

Noise Action Plan 2018-2023

Managing the impact of noise on local communities

How we manage noise at Edinburgh Airport is an extremely important part of our commitment to our surrounding communities. Our 5 Year Noise Action Plan (NAP) sets out our plan to manage noise at Edinburgh Airport.

Gordon Dewar
Chief Executive



Glossary

We've included some technical terms and general noise/aviation terms in our glossary to help you when reading this document.

General terms

ACARE	Advisory Council for Aeronautics Research in Europe
AIP	Aeronautical Information Package. The AIP contains information on the airport facilities, airspace, local traffic regulation and noise abatement procedures. This includes the procedures to be followed by departing and arriving aircraft, directions in respect of Continuous Descent Approaches and the rules for light aircraft operations. http://www.natsuk.eadit.com/public/index.php%3Foption=com_content&task=blogcategory&id=62&Itemid=111.html
ATC	Air Traffic Control
ATM	Air Transport Movement
CAA	The Civil Aviation Authority; the CAA are our regulators.
CCD	Continuous Climb Departures
CDA	Continuous Descent Approach
CRR	Corporate Responsibility Report
ILS	Instrument Landing System. The ILS is a radio system that transmits two beams, the localiser and the glide path. The localiser beam defines the centreline of the runway and extends along the approach path for approximately 20 nautical miles. The glide path beam defines the glide slope that aircraft should fly while following the localiser course to approach the runway.
mppa	Million passengers per annum
NATS	Licensed to provide en-route air traffic control for the UK and the eastern part of the North Atlantic.

NDB	Non Directional Beacon. An NDB is a single aerial transmitter which transmits directional information to an aircraft. Should the ILS be out of service, a Non Directional Beacon (NDB) approach is used. These are also required as part of a pilot's training schedule so may, on occasion, be used even when the ILS is operational.
Noise Contour Map	A map which shows contour lines indicating noise exposure in dB for the area that it encloses.
NPR	Noise Preferential Routes. Departing aircraft are required to remain within NPR until an altitude of 3,000ft or 4,000ft has been achieved. Depending on the Standard Instrument Departure (SID) route that they are using.
NTK	Noise and Track Keeping monitoring system. The NTK system associates radar data from air traffic control radar with related data from both fixed (permanent) and mobile noise monitors at prescribed positions on the ground.
PAN	Planning Advice Note
SID	Standard Instrument Departure Route. The SID is the flight path that an aircraft flies, and will depend on a number of factors including the destination of the aircraft and other traffic in the sky at the time.
Sustainable Aviation	A UK aviation industry initiative aiming to set out a long term strategy for the industry to address its sustainability issues.

Technical terms

'A' weighting

The human ear responds to some tones better than to others, so you can hear somebody talking but cannot hear the very low tones of a car travelling in the distance or the very high tones made by a dog whistle or bat. To account for this, a sound level meter is fitted with filters, the most common being 'A' weighting which is similar to the response of the human ear.

dB(A)

Decibels A-weighted.

L_{day}

The A-weighted long-term average sound level as defined in ISO 1996-2: 1987, determined over all the day periods of a year, 07:00-19:00.

L_{den}

Unlike L_{Aeq} dB contours, L_{den} dB contours are based on air traffic movements over the entire year. In addition, an arbitrary weighting (or penalty) 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 disturbance at night. Contours for strategic noise mapping are presented in 5 dB steps from 55 dBA to 75 dBA except for L_{night} where the contours are presented between 50 dBA and 70 dBA. The strategic contours for Edinburgh Airport are presented in Appendix B, C and D.

L_{eq} or L_{Aeq}

Equivalent continuous sound level or L_{eq} is defined as the level of hypothetical steady sound which, over the measurement period, would contain the same (frequency-weighted) sound energy as the actual variable sound. L_{eq} can be measured over any scale in practice. L_{Aeq} is A-weighted to represent weighting for human hearing and is the most commonly used and is widely accepted as the most accurate parameter to use for determining nuisance and disturbance.

L_{evening}

The A-weighted long-term average sound level as defined in ISO 1996-2: 1987, determined over all the evening periods of a year, 19:00-23:00.

L_{max}

L_{max} is the highest value of the time-weighted sound pressure level, which occurs during the measurement period. It is commonly used to measure the effect of very short duration bursts of noise, such as for example sudden bangs, shouts, car horns, emergency sirens etc. which audibly stand out from the general level of, say, traffic noise.

L_{night}

The A-weighted long-term average sound level as defined in ISO 1996-2: 1987, determined over all the night periods of a year; 23:00-07:00.

L_{AeqT}

This is the equivalent continuous sound level or L_{eq} weighted for both human hearing and over a specified time period.

L_{Amax}

The L_{max} measurement A-weighted to represent weighting for human hearing.

Foreword by Chief Executive

It will come as no surprise that noise and its impacts are one of the main topics of discussion between a growing international airport and its surrounding communities.

For us, it is an area of passionate discussion, investment and an area of emerging collaboration with a range of groups.

In recent years, we have grown as an airport, increasing the number of passengers by almost 3.5 million over the last four years and delivering more choice and destinations for people. We are proud of this growth which has also created more jobs, stronger business partnerships and a more successful Scotland.

However, we remain committed to being a responsible business that balances our growth and economic benefits with managing and reducing our impact on the environment and local community, and improving our sustainability performance. We demonstrate this commitment by having our environmental management system externally accredited to the ISO 14005 standard. This Noise Action Plan (NAP) sets out our plans to address these noise issues and reduce the noise impact on local communities.

We recently ran an Airspace Change Programme (ACP) including two public consultations. This five-year NAP is based solely on the currently flown flight paths as required by the Environmental Noise (Scotland) Regulations 2006.

If the proposed flight paths are approved by the CAA and changes are made to our flight paths in the future, a new five-year NAP must be produced and the public will be consulted on a new draft version of the plan.

How we manage noise at Edinburgh Airport is an extremely important part of our commitment to the communities in and around us.

A six week public consultation took place 20 February – 2 April 2018 which helped shape our NAP for the next five years.



Regards

Gordon Dewar
Chief Executive

Contents

	Page
01 ● Foreword by Chief Executive	4
02 ● Executive summary	6
03 ● Purpose and scope of the Noise Action Plan	8
04 ● Existing noise management	11
05 ● Background to noise and regulation	14
06 ● Description of the airport location and airspace	18
07 ● Results of the 2018 noise mapping	22
08 ● Evaluating implementation of 2013-2018 Noise Action Plan	24
09 ● Noise Action Plan: 2018-2023	28
10 ● More information	31
11 ● Appendices	
A Contour maps and population statistics methodology	33
B L _{den} contour map	34
C L _{Aeq} contour map	36
D L _{night} contour map	38
E Useful links	40
F Insulation Grant Scheme	40
G Current noise fining procedures	41
H Conclusions of the Ricardo - AEA 2013/2014 AQ monitoring	42
I ICAO Appendix 16 Volume 1 - Environmental Protection, Aircraft Noise	43
J The cost of noise management	43
K Complaints policy	44

Executive summary

This document outlines why we have a Noise Action Plan (NAP), sets out progress against the 2013-2018 NAP actions and outlines our actions for 2018-2023.

Edinburgh Airport is one of the fastest growing airports in the UK. In 2017, we broke an annual record for passengers at any Scottish airport with confirmation of over 13.4 million people flying through the airport. We cannot completely eliminate the noise caused but we aim to manage and reduce our impact on our neighbouring communities, wherever possible through planning, monitoring and mitigation.

The EU Noise Directive (2002/49/EU) and Environmental Noise (Scotland) Regulations 2006 require airports with over 50,000 movements a year to produce a noise action plan. The Scottish Government's Environmental Assessment (Scotland) Act 2005 requires airports to produce a Noise Action Plan every five years.

The key themes for 2018-2023 are:

- a) continue our commitment to managing aircraft noise impacts associated with Edinburgh Airport's operations including:
 - (i) the quietest fleet practicable
 - (ii) the quietest practicable aircraft operations
 - (iii) effective and credible noise mitigation schemes

- b) continue to engage with the communities affected by aircraft noise and better understand and respond to their concerns and priorities
 - (i) influence planning policy to minimise the number of noise sensitive properties around our airport
- c) effectively manage aircraft noise
- d) build on our extensive understanding of aircraft noise to further inform our priorities, strategies and targets.

The EU's Environment Noise Directive also requires that each action plan should contain estimates in terms of the reduction in the number of people affected (annoyed, sleep disturbed or other). While this is difficult to estimate, a high-level number has been included as part of the action plan in Section 09.

We recognise that it is important to keep communities and other stakeholders informed about any progress made. We are committed to reporting publicly on our performance and the effectiveness of our actions to address community concerns. With this in mind, we report on our progress against the action plan in our annual Corporate Responsibility Report (CRR). The CRR is posted on our website at edinburghairport.com/community

We have recently set up an Edinburgh Airport Noise Advisory Board (EANAB) made up of representatives of community councils and other relevant bodies. The EANAB has been established to create and maintain an impartial pathway for the community at large to engage with Edinburgh Airport in the understanding and resolution of issues relating to aircraft noise associated with Edinburgh Airport, with the primary aim of minimising the noise impact on affected or potentially affected communities.

By prioritising noise management activities on the most effective actions, we believe we can ensure maximum benefits for noise-affected communities.

To produce the contour maps that are used in this 2018-2023 NAP, we used population data that was produced for the Scottish Government by Jacobs Ltd, and supplied to Edinburgh Airport. The parameters used in the production of this data are detailed in Appendix A.

Purpose and scope of the Noise Action Plan

Purpose

The EU Noise Directive (2002/49/EU) and Environmental Noise (Scotland) Regulations 2006 require airports with over 50,000 movements a year to produce a noise action plan every five years. Details of the legislation, contour maps and noise action plans for road operators, rail providers, relevant airport operators and large urban areas can be found at <https://noise.environment.gov.scot/>

People have different levels of sensitivity to noise and we recognise that noise from aircraft operations is a concern for the communities around the airport. We engage with local communities in a number of ways and this NAP is just one of them.

Scope

This NAP seeks to manage all noise on the airfield. This goes further than the EU Noise Directive (2002/49/EU) which just considers noise created by aircraft from the start of take-off and noise from aircraft turning off the runway after landing. We believe that the impact of noise should be considered more holistically and while noise from the landing and take-off cycle may affect specific communities more than others, we will also propose actions to mitigate impact of noise from aircraft taxiing or having their engine running on the airfield.

The scope of the action plan does not include noise from airport construction activities or noise from road and rail traffic associated with the airport. Construction works are temporary. Noise from major road and rail routes in the vicinity of Edinburgh Airport is covered by the Scottish Government NAPs.

One of the key outputs of the NAP is L_{den} noise contours for 2016 along with detail of the area, population and number of households within the contour banding.

The contour maps within this NAP were prepared by the Civil Aviation Authority (CAA). The 2016 contours are shown in Appendix B, C and D. Contour maps must be prepared using the previous year's full-year data, and were submitted to the Scottish Government in March 2017.

In Section 05, we explain the difference between the commonly used contour metrics, with further technical descriptions available in the glossary.

Existing noise management

At Edinburgh Airport, we strive to achieve a balance between the benefits that our airport brings to Edinburgh and Scotland, and the noise disturbance that our operations may cause to our neighbours and the wider community.

We recognise we cannot completely eliminate noise caused by our operations we aim to operate practical, responsible and realistic environmental controls; to reduce the number impacted, while creating local and national employment and supporting substantial inward investment in our region.

Airports have important statutory responsibilities to manage noise from their operations, this forms part of our strategy and we report on noise annually in our CRR. We also respond directly to individuals who contact us via our dedicated Freephone noise number, our feedback system or email options.

Noise monitoring and fining

As part of our commitment to mitigate against the noise from operations at Edinburgh Airport we currently have policies and procedures in place which control, monitor, and where necessary fine aircraft operators who do not follow our procedures.

Aircraft flying to and from Edinburgh Airport are monitored by three permanent and fixed noise monitoring stations located at Cramond, Uphall/Broxburn and Livingston.

To measure the noise from individual aircraft the noise measurement parameter L_{max} is used. This is measured in decibels (dB), and is the measurement of the maximum noise level during each aircraft movement.

There are maximum allowed levels for daytime noise (06:00-23:30) and night time noise (23:30-06:00) – these are 94 dBA L_{max} and 87 dBA L_{max} respectively. Flights must not exceed these levels and airlines are fined for all exceedances. This is a voluntary policy introduced by Edinburgh Airport to mitigate against noise nuisance in our communities.

Further information on our current noise fining policy and procedures can be found within Appendix G.

Placement of noise monitors

We have fixed noise monitors that are positioned using the recommendations of a scientific study which was carried out by the CAA for the Department for Transport. This study was carried out to ensure that the major London airports positioned their noise monitors in locations that would ensure consistent and accurate noise measurements could be obtained. Edinburgh Airport follows this guidance as do other major airports in the UK, including Gatwick, Heathrow, Stanstead and Glasgow.

Noise and Track Keeping system

In 2017, we commissioned a project to implement a customer-focused and accessible Noise and Track Keeping system (NTK). This new NTK system developed by Casper will be publicly available in Summer 2018. As well as improved analysis and reporting, this system will allow members of the public to track the path of flights arriving and departing Edinburgh Airport

very close to real time. A slight delay is built into the system for security reasons. The public will be able to monitor flights of interest and view the associated level of noise at the fixed-noise monitoring site nearest to them. The online tool will allow members of the public to check aircraft noise levels and flight-specific information such as flight position and altitude using our own radar data.

In line with our complaints procedure members of the public who do not have access to the internet can contact us regarding their concerns either by post or via our dedicated noise line on 0800 731 3397 (Freephone 24/7). Our complaints procedure is available within Appendix K or online via our website www.edinburghairport.com

Edinburgh Airport Noise Advisory Board

The Edinburgh Airport Noise Advisory Board (EANAB) is a recently established Board and a forum involving the airport, its neighbours and partners to ensure communities are involved, engaged and informed through open dialogue and clear data.

The EANAB has been established to create and maintain an impartial pathway for the community at large to engage with Edinburgh Airport in the understanding and resolution of issues relating to aircraft noise associated with Edinburgh Airport, with the primary aim of minimising the noise impact on affected or potentially affected communities.

EANAB forms part of the airport's wider stakeholder engagement and the independent Chair of the EANAB also sits on the airport's Consultative Committee.

Ground noise and engine running

We recognise that ground noise can also cause significant disturbance to the local community. For that reason, although not required under the Environment Noise Directive, we will continue to seek to address this through operating practices.

Engine running is an essential part of airport operations. Engines need to be tested for safety reasons and engine runs form 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 exceptional circumstances require us to do so. High power engine running takes place to the south east of the airfield which is the furthest location from any residential properties. Other engine testing generally takes place on the aircraft stands.

All ground engine runs are subject to prior approval by Airside Operations and ATC. Permission for ground runs outwith the following days and times will only be permitted under exceptional circumstances:

Monday to Friday 23:01-05:59 Saturday and Sunday 23:01-08:59

In order to help our community better understand our engine running requirements, we included a specific action within our NAP to report on the frequency and times of engine running through our quarterly report to EACC. We propose to maintain this communication.

Continuous Descent Approaches

Arriving aircraft are encouraged to use Continuous Descent Approaches (CDA).

With a 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 result in reduced fuel burn and emissions and mean less noise exposure for communities under the arrivals flight path. This type of procedure can result in noise reductions of up to 5 dB.

Continuous Climb Departures

Like CDAs, Continuous Climb Departures (CCD) are encouraged due to the noise reductions and fuel savings on local communities.

The greatest benefit of continuous climb departures is the significant reduction in CO₂ emissions and the benefits this has on air quality.

Sustainable Aviation has promoted continuous climb techniques at UK airports, with the procedure being used up until 10,000ft. From 55% of departures using the technique in 2006, implementation grew to 67% in

2014. Sustainable Aviation is also promoting best practice in take-off and landing cycle operations through the publication, in partnership with others, of codes of practice. Climbing to optimum cruising altitude and out of congested airspace can reduce CO₂ per departure by 100-300 kilograms.

Further information on CDAs and CCDs and the scientific reasoning behind the use of these procedures may be found on Sustainable Aviation's website www.sustainableaviation.co.uk

Noise insulation scheme

As part of the noise mapping for this NAP, new L_{eq} dBA 16hr contour maps were produced for Edinburgh Airport by our regulator the Civil Aviation Authority (CAA). These will be used to determine the eligibility of properties to assist with the installation and replacement of double-glazed windows and loft insulation.

In 2016 we increased the number of properties eligible to apply to the scheme by including the 63 dB contour. Properties within the 63 dB and greater contours may apply for assistance as detailed below.

Scheme details

Households without double glazing in the 63 dB or greater contour of the airport, who haven't benefited from the scheme before, are entitled to apply for:

- free secondary glazing to fit existing windows; or
- a 50% contribution to standard double glazed PVCu replacement windows; or
- a 50% contribution to high specification double glazed PVCu replacement windows, specially designed to reduce noise levels, or a combination of these options
- a 50% contribution for replacing glass sealed units (glass only keeping existing window frames).

Owners of properties already fitted with double glazing who do not want it replaced, will still be eligible for loft insulation free of charge as part of the scheme.

Night noise mitigation

As part of our ongoing commitment to reducing the impact of our operations on our closest neighbours, we currently impose stricter noise controls and limits during the hours of 23:30 to 06:00.

Noise fining

Between the hours of 23:30 and 06:00 aircraft must not exceed 87 dB L_{max} at Edinburgh Airport's fixed-noise monitoring stations, a financial penalty will be imposed on all aircraft which exceed this limit. The minimum penalty for exceeding the limit is £1,000, rising to £2,000 if the exceedance is greater than 3 dB. Further information on our noise fining policy can be found in Appendix G.

Engine testing

We do not allow engine testing during the night unless exceptional circumstances require us to do so. High power engine running takes place to the south east of the airfield which is the furthest location from any residential properties.

Military aircraft

Military aircraft are exempt from the noise certification criteria that apply to civilian aircraft. This is a UK Governmental exemption and UK airports' noise standards, including Edinburgh's NAP, cannot be imposed on military aircraft operations. We restrict military operations to between 07:00 and 23:00 hours with the only exceptions being for essential operations, mostly on compassionate grounds. In these cases, we may permit arrival operations only, with subsequent departure being permitted after 07:00. Military aircraft are also exempt from the terms of the EU Noise Directive (2002/49/EU).

Complaints policy

We understand that our operations have an impact on our local communities and that residents may want to complain about aircraft activity. This policy explains how we receive and process complaints. Our current complaint policy is detailed in Appendix K.

Background to noise and regulation

Sources of airport noise

Noise at airports is caused by a variety of sources, not only from aircraft taking off and landing on our runway but also:

- engines running on the airfield prior to take off and after landing
- vehicles on the airfield servicing aircraft
- cargo vehicles servicing cargo operations
- ground running of engines.

Noise from aircraft is caused by air going over the aircraft's fuselage (body) and wings – known as airframe – and its engines. When air passes over the aircraft's airframe, 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 have been getting progressively quieter as designs and engine technology have advanced, and it is expected that today's airlines will be operating even quieter models in the future.

Different people react differently to noise. Perceptions vary not only on the level of noise but also depending on the character, on the time of day, the location and the level of background noise present. Reactions to noise can be influenced by an individual's attitude to the noise level experienced. However, these attitudes are less well understood than the technical science of sound-generation and measurement.

The Scottish Government in Planning Advice Note 1/2011: Planning and Noise, details common sounds, and their decibel rating at source:

- unsilenced pneumatic drill (at 7m distance) – 95 dBA
- heavy diesel lorry (40km/h at 7m distance) – 83 dBA
- modern twin-engine jet (at take-off at 152m distance) – 81 dBA
- passenger car (60 km/h at 7m distance) – 70 dBA
- office environment – 60 dBA
- ordinary conversation – 50 dBA
- quiet bedroom – 35 dBA.

To put some of these noise levels into perspective 70 dBA is the average noise level at the Newbridge roundabout while standing on the pavement while 60 dBA is the average noise level generated by aircraft in the communities close to the airport at the eastern end of Ratho Station or in parts of Cramond. Actual average noise levels in Ratho Station may be higher due to the proximity of motorways and arterial routes into Edinburgh. On that basis, someone's perception of noise at different points within Ratho Station or Cramond could vary.

PAN 1/2011 helpfully describes perception in relation to the decibel scale. It advises that decibels incorporating an 'A' frequency weighting (dBA), differentiate between sounds of different frequency (pitch) in a similar way to the human ear and broadly agree with people's assessment of loudness. It also explains that for noise of a similar character, a change of 3 dBA is the minimum perceptible under normal conditions, and a change of 10 dBA corresponds roughly to halving or doubling the loudness of a sound.

In practice, the perceived exposure of aircraft noise is influenced by weather conditions, character of the location and individual attitudes as well as the source level of noise.

For aviation purposes, as a flight increases in altitude the noise from the aircraft disperses and dissipates outwards, with noise levels decreasing as the height of the aircraft increases. In order to assess environmental noise exposure to those living near an airport, it is necessary to take into account the impact of many events over longer periods – days, months, years. These events will generally differ in magnitude; there will be different numbers in each hour or day; and they will occur at different times of day. Most measurements for these assessments use the LA_{eq} time averaging parameter.

Noise contour maps are used to predict which geographical areas will likely be the most disturbed by noise. They are provided to us by our regulator the CAA based on the previous year's actual data, and help Edinburgh Airport to predict areas where noise disturbance may occur and determine areas that may be entitled to extra insulation in their homes to help reduce the noise disturbance from aircraft.

L_{den} Contours

The Environmental Noise (Scotland) Regulations 2006 requires that strategic noise mapping should be conducted every five years. Unlike the conventional summer 16-hour dB LA_{eq} contours, the regulations require a different range of noise parameters: L_{day}, L_{evening}, L_{night}, LA_{eq}16hr, and L_{den}. A full definition of these terms is provided in the glossary.

LA_{eq} Contours

Under UK legislation the most common method for representing noise at airports is the Equivalent Continuous Sound Level, LA_{eq} which is an average of the noise levels for the busiest 16 hours of the day, between 07:00-23:00 from mid-June to mid-September. In line with UK Government policy, this assessment parameter is used in the production of airport masterplans.

It is difficult to compare the two noise metrics due to the different methods of calculating them, however, in general terms, the L_{den} contours tend to be larger than the dB LA_{eq}. This is due to the L_{den} for evening and night periods penalties of 5 dB and 10 dB. Although the weightings do not directly mirror 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 daytime.

Guide to legislative controls

Currently, the UK Government only has direct responsibility for aircraft noise management at Heathrow, Gatwick and Stansted Airports. There are five main tiers of regulation governing aircraft noise in Scotland:

- International regulation
- European Union
- UK Government
- CAA
- Scottish Government
- Local Authorities.

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 which member countries' fleets must meet. Further details of these standards can be found at www.caa.co.uk or www.icao.int

The ICAO is an inter-governmental organisation that sets operating standards for aviation operations over the world. These standards are adopted by ICAO member states. ICAO has set a number of standards for aircraft noise

certification, which are contained in ICAO Appendix 16 Volume 1 – Environmental Protection, Aircraft Noise. This document sets maximum acceptable noise levels for different aircraft during take-off and landing, categorised as Chapter 2, 3 and 4 (see Appendix I for further details).

- 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 and 4 parameters. These aircraft are quieter than Chapter 2 aircraft.
- Chapter 4 standards have applied to all new aircraft manufactured since April 2006. These aircraft must meet a standard of being 10 dB quieter than Chapter 3 aircraft based on three standard measuring locations close to the airport.

A new standard, known as Chapter 14, is now under consideration by ICAO. As currently proposed this would represent an increase in stringency of 7 dB compared with Chapter 4 and would apply to new large civil aircraft submitted for certification after 31 December 2017 and smaller aircraft from 2020.

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
- restrictions on the use of the noisiest aircraft. For example EC Directive 92/14/EEC, which restricts the landing of Chapter 2 aircraft at European airports.

With the exception of military aircraft, aircraft which do not meet the standards specified in Part II, Chapter 3 of Volume 1 ICAO Appendix 16 will not be permitted to operate to/from Edinburgh Airport.

European regulation

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, Chapter 2 which prevented aircraft from landing in the EU from 1st April 2002
- 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 (known as the Environmental Noise Directive or ENDS), which requires member states to create noise maps and five-year ENDS from all transport sources in urban areas. This is the Directive under which we have produced this draft noise action plan. Maps from each transport source are published on the noise mapping site <https://noise.environment.gov.scot/>

UK regulation

The UK Government is responsible for the policy framework for aircraft noise control at UK airports and has prescribed a range of controls on aircraft noise impacts.

- In December 2003, The Future of Air Transport White Paper outlined several new policies for airports which control, mitigate and compensate for aircraft noise.
- 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 regulation and Local Authority regulations

The regulation of aviation and air transport (including the Civil Aviation Act) has not been devolved to the Scottish Government. However, certain functions, such as aircraft noise, are exercised by Scottish Ministers.

- Scottish Planning Policy (SPP). Planning Advice Notes (PANs) provide advice on good practice and other relevant information. PAN1/2011 demonstrates the role of the planning system in preventing and limiting the adverse effects of noise without prejudicing investment in enterprise, development and transport. PAN 1/2011 does not aim to provide a definitive source of prescriptive guidance on noise issues. Rather, it sets out the range of noise issues that planning authorities need to be aware of in formulating development plans, making decisions on planning applications and in taking enforcement action to preserve and enhance environmental quality.
- The Environmental Noise (Scotland) Regulations 2006 set out the information and general requirements of five-year Noise Action Plans from all transport sources in urban areas on which this NAP is based.

Description of the airport location and airspace

Edinburgh Airport covers 367 hectares and its current layout and land use are shown in Figure 1. It is bounded to the north by the River Almond, to the south by the Royal Highland and Agricultural Society of Scotland land and to the east by the Edinburgh to Fife rail line.

The existing terminal building and main runway were developed in 1977 replacing the Turnhouse facilities which had been in place since before the Second World War. The facilities at Turnhouse now house our expanding cargo operation, which is Scotland's small parcels hub and a key facility supporting Scottish businesses and the economy.

The core developed area is around the terminal building. Other developed areas comprise the business aviation terminal and maintenance area adjacent to the Gogar Burn and the western ancillary area at Almond Road. The airport grew from less than 1 million passengers per annum (mppa) in 1977 to 1.85 mppa at privatisation in 1987. Since then, by intensively developing the land within our boundaries to provide all the facilities required to support growth, in 2017, the airport handled 13.4 mppa.

Airfield development

The Airfield Development Programme began in October 2016 and has seven distinct projects associated with it. The programme looked to deliver incremental capacity for night stopping aircraft and code E aircraft, upgrade our taxi lanes and install fixed electrical ground power. The project represents a substantial investment in the future of Edinburgh Airport and in our key asset, the airfield.

Terminal expansion project

As part of continued investment in the airport infrastructure and long-term planning, a £80 million investment plan includes a new extension to help the airport handle record passenger numbers. The new three-story extension will provide an additional six gates, seating areas, extended immigration, customs and international reclaim facilities, a bigger and improved baggage hall as well as more retail space. The building is due to be completed by Summer 2018 and will provide first class infrastructure for passengers, with 16.5 mppa expected to pass through the terminal by 2021.

Second runway

The airport's secondary runway (R12/30), was rarely used and was short by modern airport standards. It had no instrument landing equipment and this restricted the use of this runway to smaller aircraft in periods of good visibility. Plans were announced to close the runway to develop a business hub on a site to the south east of the existing terminal building. The Crosswinds project would expand towards the Gogar roundabout and could include things like offices, industrial buildings and residential property. It is a prime commercial development opportunity due to the connectivity offered by the airport and will support high-quality sustainable jobs, support improved productivity and deliver for airport and commercial developments. Runway 12/30 was closed on 1 April 2018.

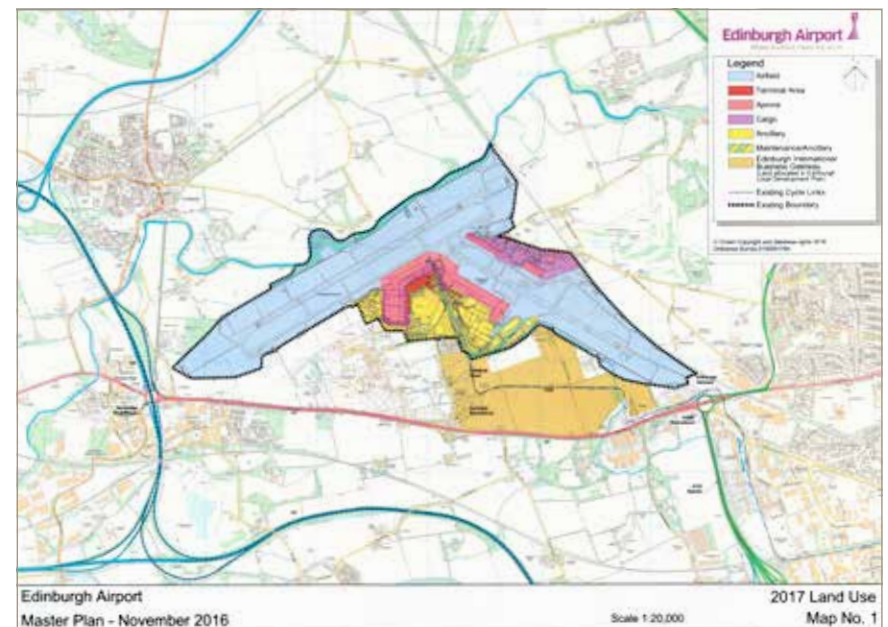
Flight profiles

Naturally, passenger demand is greater in the summer months as leisure demand increases, with peaks in July and August during school holidays. Daily demand profiles show that weekdays are busier on average in the peak months than weekends. This is due to the combination of business and leisure demand during the week and reduced business traffic at weekends.

Edinburgh is an overnight base for a large number of aircraft - this results in a peak departing period at the beginning of each day and a peak arriving period at the end of the day. Other busy periods during the day reflect the in-bound and out-bound patterns created by a busy short-haul, domestic route network.

The monthly profile of passenger air transport movements shows that available capacity is relatively consistent throughout the year. This demonstrates that airlines operating from Edinburgh are generally running year-round businesses with fixed frequencies. Any slight fluctuations are caused by charter operations.

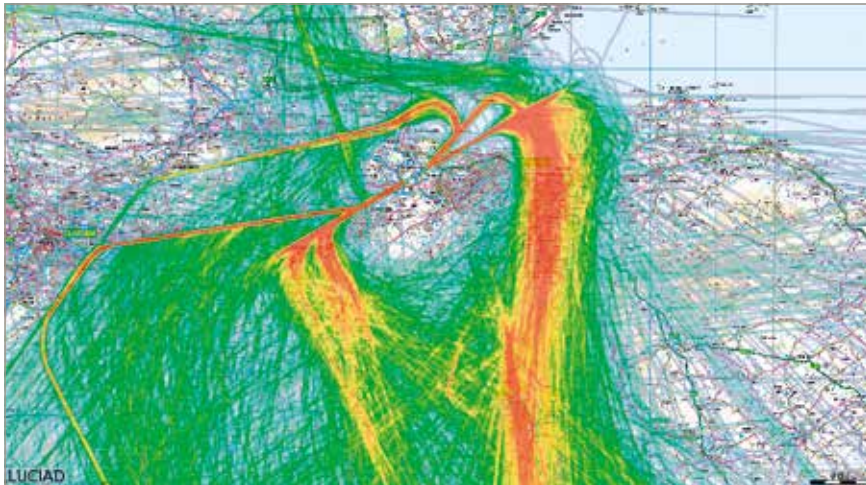
Figure 1: Land use



Current arrival and departure flight paths

Figure 2 below shows the traffic patterns over a two-week period including periods when both Runways 24 and 06 are in use, and shows the density and spread of the current flight paths. The current declared capacity for flight movements is 42 movements per hour. More information on our current flight paths is available in Appendix 1 – Procedure for arriving and departing aircraft.

Figure 2: Current arrival and departure flight paths



This map derived from a traffic sample of radar taken from 3-9 July 2017 (inclusive).

Departures

Departing aircraft are required to remain within the Noise Preferential Routes (NPR) until an altitude of 3,000ft or 4,000ft has been achieved – depending on the Standard Instrument Departure (SID) route that they are using. The SID routes end at 6,000ft after which they will be vectored by Air Traffic Control directly. The SID that an aircraft flies will depend on a number of factors including the destination of the aircraft and other traffic in the sky at the time.

Arrivals

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 result in reduced fuel burn and emissions and also mean less noise exposure for communities under the arrivals flight path. This type of procedure can result in noise reductions of up to 5 dB. The use of CDAs is promoted in the AIP. We have provided a link to the website where this can be viewed in Appendix E.

Air quality

There are interdependencies between emissions of local air pollutants (surface traffic) and carbon dioxide (CO₂) from aircraft engines which affect aircraft noise management. The challenge for the aviation industry is to manage and balance these issues. We periodically carry out air quality surveys, the objectives of these surveys are to assess the impact on air quality due to emissions from activity at Edinburgh Airport, such as road traffic and aircraft.

The main pollutant of concern is nitrogen dioxide (NO₂). NO₂ is formed by nitrogen oxide (NO_x) emissions from surface traffic, aircraft and airport operations.

We commissioned Ricardo-AEA to undertake a six-month air quality survey investigating nitrogen dioxide (NO₂) concentrations at Edinburgh Airport during 2013-2014. The survey commenced from mid-July 2013 and continued into February 2014. This survey followed on from similar studies carried out during 1999, 2003-2004, 2006-2007 and 2010-2011. A further air quality survey is currently being carried out and will run December 2017 – May 2018, once the Air Quality report is finalised it will be published on our website.

There is a range of legislation which seeks to manage and reduce the emissions of air pollutants at source. For example, emissions from aircraft are regulated in the UK by the European Aviation Safety Agency and the CAA.

The International Civil Aviation Organization (ICAO) sets international standards for smoke and certain gaseous pollutants for newly-produced large jet engines; it also restricts the venting of raw fuels. The latest standards came into effect in 2013 and apply to engine types certified after this date.

In addition to reducing aircraft emissions, all aircraft vehicles are required to meet certain standards to limit vehicle exhaust emissions standards. A large number of electric vehicles are already used airside, primarily by handling agents, in order to transport luggage to and from the aircraft.

We actively encourage our passengers to make full use of public transport; connectivity to the airport has never been easier. We've worked with partners to install ticket machines in our terminal for the various modes of public transport – of which there are many.

The Edinburgh tram stop is very close to the terminal building. We also have the nearby and new Edinburgh Gateway train station with direct links to Edinburgh, Fife and other areas of Scotland. Bus routes are also expanding – the Airlink 100, Skylink 200 and Livingston Route 21A all offer incremental choice to car and taxi options.

Move towards RNAV technology

The UK Government's Future of Airspace Strategy requires all airports within the UK to use an area navigation (RNAV) system. This concentrates flight paths in a narrower and more precise track compared to the current flight paths which are typically dispersed. The existing flight paths used by aircraft (termed 'conventional' flight paths) rely on the 1950s technology of ground-based radio beacons. Edinburgh Airport along with other UK airports must move towards the use of this technology, and will do so within the term of the 2018-2023 NAP. As part of our Air Space Change programme (ACP), we proposed the introduction of RNAV routes; aircraft would follow the routes more consistently than they do today.

Results of the 2018 noise mapping

Fewer people are impacted by contours exceeding 55 dB L_{den} than in previous years. Although the area (km²) within the contours has not decreased, the population within the contours affected by noise has reduced by 3,250 persons in comparison to the 2013-2018 NAP.

The contour maps provided on the Scottish noise mapping website were produced for the Scottish Government by Jacobs Ltd using the following parameters, and in determining the population affected and number of dwellings within the contours:

- OS Mastermap for the building footprints
- OS AddressBase data to determine the location of dwellings;
- a population density per household of 2.07 persons.

In addition, for population and dwellings, Jacobs Ltd have rounded to the nearest 100, and for area they rounded to nearest 1km², which is in accordance with the EU Noise Directive (2002/49/EU). The Scottish Government will publish the maps and statistics on the Scottish noise mapping website.

L_{Aeq} contours

The UK Government says that communities become significantly annoyed by aircraft noise above 57 L_{eq} dBA. This is why contours are presented from 57 dB to 72 L_{eq} dBA in steps of 3 dB.

The latest summer 16-hour L_{eq} dBA contours for 2016 are shown in Appendix C. These show that the 57 dBA contour has increased in size compared with 2011 from 13km² to 15km², which is equal to the approximate size of the contour maps produced in 2006 of 15.1km².

However, the number of people living within the 57 dBA contour has actually remained the same at 3,300 in comparison to the population data from 2011.

L_{den} contours

L_{den} contours are based on air traffic movements over the entire year. In addition, a 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 disturbance during these periods. Contours for strategic noise mapping are presented in 5 dB steps from 55 dBA to 75 dBA except for L_{night} where the contours are presented between 50 dBA and 70 dBA. The strategic contours for Edinburgh Airport are presented in Appendix B.

L_{night} contours

The latest 8-hour L_{night} contours for 2016 are shown in Appendix D. These show that there has been an overall decrease in the size, population affected, and number of properties within all of the contours in comparison to 2011 data.

Table 1:

Estimated areas, populations and households within Edinburgh Airport year 2016 L_{day} noise contours.

L_{day} dBA	Population	Households	Area (km ²)
>= 55	5,400	2,600	25
>= 60	1,200	600	9
>= 65	200	100	3
>= 70	0	0	1
>= 75	0	0	1

Table 2:

Estimated areas, populations and households within Edinburgh Airport year 2016 $L_{evening}$ noise contours.

$L_{evening}$ dBA	Population	Households	Area (km ²)
>= 55	4,200	2,000	20
>= 60	800	400	7
>= 65	100	0	2
>= 70	0	0	1
>= 75	0	0	1

Table 3:

Estimated areas, populations and households within Edinburgh Airport year 2016 L_{night} noise contours.

L_{night} dBA	Population	Households	Area (km ²)
>= 50	4,200	2,000	19
>= 55	800	400	7
>= 60	100	0	3
>= 65	0	0	1
>= 70	0	0	1
>= 75	0	0	0

Table 4:

Estimated areas, populations and households within Edinburgh Airport year 2016 L_{den} noise contours.

L_{den} dBA	Population	Households	Area (km ²)
>= 55	13,800	6,700	38
>= 60	3,200	1,600	14
>= 65	400	200	5
>= 70	0	0	2
>= 75	0	0	1

Table 5:

Estimated areas, populations and households within Edinburgh Airport year 2016 $LA_{eq,16h}$ dBA noise contours.

$LA_{eq,16h}$ dBA	Population	Households	Area (km ²)
>= 55	5,200	2,500	23
>= 60	1,100	500	8
>= 65	200	100	3
>= 70	0	0	1
>= 75	0	0	1

Table 6:

Estimated areas, populations and households within Edinburgh Airport year 2016 $LA_{eq,16h}$ dBA noise contours including data for the 57 dBA contour for comparison with 2013 NAP.

$LA_{eq,16h}$ dBA	Population	Households	Area (km ²)
>= 55	5,200	2,500	23
>= 57	3,300	1,600	15
>= 60	1,100	500	8
>= 65	200	100	3
>= 70	0	0	1
>= 75	0	0	1

Evaluating implementation of 2013-2018 Noise Action Plan

Performance indicators for the Action Plan

We will monitor a set of performance indicators to assess our effectiveness in each area of focus, to ensure that the work we are undertaking is resulting in the maximum benefit in terms of reducing noise impacts.

Our performance against these indicators will be regularly reviewed internally through our environmental governance structure. We will also report on progress against them in our annual CRR.

During the five-year period of this action plan, we may add to or amend the range of performance indicators to respond to improvements that enable us to better manage the airport noise impacts.

During 2016-2017 we carried out two public consultations on our Airspace Change Programme which focused the public's attention on our flight paths and noise; this resulted in an increase in noise complaints and enquiries to Edinburgh Airport.

Table 7

This table outlines the key performance indicators used to measure the implementation of actions including in the 2013-2018 NAP.

Key performance indicator	2002 baseline (where applicable)	2006 performance	2011 performance	2016 performance
Number of air traffic movements	114,293	126,912	113,357	121,520
Area/population 57 dB LA _{eq} contour	N/A	15.1km ² /3,200	13.0km ² /3,300	15.0km ² /3,300
Night movements 23:00 - 07:00*		9,153	9,887	10,861
Departure noise limits dB L _{max}				
• Day	N/A	94	94	94
• Night	N/A	87	87	87
Number of noise-related enquiries	36	261	63	3,704
Number of noise-related enquirers	31	161	46	2,689

*Night time noise figures have been calculated using the legal definition of noise, 23:00 to 07:00. This is the time period used by the Scottish Government and the CAA to determine the 8-hour L_{night} noise contours. This ensures clarity when used in reference to the time periods defined by the noise contour maps and population data provided in the tables within Section 06. This differs from the definition of night noise used within previously published NAPs, and the figures within this NAP differ from those quoted in previous versions due to the change in the time period used.

Table 8:

This table outlines the performance against the actions set out in the 2013-2018 NAP.

Action	Impact	Timescale	Performance indicator	Approx estimate of people affected 2013	Actions
1. Demonstrate we are doing all that is reasonably practicable to minimise noise impacts					
1a. Quietest fleet practicable					
We will continue to work with airlines to promote the most efficient aircraft when introducing new business to Edinburgh	Arrivals (A) Departures (D) Ground noise (GN)	Ongoing	Track the annual percentage of Chapter 4 operations. Contours changes	16,850	Completed throughout 2013-2018 NAP
We will continue to review the landing fee differential at least every year	A, D, GN	2014-18	Conditions of use document changes in charging. Change to contours. Track percentage within different charging categories	N/A	Completed throughout 2013-2018 NAP
1b. Quietest practicable aircraft operations, balanced against NO_x and CO₂ emissions					
We will continue to promote a best practice guide for departures to airlines operating at Edinburgh Airport	D	Ongoing	Contour changes	16,850	Reviewed 2015 and 2017
We will continue to promote CDAs and CCDs to airlines operating at Edinburgh Airport	A	Ongoing	Percentage of CDAs achieved. Contour changes	16,850	Ongoing - we commissioned an improved Noise and Track system which will assist in reporting abilities to FLOPSY meetings, installation complete by early 2018
We will continue to fine aircraft in breach of noise limits and increase the fine level if appropriate	D	Review in 2014 and 2017	Number of infringements	16,850	Complete and ongoing
We will continue to work with our partners in Sustainable Aviation to develop and promote low noise flight procedures through evaluation of future operational methods and implementation of best practice	A, D, GN	Annual	Website. Annual CSR. Attend SA meeting and working group sessions	16,850	Completed throughout 2013-2018 NAP
We will continue to engage with our aviation partners to improve adherence to the standard airport procedures	A, D	Ongoing	Update the EACC	N/A	Completed throughout 2013-2018 NAP
We will control ground running of aircraft engines. To ensure that the environmental impact of aircraft engine running on the local community is kept to a minimum, aircraft operators with maintenance commitments at the airport are expected to plan their schedule to avoid the need for ground running of engines at night from between 23:00-06:00 during weekdays and 23:00-09:00 at the weekend. Only during exceptional circumstances is engine running allowed between these times	GN	Ongoing	Number, location and duration	100	Reported internally on a quarterly basis

Table 8:

This table outlines the performance against the actions set out in the 2013-2018 NAP continued.

Action	Impact	Timescale	Performance indicator	Approx estimate of people affected 2013	Actions
We will continue to prioritise stand allocation so as to minimise ground noise impacts	GN	Ongoing	Number of aircraft on ground noise-sensitive stands during noise-sensitive periods. Monitored and recorded monthly	100	Ongoing - reported internally on a quarterly basis
In conjunction with our partners in Sustainable Aviation we will continue to lobby for and seek to support continual improvements in technology and operations towards the ACARE goal of 65% reduction in perceived external noise by flying aircraft by 2050 relative to equivalent new aircraft in 2000	A, D, GN	Ongoing	N/A	N/A	Completed throughout 2013-2018 NAP
1c. Effective and credible noise mitigation schemes					
We will continue to offer a relocation assistance scheme for those households within the airports 69 dB L _{eq} noise contour, in line with government policy	A, D	Ongoing	Number of requests made	0	Completed throughout 2013-2018 NAP
We will continue to benchmark our noise mitigation and compensation measures with other comparable airports	Perceived impacts	2015	Publish a table	N/A	Completed throughout 2013-2018 NAP
We propose to compare noise contours and the number of people exposed with other airports to understand if other noise mitigation schemes have been more successful. We will then seek to understand if this can be applied to Edinburgh	A, D, GN	2015	Publish a table. Take reasonable action	16,850	Completed throughout 2013-2018 NAP
We will continue to honour the Edinburgh Airport vortex scheme	Perceived impacts	Ongoing	Number of properties subjected to vortex damage	N/A	Completed throughout 2013-2018 NAP
2. Engage with communities affected by noise impacts to better understand their concerns and priorities, reflecting them as far as possible in airport noise strategies and communication plans					
We will continue to offer a Freephone number for complaints and enquiries regarding aircraft noise. Complaint data will be published in our CRR	Community trust and awareness	Ongoing	Number of contacts and method of contact	16,850	Complete reported internally on a quarterly basis and yearly via CRR
We will annually review our communication material to ensure relevance and ease of understanding	Community trust and awareness	Annually		N/A	Completed throughout 2013-2018 NAP

Table 8:

This table outlines the performance against the actions set out in the 2013-2018 NAP continued.

Action	Impact	Timescale	Performance indicator	Approx estimate of people affected 2013	Actions
We will continue to log all complaints relating to aircraft operations and publish the statistics quarterly	Community trust and awareness	Quarterly	Number of callers, events, month and area	N/A	Complete reported internally and to EACC on a quarterly basis
We will seek to acknowledge 100% of all complaints and enquiries within two working days and respond within five working days. Performance against this will be published at the Airport Consultative Committee	Community trust and awareness	Ongoing	Response rate tracker	N/A	Complete reported internally and to EACC on a quarterly basis
We will publish a summary of consultation responses within six months of the close of this consultation	Community trust and awareness	2014	Publication of feedback report	N/A	Completed throughout 2013-2018 NAP
We will publish our progress against the action plan on an annual basis	Community trust and awareness	Annually	CRR and % of actions complete	N/A	Completed throughout 2013-2018 NAP
We will continue to direct all money raised by noise infringements to the Edinburgh Airport Community Board	Community trust and awareness	Ongoing	Number of infringements and fines raised published in the CRR	N/A	Completed throughout 2013-2018 NAP
In our newsletter to the local community we will report on engine running frequency and times	Community trust and awareness	Ongoing	Number of engine ground runs	N/A	Completed throughout 2013-2018 NAP
3. Influence planning policy to minimise the number of noise sensitive properties around our airport					
We will continue to engage with the local planning authority to ensure awareness of aircraft operations is considered in the development of sensitive land use	Land use planning, community trust and awareness	Ongoing	Number of interactions with the local planning authority	N/A	Completed throughout 2013-2018 NAP
We will continue to commission and publish forecast L_{eq} contours for aircraft noise in future masterplans	Land use planning, community trust and awareness	Ongoing	Publication of forecast contours	N/A	Published within the surface access strategy
4. Manage noise efficiently and effectively					
We will continue to operate and enhance our noise management systems by various means such as holding quarterly management system reviews, analysing noise data periodically and reviewing noise complaint trends	Consistent and effective management	Ongoing	N/A	N/A	Completed throughout 2013-2018 NAP
5. Achieve a full understanding of aircraft noise to inform our priorities, strategies and targets					
We will continue to work with Sustainable Aviation and local stakeholders to understand and address the interdependencies of aircraft operations management and noise	A, D, GN	Ongoing	Group participation, research funding and trial participation	N/A	Completed throughout 2013-2018 NAP

Noise Action Plan: 2018-2023

Table 9

This table outlines the actions for the 2018-2023 NAP.

Action	Impact	Timescale	Performance indicator	Approx estimate of people affected 2018
1. Demonstrate we are doing all that is reasonably practicable to minimise noise impacts				
1a. Quietest fleet practicable				
We will continue to work with airlines to promote the most efficient aircraft when introducing new business to Edinburgh	Arrivals (A) Departures (D) Ground noise (GN)	Ongoing	Track the annual percentage of Chapter 4 operations. Contours changes	13,800
We will continue to monitor air quality at Edinburgh Airport (NO _x)	Arrivals (A) Departures (D) Ground movements	2018 and ongoing	Report AQ findings within annual CRR	N/A
We will continue to review the landing fee differential at least every year	A, D, GN	2018-2023	Conditions of use document changes in charging. Change to contours. Track percentage within different charging categories	N/A
1b. Quietest practicable aircraft operations, balanced against NO_x and CO₂ emissions				
We will continue to promote a best practice guide for departures to airlines operating at Edinburgh Airport	D	Ongoing	Contour changes.	13,800
We will continue to promote CDAs and CCDs to airlines operating at Edinburgh Airport	A, D	Ongoing	Percentage of CDAs achieved. Contour changes. Report to Flight, Operations and Safety - FLOPSY meetings	13,800
We will continue to fine aircraft in breach of noise limits and increase the fine level if appropriate	D	2018-2023	Report number of infringements to both EACC and EANAB	13,800

Table 9

This table outlines the actions for the 2018-2023 NAP continued.

Action	Impact	Timescale	Performance indicator	Approx estimate of people affected 2018
We will continue to work with our partners in Sustainable Aviation to develop and promote low noise flight procedures through evaluation of future operational methods and implementation of best practice	A, D, GN	Annual	Website. Annual CSR	13,800
We will continue to engage with our aviation partners to seek to improve adherence to the standard airport procedures	A, D	Ongoing	Update the EACC	N/A
We will control ground running of aircraft engines. To ensure that the environmental impact of aircraft engine running on the local community is kept to a minimum, aircraft operators with maintenance commitments at the airport are expected to plan their schedule to avoid the need for ground running of engines at night from between 23:00-06:00 during weekdays and 23:00-09:00 at the weekend. Only during exceptional circumstances is engine running allowed between these times	GN	Ongoing	Number, location and duration	400
We will continue to prioritise stand allocation so as to minimise ground noise impacts	GN	Ongoing	Number of aircraft on ground noise sensitive stands during noise sensitive periods. Monitored and recorded monthly	400
In conjunction with our partners in Sustainable Aviation we will continue to lobby for and seek to support continual improvements in technology and operations towards the ACARE goal of 65% reduction in perceived external noise by flying aircraft by 2050 relative to equivalent new aircraft in 2000	A, D, GN	Ongoing	N/A	N/A
1c. Effective and credible noise mitigation schemes				
Night Noise, we will investigate and implement increased landing/take-off fees for the night time period, this fee will be based on aircraft noise classification. All associated monies raised will be donated to local good causes	A, D, community trust and awareness, consistent and effective management	Q2/Q3 2019	Produce and publish a Night Noise policy Q3/Q4 2019	N/A
We will continue to offer a relocation assistance scheme for those households within the airports 69 dB L _{eq} noise contour in line with government policy	A, D	Ongoing	Number of requests made	0
We will continue to benchmark our noise mitigation and compensation measures with other comparable airports	Perceived impacts	2018-2023	Publish a table	N/A
We propose to compare noise contours and the number of people exposed with other airports to understand if other noise mitigation schemes have been more successful. We will then seek to understand if this can be applied to Edinburgh	A, D, GN	2018-2023	Publish a table. Take reasonable action	13,800
We will continue to honour the Edinburgh Airport vortex scheme	Perceived impacts	Ongoing	Number of properties subjected to vortex damage	N/A

Table 9

This table outlines the actions for the 2018-2023 NAP continued.

Action	Impact	Timescale	Performance indicator	Approx estimate of people affected 2018
We will carry out Community based noise surveys during the summer months to further our understanding of the noise climates under our flight paths	Community trust and awareness. Consistent and effective management.	2018 yearly	Publication of survey reports on noiselab website, reports will be made available to public and EDNAB/EACC	N/A
We will commission LA _{eq} summertime contour maps and subsequent database of eligible properties every two years	Community trust and awareness. Consistent and effective management.	2019 and 2021	Publication of LA _{eq} summertime contour maps on Edinburgh Airport Noise Lab website	13,800
2. Engage with communities affected by noise impacts to better understand their concerns and priorities, reflecting them as far as possible in airport noise strategies and communication plans				
We will launch a noise and track keeping system on our website that allows the public to investigate and monitor flights themselves, and make enquiries or complaints about our flight operations	Community trust and awareness. Knowledge and understanding of noise. A, D	Launch Summer 2018	NTK being used by the public	General public
We will continue to offer a free phone number for complaints and enquires regarding aircraft noise. Complaint data will be published in our CRR	Community trust and awareness	Ongoing	Number of contacts and method of contact	13,800
We will make quarterly noise reports available online via our Edinburgh Airport Noise Lab web pages	Community trust and awareness	Ongoing	Publication on website and the community news letter	13,800
We will provide noise insulation grants to schools who fall within our 63db or greater noise contours and work with Local Government Planning Departments to ensure that all new build schools within 63db and greater contours are built to relevant building acoustic standards	Community trust and awareness. A, D	Ongoing	N/A	N/A
We will annually review our communication material to ensure relevance and ease of understanding	Community trust and awareness	Annually		N/A
We will review Noise Complaints Policy to ensure it is relevant to our complainants. We will continue to publish this policy on our Noise Lab and reference this in our Community Newsletter to ensure that those who want to complain, know the process. We will also log all complaints relating to aircraft operations and publish the statistics quarterly	Community trust and awareness	Quarterly	Number of callers, events, month and area	N/A
We will seek to acknowledge 100% of all complaints and enquiries within two working days and respond within five working days. Performance against this will be published at the Airport Consultative Committee	Community trust and awareness	Ongoing	Response rate tracker	N/A

Table 9

This table outlines the actions for the 2018-2023 NAP continued.

Action	Impact	Timescale	Performance indicator	Approx estimate of people affected 2018
We will publish a summary of consultation responses within six months of the close of this consultation	Community trust and awareness	2018-2023	Publication of feedback report	N/A
We will publish our progress against the action plan on an annual basis	Community trust and awareness	Annually	Published in CRR, reported to EANAB and % of actions complete	N/A
We will continue to direct all money raised by noise infringements to the Edinburgh Airport Community Board	Community trust and awareness	2018-2023	Number of infringements and fines raised published in the CRR	N/A
In our newsletter to the local community we will report on engine running frequency and times	Community trust and awareness	Quarterly	Number of engine ground runs	N/A
3. Influence planning policy to minimise the number of noise sensitive properties around our airport				
We will continue to engage with the local planning authority to ensure awareness of aircraft operations is considered in the development of sensitive land use	Land use planning, community trust and awareness	Ongoing	Number of interactions with the local planning authority	N/A
We will continue to commission and publish forecast L_{eq} contours for aircraft noise in future masterplans	Land use planning, community trust and awareness	Ongoing	Publication of forecast contours	N/A
4. Manage noise efficiently and effectively				
We will continue to operate and enhance our noise management systems by various means such as holding quarterly management system reviews, analysing noise data periodically and reviewing noise complaint trends	Consistent and effective management	Ongoing		N/A
5. Build on its extensive understanding of aircraft noise to inform our priorities, strategies and targets				
We will continue to work with Sustainable Aviation and local stakeholders to understand and address the interdependencies of aircraft operations management and noise	A, D, GN	Ongoing	Group participation, research funding and trial participation	N/A

10

More information

This document is produced to provide you with information that demonstrates the working behind the NAP actions. If you would like more information, please visit the Edinburgh Airport Noise Lab at edinburghairport.com/noise

Appendices

Appendix A

Contour maps and population statistics methodology

NAP contour maps

The contour maps provided within the NAP were provided to us by our regulator, the CAA. The maps and population statistics were produced using the following parameters:

- The contours have been generated using the latest version of ANCON (v2.3) and the 2016 annual traffic data provided.
- Estimated areas, populations and households within all the contours, using an updated 2016 population database (based on the 2011 Census) were supplied by CACI Ltd.

Scottish Noise Mapping website

The contour maps provided on the Scottish noise mapping website were produced for the Scottish Government by Jacobs Ltd using the following parameters:

- OS Mastermap for the building footprints
- OS AddressBase data to determine the location of dwellings;
- a population density per household of 2.07 persons.

In addition, for population and dwellings Jacobs rounded to the nearest 100 and for area rounded to nearest 1km², which is in accordance with EU Noise Directive (2002/49/EU). The Scottish Government will publish the maps and statistics on the Scottish noise mapping website.

Appendix B

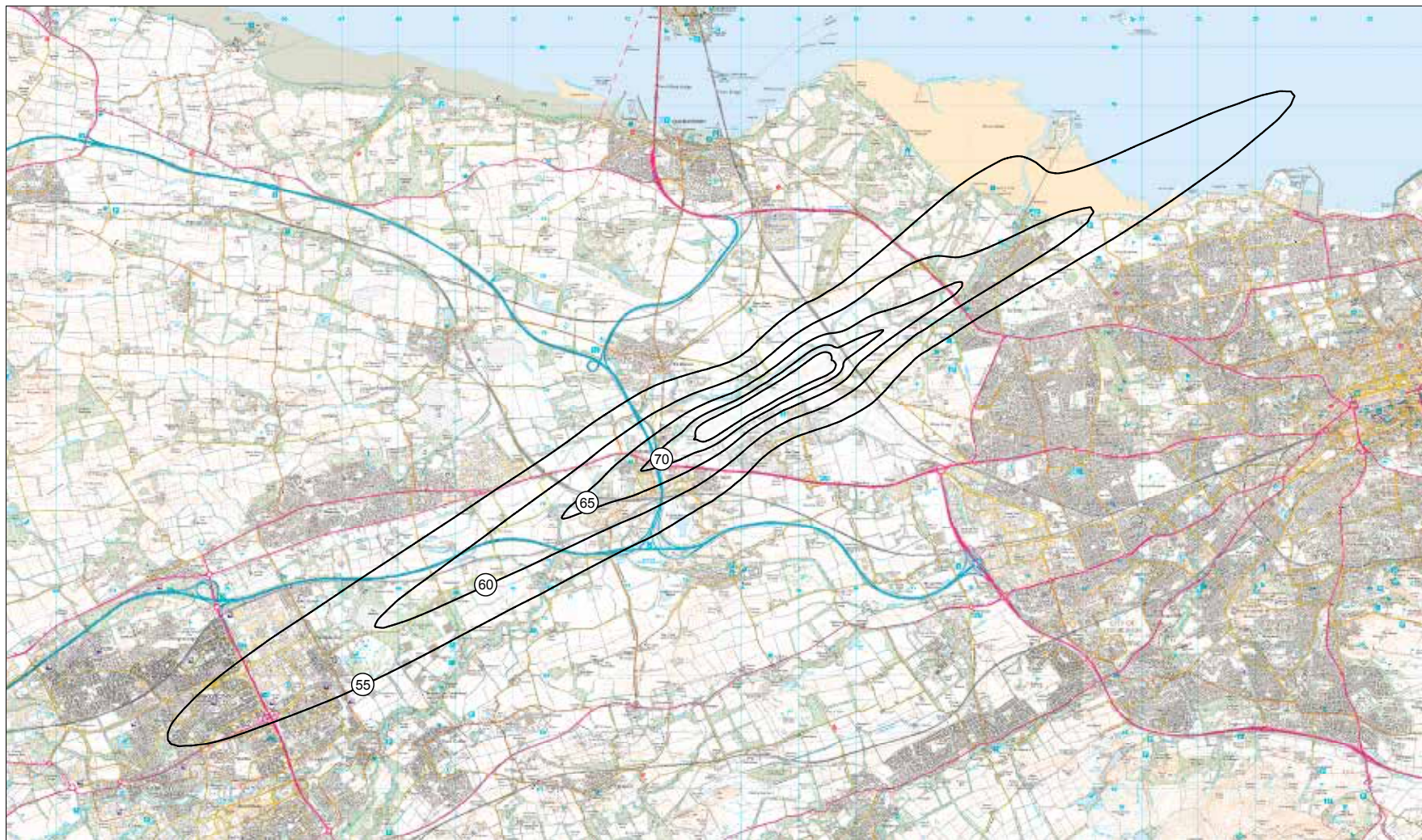
L_{den} contour map

The noise maps are produced by computer software that calculates the noise level at specific points as the noise spreads out from the sources of noise that have been modelled. The software can take account of features that affect the spread of noise such as buildings and the shape of the ground (e.g. earth mounds), and whether the ground is acoustically absorbent (e.g. fields) or reflective (concrete or water).

L_{den} 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 L_{eq} dBA contours, the regulations require a different range of noise parameters: L_{day}, L_{evening}, L_{night}, LA_{eq}16hr, and dB L_{den}. A full definition of these terms is provided in the glossary.

L_{den} is based on air traffic movements over the entire year, unlike dB LA_{eq} contours which 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. L_{night} differ in that they are presented between 50 dBA and 70 dBA.



0 1 2 3 4 5 km

EDINBURGH AIRPORT
2016 L_{den} 55-75 dB(A) Contours
Actual Modal Split 68% W / 32% E

Appendix C

LA_{eq} contour map

The UK Government uses the Equivalent Continuous Sound Level, L_{eq} dBA for this purpose which provides average noise levels for the busiest 16 hours of the day, between 07:00-23:00 over the year. This is the most common international measure of aircraft noise. This is measured over the whole year in this case 2016, 16-hour period refers to 07:00-23:00 (local time). This is the time period and parameter set out by legislation - The Environmental Noise (Scotland) Regulations 2006.



EDINBURGH AIRPORT
2016 Annual Day $L_{Aeq,16hr}$ 57-72 dB(A) Contours
Actual Modal Split 68% W / 32% E

Appendix D

L_{night} contour map

The L_{night} contour map shows the A-weighted long-term average sound level determined over all the night periods of a year; night time for this type of measurement is defined as 23:00-07:00 which is commonly used in environmental noise measurement and legislation to define the night time period, and may often be shown in noise reports and contour mapping as the L_{night} (8hrs).



EDINBURGH AIRPORT
2016 L_{night} 50-70 dB(A) Contours
Actual Modal Split 70% W / 30% E

Appendix E

Useful links

EU Noise Directive (2002/49/EU):
<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32002L0049&from=EN>

Noise (Scotland) Regulations 2006:
<http://www.opsi.gov.uk/legislation/scotland/ssi2006/20060465.htm>

Scottish Noise Mapping:
<https://noise.environment.gov.scot/>

The CAA:
www.caa.co.uk

The Airport Operators Association:
<http://www.aoa.org.uk/>

Sustainable Aviation:
<http://www.sustainableaviation.co.uk/>

Scottish Air Traffic Control (SATS):
<https://nats.aero/blog/wp-content/uploads/2016/08/PrestwickCentre-FINAL.pdf>

NATS – Aeronautical Information Service/AIP:
http://www.nats-uk.ead-it.com/public/index.php?option=com_content&task=blogcategory&id=62&Itemid=111.html

Edinburgh Airport Noise Lab – information on our complaints policy, insulation grant scheme and new Noise and Track Keeping monitoring system can be found via our website:
<http://www.edinburghairport.com/about-us/community-and-environment/edinburgh-airport-noise-lab/noise-at-edi>

Edinburgh Airport 2017:
www.edinburghairport.com/expansion

ICAO Appendix 16 Volume 1 – Environmental Protection, Aircraft Noise:
https://www.icao.int/environmentalprotection/Documents/Publications/Doc_9501_Volume_1.pdf

ISO 1996-2: 1987 REVISED 2007 – ISO 1996-2:2007 Acoustics – Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels:
<https://www.iso.org/standard/41860.html>

Appendix F

Insulation Grant Scheme

Households without double glazing in the 63 dB contour of the airport, who haven't benefited from the scheme before, are entitled to apply for:

- free secondary glazing to fit existing windows; or
- a 50% contribution to standard double glazed PVCu replacement windows; or
- a 50% contribution to high specification double glazed PVCu replacement windows, specially designed to reduce noise levels, or a combination of these options;
- a 50% contribution for replacing glass sealed units (glass only keeping existing window frames).

Properties already fitted with double glazing and do not want it replaced, can arrange for a free home survey to be carried out to identify whether the home's current insulation qualities can be improved. Loft insulation has also been found to help further reduce noise disturbance. For this reason, eligible households would also be entitled to ventilation and loft insulation free of charge as part of the scheme. For further information call us on 0800 731 3397.

Noise Insulation Scheme process

1. Residents should arrange their own quotes for doubling glazing installers. This should detail per window and door.
2. Houses built since 2009 are not eligible for the scheme.
3. Residents should send the quotes to Edinburgh Airport.
4. Edinburgh Airport write back to the resident with the confirmed contribution the airport will pay.
5. Residents and airport agree how the airport contribution will be billed. A cheque can be posted to the resident after installation. Installers can invoice the airport directly for the airport contribution agreed.
6. Residents go ahead and instruct the work to be done and notify the airport when the new glazing is installed.
7. Airport visits the property to check that the job has been completed.
8. Airport pays their contribution.

Appendix G

Current noise fining procedures

Noise monitors and noise fining

Aircraft flying to and from Edinburgh Airport are monitored by three permanent and fixed noise monitoring stations located at Cramond, Uphall/ Broxburn and Livingston. There are maximum allowed levels for daytime noise (06:00-3:30) and night time noise (23:30-06:00) – these are 94 dBA L_{max} and 87 dBA L_{max} respectively. Flights must not exceed these levels and airlines are fined for all exceedances. This is a voluntary policy introduced by Edinburgh Airport to mitigate against noise nuisance in our communities. All money received from fines is donated to our community fund for distribution to local good causes.

Placement of noise monitors

Fixed site noise monitors are positioned at 6.5km from start of roll (the point in the runway where a flight begins its departure); the monitors record levels for both departing and arriving aircraft at these fixed positions. The positioning of the noise monitors is in accordance with a detailed scientific study carried out for the Department for Transport (DfT) by the Civil Aviation Authority (CAA). Edinburgh Airport follows this guidance along with Glasgow, Heathrow, Gatwick and Bristol airports amongst others. Further information on all CAA scientific studies can be found on the CAA website.

Appendix I

ICAO Appendix 16 Volume 1 – Environmental Protection, Aircraft Noise

Aircraft noise certification

Certificated noise levels for larger aircraft are classified by the ICAO Standards and Recommended Practices – Aircraft Noise: Appendix 16 to the Convention on International Civil Aviation into:

- a) Chapter 2 types, characterised by the noisier, low bypass turbofan aircraft and early high bypass turbofan aircraft.
- b) Chapter 3 types, characterised by the modern, quieter, high bypass turbofan aircraft.

Under European legislation, since 2002, Chapter 2 aircraft (of over 34 tonnes maximum take-off weight or with more than 19 seats) have no longer been allowed to operate at European airports. There are separate noise certification schemes for small propeller aircraft and for helicopters.

In June 2001, following the fifth meeting of the Committee on Aviation Environmental Protection (CAEP/5), the Council of ICAO adopted a new Chapter 4 noise standard, which is more stringent than the current Chapter 3 standard.

In order for an aircraft to qualify for the Chapter 4 standard, the following criteria must be met as a minimum:

- The relevant Chapter 3 noise limit at each certification point (flyover, side-line or approach) must not be exceeded, i.e. no trade-offs between points are permitted;
- Relative to the Chapter 3 standard, the minimum margin at any two-certification points must be at least 2 EPNdB;
- Relative to the Chapter 3 standard, the cumulative margin at the three-certification point must be at least 10 EPNdB.

From 1 January 2006, the Chapter 4 standard applies to newly-certificated aircraft, although manufacturers may also opt to re-certificate some of their existing Chapter 3 designs to the Chapter 4 standard.

Examples of aircraft covered by Chapter 2 – the Boeing 727 and Douglas DC-9.

Examples of aircraft covered by Chapter 3 – the Boeing 737-300/400, Boeing 767 and Airbus A319.

Some Chapter 2 aircraft, such as the Boeing 737-200 have been 'hush kitted' and re-certificated to the Chapter 3 standard.

Chapter 3 certificated aircraft may meet the Chapter 4 standard but they will only be classified as Chapter 4 if their manufacturer has opted to re-certificate them. For example, some A319s are certificated as Chapter 3 and some as Chapter 4. The aircraft are essentially the same and there would be no noise difference discernible to the observer on the ground.

As yet there is no agreed date for the phase out of Chapter 3 aircraft.

Appendix J

The cost of noise management

Type	Description	Approximate cost per year
Staff costs	Communications Team, Environment team, Airside team, Environmental Noise Advisor	£43,000
Equipment costs	Noise monitor maintenance and calibration, radar maintenance	£29,000
Publications	Community newsletters	£20,448
New NTK system	Commissioning, installation, project team and project management	One-off payment £180,000
Noise Advisory Board (EANAB)	Independent noise consultant, meeting costs, sundry payments	To be confirmed by the EANAB
NAP	Production of contour maps, consultation material and management of consultation process	£50,000

Appendix K

Complaints policy

How we handle complaints about aircraft activity

We understand that our operations have an impact on our local communities and that residents may want to complain about aircraft activity. This policy explains how we receive and process complaints.

Introduction

This Policy on Handling Aircraft Noise Complaints has been revised in light of the introduction of the Casper Noise and Tracking System in Summer 2018.

Policy objectives:

- The acknowledgement and timely response of complaints.
- The provision of sufficient information to understand the source of the issue, and where appropriate, what action has been taken.
- The consistent recording of all complaint data.
- The establishment and maintenance of a complete record of complaints received transparent to the community, regulator and other stakeholders.
- The utilisation of a digital platform to facilitate these objectives.

Summary

- The principal mechanism for registering noise complaints at Edinburgh is through the online Casper system. However, we accept that not everyone has access or the ability to use the internet, and we will also accept complaints received via telephone to our dedicated noise complaints line, 0800 731 3397 (Freephone 24/7) or by letter.
- We will register, acknowledge and investigate all complaints received that have a full name, email address (where available) and postal address. All names, email addresses and postal addresses will be treated as strictly confidential and not used for any purpose other than registering complaints.

- Emails sent to our Executive team will be passed onto the Communications team to log, investigate and respond to on their behalf.
- To the extent we can, we will provide individuals with relevant information to help with understanding the issue raised. We believe that the fairest and most beneficial method for dealing with enquiries from all residents is to be clear and open about existing policies, the measures used to control noise and how these together affect how the airport operates.
- We will investigate the cause of complaints arising from specific causes such as poor track keeping but we will not repeatedly supply the same or similar information or substantial amounts of data.
- The Casper complaint database will provide aggregate data that is accessible to third parties.
- We will continue to monitor our overall performance, for example, with respect to track keeping and number of complaints received within our performance indicator of five working days.
- We will use data to continue to work proactively with airlines and air traffic service providers to enhance noise mitigation performance at the airport.

Receiving complaints

Complaints regarding aircraft noise made to the airport should be submitted via our dedicated complaints web portal (Casper) – www.edinburghairport.com/noiselab

In circumstances where the complainant does not have access to the internet complaints can be made by letter to our postal address at the end of this document or by telephone to our dedicated noise complaints line, 0800 731 3397 (Freephone 24/7). Complaints received by post and telephone will be entered into the Casper system by our staff, to maintain a single, uniform and transparent record of all complaints.

We will register, acknowledge and, where appropriate, investigate all complaints received.

For statistical purposes, it is essential that we are provided with a full name, valid email address (where available) and postal address and the reason for the complaint, otherwise the complaint cannot be logged.

Names, email addresses and postal addresses given will not be made public or used for any purpose other than registering complaint details, and to allow direct response to the complainant. Complaint reports by postal code area are recorded through Casper and published. We can only provide information on aircraft that operate to and from Edinburgh Airport.

We receive a number of complaints made by images taken from apps such as Flight Radar. This does not provide the information we need to investigate complaints, which we do by using our own noise and track keeping software. When complaints are provided in this format we will request that residents provide the required information detailed above.

Specific enquiries

Complaints regarding specific flights must be individually registered. For complaints regarding specific departures we will, in line with this policy, supply details of the flight which is the subject of the complaint, such as airline, flight number and height. Where complaints are registered regarding a number of flights, we will endeavour to provide general information which will add to an individual's understanding of the situation.

In the case of arriving aircraft, there is no requirement for track keeping as is the case with departing aircraft, however we will supply information to help explain the reasons for an unusual event, for example, a change to a normal operating pattern. Where it is deemed to help understand the noise relating to a particular area, we will supply typical days' tracks of aircraft overflight and background information relating to operations.

Provision of information

We provide a full and comprehensive information service and our policy is to make available as much detail about aircraft operations as is reasonably practical (for example, noise limits, runway direction and aircraft heights within Noise Preferential Routes). All this information is publicly accessible through Edinburgh Airport's Noise website - www.edinburghairport.com/noiselab/

Requests for information above what is publicly provided through NTK system will be considered on its merits. We will take into account the amount of information that has already been made available, the resources required to process the information requested, and whether the information requested seems likely to enhance further understanding. We may however decline to undertake extensive data-gathering exercises in support of individual complaints.

General enquiries

We will supply information which explains aircraft routes and procedures, which includes maps showing typical tracks relating to individual postcodes, so as to be transparent and accurate about the possible impacts of aircraft operations for those living near Edinburgh Airport.

The Edinburgh Airport Noise Website - www.edinburghairport.com/noiselab provides detailed information on aircraft activity and how aviation may impact local communities, as well as hosting the dedicated complaints handling portal detailed above.

Persistent complainants

We sometimes receive a large number of complaints from individuals. Whilst we take all concerns seriously we will take a view on whether an individual's request for information is taking up a disproportionate amount of time and resources.

We have adopted a three-stage process to investigating and responding to multiple complaints received by one individual.

Step 1

We will fully investigate and respond in detail to the first complaint received.

Step 2

If we are then contacted again and asked for additional information we will review our original response and, if appropriate and necessary, provide additional information.

Step 3

If a complainant contacts us a third time and we believe there is no additional information that can be provided to enhance understanding, we will inform the complainant that the complaint will be logged but will not be further responded to.

We work directly with Community Councils to understand concerns of local residents and communities. You may also wish to speak to your Community Council representative who can provide you with more information or pass feedback onto us.

Monitoring of noise abatement procedures and complaints

We will analyse complaints on a quarterly basis to establish trends, ensuring we can keep track of community concerns and where appropriate improve our communication on these issues and look into possible mitigation actions.

We will report on our complaints data at our quarterly EACC meetings, to the EANAB and in our quarterly community newsletter. The EACC and EANAB meetings allow us to share information between interested parties including representatives of Community Councils and local resident's groups. We can also share this information with other Community Councils if requested.

We will make quarterly noise reports available online via our Edinburgh Airport Noise Lab.

We will report on the number of complaints received, the number of complainants, any complainants that reached step 3 in the complaints process, a summary of key concerns and highlight any significant changes or trends that have emerged to ensure all complaints are publicly and transparently reported.

Abusive complaints

Edinburgh Airport Ltd will not respond to any complaints made that are of an abusive or threatening nature or containing obscene language. Any such complaints may be referred to the Police for investigation.

Assurance

We aim to respond to complaints within five working days. When a more detailed investigation is required we will send an acknowledgment email advising where possible a date when you can expect a full response.

We appreciate that the information we provide may be technically detailed and will aim to ensure that our responses are provided in a jargon-free and easily accessible way. When requests for information are made, we will consider each on its merit and while we aim to be as helpful and transparent as possible we have to consider the resources available to us, the needs of other complainants and ensure that everyone is treated fairly.

Policy review

We will keep this policy under periodic review.

Postal address

Noise
Communications Team
Terminal Building
Edinburgh Airport Limited
Edinburgh
EH12 9DN
Scotland

If you need this document in a different format, please contact us at edcommunications@edinburghairport.com or call us on 0131 348 4141

April 2018