



GLASGOW  
AIRPORT

PROUD TO SERVE SCOTLAND

# NOISE ACTION PLAN 2013-2018

JANUARY 2014



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## FOREWORD

Glasgow Airport is one of Scotland's primary infrastructure assets and a key driver of economic growth. Over seven million passengers travelled through Glasgow in 2013, making it one of the UK's busiest regional airports. It provides domestic and international connectivity to over 100 destinations, including vital links to the Highlands and Islands, Europe, North America and the Middle East. Nearly 4,500 jobs are supported directly on site and 7,320 across Scotland. In economic terms, the airport contributes nearly £200 million annually to the Scottish economy.

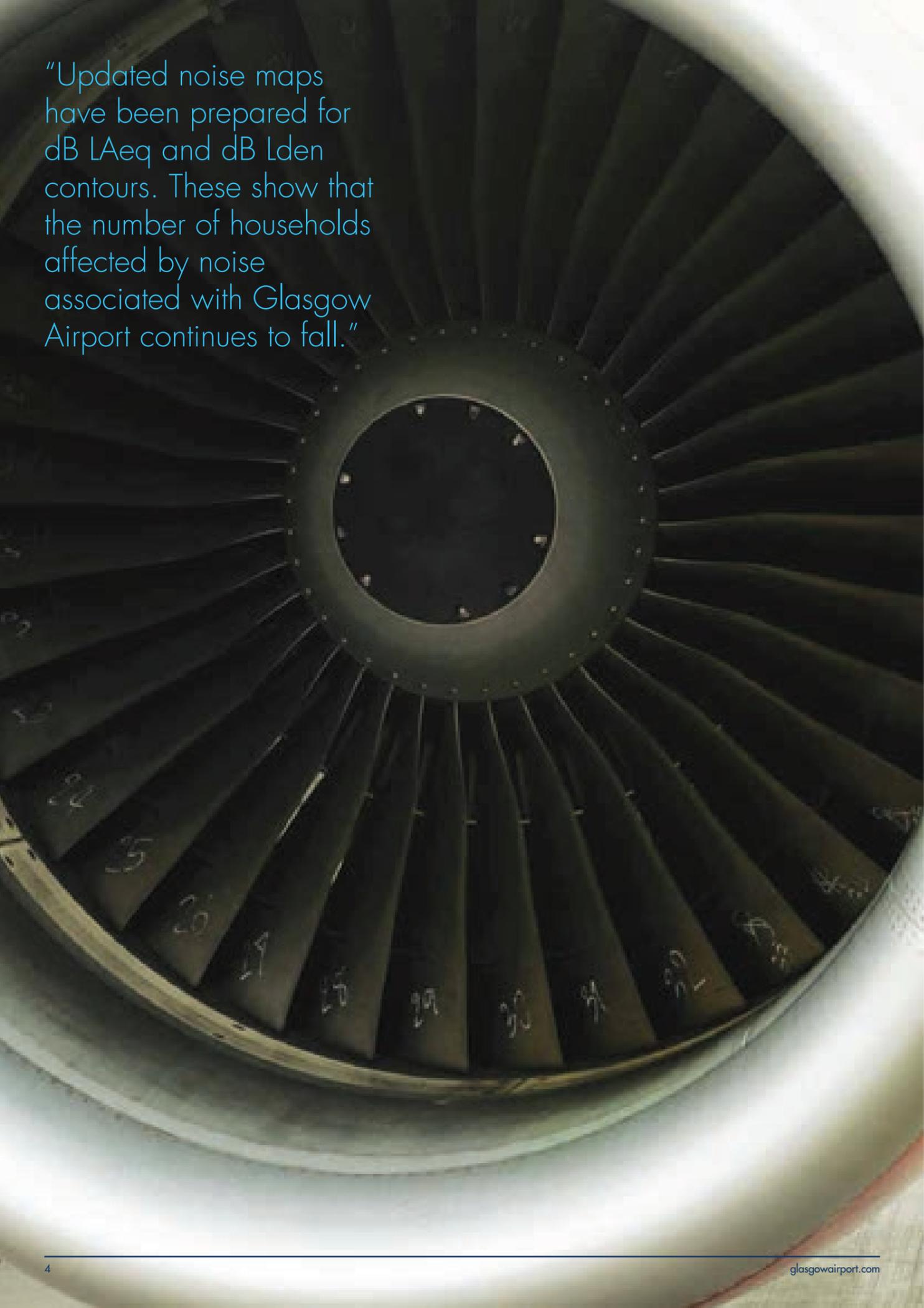
Operating such an important national asset comes with responsibilities, and in talking to our neighbouring communities and other stakeholders, I know that airport related noise is an important issue for some people. Managing noise effects is an integral part of how we grow the airport responsibly in 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. These measures have been effective. 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.

Finally, I would like to thank all of those who participated in the draft Noise Action Plan consultation. We considered these responses carefully and have incorporated further actions to reflect some of the specific issues raised.

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."

Amanda McMillan  
Managing Director, Glasgow Airport



“Updated noise maps have been prepared for dB LAeq and dB Lden contours. These show that the number of households affected by noise associated with Glasgow Airport continues to fall.”

## EXECUTIVE SUMMARY

This document sets out Glasgow Airport’s noise action plan which aims to manage and, where possible, reduce the effects of airport related noise. In accordance with European Union and Scottish Government regulations, Glasgow Airport has produced this plan to replace the 2008-2013 noise action plan. The draft plan was the subject of a 12 week public consultation, the summary results of which can be found at Appendix D.

The scope of this plan considers noise created by airside and terminal operations, aircraft approaching and taking off from the airport, taxiing aircraft and engine testing carried out within the airport perimeter.

Glasgow Airport recognises that noise from aircraft operations can be an important issue for local communities. Minimising and mitigating the effects of noise is an integral part of how we operate and grow the airport responsibly. Accordingly, the airport has developed a package of measures over a number of years designed to minimise and mitigate against aircraft noise, including:

- Noise Preferential Routes;
- engine test run restrictions;
- investing in Fixed Electric Ground Power systems;
- introducing a noise insulation scheme for residential properties within the 66 decibel contour area;
- launching a dedicated 24 hour noise action line; and
- adopting strict Department for Transport day and night-time noise restrictions.

Updated noise maps have been prepared for dB LAeq and dB Lden contours. These show that the number of households affected by noise associated with Glasgow Airport continues to fall. Further analysis shows that, in 2012, only 4% of flight movements operated between the hours of 23.00 and 06.00hrs.

Finally, Chapters six and seven set out the airport’s noise action plan, including measures to provide an annual progress report which will be verified by independent auditors.



## 1. INTRODUCTION

### Purpose

The draft plan was the subject of a 12 week public consultation, the summary results of which can be found at Appendix D). It replaces the 2008-2013 noise action plan. It has been prepared in accordance with European Union and Scottish Government regulations which require airports with over 50,000 movements a year, to produce noise action plans. The Scottish Government is responsible for producing separate noise action plans for large urban areas, strategic road and rail networks.

Glasgow Airport recognises that noise from aircraft operations can be an important issue for local communities. Minimising and mitigating the effects of noise is an integral part of how we operate and grow the airport responsibly. The publication of this noise action plan sets out

Glasgow Airport's intentions to build upon the progress we have made between 2008 and 2013 and continue to engage with our neighbours and stakeholders to collectively take effective action. The noise action plan will operate between 2013 and 2018.

### Scope

The scope of this plan considers noise created by airside and terminal operations, aircraft approaching and taking off from the airport, taxiing aircraft and engine testing carried out within the airport perimeter. It includes actions based on current facilities and known developments up to 2018 as indicated in the Glasgow Airport Master Plan (see [www.glasgowairport.com/planning-and-development](http://www.glasgowairport.com/planning-and-development) for more information). The action plan does not include noise from airport construction activities or noise from road traffic.

European Directive 2002/49/EU requires the action plan to make reference to the airport's dB Lden noise contours for 2011, as published by the Environment Research Consultancy Department (ERCD) of the Civil Aviation Authority (CAA). These contours are shown in Appendices A and B. The Directive also requires that each action plan should contain estimates in terms of the reduction in the number of people affected. An estimate of this number has been included as part of the action plan table in Chapter 6. Under the Environmental Assessment (Scotland) Act 2005, noise action plans also require a scoping report and environmental report. This will be carried out for the overarching Scottish Government noise action plan, which incorporates the airport plans.

## 2. THE FRAMEWORK FOR MANAGING NOISE AT GLASGOW AIRPORT

Glasgow Airport has been an integral part of the social and economic life of Glasgow and the west of Scotland for over 40 years, providing vital connectivity for people, goods and investment. As a business, it directly provides around 4,500 jobs and contributes nearly £200 million a year to the economy.

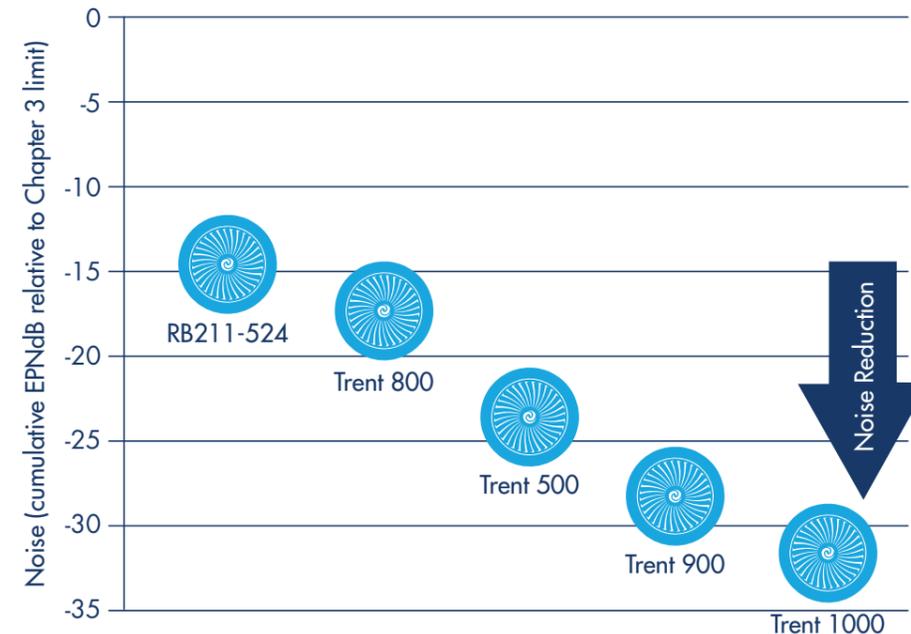
Nevertheless, we recognise that a balance has to be struck between the positive benefits of the airport and some of the more negative effects such as noise. In this respect, the airport has developed a package of measures over a number of years designed to minimise and mitigate against aircraft noise. Some of these measures have been required by Government policy, but most have been implemented by Glasgow Airport on a voluntary basis. The measures fall within the following themes:

- aircraft technology;
- quieter operating procedures;
- noise insulation and land use planning;
- working with local communities; and
- operating restrictions.

### Aircraft Technology

Glasgow airport has worked with our partners in the aerospace sector through Sustainable Aviation's Noise Road-Map (see [www.sustainableaviation.co.uk](http://www.sustainableaviation.co.uk) for more information) to promote research and development of quieter aircraft. Modern aircraft are now significantly quieter than the first generation of jet aircraft, with a 75% reduction in the noise people perceive<sup>1</sup>. For example, Figure 1 shows how the Rolls-Royce Trent family of engines have significantly reduced jet velocities for the same thrust and consequently make much less noise.

Figure 1  
Entry into Service Date



1. The Future of Air Transport White Paper, Department for Transport, 2003.

### Quieter Operating Procedures

Together with our airline, NATS and Sustainable Aviation partners, Glasgow Airport has developed and implemented a number of operating procedures which help to reduce noise effects. These include measures to define Noise Preferential Routes (NPR) for arriving and departing aircraft which seek to minimise flying over centres of population. Arriving aircraft are also encouraged to adopt a Continuous Descent Approach (CDA) which involves aircraft maintaining a steady angle of approach, rather than the more conventional stepped approach which involves prolonged periods of level flight. Continuous Descent Approaches reduce noise because they require less engine thrust and keep aircraft higher for longer. This is not always possible at Glasgow due to the height of the hills which surround the city but is encouraged wherever possible.

On the ground, Glasgow Airport restricts when engine test runs can be carried out (not permitted between 2200 and 0700), and where they are carried out, with specified locations having been identified to minimise noise effects. The airport has also installed Fixed Electric Ground Power systems at many aircraft parking stands to minimise the need for noisier Auxiliary Power Units.

### Noise Insulation and Land Use Planning

In line with the UK Government's 'Future of Air Transport' White Paper, Glasgow Airport introduced a noise mitigation scheme for 'noise sensitive buildings' within the 63 decibel contour area and a home owner relocation scheme for home owners within the 69 decibel contour area. However, following on from a commitment made in the 2008-2013 noise action plan, the airport consulted upon and introduced a further noise insulation scheme for residential properties within the 66

decibel contour area. The airport also monitors development plans and planning applications for development within or near the flight path to identify potentially inappropriate development or highlight the requirement for suitable noise insulation.

### Working with Local Communities

In 2007, the airport launched a dedicated 24 hour noise action line (0800 013 2429) to make it easier for local residents to contact the airport with any concerns. The freephone noise action line is monitored and all calls are investigated using the noise and track keeping system. The airport also publishes a community newsletter, FlightPath, every three months. This is distributed to over 18,000 households and includes information about the noise action line, current consultation opportunities and the number of complaints received in the preceding period.

### Operating Restrictions

The airport adopts strict Department for Transport day and night-time noise restrictions, which are legally required at larger airports such as Heathrow and Gatwick, but which have been adopted on a voluntary basis by Glasgow Airport. In 2003, Glasgow Airport installed a new noise and track keeping system which operates to standards set by the International Civil Aviation Organization. This system enables the airport to continuously monitor noise at three locations and pin-point the position and height of arriving and departing aircraft. Airlines which breach the voluntary noise limits can be, and indeed have been, fined.

Noisier aircraft (referred to as 'Chapter 2 aircraft') have been banned for a number of years from operating at Glasgow Airport and differential landing charges encourage airlines to operate quieter aircraft types. Indeed, Glasgow was one of the first airports to ban Chapter 2 aircraft before it was rolled out across Europe.

All of this hard work has made a difference. In 2007, the CAA examined the noise climate around the airport. It found that Glasgow Airport's noise footprint shrank in 2006 compared to 2002, despite a rise in passenger numbers from 7.8 to 8.8 million. It also found that the noise footprint in 2006 was less than half the size it was in 1990. In practice, this means that noise is an issue for fewer households, even though the airport has grown significantly. As stipulated in the planning permission granted for the major expansion of Glasgow Airport in 1987, the airport remains fully committed to ensuring the total noise energy emitted around the airport is no greater than in 1987.



"Together with our airline, NATS and Sustainable Aviation partners, Glasgow Airport has developed and implemented a number of operating procedures which help to reduce noise effects."

### 3. BACKGROUND TO NOISE AND REGULATION

#### What is Aircraft Noise?

Air and ground noise is created by aircraft approaching or taking off from airports, by taxiing aircraft and by engines running on the airfield. This noise is caused by:

- air going over the aircraft's fuselage (body) and wings – known as air frame; and
- aircraft engines

When air passes over the aircraft's body, it causes friction and turbulence, which results in noise. The level of noise generated varies according to aircraft size and type, and can differ even for identical aircraft. Engine noise is created by the sound of the engine's moving parts and by the sound of air being expelled at high speed.

Aircraft manufactured today are much quieter than they were 40, 30 or even 20 years ago and these will be replaced by even quieter aircraft in the future. Indeed, the noise footprint of a new Boeing 787 'Dreamliner' is 60%

smaller than similarly sized aircraft. But even though each individual aircraft is quieter, there are more planes flying now. This means that although the average level of noise is lower than before, the frequency of aircraft movements and hence noise 'events' has generally increased.

**Ground Noise and Engine Running**  
Although not required under the Environment Noise Directive in this round of mapping and action planning, the consultation for the previous noise action plan highlighted that ground noise can be a significant disturbance to the local community, just as air noise can. The airport therefore decided to include the issue of ground noise within the plan. Ground noise relates to the noise produced by aircraft when running their engines while on the ground, either for taxiing or engine running.



Engine running 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 local residents and therefore adopt certain measures to reduce the impact on the community. We do not allow engine testing during the night, unless required due to exceptional circumstances.

#### Night Flights

Glasgow Airport has always operated on a 24 hour basis, though the number of night time flights is relatively low. In 2012, less than 3,000 flight movements – out of an annual total of over 71,000 flights – operated between the hours of 23.00 and 06.00hrs. Over the course of a year, this equates to only 4% of all flight movements.

A certain number of these night flights are necessary in order to correspond with schedules and time differences around the world. Also, a number of Glasgow's night flights are Air Ambulance flights to and from the Highlands and Islands, and provide a valuable social lifeline for remote communities.

However, we are mindful of the inconvenience this can sometimes cause local residents, and Glasgow Airport therefore voluntarily adopts Department for Transport night-time noise restrictions, which limit noise levels between the hours of 23.00 and 06.00. Glasgow Airport has no obligation to impose night time limits, and does so on an entirely voluntary basis. Glasgow Airport will continue to monitor the number of night time flight movements but does not foresee a material increase in the number of such movements.

#### The Effects of Noise

There are many different effects and sources of noise and individuals experience each of them to varying degrees. Perceptions can vary

depending on the time of day, the location, and the level of background noise in a particular location. Attitudes and reactions to noise are just as, if not more, important as the noise level experienced, but these attitudes are less understood than the technical science of sound-generation and measurement.

The effects can include general distraction, speech interference and sleep disturbance. Sometimes these effects can lead to annoyance and possibly more overt reactions, like complaints. Research into the potential health effects of noise is still unclear. Nevertheless the possibility that severe annoyance might induce stress cannot be ignored. The Air Transport White Paper acknowledged the potential health effects of aviation and noted the Government's intention to continue with research on the effects of noise on human health. Glasgow Airport will continue to monitor government research in these areas.

#### Measuring Noise

##### dB LAeq Contours

Every four years, the CAA produces contours which estimate the average aircraft related noise experienced by people living around Glasgow Airport. The Government uses the Equivalent Continuous Sound Level, dB LAeq for this purpose which provides average noise levels for the busiest 16 hours of the day, between 0700 – 2300 over the busiest three months of the year, from mid June to mid September. This is the most common international measure of aircraft noise.

The UK Government says that communities become significantly annoyed by aircraft noise above 57dB LAeq. This is why contours are presented from 57 to 72 dB LAeq in steps of 3 dB. However, Glasgow Airport recognises that while the 57 dB LAeq contour provides some basis for action to identify and try to reduce the noise climate, it does not in isolation express the full extent of noise impacts on local communities.

The latest summer 16-hour dB LAeq contours for 2011 are shown in Annex C. These show that the 57 dB contour has decreased in size compared with 2006 from 15.1 km<sup>2</sup> to 8.9km<sup>2</sup> despite an increase in traffic.

##### dB Lden Contours

The Environmental Noise (Scotland) Regulations 2006 requires that strategic noise mapping should be conducted at five yearly intervals. Unlike the conventional summer 16-hour dB LAeq contours, the regulations require a different range of noise parameters: Lday, Levening, Lnight, LAeq16hr, and dB Lden. A full definition of these terms is provided in the glossary in Annex A.

All these parameters are based on air traffic movements over the entire year, unlike conventional dB LAeq contours that are based on air traffic during the busiest summer months. In addition, an arbitrary weighting of 5 dB is applied to each of the evening (19:00-23:00) movements and 10 dB for each of the night (23:00 - 07:00) movements, to take into account the greater perception of disturbance at night.

Contours for strategic noise mapping are presented in 5 dB steps from 55 dBA to 75 dBA except for Lnight where the contours are presented between 50 dBA and 70 dBA. The strategic contours for Glasgow Airport are presented in Annex D.

The fundamental differences in methodologies for calculating dB LAeq and dB Lden contours leave it difficult to make meaningful direct comparisons. In general terms, the area of the dB Lden contours tends to be larger than those for dB LAeq due to the weightings for evening and night flights. Although the weightings do not directly accord with perceptions, it is clear from community engagement and surveys that flights at night time and evenings tend to cause greater annoyance and disturbance than flights during the daytime.

## Interdependencies

There are interdependencies between emissions of local air pollutants and carbon dioxide (CO<sub>2</sub>) from aircraft engines which affect aircraft noise management. Most of the technological advances in aircraft design in the last twenty years have led to both a reduction in noise and CO<sub>2</sub> emissions. However in some cases, the drive towards quieter aircraft has resulted in an increase in emissions of local air pollutants such as oxides of nitrogen (NO<sub>x</sub>). The challenge for the aviation industry is to manage and balance these three issues simultaneously.

It is also important to ensure that operational controls are balanced in respect of noise. For example, the adoption of a reduced thrust setting for an aircraft during take-off can lower the NO<sub>x</sub> emissions by 30% or more. While many airlines already employ 'reduced thrust' as their standard operating procedure, there can be a small increase in the noise experienced by those under the departure flight path as the aircraft takes a more gentle angle of ascent.

Glasgow Airport has long been aware of the interdependencies between noise, local air quality and CO<sub>2</sub> emissions and has undertaken a number of studies to help quantify the exact balance that needs to be struck for individual situations. The level of scientific understanding of interdependencies is however incomplete and Glasgow Airport will continue to promote further research.

## The Regulation of Aircraft Noise

There are five main tiers of regulation governing aircraft noise in Scotland:

- International (International Civil Aviation Organisation);
- European Union;
- UK Government;
- Scottish Government; and
- Local Authority.

As demonstrated above, the airport itself can and does act as another important regulator of aircraft noise in its own right. The Civil Aviation Act 2006 clarified the scope of the powers available to airport operators in aircraft noise management. An airport may charge aircraft operators for use of the aerodrome by reference to the noise or emissions from an aircraft. This enables the airport operator to introduce differential charging to help to provide an incentive to use quieter and cleaner aircraft. The airport can also levy financial penalties on an aircraft operator which breaches noise abatement requirements.

Information on the financial incentives used by Glasgow Airport to encourage the use of quieter aircraft and operational practices are listed in the Airport Conditions of Use (available from [www.glasgowairport.com/about-us/doing-business-with-us/conditions-of-use](http://www.glasgowairport.com/about-us/doing-business-with-us/conditions-of-use)).

## International Regulation

At an international level, the International Civil Aviation Organisation (ICAO) sets progressively tighter certification standards, known as Chapters for noise emissions from civil aircraft to which member countries' fleets must conform. In addition to these specific requirements, the ICAO requires member states to adopt a "balanced approach" to noise management which looks beyond individual aircraft to reduce noise impact through:

- reducing aircraft noise at source;
- land-use planning;
- changes to operational procedures; and
- restrictions on the use of the noisiest aircraft.

## European Union

The European Union (EU) is increasingly assuming responsibility for the regulation of aircraft noise standards. The Directives of most relevance are:

- EC Directive 92/14/EEC, which banned Chapter 2 aircraft from landing in the EU from 1st April 2002. Examples of these are the BAC-1-11 or the B737-200;
- EC Directive 2002/30, which introduced discretionary powers to restrict the operation of marginally compliant Chapter 3 aircraft, where circumstances support this measure. The Directive also required the publication of an environmental noise objective for the airport and the adoption of a balanced approach to noise management including the four dimensions agreed by ICAO; and
- EC Directive 2002/49 ('environmental noise directive'), which requires member states to create 'noise maps' of noise from all transport sources in urban areas. The Directive also aims to harmonise methods for measuring noise across the EU. This is the Directive under which we have produced this draft noise action plan.

## UK Government

The UK Government has an important role in setting and developing the policy framework for aircraft noise control at UK airports and has prescribed a range of controls on aircraft noise impacts. The UK Government recently published its Aviation Policy Framework which recognises both the positive benefits that aviation brings and some of the challenges, such as noise, which need to be addressed. The Aviation Policy Framework notes that the UK Government fully recognises the ICAO Assembly 'balanced approach', which Glasgow Airport supports.

Full details of the range of aircraft operations related noise controls are set out in statutory notices and published in the UK Aeronautical Information Package (UKAIP) and elsewhere as appropriate. These



controls include techniques such as Continuous Descent Approaches (CDAs), other noise abatement procedures and operating restrictions (limits on night flights for example). The 1982 and 2006 Civil Aviation Acts grant the UK Government and airports powers to introduce noise control measures, including mitigation.

## Scottish Government

The regulation of aviation and air transport (including the Civil Aviation Act) has not been devolved to the Scottish Parliament. The issue of Environmental Noise is devolved and responsibility for implementing the Environmental Noise Directive through the Environmental Noise (Scotland) Regulations 2006 lies with Scottish Ministers.

PAN 1/2011 provides advice on the role of the planning system in helping to prevent and limit the adverse effects

of noise. In doing so, it seeks to promote 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.

## Local Authority

Local authorities are not directly responsible for the control of noise associated with air traffic. However, when determining planning applications through the Town and Country Planning system, local authorities can enter into agreements and/or attach planning conditions to cover issues such as noise. The current Noise and Track Keeping system at Glasgow was originally a condition of the planning permission granted for the expansion of the airport in 1987.

## 4. GLASGOW AIRPORT TODAY

Glasgow Airport is located one mile north of Paisley and around eight miles west of Glasgow city centre. The 'natural' boundaries of the site are 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 7.2 million passengers in 2012 and serves around 100 destinations across the UK, Europe, North America and the Middle East.

More general information concerning the airport infrastructure and passenger demand can be found in the airport master plan (available at [www.glasgowairport.com/masterplan](http://www.glasgowairport.com/masterplan)).



## 5. RESULTS OF THE 2011 NOISE MAPPING

Tables 1 to 5 below show the results of 2011 noise mapping for Glasgow Airport. Maps showing these results can also be found at Appendices A and B.

TABLE 1 - ESTIMATED AREAS, POPULATIONS, HOUSEHOLDS WITHIN YEAR 2011  $L_{den}$  CONTOURS

Contour Level dB(A)	Area (km <sup>2</sup> )	Population	Households
> 55	20.7	29,800	13,450
> 60	7.2	3,100	1,350
> 65	2.5	0	0
> 70	0.9	0	0
> 75	0.5	0	0

TABLE 2 - ESTIMATED AREAS, POPULATIONS, HOUSEHOLDS WITHIN YEAR 2011  $L_{Aeq,16hr}$  CONTOURS

Contour Level dB(A)	Area (km <sup>2</sup> )	Population	Households
> 57	8.9	5,750	2,600
> 60	4.6	1,100	500
> 63	2.4	0	0
> 66	1.3	0	0
> 69	0.7	0	0
> 72	0.5	0	0

TABLE 3 - ESTIMATED AREAS, POPULATIONS, HOUSEHOLDS WITHIN YEAR 2011  $L_{day}$  CONTOURS

Contour Level dB(A)	Area (km <sup>2</sup> )	Population	Households
> 55	14.6	16,900	7,800
> 60	4.9	1,100	500
> 65	1.7	0	0
> 70	0.7	0	0
> 75	0.4	0	0

TABLE 4 - ESTIMATED AREAS, POPULATIONS, HOUSEHOLDS WITHIN YEAR 2011  $L_{evening}$  CONTOURS

Contour Level dB(A)	Area (km <sup>2</sup> )	Population	Households
> 55	11.4	12,700	5,750
> 60	3.6	1,100	500
> 65	1.2	0	0
> 70	0.5	0	0
> 75	0.3	0	0

TABLE 4 - ESTIMATED AREAS, POPULATIONS, HOUSEHOLDS WITHIN YEAR 2011  $L_{night}$  CONTOURS

Contour Level dB(A)	Area (km <sup>2</sup> )	Population	Households
> 50	8.6	4,500	2,050
> 55	3.0	< 50	< 50
> 60	1.1	0	0
> 65	0.5	0	0
> 70	0.3	0	0

Notes: Population and household estimates are given to the nearest 50, and based on 2001 Census data updated for 2011, supplied by CACI Information Solutions. © CACI Limited 2011 All Rights Reserved.

## 6. ACTION PLAN

TABLE 1 - ESTIMATED AREAS, POPULATIONS, HOUSEHOLDS WITHIN YEAR 2011  $L_{den}$  CONTOURS

Action	Timescale	Performance Indicator	Approximate number of people affected
<b>Aircraft Technology</b>			
We will continue to work with our partners in the aerospace sector through Sustainable Aviation to progress the Noise Road-Map and promote research and development of even quieter aircraft.	On-going	Progress against the EU Flightpath 2050 programme which seeks to achieve a 65% reduction in perceived noise, or 15dB, from aircraft by 2050 compared to 2000.	All communities within and beyond the 55 decibel contour area.
We will continue to work with our partners in the aerospace sector through Sustainable Aviation to achieve the visionary noise goals of Flightpath 2050 and CLEEN.	On-going	Progress against the EU Flightpath 2050 programme which seeks to achieve a 65% reduction in perceived noise, or 15dB, from aircraft by 2050 compared to 2000.	All communities within and beyond the 55 decibel contour area.
<b>Quieter Operating Procedure</b>			
We will promote adherence to the Arrivals Code of Practice (ACOP) and in particular the achievement of Continuous Descent Approaches, where possible.	2014, 2015, 2016, 2017, 2018	Percent of approaching flights achieving CDA.	n/a
We will encourage aircraft operators to plan maintenance schedules to avoid the need for ground running of engines at night. Night for these purposes is defined as the period between 2200 - 0700 hours local time.	On-going	Number, location and duration of engine runs.	n/a
We will continue to engage with our aviation partners to seek to improve adherence to the AIP.	On-going	Update of actions to airport consultative committee.	n/a
We will develop, publish and implement a policy prioritising airlines operating Chapter 4 aircraft when introducing new business to Glasgow.	On-going	Percentage of Chapter 4 aircraft flight movements.	All communities within and beyond the 55 decibel contour area.
We will review the landing fee differential at least every year commencing in 2014.	2014, 2015, 2016, 2017, 2018	Changes in charging within Conditions of Use document. Track percentage within different charging categories. Contours.	n/a

We will continue to work with our partners in Sustainable Aviation to develop and promote low noise flight procedures through evaluation of operational methods and implementation of best practice. We will report on these annually through our Sustainability Report.	2014, 2015, 2016, 2017, 2018	Publish update of activities in annual Sustainability Report.	n/a
We aim to maintain or decrease the square kilometer area which falls within the 2006 57db Leaq contour line as determined by the CAA for the duration of this action plan.	On-going		All communities within and beyond the 57 decibel contour area.
<b>Noise Insulation and Land Use Planning</b>			
We will continue to engage with local planning authorities to ensure awareness of aircraft operations is considered in the development of sensitive land uses.	On-going	Number of responses issued to local planning authorities.	n/a
We will actively contribute to improving aircraft noise information in local planning policy.	On-going	Number of responses submitted to preparation of new development plans.	n/a
We will continue to monitor developments with respect to the measurement of aircraft noise to ensure that the approach we apply is consistent with that adopted at other UK airports.	On-going	n/a	n/a
We will continue to offer relocation and noise insulation assistance through our established schemes.	On-going	Number of applications for assistance.	n/a
<b>Working with local communities</b>			
We will continue to operate a free noise action line.	On-going	Number of calls received.	n/a
We will continue to operate the Noise and Track Keeping system to enable monitoring and investigation of noise issues.	On-going	NTK system operation.	n/a
We will continue to log all complaints relating to aircraft operations and publish the statistics quarterly and in the FlightPath newsletter.	On-going	Statistics published quarterly and in FlightPath newsletter.	n/a

We will seek to respond to 100% of all complaints and enquiries within 3 working days and publish our performance at the Airport Consultative Committee and in the FlightPath newsletter.	On-going	Statistics published at the Airport Consultative Committee and in FlightPath newsletter.	n/a
We will publish an update of progress against the action plan on an annual basis in our Sustainability Report.	2014, 2015, 2016, 2017, 2018	Progress against noise action plan published in annual Sustainability Report.	n/a
We will continue to direct all money raised by noise infringement fines to the independent Glasgow Airport FlightPath Fund.	On-going	Amount of fines directed to the FlightPath Fund.	n/a
We will report on the frequency and times of engine running to the local community through the FlightPath newsletter.	2014, 2015, 2016, 2017, 2018	Number of articles in FlightPath newsletter.	n/a
Distribution of the FlightPath newsletter will be extended to parts of Bearsden to improve communication between the airport and neighbouring communities.	On-going	Increased circulation of newsletter	1704
<b>Operating Restrictions</b>			
We will continue to adopt strict Department for Transport day and night-time noise restrictions, which are legally required at larger airports such as Heathrow and Gatwick, but which have been adopted on a voluntary basis by Glasgow Airport.	On-going	Number of breaches.	All communities within and beyond the 55 decibel contour area.
We will continue to fine aircraft in breach of the DfT noise limits.	On-going	Number of fines issued.	All communities within and beyond the 55 decibel contour area.

## 7. MONITORING AND REPORTING ON OUR PROGRESS

In order to evaluate the effectiveness and delivery of the noise action plan we have:

- established performance indicators;
- set specific targets where appropriate;
- committed to providing an annual action plan progress report; and
- committed to continuing an independent audit process to verify statements made in our annual sustainability report.

### Performance Indicators

We will monitor the set of performance indicators to track progress against each area of focus. This will help to ensure that the work we are undertaking is resulting in the maximum benefit in terms of managing noise effects. Our performance against these indicators will be regularly reviewed internally through our Managing Responsibly System. During the five-year period of this action plan, we may add to or amend the range of performance indicators to respond to

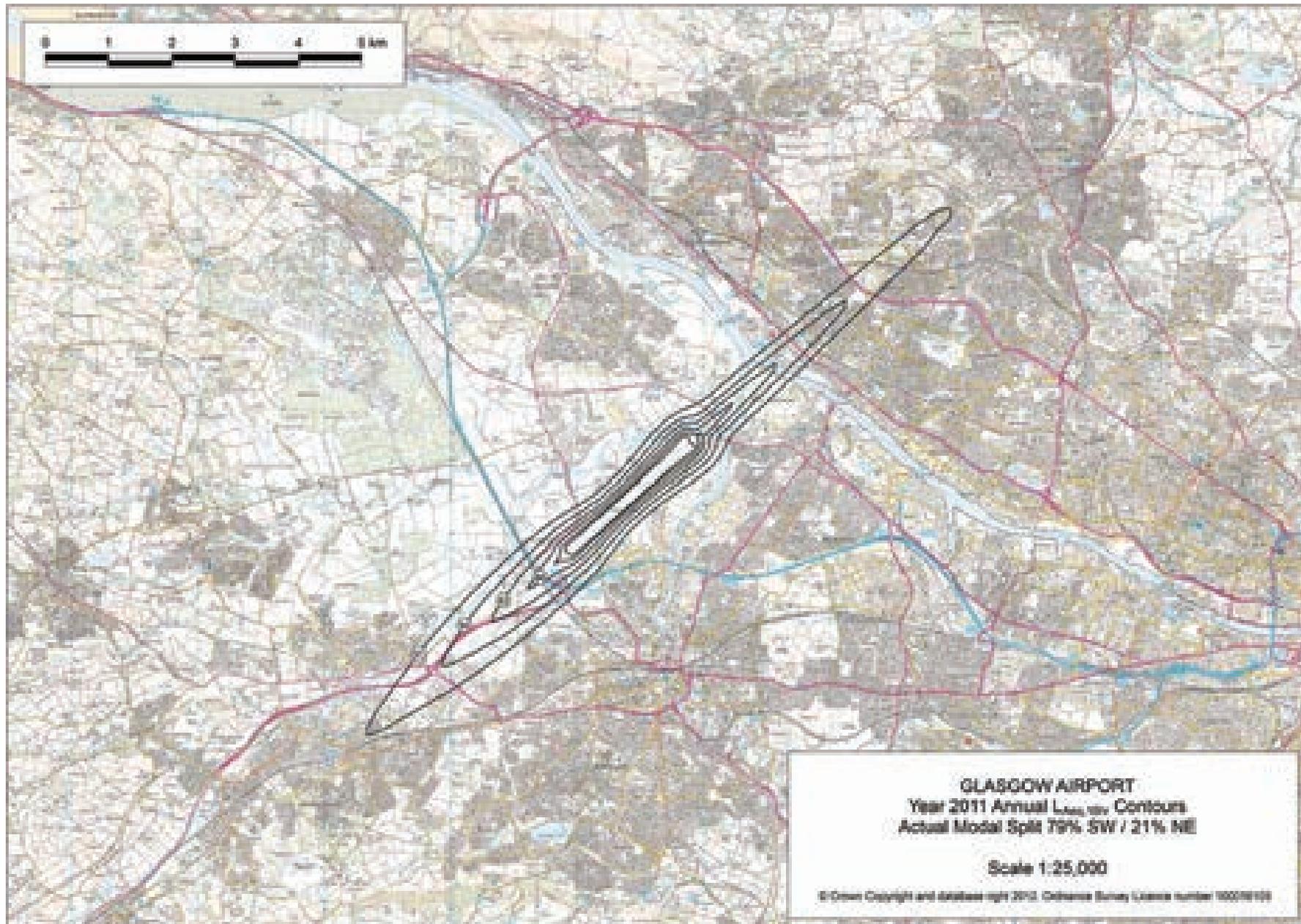
improvements which enable us to better manage the airport noise impacts. From time to time we may set an annual target against one or more of the performance indicators and include this in our annual reporting.

### Tracking Progress

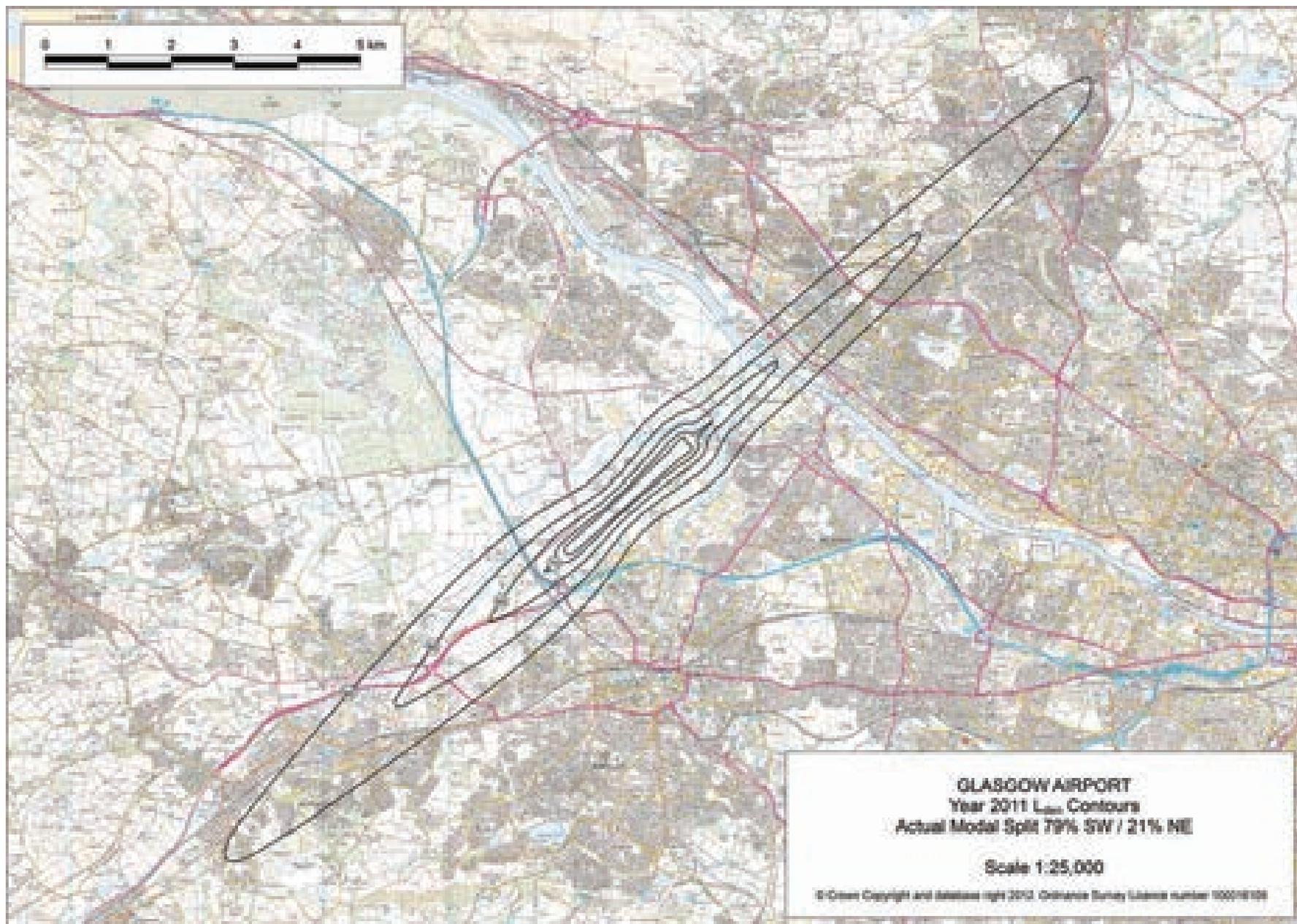
We will produce a summary noise action plan progress report on an annual basis which will detail activity against all of the actions within the plan. We intend to continue with independent verification of the progress claims made within our sustainability report. In addition we have selected a number of key performance indicators which will help provide a concise overview of the impact and delivery of the noise action plan. These are set out in chapter 6.



## APPENDIX A: DB LAEQ NOISE MAPS



## APPENDIX B: DB LDEN NOISE MAPS



## APPENDIX C: FINANCIAL INFORMATION

Type	Description	Estimated Cost
Staff Costs	Flight Evaluation, Communications, Environment and Airside teams	£50,000
Computer Costs	Noise and Track Keeping System	£20,000
Equipment Costs	Noise Monitor maintenance, Radar maintenance	£20,000
Publications	Community Newsletters	£5,000
Fines	Fines for breaching noise limits	£1,000 to FlightPath Fund
Noise Action Line	Dedicated phone line rental	£600

## FEEDBACK AND QUESTIONS

If you have any feedback or questions relating to this document, please contact:

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