Edinburgh Airport
Where Scotland meets the world

Climate Change Adaptation Report

Progress Report 2021

Contents

1. Executive summary

Edinburgh Airport is Scotland's busiest airport, accommodating significant numbers of full service, low-cost, regional and charter airlines.

The aviation industry is highly weather sensitive, without mitigation adverse weather conditions have the potential to affect the safety of aircraft both in the air and during take-off, landing and taxiing. We have a well-established risk management process that covers weather related disruptions. However, despite these mitigations we recognise the threat that climate change has on our operation. In 2021 we launched our sustainability strategy and are committed to playing our part and taking action to minimise global temperature rise and the negative impacts of climate change.

The latest climate projections, UK Climate Projections 18 (UKCP18), suggest that even with mitigation to limit global warming there will still be changes to the climate. It is projected that there will be an increased chance of warmer, wetter winters and hotter, drier summers along with an increase in the frequency and intensity of extreme weather events.

This report has been prepared to ensure that climate related risks have been identified and assessed, considering three future timeframes; 2025, 2050 and 2080 and the mitigations remain appropriate.

To prepare this report Edinburgh Airport has identified and calculated climate change risks, considering current and future planned actions. Overall, 33 risks have been identified. These risks were categorised by climate variable; temperature, rainfall, fog, snow, storms, wind and lightening. In addition two risks around sea level rise and four non-physical risks were also identified. Of these 22 have been classified as green requiring no further actions, 10 amber requiring monitoring or action to be taken and 1 red. The red risk related to the risk of pandemic and has been classified as red due to the ongoing COVID-19 pandemic.

These risks will be included in the appropriate departments risk register and managed through the established risk management processes and procedures in place.

2. Introduction

Through the Adaptation Reporting Power of the Climate Change Act 2008, the Secretary of State can request organisations with functions of a public nature voluntarily produce reports on what they are doing to adapt to climate change.

This progress report includes a review of climate projections using the latest available data and a review of climate related risks on Edinburgh Airport's operations. These risks feed into our risk management processes ensuring that our climate change adaptation response remains appropriate and effective.

3. Context

3.1 About Edinburgh Airport

Edinburgh Airport, located 13km west of Edinburgh city centre, is Scotland's busiest airport. The airport covers approximately 340 hectares, bound to the north by the River Almond, to the south by Royal Highland and Agricultural Society of Scotland (RHASS) land and to the east by the Edinburgh to Fife rail line. The airport is owned by a consortium of investors led by Global Infrastructure Partners (GIP).

The airport accommodates significant numbers of full service, low-cost, regional and charter airlines; this broad range of carriers is integral in supporting such a large route network. The European Short

Haul network is well represented with as is the UK Domestic market. Within the European context, all of the major hubs (Heathrow, Amsterdam, Paris-CDG, Frankfurt, Madrid and Istanbul) are represented, offering global connectivity, whilst the secondary hubs of Helsinki and Dublin provide an array of connections to the Far East and Americas respectively. Beyond the confines of Europe, there are a growing number of long-haul routes. Closer to home there are direct flights to airports in the Highlands and Islands, indicative of the role Edinburgh Airport plays in connecting Scotland to the rest of the world.

The existing terminal building and main runway were developed in 1977 replacing the runway and terminal facilities at Turnhouse to the east of the existing terminal. There is one runway in operation[1]; Runway 06/24 which is 2,557m in length and lies in a south-west/north-east direction, oriented into the prevailing wind. The runway has capacity for 55 movements per hour and the airfield has parking positions for 64 Code C and 15 Code D or E aircraft. Aircraft codes relate to the wingspan of the aircraft, with A being the smallest and F being the largest. Code E aircraft have wingspans between 52-56 meters such as the B777.

The aviation industry is highly weather sensitive, and without mitigation adverse weather conditions have the potential to affect the safety of aircraft both in the air and during take-off, landing and taxiing. However the industry's international nature has facilitated the development of good practice operational and technological mitigations gained from experience in extreme conditions around the world, to minimise the impact from most climatic phenomena on aircraft operation and scheduling. Safety is the paramount concern of airlines and airport operators and this is enforced by the Civil Aviation Authority (CAA) which is the public corporation which oversees and regulates all aspects of aviation in the United Kingdom. The CAA, airport operators such as EAL, and the aviation industry have developed comprehensive precautionary measures to ensure flight safety during the full range of adverse weather conditions experienced.

3.2 Sustainability

In 2021 Edinburgh Airport published its first Sustainability Strategy. Our strategy encompasses the entire airport campus – our business and the businesses we work with. We understand that we cannot achieve our goals alone and will seek to work with government, industry organisations, stakeholders and communities.

We have structured our activities around four key pillars; zero carbon, Scotland's best business, trusted neighbour and enhancing Scotland.

We know a pivotal part of any sustainability strategy is setting out the steps we will take to tackle emissions and how our work will reduce our carbon footprint, we also commit to working in partnership to ensure we are leading and advocating in the fight against Climate Change, helping Scotland and the UK transition to a low carbon economy by leading within aviation to achieve Net Zero and continuing to pursue progressive onsite carbon management.

The Sustainability Strategy, along with the revised climate change risk register, will complement the existing risk management processes in place and help ensure that the airport is well prepared for any future climate change.

[1] In 2018 the airport decommissioned its secondary 'crosswind' runway.

3.3 Resilience and managing risk

Edinburgh Airport has a comprehensive approach to risk management given the diverse threats and challenges facing the aviation industry today. Dealing with meteorological risks is an important part of this process. The risks identified as part of this climate change risk assessment will be integrated into the existing risk registers.

Weather related disruption is something that Edinburgh Airport has had to face historically and will not be a new challenge for the airport resulting from climate change.

Risks at Edinburgh Airport are managed by a suite of control measures which include extant risk management equipment, design standards, operations, procurement, policies and procedures. Many of these control measures are able to be adjusted as conditions dictate (i.e. changes to the heating and cooling regime in terminal buildings, increased staffing for snow clearance during periods of wintry conditions). Alongside standard control measures, to cope with existing extremes Edinburgh Airport has comprehensive contingency plans in place which are regularly reviewed and tested and form an integral element of EAL's risk management function.

The Airport Operations Manager (AOM) role is to understand Edinburgh Airport's organisational resilience and work with everyone to improve it. The team engage with departments across the business to understand risks and aim to remove as much uncertainty as possible by a collaborative process of planning, exercising and reviewing. The AOM team coordinate EAL's emergency, contingency and continuity plans and ensure we are ready to manage all incidents.

Crises and contingency plans are managed via a tactical response defined as bronze, silver and gold crisis management teams. Whether a bronze, silver or gold crisis command response is required is determined by a number of key criteria, and the crisis management response being used can be up or down graded depending on how the situation on the ground changes. These crisis management teams are drawn from experienced EAL staff with familiarity of key systems, assets and operations at the airport.

4. Climate Risks and Opportunities

4.1 Risk Assessment Methodology Overview

An overview of the methodology underpinning the risk assessment is provided below:

1. Establish the current climatic baseline
2. Establish future climatic projections
3. Identify risks
4. Agree and prioritise risks and actions

4.1.1 Establish the current climatic baseline

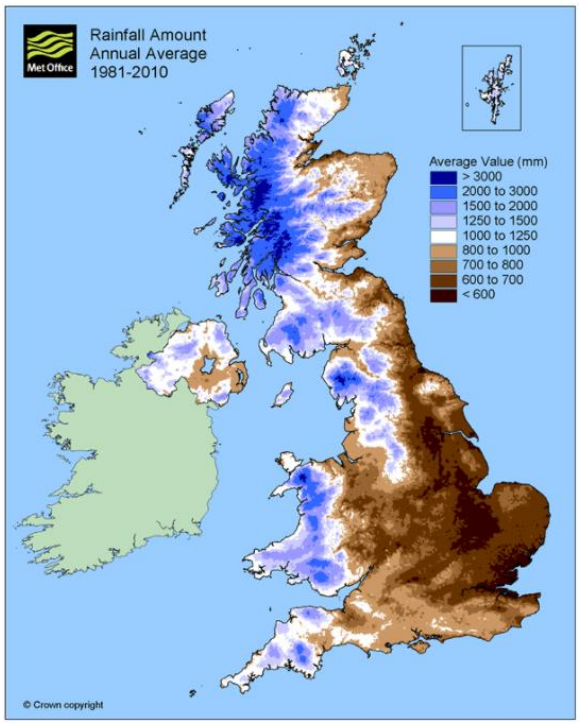
To understand future potential impacts we must first set a baseline and establish how resilient our operations are to current conditions.

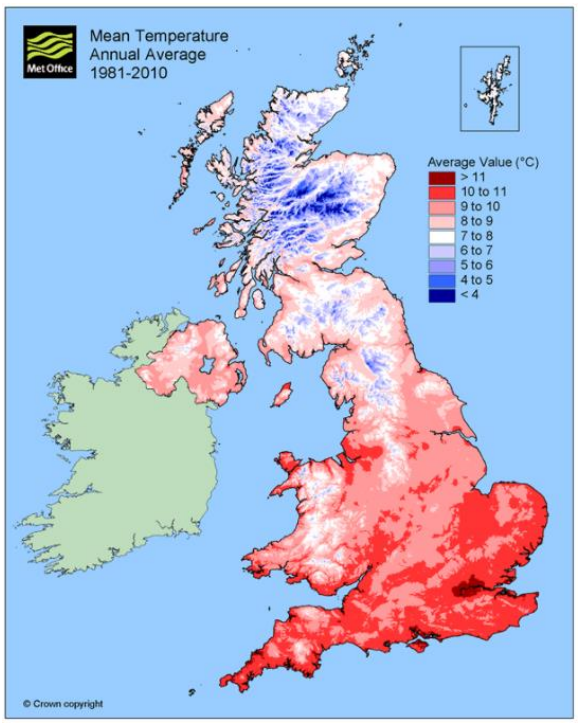
The climate in Edinburgh is classified as warm and temperate with significant rainfall. The average annual maximum temperature is 12.5°C, whilst the average annual minimum temperature is 5.6°C. On average there is 754mm of rain, with 137 days of the year where rainfall exceeds 1mm.

The baseline data was obtained from the Met Office, taken from the closest climate station at Gogarbank.

Table 1 Overview of average climatic condition at Gogarbank[2]

Month	Maximum temperature (°C)	Minimum temperature (°C)	Days of air frost (days)	Sunshine (hours)	Rainfall (mm)	Days of rainfall ≥1 mm (days)	Monthly mean wind speed at 10 m (knots)
January	6.6	1.1	11.5	45.5	76.3	13.6	9.9
February	7	1.3	10.9	69.6	53.8	9.8	10.2
March	9	2.6	7.5	106.9	55.9	11.8	9.9
April	11.6	4.1	3.8	136.3	46.1	9.8	8.3
May	14.6	6.5	0.9	188.3	49	11.4	7.8
June	17.2	9.1	0	154.1	61.5	10.4	7.3
July	19.2	10.9	0	170.7	64.1	10.2	6.8
August	19.1	10.8	0	149	67.8	11.2	7.2
September	16.6	9.2	0.3	125.5	58	10.4	7.9
October	12.9	6.2	2.3	96.1	84.5	12.8	8.2
November	9.2	3.6	7	65.2	73.7	13	8.6
December	6.6	1.1	12.3	35.3	63.6	12.9	9
Annual	12.5	5.6	56.4	1342.7	754.2	137.2	8.4





[2] Table taken from Met Office, Edinburgh/Gogarbank (Edinburgh) UK climate averages - Met Office

4.1.2 Establish future climatic projections

In order to assess future climate risks UK Climate Projections 2018 (UKCP18) has been used. UKCP18 uses cutting edge climate science to provide observations and climate change projections out to 2100 supporting decision makers to assess climate related risks. Although multiple emission scenarios are available within UKCP18 for the purpose of this report two scenarios have been used; RCP4.5 which represents a 2.4°C global mean surface temperature increase has been used as a low emissions scenario and RCP8.5 which represents a 4.3°C global mean surface temperature has been used as a high emissions scenario. The paragraphs below summarise key climate changes.

Temperature

Observations show an annual warming which is expected to continue. It is expected that there will be more warming within the summer with a marked north/south contrast with Scotland experiencing less of an increase in maximum summer temperatures than the south of England. Summer temperatures are predicted to increase by between 5 – 17%, with winter temperatures increasing by between 1 – 10%.

Precipitation

Observations show high levels of variability in precipitation with a slight increase in winter precipitation, with a move towards warmer, wetter winters and hotter, drier summers. Summer rainfall is predicted to increase by around 5%, with winter rainfall increasing by around 23% although it is important to note there is a great deal of variation within the precipitation models.

Short, intense rainfall events can lead to surface flooding while prolonged rainfall saturates soil, increasing the risk of river flooding. In the UK and Europe, flooding is one of the most economically and socially disruptive natural hazards with impacts on transport, infrastructure and energy supply.

Snow

Widespread and substantial snow events have occurred in 2018, 2013, 2010 and 2009, but the number and severity have generally declined since the 1960s. Projections show a decrease in falling and lying snow across the UK.

Wind

There are no clear trends in storminess, as determined by maximum gust speeds, from the UK wind network over the last four decades. Projections show an increase in wind speeds during winter months accompanied by an increase in frequency of winter storms over the UK.

4.1.3 Identify risks

As a result of industry feedback provided during the second round of reporting, in 2016, the AOA created a working group tasked with agreeing a standard risk assessment template to be used by all reporting airports including Edinburgh. The Environment Manager attended this working group and was responsible for ensuring that the template could also be adopted internally at Edinburgh and would be compatible with existing risk registers.

The steps below outline action taken:

1. Identify risks and potential consequences – the risk register prepared for the initial Climate Change Adaptation Plan in 2011 was used as a starting point to identify potential risks and opportunities. A benchmarking exercise was then conducted against other UK airports to ensure completeness. A workshop was help with representatives from Operations and Engineering to review the identified risks and potential consequences.

2. Evaluate the likelihood of the consequences in the short, medium and long term – climate projections and local knowledge and awareness of previous adverse weather events was used to evaluate likelihood. A workshop was held with Glasgow Airport to review likelihood scoring.
3. Evaluate the severity on the consequence - climate projections and local knowledge and awareness of previous adverse weather events was used to evaluate severity. A workshop was held with Glasgow Airport to review severity scoring.
4. Establish control rating for risk control measures currently in place - local knowledge and awareness of previous adverse weather events was used to establish risk control measures and the adequacy of these controls.
5. Define adaptation response required – climate projections, local knowledge and expert judgement were used to determine actions required. These actions were allocated an Executive owner who then had responsibility for managing the risks on an ongoing basis.

Scoring has been based on expert judgement informed by the best available evidence and necessarily involves some judgement. Decisions on the appropriate risk scores, and quantification of likely consequences and likelihood and an assessment of the existing control measures for each risk was made by the Environment Manager in conjunction with technical experts from across EAL's business units.

4.2 Climate Change Risks

In the original Climate Change Adaptation Plan published in 2011, 32 risks were identified. These risks were prioritised based on:

- the identified effects and their likelihood and consequence on airport operations
- the likelihood critical thresholds would be exceeded
- the robustness of existing control measures in place to manage the risk.

The risks were classified into significant (red), moderate (amber) and low (green).
Risks in the short term were generally low (green). In the medium to longer term as climate change was predicted to accelerate, and assuming no changes to existing airport controls, risk levels were shown generally to rise in significance.

For Edinburgh Airport the most significant risks arising from climate change were from projected longer term changes to temperature and precipitation extremes.

For this third round of reporting the original risks were reviewed, some risks were removed, others were combined and an additional seven risks were added. In total 33 risks were identified.

These risks were categorised by climate variable; temperature, rainfall, fog, snow, storms, wind and lightening. In addition two risks around sea level rise and four non-physical risks were also identified.

Following a review of the risks using the same prioritisation method used in 2011, the following was determined:

- 22 green risks
- 10 amber risks
- 1 red risk

The red risk relates to changes in global distribution of pests and disease and has scored highly due to still being impacted by the COVID-19 pandemic.

The amber risks can be further categorised into:

1. Temperature – local weather resulting in freezing/thaw conditions causing damage to airfield surfaces and global climate changes affecting bird migration patterns and increasing the potential for bird strikes.
2. Rainfall – damaged caused by flood events and hazardous conditions.
3. Snow – increasing snowfall challenging existing winter contingency plans.
4. Storms – increased risk of schedule interruptions.
5. Non-physical – reputational damage resulting in a loss of passengers.

A summary of the Climate Change Adaptation Risk Register can be viewed in Appendix 1 of this report.

4.3 Identified Actions

Following the completion of the Climate Change Adaptation Risk Register a number of actions were identified. Table 2 summarised the actions identified and action owners.

Table 2 Actions and Action Owners

Action	Action owner	Timescale
Continue to build new infrastructure to appropriate design standards	Technical Director – Capital Projects team	Ongoing
Continue to review and ensure robustness of heating and cooling systems	Technical Director – Engineering team	Ongoing
Continue to monitor de-icing and anti-icing effectiveness following changes to winter weather conditions	Operations Director – Airside Operations team	Ongoing
Consider ground source heating option when resurfacing runway	Technical Director – Capital Projects team	TBC
Wash up after COVID-19 pandemic, information and lessons learned to be implemented	Operations Director – Airport Operations and Resilience team	TBC
Annual review of Wildlife Hazard Management Plan	Operations Director – Airside Compliance team	Annual
Ongoing Air Quality studies, including PM monitoring for the first time in 2022/3 study	Technical Director – EHS team	2022
Finalise Flood Risk Assessment project and implement any actions or mitigations as required	Technical Director – Capital Projects team	Ongoing
Investigate possibility of including driving in adverse weather conditions into driver training package	Technical Director – EHS team	2022
Continue to investigate reports of vortex damage and ensure repairs by a reliable contractor	Communications and Sustainability Director – Airspace and Noise team	Ongoing
Monitor changes in lightning strikes and alter required documentation accordingly	Technical Director – Engineering team	Ongoing

Edinburgh Airport operates an integrated management system (Managing Responsibly System) which is certified to ISO14001, ISO9001 and ISO45001. This system has been in place for a number of years and is used to drive continual improvement. A key component to this system is the risk registers which track departmental risks and provides an overall view of the most significant business risks. Climate related risks e.g. flooding and adverse weather and included in these registers.

Additionally there are a number of contingency plans in place, these are tested in partnership with external stakeholders e.g. local authorities and emergency services to ensure their effectiveness.

Following the classification of the identified risks, two types of responses have been identified:

1. Watching brief: where existing controls have been deemed to be appropriate or risks are longer term and require monitoring of science and the effects of climate change.
2. Action required: where an action is required either to manage short term risks or long term risks with long planning or implementation cycles.

All risks have been allocated to an Executive team member and will be managed through the existing risk management processes in place. To ensure actions are progressed and adequately managed the climate change adaption risk register will be owned by the Environment Manager who will be responsible for reviewing and updating as required.

Risks that have been identified as amber are currently being managed through existing processes i.e. the Winter Operational Plan or through ongoing capital project i.e. the current Flood Risk project which aims to determine current and future flood risk and identify mitigations required.

4.4 Climate Change Opportunities

Not all of the impacts associated with climate change should be considered as negative for Edinburgh Airport, a number of changes arising from climate change could also present opportunities. It is important that ways to maximise these opportunities are considered in future development plans. The opportunities identified as likely to arise from climate change are considered below:

- Changes to destination choice due to negative climate change impacts overseas (i.e. an increased risk of heat stress in Mediterranean countries) could increase the flow of in-tourists to Scotland. Conversely this may reduce outbound tourism if more people decide to holiday in the UK, however this may be less in Scotland than the rest of the UK as Scotland already has strong tourism links.
- Warmer temperatures are likely to shorten the time when heating is required at Edinburgh Airport, whether this reduction in energy demand for heating is likely to be outweighed by an increase in cooling demand is uncertain.
- A potential reduction in fog frequency over the average year, and a potential decrease in the likelihood of snow could lead to a reduction in weather related disruption at Edinburgh Airport in the future. Given the future variability of the climate projected to result from climate change and the fact that snow and fog cannot be ruled out in the future, it is however, important that control measures to respond to snow or foggy conditions are maintained.

4.5 Interdependencies

During the process of completing the climate change risk assessment a number of interdependencies were identified. We will continue to work collaboratively with stakeholders on these interdependencies and where appropriate ensure that climate change risks are specifically addressed:

1. On campus interdependencies – the airport campus is made up of a number of organisations which are dependent on the facilities that Edinburgh Airport provides and in turn the airport is dependent on them to operate. It is essential that we continue to work with our third parties to ensure a joint up approach to climate change adaptation.
2. Road network – as well as passengers and staff travelling to the airport, supplies such as fuel, de-icer, and retail goods are dependent on the road network to and from the airport. Whilst there are existing controls in place e.g. set amounts of materials stored on site these volumes should be monitored to ensure an uninterrupted supply. The airport is involved in a number of wider resilience forums, these will be continued to ensure any disruptions are well managed and mitigated against where possible.

3. Air Traffic Control – in addition to local weather considerations, consideration must also be given to the wider ATC network and conditions and knock on impacts this may have. It should be noted this may also present opportunities e.g. to accept diverted flights from other airports.
4. Energy and water supplies and resiliency – the airport requires a stable supply of energy and water to operate and is dependent on suppliers to ensure that their infrastructure is adequate to meet future climate changes. We are in the process of developing a solar farm on campus which will reduce our dependency on grid electricity to an extent.
5. Upstream developments - one of the biggest challenges facing the airport is understanding how longer-term climate change impacts together with local infrastructure developments out with the airport boundary may impact on the longer term flood risk for airport land. We will continue to work with local authorities and SEPA as well as through existing safeguarding processes to help to mitigate against this.
6. UK and Scottish Government – policies must align and support be available to ensure that interdependencies are considered holistically.
7. SEPA – SEPA play a key role in managing and mitigating Scotland's flood risk, we must continue to work towards agreed shared goals through local and national flood risk plans.

4.6 Assumptions

There are a number of fundamental assumptions which underpin Edinburgh Airport's climate change risk assessment. For this assessment it is assumed that:

- UKCP18 projections are an accurate representation of the climate change impacts which will occur
- risks to the supply of key services upon which Edinburgh Airport relies, i.e. electricity, gas, water will be adequately managed by the authorities and organisations responsible for their supply
- external climate risks e.g. to the wider surface network will be adequately managed by the appropriate owners/operators
- aviation infrastructure and technology continues to operate fundamentally in the same way as envisaged today
- third party organisations, whose business affects EAL's activities and resilience continue to operate in the same manner and at the same performance standards that they do today
- passenger and cargo requirements for air transportation will continue to develop in line with EAL and CAA forecasts, and that UK population levels develop in line with government forecasting
- Edinburgh Airport's current business and development plans are assumed to be acceptable to the government.

4.7 Uncertainties

4.7.1 Scientific

The risk assessment has been completed using UKCP18, the most up to date climate model available. Climate change science, however, is a field that is rapidly advancing, as modelling techniques, the datasets of observed change and the scientific understanding of the complexity of the climate system all improve. There are considerable scientific uncertainties associated with lack of information and disagreement about what is known or even knowable embedded in the current state of climate change science. It is important to remember that climate projections should not be misinterpreted as climate predictions. The scientific community adopts the term projections (and not predictions) when describing future changes in climate, as projections involve assumptions in parameters, e.g. future socio-economic and technological developments and are therefore subject to substantial uncertainty.

No climate change projection should be seen as a prediction, and the modelling referred to in this report should be considered to be the best available evidence at this time.

4.7.2 Emission scenarios

Emissions scenarios contain assumptions about a wide number of variables including; future population levels, wealth and consumption, technologies and the energy mix. All of these estimated variables are based upon expert judgement and are prone to uncertainty.

To respond to this uncertainty the precautionary principle remains central to this assessment. The emissions scenarios and probability percentiles selected for the study represent for each climate variable a threshold that most current models suggest is unlikely to be exceeded i.e. a reasonable worst case, based on the science available today.

4.7.3 Timescales of change

There are considerable uncertainties relating to the pace and scale of the changes that climate change may bring about. Should modelling assumptions about the ability of natural systems such as the oceans to absorb atmospheric carbon dioxide be too optimistic, as the observed science is increasingly suggesting, then the impacts of climate change projected for the long term may occur more quickly than expected.

Edinburgh Airport's current risk management considers the reasonable worst case scenario in terms of consequences and likelihood for any risk on its risk registers. For some of the risks associated with climate change it is very difficult to express probabilistically the frequency with which they may occur, and when they are projected to occur, particularly when considering long timescales.

The long term incremental nature of some climate change impacts, such as changes to flood return periods, may mean that the consequence of climate change risks are not a fixed value but could worsen as time passes, and as a result the risk assigned in the risk management documents should be regularly revised to capture these changes and ensure that risk management control measures are sufficient to deal with them.

The regular review of risk registers undertaken by each senior managers, is considered to be the most appropriate mechanism to ensure that each risk is being considered in the light of the latest science and situational data to ensure that both the likelihood of a given risk occurring and an up to date definition of its likely consequences are stated.

4.7.4 Airport and aviation

There are also considerable uncertainties with regard to the future development and role of Edinburgh Airport, the regulatory environment surrounding airport operations and the future evolution of the wider aviation industry due to uncertainties that can affect demand e.g. economic changes, fuel process, reputational impact of flying, changes to regional transportation systems and the impact of technology.

4.8 Next steps

In order to ensure that our climate change adaptation response remains appropriate and effective the following next steps have been identified:

- Ensure all identified risks are assigned owners and the risks are incorporated into existing risk registers.
- Review the climate change adaptation risk register on a regular basis (every two years) to ensure actions are progressed, risks remain appropriately assessed and any newly identified risks are included.

- Use the latest climate science to ensure further improvements in climate change adaptation and resilience.
- Regularly review changes to climate change science to ensure risk registers and controls are accurate and up to date.
- Continue to work with external stakeholders to the airport and aviation industry to share best practice and ensure appropriate levels of adaptation and resilience.

Appendix A Climate Change Risk Register

STAGE A								STAGE B				STAGE C					
Risk Code	Climate Variable	Risk (including indirect and interdependency risks)	Decision threshold, process or trigger point for action on the risk	Narrative	Potential Consequences (Functions, Service, Assets affected)	ARP 3 Risk Score [Current]	Confidence (high / medium / low)	Control Measures/Strategy	Adequacy	Further Planned Actions	ARP 3 Risk Score [Post-Control]	ARP3 Risk Score [2050 + Post-	Confidence (high / medium / low)	ARP3 Risk Score [2080 + Post-	Confidence (high / medium / low)	Narrative on Horizon Scores	Assumptions (including on data, operational, regulatory changes, etc)
T1	Temperature	Overheating in buildings	Critical threshold not currently tested	Overheating in buildings including temperature critical buildings	Increased cooling demand. Health impacts on vulnerable groups. Reduced staff productivity. Temperature sensitive plant may experience failure, damage or inefficiency.	8	H	Building Management System (BMS) Chilling capacity Air conditioning design standards Occupational Health awareness campaigns Trained First Aiders available across campus	Y	Watching brief: continue to build to appropriate design standards and monitor BMS, continue to review and ensure robustness of cooling systems	4	6	M	6	M	Using UKCP18 Climate projections temperatures are predicted to rise, resulting in this risk increasing over time.	Mitigations and future risk based on current HVAC systems
T2	Temperature	Structural damage to runway and aprons	Critical threshold not currently tested	Airfield surface and sub-surface structural damage to runway and aprons caused by temperatures exceeding design standards i.e. melting, cracking.	Financial costs to repair damage. Operational disruption. Airport closure. Reputational damage.	12	H	Runway inspections Planned remedial works Suitable and appropriate designers and contractors are used	Y	Watching brief: current actions deemed sufficient, continue to ensure climate considerations in the asphalt mix and repair according to correct standards	2	4	M	4	M	Using UKCP18 Climate projections temperatures are predicted to rise, resulting in this risk increasing over time.	N/A
T3	Temperature	Airfield surface and sub-surface structural damage to runway and aprons as a result of freeze-thaw	UK tarmac standards (roads, aprons) begin to lose integrity when consistently subjected to freeze-thaw conditions resulting in cracking	Airfield surface and sub-surface structural damage to runway and aprons caused by temp dipping below zero and subsequently increasing on a continuous cycle. The expanding ice can cause cracking in the surface	Financial costs to repair damage. Operational disruption. Airport closure. Reputational damage.	12	M	Runway inspections Planned remedial works Suitable and appropriate designers and contractors are used	Y	Continue to monitor de-icing and anti-icing effectiveness, potential increase of runway inspections or resurfacing may be required Consider ground source heating option when resurfacing runway	6	10		10	L	Using the UKCP18 Climate projections temperatures during the winter months are likely to become wetter, with the increase in temperature unlikely to eliminate freezing conditions.	N/A
T4	Temperature	Reduced lift for departing aircraft due to 'thin air' and reduced engine efficiency in very hot weather	Critical threshold not currently tested and not a critical issue	Reduced lift for departing aircraft due to 'thin air' and reduced engine efficiency in very hot weather	Increased noise, GHG emissions, fuel use. Decreased load factor, ATM rate. Potential for backlog, delays and cancellations. Diversions and cancellations would result in lost landing fees. Reduced range of aircraft operating out of Edinburgh Airport.	3	High	Aircraft operate in areas of much higher temperatures across the world, this is unlikely to be an issue. Ongoing engagement with airline partners. Option in 2040 Masterplan to increase the length of the runway if required.	Y	Watching brief: ongoing engagement with airline operators	2	2	M	2	M	Temperature rise is unlikely to be a risk for departing aircraft	N/A
T5	Temperature	Damage to public road surfaces caused by heat exceeding design standards i.e. softening, cracking	UK tarmac standards begin to lose integrity once temperatures in the shade exceed 32°C	Damage to road surfaces limiting access to airport or critical parts of the airfield	Loss of access to and from the airport due to road closures. Increased maintenance. Temporary closures of affected areas for repairs. Risk of maintenance vehicles contributing to congestion	6	High	Various levels of inspections are carried out by Airside Operations and Engineering on a regular basis. Ongoing engagement with local authority regarding public access road to the airport. Contingency road across old secondary runway available if required.	Y	Watching brief: ongoing monitoring and engagement with local authority. Currently going through planning process to construct a new road.	4	6	M	6	M	Using UKCP18 Climate projections temperatures are predicted to rise, resulting in this risk increasing over time.	Assume planning consent will be given for access road

T6	Temperature	Increased fire risk due to hotter temperatures combined with increased lightning and drought potential. Primarily due to grass fires, and increased risk of electrical fires	Critical threshold not currently tested and not a critical issue	Increased risk of fire	Visibility hazard posed. Evacuation and disruption. Asset damage. Health and safety impacts. Firewater supply limited by droughts. Diversions and cancellations would result in lost landing fees	6	High	Onsite Fire Service, regular testing of equipment and procedures. Fire training given to staff; regular safety inspections conducted.	Y	Watching brief: continue to monitor the potential for increased fire risk as a result of climate change	3	4	M	4	M	Using UKCP18 Climate projections temperatures are predicted to rise, resulting in this risk increasing over time.	
T7	Temperature	Change in global distribution of pests and disease	N/A	Pandemic impact on air travel resulting in reduced/zero demand	H&S risks to staff, increased pressure on Port Health, reduced public confidence in air travel	20	High	Learning from previous pandemics, including COVID-19. PPE measures e.g. face mask and introduction of social distancing, staff working from home where possible	Y	Wash up After COVID-19 pandemic, information and lessons learned to be implemented	20	20	M	20	M	High scoring risk, as result of current COVID-19 pandemic	There will be a lesson learned/wash up event and further plans developed on the back of the COVID-19 pandemic
T8	Temperature	Change in distribution of pests and diseases. Potential changes to bird migration patterns and bird strike risk.	Requires further research	Potential change to bird migration patterns and bird strike risk	Changes to insect populations impact bird population and bird strike risk resulting in accidents or diversions	16	High	Annual Bird strike Management Standards check carried out by third party experts who determine current Risk bird strike RA. Current “Isolated Aircraft Position" on Airfield. Keeping an eye out (red kites). Wildlife reports, engagement with external sources other airports, CAA, various industry forums. On site bird and wildlife management	Y	Annual review of WHMP (Wildlife Hazard Management Plan) and awareness of changing physical characteristics of airfield through Capital Projects processes.	12	12	L	12	L	Changes to bird migration patterns requires further research	Assume continued wildlife management best practice
T9	Temperature	Change to travel destinations	Requires further research	Change to travel destinations, certain countries might be less appealing if too hot or impacted by climate e.g. fires. Opportunity to change destination mix or increase inbound traffic.	Reduction in outbound passengers, opportunity to enter new markets or increase inbound travel	4	High	Ongoing research by aviation team, including engagement with airline operators	Y	Watching brief: ongoing market monitoring and engagement with airlines	4	4	H	4	H	It is likely that climate change will result in changes to international travel, however the risk is adequately controlled	Assume that there will be changes to international travel as a result of climate change
T10	Temperature	Heatwave conditions result in negative impacts on air quality. More pressure to comply with air quality standards.	Air Quality standards have been developed for pollutants of concern for human health: Nitrogen Dioxide 1 hour mean 200 µg m-3 not to be exceeded more than 18 times a year Nitrogen Dioxide annual mean 40 µg m-3 PM10 24 hour mean - 50 µg m-3, not to be exceeded more than 7 times a year PM10 annual mean 18 µg m-3	Poor air quality can cause short- and long-term health effects as well as damaging the local environment	Heat and sunlight essentially cook the air along with any chemical compounds within it which reacts with naturally occurring nitrogen oxide creating a “smog” of ground-level ozone gas. Reductions in visibility. H&S impacts for vulnerable groups i.e. those with respiratory ailments or heart problems.	6	High	Low visibility operating procedures well established, air quality studies take place every 3 years; no exceedances found in previous reports, ongoing engagement with local authorities	Y	Ongoing Air Quality studies, including PM monitoring for the first time in 2022/3 study	2	2	M	2	M	Horizon scored based on move towards electric vehicles resulting in an improvement to local air quality	Assuming more stringent regulatory requirements on electric vehicles for staff and passenger surface access and operational vehicles

R1	Rainfall	Localised flooding if older drainage system overwhelmed by heavy rainfall events	Threshold to be confirmed following on from current ongoing flood risk project	Localised flooding if drainage system becomes overwhelmed	Inundation of underground services and infrastructure. Water ingress to buildings, utility supply infrastructure and tunnels. Localised loss of power. Mobilisation of pollution. H&S risks. Airside and surface access disruption. Diversions and cancellations would result in lost landing fees. Ponding on airfield can result in bird attraction and surface breakup.	16	High	Ongoing Surface to Foul project will create additional capacity in the storm network. There is also a wider flood risk project in place that will allow us to improve our understanding of flooding and develop additional controls as required. Airfield monitoring and inspections to monitor time it can take for ponding to drain Airfield grass mix includes reed canary grass as a natural control measure Confident in runway drainage system	N	Flood Risk Project will be used to improve understanding of flood risk and improve existing controls as required, considering future climate projections	12	16	M	20	M	Using UKCP18 Climate projections, rainfall and increased extreme weather events are predicted to increase, raining this risk over time	Assuming no further mitigation action is planned in addition to increased development including an increase in hard standing
R2	Rainfall	Localised flooding of River Almond and Gogar Burn.	Threshold to be confirmed following on from current ongoing flood risk project	Offsite impacts could impede the flow of passengers, crew and staff if the UK surface transport network is affected. Potential for backlog, delays and cancellations. Diversions and cancellations would result in lost landing fees. Could also result in flooding of critical assets and infrastructure as described above	Flooding of rivers into terminal buildings, car park facilities and airfield.	16	High	Ongoing monitoring of SEPA flood warning data and river levels, heavy rainfall/flooding included in resilience planning and scenario tested, debrief events following on from flooding, flood risk plan in place.	N	Flood Risk Project will be used to improve understanding of flood risk and improve existing controls as required, considering future climate projections	12	16	L	20	L	Using UKCP18 Climate projections, rainfall and increased extreme weather events are predicted to increase, raining this risk over time	Assuming no further mitigation action is planned in addition to increased development including an increase in hard standing
R3	Rainfall	Changes to groundwater levels could cause subsidence and water ingress damage to buildings and surfaces.	Threshold to be confirmed following on from current ongoing flood risk project	Damage to buildings, internal and external areas and infrastructure	Potential for damage to subsurface utilities. Water ingress to low lying assets i.e. basements	16	High	Ongoing monitoring of SEPA flood warning data and river levels, heavy rainfall/flooding included in resilience planning and scenario tested, debrief events following on from flooding, flood risk plan in place.	N	Flood Risk Project will be used to improve understanding of flood risk and improve existing controls as required, considering future climate projections	8	12	L	16	L	Using UKCP18 Climate projections, rainfall and increased extreme weather events are predicted to increase, raining this risk over time	
R4	Rainfall	Torrential rain creates hazardous conditions for vehicles and planes i.e. airside and landside road vehicles and taxiing and landing aircraft.	Threshold will vary depending on aircraft/airline	Torrential rain creates hazardous conditions for vehicles and planes i.e. airside and landside road vehicles and taxiing and landing aircraft.	Increased risk of RTAs, congestion and H&S impacts. Reduced visibility and braking co-efficient and increased risk of hydro-planning for aircraft increases risk of aircraft incidents, requires reduced ATM rate. Increased separation means potential for backlog, delays, compromised night flying quotas and cancellations. Diversions and cancellations would result in lost landing fees. Increased in holding will increase greenhouse gas emissions and may result in increased noise complaints.	12	High	Grooved runway, drainage system, ATC procedures i.e. increased separation distances, runway safety zones, operational guidance for pilots/airside staff, warning signs on motorway network to announce hazardous conditions. Driver training programme that all airside drivers must complete.	Y	Investigate possibility of including driving in adverse weather conditions into driver training package	6	12	M	12	M	Using UKCP18 Climate projections there is an increased risk of extreme weather events e.g. flash flooding	

R5	Rainfall	Pollution Control Systems (interceptors) are challenged during extreme rainfall events	Interceptor capacity limits	Excess rainfall may overwhelm the interceptors (in particular the open interceptors) resulting in pollution of local watercourses	Breach of CAR licence, resulting in Enforcement Action from SEPA	16	High	Monthly water quality monitoring. Ongoing monitoring and maintenance of interceptors which are under a planned maintenance programme. New capital projects include interceptors build to design standards. Archimedes screws are a major part of water management onsite; maintenance work is planned for 2021 to ensure they remain effective.	Y	Flood Risk Project will be used to improve understanding of flood risk and improve existing controls as required, considering future climate projections	12	12	L	16	L	Using UKCP18 Climate projections there is an increased risk of extreme weather events e.g. flash flooding	
R6	Rainfall	Drought conditions problematic for water intensive activities and can cause bore hole levels to drop	Critical threshold not currently tested	Drought conditions problematic for water intensive activities and can cause bore hole levels to drop	Impacts on landscaping, surfaces, dust, subsidence and the airport's appearance. Water demand restrictions possible. Increased water supply costs. May impact water supply to areas where future rainwater harvesting occurs.	3	High	Designing new assets with water efficiency measures to minimise consumption, monitoring consumption, leak detection, targeting, and retrofitting water conservation measures to older buildings such as rainwater harvesting.	Y	Following any installation of rainwater harvesting measures, ensure back-up connection to mains to ensure secure water supply. Ensure tank is of a sufficient capacity to maximise storage during high intensity rainfall events to offset low rain in drought conditions	3	4	H	4	M	Severe drought unlikely to be problematic as a result of Climate Change at Edinburgh Airport	Assuming rainwater harvesting measures are installed and water efficiency measures continue to be built into new developments
F1	Fog	Seasonal changes to fog frequency result in changes to fog related disruption	Low visibility procedures come into force when runway visual range is less than 600m and or cloud ceiling is less than 200 feet	Increase in fog disruption impacting on aircraft and airside operating procedures	Fog causes increased separation distances, reduction in ATM rate. Potential for backlog, delays and cancellations. Diversions and cancellations would result in lost landing fees. Restrictions on maintenance teams' activities airside - free ranging curtailed, lookouts required. Delays on road network. Opportunity to take diverted flights from other airports	12	High	Current Low Visibility legislation and procedures is appropriate for current weather conditions.	Y	Watching brief: continue to monitor conditions and processes	4	4	L	2	L	Using UKCP18 Climate projections there is an indication that fog risk will reduce, resulting in a lower risk however there is low certainty around this	
S1	Snow	Increased energy demand for heating stretches supply	Sustained temperatures below 6 degrees would require heating of unoccupied buildings	Increased energy demand during prolonged periods of cold weather	Increased GHG emissions. Plant inefficiency and risk of failure. Increased energy costs.	8	High	Building Management System and Energy Management System used to monitor performance and highlight inefficiencies Switch to 100% renewable electricity in 2018 and 100% green gas in 2021 Asset replacement planned for 2022/3 for terminal boilers	Y	Watching brief: continue to monitor conditions and processes	4	4	M	4	M	Future scenarios presume a move away from gas, energy demand to be considered in future building design	

S2	Snow	Increasing variability of snowfall challenges winter contingency plans, de-icing supplies and staff experience	Determined by Winter Operating Plan	Changes to winter weather may result in the winter plans being inefficient or unable to cope.	Years of no snow followed by heavy snow combined with staff turnover could lead to negative impacts on corporate knowledge and staff / systems out of practice. Supplies could be inadequate if based on recent past rather than potential extremes. Airside operations including runway could be disrupted. Closure, cancellations and delays possible. Diversions and cancellations would result in lost landing fees. Prolonged and increased cold temperatures may result in ECO2 becoming inefficient and Konsin being required, or additional de-icer product being required, which has a negative impact on water quality.	12	High	Winter Plan reviewed annually Regular training for the Winter teams Variety of long and short term forecasting used to monitor weather conditions Staff are alerted of hazardous weather conditions Water Quality Project to prevent any de-icer products entering local water courses Ensure continued availability of supply of de-icer product	Y	Watching brief: continue to review winter plans on an annual basis and include adverse weather in contingency planning and testing. Water Quality Project due to commence in 2022 with the aim of addressing water quality issues. Future climate change considerations should be included in the project design	8	8	M	8	M	Using UKCP18 Climate projections it is predicted there will be an increase in extreme weather events, the controls in place are deemed enough	Assume water quality project goes ahead
S3	Snow	Wintry conditions pose health and safety risks for passenger and staff.	Determined by Winter Operating Plan	Wintry conditions pose health and safety risks for passenger and staff e.g. increased risk of slips, trips, falls, hazardous driving conditions, thermal discomfort	Reduced thermal comfort for outdoor staff and staff working in unheated areas. Risk of trips and falls. Hazardous driving conditions landside and airside. Construction project delays.	6	High	De-icing and gritting plan for vehicle routes and walkways Winter Operating Plan reviewed on an annual basis Occupational Health campaigns Ongoing monitoring of STF to identify hot spots and further actions required	Y	Watching brief: continue to monitor	4	6	M	6	M	Using UKCP18 Climate projections it is predicted there will be an increase in extreme weather events, the controls in place are deemed enough however the likelihood may rise	
S4	Storms	Increased risk of wind damage to assets, standing aircraft, vehicles and injuries to staff, risk of FOD damage	Various wind speed resilience thresholds	Wind may result in damage to assets	Delays to construction projects possible. Staff vulnerable to injury. Unable to serve aircraft due to high winds, air bridges and steps not available resulting in delays and cancellations. Delays in accessing aircraft hold.	6	High	Low risk due to underground elect supplies FOD controls and weather warnings which are legislated through CAA	Y	Watching brief: continue to monitor	4	6	M	9	M	Using UKCP18 Climate projections it is predicted there will be an increase in extreme weather events	
S5	Storms	Increased risk of schedule interruption from stormy conditions.	Determined by Airline Operators / Air Traffic Control Met Office Weather Warnings	Predominately storms are south westerly, our location helps to mitigate any adverse impacts on arriving or departing aircraft. However, disruption to wider flight schedules may occur. Offsite impacts could impede the flow of passengers, crew and staff if destination airports or the UK surface transport network is affected. Destination choice and demand affected. Impacts on passenger and cargo flow could lead to overcrowding of onsite facilities and negative publicity. Reduced staffing levels due to school or road network closures could impact operations at the airport. Potential for backlog, delays and cancellations. Diversions and cancellations would result in lost landing fees.	Decreased rate of ATMs likely during low pressure storms. Increased separation needed. In extreme conditions possible short-term closure of runways. Potential for backlog, delays and cancellations. Diversions and cancellations would result in lost landing fees. Smaller aircraft may be unable to fly. Opportunity for increased diversions from other airports e.g. Glasgow	12	High	Air Traffic Control monitor weather conditions and can increase separation as required. Welfare facilities can be provided for staff/passengers who become stranded. Contingency planning and testing	Y	Watching brief: continue to monitor and prepare for situations where staff/passengers become stranded	6	9	M	12	M	Using UKCP18 Climate projections it is predicted there will be an increase in extreme weather events	

W1	Wind	Increased longevity of wind tip vortex effect due to general becalming of surface wind speeds.	Determined by Air Traffic Control, wing tip vortex is particularly problematic for small planes taking off in quick succession after large aircraft.	Increased longevity of wind tip vortex effect due to general becalming of surface wind speeds.	Increased risk of damage to local properties and associated repair costs for EAL. Potential for backlog, delays and cancellations. Diversions and cancellations would result in lost landing fees.	6	High	ATC flow processes are in place to ensure that vortex separation is in place Vortex repairs procedure for damaged properties 2040 Masterplan includes plans to stagger aircraft more efficiently depending on type/size	Y	Watching brief: continue to investigate reports of vortex damage and ensure repairs by a reliable contractor as necessary	3	3	M	3	M	Using UKCP18 Climate projections there is no predicted change to wind directions	
W2	Wind	Change to prevailing wind direction affects runway utilisation and schedules.	Commercial aircraft are tested to a 'demonstrated' maximum crosswind as part of their certification	Predominately storms are south westerly, our location helps to reduce the risk of crosswind	Reductions in take-off and landing rates if crosswind procedures are in place for longer time periods. Potential for backlog, delays and cancellations. Diversions and cancellations would result in lost landing fees.	6	High	Future climate analysis doesn't indicate that the prevailing wind directions for the British Isles will change. Modern aircraft have higher tolerances of crosswind, typically 30kts Air Traffic Control monitor wind direction to determine runway utilisation All aircraft are performance tested to operate in cross winds	Y	Watching brief	3	3	M	3	M	Using UKCP18 Climate projections there is no predicted change to wind directions, current controls adequately manage the risk	
L1	Lightning	Power cuts and voltage spikes to parts of the airport during electrical storms.	Modern control systems are sensitive to voltage spikes	Risk of disruption and equipment failure or damage	Risk of disruption and equipment failure or damage resulting in additional costs, reputational damage	6	High	Previous power outage actions have mitigated this risk. UPS for safety critical systems, dual fed electrical supply For our infrastructure, we have lightning protection testing in place - lightning rods in place tested every 11 months	Y	Watching brief: continue to monitor	4	4	L	4	L	Using UKCP18 Climate projections forecast predictions on changes to lightening is low	
L2	Lightning	Increased lightning strikes	All commercial aircraft are tested for resilience to lightning strike as part of their certification. Planes can withstand lightning strike in the air but during take-off and landing instrument loss would be critical hence the diversion of routes and stacks.	If there's a strike it may be on the ground for a time due to having to reset etc so could cause disruption that way	Operational disruption caused by decrease in aircraft movements; a strike on the ground would result in delays to operations as the aircraft would spend longer on stand restarting and checking equipment this may impact on the flight schedule, increased insurance claims; Reputational damage; H&S incident	6	High	Aircraft design will consider future changes to lightning strikes Weather monitoring	Y	Watching brief, continue to engage with airlines to understand any trends Monitor changes in lightning strikes and alter required documentation accordingly	4	4	L	4	L	Using UKCP18 Climate projections forecast predictions on changes to lightening is low	
L3	Lightning	Airfield operations could be disrupted by increased electrical storm frequency / severity.	All commercial aircraft are tested for resilience to lightning strike as part of their certification. Planes can withstand lightning strike in the air but during take-off and landing instrument loss would be critical hence the diversion of routes and stacks.	Lightning in the immediate vicinity would result in certain operations being halted e.g. refuelling which may result in delays to operations	Planes affected by lightning strike taken out of service and assessed before returning to fleet. Diversions of take-off and landing routes and stack locations to avoid convection storms. In extreme circumstances incoming aircraft would have to be diverted. Potential for backlog, delays and cancellation. Diversions and cancellation would result in lost landing fees.	6	High	Suspension of refuelling. Suspension of construction activities.	Y	Watching brief: continue to monitor the impact of lightning on the operation	4	4	L	4	L	Using UKCP18 Climate projections forecast predictions on changes to lightening is low	

SL1	Sea-Level Rise	Sea-Level Rise/ storm surge risks disruption to infrastructure i.e. utility supplies, surface transport routes (without adaptation)	Critical threshold not currently tested	Sea-Level Rise/ storm surge risks disruption to infrastructure i.e. utility supplies, surface transport routes	Surface access, essential services could be disrupted.	2	High	Contingency plans are in place for dealing with offsite impacts affecting transport routes and utility supplies. Potential for opportunity should other, coastal airports be affected by sea level rise.	Y	No action required in the short term. Consultation looking at longer term risks may be undertaken in the medium term, but significant changes are likely to occur to airline schedules in the interim period anyway for risks other than climate change.	2	3	M	3	M	Horizon risk still low due to location of Edinburgh Airport, it is unlikely to be affected by sea level rise	
SL2	Sea-Level Rise	Sea Level Rise / storm surge risks loss of low-lying destination airports i.e. Schiphol, Venice (without adaptation).	Critical threshold not currently tested	Sea Level Rise / storm surge risks loss of low-lying destination airports i.e. Schiphol, Venice (without adaptation).	Inability to receive aircraft	2	High	Ongoing engagement with other airports, sharing of best practice	Y	No action required in the short term. Consultation looking at longer term risks may be undertaken in the medium term, but significant changes are likely to occur to utility supply infrastructure and surface access routes in the interim period anyway for risks other than climate change.	2	6	M	9	M	Horizon risk is elevated slightly due to a higher risk at receiving airports	
NP 1	Non-physical	Policy and regulatory changes reduce demand for air travel	N/A	Policies to price carbon through taxation or carbon trading schemes may reduce the demand for flying. If international policies do not adequately address aviation emissions over time additional government measures may limit expansion and growth opportunities. Additionally policy/regulatory changes may mean assets can no longer be used resulting in stranded assets.	Reduction/limit to airport growth	6	High	The Sustainability Strategy was launched in 2021, setting a Net Zero target ahead of UK and Scottish Government targets Member of a number of industry groups e.g. Sustainable Aviation, ACI, AOA aiming to ensure a clear and consistent approach for the aviation industry to achieve Net Zero Support and engagement with the development and implementation of Sustainable Aviation Fuels (SAF) Ongoing engagement with stakeholders	Y	Full time Head of Sustainability employed	4	8	L	8	L	Increased risk over time depending on how the industry and government respond to climate change	Continued action will be taken across the aviation sector limit the impact of climate change

NP 2	Non-physical	Financial and market changes	N/A	Investors and lenders are increasingly looking to move towards funding decarbonisation strategies. Businesses in high-carbon sectors are potentially at risk of attracting higher rates on lending or an increase in resources to secure funding	Reduction in lending	6	High	We are engaging with our investors and lenders to understand their priorities and share our decarbonisation plans. We also remain committed to robust and transparent external disclosures on our climate-related financial risks, our developing decarbonisation strategy and our progress with delivering the strategy	Y	Watching brief: continue to monitor	4	8	M	8	M	Increased risk over time as climate change impacts and pressure from stakeholders increase	
NP 3	Non-physical	Reputational impact of flying	N/A	Passengers may change their travel behaviours to reduce their personal carbon footprints e.g. by flying less or choosing short haul over long haul resulting in a loss of revenue	Reduction/limit to airport growth	6	High	Launching a Sustainability Strategy to reduce our emissions and help passengers make informed decisions. Ongoing engagement with airlines and monitoring changes in the market.	Y	Watching brief: continue to monitor	12	15	L	15	L	Increased risk over time as climate change impacts increase and passenger behaviours change	
NP4	Non-physical	Technology limitation	N/A	Adaptation and mitigation are limited by current technology, as technology develops additional solutions to climate risks could be achieved.	Mitigation and adaptation limitations	6	Medium	Monitor changes and improvements to technology	Y	Watching brief: continue to monitor	4	6	L	6	L	Increased risk over time as climate change accelerates and technology advances remain unknown	