

Bristol Airport Limited

Development of Bristol Airport to Accommodate 12 Million Passengers Per Annum

Environmental Statement
Addendum – Technical
Appendices (Volume 2)



Report for

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Appendix 1A

Updated Construction Programme

Component	Construction Start (month/year)	Completion (month/year)
Operational Extension to the Silver Zone Car Park (Phase 1)	Apr-22	Jun-22
Highway Improvements (A38)	Oct-22	Apr-23
New Arrivals Area with Vertical Circulation Cores	Nov-22	Apr-23
South Terminal Extension	Nov-22	Apr-24
Extension to the Silver Zone Car Park (Phase 2)	Dec-22	Dec-23
West Terminal Extension Phase 2a	Sep-23	Jun-24
Gyratory with Internal Surface Car Parking	Oct-23	May-24
Canopies	Sep-25	May-26
Eastern Taxiway Link	Jan-27	Jun-27
Taxiway Widening (and Fillets)	Jan-27	Jun-27
MSCP Phase 3	Sep-27	Jul-28
West Terminal Extension Phase 2b	Nov-27	Mar-29
Walkway to East Pier with Circulation Cores and One Pre-Board Zone	Sep-28	Jun-29
East Pier with Vertical Circulation Cores and Five Pre-Board Zones	Sep-28	Jun-29
New Service Yard	Nov-28	Mar-29
Operational Change to Use of Stands 38 and 39	N/A	Apr-22

Appendix 1B

Glossary

Term	Definition
Ambient noise	Usually expressed using the $L_{Aeq,T}$ unit, commonly understood to include all sound sources present at any particular site, regardless of whether they are actually defined as noise.
Annual Average Daily Traffic	The average traffic volume in both directions on a section of road, adjusted for seasonal variation.
Assessment year	Individual years that have been used to assess the impacts of the Proposed Development.
A-weighting	The sensitivity of the ear is frequency dependent. Sound level meters are fitted with a weighting network which approximates to this response and allows sound levels to be expressed as an overall single figure value, in dB(A).
Background noise	This is the steady noise attributable to less prominent and mostly distant sound sources above which identifiable specific noise sources intrude. It is usually expressed using the LA_{90} unit.
Baseline	The existing environmental conditions at time of survey and assessment.
Biodiversity	The concept of a variety in all species of plants and animals through which nature finds its balance.
Carbon Budget	The UK Carbon Budget is the total quantity of greenhouse gas emissions permitted in the United Kingdom over a specified period.
Carbon dioxide equivalent	A measure used to compare the emissions from various greenhouse gases based on their global warming potential relative to that of carbon dioxide.
Carbon neutral	A state in which the activities described result in no net impact on the climate from greenhouse gas emissions. For Bristol Airport this is based on reaching net zero Scope 1 and 2 emissions primarily by offsetting, with a commitment to achieve this by 2025.
Carbon offsetting	The action of compensating for greenhouse gas emissions arising from a particular activity by participating in a scheme or activity designed to make equivalent reductions in greenhouse gas emissions in the atmosphere.
GHG emission	The release of GHGs into the atmosphere.
Climate emergency (declaration)	A situation in which urgent action is required to reduce or halt climate change. A climate emergency declaration is an action by government or local councils to acknowledge human's influence in a climate emergency.
Climate change adaptation	The adjustment in natural or human systems in response to actual or expected climatic changes or their effects, which moderates harm or exploits beneficial opportunities.
Climate change mitigation	Action to reduce the causes of climate change (e.g. emissions of greenhouse gases), as well as reducing future risks associated with climate change.
Climate change projections	Projections of changes in climate variables expressed in terms of the difference between the absolute future climate and a baseline climatology for a given location, time period and emissions scenario of greenhouse gases.

Term	Definition
Climate change resilience	The capacity of both natural and human systems to keep their original form and function, and to survive and adapt in the context of the stresses and shocks imposed upon them by climate change.
Committee on Climate Change	An independent advisory body, established under section 32 of the Climate Change Act 2008, tasked with helping the UK Government set and meet carbon budgets and adapt to climate change.
Core Case	The growth scenario / estimate assuming passenger demand will reach 10 mppa in 2024 and 12 mppa in 2030.
Cumulative Effect	The combined effects of foreseeable human induced changes within a specific geographical area over a certain period of time. Effects can be both direct and indirect.
dB / Decibel	<p>The unit used to describe the magnitude of sound is the decibel (dB) and the quantity measured is the sound pressure level. The decibel scale is logarithmic, and it ascribes equal values to proportional changes in sound pressure, which is a characteristic of the ear. Use of a logarithmic scale has the added advantage that it compresses the very wide range of sound pressures to which the ear may typically be exposed to a more manageable range of numbers. The threshold of hearing occurs at approximately 0dB (which corresponds to a reference sound pressure of 2×10^{-5} Pascals) and the threshold of pain is around 120dB.</p> <p>The sound energy radiated by a source can also be expressed in decibels. The sound power is a measure of the total sound energy radiated by a source per second, in watts. The sound power level, L_w is expressed in decibels, referenced to 10-12 watts.</p>
Effect	A temporary or permanent consequence of a singular or collective impact associated with the proposal.
EIA Regulations	Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (SI No 571).
Embodied carbon	Carbon dioxide emitted during the manufacture, transport and construction of materials, together with end of life emissions.
Future emissions scenario	Scenarios of how greenhouse gas emissions for certain factors may vary in future. Due to uncertainty in future trends an upper, central and lower emission scenario has been considered.
Environment	Our physical surroundings including air, water and land.
Environmental Impact Assessment	An assessment undertaken to determine the potential impacts of a proposed development on various elements of the environment, such as upon air quality and ecology, and social issues, such as socio-economics and transport.
Environmental Statement	The report of the Environmental Impact Assessment of a proposed development.
Faster Growth Case	The growth scenario assuming passenger demand will reach 10 mppa in 2022 and 12 mppa in 2027.
Frequency (Hz)	Frequency is analogous to musical pitch. It depends upon the rate of vibration of the air molecules that transmit the sound and is measured as the number of cycles per second or Hertz (Hz). The human ear is sensitive to sound in the range 20 Hz to 20,000 Hz (20 kHz). For acoustic engineering purposes, the frequency range is normally divided up into discrete bands. The most commonly used bands are octave bands, in which the upper limiting frequency for any band is twice the lower limiting frequency, and one-third octave bands, in which each octave band is divided into three. The bands are described by their centre frequency value and the ranges which are typically used for building acoustics purposes are 63Hz to 4 kHz (octave bands) and 100Hz to 3150Hz (one-third octave bands).

Term	Definition
Future Baseline	The situation that would occur if the Proposed Development that is the subject of the Environmental Impact Assessment does not proceed. The predicted impacts of the Proposed Development are compared against this theoretical scenario.
Greenhouse Gas	A gas such as carbon dioxide, methane, chlorofluorocarbons, nitrous oxide, ozone, and water vapour that contributes to the greenhouse effect by absorbing infrared radiation.
Groundwater	Water held underground in the soil or in pores and crevices in rock.
Habitat	Where a particular organism or population can be found.
Impact	Only used within the context of the term Environmental Impact Assessment, which describes the process from scoping through Environmental Statement preparation to subsequent monitoring and other work.
In-combination climate change impacts	The impact of climate change and the Proposed Development on environmental receptors identified elsewhere in the Environmental Statement.
Indirect Effects	Impacts on the environment, which are not a direct result of the Proposed Development but are often produced away from it or as a result of a complex pathway.
Inter-project effects assessment	An assessment of how the environmental effects resulting from the Proposed Development could combine with the same topic-related effects generated by other proposed or committed developments to affect a common receptor. For example, noise generated by the construction of the Proposed Development and that generated from another construction site nearby could affect the same residential property receptor.
Inter-related effects assessment	Assessment of whether any of the individual environmental topic effects resulting from the Proposed Development, which are not significant in their own right, could combine to create effects that are significant. For example, noise generated by the operation of the Proposed Development and views of it from nearby residential properties may individually not result in significant effects, though combined, they could result in a significant effect on residential amenity.
LA90	Level exceeded 90% of the time (background noise).
LAeq,T	Equivalent continuous A-weighted sound pressure level.
LAmax,T	The maximum A-weighted sound pressure level, normally associated with a time weighting, F (fast), or S (slow), such as LA _{F,max} or LA _{S,max} .
Land use	The primary use of the land, including both rural and urban activities.
Methodology	The specific approach and techniques used for a given study.
Mitigation	Any process, activity or entity designed to avoid, reduce, or remedy adverse environmental effects likely to be caused by a development project.
Net Zero	A state in which the activities described result in no net impact on the climate from greenhouse gas emissions. For Bristol Airport this is considered to be reducing direct Scope 1 and indirect Scope 2 emissions wherever practicable and offsetting where necessary. Bristol Airport have an ambition to be net zero by 2050.
N60 & N70	Nx contours define ground receptors exposed to a number of events with a maximum noise level of x dB LA _{Smax} or greater.
Nitrogen dioxide	Reddish brown gas (in high concentrations), respiratory irritant and precursor to photochemical processes which produce other pollutants, photochemical smog and contribute to global warming.

Term	Definition
Nitrogen monoxide	Clear, colourless gas produced by combustion process – not a primary air pollutant but may be a contribution to photochemical processes giving rise to other pollutants, such as smog.
Nitrous oxide	Inert product of combustion, which does not contribute to local air pollution.
Nomis	Official labour market statistics.
Non-Technical Summary	The 'executive summary' of an Environmental Statement prepared in non-technical language so that it can be read by the layperson.
Nx	Nx or Number Above is the total number of aircraft operations that exceed a specified sound level threshold. For example, N65 is the count of departure and arrival events in excess of 65dB L _{AMAX} .
Operational Phase	Standard operation after commissioning.
Paris Accord / Paris Agreement	An agreement within the United Nations Framework Convention on Climate Change (UNFCCC) that sets out a global action plan to mitigate greenhouse gas emissions and limiting global warming to well below 2°C, as well as strengthening the ability of countries to deal with the impacts of climate change.
Particulate matter	Particulate matter (PM), also known as particle pollution, is a complex mixture of extremely small particles and liquid droplets that get into the air. Once inhaled, these particles can affect the heart and lungs and cause serious health effects.
Potentially	Likely environmental effects.
Proposed Development	The proposed expansion of Bristol Airport beyond the permitted passenger cap of 10 million passengers per annum to 12 million passengers per annum through a planning application to North Somerset Council.
Rating level, L_{A,r,Tr}	The specific sound level plus any adjustment for the characteristic features of the sound.
Receptors	A component of the natural or man-made environment such as water or a building that is affected by an impact.
Residual Impacts	Effects remaining after mitigation measures have been implemented.
Residual GHG emissions	GHG Emissions remaining after mitigations, including offsetting, have been implemented.
Scope 1, 2 and 3 GHG emissions	Scope 1 emissions are direct emissions from the activities of an organisation (in this case Bristol Airport Limited). Scope 2 emissions are indirect emissions, primarily relating to the electricity purchased and used. Scope 3 emissions all other indirect emissions from the activities of an organisation, occurring from sources that they do not own or control.
Scoping	An early stage within the Environmental Impact Assessment process where the significance of environmental issue and scope of the environmental studies are determined.
Severance	Refers to the barrier effect of linear transport infrastructure.
Significant effect	Significant effects are those identified as 'Major' within the significance evaluation matrix (contained within Chapter 4: Approach to Assessment).
Slower Growth Scenario	The growth scenario assuming passenger demand will reach 10 mppa in 2027 and 12 mppa in 2034.

Term	Definition
Sound	This is a physical vibration in the air, propagating away from a source, whether heard or not.
Sound power levels (L_w)	Sound power levels (L_w) are used to describe the sound output of a sound source.
Superficial/drift deposits	Unconsolidated alluvial, residual, or glacial deposits overlying bedrock or occurring on or near the surface of the earth. Superficial/drift deposits are the youngest geological deposits formed during the most recent period of geological time, the Quaternary, which extends back about 2.6 million years from the present.
Surface water	Water found on the surface of the Earth (not underground or in the atmosphere), for example in rivers, seas, lakes and reservoirs.
Taxiing	Taxiing is the slow movement of an aircraft on the ground, under its own power, before take-off or after landing.
Traffic flows	The interactions between travellers and infrastructure.
Trip generation	Predicts the number of trips originating in or destined for a particular area.
Vibration	Vibration is an oscillatory motion. The magnitude of vibration can be defined in terms of displacement, i.e. how far from the equilibrium something moves, velocity (how fast something moves), or acceleration (the rate of change of the velocity).
Visual Effect	The change in the appearance of the townscape as a result of the development. This can be positive or negative.

Appendix 1C

Abbreviations

Abbreviation	Term
A&E	Accident and Emergency
AADT	Annual Average Daily Traffic
AAWT	Annual Average Weekly Traffic
ADMS	Atmospheric Dispersion Modelling System.
AEDT	Aviation Environmental Design Tool
AEL	Associated Emission Levels
AEP	Annual Exceedance Probability
ANPS	Airports National Policy Statement
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
APF	Aviation Policy Framework
AQAL	Air Quality Assessment Level
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AQS	Air Quality Standards
ASR	Annual Status Report
ATC	Automated Traffic Count
ATM	Air Traffic Movement
AURN	Automatic Urban and Rural Network
BAL	Bristol Airport Limited
BAT	Best Available Technique
BCC	Bristol City Council
BEIS	Department for Business, Energy and Industrial Strategy
BS	British Standards
c.	Circa
CAA	Civil Aviation Authority
CCC	Committee on Climate Change
CCC ASC	Committee on Climate Change Adaptation Sub-Committee
CEA	Cumulative Effects Assessment

Abbreviation	Term
CEMP	Construction Environmental Management Plan
CLVIA	Cumulative Landscape and Visual Impact Assessment
CM	Conceptual Model
CO	Carbon monoxide
CO₂	Carbon dioxide
CoCP	Code of Construction Practice
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CRTN	Calculation of Road Traffic Noise
CS	Core Strategy
CTC	Classified Turning Count
dB	Decibel
dB(A)	A-weighted decibel
DCLG	Department for Communities and Local Government
DeMP	Development Management Policies
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
DS	Drainage Strategy
EA	Environment Agency
EAL	Environmental Assessment Levels
EFT	Emission Factor Toolkit
EIA	Environmental Impact Assessment
ES	Environmental Statement
ESA	Employment Support Allowance
ETS	Emissions Trading Scheme
EU	European Union
FDI	Foreign Direct Investment
FTE	Full Time Equivalent
GHG	Greenhouse gas
GIS	Geographical Information System
GVA	Gross Value Added
ha	Hectare
HE	Highways England
HGV	Heavy Goods Vehicle

Abbreviation	Term
HIA	Health Impact Assessment
Hz	Hertz
IEMA	Institute of Environmental Management and Assessment
IMD	Index of Multiple Deprivation
IPCC	Intergovernmental Panel on Climate Change
JLTP	Joint Local Transport Plan
JSA	Job Seekers Allowance
JSP	Joint Spatial Plan
JTS	Joint Transport Study
kHz	Kilohertz
km	Kilometre
LAQM	Local Air Quality Management
LGV	Large Goods Vehicle
LOAEL	Lowest Observed Adverse Effect Level
LPA	Local Planning Authority
Met	Meteorological
MHCLG	Ministry of Housing, Communities and Local Government
mppa	million passengers per annum
MSCP	Multi-story car park
MT	Motor Transport
Mt	Million tonnes
N	Nitrogen
N/A	Not applicable
NAEI	National Atmospheric Emissions Inventory
NO	Nitrous oxide/monoxide
NO ₂	Nitrogen dioxide
NO _x	Oxide of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPS	National Policy Statement
NPSE	Noise Policy Statement for England
NSC	North Somerset Council
NTS	Non-Technical Summary

Abbreviation	Term
ONS	Office for National Statistics
OS	Ordnance Survey
PC	Process Contribution
PEC	Predicted Environmental Contribution
PIC	Personal Injury Collision
PM	Particulate Matter (subscript denoting diameter in μm)
PPG	Planning Practice Guidance
PPS	Planning Policy Statements
QRA	Quantitative Risk Assessment
R^2	Coefficient of determination
SEL	Sound Exposure Level
SI	Statutory Instrument
SO ₂	Sulphur dioxide
SPD	Supplementary Planning Document
SRN	Strategic Road Network
TA	Transport Assessment
TAA	Transport Assessment Addendum
TCPA	Town and Country Planning Act
TEMPro	Trip End Model Presentation Program
UKCP09	UK Climate Projections 2009
UNFCCC	United Nations Framework Convention on Climate Change
WTP	Workplace Travel Plan
YAL	York Aviation Limited
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility

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