

NOISE ACTION PLAN

Draft Noise Action Plan 2018-2023

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1 FOREWORD

Glasgow Airport is one of Scotland's primary infrastructure assets and an integral part of the social and economic welfare of the West of Scotland, supporting over 7,000 jobs. Nearly 10 million passengers travelled through Glasgow in 2017, making it one of the UK's busiest regional airports. It provides domestic and international connectivity to over 130 destinations worldwide, including Europe, North America and the Middle East.

Operating such an important national asset comes with responsibilities, and in talking to our neighbouring communities and other stakeholders, I know that airport related noise is an important issue for people.

Managing noise effects is an integral part of how we grow the airport responsibly in a manner which balances the positive economic and social benefits of the airport and some of the more negative effects such as noise. That is why we have introduced a comprehensive package of noise related measures over a number of years. In this Noise Action Plan we are proposing a number of new noise related measures, such as a new Noise Insulation Policy and proposals for a new arrival and departure route design.

The evolution of aircraft technology continues to yield reductions in noise emissions and we have reduced the size of the airport's noise footprint significantly. I want this plan to build upon this success and continue our progress.

Managing noise will only be achieved by effective partnerships, and I am confident that this updated Noise Action Plan provides a firm foundation to move forward.



Mark Johnston
Operations Director
Glasgow Airport

2 EXECUTIVE SUMMARY

This document sets out Glasgow Airport's Noise Action Plan which aims to manage and, where practical, reduce the adverse effects of aviation related noise. The preparation of a Noise Action Plan is a requirement of the European Union (EU) Environmental Noise Directive 2002/49/EU and The Environmental Noise (Scotland) Regulations 2006. Glasgow Airport has produced this Noise Action Plan to update and replace the 2013-2018 Noise Action Plan. The Noise Action Plan will be the subject of a 13 week public consultation and, once finalised following engagement with stakeholders and communities, will operate from 2018-2023.

This plan covers noise created by airside operations, aircraft approaching to and departing from the airport, taxiing aircraft and engine testing carried out within the airport perimeter. The regulation of aircraft noise is relatively complex with a number of decision-making bodies. A summary of the policy and regulatory framework is provided in Section 4 to explain matters that we are directly responsible for and those matters that are out with our direct control and which we can therefore only influence.

We recognise that noise from aircraft operations can be an important issue for local communities. Minimising and mitigating the adverse effects of noise is an integral part of how we operate and grow the airport responsibly. Importantly, the assessment of aviation noise and adverse effects has recently been subject to significant changes in UK Government policy and we have taken this into account in our Noise Action Plan.

The airport has developed a package of measures over a number of years designed to minimise and mitigate the total adverse effects of noise. In updating our Noise Action Plan we are using the opportunity to take into account the latest research and policy on adverse effects of aviation noise. Our proposed updates and enhancements over and above our existing mitigation measures include:

- proposals for an arrival and departure route design that limits, and where possible, reduces noise impacts; and
- development of a Noise Insulation Policy to mitigate noise for residents most affected by aircraft noise.

2017 noise contours have been developed for the airport and are presented in **Appendix A**.

Finally, Section 9 sets out our Noise Action Plan, including key performance indicators, targets and timescales. Progress against the Noise Action Plan will be communicated in an externally verified annual report.



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This plan covers noise created by airside operations, aircraft approaching to and departing from the airport, taxiing aircraft and engine testing carried out within the airport perimeter. The regulation of aircraft noise is relatively complex with a number of decision-making bodies. A summary of the policy and regulatory framework is provided in Section 4 to explain matters that we are directly responsible for and those matters that are out with our direct control and which we can therefore only influence.

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At Glasgow Airport we recognise that aircraft noise can be an important issue for local communities. Although aircraft noise cannot be eliminated, it can be managed responsibly. We support the Air Navigation Guidance objective to limit and, where possible, reduce the number of people in the UK significantly affected by adverse impacts from aircraft noise. This means balancing the positive social and economic benefits of Glasgow Airport with any adverse effects on local communities.

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3 INTRODUCTION

3.1 PURPOSE

The purpose of the Noise Action Plan is to set out our plan to manage, and where practical, reduce the adverse effects of aviation noise. This Noise Action Plan is an update to the 2013-2018 Noise Action Plan and, following a 13 week public consultation and engagement with stakeholders and communities, will operate from 2018-2023.

At Glasgow Airport we recognise that aircraft noise can be an important issue for local communities. Although aircraft noise cannot be eliminated, it can be managed responsibly. We support the Air Navigation Guidance¹ objective to limit and, where possible, reduce the number of people in the UK significantly affected by adverse impacts from aircraft noise. This means balancing the positive social and economic benefits of Glasgow Airport with any adverse effects on local communities.

This Noise Action Plan therefore sets out our plan to manage and, where practical, reduce the adverse effects of aircraft related noise. It builds upon years of progress in developing mitigation measures in consultation with our neighbours and stakeholders. Importantly, this Noise Action Plan introduces some important updates and enhancements to our current mitigation measures, in line with the latest developments in policy and research relating to noise and health.

3.2 SCOPE

This Noise Action Plan complies with the European Union (EU) Environmental Noise Directive 2002/49/EU (END) and associated UK government regulations. The airport operator (Glasgow Airport Limited) is deemed the competent authority for preparing the Noise Action Plan. Guidance from UK government² states that Noise Action Plans should be designed to manage noise issues and effects arising from aircraft departing from and arriving at the airport, including noise reduction if necessary.

Though other noise sources (such as 'ground noise' from airport activities) are not required to be included, the guidance suggests that this should not preclude their inclusion.

Our Noise Action Plan therefore also covers aircraft taxiing to and from stands and engine testing carried out within the airport perimeter.

The Noise Action Plan does not include noise from airport construction activities or noise from road traffic.

3.3 AIRPORT DESCRIPTION

Glasgow Airport is located one mile north of Paisley and approximately eight miles west of Glasgow City centre. The airport boundary is formed by the Black Cart Water to the north, the White Cart water to the east and the M8 motorway to the south and west. Within these boundaries the airport covers some 340 hectares.

The airport handled almost 10 million passengers in 2017 and has 30 airlines serving approximately 130 destinations worldwide, including Europe, North America and the Middle East. More information concerning the airport infrastructure and passenger demand can be found on our website (www.glasgowairport.com/corporate/about-us/).

3.4 CONSULTATION

The launch of this draft noise action plan will be followed by a public consultation. The final version of the Noise Action Plan will be published by the end of 2018 and incorporate a record of consultation responses and how Glasgow Airport has taken these into consideration. If you would like to take part in the consultation, you can do so by writing to:

**Noise Action Plan Consultation
Glasgow Airport
Erskine Court, St Andrew's Drive
Paisley PA3 2SW**

Or by email to: napconsultation@glasgowairport.com

The public consultation will last a total of 13 weeks. For details of the consultation, including the dates and locations of drop in events, please see www.glasgowairport.com/community/noise

[1] <https://www.gov.uk/government/publications/uk-air-navigation-guidance-2017>

[2] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276226/noise-action-plan-airport-operators-guidance-201401.pdf

4 LEGAL & POLICY FRAMEWORK

The mitigation and management of aircraft noise relies heavily on National and International initiatives and regulation imposed by:

- the International Civil Aviation Organization (ICAO);
- the European Union;
- the UK Government;
- the Scottish Government;
- local authorities; and
- Glasgow Airport itself.

4.1 THE ICAO AND THE 'BALANCED APPROACH'

The International Civil Aviation Organisation (ICAO) is a specialised agency of the United Nations, created to promote the safe and orderly development of international civil aviation throughout the world. It sets standards and regulations necessary for aviation safety, security, efficiency and regularity, as well as for aviation environmental protection. After a Standard is adopted it is put into effect by each ICAO member state in its own territories.

ICAO recognises that aircraft noise is the most significant cause of adverse community reaction related to the operation and expansion of airports and it requires all of its member states to adhere to an approach to managing aircraft noise known as the 'Balanced Approach'. The Balanced Approach aims to address noise management in an environmentally responsive and economically responsible way, and encompasses four principal elements:

- 1 reduction of noise at source;
- 2 land-use planning and management;
- 3 noise abatement operational procedures; and
- 4 operating restrictions on aircraft.

Our Noise Action Plan embraces the Balanced Approach and the plan outlined in Section 9 adopts this format.

ICAO is also responsible for aircraft certification and it has set progressively tighter certification standards for noise emissions from civil aircraft. Aircraft operating in member states must conform to these standards, which are known as 'Chapters'. The Chapters set maximum acceptable noise levels for different aircraft under specific test conditions.

Chapter 2 aircraft have been banned from the EU since 1st April 2002, unless they are granted specific exemptions. The vast majority of civil aircraft now operating therefore fall within Chapters 3 and 4, i.e. they have a smaller noise footprint than the previous Chapter 2 aircraft. All new aircraft manufactured from 2006 onwards must meet the requirements of Chapter 4. From 2017, a new noise standard with increased stringency (Chapter 14) is in force for high-weight aircraft with the new standard becoming effective for low-weight aircraft from 2020.

4.2 EUROPEAN UNION

There are several European Union directives and regulations that apply to the regulation of aircraft noise.

- EC Directive 92/14/EEC banned Chapter 2 aircraft from landing in the EU from 1st April 2002.
- EC Directive 2002/30 introduced discretionary powers to restrict the operation of marginally compliant Chapter 3 aircraft, provided circumstances support this measure. The directive also requires the adoption of the ICAO Balanced Approach to Noise Management and the publication of an environmental noise objective for the airport.
- EC Directive 2002/49 (known as the 'Environmental Noise Directive') requires member states to publish noise maps and noise management action plans for major airports (more than 50,000 movements a year) every 5 years.
- Regulation (EU) No.598/2014 of the European Parliament and of the Council of 16 April 2014 on the establishment of rules and procedures with regard to the introduction of noise related operating restrictions at union airports within a Balanced Approach and repealing Directive 2002/30/EC.

4.3 UK GOVERNMENT

The UK Government plays an important role in setting policy for aviation noise management. The Civil Aviation Acts of 1982 and 2006 granted the UK Government and its airports the power to introduce mitigation and noise control measures. The 2013 Aviation Policy Framework (APF) set out the challenges of noise control at airports, and noted the Government's recognition of the Balanced Approach principle of aircraft noise management.

More recently, the UK Government has published, and consulted on, its Airspace Policy (AP) framework. The Government's consultation response³ on the AP provides an update to some of the policies on aviation noise outlined in the APF and should be viewed as current Government policy. The Government has also published the Air Navigation Guidance 2017 which provides 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.

Importantly the AP sets out a range of new proposals that the Government will implement that are relevant to the Noise Action Plan:

- changes to aviation noise compensation policy;
- the creation of an Independent Commission on Civil Aviation Noise (ICCAN)⁴; and
- new metrics and appraisal guidance to assess noise impacts and their impacts on health and quality of life.

These new proposals are discussed further in the following sections.

4.3.1 CHANGES TO AVIATION NOISE COMPENSATION POLICY

The Government has proposed a number of changes to aviation noise compensation policy in order to improve fairness and transparency. We support these proposals and have taken them into account in the development of our Noise Insulation Scheme.

4.3.2 THE INDEPENDENT COMMISSION ON CIVIL AVIATION NOISE

The Government has proposed the creation of an Independent Commission on Civil Aviation Noise (ICCAN). ICCAN will be responsible for creating, compiling and disseminating best practice to the aviation industry on the management of civil aviation noise and will be responsible for advising government in this area. We support these proposals and will carefully consider any best practice guidance published by ICCAN that is relevant to Glasgow Airport.

4.3.3 NEW METRICS AND APPRAISAL GUIDANCE FOR ASSESSING NOISE IMPACTS

Long term exposure to environmental noise such as road, rail and aircraft noise can lead to impacts on health and quality

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of life. This is recognised and addressed in noise policy which aims to avoid, mitigate and minimise the adverse impacts of noise in health, in the context of sustainable development. At Glasgow Airport we share these objectives and have adopted them as part of our Noise Action Plan.

Thresholds for noise assessment are defined in current government policy in terms of the Lowest Observable Adverse Effect Level (LOAEL). The LOAEL is the level above which adverse effects on health and quality of life can be detected. Current policy proposes a Lowest Observable Adverse Effect Level (LOAEL) of 51 dBA_{eq,16hr} based on the most recent large-scale research study in the UK on aircraft noise (Survey of Noise Attitudes 2014: Aviation, SoNA⁵). A nighttime LOAEL of 45dBA_{eq,8h} is also proposed in the policy, based on the Government's current monetisation methodology (known as WebTAG⁶) and the World Health Organization's methodological guidance for estimating the burden of disease from environmental noise⁷. We support these proposals to assess noise down to these thresholds and have reflected this in our noise mapping (see section 8).

4.4 SCOTTISH GOVERNMENT

The Environmental Noise (Scotland) Regulations 2006 transpose and implement the Environmental Noise Directive (2002/49/EC).

The Planning Advice Note 1/2001: Planning and Noise provides advice on the role of the planning system in helping to prevent and limit the adverse effects of noise, including "a pragmatic approach to the location of new development within the vicinity of existing noise generating uses to ensure that quality of life is not unreasonably affected and that new development continues to support sustainable economic growth".

[3] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/653801/consultation-response-on-uk-airspace-policy-web-version.pdf

[4] The ICCAN will be an independent UK body responsible for creating, compiling and disseminating best practice to the aviation industry.

[5] <http://publicapps.caa.co.uk/docs/33/CAP%201506%20FEB17.pdf> [6] <https://www.gov.uk/guidance/transport-analysis-guidance-webtag> [6] <https://www.gov.uk/guidance/transport-analysis-guidance-webtag>

[7] <http://www.euro.who.int/en/health-topics/environment-and-health/noise/publications/2012/methodological-guidance-for-estimating-the-burden-of-disease-from-environmental-noise>

5 AIRCRAFT NOISE & ITS EFFECTS

5.1 INTRODUCTION TO AIRCRAFT NOISE

Broadly speaking, aircraft noise can be categorised in two parts: air noise and ground noise.

5.1.1 AIRCRAFT 'AIR NOISE'

Air noise from aircraft is generally caused by air passing over the aircraft's airframe (fuselage, wings and underframe) and noise from the engines. When air passes over the airframe it causes friction and turbulence which results in noise. Engine noise is created by the sound of the engine's moving parts and by the sound of air being expelled from the engines at high speeds. The degree of noise generated varies according to aircraft type and size.

Aircraft manufactured today are generally much quieter than they have been in the past and the ICAO set increasingly stringent certification standards for aircraft noise emissions. As a result, the aircraft fleet at Glasgow Airport are becoming increasingly quieter.

5.1.2 AIRCRAFT 'GROUND NOISE'

Ground noise is any noise produced by aircraft whilst on the ground and is often related to the following activities:

- aircraft travelling (taxiing) between the runway and stands (where they park), including holding;
- aircraft at their stands with their auxiliary power units (APU) running; and
- engine testing.

Ground noise impacts tend to be limited to those areas closest to the airfield where they can be more prominent relative to air noise.

Engine testing is an essential part of airport operations. Engines need to be tested for safety reasons, and engine running forms part of the maintenance programme for aircraft. We understand that this noise can cause disturbance to residents closest to the airfield and therefore we adopt measures to reduce the impact on the community. We do not allow engine testing during the night, unless required due to exceptional circumstances.

5.2 MEASURING AND ASSESSING AIRCRAFT NOISE

Measuring sound and describing its impacts or effects is an inherently complex process. Some individuals find noise more disruptive than others. Any attempt to define and measure sound, particularly as a single number, therefore has limitations, and cannot fully capture the spectrum of personal experiences of noise. However, seeking to quantify sound is essential to managing the noise challenge.

There is not a single metric that meets all needs for assessing, quantifying or communicating noise effects and there is a need to use a number of different metrics. For example, some metrics are better correlated with health effects, whilst other metrics can be more useful for communicating and understanding impacts, or for use in performance management monitoring. The key metrics used in the Noise Action Plan are summarised below, but we use a great deal more metrics in quantifying noise at Glasgow Airport, for example in relation to our Airspace Change Proposal (ACP) (see Section 7).

5.2.1 THE $L_{Aeq,T}$ (EQUIVALENT CONTINUOUS SOUND LEVEL) METRIC

There are a range of metrics which are used to describe sound and inform policy relating to aircraft, rail and construction noise. The most common international measure of noise is the L_{Aeq} , meaning 'equivalent continuous sound level'. This is a measurement of the total sound energy over a period of time. It is easiest to think of this as an average, but important to note that all the sound energy in the time period is captured by this metric.

In the UK, daytime aircraft noise is typically measured by calculating the equivalent continuous sound level in decibels (dB) over 16 hours (07:00 to 23:00) to give a single daily figure ($L_{Aeq,16hr}$). Night-time aircraft noise is most typically measured over an 8 hour night period (23:00 to 07:00). The average noise exposure is commonly calculated for the 92 day summer period from June 16th to September 15th. The summer day period is used because people are more likely to have their windows open or be outdoors, and because aviation activity is generally at its most intense during the summer periods.



Separate assessment for day and night recognises that daytime and night-time noise can lead to quite different effects (principally daytime annoyance and night-time sleep disturbance) and thus it is better to define and measure daytime and night-time noise separately.

5.2.2 THE L_{den} (DAY EVENING NIGHT EQUIVALENT SOUND LEVEL) METRIC

The day evening night equivalent sound level (L_{den}) noise metric is a 24 hour noise metric that applies a 5 dB(A) penalty to noise during the evening (19:00 to 23:00) and a 10 dB(A) penalty to noise during the night (23:00 to 07:00), reflecting relatively higher sensitivity to noise during these periods. L_{den} is frequently used to quantify aircraft noise in Europe as it was adopted as a common environmental noise indicator for the European Union in the Environmental Noise Directive (2002/49/EC) for road, rail and industrial sources as well as aircraft noise. It is typically calculated over a full calendar year.

6 NOISE MANAGEMENT AT GLASGOW AIRPORT

Glasgow Airport has been an integral part of the social and economic welfare of Glasgow and the west of Scotland for over 50 years, providing vital connectivity for people, goods and services; as a business it supports in excess of 7,000 jobs. As well as the benefits provided by the airport, we also recognise that aircraft noise can be an important issue for local communities. Although the noise generated by the airport cannot be eliminated, it can be managed responsibly. We support the UK Government's objective to minimise and where possible reduce the number of people affected by aircraft noise, where it is sustainable to do so. This means balancing the positive social and economic benefits of Glasgow Airport with any adverse effects on local communities.

This Noise Action Plan therefore sets out our plan to manage and, where practical, reduce the adverse effects of airport related noise. It builds upon years of progress in developing mitigation measures in consultation with our neighbours and stakeholders. Importantly, this Noise Action Plan introduces some significant updates and additions to our current mitigation measures, in line with the latest developments in policy and research relating to noise and health.

6.1 AIRCRAFT TECHNOLOGY

We are members of Sustainable Aviation, a unique alliance of UK airlines, airports, aerospace manufacturers and air navigation service providers. We regularly attend and contribute to the meetings of Sustainable Aviation and we work with our partners to promote research and development of even quieter aircraft.

Modern aircraft are now significantly quieter than the first generation of jet aircraft, and the ICAO are setting progressively tighter noise certification standards for new aircraft.

6.2 QUIETER OPERATING PROCEDURES

We have worked with airlines, NATS⁸ and Sustainable Aviation partners to develop and implement a number of operating procedures which are designed to reduce noise impacts.

Arriving aircraft are encouraged to adopt Continuous Descent Operations (CDO) which involve aircraft maintaining a steady state of approach, rather than the more conventional stepped approach which involves prolonged periods of level flight. CDO reduces noise as it requires less engine thrust and keeps aircraft higher for longer.

We are also separately consulting on an ACP which will allow aircraft to utilise performance based navigation (PBN), allowing aircraft to fly more accurately along departure routes and therefore provide an opportunity to minimise the number of people affected by aircraft noise. See Section 7 for further detail on the airspace change proposal (ACP) and consultation.

We measure and monitor aircraft noise using two Noise Monitoring Terminals (NMTs) near to the end of each runway. We have departure noise limits in place 94dB LA_{max} during the day and 87dB LA_{max} during the night).

The NMTs form part of the Noise and Track Keeping (NTK) system which we use to:

- investigate noise complaints;
- track violations against departure noise limits and fine airlines;
- track and report on CDO adherence; and
- track and report on noise abatement procedure adherence.

On the ground, we restrict when engine test runs can be carried out (they are not permitted during night-time hours, 23:00 – 07:00, except in exceptional circumstances). The location of test runs is also controlled, and specific locations have been identified to minimise noise effects. We have also installed Fixed Electrical Ground Power (FEGP) systems at many aircraft parking stands to minimise the need for the use of noisier Auxiliary Power Units (APUs).

[8] NATS Holdings, formerly National Air Traffic Services, is the main Air Navigation Service Provider in the UK.



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As well as the benefits provided by the airport, we also recognise that aircraft noise can be an important issue for local communities. Although the noise generated by the airport cannot be eliminated, it can be managed responsibly. We support the UK Government's objective to minimise and where possible reduce the number of people affected by aircraft noise, where it is sustainable to do so.

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We engage directly with local planning authorities to ensure awareness of aircraft operations is considered in the development of sensitive land uses. We contribute to local development plans and monitor planning applications within the vicinity of Glasgow Airport. We also actively contribute to improving aircraft noise information in local planning policy and seek to influence policy where appropriate.

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6.3 NOISE INSULATION AND LAND-USE PLANNING

We engage directly with local planning authorities to ensure awareness of aircraft operations is considered in the development of sensitive land uses. We contribute to local development plans and monitor planning applications within the vicinity of Glasgow Airport. We also actively contribute to improving aircraft noise information in local planning policy and seek to influence policy where appropriate.

We currently operate a home owner relocation scheme for residential properties within the 69dBAeq,16h contour area and noise insulation schemes for sensitive buildings within the 63dBAeq,16h contour area and residential properties within the 66dBAeq,16h contour area.

The Government's current aviation policy is set out in the Aviation Policy Framework (APF). The policies set out within the Consultation Response on UK Airspace Policy⁹ provide a recent update to some of the policies on aviation noise contained within the APF, and is considered to represent the current government policy. The policy now requires financial assistance to be offered towards the noise insulation of residential properties in the 63dBAeq,16h noise contour or above.

Therefore, we are proposing to update our noise insulation scheme to reflect these recent changes in aviation policy, see Section 9 for further details.

6.4 OPERATING RESTRICTIONS

The ICAO Balanced Approach and EU Regulation 598 require us to consider all other aspects of the Balanced Approach (reduction of noise at source; land-use planning and management; and noise abatement operational procedures), before implementing any operating restrictions. This ensures that the range of possible mitigation measures is considered in a consistent way with a view to addressing noise impacts in the most cost-effective way. There are no operating restrictions in place at Glasgow Airport.

6.5 WORKING WITH LOCAL COMMUNITIES

We operate a free noise action line (0800 013 2429) and dedicated email inbox (GLAnoise@glasgowairport.com) through which we log all complaints and seek to respond to 100% of complaints and enquiries within three working days. We publish our performance against this target at the Airport Consultative Committee and in the FlightPath newsletter.

The FlightPath Fund is the main focus of Glasgow Airport's corporate and social responsibility strategy to ensure local people share in our success and we take great pride in the active role we play. In 2010 Glasgow Airport established the FlightPath Fund with the sole intention of providing support to those charities and community groups that are committed to improving the facilities and services available to local people. Since then, it has awarded over £1.2M to more than 450 community groups, charities and innovative projects. Funds come directly from Glasgow Airport itself which makes an annual donation to the FlightPath Fund and from passenger collections within the airport. It is important to note that the FlightPath Fund is not a noise compensation fund nor an alternative to a noise insulation scheme, rather it is a way for us to share our financial success with our local communities and neighbours through the improvement in their quality of life.



The FlightPath Fund is the main focus of Glasgow Airport's corporate and social responsibility strategy to ensure local people share in our success and we take great pride in the active role we play. In 2010 Glasgow Airport established the FlightPath Fund with the sole intention of providing support to those charities and community groups that are committed to improving the facilities and services available to local people. Since then, it has awarded over £1.2M to more than 450 community groups, charities and innovative projects.



^[9] Consultation Response on UK Airspace Policy: A framework for balanced decisions on the design and use of airspace https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/653801/consultation-response-on-uk-airspace-policy-web-version.pdf

7 AIRSPACE CHANGE CONSULTATION



A key element of the strategy involves the replacement of ground-based navigation aids across the UK with new state-of-the-art satellite navigation systems, by the end of the decade. In moving to this new navigational system, we have a requirement to modernise our current arrival and departure procedures.



As well as consulting on our draft Noise Action Plan, we are also consulting on our proposed airspace change. An industry-wide drive, led by our regulator, the Civil Aviation Authority (CAA), to create airspace infrastructure fit for the 21st century is now underway as part of their Future Airspace Strategy¹⁰. A key element of the strategy involves the replacement of ground-based navigation aids across the UK with new state-of-the-art satellite navigation systems, by the end of the decade. In moving to this new navigational system, we have a requirement to modernise our current arrival and departure procedures.

In particular, the new departure procedures will utilise performance based navigation (PBN), which allow aircraft to fly more accurately along departure routes.

Following a full and open consultation, it is our intention to implement new procedures that will enable us to operate smoother and more efficient arrival and departure routes. It will also minimise the amount of time planes queue, both in the air and on the ground, reducing overall emissions and helping to improve flight punctuality for all of our customers.

The environmental assessment work for the ACP have been undertaken concurrently with the development of this Noise Action Plan, and it similarly takes into account the latest developments in policy and research on noise and health.

The ACP is the subject of a separate consultation, for further details please see www.glasgowairport.com/airspace.

[10] <https://www.caa.co.uk/Commercial-industry/Airspace/Future-airspace-strategy/Future-airspace-strategy/>



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8 RESULTS OF 2017 NOISE MAPPING

Table 1 to Table 3 show the results of the 2017 noise mapping for Glasgow Airport. Maps showing the noise contours can also be found in **Appendix A**. Population data and household estimates are given to the nearest 100 and are based on 2011 census data updated for 2017, supplied by CACI Information Solutions.

The latest developments in aviation policy have been taken into account when setting the thresholds for noise assessment in the 2017 noise mapping.

It is important to recognise that the contours provide an indication of those areas where adverse effects might occur. For example, SoNA¹¹ suggests that 7-9% of people will be highly annoyed at daytime $L_{Aeq,16h}$ levels between 51 and 54 dB.

Table 1: 2017 annual (78% W / 22% E) L_{den} area, building and population counts

L_{den} (dBA)	AREA (km ²)	POPULATION	HOUSEHOLDS
> 55	32.1	47,000	22,000
> 60	11.3	7,100	3,300
> 65	3.9	100	<100
> 70	1.4	0	0
> 75	0.6	0	0

Table 2: 2017 average summer day (78% W / 22% E) $L_{Aeq,16h}$ area, building and population counts

$L_{Aeq,16h}$ (dBA)	AREA (km ²)	POPULATION	HOUSEHOLDS
> 51	56.6	83,200	38,900
> 54	30.0	43,500	20,500
> 57	16.2	14,500	6,750
> 60	8.7	3,100	1,500
> 63	4.7	500	250
> 66	2.5	0	0
> 69	1.4	0	0
> 72	0.9	0	0

[11] <http://publicapps.caa.co.uk/docs/33/CAP%201506%20FEB17.pdf>

Table 3: 2017 average summer night (78% W / 22% E) LAeq,8h area, building and population counts

LAeq, 8h (dBA)	AREA (km ²)	POPULATION	HOUSEHOLDS
> 45	57.4	80,600	37,600
> 48	31.0	41,500	19,200
> 51	16.0	17,300	7,800
> 54	8.4	4,900	2,300
> 57	4.3	1,100	600
> 60	2.2	0	0
> 63	1.2	0	0
> 66	0.7	0	0

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We will engage directly with local planning authorities to ensure awareness of aircraft operations is considered in the development of sensitive land uses. We will continue to contribute to local development plans and monitor planning applications within the vicinity of Glasgow Airport.

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9 NOISE ACTION PLAN

Table 4: Noise Action Plan

ACTION AFFECTED	PERFORMANCE INDICATORS	TARGETS & TIMESCALES	NO. OF PEOPLE
Reduction of noise at source			
We will develop, publish and implement a policy prioritising airlines operating Chapter 4 and Chapter 14 aircraft when introducing new business to Glasgow.	Percentage of Chapter 4 aircraft movements.	Targets will be set for the proportion of Ch4 and Ch 14 to be operating by specified dates. The targets and timescales will be defined following consultation with airlines.	n/a
We will work with the airlines through our airline consultation process to review the landing fee differential to incentivise the use of quieter aircraft.	Completion of annual review	Annual review	n/a
We will continue to work with our partners in the aerospace sector through sustainable aviation to achieve the visionary noise goals of FlightPath 2050 which seek to achieve a 65% reduction in perceived noise, or 15dB, from aircraft by 2050 compared to 2000.	Progress against the EU Flightpath 2050 target of a 65% reduction in perceived noise, or 15dB, from aircraft by 2050 compared to 2000.	2050	n/a
Land-use planning and management			
We will engage directly with local planning authorities to ensure awareness of aircraft operations is considered in the development of sensitive land uses. We will continue to contribute to local development plans and monitor planning applications within the vicinity of Glasgow Airport.	Number of planning applications reviewed and number of responses issued to local planning authorities.	Ongoing	n/a

ACTION AFFECTED	PERFORMANCE INDICATORS	TARGETS & TIMESCALES	NO. OF PEOPLE
Land-use planning and management cont.			
<p>We will develop and implement a Noise Insulation Policy to mitigate noise for residents most affected by aircraft noise in line with UK Airspace Policy. We will continue to offer our existing home relocation schemes.</p> <p>We will develop a Noise Insulation Policy through: engagement with MSPs, LPAs, Consultative Committee]; having regard to benchmarking with other airports of a similar size; and any best practice guidance issued by the Independent Commission for Civil Aviation Noise (ICCAN).</p> <p>The Noise Insulation Policy will be implemented as part of a range of measures that will be used to minimise and, where practical, reduce the adverse impacts of aircraft noise. The scheme will be delivered in line with the ICAO Balanced Approach and will not be used as a substitute for other measures that reduce aircraft noise at source or through noise abatement operational procedures.</p> <p>The Noise Insulation Policy will be completed within 12 months from the adoption of this Noise Action Plan and will include, but not be limited to:</p> <ul style="list-style-type: none"> • eligibility rules; • the sound insulation packages (for example secondary glazing or replacement windows and supplementary ventilation); • the extent of the financial contribution; • delivery mechanisms; and • the programme for delivery. <p>We will also explore with the Scottish Government and other organisations whether funding opportunities exist to widen the scope of the scheme to include energy conservation and other retrofit measures with the aim of improving health and quality of life.</p>	<p>Number of properties exposed to noise within the 63dBL_{Aeq,16h} contour.</p> <p>Number of properties insulated.</p> <p>Feedback from residents on satisfaction with the scheme.</p>	<p>Noise Compensation Policy to be developed and completed within 12 months</p>	<p>Residential properties within the 63dBL_{Aeq,16h} contour</p>

ACTION AFFECTED	PERFORMANCE INDICATORS	TARGETS & TIMESCALES	NO. OF PEOPLE
Land-use planning and management cont.			
We will actively contribute to improving aircraft noise information in local planning policy and seek to influence policy where appropriate. We will encourage the use of good acoustic design to avoid and minimise adverse impacts arising from the development of new noise sensitive buildings and encourage the adoption of the principles advocated by the Professional Practice Guidance: Planning & Noise – New Residential Development ¹² .	Number of new development plans reviewed and number of responses issue to local planning authorities.	Ongoing	n/a
Noise abatement operational procedures			
We will promote adherence to the Arrivals Code of Practice (ACOP) and in particular the achievement of Continuous Descent Approaches (CDA) where possible.	Percentage of approaching flights achieving CDA. Airlines are advised individually on a monthly basis of their % achievement.	Ongoing target of: 60% - Runway 23 57% - Runway 05	n/a
We are currently undertaking an airspace change proposal (ACP) and we will review and report on aircraft performance and adherence to departure routes in the first 12 months of its implementation.	Implementation of airspace change.	Review and report within 12 months of implementation	n/a
We will fine aircraft in breach of our departure noise limits (94dB(A) during the day and 87dB(A) during the night) and direct the money raised through these fines to the FlightPath Fund.	Money raised for FlightPath Fund.	Ongoing	Communities within close proximity to the airport.
We will continue to encourage aircraft operators to plan maintenance schedules to avoid the need for ground running of engines at night. We will continue to enforce our policy that runs should not last longer than 20 minutes. We will investigate any complaints received from ground running activity and revisit our policies if appropriate. We will report on the frequency and times of engine running to the local community through the website.	Number, location and duration of engine runs.	Ongoing	Communities within close proximity to the airport.

[12] <http://www.ioa.org.uk/publications/propg>

ACTION AFFECTED	PERFORMANCE INDICATORS	TARGETS & TIMESCALES	NO. OF PEOPLE
Operating restrictions			
<p>Our Noise Action Plan is consistent with the ICAO Balanced Approach and EU Regulation 598, which requires operating restrictions to be considered only after other measures of the Balanced Approach have been exhausted and only where it is cost effective to do so. We will continually review the effectiveness of our mitigation measures in the context of the balanced approach to ensure that mitigation is considered in a consistent way with a view to addressing noise impacts in the most cost-effective way.</p>	<p>Tracking of Noise Action Plan and mitigation measures.</p>	<p>Ongoing</p>	<p>n/a</p>
Working with local communities			
<p>We will discuss noise issues and report on our progress against the Noise Action Plan under a standing agenda item of the Consultative Committee.</p>	<p>Number of meetings.</p>	<p>Ongoing</p>	<p>n/a</p>
<p>We will carefully consider any best practice guidance published by ICCAN on information and communication requirements.</p>	<p>Number of best practice guidance publications reviewed.</p>	<p>Ongoing</p>	<p>n/a</p>
<p>We will continue to operate a free noise action line and dedicated email inbox. We will log all complaints, seek to respond to 100% of complaints and enquiries within 3 working days and publish our performance at the Airport Consultative Committee and in the FlightPath newsletter.</p>	<p>Number of calls/ emails received. Statistics published quarterly and in FlightPath newsletter.</p>	<p>Ongoing</p>	<p>n/a</p>
<p>We will continue to operate the Noise and Track Keeping system to enable monitoring and investigation of noise issues.</p>	<p>Number of complaints investigated using NTK system.</p>	<p>Ongoing</p>	<p>n/a</p>



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<p>We will continue to operate the Noise and Track Keeping system to enable monitoring and investigation of noise issues.</p>	<p>Number of complaints investigated using NTK system.</p>	<p>Ongoing</p>	<p>n/a</p>

10 MONITORING & REPORTING ON OUR PROGRESS



Our performance against these indicators will be regularly internally reviewed through our Managing Responsibly System. During the five year period of this action plan we may need to add or amend the range of performance indicators to respond to developments which enable us to better manage noise impacts.



In order to evaluate the effectiveness and delivery of the Noise Action Plan, we have established performance indicators, timescales and targets where appropriate and committed to reporting on our progress through various avenues:

- regularly on our website;
- monthly in our Sustainability Committee meetings; and
- annually via an externally verified progress report.

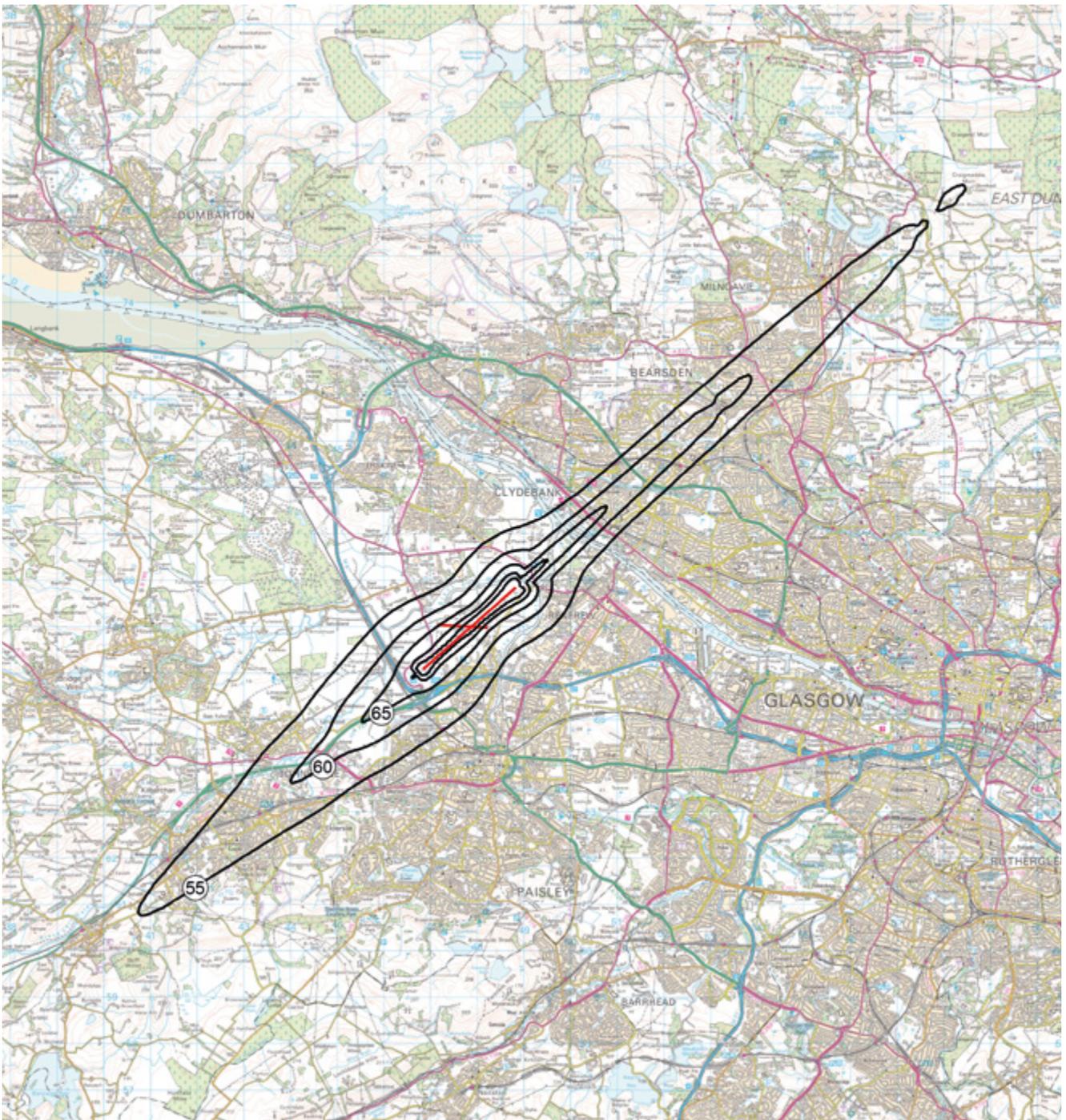
We have also committed to developing a new avenue for reporting progress through the creation of a standing agenda item of the Consultative Committee.

We will monitor against our established performance indicators to track progress against each area of focus to ensure that the work we are undertaking is resulting in the most efficient benefit in terms of managing noise impacts. Our performance against these indicators will be regularly internally reviewed through our Managing Responsibly System. During the five year period of this action plan we may need to add or amend the range of performance indicators to respond to developments which enable us to better manage noise impacts.

APPENDIX A

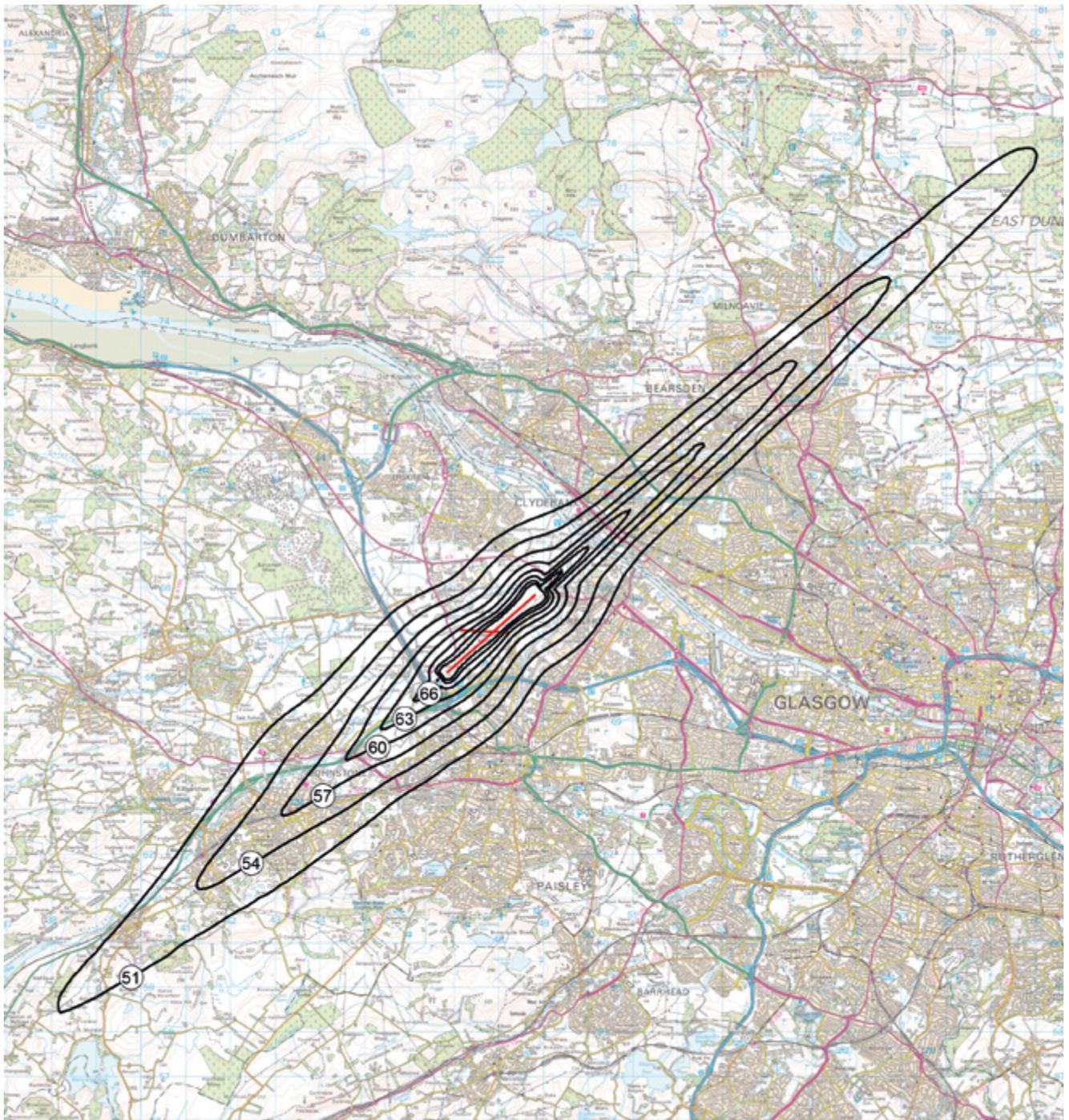
NOISE CONTOUR MAPS

2017 annual (78% W / 22% E) L_{den} noise contours



— NOISE CONTOURS
— RUNWAY

2017 average summer day (78% W / 22% E) $L_{Aeq,16h}$ noise contours

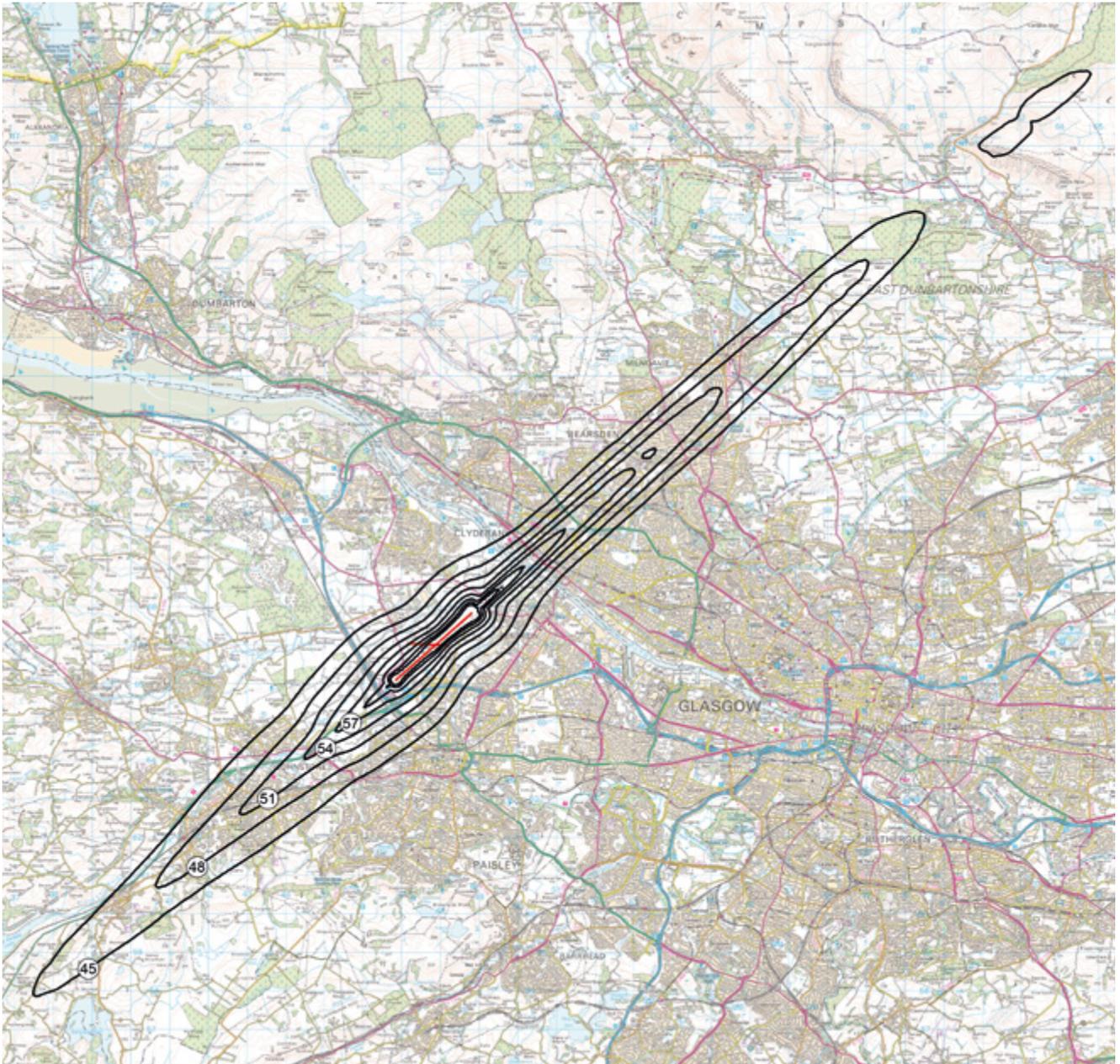


— NOISE CONTOURS
— RUNWAY

APPENDIX A

NOISE CONTOUR MAPS CONT.

2017 average summer night (78% W / 22% E) $L_{Aeq,8h}$ noise contours



— NOISE CONTOURS
— RUNWAY

APPENDIX B

FINANCIAL INFORMATION: ANNUAL RUNNING COSTS

Type	Description	Estimated Cost
Staff Costs	Flight Evaluation, Communications, Environment and Airside teams	£60,000
Computer Costs	Noise and Track Keeping System	£29,000
Equipment Costs	Noise Monitor maintenance, Radar maintenance	£24,000
Publications	Community Newsletters	£9,912
Fines	Fines for breaching noise limits	£1,200
Noise Action Line	Dedicated phone line rental	£150

As part of the development of the Noise Insulation Policy, a cost assessment will be undertaken which will take into account the cost of implementation and the likely benefit expected to be accrued.

All information published in the document is correct at time of publication, January 2018. Printed copies available on request.

glasgowairport.com/community/noise