



**GREATER
GOOD**

Our plan for a sustainable future

CLIMATE CHANGE ADAPTATION REPORT

Fourth Round Progress Report 2024

Edinburgh Airport 

POWERED BY  

EXECUTIVE SUMMARY

PURPOSE OF THIS REPORT

This report evidences the climate change related risks to Edinburgh Airport, representing the fourth round of climate adaptation reporting in line with the UK Government's Adaptation Reporting Power under [Section 62 of the Climate Change Act 2008](#). As per the authority given to the Secretary of State to direct organisations within the infrastructure sector, including airports, to detail their climate adaptation plans, this report outlines:

- The current and future projected impacts of climate change on Edinburgh Airport
- Edinburgh Airport's proposals for adapting to climate change
- An assessment of progress towards implementing the policies and proposals set out in Edinburgh Airport's 2021 Climate Change Adaptation Report.

Historically, this reporting has been undertaken over a 5-year cycle, however, following the Department for Environment, Food & Rural Affairs' [2023 consultation](#) the closing date for the fourth round of reporting is late 2024 rather than 2026 to coincide with other elements of the statutory framework for climate change adaptation. This enables this adaptation report to be included in the analysis for the Climate Change Committee's independent risk advice to government, ahead of the publication of the fourth Climate Change Risk Assessment (CCRA4), delivered in 2026. This report has been prepared in accordance with guidance set out in [The Third National Adaptation Programme \(NAP3\)](#), the [Fourth Strategy for Climate Adaptation Reporting](#).

SUMMARY OF CLIMATE CHANGE RISKS TO EDINBURGH AIRPORT

Edinburgh Airport's climate change risk profile has not changed considerably since the third reporting round in 2021. Risks included in the 2021 risk register have been reviewed and updated accordingly, including updating the narrative, potential consequences, and the risk titles themselves.

Both the physical impacts of climate change as well as the societal transition to a low carbon economy, present risks to Edinburgh Airport. These risks, have each been assigned a risk owner, whose responsibility it is to ensure that control measures are in place to mitigate the risk as well as reporting on changes to the risk, its likelihood or impact to the airport. In line with Edinburgh Airport's governance and risk management processes, all risks out with the airport's appetite will be reported to the airport's senior executive team and the board.

The greatest risks to Edinburgh Airport before mitigation include four rainfall risks; two temperature risks; two lightning risks; and two compound event risks. After mitigation, two risks fall outside the risk appetite of Edinburgh Airport which related to localised flooding and a compound event from rainfall and wind.

The risks associated with future climate changes have been assessed using the UK Climate Change Projections and scenarios associated with the RCP 4.5 and RCP 8.5 pathways (the medium and high emission scenarios). In the medium-term, up to 2040, six risks are anticipated to be out with the risk appetite of Edinburgh Airport with four associated with rainfall (relating to flooding, damage

caused by groundwater levels, and vehicle incidents), and two associated with the transition to a low carbon economy (relating to policy and market changes influencing demand and lending). In the long term, up to 2080, ten risks are identified as being major and two are considered severe, both relating to rainfall and disruption/damage from flooding.

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ABBREVIATIONS & ACRONYMS

The abbreviations and acronyms used throughout this report are outlined in the table below.

Abbreviation/ Acronym	
ACA	Airport Carbon Accreditation Scheme
ARP	Adaptation Reporting Power
AOA	Airport Operators Association
ATC	Air Traffic Control
CAA	Civil Aviation Authority
CCC	Climate Change Committee
CCRA4	Fourth Round Climate Change Risk Assessment
CO ₂	Carbon Dioxide
COP26	26th United Nations Climate Change Conference
DEFRA	Department for Environment, Food & Rural Affairs
EDI	Edinburgh Airport
EHS	Environment, Health & Safety
ESG	Environment, Social & Governance
EV	Electric Vehicle
FRM	Flood Risk Mitigation

Abbreviation/ Acronym	
GHG	Greenhouse Gas
GIP	Global Infrastructure Partners
HVO	Hydrotreated Vegetable Oil
ICAO	International Civil Aviation Organization
NAP3	Third National Adaptation Programme
IPCC	Intergovernmental Panel on Climate Change
LTO	Landing and Take-off Cycle
RE	Renewable Energy
RCPs	Representative Concentration Pathways
SEPA	Scottish Environment Protection Agency
SAF	Sustainable Aviation Fuel
TCFD	Task Force on Climate-Related Financial Disclosures
UKCP18	UK Climate Projections 2018
UNFCCC	United Nations Framework Convention on Climate Change
VINCI	Virtual Intelligent Networks for Computing Infrastructures

POLICY DRIVERS

This report and the accompanying climate change risk register have been prepared with the following key international, national, and local policy drivers in mind, though this is not an exhaustive list.

INTERNATIONAL

[United Nations Framework Convention on Climate Change](#)

[Paris Agreement](#)

[IPCC Summary for Policymakers: Global Warming of 1.5°C](#)

[EU Adaptation Strategy](#)

[UN Sustainable Development Goals](#)

[The "Glasgow Climate Pact"](#)

NATIONAL

[Climate Change Act 2008](#)

[Climate Change Act \(Scotland\) 2009](#)

[UK Climate Projections](#)

[Third UK Climate Change Risk Assessment 2022](#)

[UK Climate Resilience Programme](#)

[Flood Risk Management \(Scotland\) Act 2009](#)

[National Flood Risk Assessment \(NFRA\) 2018](#)

[National Planning Framework 4](#)

[Scotland's Biodiversity Strategy](#)

LOCAL

[Edinburgh City Vision 2050](#)

[2030 Climate Strategy](#)

[City Plan 2030](#)

[Vision for Water Management in the City of Edinburgh 2020](#)

[City Mobility Plan 2030](#)

[Edinburgh Biodiversity Action Plan 2022-2027](#)

[Forth Estuary Local Flood Risk Management Plan 2022-2028](#)

1 INTRODUCTION

1.1 PURPOSE OF THE FOURTH ROUND CLIMATE CHANGE ADAPTATION REPORT

Representing the fourth round of climate change adaptation reporting in line with the UK Government's Adaptation Reporting Power (ARP4) under [Section 62 of the Climate Change Act 2008](#), this report provides an update to Edinburgh Airport's (EDI) [Climate Change Adaptation Report 3 \(CCAR3\)](#) for the third round reporting period in 2021. The report includes updates on the risk register presented in CCAR3 along with an update on the progress of mitigation measures previously identified. The updated risk register presented within the appendix of this report, outline the risks posed to Edinburgh Airport resulting from climate changes using the [2018 UK Climate Projections \(UKCP18\)](#), and outlines adaptation measures in place with consideration to future climate changes.

1.2 PROFILE OF EDINBURGH AIRPORT

EDI is Scotland's busiest airport, as well as the 6th busiest airport in the UK. It is located 13km West of Edinburgh city centre, covering approximately 341 hectares. In the North, the airport is bordered by the River Almond, while the Gogar Burn runs through the airport grounds and into the river. The airport is well connected to several of Scotland's cities through public transport links including buses, trams, and trains. The airport also sits at the intersection of three principal motorways, providing good connection via private vehicles.

The terminal building and main runway were constructed in 1977, and the terminal occupies 3.8 hectares with a gross floor area of 71,280m². The operational runway, Runway 06/24, is 2,557 meters long and aligned in a South West/North East direction, suitable for the prevailing wind. The runway handles up to 55 movements per hour and the airport currently connects Scotland with 42 countries via 35 airlines serving 152 destinations¹. In 2023, the airport saw a total number of 115,000 aircraft movements (17% up from 2022), with an equal split between the number of arrivals and departures.

In 2023, EDI had approximately 14.4 million passengers in total, almost reaching the pre-COVID all time high number of 14.7 million in 2019. Of the 14.4 million, 10.1 million were international with 4.3 million being domestic; this represented year-on-year growth of 28% for international passengers and 39% year-on-year growth for domestic demand. In 2024, passenger numbers are projected to surpass 15 million, and the airport is carrying out several projects to accommodate this growing traffic.

In 2023, the airport saw a total number of

115,000
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passengers in total
(almost reaching the pre-COVID all time high number of 14.7 million in 2019)

¹ Note that these numbers change frequently, with the airport constantly building partnerships and welcoming new airlines

1.3 SUSTAINABILITY AT EDINBURGH AIRPORT

Greater Good Strategy

In 2021, EDI's Greater Good Sustainability Strategy was launched, outlining targets to be taken across the airport and seeks collaboration with the government, industry

organisations, stakeholders, and communities. The strategy is centred around four pillars (Figure 1). After reviewing progress on all goals and releasing annual sustainability reports in 2021, 2022 and 2023, as well as conducting a materiality assessment in spring 2024, the second version of the Greater Good Strategy is set to be released in the second half of 2024.

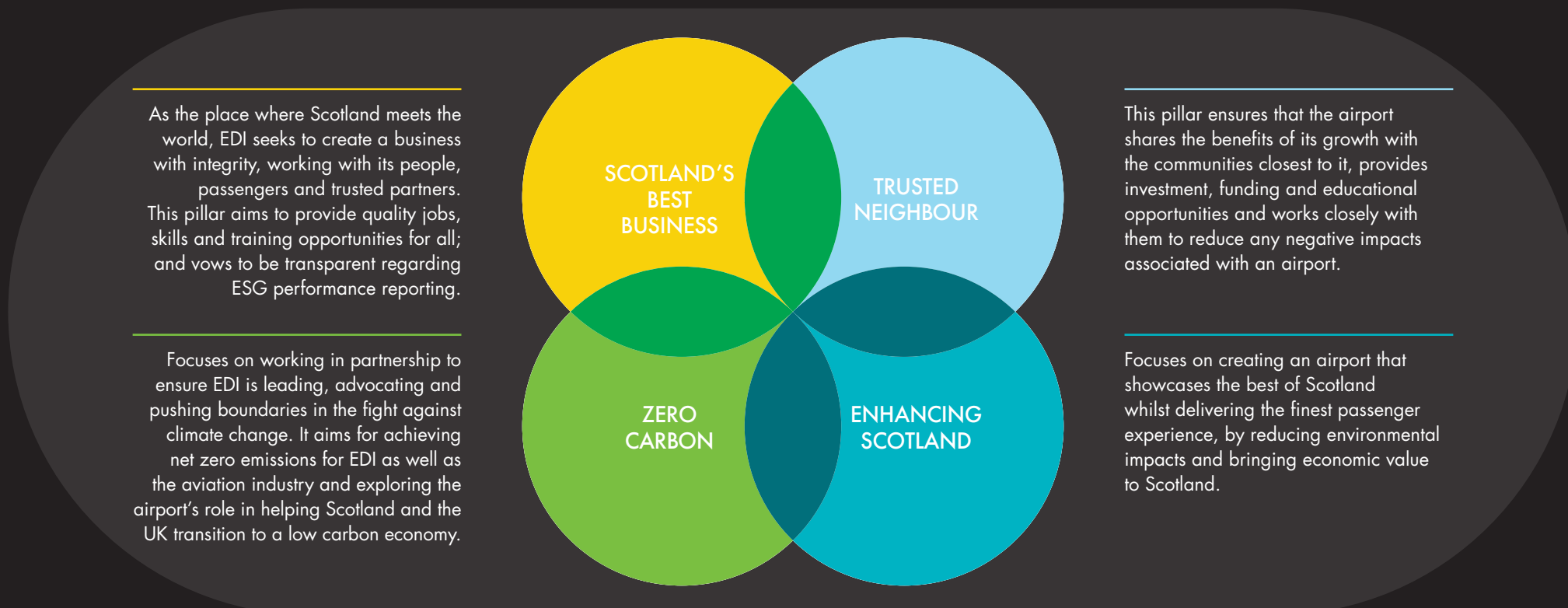


Figure 1 Greater Good Sustainability Strategy Pillars

Net Zero

Edinburgh Airport's Net Zero Strategy, published in 2023, outlines three clear milestones to reach net zero by 2045, in line with the Scottish Government's target. The airport is currently certified at Level 4 (Transformation) by the [Airport Carbon Accreditation \(ACA\)](#). Edinburgh Airport's net zero milestones are;

2030: Net zero for Scopes 1 & 2

- Switch to clean, renewable alternatives of fuel and energy
- Rollout of operational electric vehicles (procurement of 15 electric cars/vans and 4 electric buses to date)
- Use ECO2 low carbon de-icer
- Procure 100% green energy including renewable electricity and biomethane
- Self-generate 60% of the airport's energy needs by 2030

2040: Net zero for Scope 3 (excluding ATMs)

- 6 year £1.5 million capital programme directed at increasing campus wide provision of EV chargers (33 installed to date)
- The Campus Partner Sustainability Standard encourages third parties to reduce utility usage and reduce waste
- Preference of electric and HVO (hydrotreated vegetable oil) as an alternative to diesel for third party vehicles

2045: Net zero for Scope 3 (including ATMs)

- Liaise with airlines to modernise their fleet via researching and investing in areas such as aerodynamic modifications or alternative propulsion technologies
- Airport places emphasis on working towards the adoption of Sustainable Aviation Fuels (SAF) while potential for hydrogen and electric flights is also being explored
- Airspace Change Programme to be completed by 2027 and will contribute to airspace improvement via reducing flown miles and fuel spend, as well as the carbon footprint of flights

2 CLIMATE CHANGE IMPACTS AT EDINBURGH AIRPORT

2.1 TEMPORAL SCOPE

Three time periods are considered in Edinburgh Airport's climate change risk assessment.

1. Baseline: Historic climate conditions based on the 30 year average for the period 1981-2010.
2. Medium-term: Includes climate change risks for the period up to 2040, the mid-century.
3. Long-term: Includes climate change risks for the period up to 2080, the end of the century.

Note that these time periods differ from those included in Edinburgh Airport's CCAR for the third reporting period which classified short term as 2025, medium term as 2050 and long term as 2080.

Historic Climate Conditions (Baseline)

The historic climate conditions at Edinburgh Airport are based on the 30 year average for the period 1981-2010, forming the baseline for this climate risk assessment (Table 1). The historic climate conditions at Edinburgh Airport are based on the 1 km resolution HadUK-Grid dataset derived from station data at Gogarbank, located approximately 3km south of the airport's runway (Figure 2).



Figure 2 Distance of Gogarbank Station Data. Green line shows distance of 3km from station to runway

2.2 UK CLIMATE PROJECTIONS

The 2018 UK Climate Projections (UKCP18), produced by the Met Office, provide information on the potential future climate trends across the UK. The projections provide a range of potential climate outcomes, based on a set of four Representative Concentration Pathways (RCPs) for greenhouse gas emissions outlined in Table 2.

This report and the accompanying climate change risk register have been completed with the scenarios associated with the RCP 4.5 and RCP 8.5 pathways (the medium and high emission scenarios). This approach is consistent with the UK CCC who advise taking a precautionary approach and adapting to a global mean surface temperature of 2°C, while preparing for a temperature increase of 4°C. This approach is also consistent with EDI's CCAR3. Higher resolution projections have been updated including the Regional (12km) and Local (2.2km) projections providing information on local climate effects, which have been applied to the climate change risk register as they provide full coverage of the climate change scenarios.

Climate Factor at Gogarbank Station	Annual Average for 1981-2010
Maximum temperature	12.48
Minimum temperature	5.55
Days of air frost (days)	56.37
Hours of sunshine (hours)	1342.71
Rainfall (mm)	754.15
Days of rainfall >1mm (days)	137.21
Monthly mean wind speed at 10m (knots)	8.40

Table 1 Baseline climate conditions at Gogarbank Station near Edinburgh Airport

Emissions scenario	RCP	Temperature change by 2100 (°C)	Scenario Assumptions
low emissions	2.6	1.6 (0.9-2.3)	This scenario assumes rapid reductions in GHG emissions globally.
medium emissions	4.5	2.4 (1.7-3.2)	This scenario assumes continued increases in GHG emissions globally, with a reduction in the rate of emissions from 2050 onwards.
medium emissions	6.5	2.8 (2.0-3.7)	This scenario assumes continued increase in GHG emissions at the same rate as existing emissions.
high emissions	8.5	4.3 (3.2-5.4)	This scenario shows the most extreme changes that are projected if emissions continue to rise, and the IPCC emission reduction targets are missed.

Table 2 The RCP pathways for the global mean surface temperature by 2100 (IPCC)

2.3 PROJECTED CLIMATE CHANGES

Current Climate Changes

During the last decade, EDI has been impacted by several extreme weather events. These illustrate how short and long term climate changes are causing an increase in frequency of storms, extreme temperatures and similar events that previously have been considered largely infrequent. These events serve as justification for including certain risks in the climate change risk register, as they caused considerable consequences such as operational disruption, financial costs, and posed health and safety hazards.

Scotland has experienced a warming trend, shifting rainfall patterns, and rising sea levels. Scotland's 10 warmest years on record have all occurred since 1997 and the average temperature in the last decade (2014-2023) was $\sim 1.02^{\circ}\text{C}$ warmer than the 1961-1990 average. 2022 was the warmest year on record in the UK, with temperatures exceeding 40°C in mid July for the first time, posing a risk of declining air quality and increased risk of negative health effects to vulnerable groups. In some areas of Fife, a water ban was imposed due to water scarcity.

There has also been an increase in rainfall over Scotland in the past few decades, with an increasing proportion coming from heavy rainfall events. The average year in the last decade (2014-2023) was 10% wetter than the yearly average between 1961-1990. June 2024 saw 40 mm of rainfall within an hour, causing flash floods all over Edinburgh and in 2022 flooding of Gogar Burn and River Almond.

Heavy snowfall events have occurred, impacting surface access and air traffic operations at the airport, and in the case of the 2010 and 2018 events, resulted in airport closure due to the freezing of the runway.

Additionally, the mean sea level around the UK has risen by approximately 18.5cm from the start of the 20th century at a rate which has increased over the last 30 years. While this has not directly impacted EDI, this has implications on transport links to the airport as well as to destination airports.

Lastly, compound events can be linked to multiple climate variables and do not necessarily occur directly on airport grounds, but impact operations through various interdependencies. Over the last five years, various storms brought amber and red weather warnings to the vicinity of Edinburgh Airport, resulting in heavy winds of over 90 mph, heavy precipitation that led to flooding. They impacted roads and public transport, restricting surface access and supplies delivery to Edinburgh Airport. For example, in 2024, Storm Kathleen impacted multiple airports, causing disruption and diversions, resulting in Edinburgh Airport receiving diverted flights from Glasgow and Aberdeen airports.



Future Climate Changes

Short Term

In the short term, the increased likelihood and volume of rainfall events during both summer and winter will increase the risk of flooding caused by groundwater and surface water surges resulting in potential damage to EDI assets. There may also be an increase in fluvial flooding resulting from increased volume of precipitation in upstream catchments of the River Almond and Gogar Burn. These flooding events may impact the ability of flights to land and take off causing disruption to the airport, the airlines and passengers.

While winters are predicted to be milder and wetter resulting in fewer extreme cold and snow events, extreme weather events are likely to occur, such as the 2018 “Beast from the East” which resulted in flight cancellations and closure of the airport.

There are also anticipated increases in the sea level along Edinburgh’s coastline, with increases of up to 20cm likely by 2040. While EDI is ~3km South-West of Cramond and >4km South of South Queensferry which both sit on the Firth of Forth, the impacts of sea level rise on local communities could impact EDI’s employee and passenger surface access.

Both the medium and high emissions scenarios anticipate increased temperatures and reduced rainfall during summer months, leading to prolonged periods of warmer, drier weather. This could result in overheating in key EDI temperature critical buildings including Air Traffic Control.

Long Term

In the longer term the increased risk of flooding from the River Almond and Gogar Burn remains high resulting in asset damage. This could also result in flooding of the runway at EDI, impacting the ability for aircraft to land and take-off resulting in delays and cancellations.

Additionally, there will be an increase in storm intensity over the next 30 years, with further increases in the following 20 years. UKCP18 shows uncertainty in changes to wind speed, though it is likely that wind gust speeds and storm intensity will increase. This could result in disruption to EDI with increased delays and cancellations.

Edinburgh’s coast will experience sea level rise up to 60cm under the medium emissions scenario (RCP 6.5) or up to 1m under the high emissions scenario (RCP 8.5). These changes could have severe impacts on EDI’s interdependencies with public transport links and road networks which connect local communities in coastal areas to EDI, impacting surface access.

Anticipated changes to temperature under the UKCP18 medium and high emission scenarios predicts the number of days exceeding 22°C will increase in frequency to 11 days per year by 2070. Heatwaves are also expected to increase in frequency by approximately 4 times on average per year than pre-2010 levels. This has the likelihood of increasing the demand from EDI’s HVAC system, requiring increased volumes of gas and electricity to heat or cool the airport’s buildings.

Compound events (which result from multiple climate variables occurring at the same location and have a combined impact greater than the variables in isolation), are anticipated to become more frequent with continued climate changes. For example, compound flooding events occur when large surface runoff, combined with heavy rainfall leads to extreme river discharge. This effect combined with strong winds or thunderstorms has the potential to cause disruption and cause infrastructure damage.

Impacts to EDI

These impacts of climate change on EDI in the short and long-term fall into three categories. Firstly, the impacts of climate change may affect the airport’s function to transport passengers and cargo. The impacts of climate change could interrupt aircraft landing and take-off into and out of EDI, causing disruption to passengers and airlines. Secondly, the impacts of climate change may affect the airport’s operations due to damage to EDI assets. The airport’s performance may then be affected if the function and operation are impacted.

2.4 APPROACH TO CLIMATE CHANGE RISK MANAGEMENT

The Climate Change Risk Register is owned by the airport's sustainability team and fed into by multiple disciplines across the business. Edinburgh Airport's approach to risk management is based on the principles and process outlined in [ISO 31000: Risk Management](#). There is an overlap of several risks included in the Environmental, Health, Safety and Quality Risk Register and those included in the Climate Change Risk Register. As such, the EHSQ Team and the Sustainability Team liaise frequently to ensure updates to both registers as required. Each risk has been assigned a risk owner, whose responsibility it is to ensure that control measures are in place to mitigate the risk as well as reporting on changes to the risk, its likelihood or impact to the airport.

2.5 TASK FORCE ON CLIMATE-RELATED FINANCIAL DISCLOSURE

Climate change is the biggest medium to long term risk for EDI and is one of the company's strategic priorities. EDI maintains a long-term view of climate risk and continues to strengthen its approach to climate risk, including implementation of the recommendations of [Task Force on Climate-Related Financial Disclosure \(TCFD\)](#). The financial risks to EDI resulting from the projected climate trends are assessed as part of the annual TCFD. As part of TCFD, EDI discloses climate related risks and how they are managed. EDI has adopted and implemented the recommendations of TCFD to guide the company's overall approach to managing climate risk.



3 CLIMATE CHANGE RISK REGISTER UPDATE

3.1 METHODOLOGY

Climate Change Risk Register workshops were held throughout summer 2024 with key disciplines across the airport. The aim of the sessions was to review the risks and their scores identified in 2021 for the third round of reporting and identify any new risks. When reviewing the 2021 risk register, the disciplines took the opportunity to strengthen the wording of the risks and ensure the control measures were accurate and up to date. They also identified any interdependencies with external stakeholders and identify appropriate actions to better address such risks.

The risk register assesses risks on their impact on EDI’s assets and operations and the likelihood of the risk materialising. Both the impact and likelihood are scored between 1 and 5 as detailed in Table 3. This methodology follows the guidance from the Airport Operators Association and is consistent with the risk scoring applied by other airports across the UK.

Score	Level	Description
Impact Score		
1	Minimal	Noticeable but manageable event, absorbed through normal activity.
2	Minor	An event which can be managed via existing processes. Minor adverse consequences.
3	Moderate	A significant event which requires prompt action to prevent escalation. Can usually be managed under normal circumstances.
4	Major	A large event that requires high level engagement, special arrangements, and effective management. Crisis Management Teams activated.
5	Catastrophic	A critical event with devastating consequences. Potential or actual disaster for the business. Loss of life.
Likelihood Score		
1	Improbable	Event should virtually never occur but could under exceptional circumstances.
2	Unlikely	Remote. It is possible that the event could occur but not likely.
3	Less than likely	Occasional. Event could occur sometime.
4	More than likely	Event will likely occur in most circumstances, can be anticipated.
5	Probable	Frequent. Event will almost certainly occur in most circumstances.
Risk Score		
1-3	Minor	This risk score signifies a minor risk for Edinburgh Airport.
4-9	Moderate	This risk score signifies a moderate risk for Edinburgh Airport.
10-16	Major	This risk score signifies a major risk for Edinburgh Airport.
20-25	Severe	This risk score signifies a severe risk for Edinburgh Airport.

Table 3 Risk Register Scoring Methodology Based on Impact and Likelihood

3.2 ASSIGNING RISK

The risk score is based on the impact of the risk and the likelihood of the risk as outlined in Figure 3. This methodology is in line with the AOA guidelines and the methodology used by airports in the UK. This is also consistent with the methodology used in EDI's CCAR3.

		Likelihood of occurring				
		1 Improbable	2 Unlikely	3 Less than likely	4 More than likely	5 Probable
Impact on airport	1 Minimal	Low 1	Low 2	Low 3	Medium 4	Medium 5
	2 Minor	Low 2	Medium 4	Medium 6	Medium 8	High 10
	3 Moderate	Low 3	Medium 6	Medium 9	High 12	High 15
	4 Major	Medium 4	Medium 8	High 12	High 16	Critical 20
	5 Catastrophic	Medium 5	High 10	High 15	Critical 20	Critical 25

Figure 3 Risk score based on the impact and likelihood scores

3.3 RISK CATEGORIES

Infrastructure Interdependencies

It is important that the climate change risks assessed for EDI also consider the impacts on other affected organisations and communities who share interdependency with the airport, in particular those in the infrastructure sector. Infrastructure interdependencies are defined as occurring when commodities or services offered by one infrastructure system are required by another infrastructure to operate, and vice versa. For example, Edinburgh Airport is interdependent with several other infrastructure systems as shown on the right.

During the process of completing the climate change risk assessment in 2021, several interdependencies were identified, however, this methodology has been updated and the interdependent risks have been included as an individual risk variable.

Transitional Risks

The transition to a low carbon economy requires mitigation and adaptation to climate change, which encompasses changes to policies and legislation, technology, and financial and market changes. These changes pose a risk to the aviation sector as a whole and therefore they have been considered within this CCAR. While transition risks are included in the assessment, Edinburgh Airport's Net Zero Strategy sets out the airport's ambitions to transition to net zero by 2045, and therefore this report and accompanying risk register have a stronger focus on the physical and operational risks.

Edinburgh Airport is interdependent with several other infrastructure systems:



Transport infrastructure
(e.g. Lothian buses, Edinburgh Trams, ScotRail)



Electrical and power supply network
(e.g. British Gas and Scottish Power)



Water supply network
(including wastewater) (Scottish Water)



Waste management



Computational resources



Supply chain



Environmental management
(e.g. flood risk management) (SEPA)



Air Traffic Control

3.4 RISK APPETITE

Edinburgh Airport management along with the board have developed a risk appetite process to help with resource management on risks which should be further mitigated. As part of this, risk appetites for different categories of risk were developed, with risks relating to sustainability considered out of appetite if they score a 12 and above (Figure 4).

Where a residual risk sits within the thresholds allowed per its definition then it will be considered as being 'within appetite.' Where a residual risk has a higher rating than the threshold per its definition then it is 'out of appetite'.

In line with Edinburgh Airport's governance and risk management processes, all risks out with the airport's appetite will be reported to the airport's senior executive team and the board. This ensures visibility of the airport's greatest risks resulting from climate change across all departments.

		Likelihood of occurring				
		1 Improbable	2 Unlikely	3 Less than likely	4 More than likely	5 Probable
Impact on airport	1 Minimal	Low 1	Low 2	Low 3	Medium 4	Medium 5
	2 Minor	Low 2	Medium 4	Medium 6	Medium 8	High 10
	3 Moderate	Low 3	Medium 6	Medium 9	High 12	High 15
	4 Major	Medium 4	Medium 8	High 12	High 16	Critical 20
	5 Catastrophic	Medium 5	High 10	High 15	Critical 20	Critical 25

Figure 4 Risk Appetite Illustration

4 CLIMATE CHANGE RISKS AT EDINBURGH AIRPORT

4.1 UPDATES TO THE RISK REGISTER

The Climate Change Risk Register workshops at Edinburgh Airport detailed comparable risks to those identified in 2021 for the third reporting round. Most risks have been retained in the register; however, these risks have been amended, reworded or revised with updated information. Additionally, new risks have been added to the register, while other risks have been combined. A copy of the risk register can be found in Appendix 1.

In total, 40 risks were identified, compared with 33 risks in 2021. Seven new risks were identified (Table 4) during this reporting round, including risks under two new risk categories (compound events which are multi climate variable risks; and interdependency risks arising from an organisation’s reliance on another organisation or sector).

Level	Description
Transition	Financial performance impacted by competition with low carbon modes of transport
	Risk of limit to airport growth
Compound Events	Increased climate related insurance claims due to cumulative impact of extreme weather events
Temperature	Risk of water, hydraulic fluid and fuel in ground service equipment freezing due to low temperatures
Interdependency	Interdependency risk resulting from disruptions in the utilities supply network
	Interdependency risk resulting from disruptions to transport network impacting passenger and staff surface access to the airport
	Interdependency risk resulting from disruptions to transport network disrupting the delivery of essential supplies

Table 4 New Risks Identified

There are eight risks which have been re-scored since their initial scoring in 2021, as illustrated in Figure 7 and Figure 10. For example, in 2021, the greatest risk identified at the time was a health and safety risk from global temperature changes resulting in a “Change in global distribution of pests and disease”. At the time of CCAR3, COVID-19 was prevalent and had caused global disruption to sectors worldwide, including the aviation sector. Previously Edinburgh Airport classed this as a severe risk, scoring 20 before mitigation with control measures. Upon the lessons learnt from the COVID-19 pandemic, a decision was made to retain the risk but with an updated score. This fourth round of reporting found the risk to be moderate, scoring 6 before mitigation with control measures.

In 2021, the next set of risks scoring the highest were all classed as having a major impact with a score of 16. Four out of five of these risks were related to heavy rainfall events resulting in flooding in or around Edinburgh Airport. These risks have all been retained due to the nature of the airport having the River Almond and the Gogar Burn on-site. The fifth risk, related to changes in global temperatures impacting bird populations and in turn increasing the risk of bird strikes. This risk has been retained but updated from being a risk caused by temperature changes, to a risk caused by compound events.

A decision was made to update the risk included in the 2021 risk register which relates to fog (low lying cloud). UKCP18 Climate projections indicate that occurrences of fog will reduce with fewer fog days across Scotland, resulting in a lower risk however there is low certainty around this risk. This risk has been reworked into a new risk which combines fog with increased rainfall as a compound event, resulting in poor visibility.

After mitigation, two risks sit out with EDI’s appetite (Figure 6 and Figure 9), including:

- Rainfall: Increased risk of disruption to airfield operations due to localised flooding of River Almond and Gogar Burn
- Compound Event: Combined impact of increased precipitation, increased wind, and low temperatures increase the risk of damage to assets, standing aircraft, vehicles and injuries to staff

For both risks, there have been significant control measures put in place, however, the risks remain high due to the nature of the climate variables. Edinburgh experiences heavy rainfall, and in recent years EDI has experienced flooding of the main runway, the airport taxi drop-off area, and several local roads around the west of Edinburgh including the access road into the airport. This flooding event was the second highest on record for the River Almond, as reported by SEPA. For both risks they will be monitored with the risk owners and all feasible control measures will be assessed for implementation.

In the medium and long term, the majority of identified risks sit within the moderate risk score (Table 5), with seven risks identified as being major risks by 2040, which rises to ten risks by 2080. Two risks are considered severe by 2080, both relating to rainfall and disruption/damage from flooding. More detail on these risks can be found in Appendix 1 including the assumptions made.

	Up to 2040	Up to 2080
Minor	4	2
Moderate	29	26
Major	7	10
Severe	0	2

Table 5 Medium- and long-term risk scores

Climate Variable	Risk	Risk Score
Top Risks Before Mitigation		
Rainfall	Increased risk of localised flooding if older drainage system become overwhelmed by heavy rainfall events	16
	Increased risk of disruption to airfield operations due to localised flooding of River Almond and Gogar Burn	16
	Changes to groundwater levels could cause subsidence and water ingress damage to airport buildings and surfaces	16
	Pollution Control Systems (interceptors) are challenged during extreme rainfall events	16
Temperature	Extreme temperatures increase the risk of structural damage to airport infrastructure	16
	Extreme temperatures increase the risk of damage to the airfield surface and sub-surface structural damage to runway and aprons	16
Lightning	Increased lightning strikes could disrupt aircraft movements	16
	Increased lightning strikes increase risk of disruption to airfield operations	16
Compound Event	Increased bird strike risk due to possible ecosystem changes in and around Edinburgh Airport resulting from changes in rainfall and temperature	16
	Seasonal changes in multiple climate drivers (such as fog and rainfall) causing reduced visibility, increasing the risk of accidents and collisions	16
Top Risks After Mitigation		
Rainfall	Increased risk of disruption to airfield operations due to localised flooding of River Almond and Gogar Burn	12
	Pollution Control Systems (interceptors) are challenged during extreme rainfall events	12
	Changes to groundwater levels could cause subsidence and water ingress damage to airport buildings and surfaces	8
	Increased risk of incident with airside and landside road vehicles, and taxiing and landing aircraft due to heavy rainfall	8
Temperature	Risk of water, hydraulic fluid and fuel in ground service equipment freezing due to low temperatures	9
Snow	Increased snow hazard and de-icing requirements due to extreme snowfall events	8

Table 6 The Risks before and after mitigation

Climate Variable Key:

Event Type:	Rainfall	Temperature	Wind	Lightning	Snow	Sea-Level Rise
Risk No's:	1-6	7-15	16-17	18-20	21-22	23

		Likelihood of occurring				
		1 Improbable	2 Unlikely	3 Less than likely	4 More than likely	5 Probable
Impact on airport	1 Minimal	Low 1	Low 2	Low 3	Medium 4	Medium 5
	2 Minor	Low 2	Medium 4	Existing risk: 11, 22 New risk: 13 Medium 6	Existing risk: 15 Medium 8	High 10
	3 Moderate	Existing risk: 6 Low 3	Existing risk: 12, 17, 18, 23 New risk: 16 Medium 6	Existing risk: 5, 10 Medium 9	Existing risk: 4 High 12	High 15
	4 Major	Medium 4	Existing risk: 7 Medium 8	Existing risk: 14, 21 High 12	Existing risk: 1, 2, 3, 8, 9, 19, 20 High 16	Critical 20
	5 Catastrophic	Medium 5	High 10	High 15	Critical 20	Critical 25

● Existing risk
 ● New risk
 ● Out of appetite risk

Figure 5 Physical risks before mitigation

Climate Variable Key:	Event Type:	Rainfall	Temperature	Wind	Lightning	Snow	Sea-Level Rise
	Risk No's:	1-6	7-15	16-17	18-20	21-22	23

		Likelihood of occurring				
		1 Improbable	2 Unlikely	3 Less than likely	4 More than likely	5 Probable
Impact on airport	1 Minimal	Low 1	(11) (17) Low 2	Low 3	(15) (19) (20) Medium 4	Medium 5
	2 Minor	Low 2	(7) (8) (9) (12) (13) Medium 4 (18) (22) (23)	(5) Medium 6	(3) (4) Medium 8	High 10
	3 Moderate	(6) (16) Low 3	(1) (10) Medium 6	(14) Medium 9	High 12	High 15
	4 Major	(21) Medium 4	Medium 8	(2) High 12	High 16	Critical 20
	5 Catastrophic	Medium 5	High 10	High 15	Critical 20	Critical 25

● Existing risk
 ● New risk
 ● Out of appetite risk

Figure 6 Physical risks after mitigation

Event Type:	Rainfall	Temperature	Wind	Lightning	Snow	Sea-Level Rise
Risk No's:	1-6	7-15	16-17	18-20	21-22	23

		Likelihood of occurring				
		1 Improbable	2 Unlikely	3 Less than likely	4 More than likely	5 Probable
Impact on airport	1 Minimal	Low 1	<div style="display: flex; justify-content: space-around;"> 11 17 </div> Low 2	Low 3	<div style="display: flex; justify-content: space-around;"> 15 19 </div> Medium 4	Medium 5
	2 Minor	Low 2	<div style="display: flex; justify-content: space-around;"> 7 8 9 </div> Medium 4	<div style="display: flex; justify-content: space-around;"> 5 </div> Medium 6	<div style="display: flex; justify-content: space-around;"> 3 4 </div> Medium 8	High 10
	3 Moderate	<div style="display: flex; justify-content: space-around;"> 6 16 </div> Low 3	<div style="display: flex; justify-content: space-around;"> 1 10 </div> Medium 6	<div style="display: flex; justify-content: space-around;"> 14 </div> Medium 9	High 12	High 15
	4 Major	<div style="display: flex; justify-content: space-around;"> 21 </div> Medium 4	Medium 8	<div style="display: flex; justify-content: space-around;"> 2 </div> High 12	High 16	Critical 20
	5 Catastrophic	Medium 5	High 10	High 15	Critical 20	Critical 25

● Decreased
 ● Increased
 ● Unchanged/new risk

Figure 7 Physical risk after mitigation compared to ARP 3 scoring

Risk Key: Risk Type: Compound Event Interdependency Transition
 Risk No's: 24-28 29-34 35-40

		Likelihood of occurring				
		1 Improbable	2 Unlikely	3 Less than likely	4 More than likely	5 Probable
Impact on airport	1 Minimal	Low 1	Existing risk: 28, 40 Low 2	Low 3	Existing risk: 37 Medium 4	Medium 5
	2 Minor	Existing risk: 34 Low 2	Medium 4	Existing risk: 36 Medium 6	Existing risk: 30 Medium 8	High 10
	3 Moderate	Low 3	Existing risk: 29, 35, 38 Medium 6	Existing risk: 26, 31, 32, 33 Medium 9	Existing risk: 24 High 12	Existing risk: 39 High 15
	4 Major	Medium 4	Medium 8	Existing risk: 25 High 12	Existing risk: 27 High 16	Critical 20
	5 Catastrophic	Medium 5	High 10	High 15	Critical 20	Critical 25

Existing risk New risk Out of appetite risk

Figure 8 Compound, interdependency, and transition risks before mitigation

Risk Key: Risk Type: Compound Event Interdependency Transition
 Risk No's: 24-28 29-34 35-40

		Likelihood of occurring				
		1 Improbable	2 Unlikely	3 Less than likely	4 More than likely	5 Probable
Impact on airport	1 Minimal	Low 1	(27) Low 2 (40)	Low 3	(30) Medium 4 (37)	Medium 5
	2 Minor	(34) Low 2	(28) (29) Medium 4 (35) (36)	(31) (32) Medium 6 (33)	Medium 8	High 10
	3 Moderate	Low 3	(26) (38) Medium 6 (39)	(25) Medium 9	(24) High 12	High 15
	4 Major	Medium 4	Medium 8	High 12	High 16	Critical 20
	5 Catastrophic	Medium 5	High 10	High 15	Critical 20	Critical 25

Existing risk New risk Out of appetite risk

Figure 9 Compound, interdependency, and transition risks after mitigation

Risk Key: Risk Type: Compound Event Interdependency Transition
 Risk No's: 24-28 29-34 35-40

		Likelihood of occurring				
		1 Improbable	2 Unlikely	3 Less than likely	4 More than likely	5 Probable
Impact on airport	1 Minimal	Low 1	(27) Low (40) Low 2	Low 3	(30) Medium (37) Medium 4	Medium 5
	2 Minor	(34) Low 2	(28) (29) Medium (35) (36) Medium 4	(31) (32) Medium (33) Medium 6	Medium 8	High 10
	3 Moderate	Low 3	(26) (38) Medium (39) Medium 6	(25) Medium 9	(24) High 12	High 15
	4 Major	Medium 4	Medium 8	High 12	High 16	Critical 20
	5 Catastrophic	Medium 5	High 10	High 15	Critical 20	Critical 25

● Decreased ● Increased ● Unchanged/new risk

Figure 10 Compound, interdependency, and transition risks after mitigation compared to ARP 3 scoring

5 CLIMATE CHANGE ADAPTATION CASE STUDIES

This section outlines three case studies of mitigation and control measures taken to reduce the risk of climate variables to EDI.

5.1 CASE STUDY 1: FLOOD RISK

There are four risks associated with flooding including:

1. Increased risk of localised flooding if older drainage system become overwhelmed by heavy rainfall events
2. Increased risk of disruption to airfield operations due to localised flooding of River Almond and Gogar Burn
3. Changes to groundwater levels could cause subsidence and water ingress damage to airport buildings and surfaces
4. Pollution Control Systems (interceptors) are challenged during extreme rainfall events

Each of these risks have been assigned a score of 16, owing to the UKCP18 climate projections concerning rainfall and flooding, and the proximity of Edinburgh Airport to several water sources. There are several mitigation and control measures in place at Edinburgh Airport addressing risks connected to rainfall and flooding, listed in the Risk Register in Appendix 1.

One control measure serving as an example of monitoring the success of past actions and amending them based on experience is regarding R2; increased risk of disruption to airfield operations due to localised flooding of River Almond and Gogar Burn. This risk was identified both in CCAR3 and CCAR4. Control measures identified in 2021 included ongoing monitoring of SEPA flood warning data and river levels, including heavy rainfall/flooding in resilience planning and scenario testing, debriefing events following on from flooding and having a Flood Risk Plan in place.

During a notable period of increased rainfall in 2023, the runway suffered partial flooding as debris from Gogar Burn and River Almond accumulated against the flood screens found at Bailey Bridge and Gogar Loop, blocking the drain. In response to this, control measures were implemented to remove the security screens. The screens from Bailey Bridge (Figure 9) and Gogar Loop (Figure 10) were removed in June 2023. These control measures resulted in decreased flood risk from the River Almond and Gogar Burn and reduced the risk of future disruption of the runway's operation. The control measures in the CCAR4 Risk Register have been updated to reflect the inclusion of live updates through SEPA's flood line warning system informing the flood risk in local area.

Further details can be found in the risk register in Appendix 1.



Figure 11



Figure 12

Figure 11 Removal of flood screens from Bailey Bridge
Figure 12 Removal of flood screens from Gogar Burn

5.2 CASE STUDY 2: SNOW HAZARD

Increased snow hazard and de-icing requirements due to extreme snowfall event was identified as a risk both in the 2021 and the present report with a risk score of 12. Based on the UKCP18 climate projections, snowfall is predicted to become less frequent in Edinburgh, however, the increasingly extreme infrequent events pose a risk of insufficient equipment (vehicles, de-icer supplies) and staff knowledge to respond to emergencies. In the past, the Beast from the East in 2018 or the airport closure in December 2010 due to record low temperatures and partial freezing of the runway have proved that it is vital to stay prepared for these events.

To address this risk, there are several mitigation and control measures in place, listed in the Risk Register in Appendix 1. A core part of this is the regular training being held for the Winter Teams from August to September as well as the annual reviewing of the Winter Plan. Sensors situated on the runway monitor weather conditions and forecast data, which makes it possible for the Snow teams to arrive on site and prepare for operation before the extreme snowfall arrives. Further control measures include having procedures in place for AOM to notify all staff of hazardous weather conditions and by having additional snow clearing kit available from third-party contractors on site.

Weather events related to snow and low temperatures also pose an environmental safety risk through de-icer making its way into the local water courses, Gogar Burn and the River Almond. This is mitigated through the Water Quality Project. In 2019, Edinburgh Airport switched from using a glycol-based de-icer (Konsin) to ECO2, a water-based product that causes significantly less environmental harm. Since then, additionally to the continued supply of ECO2, a supply of approximately 50,000 litres of Konsin is being kept on the grounds, to be used in case ECO2 proves to be inefficient during particularly low temperatures. In December 2023, Edinburgh Airport purchased two new purpose-built de-icing vehicles (Figure 13 and Figure 14) These vehicles are equipped with monitors to prevent over-spray of de-icer, which in turn prevents over-use and potential pollution to water courses. Real-time data is available to monitor the de-icer application and usage which enables accurate records of product usage.



Figure 13



Figure 14

Figure 13 Snow equipment
Figure 14 Snow equipment in use

5.3 CASE STUDY 3: CONTROL POST

UKCP18 predictions regarding temperature in Scotland imply that average temperature will gradually increase over the next decades, leading to more frequent hot days. This affects working conditions, as extreme temperatures increase the risk of negative human health impacts, especially on vulnerable groups and can result in for instance heat stroke, dehydration, cardiovascular, respiratory, and cerebrovascular disease. This risk has been included as one of the new risks in the 2024 Risk Register and given a score of 6 (see Appendix 1). Mitigation and control measures include trained First Aiders being always available on campus, using Building Management Systems (BMS) to track temperature of buildings to ensure compliance with Duty of Care for employees and passengers, awareness campaigns and feedback mechanisms.

One of the main projects linked to the mitigation of this risk is the installation of 3 brand new control posts on the grounds of Edinburgh Airport throughout 2024. The control posts themselves are built by Ecosystems Technologies, a company specializing in biogenic based off site manufacturing (BIO-OSM) of modular buildings. The units are being assembled off grounds and are built from sustainably sourced local wood. They are then delivered to replace old control posts previously in use at Edinburgh Airport. This construction method using timber has lower short term and long term climate impacts than traditional methods using concrete or steel, a key aspect of the airport's choice.

Each control post has LED lights installed, reducing energy use. The units are using air source heat pumps as their HVAC system, these deliver improved heating and cooling and are less resource intensive.

Control Post 4 was delivered to the site and became operational in April 2024 (Figure 15 and Figure 16), while Control Post 3 is expected to arrive at the end of August. The project will conclude with the delivery of Control Post 1, which is expected to be in mid-October 2024. Control Posts 1, 3 and 4 contribute significantly to improved staff working conditions and the reduction of health hazards linked to extreme temperatures.



Figure 15



Figure 16

Figure 15 Control Post interior featuring ventilation system and LED lighting
Figure 16 Control Post exterior

APPENDIX 1: CLIMATE CHANGE RISK REGISTER

Risk No.	1	Risk	Increased risk of localised flooding if older drainage system become overwhelmed by heavy rainfall events	Risk Score	Pre-mitigation	16	<table border="1"> <thead> <tr> <th>2024 Planned Actions</th> <th>Narrative on Forecast Scores</th> <th>Assumptions</th> </tr> </thead> <tbody> <tr> <td>Runway resurfacing project (2025) will result in height of runway to increase by approximately 100mm resulting in reduced risk to flooding.</td> <td rowspan="2">UKCP18 indicates that rainfall and extreme weather events such as flash flooding are predicted to increase, increasing this risk over time.</td> <td rowspan="2">Long term risk is based on assumption of no further mitigation action planned. Assumption that the long term risk (2061-2080) will reduce if EDI continues to mitigate against worsening flood risk.</td> </tr> <tr> <td>Asset replacement such as Archimedes screws which are being refurbished to mitigate flood risk on the airfield.</td> </tr> </tbody> </table>			2024 Planned Actions	Narrative on Forecast Scores	Assumptions	Runway resurfacing project (2025) will result in height of runway to increase by approximately 100mm resulting in reduced risk to flooding.	UKCP18 indicates that rainfall and extreme weather events such as flash flooding are predicted to increase, increasing this risk over time.	Long term risk is based on assumption of no further mitigation action planned. Assumption that the long term risk (2061-2080) will reduce if EDI continues to mitigate against worsening flood risk.	Asset replacement such as Archimedes screws which are being refurbished to mitigate flood risk on the airfield.
	2024 Planned Actions				Narrative on Forecast Scores	Assumptions										
Runway resurfacing project (2025) will result in height of runway to increase by approximately 100mm resulting in reduced risk to flooding.	UKCP18 indicates that rainfall and extreme weather events such as flash flooding are predicted to increase, increasing this risk over time.	Long term risk is based on assumption of no further mitigation action planned. Assumption that the long term risk (2061-2080) will reduce if EDI continues to mitigate against worsening flood risk.														
Asset replacement such as Archimedes screws which are being refurbished to mitigate flood risk on the airfield.																
Climate Variable	Rainfall	Potential Consequences	Mitigation and Control Measures	Post-mitigation	6											
				Up to 2040	16											
				Up to 2080	20											
<p>Past extreme rainfall events have resulted in flooding in and around the site at Edinburgh Airport. For example, in December 2022 extreme rainfall led to the Gogar Burn reaching its highest recorded level at Edinburgh Airport causing the River Almond to burst its banks. Heavy rainfall, combined with poor drainage can overwhelm the drainage system, particularly older infrastructure which is not being designed for increased volume flows. Heavy rainfall can also have potential impacts on non-aviation operations at the airport, for example, it could increase the risk of flooding of the car park.</p>		<ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> - restricted surface and airside access - localised loss of power - inundation of underground services and infrastructure - water ingress to buildings, utility supply infrastructure and tunnels - ponding on airfield resulting in bird attraction and surface breakup Financial risk due to <ul style="list-style-type: none"> - lost landing fees in case of diversions or cancellations - loss of non-aero income (for example, reduced income due to flooding of car parks) repairation costs - use of backup generators while power is out Environmental damage resulting from flooding mobilising pollutant materials Delays to construction and maintenance works 	<ul style="list-style-type: none"> Flood assessment was commissioned which includes future flood risk modelling Three trash screens from the Gogar Burn (which were increasing flood risk as they allowed debris builds up; thus backing up water causing manhole discharges and in recent history near overtopping of banks) were removed in 2023 Overgrown vegetation on the banks of the Gogar Burn is cut back annually to reduce build up of debris if a flooding event occurs Flap valves were installed in the Gogar Burn to ensure that the water drains efficiently and does not discharge back upstream Filter drains were installed on the airfield on the north side of the runway to reduce the impact of flooding Airfield grass mix includes reed canary grass as a natural control measure Air Traffic Control critical assets has been raised above ground by approximately 2ft to reduce damage to assets from flooding Surface to Foul project was completed in 2022 to create additional capacity in the storm network which included installing a surface water pipe and manholes 	<p>Runway resurfacing project (2025) will result in height of runway to increase by approximately 100mm resulting in reduced risk to flooding.</p> <p>Asset replacement such as Archimedes screws which are being refurbished to mitigate flood risk on the airfield.</p>	<p>UKCP18 indicates that rainfall and extreme weather events such as flash flooding are predicted to increase, increasing this risk over time.</p>	<p>Long term risk is based on assumption of no further mitigation action planned. Assumption that the long term risk (2061-2080) will reduce if EDI continues to mitigate against worsening flood risk.</p>										

Risk No.	2	Risk	Increased risk of disruption to airfield operations due to localised flooding of River Almond and Gogar Burn	Risk Score	Pre-mitigation	16				
	Post-mitigation				12					
Climate Variable	Rainfall	Up to 2040	16							
		Up to 2080	20							
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions		
<p>Past extreme rainfall events have resulted in water covering the runway at Edinburgh Airport. For example, in December 2022 extreme rainfall led to the Gogar Burn reaching its highest recorded level at the airport causing the River Almond to burst its banks with water reaching the runway. These events can cause disruption to flight schedules as there is a risk of aircraft aquaplaning. The flooding events can also impact surface access of passengers and staff.</p>		<ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> restricted surface and airside access inability of aircraft to use the runway, resulting in diversions and cancellations Financial risk due to <ul style="list-style-type: none"> lost landing fees in case of diversions or cancellations reparation costs use of backup generators while power is out Reputational damage due to change in flight schedule, diversions and cancellations Delays to construction and maintenance works 		<ul style="list-style-type: none"> 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 Flood assessment was commissioned which includes future flood risk modelling Trash screens (which were increasing flood risk as they allowed debris builds up; thus backing up water causing manhole discharges and in recent history near overtopping of banks) were removed in 2023 Live updates through SEPA's flood line warning system, which inform the flood risk in local area Attendance to SEPA LAG groups to discuss localised flooding risk 		<p>Asset replacement such as Archimedes screws which are being refurbished to mitigate flood risk on the airfield.</p>	<p>UKCP18 indicates that rainfall and extreme weather events such as flash flooding are predicted to increase, increasing this risk over time</p>	<p>Long term risk is based on assumption of no further mitigation action planned. Assumption that the long term risk (2061-2080) will reduce if EDI continues to mitigate against worsening flood risk.</p>		

Risk No.	3	Risk	Changes to groundwater levels could cause subsidence and water ingress damage to airport buildings and surfaces	Risk Score	Pre-mitigation	16				
	Climate Variable				Rainfall	Post-mitigation	8			
					Up to 2040	12				
					Up to 2080	16				
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions		
<p>Changes to groundwater levels resulting from increased rainfall can happen during events such as when 40 mm of rain fell within one hour in Edinburgh in June 2021, causing flash flooding in several areas of the city. This could increase the risk of subsidence and water ingress damage to airport buildings and surfaces. Groundwater flooding can cause leaks in tunnels and basements. This risk can cause premature degradation of these assets and in extreme cases pose a risk to airport operations due to sub-surface infiltration incidents.</p>		<ul style="list-style-type: none"> Operational disruption due to damage of subsurface utilities crucial for operation Financial risks due to <ul style="list-style-type: none"> - water ingress causing infrastructure damage to low lying assets such as the airport's basement - reparation costs 		<ul style="list-style-type: none"> Ongoing monitoring of SEPA flood warning data and river levels Heavy rainfall/flooding is included in resilience planning and scenario tested Debrief takes place following any flooding events to ensure lessons learnt are captured and applied 		<p>Asset replacement such as Archimedes screws which are being refurbished to mitigate flood risk on the airfield.</p>	<p>UKCP18 indicates that rainfall and extreme weather events such as flash flooding are predicted to increase, increasing this risk over time</p>	<p>Long term risk is based on assumption of no further mitigation action planned. Assumption that the long term risk (2061-2080) will reduce if EDI continues to mitigate against worsening flood risk.</p>		

Risk No.	4	Risk	Increased risk of incident with airside and landside road vehicles, and taxiing and landing aircraft due to heavy rainfall	Risk Score	Pre-mitigation	12			
	Post-mitigation				8				
Climate Variable	Rainfall	Up to 2040	12						
		Up to 2080	16						
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
<p>Heavy rainfall can create dangerous conditions for airside and landside road vehicles, plus taxiing and landing aircraft. Reduced visibility and braking co-efficient and increased risk of hydro-planning for aircraft increases risk of aircraft incidents. This results in increased separation of aircraft landing and taking off, which could result in backlog and delays. Diversions and cancellations would result in lost landing fees. Sudden events of extreme rainfall are becoming more frequent, seen in Edinburgh in 2021 when 40 mm of rain fell within one hour in June.</p>		<ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> increased separation of aircraft landing and taking off due to low visibility, which could result in backlog, delays and cancellations loss of capacity in cargo facilities owing to increased separation of aircraft landing and take-off due to low visibility Financial costs due to <ul style="list-style-type: none"> diversions and cancellations leading to lost landing fees Health and safety risks due to airside operations staff carrying out work in reduced visibility conditions 		<ul style="list-style-type: none"> Grooved runway, drainage system Implementation of flow rate (Air Traffic Control manage aircraft landing and taking off) 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 		Update of Driver Policy by early 2025.	UKCP18 indicates that rainfall and extreme weather events such as flash flooding are predicted to increase, increasing this risk over time.	Long term risk is based on assumption of no further mitigation action planned. Assumption that the long term risk (2061-2080) will reduce if EDI continues to mitigate against worsening flood risk.	

Risk No.	5	Risk	Pollution Control Systems (interceptors) are challenged during extreme rainfall events	Risk Score	Pre-mitigation	9			
	Climate Variable				Rainfall	Post-mitigation	6		
Up to 2040		6							
Up to 2080		6							
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
Excess rainfall may overwhelm the Pollution Control System (PCS) (open interceptors) resulting in pollution of local watercourses.		<ul style="list-style-type: none"> Breach of CAR licence, resulting in Enforcement Action from SEPA 		<ul style="list-style-type: none"> Monthly water quality monitoring by Scottish Water to ensure we are compliant with trade effluent agreements Ongoing monitoring and maintenance of interceptors which are under a planned maintenance programme Foul network flow capacity mapping has been carried out 		New projects will consider interceptor capacity and they will be built into the design when required.	UKCP18 indicates that rainfall and extreme weather events such as flash flooding are predicted to increase, increasing this risk over time.	Long term risk is based on assumption of no further mitigation action planned. Assumption that the long term risk (2061-2080) will reduce if EDI continues to mitigate against worsening flood risk.	

Risk No.	6	Risk	Extreme weather events and decreased water availability cause disruption to water intensive activities	Risk Score	Pre-mitigation	3				
	Climate Variable				Rainfall	Post-mitigation	3			
					Up to 2040	4				
					Up to 2080	4				
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions		
<p>Extreme weather events and decreased water availability as a result of changes in precipitation patterns could cause disruptions to the water supply at Edinburgh Airport (including low water availability and droughts). If water bans become more frequent during periods of low water availability (such as the water ban imposed in Fife in 2022 due to significant water scarcity levels), this could impact operations at the airport especially impacting fire safety services.</p>		<ul style="list-style-type: none"> Operational disruption due to possible water demand restrictions Financial risk due to increased water supply costs Health and safety risks due to restricted water supply to safety services Delays to construction and maintenance works 		<ul style="list-style-type: none"> Designing new assets with water efficiency measures to minimise consumption, monitoring consumption, leak detection, targeting 		Continued monitoring of water consumption.	UKCP18 indicates that severe drought is unlikely to be problematic at EDI, however, due to the uncertainty in this and the increase in irregular extreme summer temperature events there is a slight increase in this risk over time.	Assumption that the long term risk (2061-2080) will reduce if climate projections show a greater likelihood of drought in Scotland.		

Risk No.	7	Risk	Increased temperatures cause increased risk of overheating in buildings including temperature critical infrastructure	Risk Score	Pre-mitigation	8				
	Climate Variable				Temperature	Post-mitigation	4			
					Up to 2040	4				
					Up to 2080	6				
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions		
<p>Under increased temperatures there is a greater risk of overheating in Edinburgh Airport's buildings including temperature critical buildings such as Air Traffic Control and IT node rooms. During the July 2022 heatwave, temperatures on the grounds of Edinburgh Airport passed 30°C, while an amber heat warning was issued over most of eastern Scotland.</p>		<ul style="list-style-type: none"> Operational disruption due to failure, damage, or inefficiency of temperature sensitive plant Financial risk due to <ul style="list-style-type: none"> - increased energy costs of cooling demand - potential installation of backup generators for extra capacity Delays to construction and maintenance works due to plant inefficiency and failure 		<ul style="list-style-type: none"> Building Management System (BMS) controls all passenger and office areas and is monitored daily by Edinburgh Airport and twice weekly by external supplier experts The heating and cooling infrastructure has an existing capacity of five chillers, which is sufficient as in hot weather typically two chillers are required 		<p>Continue to build to appropriate design standards and monitor BMS, reviewing the robustness of cooling systems and ensuring to replace aged assets.</p>	<p>UKCP18 indicates that temperatures in Edinburgh will increase, with the average number of days exceeding 22°C increasing in frequency to 11 days per year by 2080, resulting in this risk increasing over time.</p>	<p>Assumption that the long term risk (2061-2080) will reduce if mitigation is in place to reduce impact of extreme heat on EDI's critical infrastructure.</p>		

Risk No.	8	Risk	Extreme temperatures increase the risk of structural damage to airport infrastructure	Risk Score	Pre-mitigation	16			
	Climate Variable				Temperature	Post-mitigation	4		
					Up to 2040	4			
					Up to 2080	4			
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
<p>Extreme temperatures (both hot and cold) can increase the risk of structural damage to airport infrastructure. For example, increased temperatures can cause thermal expansion of building infrastructure (such as concrete and steel), leading to failures and reduced lifespan of critical infrastructure.</p>		<ul style="list-style-type: none"> Operational disruption due to closing of runway to carry out repairs, potential airport closure Financial risk due to cost of repairing damage Health and safety risks due to the state of the runway affecting landing/take-off procedure safety Reputational damage due to change in flight schedule, diversions and cancellations 		<ul style="list-style-type: none"> Various levels of inspections are carried out by Airside Operations and Engineering on a regular basis resulting in patching and repairs as required Planned remedial works take place twice a year, runway resurfacing project planned for 2025 Suitable designers and contractors are used to conduct repairs, ensuring that design standards are achieved. The asphalt mix is determined by usage, over time this will change depending on operational requirement and climate predictions will be used as a factor when making these decisions Dedicated runway repairs team on-site from 05:30 – 22:00 who are available to make repairs to the runway if required 		<p>Continue to ensure climate considerations in the asphalt mix and repair according to correct standards.</p>	<p>UKCP18 indicates temperature increases in both the summer and winter months, in addition to increases in irregular extreme events such as heatwaves and periods of low temperatures with heavy snowfall, therefore increasing this risk over time.</p>	<p>Assumption that the long term risk (2061-2080) will reduce if mitigation is in place to reduce impact of extreme heat on EDI's critical infrastructure.</p>	

Risk No.	9	Risk	Extreme temperatures increase the risk of damage to the airfield surface and sub-surface structural damage to runway and aprons	Risk Score	Pre-mitigation	16				
	Post-mitigation				4					
Climate Variable	Temperature	Up to 2040	10							
		Up to 2080	10							
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions		
<p>During extreme temperatures (both hot and cold), there is an increased risk of airfield surface and sub-surface structural damage to runway and aprons caused by temperatures exceeding design standards.</p>		<ul style="list-style-type: none"> Operational disruption due to closing of runway to carry out repairs, potential airport closure Financial risk due to reparation costs Health and safety risks due to the state of the runway affecting landing/take-off procedure safety Reputational damage due to change in flight schedule, diversions and cancellations 		<ul style="list-style-type: none"> Various levels of inspections are carried out by Airside Operations and Engineering on a regular basis resulting in patching and repairs as required Suitable and appropriate designers and contractors are used to conduct repairs, ensuring that design standards are achieved. The asphalt mix is determined by usage, over time this will change depending on operational requirement and climate predictions will be used as a factor when making these decisions Additional surface temperatures installed to provide actual freezing temperature on the runway, allowing reduction in volume of de-icer used 		<p>Continue to monitor de-icing and anti-icing effectiveness following changes to winter weather conditions, potential increase of runway inspections or resurfacing may be required. Planned remedial works take place twice a year, runway resurfacing project planned for 2025.</p>	<p>UKCP18 indicates temperature increases in both the summer and winter months, in addition to increases in irregular extreme events such as heatwaves and periods of low temperatures with heavy snowfall, therefore increasing this risk over time.</p>	<p>Assumption that there will be continued runway degradation as aircraft traffic increases.</p>		

Risk No.	10	Risk	Reduced lift for departing aircraft due to 'thin air' and reduced engine efficiency during extreme high temperatures	Risk Score	Pre-mitigation	9	Narrative	Potential Consequences	Mitigation and Control Measures	2024 Planned Actions	Narrative on Forecast Scores	Assumptions
	Climate Variable				Temperature	Post-mitigation						
<p>Reduced lift for departing aircraft due to 'thin air' and reduced engine efficiency during periods of very hot temperatures having impacts on aircraft maximum take-off weight (MTOW) impacting landing and take-off. This could also reduce cargo aircraft carrying capacity, resulting in a reduced MTOW and therefore reduced cargo load.</p>		<ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> - decreased load factor or air traffic movement rate - potential for backlog, delays and cancellations owing to reduced engine efficiency - loss of capacity in cargo facilities Financial risk due to <ul style="list-style-type: none"> - diversions and cancellations resulting in lost landing fees - reduced range of aircraft operating to or from Edinburgh Airport, as temperature limits opportunities to grow on narrow body aircraft from markets like the Middle East and India Environmental impact due to increased noise, greenhouse gas emissions and fuel use 		<ul style="list-style-type: none"> Aircraft operate in areas of much higher temperatures across the world, this is unlikely to be an issue Ongoing engagement with airline partners 		Ongoing engagement with airline partners.	UKCP18 indicates that temperatures in Edinburgh will increase, with the average number of days exceeding 22°C increasing in frequency to 11 days per year by 2080, resulting in this risk increasing over time.	Assumption that the long term risk (2061-2080) will reduce if technology advancements increase aircraft engine efficiency during very hot temperatures.				

Risk No.	11	Risk	Increased fire risk of combustible materials from high temperatures	Risk Score	Pre-mitigation	6	<table border="1"> <thead> <tr> <th>2024 Planned Actions</th> <th>Narrative on Forecast Scores</th> <th>Assumptions</th> </tr> </thead> <tbody> <tr> <td>Continue to monitor and apply best practice.</td> <td>Using UKCP18 Climate projections temperatures are predicted to rise, resulting in this risk increasing over time.</td> <td>Assuming the airport fire service continues service as usual including fire training and testing.</td> </tr> </tbody> </table>			2024 Planned Actions	Narrative on Forecast Scores	Assumptions	Continue to monitor and apply best practice.	Using UKCP18 Climate projections temperatures are predicted to rise, resulting in this risk increasing over time.	Assuming the airport fire service continues service as usual including fire training and testing.
	2024 Planned Actions				Narrative on Forecast Scores	Assumptions									
Continue to monitor and apply best practice.	Using UKCP18 Climate projections temperatures are predicted to rise, resulting in this risk increasing over time.	Assuming the airport fire service continues service as usual including fire training and testing.													
Climate Variable	Temperature	Post-mitigation	2												
		Up to 2040	4												
		Up to 2080	4												
Narrative		Potential Consequences		Mitigation and Control Measures											
<p>Increased temperatures, combined with increased lightning, low precipitation and drought potential increase the fire risk of combustible materials. This could result in natural combustion of vegetation, for example, causing grass fires in the surrounding area of Edinburgh Airport. Grass and vegetation fires could cause poor visibility due to smoke and possible fire damage to infrastructure servicing Edinburgh Airport. Under the Regulation Reform (Fire Safety) Order 2005, airports in the UK are categorised from 1 to 10 depending on the type and size of aircraft they handle, and the number of crew required to respond to emergencies. Edinburgh Airport is fire category 9, and therefore requires a high level of rescue and firefighting cover as determined by the Civil Aviation Authority.</p>		<ul style="list-style-type: none"> Operational disruption due to smoke from fires becoming a visibility hazard, resulting in flight schedule disruption and cancellations Financial cost resulting from <ul style="list-style-type: none"> - lost landing fees - reparation costs Health and safety risk resulting from fire and smoke being inhaled by staff and passengers Environmental damage due to fire water runoff polluting nearby water courses 		<ul style="list-style-type: none"> Onsite Fire Service who conduct regular testing of equipment and procedures Online fire prevention training is compulsory for all staff upon onboarding and refreshed annually In accordance with Civil Aviation Authority guidance, regular safety inspections are conducted through the equipment management schedule (water supply equipment, hydrants, replenishment tanks) There are six wildfire beaters located at the solar farm for quick intervention if there is a grass fire 											

Risk No.	12	Risk	Increased risk of global distribution of pests and disease	Risk Score	Pre-mitigation	6			
	Climate Variable				Temperature	Post-mitigation			
					Up to 2040	4			
					Up to 2080	6			
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
<p>Increased temperatures could result in changes to the global distribution of pests and diseases which could increase the likelihood and frequency of epidemics and pandemics. The impact of the COVID-19 pandemic on air travel resulted in long periods of reduced/zero air travel, highlighting the vulnerability of the aviation sector to pandemic risk.</p>		<ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> - airport operations being restricted or suspended to stop global distribution of disease - implementation of safety protocols impacting operations Financial costs resulting from airport closure or travel restrictions Health and safety risks due to a potential pandemic risk 		<ul style="list-style-type: none"> Learning from previous pandemics, including COVID-19 Personal protective equipment (PPE) measures, for example, the use of face masks and introduction of social distancing 		<p>Continue to monitor and apply lessons learnt from previous pandemics.</p>	<p>IPCC prediction that increasing global temperatures will increase the risk of epidemic infectious diseases.</p>	<p>Assumption that the long term risk (2061-2080) will reduce if lessons learnt from previous global pandemics are applied.</p>	

Risk No.	13	Risk	Extreme temperatures increases risk of human health impacts	Risk Score	Pre-mitigation	6			
	Climate Variable				Temperature	Post-mitigation			
					Up to 2040	4			
					Up to 2080	6			
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
<p>Under increased temperatures (both hot and cold) there is a greater risk of human health impacts including vulnerable groups. During periods of high temperatures this can include heat stroke, dehydration, cardiovascular, respiratory, and cerebrovascular disease. High temperatures can also have a negative impact on air quality due to increased frequency of low dispersion conditions, particularly during prolonged hot spells. These conditions can further exacerbate human health impacts. During the July 2022 heatwave in Scotland, the government officially advised the public to look out for their health and avoid effects such as heat exhaustion. Such extreme temperatures increase the risk of Edinburgh Airport’s passengers and staff experiencing health risks.</p>		<ul style="list-style-type: none"> Health and safety risks due to <ul style="list-style-type: none"> vulnerable groups experiencing health impacts caused by extreme temperatures breaching of temperature standards and regulated environments Operational disruption due to reduced staff productivity Environmental damage caused by <ul style="list-style-type: none"> reduced air quality affecting biodiversity formation of ground-level ozone Delays to construction and maintenance works 		<ul style="list-style-type: none"> Air conditioning design standards are defined by the UK government Occupational Health run awareness campaigns throughout the year, sun protection and working in hot weather are included in the staff awareness campaigns Trained First Aiders available across campus Use BMS to track temperature of buildings to ensure compliance with Duty of Care for employees and passengers and temperature standards and regulated environments (HSE code of practice lower limit is 16°C in office environment and 13°C for physical roles) Employees can report a “Safety Share” including temperature of office space which notifies the HSE Team who can adjust temperature 		<p>Three Control Posts at Edinburgh Airport are being replaced with upgraded posts which have better ventilation.</p>	<p>UKCP18 indicates that temperatures in Edinburgh will increase, with the average number of days exceeding 22°C increasing in frequency to 11 days per year by 2080, resulting in this risk increasing over time.</p>	<p>Assumption that the long term risk (2061-2080) will reduce if mitigation is in place to reduce impact of extreme heat on passengers and staff at EDI.</p>	

Risk No.	14	Risk	Risk of water, hydraulic fluid and fuel in ground service equipment freezing due to low temperatures	Risk Score	Pre-mitigation	12				
	Climate Variable		Temperature		Post-mitigation	9				
					Up to 2040	9				
					Up to 2080	12				
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions		
<p>Extremely low temperatures increase the risk of water, hydraulic fluid and fuel in ground handlers' ground service equipment (GSE) freezing. Ground handling activities form an essential part of Edinburgh Airport's operations, directly contributing to flight and aerodrome safety. Previous winters have seen low temperatures resulting in the freezing of water, hydraulic fluid and fuel in Ground Handlers' facilities, GSE and vehicles. This impacts operations since ground handling services at Edinburgh Airport include ground administration and supervision; passenger handling; baggage handling; aircraft services; fuel and oil handling; and surface transport.</p>		<ul style="list-style-type: none"> Operational disruption resulting from disruption to Ground Handlers operations, preventing aircraft take-off, in turn disrupting the flight schedule Financial risk due to ground service equipment disruption impacting flight schedule 		<ul style="list-style-type: none"> Edinburgh Airport issue note to Ground Handlers to safeguard vehicles and prepare for extreme low temperatures during winter months Updated Ground Handler Agreement as of 2024 encourages Ground Handlers to electrify 85% of their GSE by 2030 		<p>Continue to monitor and engage with Ground Handlers to encourage electrification of GSE fleet.</p>	<p>UKCP18 indicates warmer winter months on average, with increases in irregular extreme events such as periods of low temperatures with heavy snowfall, therefore increasing this risk slightly over time.</p>	<p>Assumption that the long term risk (2061-2080) will reduce if technology advancements improve resiliency of GSE to extreme temperatures.</p>		

Risk No.	15	Risk	Low temperatures result in increased energy demand for heating supply	Risk Score	Pre-mitigation	8	<table border="1"> <thead> <tr> <th>2024 Planned Actions</th> <th>Narrative on Forecast Scores</th> <th>Assumptions</th> </tr> </thead> <tbody> <tr> <td>Explore alternative on site electricity supply such as on site solar and district heat network.</td> <td>UKCP18 indicates warmer winter months on average, with increases in irregular extreme events such as periods of low temperatures with heavy snowfall, therefore increasing this risk slightly over time.</td> <td>Assumption that the long term risk (2061-2080) will reduce if EDI's on site energy generation increases.</td> </tr> </tbody> </table>			2024 Planned Actions	Narrative on Forecast Scores	Assumptions	Explore alternative on site electricity supply such as on site solar and district heat network.	UKCP18 indicates warmer winter months on average, with increases in irregular extreme events such as periods of low temperatures with heavy snowfall, therefore increasing this risk slightly over time.	Assumption that the long term risk (2061-2080) will reduce if EDI's on site energy generation increases.
	2024 Planned Actions				Narrative on Forecast Scores	Assumptions									
Explore alternative on site electricity supply such as on site solar and district heat network.	UKCP18 indicates warmer winter months on average, with increases in irregular extreme events such as periods of low temperatures with heavy snowfall, therefore increasing this risk slightly over time.	Assumption that the long term risk (2061-2080) will reduce if EDI's on site energy generation increases.													
Climate Variable	Temperature	Post-mitigation	4												
		Up to 2040	4												
		Up to 2080	6												
Narrative		Potential Consequences		Mitigation and Control Measures											
Under prolonged periods of cold weather there is a greater risk of cold temperatures in airport buildings which will require an increased energy demand for heating of the building. This will increase the energy spend and associated emissions.		<ul style="list-style-type: none"> Operational disruption due to failure, damage, or inefficiency of temperature sensitive plant Financial risk due to <ul style="list-style-type: none"> - increased energy costs of heating demand - potential installation of backup generators for extra capacity Environmental impact leading to increased greenhouse gas emissions due to increased energy demand 		<ul style="list-style-type: none"> Building Management System used to monitor performance in real time and can highlight inefficiencies and data on compliance 											

Risk No.	16	Risk	Increased longevity of wingtip vortices due to general becalming of surface wind speeds	Risk Score	Pre-mitigation	6				
	Climate Variable				Wind	Post-mitigation	3			
					Up to 2040	3				
					Up to 2080	3				
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions		
Increased longevity of wingtip vortices (circular patterns of rotating air left behind a wing as it generates lift) to general becalming of surface wind speeds.		<ul style="list-style-type: none"> Operational disruption due to backlog, delays, and cancellations Financial costs due to <ul style="list-style-type: none"> - repair costs associated with local property damage - diversions and cancellations resulting in lost landing fees Reputational risk due to increased community complaints due to wing tip vortex damage 		<ul style="list-style-type: none"> Air Traffic Control processes are in place to ensure safe vortex separation <ul style="list-style-type: none"> - assessment of the correct timings to ensure accurate spacing between aircraft - calibration of instrumentation to allow for accurate flight path assurance 		Continue to investigate reports of vortex damage and ensure inspection and repairs by a reliable contractor as necessary.	UKCP18 indicates uncertainty in changes to wind speed and direction, therefore there are no changes to the risk score in the long term.	Assumption that there will be unpreventable incidents of vortex damage to residential properties.		

Risk No.	17	Risk	Change to prevailing wind direction and wind speed can affect runway utilisation and schedules	Risk Score	Pre-mitigation	6				
	Climate Variable				Wind	Post-mitigation	2			
					Up to 2040	3				
					Up to 2080	3				
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions		
<p>A change to prevailing wind direction and an increase in wind speed can lead to a decrease in the controllability of aircraft during take-off. This can cause negative impacts on the take-off distance required by aircraft, ultimately leading to delays. Winds at Edinburgh Airport are predominantly south westerly, and the location and direction of the runway enables the airport to reduce the risk of crosswind. During periods of strong wind, air bridges cannot be used and aircraft doors cannot open resulting in delays in passengers disembarking and luggage offload/load. Catering and ambulift vehicles also cannot be used resulting in further delays.</p>		<ul style="list-style-type: none"> Operational disruption due to reductions in take-off and landing rates if crosswind procedures are in place for longer time periods Financial risk due to diversions and cancellations resulting in lost landing fees Reputational risk due to diversions and cancellations 		<ul style="list-style-type: none"> Air Traffic Control monitor wind direction to determine runway utilisation All aircraft are performance tested to operate in cross winds 		<p>No immediate action required in the short term.</p>	<p>UKCP18 indicates uncertainty in changes to wind speed and direction, therefore there are no changes to the risk score in the long-term.</p>	<p>Assumption that there will be no significant changes to wind speed or direction in the long term, however, the long term risk be updated if this changes.</p>		

Risk No.	18	Risk	Risk of equipment failure from damage by lightning event, resulting in operational disruption	Risk Score	Pre-mitigation	6			
	Climate Variable				Lightning	Post-mitigation			
					Up to 2040	4			
					Up to 2080	4			
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
<p>Lightning can cause power cuts and voltage spikes to parts of Edinburgh Airport during electrical storms. Lightning can also cause damage to electrical equipment such as electrical, communications and navigational systems. If critical equipment is damaged or fails, this can lead to operational disruption. Events such as the “thundersnow” phenomenon in December 2020 in Edinburgh can result in excessive thunder and lightning suspending airport operations.</p>		<ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> - power cuts and voltage spikes - equipment damage and failure Financial costs due to equipment repairs/ replacement and use of backup generators while power is out Health and safety risks due to staff being exposed to malfunctioning electrical equipment Delays to construction and maintenance works due to equipment failure 		<ul style="list-style-type: none"> Uninterruptible Power Supply for safety critical systems Dual fed electrical supply Lightning protection testing is in place with lightning rods tested every 11 months (full test every 5 years) 		<p>Continue to monitor the impact of lightning on EDI’s operation.</p>	<p>UKCP18 for RCP8.5 shows that by 2060-2080 lightning frequency is projected to increase in summer, increase slightly in spring, decrease in autumn, and shows little change in winter compared to 1980-2000.</p>	<p>Assumption that there will not be a significant increase in the annual average occurrence of lightning, therefore the long term risk remains the same as the immediate term risk score.</p>	

Risk No.	19	Risk	Increased lightning strikes could disrupt aircraft movements	Risk Score	Pre-mitigation	16			
	Climate Variable				Lightning	Post-mitigation	4		
					Up to 2040	4			
					Up to 2080	4			
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
<p>The International Air Transport Association advises issuing lightning alerts at 5 miles (8km) within the airport and to stop operations at 3 miles (5km) within the airport. IATA advise using a 3-mile critical radius and resuming operations once the lightning activity has moved beyond this radius. If there's a lightning strike within the 3-mile critical radius, all aircraft movements are suspended, impacting the flight schedule which is halted until the lightning activity has moved beyond the critical radius.</p>		<ul style="list-style-type: none"> Operational disruption caused by suspension of aircraft movements due to lightning strike on the ground resulting in flight schedule disruption Financial risk due to diversions and cancellations resulting in lost landing fees Health and safety risk caused by injury from faulty equipment damaged by lightning strike Reputational risk due to change in flight schedule causing backlog, delays, diversions and cancellations 		<ul style="list-style-type: none"> Thunder storm warning received and communicated to third parties Lightning protection testing is in place with lightning rods tested every 11 months (full test every 5 years) 		Continue to monitor the impact of lightning on EDI's operation.	UKCP18 for RCP8.5 shows that by 2060-2080 lightning frequency is projected to increase in summer, increase slightly in spring, decrease in autumn, and shows little change in winter compared to 1980-2000.	Assumption that there will not be a significant increase in the annual average occurrence of lightning, therefore the long term risk remains the same as the immediate term risk score.	

Risk No.	20	Risk	Increased lightning strikes increase risk of disruption to airfield operations	Risk Score	Pre-mitigation	16			
	Climate Variable				Lightning	Post-mitigation	4		
					Up to 2040	4			
					Up to 2080	4			
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
<p>The International Air Transport Association advise suspending operations if lightning strikes occur within a 3-mile radius of the airport, suspending airport operations including aircraft refuelling; use of certain ground support equipment; and suspension of the disembarking and boarding of passengers, luggage and cargo. If lightning strikes within the airport's 3-mile critical radius, ground handlers are required to suspend use of headsets for ground to flight deck communication and for push-back tags. While use of headsets are suspended, ground handlers must instead use hand signals, which has the potential to cause errors resulting in disruption to the flight schedule.</p>		<ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> - diversions of take-off and landing routes to avoid lightning strikes - potential for backlog, delays and cancellations due to flight schedule changes to avoid lightning strikes - planes affected by lightning strikes being removed from fleet to be assessed - push back errors due to suspension of headsets - loss of capacity in cargo facilities Financial risk due to diversions and cancellations resulting in lost landing fees Reputational risk due to change in flight schedule, diversions and cancellations 		<ul style="list-style-type: none"> Thunderstorm warning received and communicated to third parties Airfield patrolled to ensure that no headsets are being used by the Ground Handlers 		Continue to monitor the impact of lightning on EDI's operation.	UKCP18 for RCP8.5 shows that by 2060-2080 lightning frequency is projected to increase in summer, increase slightly in spring, decrease in autumn, and shows little change in winter compared to 1980-2000.	Assumption that there will not be a significant increase in the annual average occurrence of lightning, therefore the long term risk remains the same as the immediate term risk score.	

Risk No.	21	Risk	Increased snow hazard and de-icing requirements due to extreme snowfall events	Risk Score	Pre-mitigation	12			
	Climate Variable				Snow	Post-mitigation	8		
					Up to 2040	8			
					Up to 2080	12			
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
<p>Snowfall events are predicted to become less frequent in Edinburgh, however, infrequent extreme snowfall events are likely to occur such as the record snowfall of December 2010, when temperatures in some part of Scotland dropped below -14°C and the partial freezing of the runway resulted in the closure of Edinburgh Airport. This could lead to a gap in staff knowledge on how to respond to heavy snowfall events. This could also lead to inadequate supplies if supplies are based on recent years rather than potential extremes. Prolonged and increased cold temperatures may result in ECO2 becoming inefficient and Konsin being required, which has a negative impact on water quality.</p>		<ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> airport operations being restricted/suspended due to extreme snowfall event reduced staff productivity Financial costs resulting from <ul style="list-style-type: none"> airport closure or travel restrictions Supplies required to combat extreme snowfall 		<ul style="list-style-type: none"> Winter Plan reviewed annually Regular training for the Winter teams (training from August to November, training for airport operations escort drivers, snow vehicle drivers) Use of sensors in the runway with forecast data to monitor weather conditions and respond Purchased two new purpose-built de-icing vehicles in December 2023 (new vehicles have monitors to prevent over spray of de-icer to prevent over use and potential pollution to water courses). Real time data available to monitor de-icing application and usage Airport Operations alert staff to hazardous weather conditions Water Quality Project to prevent any de-icer products entering local waterways Ensure continued availability of supply of de-icer product Additional snow clearing kit available from third party contractors 		<p>Asset replacement including upgrading road de-icing vehicles, procuring two new compact snow clearers for apron areas in December 2024 and replacing the runway sweeper by the end of 2026.</p>	<p>UKCP18 indicates that winters will become milder and wetter resulting in fewer extreme cold and snow events, however, as irregular extreme weather events are likely to occur with heavy snowfall, there is a slight increase in this risk over time.</p>	<p>Long term risk is based on assumption of no further mitigation action planned. Assumption that the long term risk (2061-2080) will reduce if EDI continues to mitigate against extreme snowfall events.</p>	

Risk No.	22	Risk	Increased risk of human health impacts due to extreme snowfall events	Risk Score	Pre-mitigation	6	<table border="1"> <thead> <tr> <th>2024 Planned Actions</th> <th>Narrative on Forecast Scores</th> <th>Assumptions</th> </tr> </thead> <tbody> <tr> <td>Continued monitoring to identify hot spots and further actions required.</td> <td>UKCP18 indicates that winters will become milder and wetter resulting in fewer extreme cold and snow events, however, as irregular extreme weather events are likely to occur with heavy snowfall, there is a slight increase in this risk over time.</td> <td>Long term risk is based on assumption of no further mitigation action planned. Assumption that the long term risk (2061-2080) will reduce if EDI continues to mitigate against extreme snowfall events.</td> </tr> </tbody> </table>			2024 Planned Actions	Narrative on Forecast Scores	Assumptions	Continued monitoring to identify hot spots and further actions required.	UKCP18 indicates that winters will become milder and wetter resulting in fewer extreme cold and snow events, however, as irregular extreme weather events are likely to occur with heavy snowfall, there is a slight increase in this risk over time.	Long term risk is based on assumption of no further mitigation action planned. Assumption that the long term risk (2061-2080) will reduce if EDI continues to mitigate against extreme snowfall events.
	2024 Planned Actions				Narrative on Forecast Scores	Assumptions									
Continued monitoring to identify hot spots and further actions required.	UKCP18 indicates that winters will become milder and wetter resulting in fewer extreme cold and snow events, however, as irregular extreme weather events are likely to occur with heavy snowfall, there is a slight increase in this risk over time.	Long term risk is based on assumption of no further mitigation action planned. Assumption that the long term risk (2061-2080) will reduce if EDI continues to mitigate against extreme snowfall events.													
Climate Variable	Snow	Post-mitigation	4												
		Up to 2040	6												
		Up to 2080	6												
Narrative		Potential Consequences		Mitigation and Control Measures											
<p>Extreme snow events are predicted to become less frequent in Edinburgh, however, infrequent extreme snowfall events are likely to occur such as the Anticyclone Hartmut in 2018 also known as "the Beast from the East" which brought unusually low temperatures and heavy snowfall across the UK including Edinburgh. Extreme snowfall events pose health and safety risks for passengers and staff through increased risk of slips, trips, falls, hazardous driving conditions and thermal discomfort particularly for staff working outdoors in unheated areas.</p>		<ul style="list-style-type: none"> Operational disruption due to reduced staff productivity Health and safety risks resulting from extreme cold and hazardous driving conditions 		<ul style="list-style-type: none"> De-icing and gritting plan for vehicle routes and walkways Winter Operating Plan reviewed on an annual basis Occupational Health campaigns Contractor grits all surface access on-site Information on internal employee platform on working in cold conditions 											

Risk No.	23	Risk	Disruption to low lying destination airports from sea level rise and storm surge risks	Risk Score	Pre-mitigation	6			
	Climate Variable				Sea Level Rise	Post-mitigation	4		
					Up to 2040	6			
					Up to 2080	9			
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
Sea level rise and storm surge risks will impact low lying destination airports that are connected to Edinburgh Airport, for example Schiphol Airport which lies 4.5 metres below sea level. Loss of these airports would require a change in Edinburgh's routes.		<ul style="list-style-type: none"> Operational disruption due to inability to receive aircraft Financial risk due to <ul style="list-style-type: none"> - diversions and cancellations resulting in lost landing fees Loss of revenue from reduced passenger numbers 		<ul style="list-style-type: none"> Ongoing engagement with wider aviation sector, particularly those at destination airports impacted by sea level rise 		No immediate action required in the short term.	The long term risk is elevated slightly due to a higher risk at receiving airports.	Assumption that the long term risk (2061-2080) will reduce if the existing destination airports remain operational.	

Risk No.	24	Risk	Combined impact of increased precipitation, increased wind, and low temperatures increase the risk of damage to assets, standing aircraft, vehicles and injuries to staff	Risk Score	Pre-mitigation	12	<table border="1"> <thead> <tr> <th>Narrative</th> <th>Potential Consequences</th> <th>Mitigation and Control Measures</th> <th>2024 Planned Actions</th> <th>Narrative on Forecast Scores</th> <th>Assumptions</th> </tr> </thead> <tbody> <tr> <td>Compound events are caused by the occurrence of multiple climate variables in a single location and when combined, have a greater impact than the individual climate variable. A combination of climate variables such as increased precipitation and increased wind will put more pressure on Edinburgh Airport's infrastructure and systems. This could cause delays to aircraft movements causing disruption to passengers and resulting in a loss of capacity in cargo facilities.</td> <td> <ul style="list-style-type: none"> Operational disruption <ul style="list-style-type: none"> - unable to serve aircraft due to high winds - air bridges and steps unavailable for use - delays in accessing aircraft hold - loss of capacity in cargo facilities Financial risk due to diversions and cancellations resulting in lost landing fees Health and safety risk due to staff being exposed to dangerous working conditions Delays to construction and maintenance works </td> <td> <ul style="list-style-type: none"> Air Traffic Control monitor weather conditions and can increase separation as required Constantly monitor the stand capacity in case of diversions Implementation of flow rate (Air Traffic Control manage aircraft landing and taking off) Welfare facilities can be provided for staff/passengers who become stranded Lessons learnt shared with all airlines and other third parties including ground handlers </td> <td>Continue to review processes and ensure contingency plans for all potential scenarios.</td> <td>UKCP18 indicates that weather events will become more variable and unpredictable, with extreme weather events more likely, therefore increasing this risk in the long term.</td> <td>Assumption that the long term risk (2061-2080) will reduce if mitigation is in place to reduce damage from extreme weather events to EDI infrastructure.</td> </tr> </tbody> </table>			Narrative	Potential Consequences	Mitigation and Control Measures	2024 Planned Actions	Narrative on Forecast Scores	Assumptions	Compound events are caused by the occurrence of multiple climate variables in a single location and when combined, have a greater impact than the individual climate variable. A combination of climate variables such as increased precipitation and increased wind will put more pressure on Edinburgh Airport's infrastructure and systems. This could cause delays to aircraft movements causing disruption to passengers and resulting in a loss of capacity in cargo facilities.	<ul style="list-style-type: none"> Operational disruption <ul style="list-style-type: none"> - unable to serve aircraft due to high winds - air bridges and steps unavailable for use - delays in accessing aircraft hold - loss of capacity in cargo facilities Financial risk due to diversions and cancellations resulting in lost landing fees Health and safety risk due to staff being exposed to dangerous working conditions Delays to construction and maintenance works 	<ul style="list-style-type: none"> Air Traffic Control monitor weather conditions and can increase separation as required Constantly monitor the stand capacity in case of diversions Implementation of flow rate (Air Traffic Control manage aircraft landing and taking off) Welfare facilities can be provided for staff/passengers who become stranded Lessons learnt shared with all airlines and other third parties including ground handlers 	Continue to review processes and ensure contingency plans for all potential scenarios.	UKCP18 indicates that weather events will become more variable and unpredictable, with extreme weather events more likely, therefore increasing this risk in the long term.	Assumption that the long term risk (2061-2080) will reduce if mitigation is in place to reduce damage from extreme weather events to EDI infrastructure.
	Narrative				Potential Consequences	Mitigation and Control Measures				2024 Planned Actions	Narrative on Forecast Scores	Assumptions									
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Post-mitigation	12																				
Up to 2040	6																				
Up to 2080	9																				

Risk No.	25	Risk	Increased risk of schedule interruption from the cumulative impact of extreme weather events	Risk Score	Pre-mitigation	12			
	Climate Variable				Compound Event	Post-mitigation	9		
					Up to 2040	9			
					Up to 2080	12			
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
<p>At Edinburgh Airport, the cumulative impact of extreme weather events has the potential to cause disruption to the airport’s flight schedules due to the decrease in the rate of air traffic movements, resulting in delays and cancellations. In 2024, Storm Arwen resulted in a red weather warning across Edinburgh bringing extreme rainfall and winds up to 90 mph, resulting in more than 300 flight cancellations at several UK airports, impacting flight schedules including at EDI.</p>		<ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> - Decreased rate of air traffic movements being likely during low pressure storms resulting in backlog, delays and cancellations - in extreme conditions possible short term closure of runways - smaller aircraft unable to fly due to high risk of damage - loss of capacity in cargo facilities Financial risk due to diversions and cancellations resulting in lost landing fees Reputational risk due to diversions and cancellations 		<ul style="list-style-type: none"> Air Traffic Control monitor weather conditions and can increase separation as required Constantly monitor the stand capacity in case of diversions Implementation of flow rate (Air Traffic Control manage aircraft landing and taking off) Welfare facilities can be provided for staff/ passengers who become stranded Lessons learnt shared with all airlines and other third parties including ground handlers 		<p>Continue to review processes and ensure contingency plans for all potential scenarios.</p>	<p>UKCP18 indicates that weather events will become more variable and unpredictable, with extreme weather events more likely, therefore increasing this risk in the long term.</p>	<p>Assumption that the long term risk (2061-2080) will reduce if mitigation is in place to reduce schedule interruption from extreme weather events.</p>	

Risk No.	26	Risk	Increased bird strike risk due to possible ecosystem changes in and around Edinburgh Airport resulting from changes in rainfall and temperature	Risk Score	Pre-mitigation	9	Narrative	2024 Planned Actions	Narrative on Forecast Scores	Assumptions
	Climate Variable				Compound Event	Post-mitigation				
Narrative		Potential Consequences		Mitigation and Control Measures						
<p>Changes to rainfall volumes and temperatures could alter the ecosystems in and around Edinburgh Airport resulting in changes to grassland, for example. This could impact insect populations in turn increasing available habitat for bird populations. This increases the likelihood of bird strikes which have the potential to cause minor and major damage to aircrafts particularly if the collision is with the aircraft windscreen or jet engine.</p>		<ul style="list-style-type: none"> Operational disruption caused by <ul style="list-style-type: none"> - bird strikes resulting in damage to aircraft - aircraft diversions due to bird populations Financial risk due to diversions resulting in lost landing fees Environmental damage as bird strikes reduce bird population Reputational risk due to <ul style="list-style-type: none"> - change in flight schedule, diversions and cancellations Perceived shortfalls in safety processes 		<ul style="list-style-type: none"> Airside Operations teams carry out bird control in accordance with specified procedures Daily Log records available for review of Habitat Management Liaison with local councils Liaison with local landowners/companies Off- airfield hazard site visits carried out by external expert Lethal control/culling as necessary Presence of dedicated bird dispersal on airfield at all times Installation of netting on airside water courses Correct reporting of bird strikes (ECCAIRS) Send monthly report to airlines on wildlife including bird strikes from previous month Third party consultant carries out check against Annual Bird strike Management Standards and provide recommended adaptation measures Drone surveys carried out 			<p>Continue to review processes and update Wildlife Habitat Management Plan where required.</p> <p>Increased risk over time as climate change impacts increase and there are changes to the ecosystems around EDI increasing bird populations.</p> <p>Assume continued wildlife management best practice.</p>			

Risk No.	27	Risk	Seasonal changes in multiple climate drivers (such as fog and rainfall) causing reduced visibility, increasing the risk of accidents and collisions	Risk Score	Pre-mitigation	16			
	Post-mitigation				2				
Climate Variable	Compound Event	Up to 2040	2						
		Up to 2080	4						
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
<p>UKCP18 indicate that occurrences of fog will reduce with fewer fog days across Scotland, however, the impacts of heavy rainfall combined with low lying cloud, can result in precipitation fog. This causes reduced visibility which can result in increased separation of aircraft landing and taking off, leading to backlog and delays. In May and July 2024, multiple flights due to land at another Scottish airport were diverted to Edinburgh Airport impacting the flight schedule at Edinburgh.</p>		<ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> - disruption to flight schedule increasing the potential for backlog, delays and cancellations - diversions of aircraft to land at other airport - restrictions on maintenance teams activities airside - runway incursion (improper positioning of vehicles or people on the runway) - loss of capacity in cargo facilities - delays on road network impacting employee and passenger surface access Financial risk due to diversions and cancellations resulting in lost landing fees 		<p>Low visibility procedure:</p> <ul style="list-style-type: none"> Main access points to the runway are moved to increase the distance to and from the runway Safeguard warning and low visibility warning issued to airside operations, communicated to third parties Close the perimeter track All free ranging is cancelled to control vehicle movements Notifications from the surface movement radar Free ranging curtailed, lookouts required Airside operations provide escorts over the taxiways Scheduled breaks throughout the day enable de-congestion of built up traffic Instrument landing system required to be used by aircraft during low visibility 		<p>Continue to monitor the impact of compound events on EDI's operation, specifically where conditions lead to low visibility.</p>	<p>UKCP18 indicates that weather events will become more variable and unpredictable, with extreme weather events more likely, therefore increasing this risk in the long term.</p>	<p>Assumption that the long term risk (2061-2080) will reduce if mitigation is in place to reduce schedule disruption caused by compound events.</p>	

Risk No.	28	Risk	Increased climate related insurance claims due to cumulative impact of extreme weather events	Risk Score	Pre-mitigation	2				
	Climate Variable				Compound Event	Post-mitigation	2			
					Up to 2040	6				
					Up to 2080	12				
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions		
Increased severity and frequency of extreme weather events of all types are likely to lead to increased damage to assets and disruption at Edinburgh Airport and therefore an increase in insurance claims. As part of a global risk pool, Edinburgh Airport insurance costs increase as a result of natural disaster/catastrophe globally.		<ul style="list-style-type: none"> Financial risk due to increase in climate related insurance claims 		<ul style="list-style-type: none"> Controls and mitigation measures are adopted to reduce damage from extreme weather events 		Continue to monitor and ensure mitigation adopted to minimise impact of extreme weather events on airport infrastructure.	UKCP18 indicates that weather events will become more variable and unpredictable, with extreme weather events more likely, therefore increasing this risk in the long term.	Assumption that the long term risk (2061-2080) will reduce if mitigation is in place to reduce damage from extreme weather events to EDI infrastructure.		

Risk No.	29	Risk	Damage to road surfaces caused by extreme temperatures impacting passenger and staff surface access	Risk Score	Pre-mitigation	6			
	Climate Variable		Interdependency (Temperature)		Post-mitigation	4			
					Up to 2040	6			
					Up to 2080	6			
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
<p>Extreme temperatures (both hot and cold) could result in damage to road surfaces and sub-surfaces as they experience either thermal expansion (during extremely high temperatures) or freeze thaw (during extremely low temperatures). These conditions could negatively impact the road surface integrity, disrupting the transport network and impacting passenger and staff surface access routes to and from Edinburgh Airport. This could also impact surfaces at the airport, limiting access to critical parts of the airfield.</p>		<ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> road closures resulting in loss of surface access for staff and passengers an increased need for maintenance and the temporary closures of areas affected by repairs delays to construction and maintenance works Maintenance vehicles contributing to congestion Financial risk due to reparation costs 		<ul style="list-style-type: none"> Ongoing contingency road resurfacing project 		<p>Continue to monitor and liaise with local authority and wider transport network where required.</p>	<p>UKCP18 indicates temperature increases in both the summer and winter months, in addition to increases in irregular extreme events such as heatwaves and periods of low temperatures with heavy snowfall, therefore increasing this risk over time.</p>	<p>Assumption that the long term risk (2061-2080) will reduce if mitigation is in place to reduce damage from extreme weather events to transport infrastructure.</p>	

Risk No.	30	Risk	Change to travel destinations due to extreme temperatures	Risk Score	Pre-mitigation	8			
	Climate Variable				Interdependency (Temperature)	Post-mitigation	4		
					Up to 2040	4			
					Up to 2080	6			
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
<p>Extreme temperatures at existing destinations may become less appealing as holiday destinations if they become too hot or experience extreme climate events such as wildfires. For example, popular holiday destinations across Europe are experiencing high summer temperatures resulting in wildfires. This includes countries such as Cyprus and Greece which are popular holiday destinations from Edinburgh Airport, and both experienced more than 80 wildfires in 2023, a figure that is unusually high compared to previous years going back to 2012. These effects of extremely high temperatures could impact the seasonality of destinations.</p>		<ul style="list-style-type: none"> Financial costs due to <ul style="list-style-type: none"> - a reduction in outbound passengers and reduced revenue - limitation on entering new markets or increasing outbound travel 		<ul style="list-style-type: none"> Ongoing research by aviation team, including engagement with airline operators Volume commitments with airlines in place which enables Edinburgh Airport to pitch alternative destinations 		<p>Ongoing market monitoring and engagement with airlines.</p>	<p>IPCC projections indicate increasing global temperatures throughout all seasons, however, specific projections of wildfire risks are uncertain. It is likely that climate change will result in changes to international travel due to extreme temperatures.</p>	<p>Long term risk scores assume that there will be changes to international travel as a result of climate change, however, the risk will reduce if mitigation controls are implemented at the various destination countries.</p>	

Risk No.	31	Risk	Interdependency risk resulting from disruptions in the utilities supply network (including gas, water and electricity) due to extreme climate events	Risk Score	Pre-mitigation	9	<table border="1"> <thead> <tr> <th>Narrative</th> <th>Potential Consequences</th> <th>Mitigation and Control Measures</th> <th>2024 Planned Actions</th> <th>Narrative on Forecast Scores</th> <th>Assumptions</th> </tr> </thead> <tbody> <tr> <td>Edinburgh Airport is reliant on third parties for utilities supply including gas, water, and a proportion of electricity. Extreme weather events (especially extreme wind and heavy rainfall leading to flooding) have the potential to cause major disruption to the utility supply to the airport via infrastructure damage. For example, high winds and heavy rain increase potential damage to power lines disrupting electricity supply. Historic extreme wind events (such as Storm Kathleen during April 2024 which brought wind gusts up to 90 MPH across Scotland) resulted in fallen trees in communities sitting within 2.5km of Edinburgh Airport. This increases the risk of damage to a transmission line impacting the airport's electricity supply.</td> <td> <ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> - lack of gas, water or electricity supply in certain areas of the airport - restricted operation of Ground Handlers and other third parties - lack of sufficient passenger services in terminal (services reliant on utilities: lighting, heating) - extreme case of supply disruption leading to schedule disruption Financial costs due to <ul style="list-style-type: none"> - repairing infrastructure damage - use of backup generators Health and safety risks due to altered staff working conditions </td> <td> <ul style="list-style-type: none"> 12 backup generators throughout the airport site, including one at the fire service and one at Air Traffic Control, ensuring that any loss of energy will not prevent critical infrastructure from working On-site solar farm reduces reliance on third party energy providers </td> <td>Continue to explore alternative on site energy provisions such as district heat network.</td> <td>UKCP18 indicates that weather events will become more variable and unpredictable, with extreme weather events more likely, therefore increasing this risk in the long term.</td> <td>Assumption that the long term risk (2061-2080) will reduce if mitigation is in place to reduce damage from extreme weather events to utilities.</td> </tr> </tbody> </table>			Narrative	Potential Consequences	Mitigation and Control Measures	2024 Planned Actions	Narrative on Forecast Scores	Assumptions	Edinburgh Airport is reliant on third parties for utilities supply including gas, water, and a proportion of electricity. Extreme weather events (especially extreme wind and heavy rainfall leading to flooding) have the potential to cause major disruption to the utility supply to the airport via infrastructure damage. For example, high winds and heavy rain increase potential damage to power lines disrupting electricity supply. Historic extreme wind events (such as Storm Kathleen during April 2024 which brought wind gusts up to 90 MPH across Scotland) resulted in fallen trees in communities sitting within 2.5km of Edinburgh Airport. This increases the risk of damage to a transmission line impacting the airport's electricity supply.	<ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> - lack of gas, water or electricity supply in certain areas of the airport - restricted operation of Ground Handlers and other third parties - lack of sufficient passenger services in terminal (services reliant on utilities: lighting, heating) - extreme case of supply disruption leading to schedule disruption Financial costs due to <ul style="list-style-type: none"> - repairing infrastructure damage - use of backup generators Health and safety risks due to altered staff working conditions 	<ul style="list-style-type: none"> 12 backup generators throughout the airport site, including one at the fire service and one at Air Traffic Control, ensuring that any loss of energy will not prevent critical infrastructure from working On-site solar farm reduces reliance on third party energy providers 	Continue to explore alternative on site energy provisions such as district heat network.	UKCP18 indicates that weather events will become more variable and unpredictable, with extreme weather events more likely, therefore increasing this risk in the long term.	Assumption that the long term risk (2061-2080) will reduce if mitigation is in place to reduce damage from extreme weather events to utilities.
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Climate Variable	Interdependency (Wind, Rainfall, Snow, Temperature, Compound Event)	Post-mitigation	6																		
		Up to 2040	6																		
		Up to 2080	9																		

Risk No.	32	Risk	Interdependency risk resulting from disruptions to transport network due to extreme climate events impacting passenger and staff surface access to the airport	Risk Score	Pre-mitigation	9	<table border="1"> <thead> <tr> <th>Narrative</th> <th>Potential Consequences</th> <th>Mitigation and Control Measures</th> <th>2024 Planned Actions</th> <th>Narrative on Forecast Scores</th> <th>Assumptions</th> </tr> </thead> <tbody> <tr> <td>Edinburgh Airport is reliant on the third party transport network to enable passenger and staff surface access to the airport. Extreme weather events (especially extreme wind and heavy rainfall leading to flooding) have the potential to cause disruption to the transport network via damage to transport infrastructure. Historic extreme wind events (such as Storm Kathleen in April 2024 which brought wind gusts up to 90 MPH across Scotland) have resulted in fallen trees damaging train overhead power lines in and around Edinburgh causing train delays and cancellations. Previous extreme weather events have also resulted in Edinburgh Trams to be suspended (such as Storm Darcy in 2021 which brought strong winds and heavy snow), further disrupting passenger and staff surface access.</td> <td> <ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> - passengers being unable to access the airports - essential airport operation teams missing staff due to lack of surface access - lack of staff resulting in schedule delays Health and safety risks due to altered staff working conditions </td> <td> <ul style="list-style-type: none"> Liaise with local transport providers to ensure contingency plans in place where required </td> <td>Continue to monitor and liaise with local authority and wider transport network where required.</td> <td>UKCP18 indicates that weather events will become more variable and unpredictable, with extreme weather events more likely, therefore increasing this risk in the long term.</td> <td>Assumption that the long term risk (2061-2080) will reduce if mitigation is in place to reduce damage from extreme weather events to transport infrastructure.</td> </tr> </tbody> </table>			Narrative	Potential Consequences	Mitigation and Control Measures	2024 Planned Actions	Narrative on Forecast Scores	Assumptions	Edinburgh Airport is reliant on the third party transport network to enable passenger and staff surface access to the airport. Extreme weather events (especially extreme wind and heavy rainfall leading to flooding) have the potential to cause disruption to the transport network via damage to transport infrastructure. Historic extreme wind events (such as Storm Kathleen in April 2024 which brought wind gusts up to 90 MPH across Scotland) have resulted in fallen trees damaging train overhead power lines in and around Edinburgh causing train delays and cancellations. Previous extreme weather events have also resulted in Edinburgh Trams to be suspended (such as Storm Darcy in 2021 which brought strong winds and heavy snow), further disrupting passenger and staff surface access.	<ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> - passengers being unable to access the airports - essential airport operation teams missing staff due to lack of surface access - lack of staff resulting in schedule delays Health and safety risks due to altered staff working conditions 	<ul style="list-style-type: none"> Liaise with local transport providers to ensure contingency plans in place where required 	Continue to monitor and liaise with local authority and wider transport network where required.	UKCP18 indicates that weather events will become more variable and unpredictable, with extreme weather events more likely, therefore increasing this risk in the long term.	Assumption that the long term risk (2061-2080) will reduce if mitigation is in place to reduce damage from extreme weather events to transport infrastructure.
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Climate Variable	Interdependency (Wind, Rainfall, Snow, Temperature, Compound Event)	Up to 2040	6																		
		Up to 2080	9																		

Risk No.	33	Risk	Interdependency risk resulting from disruptions to transport network due to extreme climate events disrupting the delivery of essential supplies	Risk Score	Pre-mitigation	9	Narrative	Potential Consequences	Mitigation and Control Measures	2024 Planned Actions	Narrative on Forecast Scores	Assumptions
	Climate Variable				Interdependency (Wind, Rainfall, Snow, Temperature, Compound Event)	Post-mitigation						
<p>Edinburgh Airport and third parties operating at the airport are reliant on delivery partners to deliver essential supplies (such as fuel, food and cargo). Extreme weather events (especially extreme wind and heavy rainfall leading to flooding) have the potential to cause disruption and damage to transport infrastructure. Historic extreme rainfall events (such as Storm Babet in 2023 which resulted in a red weather warning for flooding across parts of Scotland) have caused severe and widespread flooding with disruptive impacts on the transport network suspending deliveries of essential supplies. If these deliveries (such as fuel) are critical to the operation of the airport there could be disruption to flight schedules resulting in delays and cancellations.</p> <ul style="list-style-type: none"> Operational disruption due to <ul style="list-style-type: none"> lack of sufficient passenger services at terminal resulting from no supply delivery at restaurants, shops etc take-off delays resulting from changes to re-fuelling cargo flights being delayed/cancelled due to deliveries not making it to the site Health and safety risks due to altered staff working conditions <ul style="list-style-type: none"> Ensure sufficient supplies of all materials critical to operations On site fuel supply On site storage for third parties' supplies <p>Continue to monitor and liaise with suppliers, local authority and wider transport network where required.</p> <p>UKCP18 indicates that weather events will become more variable and unpredictable, with extreme weather events more likely, therefore increasing this risk in the long term.</p> <p>Assumption that the long term risk (2061-2080) will reduce if mitigation is in place to reduce damage from extreme weather events to transport infrastructure.</p>												

Risk No.	34	Risk	Disruption to Edinburgh Airport's infrastructure resulting from sea level rise and storm surge risks	Risk Score	Pre-mitigation	2			
	Climate Variable		Interdependency (Sea Level Rise)		Post-mitigation	2			
					Up to 2040	2			
					Up to 2080	4			
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
Sea level rise and storm surge risks to Edinburgh have the potential to disrupt Edinburgh Airport operations such as disrupting utility supplies and transport routes impacting surface access.		<ul style="list-style-type: none"> Operational disruption resulting from disruption to utility supplies such as electricity supply Disruption to transport routes connecting passengers and staff to Edinburgh Airport, disrupting surface access Financial risk due to staff shortage, utility disruption and loss of revenue from reduced passenger numbers 		No immediate actions required in the short term.		No immediate action required in the short term.	Due to the airport's location, EDI is unlikely to be affected by sea level rise, however there is a slight increase in the long term risk due to projections showing a rise in water levels along Edinburgh's coast.	Assumption that the long term risk (2061-2080) will reduce if flood defence projects mitigate the risk of erosion, flooding and storm surges along Edinburgh's coast.	

Risk No.	35	Risk	Risk that policy and regulatory changes reduce demand for air travel	Risk Score	Pre-mitigation	6			
	Climate Variable				Transition	Post-mitigation	4		
					Up to 2040	12			
					Up to 2080	16			
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
<p>The introduction of policies to price carbon through taxation (such as the planned Scottish Air Departure Tax) 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.</p>		<ul style="list-style-type: none"> Financial risk due to reduction/limit to airport growth Operational disruption as reduced airline profitability from introduction of a carbon tax could lead to airline collapse 		<ul style="list-style-type: none"> Net Zero Strategy published in 2023 outlining the airport's plans to be net zero in advance of the UK target Member of a number of industry groups, for example, Sustainable Aviation, ACI, AOA aiming to ensure a clear and consistent approach for the aviation industry to achieve Net Zero Ongoing engagement with stakeholders Carbon charge incentive and rebate scheme to encourage airlines to use low-emissions aircraft Completed a materiality assessment in 2024 to understand stakeholders' views on sustainability-related risks and opportunities Carbon Manager employed in 2024 		<p>Continue to engage with aviation industry and the UK and Scottish Government via industry groups.</p>	<p>Increased risk over time depending on how the industry and government respond to climate change.</p>	<p>Assumption that the long term risk (2061-2080) will reduce if alternative fuels are developed and adopted by a significant majority of airlines operating at EDI.</p> <p>Assumption that the long term risk (2061-2080) will reduce if EDI has met net zero target of 2045.</p>	

Risk No.	36	Risk	Risk that financial and market changes will impact the airport's lending	Risk Score	Pre-mitigation	6				
	Climate Variable				Transition	Post-mitigation	4			
					Up to 2040	12				
					Up to 2080	16				
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions		
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.		<ul style="list-style-type: none"> Financial risk due to <ul style="list-style-type: none"> - reduction in lending or increase in interest - limited liquidity across capital markets 		<ul style="list-style-type: none"> Engagement with investors and lenders to ensure visibility of Edinburgh Airport's decarbonisation plans Commitment to robust and transparent external disclosures on climate related financial risks through TCFD Link lending to sustainability KPIs to reduce pricing exposure 		Continue to engage with investors and lenders to ensure visibility of Edinburgh Airport's decarbonisation plans.	Increased risk over time as climate change impacts and pressure from stakeholders increase.	Assumption that the long term risk (2061-2080) will reduce if alternative fuels are developed and adopted by a significant majority of airlines operating at EDI. Assumption that the long term risk (2061-2080) will reduce if EDI has met net zero target of 2045.		

Risk No.	37	Risk	Risk that the reputational impact of flying reduces demand for air travel	Risk Score	Pre-mitigation	4				
	Climate Variable				Transition	Post-mitigation	4			
					Up to 2040	8				
					Up to 2080	12				
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions		
Climate change mitigation by society includes individuals reducing their personal carbon footprint by changing their behaviours such as flying less/excluding short-haul flights/excluding long-haul flights/excluding flying completely. Some businesses operating in the UK have introduced policies to remove domestic air travel. This change in behaviour could reduce passenger numbers flying domestically and may result in reduced revenue.		<ul style="list-style-type: none"> Financial risk due to reduction/limit to airport growth 		<ul style="list-style-type: none"> Member of several industry groups, for example, Sustainable Aviation, ACI, AOA aiming to ensure a clear and consistent approach for the aviation industry to achieve Net Zero Ongoing engagement with stakeholders 		Continue to engage with aviation industry and travel sector via industry groups.	Increased risk over time as climate change impacts increase and passenger behaviours change.	<p>Assumption that the long term risk (2061-2080) will reduce if alternative fuels are developed and adopted by a significant majority of airlines operating at EDI.</p> <p>Assumption that the long term risk (2061-2080) will reduce if EDI has met net zero target of 2045.</p>		

Risk No.	38	Risk	Risk that technology limitations reduce the airport's ability to decarbonise	Risk Score	Pre-mitigation	6				
	Climate Variable				Transition	Post-mitigation	6			
					Up to 2040	6				
					Up to 2080	9				
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions		
<p>Climate change adaptation and mitigation are both driven and limited by current technology. As further decarbonisation technology develops, additional solutions to climate risks could be achieved enabling Edinburgh Airport to decarbonise. Alternative aircraft fuels will significantly advance the ability of the aviation sector to decarbonise using Sustainable Aviation Fuel, as well as electric and hybrid aircraft.</p>		<ul style="list-style-type: none"> Mitigation and adaptation limitations 		<ul style="list-style-type: none"> Ongoing engagement with stakeholders 		<p>Continue to engage with aviation industry and government via industry groups on opportunities to develop and implement use of alternative aircraft fuels.</p>	<p>Increased risk over time as climate change accelerates and technology advances remain unknown.</p>	<p>Assumption that the long term risk (2061-2080) will reduce if alternative fuels are developed and adopted by a significant majority of airlines operating at EDI.</p> <p>Assumption that the long term risk (2061-2080) will reduce if EDI has met net zero target of 2045.</p>		

Risk No.	39	Risk	Risk of limit to airport growth due to Government policy	Risk Score	Pre-mitigation	15				
	Climate Variable				Transition	Post-mitigation	6			
					Up to 2040	6				
					Up to 2080	9				
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions		
Climate Change Committee and the Airport Environment Federation have advised for a halt to airport expansions in the UK until a UK wide capacity management framework is in place. If imposed by the Government this could prevent future growth and expansion at Edinburgh Airport including terminal expansion and increased passenger numbers.		<ul style="list-style-type: none"> Financial risk due to reduction/limit to airport growth 		<ul style="list-style-type: none"> The ongoing airspace change project should allow for optimisation of airspace and subsequently reduce the impact of such a change on aircraft movements Any growth limitations could be mitigated to an extent by increasing tariff (particularly in peak) 		Focus could shift to revenue maximisation rather than balancing passenger growth with revenue.	Increased risk over time depending on how the industry and government respond to climate change.	Assumption that the long term risk (2061-2080) will reduce if EDI has met net zero target of 2045.		

Risk No.	40	Risk	Risk of financial performance impacted by competition with low carbon modes of transport	Risk Score	Pre-mitigation	2			
	Climate Variable				Transition	Post-mitigation	2		
					Up to 2040	6			
					Up to 2080	9			
Narrative		Potential Consequences		Mitigation and Control Measures		2024 Planned Actions	Narrative on Forecast Scores	Assumptions	
<p>Some businesses operating in the UK have introduced policies to remove domestic air travel, encouraging their employees to travel by low carbon transport modes for business travel. This shift to lower carbon modes of transport for domestic travel could reduce passenger numbers flying domestically and may result in reduced revenue.</p>		<ul style="list-style-type: none"> Demand for domestic flights reduced as passengers use low carbon transport modes to travel 		<ul style="list-style-type: none"> Member of several industry groups, for example, Sustainable Aviation, ACI, AOA aiming to ensure a clear and consistent approach for the aviation industry to achieve Net Zero Ongoing engagement with stakeholders 		<p>Continue to engage with aviation industry and the UK and Scottish Government via industry groups.</p>	<p>Increased risk over time as climate change impacts increase and passenger behaviours change.</p>	<p>Assumption that the long term risk (2061-2080) will reduce if alternative fuels are developed and adopted by a significant majority of airlines operating at EDI.</p>	



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