action	Description
Actions to manage and reduce the effects of noise from aircraft on the ground	
Ground Noise Management Strategy to be reviewed by 2024	Within six months of commencement a revised Ground Noise Management Strategy (GNMS) should be submitted for approval.
Construction Environmental Management Plans	Demonstrate how construction of works will take place, including details of construction and traffic routes, mitigation plans, waste management and air quality management plan, and working hours in accordance with condition 7 of the 12mppa permission.
Pre-flight servicing	Revised GNMS to include measures to reduce noise from pre-flight servicing or checks on aircraft while stationary on stands.
Ground power	Revised GNMS to include measures to reduce and phase out mobile diesel generators through FEGP along with transitional arrangements towards FEGP for all stands.
Actions to manage and reduce the effects of noise from airborne aircraft	
Passenger limits	Planning condition 5 restricts passenger movements to 12 million passengers per annum. Details of compliance to be agreed with local authority.
Movement limit - night flights	The total number of aircraft movements at the airport including take-offs and landings between the hours of 23:30 hours and 06:00 hours for 12 months shall not exceed 4,000.
Movement limit – shoulder periods	The total number of take-offs and landings between 06:00 hours and 07:00 hours and between 23:00 hours and 23:30 hours (the 'shoulder periods') shall not exceed 9,500 in any calendar year
Contour limit - 10mppa – Day	Upon commencement of development, up to the passenger throughput at Bristol Airport exceeding 10 million passengers in any 12-month period, the area enclosed by the 57dB $L_{Aeq\ 16h}$ daytime noise contour shall not exceed 12.42 km^2.
Contour limit -11mppa – Day	Upon the passenger throughput at Bristol Airport exceeding 11 million passengers in any 12-month period the area enclosed by the 57dB $L_{Aeq\ 16h}$ daytime noise contour shall not exceed 11.56 km^2
Contour limits 12mppa – Day	The area enclosed by the 57 dB L_{Aeq} 16h daytime noise contour shall not exceed 10.70 km^2 from when passenger throughput at Bristol Airport reaches 12 mppa in any 12-month period.
Contour limits 12mppa – Night	The area enclosed by the 55 dB $L_{Aeq,8h}$ night- time noise contour shall not exceed 6.8km^2 from when passenger throughput at Bristol Airport reaches 12 mppa in any 12-month period.

New continued

Action	Description
Movement reporting	a) the number of passengers per annum; b) the number of Air Traffic Movements per annum; c) the number of nighttime flights per annum; d) the number of flights in the shoulder period per annum; e) the quota count score for the preceding British Summer Time and British Winter Time respectively; f) the number of positioning flights per annum.
New enhanced QC count system	New planning condition limit on QC. Quota count usage to be included in Annual Operations Monitoring Report.
Revised Noise Control Scheme (NCS)	An updated NCS should include a mechanism for imposing penalties on airlines that exceed noise limits. This mechanism should encompass the publication of an airline performance league table. The revised NCS will also offer incentives to promote the adoption of quieter aircraft. Furthermore, it should introduce supplementary measures aimed at encouraging aircraft operators, in coordination with the Flight Operations Committee, to adopt operational procedures and practices that drive forward improvements in the levels of aircraft noise.
Measures to mitigate the effects of aircraft noise	
Enhanced sound insulation scheme – grants	New scheme required with sound insulation grants of £8,000 for dwellings exposed to levels ≥60 dB $L_{Aeq,16h}$, £5,500 for levels ≥57 dB $L_{Aeq,16h}$ and £5,500 for those above a night time level of 55 dB $L_{Aeq,8h}$.
Sound insulation scheme – in situ testing	The noise mitigation measures included in any Noise Mitigation Scheme shall be supported by evidence of in-situ testing of effectiveness against aircraft noise for a representative sample of residential properties.
Sound insulation scheme – ventilation and overheating	As well as noise mitigation measures the Noise Mitigation Scheme shall include measures to provide suitable alternative means of ventilation and prevention of overheating where appropriate and necessary.
Sound insulation scheme – performance targets	New scheme to be designed to achieve recommended internal levels based on BS8233:2014 internal noise guidelines and World Health Organisation internal noise guidelines for noise maxima at night.
Reduce airside ground noise	Investigate the incentivisation of electric ground equipment through a revised airside vehicle permit scheme which will help reduce background noise levels. Continue to investigate the feasibility of ground service equipment pooling allowing BRS to influence an expeditious move to wholesale electric ground handling operation.
Sound insulation scheme – reporting	Details of grants provided will be provided to the Council annually.
Arrangements for monitoring aircraft noise	
Noise monitoring	The Annual Operations Monitoring Report shall include comparison of the predicted noise levels at the Noise Monitoring Terminals based on the forecast noise contours for the previous year with the 92-day averaged summer measured noise levels at the NMTs.

New continued

Action	Description
Contour reporting	Forecast aircraft movements and consequential forecast and actual noise contours for the forthcoming year shall be reported to the Local Planning Authority annually within the Annual Operations Monitoring Report. The area enclosed by the 63, 60, 57, 54 and 51 dB $L_{Aeq,16h}$ (07:00 hours to 23:00 hours) noise contours and the 55 and 40 dB $L_{Aeq,8h}$ summer night-time noise contour (23:00 hours to 07:00 hours) for the forthcoming year (from 1 January to 31 December each year) shall be reported.
Contour verification	As soon as reasonably practicable following the third Annual Monitoring Report following the Effective Date (and subsequently at three year intervals) a verification report shall be submitted which shall include input data, methodology, and output data used to calculate the noise contours as well as recommending appropriate calculation procedures.
Actions to engage and work with the local community on matters relating to aircraft noise	
Enhanced sound insulation scheme consultation	A Noise Mitigation Scheme shall be submitted to the Council for not less than three months consultation. The scheme shall not be implemented before considering any consultation feedback from the Council.
Revised Noise Control Scheme (NCS) consultation	Within six months of the Commencement of Development a draft Revised NCS scheme shall be submitted to the Council for consultation. The scheme shall be implemented within 12 months with details reported in the Annual Monitoring Report.

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 L_{Aeq} at the runway 09 and 27 noise monitors;
- The L_{Amax} 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 L_{Aeq} noise contour;
- Area of the summer 54dB L_{Aeq} noise contour.

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

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, L_{AMAX}, 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 L_{den} noise contour however the effects of ground noise were not considered in the strategic mapping in 2017.	Residents within the 55db L_{den} noise contour and up to 25 miles from the Airport for measures such as CDA and track keeping performance.	Residents within the 55db L_{den} noise contour and elsewhere in relation to deviations from recommended flight paths.	Residents within the 55db L_{den} noise contour and elsewhere in relation to deviations from recommended flight paths.	Residents within the 55db L_{den} noise contour and beyond.
Priorities	High	High	Medium	Medium	High

Long Term Strategy

Master Plan

A Master Plan for Bristol Airport was last published in 2006 and at that time, it was envisaged that the airport would grow to serve between 10 and 12 million passengers per annum by 2030.

In 2017/18, Bristol Airport held an initial consultation on a draft updated Master Plan, including options for phased growth to circa 20 million passengers per annum by 2050. This draft Master Plan also set out the proposals for development to 12 million passengers per annum, which were subsequently approved through the planning process.

Following a pronounced recovery from the COVID pandemic, Bristol Airport intends to review its long-term plans, taking into account future demand and technology, with an updated Master Plan to be developed and consulted upon in due course.

Airspace Modernisation

Airspace change presents an opportunity in the medium to long term to minimise noise impacts and reduce emissions. The aims of the modernisation and action that Bristol Airport is taking to support it are set out below.

Until recently, the way airspace is managed in the UK had not changed radically since the 1950s. Modernisation is required to improve punctuality of flights, reduce CO2 emissions, reduce noise and to ensure there is capacity to meet future demand. In 2017, the Government instructed the UK's independent aviation regulator, the Civil Aviation Authority (CAA) to develop a strategy to modernise the UK's airspace.

The CAA consulted on an initial draft of this strategy in 2018 and the final version of the Airspace Modernisation Strategy was published in December 2018. More information on CAA's guidance on the regulatory process for changing airspace design including community engagement requirements can be found in the Civil Aviation Authority's CAP1616 guidance document here.

Bristol Airport is fully committed to this initiative and are fully engaged in this programme's aims to make journeys quicker, quieter, and cleaner.

In October 2018, Bristol Airport submitted a Statement of Need setting out plans to make changes to the airspace impacting departure and arrival procedures.

In 2019, Bristol Airport developed a set of Design Principles which took into account feedback received from engagement workshops where a large number of aviation, community and local stakeholders attended. The Design Principles outline the objectives Bristol Airport is seeking to achieve through an airspace change; such as environmental and operational aims. These were submitted to the CAA in December 2019 which were approved. This completed Stage 1 of the CAP1616 process.

In early 2020, Bristol Airport began Stage 2 of the airspace change process which involved developing a long list of design options. Bristol Airport held design workshops with aviation stakeholders who were encouraged to suggest design ideas based on the Statement of Need (SoN) and Design Principles.

In March 2020, the Airspace Change Proposal (ACP) was paused as a result of the Covid-19 pandemic and its impact on Bristol Airport. In March 2021, the DfT announced that they would be providing funding to 20 UK airports, including Bristol, allowing them to continue with Stage 2 of their ACP. This is in support of the UK Airspace Modernisation Strategy which has committed to modernising the UK airspace – both low level around airports and the wider network at a higher level.

Bristol Airport made a formal request to the Civil Aviation Authority (CAA) in May 2021 to re-start the ACP which was accepted. Stage 2 activities commenced in May 2021 and involved the development of design options which were presented through engagement sessions with all stakeholders that were engaged during Stage 1 of the ACP process. We formally submitted Stage 2 documentation to the CAA in July and approval was granted on 3rd August 2022.

Bristol Airport is now working on the consultation strategy for Stage 3a of the CAP1616 process. Updates and further details will be provided to stakeholders and the community as the process progresses.


734 GHT
504 WHU

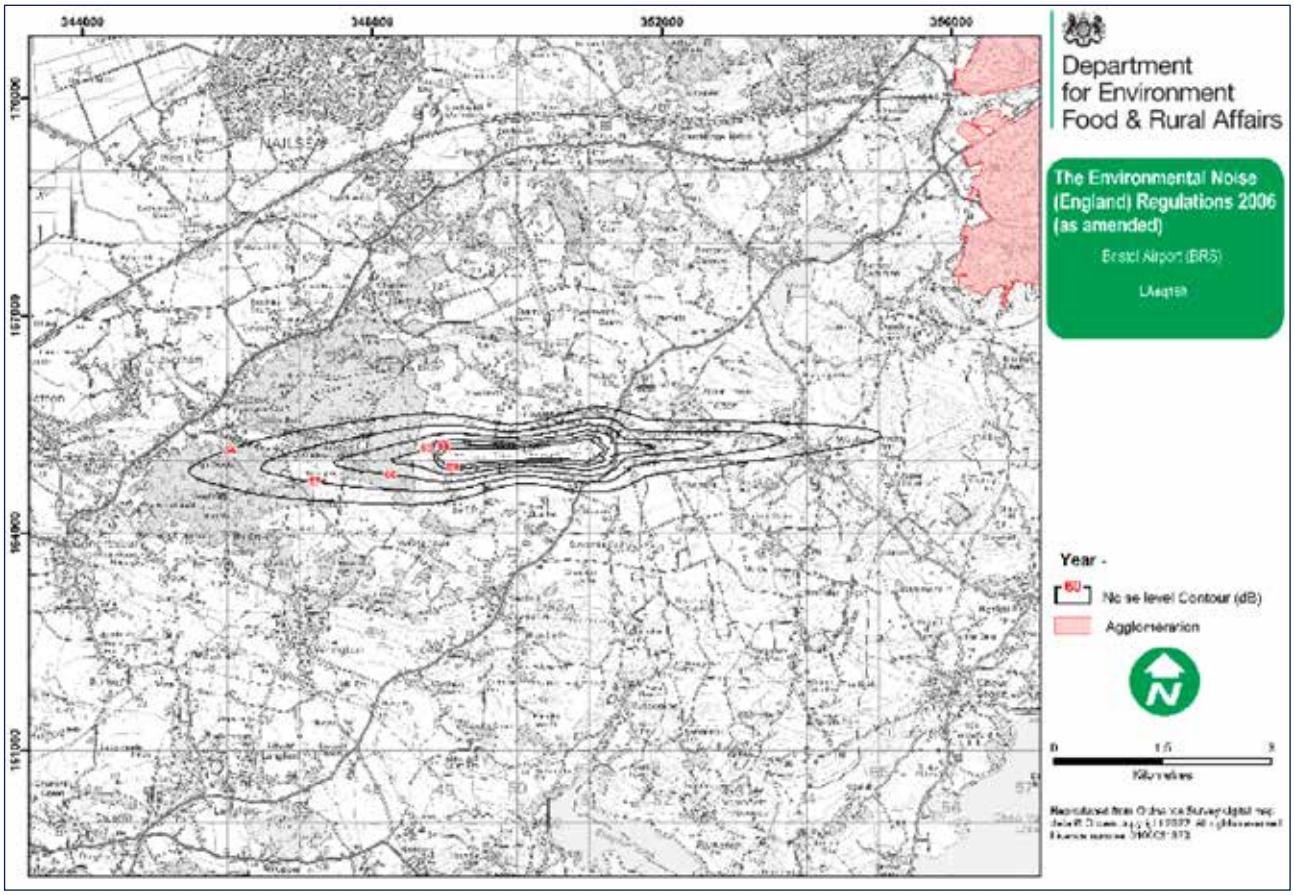
Financial Information

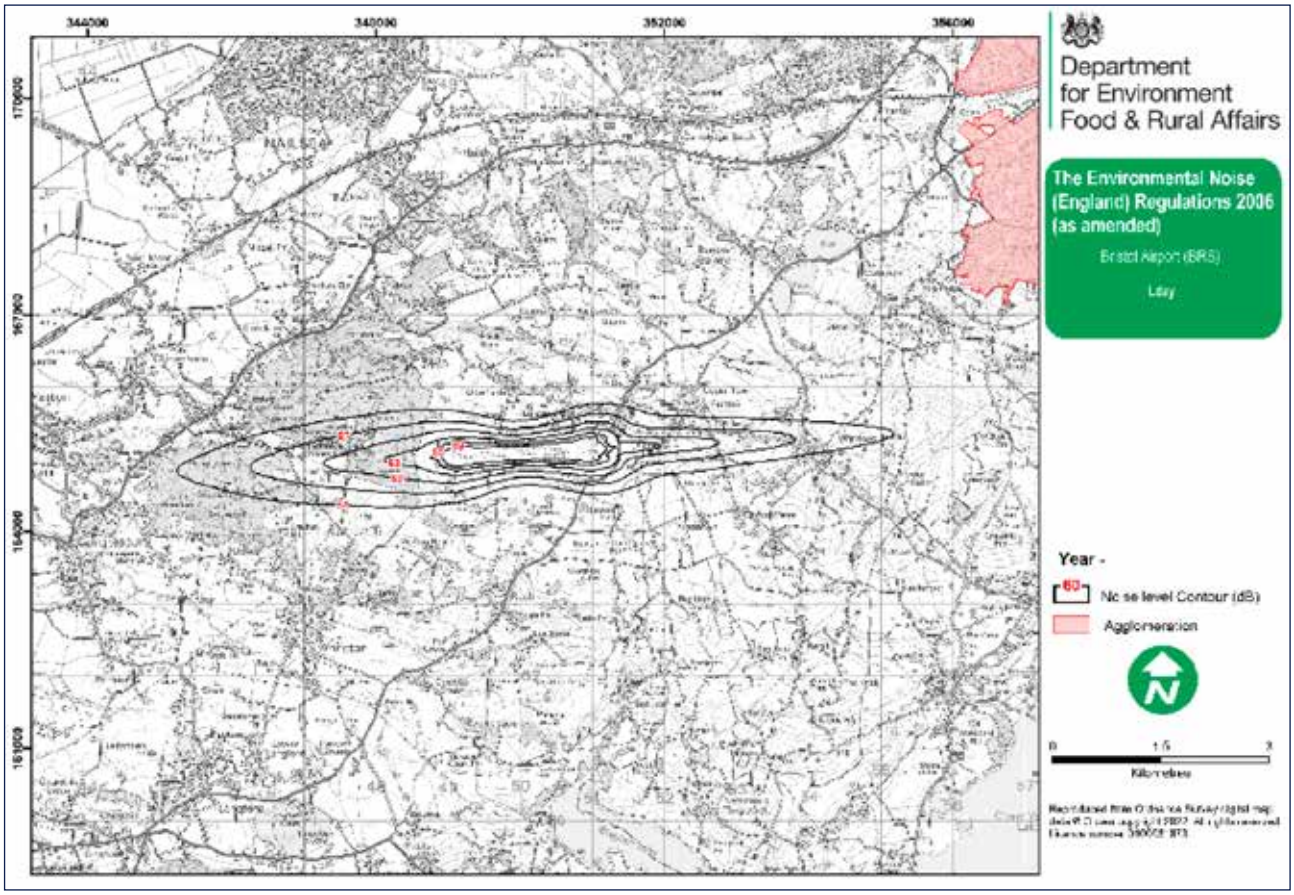
The costs associated with the implementation of the Noise Action Plan are commercially confidential.

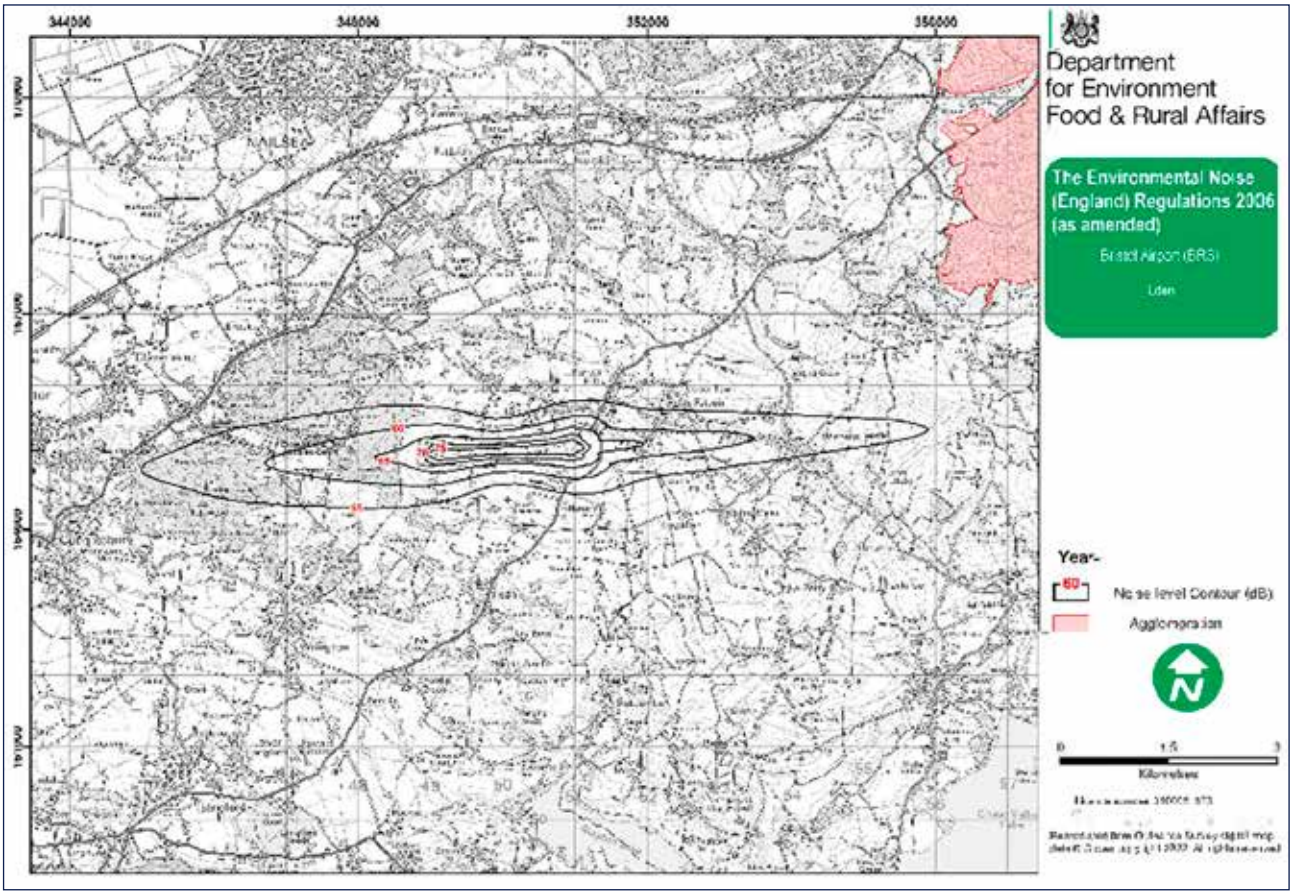
Glossary

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



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(England) Regulations 2006
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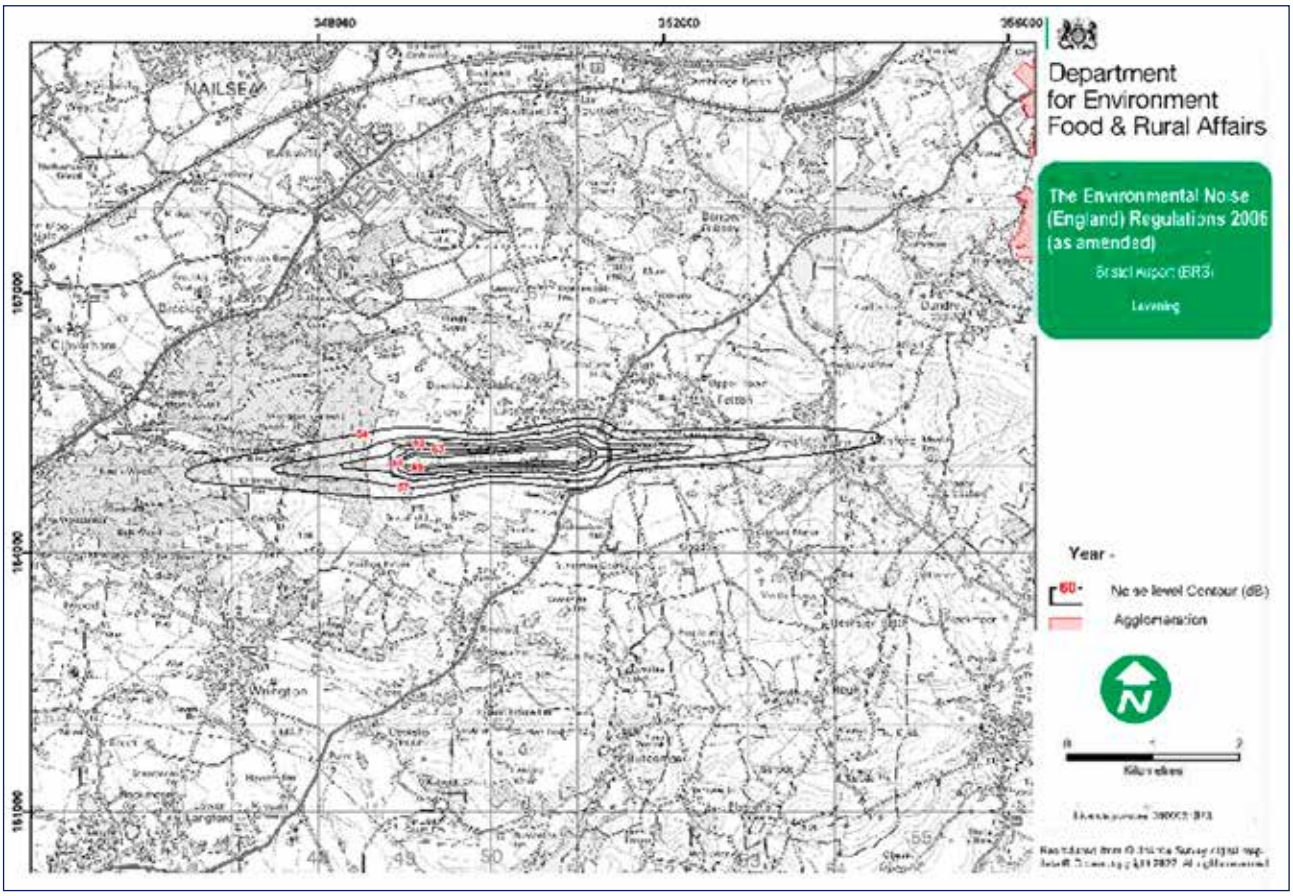
Kilometres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(England) Regulations 2006
(as amended)
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Noise level Contour (dB)
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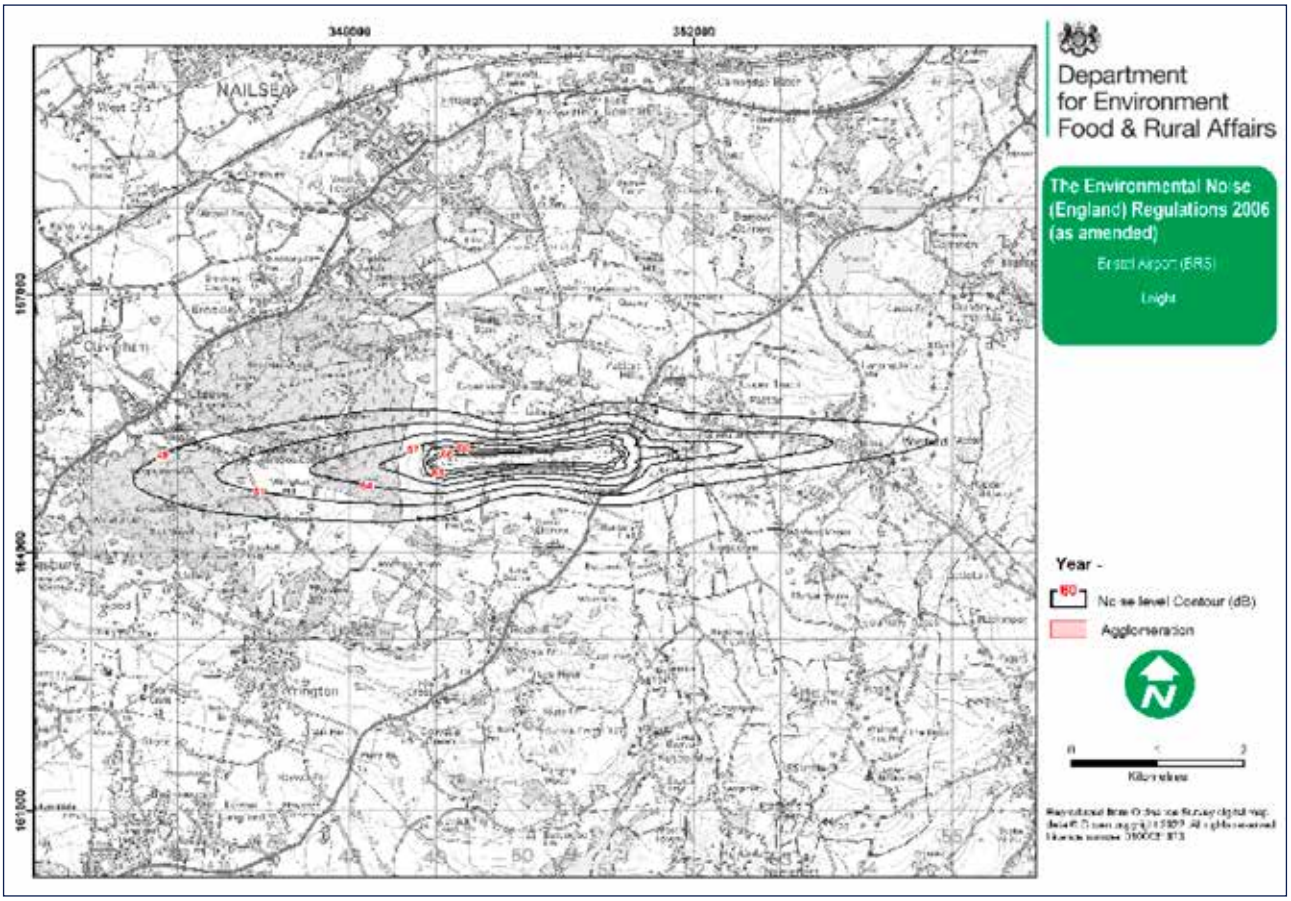
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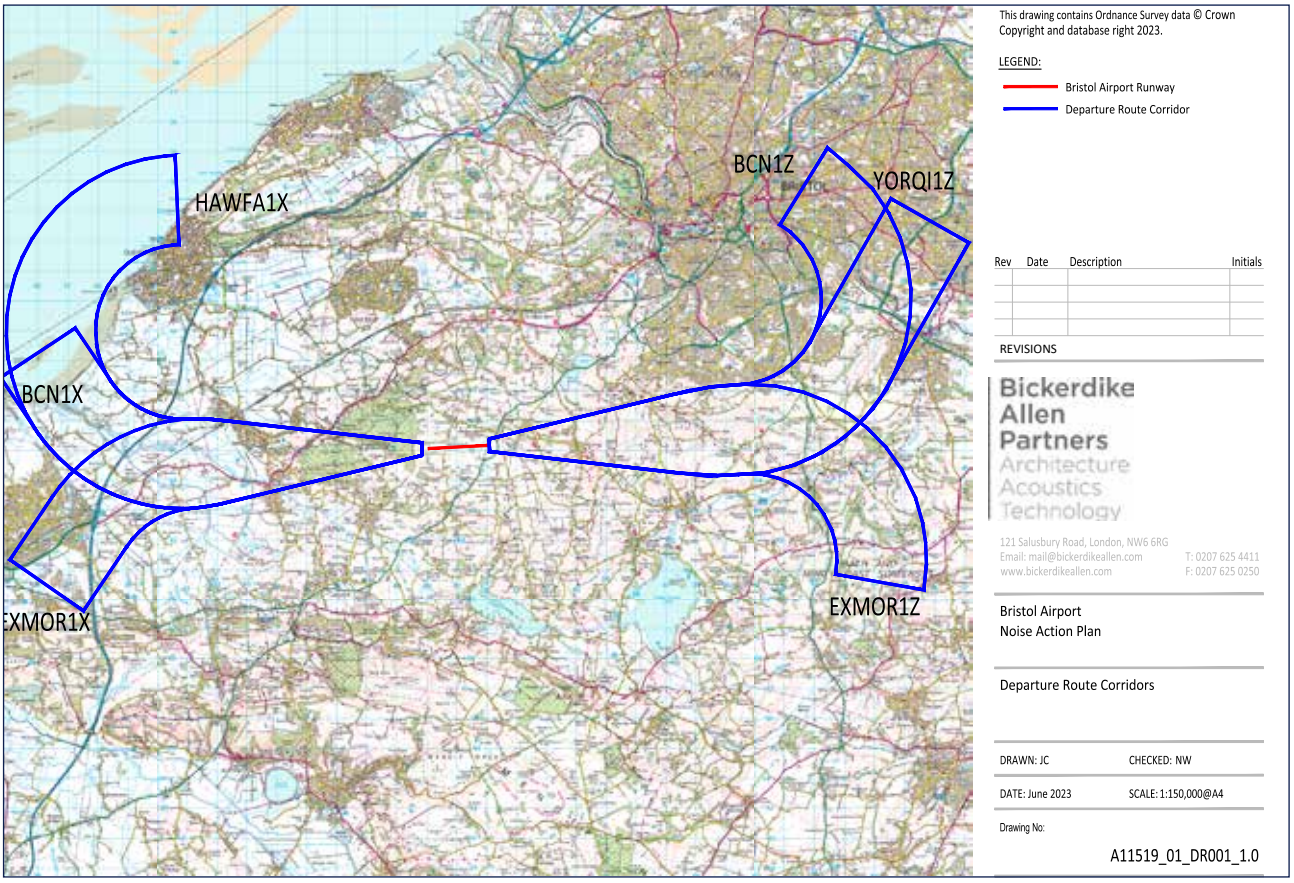
Annex B: Departure Routes



Annex C: Public Consultation: Noise Action Plan 2024- 2029

As this Noise Action Plan is a revision from a previous iteration, DEFRA guidance details consultation with an airports Consultative Committee is only required. In addition to inviting feedback from our Airport Consultative Committee members, Bristol Airport held an ad-hoc session on 5th August with the Environmental Effects Working Party, a sub-group to the ACC, to discuss the draft action plan in detail. A summary of the feedback received is below. The consultation period was for a total of 9 weeks from 26th June to 28th August.

1) The NAP 2019 to 2024 does not include an action to reduce the number of positioning aircraft movements. Will the new NAP to 2029 include this action? Are the emissions from positioning flights included in this report?

We do not have direct control over the number of positioning flights, as this is an operational requirement for airlines to limit disruption to their services. However, we are keen to work with our airlines to reduce positioning flights in the future but need to understand how any targets could realistically be achieved given that this is not within our gift.

The Secretary of State for Transport has approved Bristol Airport's application to become a 'Level 3 fully coordinated' airport, coming into force in summer 2024. This applies slots procedures to Bristol Airport's arrivals and departures throughout the year. Currently Bristol Airport only operates slots at night during the summer season. An airport slot is permission to use the airport infrastructure (runway, terminal, apron, gates, etc.). These are necessary to operate an air service at an airport on a specific date and time for the purpose of landing or take-off.

As set out by the Department for Transport, slots ensure airport operations remain within set capacity limits; ensure airport operations remain within environmental obligations, including night flight and noise limits; and will not increase the airport's capacity, as slot coordination is the administrative process for making use of an airport's capacity.

This means that airlines will have a number of slots allocated to them so it will be in their interest to minimise the amount of positioning flights to focus on passenger movements. This will therefore help reduce positioning flights over time, but not eliminate them.

Positioning flights are already recorded within the AMR. We have now recorded this as an extra action within "Movement Reporting" to ensure we continue to include this information so that it is available to review in the AMR.

2) Section 2.3, General Requirements, para 1. How have 'quiet areas' been evaluated to conclude that none are in the region of the airport?

The airport does not evaluate quiet areas. Under the Environmental Noise Directive eligible local authorities may nominate spaces for identification as a "quiet area in an agglomeration" for approval by DEFRA. At the time of writing no quiet areas have been designated within agglomerations affected by any of the Bristol Airport. DEFRA will advised that they will inform any airport concerned if this situation changes before finalisation of their Action Plan.

3) Section 2.3, General Requirements, BP 3. Is a webtag approach used for determining the direct and indirect costs?

The Webtag approach has not been used to determine indirect and direct costs associated with the NAP.

4) Section 4.1, Noise and Regulation. What chapter aircraft use Bristol Airport? What is the breakdown between the different chapters?

Chapter 3, 4 and 14 aircraft use Bristol Airport. The breakdown between the different chapters is not reported for the purposes of strategic noise mapping. We are actively working to reduce the number of Chapter 3 aircraft operating at the Airport by incentivising newer aircraft including the A320 Neo and B737 Max. Exploring the breakdown of operations by aircraft Chapter is a good suggestion and one which we will consider implementing in the future.

5) Section 4.2, National Regulations, Policy and Guidance, Aviation Policy Framework (2013), para starting "The APF expects".. The statement is made that there are "no properties at Bristol Airport exposed to these noise levels" (of 69dB $L_{Aeq,16h}$). How many noise sensitive buildings are exposed to levels of noise of 63dB $L_{Aeq,16h}$ or more?

There is a difference in information when considering strategic noise maps which are annual averages and average summer contours. Dwelling counts are provided by DEFRA based on noise mapping data to annual END specifications. The END data is reproduced below. There are no dwellings exposed to levels of 63 dB $L_{Aeq,16h}$ or more.

Estimated total number of people and dwellings above various noise levels, $L_{Aeq, 16th}$

Noise Level (dB)	Number of Dwellings	Number of People
≥ 54	300	700
≥ 57	100	100
≥ 60	<50	<100
≥ 63	0	0
≥ 66	0	0
≥ 69	0	0

"In addition to the above annual noise contours data on summer daytime contours is published within the AMR. This information will continue to be published.

6) Section 4.2, National Regulations, Policy and Guidance, Aviation Policy Framework (2013), para starting "The APF currently" As stated, the onset of significant community annoyance is acknowledged by the Government as 54dB $L_{Aeq,16h}$. It is noted in the Annual Monitoring Report 2022 that the noise climate recorded at all three permanent noise monitors is in excess of this level for at least all of 2022. Please can you add a statement acknowledging this fact to this paragraph.

The estimated total number of people and dwellings above various noise levels is provided in the NAP in **Table 3**. This includes the number of dwellings and people exposed to noise levels in excess of 54 dB $L_{Aeq,16h}$. When comparing 2022 16hr Leq dB(A) to data from 2018 and 2019 the noise climate for 4 out of the 36 compared months was higher in 2022 than in 2019. This shows the positive impact of the growing percentage of Neos and Max's operating from the airport. We hope to see noise climates falling in the future as fleets are modernised further.

Noise climate

	Congresbury		Littleton Hill		Felton	
	2019	2018	2019	2018	2019	2018
Month	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)	Leq dB(A)
January	61.5	62.4	55.8	59.5	59.9	61.1
February	60.0	60.4	57.0	55.7	60.7	60.1
March	59.5	59.6	60.4	57.1	61.4	60.2
April	63.2	60.2	57.3	56.3	60.9	60.9
May	59.6	58.9	56.3	55.9	60.6	60.8
June	59.7	59.5	57.2	56.2	61.2	61.7
July	58.0	58.3	56.1	55.8	60.9	60.5
August	58.6	60.7	57.2	56.4	61.4	61.0
September	58.8	62.2	57.4	57.4	61.7	61.2
October	59.8	64.4	57.6	57.8	61.2	60.8
November	59.4	60.1	55.2	56.3	60.2	59.5
December	59.2	59.0	57.6	57.3	60.9	60.5

7) Section 4.2, National Regulations, Local Planning Framework, North Somerset Local Plan 2038, BP 4: Change "agreed o surface" to "agreed surface"

This is a typo which has been changed.

8) Section 4.2, National Regulations, Local Planning Framework, Bristol Airport, BP 2 How do the summer average contours and the annual average contours compare? How do they compare to the measured noise environment from the permanent noise monitors?

Annual summer contours are normally larger than annual average "strategic" noise contours produced for the END. Bristol adopted the larger summer averages for the purpose of Noise Insulation Scheme eligibility and regular reporting. Noise data from the permanent noise monitors is used by Bickerdike Allen Partners LLP to validate the noise contours which are produced.

9) Section 4.2, National Regulations, Local Planning Framework, Bristol Airport, BP 6 Where is the airline performance league table reported? What are the penalties for breach of noise limits and incentives for the use of quieter aircraft?

We are currently conducting research into modernising and updating league tables, with the view to publish in future AMRs. Incentives are classified as sensitive data to both the Airport and airlines so it is something we cannot comment on.

Our noise limits are set out in our fees and charges. 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 £750 for the first 3dB exceeded, plus an extra £1,250 for each 3dB above the following limits:

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

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

10) Section 4.2, National Regulations, Local Planning Framework, Ground Noise Management Strategy, para 2

Bearing in mind that at the time of writing it is nearly August 2023, when will the 2023 GNMS new permanent ground noise monitor be installed and where?

The 12mppa planning permission S106 agreement requires us to submit a Ground Noise Management Strategy (GNMS) to the Council (for approval) within six months of commencing the 12mppa development. The 12mppa development has not yet commenced. However, we have commissioned our consultant (Bikerdike Allen Partners) to start preparing a GNMS (along with a Noise Control Scheme – also a requirement of the S106). We are targeting to share a draft GNMS with the Council early in the new year. This GNMS will include proposed operational and procedural controls on the ground running of aircraft designed to reduce noise. It will also include a proposed location for the installation of a new permanent ground noise monitor, the location of which also needs to be agreed with the Council. The date of installation is not yet confirmed, but the location and date will be a matter for BAL and NSC to agree through the GNMS.

11) Section 5.2.5, Night Flying, para 1

Please update the section number.

We believe that this is already correct.

12) Section 5.2.5, Night Flying, para 4

What are the QC for the night flights used to generate the night noise contour maps? How do they compare to the actual QC per night? BAP

The strategic noise contour maps have been produced using a log of the actual aircraft movements during the calendar year 2021. Details of the QC counts are also available within the AMR.

13) Section 5.4, Arrangements for Monitoring Aircraft Noise, general

What calibration is carried out on the three permanent noise monitors (soon to be four with the addition of the ground noise monitor) and the portable monitor? What training is provided to the operators of this equipment? Who does the independent recording and collation of the noise monitor data?

Data from our noise monitors is collated by Envirosuite. They convert this data onto our Noise and Track Keeping Software, ANOMS, for data analysis. Envirosuite is a well-known and respected company specialising in environmental monitoring since 1990. Several airports use their ANOMS system to record and collate data, including the MAG group and London Gatwick.

The calibration of BRS monitors monitored is by Envirosuite and is carried out by professional engineers annually who are subcontracted by Envirosuite, who are the manufacturers of the equipment. They use a calibrated source noise / refence device as these are class 1 microphones and undertake this activity directly on site at each location.

Noise consultants Bickerdike Allen Partners LLP (BAP) use the noise monitoring data in relation to contour validation work. BAP have over 60 years of experience in assessing sound levels and have suitable training to process data from all NMT systems.

The airport does have a mobile noise monitor which is calibrated yearly alongside the three static monitors. However, we are currently using BAP to carry out noise monitoring for residents and are therefore using their equipment at this time.

14) Section 5.4, Arrangements for Monitoring Aircraft Noise, end of section

I think it would be useful to repeat here the new Section 106 requirement for periodic correlation / validation of the noise contour maps using the noise monitor data.

The NAP refers to the A38 Diversion S106 Agreement. We believe this question is referring to Planning Condition 15 of the 12mppa Decision:

Condition 15: The area enclosed by the 63, 60, 57, 54 and 51 dB(A) Leq 16hr (07:00 hours to 23:00 hours) noise contours and the 55 and 40 dB $L_{Aeq,8hr}$ summer night-time noise contour (23:00 hours to 07:00 hours) for the forthcoming year (from 1 January to 31 December each year) shall be reported to the Local Planning Authority annually within the Annual Operations Monitoring Report. The same report shall include comparison of the predicted noise levels at the Noise Monitoring Terminals based on the forecast noise contours for the previous year with the 92-day averaged summer measured noise levels at the NMTs.

15) Section 6.1 Contour Methodology, para 1
The aircraft departure and arrival tracks demonstrate variability in aircraft movements. How are these included in the current modelling methodology? If not already included, a sensitivity analysis would determine the influence.

For arrivals, aircraft typically follow the extended centreline of the runway very closely in the vicinity of the airport, and therefore no dispersion is assumed. For departures, as aircraft do not follow precisely the routes they are assigned to, the AEDT software was used to generate a mean track for each of the eight initially distinct routes (four per runway) and these mean tracks were then dispersed as described below.

The dispersion model has the common assumption that there are seven "dispersed" tracks associated with each departure route; these comprise the mean track of each route and three sub-tracks either side. The allocation of movements adopted for the 2021 contours to each track is as follows:

- 28.2% departures along the mean track;
- 22.2% departures along each of the two sub-tracks either side of the main track offset by a distance of 0.71 standard deviations;
- 10.6% departures along each of the two sub-tracks either side of the main track offset by a distance of 1.43 standard deviations.
- 3.1% departures along each of the two sub-tracks either side of the main track offset by a distance of 2.14 standard deviations

A previous study at Bristol Airport reviewed the actual departure routes to confirm that those modelled matched what aircraft are doing in practice. The standard deviations used in the dispersion model have been determined by BAP from this analysis.

16) Section 6.1 Contour Methodology, BP 8
How are quiet areas identified? Why is it limited to only agglomerations?

The airport does not evaluate quiet areas. Under the Environmental Noise Directive eligible local authorities may nominate spaces for identification as a "quiet area in an agglomeration" for approval by DEFRA" It is limited to agglomerations (towns/cities) by law. The intent under the END is to these spaces should be quiet or relatively quiet, and generate

significant benefits (in terms of health, wellbeing, and quality of life) for the communities they serve because of their quietness. Candidate spaces might include areas within city parks, urban squares that provide a tranquil oasis, and public gardens (this list is not exhaustive).

17) Section 6.1 Contour Methodology, Tables 3 to 6
Delete "2017" from titles?

This has now been changed.

18) Section 6.2 2021 Compared to 2016 & 2011 noise mapping analysis, para 3
Point noted, however, what is the similar comparison over time? i.e. the comparable 92 day summer period contour maps or the annual average contour maps?

The NAP is required to assess noise levels strategically every five years. Planning conditions and new actions now require annual contouring work. This is a new action and will provide more detailed information using the summer contours.

19) The NAP mentions the number of destinations but fails to state the average number of flights there were in the summer months or winter months. Please can this be provided for the pre pandemic year of 2019 and the predicted year of 2029? This is necessary for residents to understand the NAP.

We report actual summer and winter period flight movements in the AMR. Data from recent years can be found in this report. We are currently unable to provide data on future flights as it is commercially sensitive.

20)The DfT state that 2021 data for the strategic noise maps is not representative of the true noise environment and encourages airports to consider alternative data. What alternative data was considered to the 2021 strategic maps published by the airport and why has this not been included?

In terms of strategic 12 month annual contours, the 2016 data is alternative data that can be considered. The END maps for 2021 are representative. However, they are representative of an anomalous period in aviation activity. Annual contours published in the AMR will provide more information. Please refer to the "contour reporting" action.

21) Action Plan, Completed Action 1

How big is the vehicle fleet? i.e. what proportion of the fleet is 16 vehicles? Are the new EV vehicles only being introduced when an existing ICE vehicle has reached its end of life?

Bristol airport is currently reviewing its fleet list and adopting a phased approach to electrification as part of our net zero programme. This phased approach includes Replacing EVs when existing ICE vehicles reach end of life. Further information on our progress can be found in Bristol Airport's Emissions and Climate Change Action Plan.

22) Action Plan, Completed Action 3

What are the timescales for the introduction of the GNM plan? Has the GNM plan been completed? If not, is this a new action?

Please see response to Question 10 above regarding the Ground Noise Management Plan.

23) Action Plan, In-progress Action 3

What is the current blend of aircraft? What has been assumed for the noise contour map analyses?

The AMR reports the blend of aircraft using the Airport. The noise contour maps use actual movement and aircraft type data provided.

24) Action Plan, In-progress Action 4

When will the review be reported? (noting the original action was for this to be reported in the annual operations report for 2021)

This will be reported on in the 2023 AMR.

25) Action Plan, In-progress Action 7

What level of reduction was achieved in 2020? Or even 2019 if the data for 2020 is not suitable due to the pandemic?

Bristol Airport is a founder member of Sustainable Aviation, a group of companies across the aviation sector that are working together to improve the sector's environmental performance.

The Advisory Council for Aeronautics Research in Europe (ACARE) provides strategic, technical, and institutional guidance to the European Commission, Member States and its stakeholders. In their 2001 document 'A Vision for 2020', ACARE set numerous goals for the sector, including "a reduction in perceived noise to one half of current average levels." The newest aircraft on the market have, on average, a noise footprint that is 30-50% that of the aircraft they are replacing thanks to new engine and airframe design and technology. Additional reductions in noise are delivered through Continuous Descent Approaches and other operational changes.

ACARE have published goals to 2050, which include operational improvements and noise abatement procedures to reduce the perceived noise emission of flying aircraft by 65% per operation relative to the 2000 baseline. Bristol Airport will update this target in the final Noise Action Plan to reflect that the UK has left the European Union and to be in line with Sustainable Aviation's forthcoming updated noise action plan.

26) Action Plan, In-progress Action 9

What are the future objectives after 2023?

We will seek to maintain target at present. It is an internal KPI but difficult to exceed the current objective due to a handful of limiting factors including technology, weather causing disruption to CDAs and smaller aircraft which can't implement CDAs.

27) Action Plan, In-progress Action 13

What are the changes compared to the current procedures?

This will be discussed with residents during the 2024 consultation.

28) Action Plan, In-progress Action 20

How many portable monitors are there? (note that Section 5.4 implies there is only one) When were they last calibrated? What training do the operators receive? How are the assessment outputs reported?

The Airport currently possess one mobile noise monitor which is currently not in use. The mobile monitor is also calibrated on an annual basis alongside the static monitors. The noise consultant group, Bickerdike Allen Partners, undertake mobile noise monitoring for the Airport. The number of properties that receive mobile noise monitoring varies on a yearly basis. BAP calibrate monitors on a yearly basis and have over 60 years of experience in assessing sound levels and have suitable training to process data from all NMT systems.

29) Action Plan, New Actions, general

The majority of these new actions have no timescales associated with them, e.g the Revised noise control scheme (NCS) has no target date for implementation.

It is dependent on when we initiate 12mpaa. We will update following this and update in 2024 AMR, where appropriate.

30) Action Plan, New Action 12

This data would be more useful provided on a rolling basis (so for any 12m period) to align with the contour limit actions above.

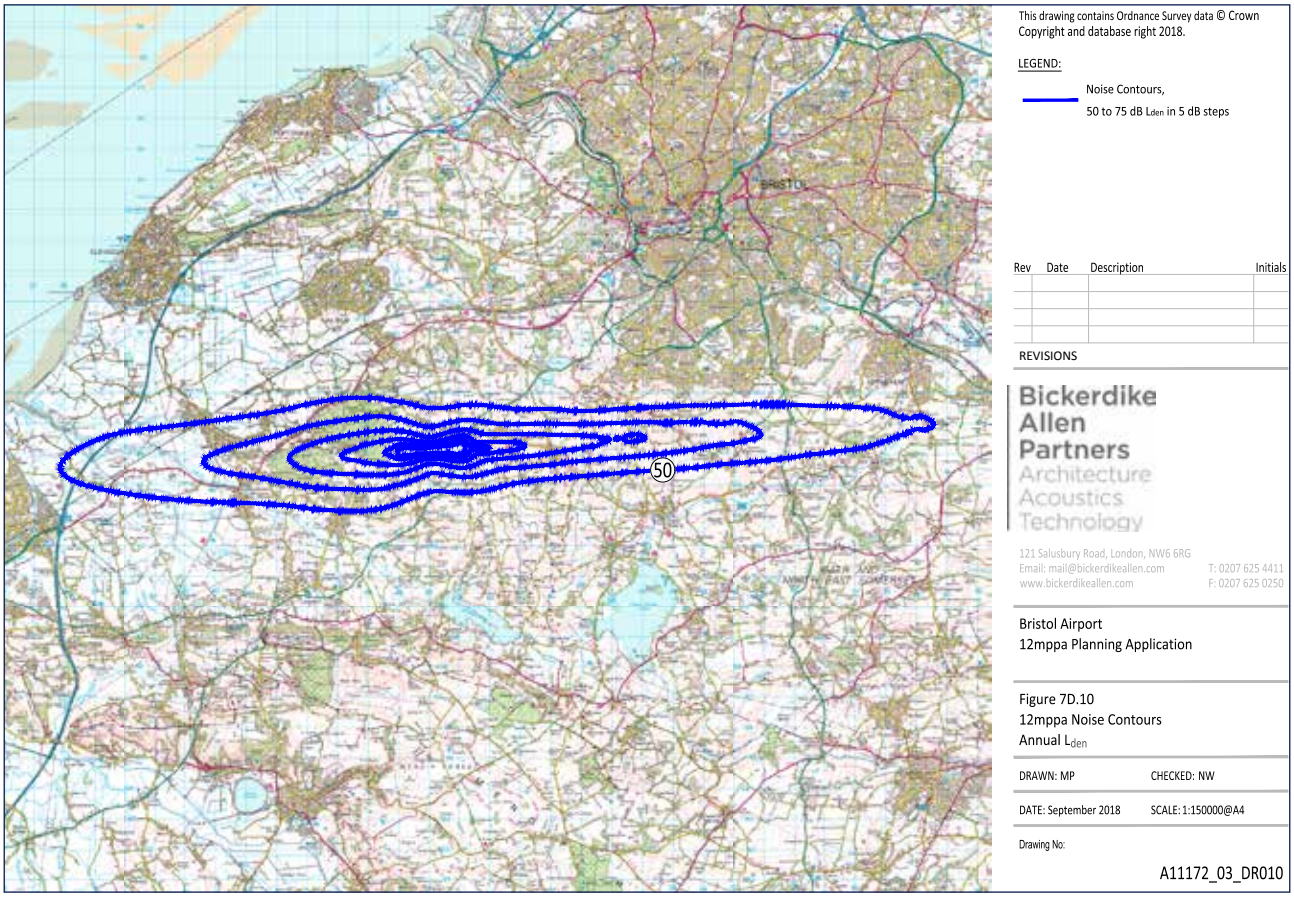
At present we will continue to report this information annually as we cannot currently accommodate this suggestion. This is something we could consider in future years.

31) Action Plan, New Action, last one

Within 12 months of what date will the scheme be implemented?

A revised Noise Control Scheme (NSC) shall be submitted to the Council (for approval) within 6 months of the Commencement of the 12mppa development. The revise NCS shall be implemented within 12 months of the Commencement of the 12mppa development.

Annex D: 12mppa Noise Contours Annual Lden – as forecasted for 2026



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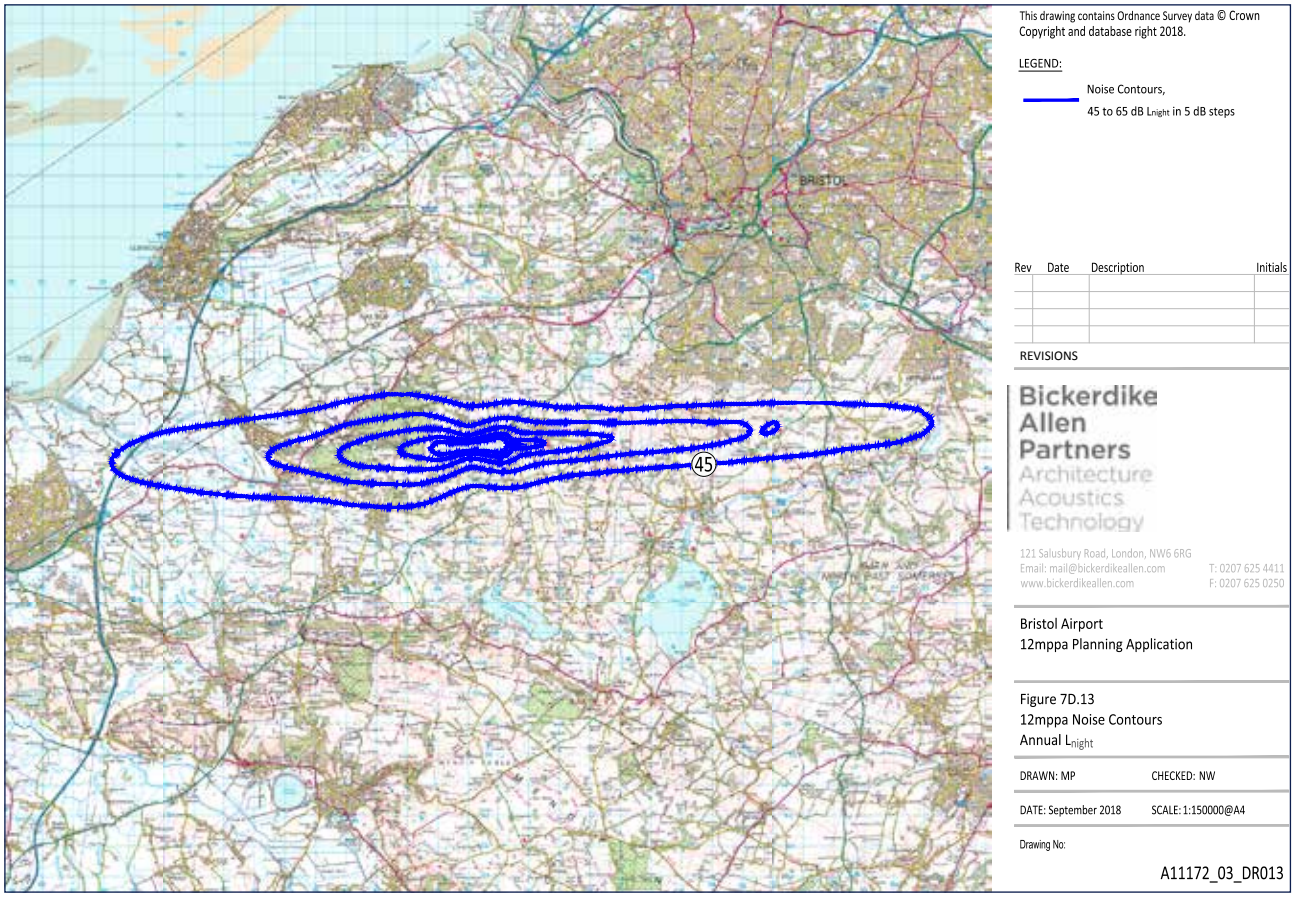

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