



Appeal by: Bristol Airport Limited

Appeal Reference: APP/D0121/W/20/3259234

North Somerset Council Application Reference: 18/P/5118/OUT

**Proof of evidence of
Dr Mark Broomfield BA DPhil MIAQM
Air Quality**

Reference: NSC/W3/1

Ricardo Energy and Environment



Ricardo
Energy & Environment

Proof of Evidence of Dr Mark Broomfield on behalf of North Somerset Council: Air Quality

Section 78 Town and Country Planning Act 1990 Appeal by Bristol Airport Ltd
against the refusal of application 18/P/5118/OUT for the development of Bristol
Airport to accommodate 12 million passengers per annum

PINS Appeal ref APP/D0121/W/20/3259234

Report ref. ED14606100 for North Somerset Council

Customer:

North Somerset Council

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Glossary and Abbreviations relevant to Air Quality

Term	Meaning
AQMA	Air Quality Management Area. An area designated by a local authority within which one or more air quality objectives are at risk of being exceeded
Air quality objective	A requirement that exceedances of an air quality standard must not exceed a specified number by a specified date. (Adapted from: https://uk-air.defra.gov.uk/air-pollution/uk-eu-limits)
Air quality standard	A concentration recorded over a given time period, which is considered to be acceptable in terms of what is scientifically known about the effects of each pollutant on health and on the environment. An air quality standard can also be used as a benchmark to indicate whether air pollution is getting better or worse. (Source: https://uk-air.defra.gov.uk/air-pollution/uk-eu-limits)
APU	Auxiliary Power Unit. This is a small gas turbine engine on an aircraft which allows an aircraft to operate autonomously without reliance on ground support equipment
Averaging period	The time over which a pollutant concentration is measured, modelled and evaluated. Relevant averaging periods range from one hour to a calendar year
Background	The background concentrations of air pollutants are the levels that occur in a location far from the influence of sources of pollution
Baseline	The baseline concentrations of air pollutants are the levels that occur in the absence of a specific new development, against which the impacts of the new development should be assessed.
Diffusion tube	A small (10-15 cm) plastic or metal tube containing an adsorbent material which traps specific airborne chemicals when exposed to the atmosphere over a period of time, typically 1 – 4 weeks. The adsorbent material is then analysed in a laboratory to determine the average air concentration during the exposure period.
µg/m ³	Micrograms per cubic metre, a measure of pollutant concentration
Nitric oxide, NO	An air pollutant, typically emitted from combustion processes and road traffic, with the chemical formula NO. Nitric oxide reacts reversibly to form nitrogen dioxide and vice versa, by interaction with sunlight, ozone and other oxidants in the atmosphere. Nitric oxide is less toxic than nitrogen dioxide.
Nitrogen dioxide, NO ₂	An air pollutant, typically emitted from combustion processes and road traffic, with the chemical formula NO ₂ . Nitrogen dioxide reacts reversibly to form nitric oxide and vice versa, by interaction with sunlight, ozone and other oxidants in the atmosphere. At high levels, nitrogen dioxide can have acute effects on health, and long-term exposure can also result in an increase in respiratory and cardiovascular disease, and premature deaths. Deposition of nitrogen dioxide also contributes to acidification and eutrophication.
Oxides of nitrogen, NO _x	For most practical purposes, oxides of nitrogen comprise nitric oxide (NO) and nitrogen dioxide (NO ₂).
Particulate matter	An air pollutant, emitted from a wide range of sources, including combustion processes, road traffic, agriculture, construction, and natural sources. Airborne particulate matter can cause a nuisance due to dust deposition, and finer fractions (including PM ₁₀ , PM _{2.5} and ultrafine particulate matter) can have effects on health.

PM ₁₀	Particulate matter with a diameter of less than 10 microns (10×10^{-6} metres). At high levels, PM ₁₀ can have acute effects on health, and long-term exposure can also result in an increase in respiratory and cardiovascular disease, and premature deaths.
PM _{2.5}	Particulate matter with a diameter of less than 2.5 microns (2.5×10^{-6} metres). At high levels, PM _{2.5} can have acute effects on health, and long-term exposure can also result in an increase in respiratory and cardiovascular disease, and premature deaths.
Ultrafine particulate matter (UFP)	Ultrafine particles refer to particulate matter that has at least one dimension less than 100 nanometres (nm). The term nanoparticles is also used to refer to the same entity. It is typical for >90% of the number of particles in the air to be in the UFP size range; but the contribution of these particles to the mass of particles in the air is very small. (Adapted from https://uk-air.defra.gov.uk/assets/documents/reports/cat09/1807261113_180703_UFP_Report_FINAL_for_publication.pdf)

1 Name and qualifications

1. My name is David Mark Broomfield. I am employed as an Associate Director with Ricardo Energy and Environment (Ricardo), a trading name of Ricardo-AEA Ltd. Ricardo is the largest specialist air quality consultancy in the UK, providing services on air quality and wider energy and environmental issues to a wide range of national and local government, commercial, international and other clients. I have held this position for 11 years, since April 2010 (I was on sabbatical between April and August 2017). Prior to joining Ricardo-AEA and its predecessor AEA Technology, I had 18 years' experience as an air quality and odour specialist in the environmental consultancy sector and in industry.
2. I have a BA in Natural Sciences (chemistry, first class) from the University of Cambridge, and a PhD in atmospheric chemistry from the University of York. I have acted as an expert witness at public inquiries, court hearings and other formal and informal proceedings on 40 previous occasions, providing written and verbal evidence on issues including air quality impact assessment; road traffic emissions; effects of emissions to air on natural ecosystems; odours; environmental and health effects of waste management; and perception of risks to health. I am a member of the Institute of Air Quality Management.
3. During the course of my work for a wide range of clients, I have carried out numerous projects in relation to the assessment of the air quality impacts associated with transportation, residential, industrial and other commercial, industrial and infrastructure developments. In relation to the air quality impacts of airport operations and developments, I have carried out projects in relation to Heathrow Airport (support to local authorities at the Terminal 5 planning inquiry) and Gatwick Airport (development of concept for "Air Quality Neutral Airport"). Most recently, I was the air quality expert witness on behalf of Uttlesford District Council at a planning inquiry following refusal of permission for a proposed increase in capacity of Stansted Airport.

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4. My expertise in relation to these proceedings covers the assessment and mitigation of air quality impacts due to airport operations and related road traffic emissions. The evidence which I have prepared and provide for this appeal Ref APP/D0121/W/20/3259234 in this proof of evidence is true and I confirm that the opinions expressed are my true and professional opinions. As such, I understand my duty to the Inspectors and I have complied with that duty.
 5. All of the opinions expressed in this Proof of Evidence are mine. This Proof of Evidence has been prepared on the basis of material that I have read myself. Where there is a range of opinion on a matter that I have dealt with in this Proof of Evidence, I have indicated what that range of opinions is and set out my reasons for the opinion that I have expressed.
 6. As a member of the IAQM I am bound by its Code of Professional Conduct which requires that members *“Maintain professional integrity at all times and be guided by the principle of applying the most appropriate science/practice for any given task. This requires members to display objectivity and refrain from being selective or partial when presenting data or facts for a written report or in oral form”*. I confirm that I have complied with this professional obligation in preparing this proof of evidence.

2 Instructions and scope of evidence

2.1 Background

7. On 11 December 2018, Bristol Airport Ltd (BAL) submitted to North Somerset Council (NSC) application Ref: 18/P/5118/OUT for planning permission for a development at Bristol Airport to enable a throughput of 12 million terminal passengers in any 12 month calendar period, comprising: 2no. extensions to the terminal building and canopies over the forecourt of the main terminal building; erection of new east walkway and pier with vertical circulation cores and pre-board zones; 5m high acoustic timber fence; construction of a new service yard directly north of the western walkway; erection of a multi-storey car park north west of the terminal building with five levels providing approximately 2,150 spaces; enhancement to the internal road system including gyratory road with internal surface car parking and layout changes; enhancements to airside infrastructure including construction of new eastern taxiway link and taxiway widening (and fillets) to the southern edge of Taxiway GOLF; the year-round use of the existing Silver Zone car park extension (Phase 1) with associated permanent (fixed) lighting and CCTV; extension to the Silver Zone car park to provide approximately 2,700 spaces (Phase 2); the provision of on-site renewable energy generation; improvements to the A38; operating within a rolling annualised cap of 4,000 night flights between the hours of 23:30 and 06:00 with no seasonal restrictions; revision to the operation of Stands 38 and 39; and landscaping and associated works.. The application was accompanied by supporting documents that included an Environmental Statement (ES).

8. Following meetings of its planning committee on 10 February and 18 March 2020, on 19 March 2020 NSC issued a Decision Notice refusing planning permission for application Ref: 18/P/5118/OUT on five grounds. Reason for refusal no.2 referred specifically to the effects of the proposed development on air quality, as follows:

“2 The noise and impact on air quality generated by the increase in aircraft movements and in particular the proposed lifting of seasonal restrictions on night flights would have a significant adverse impact on the health and well-being of residents in local communities and the proposed development would not contribute to improving the health and well-being of the local population contrary to policies CS3, CS23 and CS26 of the North Somerset Core Strategy 2017”

9. Reasons for refusal no.1 and no.5 are also potentially relevant to the air quality impact of the proposed development:

“1 The airport has planning permission to expand to a throughput of 10 million passengers per annum (mppa) which allows for further expansion in passenger growth of approximately 1 mppa above the current passenger level. The further expansion beyond 10mppa now proposed would generate additional noise, traffic and off airport car parking resulting in adverse

environmental impacts on communities surrounding Bristol Airport and which would have an adverse impact on an inadequate surface access infrastructure. The claimed economic benefits arising from the proposal would not outweigh the environmental harm caused by the development contrary to policy CS23 of the North Somerset Core Strategy 2017.

5 The proposed public transport provision is inadequate and will not sufficiently reduce the reliance on the car to access the airport resulting in an unsustainable development contrary to the National Planning Policy Framework and policies CS1 and CS10 of the North Somerset Core Strategy 2017.”

2.2 Instructions

10. I was instructed by North Somerset Council (NSC) to review the information on air quality submitted in connection with planning application 18/P/5118/OUT. The information I reviewed at that stage was primarily that contained within the Environmental Statement for the proposed development alongside relevant local planning policy and guidance. I also reviewed the NSC Report to the Planning and Regulatory Committee meeting held on 18 March 2021, and I have listened to the recordings of the Planning and Regulatory Committee meetings held on 10 February and 18 March 2021. I have also reviewed relevant information contained in the subsequent addendum to the Environmental Statement that was submitted to NSC on 30 November 2020.
11. Having reviewed that information, I had a number of concerns regarding the potential air quality impacts of the proposed development. I was satisfied that there were grounds for concern with regard to the air quality impact of the proposed development, in the context of national and local policy, which were consistent with the decision of NSC to refuse permission for the proposed development. I therefore assisted in the preparation of those parts of North Somerset Council's Statement of Case that relate to air quality issues.
12. This proof of evidence sets out the matters of concern regarding air quality and related impacts, to which I believe a decision maker needs to give consideration and weight when determining this appeal. They relate directly to Reason for Refusal No.2, and are also relevant to Reasons for Refusal No.1 and No.5. In particular, my evidence examines:
 - (a) The potential impact of the proposed development on the health and well being of local communities; and
 - (b) Whether the proposed development would contribute to improving the health and well being of the local population
13. My evidence includes consideration of the potential effectiveness of proposed mitigation measures, specified via condition, and/or through a Section 106 Agreement, and/or through a Unilateral Undertaking. However, I am not providing evidence on planning policy or the planning balance as this evidence is provided on behalf of NSC by Mr Gurtler.

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14. Following a brief description of the proposed development and its potential air quality impacts in Section 3, I go on to provide a summary of the relevant policy context in Section 4, and to consider the potential impacts of the proposed development on air quality in Section 5. I outline mitigation measures proposed by the appellant and their potential effectiveness in mitigating the air quality impacts of the proposed development in Section 6. I also consider further measures that could be considered for application through condition or other mechanisms in Section 6.
15. Finally, I set out my conclusions in relation to relevant policy and guidance in Section 7.

2.3 My experience of the site

16. With regard to air quality impacts, I consider that my review of the documents highlighted above was sufficient to gain a full understanding of the issues involved. However, in order to gain first hand experience of the airport and its surroundings, I visited the area surrounding Bristol Airport in May 2021 once this was permitted under Covid-19 related controls.

3 The proposed development and air quality

17. In my experience, the main air quality issues associated with airport operations and expansion fall into three categories:
18. Firstly, emissions from road vehicles accessing the airport, and the increases in those emissions that would result from an increase in capacity. In the UK, the principal pollutants of concern associated with road vehicles are oxides of nitrogen and particulate matter, particularly fine particulate matter, PM_{2.5}.
19. Secondly, emissions from aircraft during the Landing and Take-Off cycle. This includes contributions from taxiing on the ground, and while using the aircraft's Auxiliary Power Unit at the stand, if this is required. Typically, aircraft emissions tend to be less significant for local exposure to air pollution than road traffic emissions, but the details of this balance depend on local circumstances. Oxides of nitrogen and PM_{2.5} are again the key pollutants associated with emission from aircraft. Ultrafine particulate matter (UFP) is an emerging matter of concern for airport emissions (CD8.12 Section 4.4 page 67-68 and Section 7.1 page 94)
20. Thirdly, emissions from infrastructure at the airport such as airside vehicles and equipment, and combustion plant (e.g. Auxiliary Power Units (APUs) and plant for heating/cooling).
21. The ES Chapter 8 (CD2.5.19) describes the main potential air quality impacts of the proposed development in the section headed "Likely significant effects" (para. 8.7.24 to 8.7.33). This section highlights the following aspects of the proposed development as relevant to consideration of air quality impacts (para 8.7.25).
- (a) Increased aircraft movements, on the ground and in the air;

- (b) Increased ground support equipment (GSE) use;
 - (c) Increased landside road activity, including car park usage;
 - (d) Construction activity, including traffic; and
 - (e) Changes to road layouts and consequent changes to road traffic (e.g. reduced queuing).
22. I agree that these are the main sources of emissions to air that could be affected by the proposed development.
23. It is also important to be aware that changes to road layouts could potentially have adverse effects (for example, by moving road alignments closer to sensitive locations) as well as beneficial effects. Table 8.14 of the Environmental Statement indicates that the pollutants of potential concern are oxides of nitrogen, PM₁₀ and PM_{2.5}. While these pollutants are important, it is also important to include ultrafine particles (UFP) in the list of pollutants of potential concern. These are discussed further in Section 5.3.
24. It is therefore important to ensure that the air quality assessment supporting the application properly addresses the potential impacts of increased emissions from the sources listed in ES para 8.7.25. The ES and ESA does not provide a calculation of emissions from the proposed development, instead providing the results of air quality modelling to identify the changes in ground level concentrations of air pollutants that would be forecast to arise from the proposed development.
25. Following discussions with the appellant on 26 April 2021, the following information was provided email on 8 June 2021. This information confirms that the proposed development would give rise to increases in emissions of the key pollutants oxides of nitrogen and PM_{2.5} from the main source categories at the airport, as reproduced in Table 1. Unfortunately, the appellant was not able to provide information on emissions from vehicles travelling to and from the airport, but it is reasonable to deduce from the model results that proportionally similar increases in emissions would result from this source.

Table 1: Emissions of air pollutants associated with the airport and proposed development (T/year)

Source	Base 2017	2030 Core Case		
		10 mppa	12 mppa	Increase due to proposed development
Oxides of nitrogen				
Aircraft movements (LTO cycle)	455.16	680.60	815.85	135.25 (19.9%)
Ground support equipment	9.77	11.05	13.11	2.06 (18.6%)
Vehicles travelling to/from the airport	N/A	N/A	N/A	N/A

Source	Base 2017	2030 Core Case		
		10 mppa	12 mppa	Increase due to proposed development
Total (excluding vehicles travelling to/from the airport)	464.93	691.65	828.96	137.30 (19.9%)
PM₁₀				
Aircraft movements (LTO cycle)	6.90	5.94	6.96	1.03 (17.3%)
Ground support equipment	0.57	0.64	0.76	0.12 (18.6%)
Vehicles travelling to/from the airport	N/A	N/A	N/A	N/A
Total (excluding vehicles travelling to/from the airport)	7.47	6.58	7.73	1.15 (17.4%)
PM_{2.5}				
Aircraft movements (LTO cycle)	6.90	5.94	6.96	1.03 (17.3%)
Ground support equipment	0.41	0.47	0.55	0.09 (18.6%)
Vehicles travelling to/from the airport	N/A	N/A	N/A	N/A
Total (excluding vehicles travelling to/from the airport)	7.32	6.41	7.52	1.11 (17.4%)

26. As can be seen from Table 1, the overall effect of the proposed development is to increase airport emissions of NO_x in 2030 by 20% (137 tonnes per year) compared to the situation if the proposed development does not go ahead. Similarly, the proposed development would increase airport emissions of PM₁₀ in 2030 by 17% (1.15 tonnes per year), and would similarly increase PM_{2.5} in 2030 by 17% (1.11 tonnes per year) compared to Do-minimum. Similar additional increases in emissions of these air pollutants can be expected in airport-related road traffic.
27. These increases in emissions associated with the airport may potentially affect people located near to the airport; people located near to the roads used for access to/from the airport; and sensitive nature conservation sites near to the airport and relevant roads. The effects on air quality could potentially have consequences for public health. As discussed in Section 5, such effects occur even at concentrations below currently applicable air quality standards and guidelines.

4 Policy context

28. Although I am not providing planning evidence, in this section, I briefly outline the planning policy and guidance context which is relevant to air quality matters. Questions regarding the application of policy are however for Mr Gurtler to address on behalf of NSC.

4.1 International environmental policy

29. The approach to the environment taken by the UK, as a former member state of the European Union, has its root in the founding Treaty of the EU. As this sets the framework within which air quality directives and associated standards are set, it provides a useful aid to interpretation of air quality standards, as follows:

“1 . Action by the Community relating to the environment shall have the following objectives:

- to preserve , protect and improve the quality of the environment ,*
- to contribute towards protecting human health ...*
- to ensure a prudent and rational utilization of natural resources .*

2 . Action by the Community relating to the environment shall be based on the principles that preventive action should be taken , that environmental damage should as a priority be rectified at source , and that the polluter should pay . Environmental protection requirements shall be a component of the Community's other policies.”

(Treaty establishing the European Economic Community, part Three
“Policy of the Community,” Title VII: Environment, Article 130R)

30. This sets out the basis for managing air quality issues in Europe, referring to preventive action, rectification at source, and the principle that “the polluter pays”. This has led to the development and implementation of directives which set limit values for air quality in the European Union. The direction of policy set out in these directives goes beyond simple compliance with the air quality limit values by the dates specified in the directives. For example, the Second Recital of the 2008 Air Quality Directive states:

“In order to protect human health and the environment as a whole, it is particularly important to combat emissions of pollutants at source and to identify and implement the most effective emission reduction measures at local, national and Community level. Therefore, emissions of harmful air pollutants should be avoided, prevented or reduced and appropriate objectives set for ambient air quality taking into account relevant World Health Organisation standards, guidelines and programmes.” (emphasis added)

31. The 11th Recital of the 2008 AQ Directive states:

“Fine particulate matter (PM_{2.5}) is responsible for significant negative impacts on human health. Further, there is as yet no identifiable threshold below which PM_{2.5} would not pose a risk. As such, this pollutant should not be regulated in the same way as other air pollutants. The approach should aim at a general reduction of concentrations in the urban background to ensure that large sections of the population benefit from improved air quality. However, to ensure a minimum degree of health protection everywhere, that approach should be combined with a limit value, which is to be preceded in a first stage by a target value.” (emphasis added)

32. More recent evidence confirms that there remains no identifiable threshold for an effect on health due to PM_{2.5}. For example, a 2016 World Health Organization report stated:¹ *“Since the publication of the latest WHO guidelines, new studies have emerged showing associations between both short- and long-term exposure including mortality and cardiovascular disease morbidity at levels below the existing WHO guideline values.”*
33. Therefore, particularly in respect of PM_{2.5}, to conform with these over-arching principles, when a development affecting air quality is proposed, it is important to go beyond simple consideration of whether air quality standards are breached. Rather, the EU policy approach requires emissions to be avoided where possible, prevented if they cannot be avoided, and where they cannot be prevented for controls to be imposed to reduce emissions as far as possible. This principle has been applied in a wide range of contexts including industrial pollution control,² and in UK national aviation policy (see Section 4.3).

4.2 National air quality policy

34. The national Clean Air Strategy 2019 (CD8.7) sets the Government’s framework for management and improvement of air quality in the UK. Section 1.3 of this document refers to existing statutory obligations in the UK to keep concentrations of specified pollutants below certain levels. These levels (known as “air quality standards” or “air quality objectives”) were used as reference points in the Environmental Statement for the proposed development.

¹ WHO Expert Consultation, “Available evidence for the future update of the WHO Global Air Quality Guidelines (AQGs) Meeting report, Bonn, Germany, 29 September-1 October 2015. Available from: https://www.euro.who.int/_data/assets/pdf_file/0013/301720/Evidence-future-update-AQGs-mtg-report-Bonn-sept-oct-15.pdf

² For example, R (Rockware Glass Ltd) v Quinn Glass Limited, Chester City Council [2006] EWCA Civ 992 at paragraph 34: *“To put it bluntly, those who for their commercial purposes introduce potentially polluting operations have to be closely controlled, and cannot freeloader on non-polluting local citizens by simply claiming that the [Air Quality Standards] to which we all contribute has not yet been damaged.”*

35. The Clean Air Strategy (CD8.7 section 1.3) outlines that the UK has an obligation to achieve air quality limit values specified in Directive 2008/50/EC. These are transposed into UK law through the Air Quality Standards Regulations 2010. The Environment Act 1995 sets out a framework for Local Air Quality Management. This includes national air quality objectives which are in many cases identical to the air quality standards. The relevant air quality standards for assessing impacts on the local population are set out in the ES (CD2.5.20 Appendix 8D Table 8D.9). Compliance with those limits is certainly an important factor to be taken into account in assessing the air quality impacts of a development, but this does not provide a complete assessment of the potential impacts of the proposed development in the context of wider policy and emerging understanding of the effects of air pollution on health. Both local policy and recent national policy on air quality and aviation take a more ambitious approach to particulate matter (PM_{2.5}) and seek to ensure protection against the effects on health which are now known to occur even when levels of airborne pollutants comply with the current national air quality standards.
36. The national Clean Air Strategy also explains how the Government will tackle all sources of air pollution moving forward. As part of this Strategy, the Government has indicated its commitment to progressively cut public exposure to particulate matter pollution. Section 2.4 of the Clean Air Strategy includes a commitment to significantly tighten the current air quality objective for fine particulate matter, PM_{2.5} in the following terms:

“All ambitions to reduce average population exposure will deliver positive health benefits. That is why we have already signed up to meet ambitious emissions ceilings by 2020 and 2030 and why we now want to go further by setting a new world-leading goal to reduce human exposure to PM_{2.5}.

The UK sets air quality goals, informed by evidence from a range of sources. These include the World Health Organization (WHO) 2008 guidelines, recognised as the international benchmark for setting air quality standards.

...

The WHO guidelines recommend an ultimate goal for concentrations of PM_{2.5} of 10 µg/m³. This is less than half the current EU limit and the WHO recognises that this represents a significant challenge. 92% of the global population currently live in areas that exceed this goal.⁴⁰ The WHO therefore recommend a step-by-step approach to achieve progressive reductions. Reflecting this, we will set a bold new goal to progressively cut public exposure to particulate matter pollution, as suggested by the WHO...

... To support this we will publish evidence early in 2019 to examine what action would be needed to meet the WHO annual mean guideline limit of 10 µg/m³ and use this to set a new, ambitious, long-term target to reduce people’s exposure to PM_{2.5} even further. We will review our progress in 2022, setting out detailed interim objectives and reporting publically on our

progress. This will set a clear national ambition to drive down human exposure to PM_{2.5} as rapidly as is feasible.”

37. From this, I conclude that there is a clear policy commitment and direction of travel towards a tightening of the air quality objective for PM_{2.5}. This is particularly relevant in view of the scale and significance of Bristol Airport in terms of its effects on the local environment. The ES Addendum presents estimates of air quality impacts at 2030 when the airport is forecast on the Core Scenario to reach its capacity in terms of aircraft movements. At the same time, the Government clearly intends to move from the current objective of 25 µg/m³ towards the WHO annual mean guideline of 10 µg/m³ with a review scheduled for 2022 and an exposure reduction target specified for 2025. In my opinion, it is important that the assessment of a large-scale and long-term project such as the proposed development should take this commitment to a tightening of air quality policy at a national level into account. I have identified only one single reference to the WHO annual mean guideline of 10 µg/m³ in the ES Appendix 8A (CD2.5.20) para 8.1.3. While the importance of this guideline was noted in the ES Appendix 8A, no attempt was made to assess the impact of the proposed development against this guideline. The position was improved in the ES Addendum (see ES Addendum CD2.20.1 section 7.6.9), which did include an assessment of the impact of the proposed development against the WHO guideline for PM_{2.5}.
38. The contribution of the aviation sector to achieving these policy commitments is set out in the Clean Air Strategy section 5.6. This links to the Government’s aviation strategy “Aviation 2050,” discussed in the following section.
39. Recently, an inquest into the tragic death of Ella Kissi-Debrah has highlighted the links between air pollution and the risks of early death. The Coroner’s “*Report to prevent future deaths*” (CD8.13 section 5 item 1) identifies as a matter for concern:
- “The national limits for Particulate Matter are set at a level far higher than the WHO guidelines. The evidence at the inquest was that there is no safe level for Particulate Matter and that the WHO guidelines should be seen as minimum requirements. Legally binding targets based on WHO guidelines would reduce the number of deaths from air pollution in the UK.”*
40. This only confirms the importance of careful consideration of the potential impacts of the airport in relation to the WHO guideline for PM_{2.5}.

4.3 National aviation policy

4.3.1 Aviation Policy Framework (2013)

41. In relation to air quality matters, the Government’s Aviation Policy Framework dates from 2013 (CD6.1) and states:

“3.51 Studies have shown that NO_x emissions from aviation-related operations reduce rapidly beyond the immediate area around the runway. Road traffic remains the main problem

with regard to NOx in the UK. Airports are large generators of surface transport journeys and as such share a responsibility to minimise the air quality impact of these operations. The Government expects them to take this responsibility seriously and to work with the Government, its agencies and local authorities to improve air quality.”

42. In my opinion, this highlights the need to pay particular attention to the impact on air quality of surface transport, and for airports to take specific steps, not just to avoid significant impacts, but actually to improve air quality. This policy is aligned with the overarching policy objectives to improve air quality set out in Section 4.1 and Section 4.2.
43. The Aviation Policy Framework focuses on oxides of nitrogen (NOx) because it notes in Section 3.50 that “PM [Particulate Matter] *limits are largely met ...*” However, this is a statement of policy from 2013 and as such does not reflect the work which has been undertaken since that date which confirms that there is no safe level for airborne particulate matter (see Section 5.2 below), or the more recent moves towards more demanding standards for PM_{2.5} set out in the more recent national Clean Air Strategy of 2019 (CD8.7). In my opinion, the commitment in the national Clean Air Strategy, to move towards a much more demanding air quality standard for PM_{2.5} (discussed in Section 4.2 above) means that the Aviation Policy Framework is now out of date in relation to its consideration of particulate matter. In my view it is very important to continue to focus on particulate matter, and particularly PM_{2.5} and ultrafine particulate matter.

4.3.2 Beyond the Horizon - the future of UK aviation (2017/2018)

44. I understand that three relevant documents have been produced by DfT under this programme. “A call for evidence” of 2017 (CD6.10) pointed towards the then upcoming national Clean Air Strategy, and indicated that the Government was exploring whether it would take a more pro-active role in tackling air pollution from aviation (CD6.10 paragraph 7.34).
45. “Next steps towards an aviation strategy” (CD6.3) was published in April 2018. This makes a more generic commitment:
- “6.4 In parallel, the Government must ensure that growth is sustainable and is balanced with local and global environmental concerns. The Government has an important role in ensuring the negative impacts of aviation are mitigated. At a local level, aviation noise is the key environmental concern, and the Government will consider whether the right regulations, controls and incentives are in place to ensure the sector continues to address noise impacts as well as tackling air quality concerns.”*
46. In Section 6.25, this paper concludes that surface transport is the main source of air quality impacts around airports. It emphasises that the aviation sector should play “*an appropriate role in managing the emissions that it can control.*” This is consistent with wider commitments to improve air quality in the national Clean Air Strategy and overarching environmental policy, and highlights that airports and the aviation sector are expected make an appropriate contribution to improving air quality.

47. *"Making best use of existing runways"* (CD6.4) was published in July 2018. In relation to air quality issues, this document confirms the relevance of the National Clean Air Strategy and the importance of consideration of environmental concerns through the local planning process (paragraph 1.9). It goes on to recognise the potential adverse impacts of airports on local air quality (paragraph 1.22), and to highlight the importance of demonstrating how such impacts will be mitigated (paragraph 1.24):

"1.22 The government recognises the impact on communities living near airports and understands their concerns over local environmental issues, particularly noise, air quality and surface access. As airports look to make the best use of their existing runways, it is important that communities surrounding those airports share in the economic benefits of this, and that adverse impacts such as noise are mitigated where possible.

...

1.24 As part their planning applications airports will need to demonstrate how they will mitigate local environmental issues ..."

4.3.3 Airports National Policy Statement (2018)

48. The Airports National Policy Statement (CD6.9) was published in June 2018. I understand that legal proceedings relating to this document were dismissed by the Supreme Court. This National Policy Statement provides the primary basis for decision making on development consent applications for a Northwest Runway at Heathrow Airport, and is a relevant consideration in respect of applications for new runway capacity and other airport infrastructure in London and the South East of England.

49. Within that scope, the Airports National Policy Statement makes the following comments on air quality which highlight a similar range of issues to those relevant for consideration of this appeal.

"5.42 In order to grant development consent, the Secretary of State will need to be satisfied that, with mitigation, the scheme would be compliant with legal obligations that provide for the protection of human health and the environment."

"5.43 Air quality considerations are likely to be particularly relevant where the proposed scheme:

- is within or adjacent to Air Quality Management Areas, roads identified as being above limit values, or nature conservation sites (including Natura 2000 sites and Sites of Special Scientific Interest);*
- would have effects sufficient to bring about the need for new Air Quality Management Areas or change the size of an existing Air Quality Management Area, or bring about*

changes to exceedances of the limit values, or have the potential to have an impact on nature conservation sites; and

- *after taking into account mitigation, would lead to a significant air quality impact in relation to Environmental Impact Assessment and / or to a deterioration in air quality in a zone or agglomeration.”*

4.3.4 Aviation 2050 (2018)

50. As with the national Clean Air Strategy, an expectation that airports will play a leading role in improving air quality is set out in the DfT Aviation 2050 Green Paper of 2018 (CD6.5) which states:

“3.101 The government expects airports to make the most of their regional influence to provide innovative solutions and incentives against ambitious targets which reduce carbon and congestion and improve air quality.”

51. As regards air quality, I understand this to mean that airports should set ambitious targets to improve air quality. I would expect such targets to focus on calculated airport emissions, the calculated effects of these emissions on air quality obtained using modelling studies, and/or trends in measured levels of air pollutants in the areas potentially affected by airport activities. I would expect such targets to require improvements in future impacts compared to current air quality metrics, and/or to require improvements in future impacts compared to a “business as usual” scenario to represent the situation if improvements are not made. This policy is aligned with the overarching policy objectives to improve air quality set out in Section 4.1 and Section 4.2 of my Proof of Evidence above.
52. Aviation 2050 goes on to propose improvements to the monitoring of ultrafine particles (UFP) leading to improved understanding of the impact of aviation on UFP, and to make commitments relating to air quality monitoring and management plans (paragraph 3.127).

4.3.5 Summary

53. In summary, national aviation policy requires airports to deliver improvements in air quality, where possible. The Aviation Policy Framework and Aviation 2050 are consistent on this point. That means that it is not enough simply to avoid exceeding air quality standards. Airports should be seeking to demonstrate ongoing improvements in air quality. Aviation 2050 specifically indicates that airports should improve air quality by providing “*innovative solutions and incentives against ambitious targets.*”
54. An airport seeking permission for a new development should start by seeking to ensure that the new development will deliver an improvement in air quality, whether that is delivered through the inherent features of the proposed development, or through mitigation measures secured via Conditions or legal agreements. An airport development which delivers a worsening of air quality, and which does not demonstrate that this will be comprehensively offset by the use of

innovative solutions and incentives against ambitious targets, would not be compliant with the requirements of national aviation policy.

4.4 National Planning Policy Framework (2019)

55. NPPF (CD5.8) Paragraphs 170, 180 and 181 are relevant for consideration of the proposed development. Paragraph 170 of the NPPF from the section entitled “Conserving and enhancing the natural environment” is relevant to air quality as a component of the local environment and in terms of the potential effects on natural ecosystems due to changes in air pollution:

“170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

...

d) minimising impacts on and providing net gains for biodiversity ...

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of ... air ... pollution ... Development should, wherever possible, help to improve local environmental conditions such as air and water quality” (emphasis added)

56. NPPF paragraphs 180 and 181 are within the section entitled “Ground conditions and pollution,” and state:

“180. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development...”

“181 Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.” (emphasis added)

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57. From this, I conclude that national planning policy is that development should contribute to and enhance the natural and local environment by preventing new or existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of air pollution. Further, it is national planning policy that development should, wherever possible, help to improve local environmental air quality conditions (para. 170(e)). Opportunities to improve air quality or mitigate impacts should be identified (para. 181). I regard these aspects of national planning policy as consistent with the EU approach to “avoid, prevent, reduce” emissions of harmful air pollutants (section 4.1 above) and the national aviation policy approach which requires airports to improve air quality (section 4.3 above).
58. The NPPF thus supports the overarching policy framework for improving air quality, and the approach identified at a national level in respect of aviation. Emissions to air associated with airports should thus be expected to reduce over time, and not increase.
59. The above objectives are reflected in National Planning Practice Guidance for air quality (CD5.9 “Air Quality” section). In relation to Plan Making for example, this Guidance explains that *“Consideration of air quality issues at the plan-making stage can ensure a strategic approach to air quality and help secure net improvements in overall air quality where possible.”* (ID: 32-002)
60. This guidance goes on to highlight that (ID: 32-005):
- “Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations”*
61. This Guidance also indicates that air quality assessments could include *“measures that could deliver improved air quality even when legally binding limits for concentrations of major air pollutants are not being breached”* (ID: 32-007)
62. It is clear from the national policy context that the test for whether a development can be viewed as delivering improvements in air quality is to compare:
- a) The future situation if the proposed development goes ahead
 - b) The future situation if the proposed development does not go ahead
63. Air quality is forecast to generally improve over the coming 10 to 20 years. However, a new development cannot identify this general improvement as delivering conformance with the policy requirement to deliver improvements in air quality. The development itself must deliver this improvement. This was confirmed in a recent judgment,³ in which it was held (paragraph

³ G Cameron vs Manchester City Council, Case No. Co/4745/2019, Neutral Citation No. [2021] EWHC 336 Admin, Approved Judgement of His Honour Judge Bird, 19 February 2021

40) that an air quality assessment should “compare the future baseline with the position that would prevail if the development was in place”.

64. As regards mitigation, the National Planning Policy Guidance states (ID:32-008):

“Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact. It is important that local planning authorities work with applicants to consider appropriate mitigation so as to ensure new development is appropriate for its location and unacceptable risks are prevented. Planning conditions and obligations can be used to secure mitigation where the relevant tests are met.”

4.5 Local policy

65. The North Somerset Vision is set out in the North Somerset Partnership’s Sustainable Community Strategy 2008 – 2026 (SCS). The Vision is for: “Sustainable, inclusive, safe, healthy, prosperous communities thriving in a quality environment,” and the SCS goes on to highlight a shared priority of “Improving health and wellbeing” (page 2). In a survey carried out to develop this shared priority, “improved road safety and reduced traffic fumes” was highlighted as a community priority (page 38). This highlights the importance placed by the local community on reducing traffic pollution.
66. Reason for Refusal No.2 cites policies CS3, CS23 and CS26 of the North Somerset Core Strategy 2017 (CD5.6). These policies reflect national policy in relation to environmental quality, air quality and aviation, and are as follows:

CS3: Environmental impacts and flood risk assessment

Development that, on its own or cumulatively, would result in air, water or other environmental pollution or harm to amenity, health or safety will only be permitted if the potential adverse effects would be mitigated to an acceptable level by other control regimes, or by measures included in the proposals, by the imposition of planning conditions or through a planning obligation.

CS23: Bristol Airport

Proposals for the development of Bristol Airport will be required to demonstrate the satisfactory resolution of environmental issues, including the impact of growth on surrounding communities and surface access infrastructure.”

CS26: Supporting healthy living and the provision of health care facilities

The planning process will support programmes and strategies which increase and improve health services throughout the district, promote healthier lifestyles and aim to reduce health inequalities. This will be achieved through:

- 1) Requiring Health Impact Assessments (HIA) on all large scale developments in the district that assess how the development will contribute to improving the health and well being of the local population; ...*

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67. Policy CS3 confirms that new development will only be permitted if the resulting air pollution or harm to amenity or health would be mitigated to an acceptable level. In Section 7.2 of my evidence, I discuss what should be considered an “*acceptable level*” in the context of a proposed airport development, and in the context of the requirement of CS26 for development to contribute to improving health and well-being.
68. Policy CS23 refers specifically to the development of Bristol Airport. This policy requires the satisfactory resolution of environmental issues, and makes specific reference to the impact of airport growth on surrounding communities. Again, in Section 7.2 of my evidence I discuss what should be considered as “*satisfactory resolution*” of air quality issues resulting from a proposal for growth at Bristol Airport, in the context of the requirement of CS26 for an improvement in health and well-being.
69. Policy CS26 requires a Health Impact Assessment to be carried out to assess how a new large scale development will contribute to improving health and well-being of the local population. One key objective of this policy is to identify the potential health gains that could result from new development, and ensure that large scale development delivers improved health and well-being locally (CD5.6 para 3.320). I understand that the proposed expansion of Bristol Airport should be considered as a large scale development for the purposes of this policy. As such the development is expected to contribute to an improvement to health and well-being. This would be consistent with the policy objectives of national aviation and national planning policy described in Sections 4.1 to 4.4 above.
70. I am concerned that the Human Health chapters of the ES (CD2.5.42) and ES Addendum (CD2.20.1 Chapter 9) do not present a full picture of health impacts of the proposed development due to increases in air pollution, since they does not recognise that adverse health impacts arise even at levels below current air quality standards and objectives.

4.6 Bristol Airport Ltd policy

71. So far as I am aware, Bristol Airport Ltd (BAL) has not set any air quality targets and does not currently have any published policy with regard to the assessment or improvement of its air quality impact. The airport produces a short report on air quality monitoring as part of its “Annual Monitoring Report,” which is published via the airport’s Sustainability webpage.⁴ So far as I am aware, the airport has not to date made any wider commitments (either innovative solutions or incentives) that would reduce its air quality impact and result in an improvement in air quality.

⁴ <https://www.bristolairport.co.uk/about-us/environment/sustainability>

5 Air quality effects of the proposed development

72. The key pollutants for consideration in relation to the potential air quality impacts of the proposed development are as follows.

5.1 Nitrogen dioxide

73. The ES Addendum indicates that, by 2030, nitrogen dioxide levels at all potentially relevant locations will comply with the air quality standard of 40 µg/m³ (ESA CD2.20.1 Table 7.1 and CD20.20.5 Table 7A.1). The proposed development is forecast to have a range of effects on levels of nitrogen dioxide, resulting in a range of changes to nitrogen dioxide levels of between -1.4% of the air quality standard (i.e. an improvement in air quality) to an increase of 7.8% of the air quality standard (i.e. a worsening of air quality). An improvement in air quality is forecast at only one of the 138 human exposure locations for which data are provided in Table 7A.1. At the remaining 137 locations, the proposed development would result in a worsening of air quality. These forecasts are subject to uncertainty linked to factors such as the difficulties of forecasting the types of aircraft that will use Bristol Airport in the future, and the difficulties of knowing when the forecast increases in passenger numbers will occur (as described in the evidence of Mr Folley).

74. The health effects of nitrogen dioxide are described by the UK Government's Committee on the Medical Effects of Air Pollutants (COMEAP) (CD8.14 page 1) as follows:

"Studies have shown associations of nitrogen dioxide (NO₂) in outdoor air with adverse effects on health, including reduced life expectancy. It has been unclear whether these effects are caused by NO₂ itself or by other pollutants emitted by the same sources (such as traffic). Evidence associating NO₂ with health effects has strengthened substantially in recent years and we now think that, on the balance of probability, NO₂ itself is responsible for some of the health impact found to be associated with it in epidemiological studies."

75. A subsequent report by COMEAP (CD8.15 page viii) found:

"The available evidence does not suggest that a threshold for effects exists at the population level. However, as only some of the studies have included formal tests for this, the possibility of a threshold cannot be ruled out. It was considered possible that any level of annual average concentration of NO₂ would imply additional risk to at least some of the population, whether from NO₂ itself, assuming it has an effect, or from co-varying pollutants. Recent studies have shown associations of mortality with annual average NO₂, at concentrations lower than previous studies had shown, and there is now evidence of associations in cohorts in which the range of outdoor levels reaches as low as 5 µg/m³ annual average NO₂ concentration."

76. That is, exposure to nitrogen dioxide has a range of effects on health which include increasing mortality. The evidence indicates that there is either no threshold for these effects, or at best, a very low threshold. COMEAP went on to advise that exposure to nitrogen dioxide would result in an increase of 1.006 to 1.013 in mortality rate per 10 µg/m³ of NO₂ (CD8.15 second page numbered vii).
77. As a result, from the perspective of adverse health impacts it is not sufficient to conclude that because air quality standards or objectives are met with the proposed development, that there would be no adverse health impact arising from the development. The proposed development will result in an increase in emissions of NO_x compared to the position if the development did not occur. Even though impacts may be classified as “slight” or “negligible” at individual receptors, the proposed development will give rise to an adverse change in exposure to nitrogen dioxide in the local population at almost every location considered in the ES and ESA.
78. The effects of the proposed development on nitrogen dioxide concentrations would thus not contribute to improving the health and well-being of the local population. In fact, increases in exposure to nitrogen dioxide, even though these would be within the current air quality standards, would result in increased risks to health, principally an increase in mortality in the local population. While it is not possible to quantify the precise extent of these increased risks, the information provided with the application demonstrates that the development would result in an increase in risks to health, contrary to the requirements of national aviation and planning policy, and Policies CS3, CS23 and CS26 of the North Somerset Core Strategy 2017.

5.2 Particulate matter (PM₁₀ and PM_{2.5})

79. The ES Addendum indicates that, by 2030, PM₁₀ levels at all potentially relevant locations will comply with the air quality standard of 40 µg/m³ (ESA CD2.20.1 Table 7.2 and CD20.20.5 Table 7A.2). PM_{2.5} levels at all potentially relevant locations are forecast to comply with the national air quality standard of 25 µg/m³ (ESA CD2.20.1 Table 7.3 and CD20.20.5 Table 7A.3). PM_{2.5} levels at two of the assessed locations were forecast to be above the WHO Guideline of 10 µg/m³ (ESA CD2.20.1 Table 7.3 and paragraph 7.7.33). The proposed development would result in a slight increase in PM_{2.5} levels at both these locations. In this context, it is hard to see how the ES Addendum can claim that *“the Proposed Development is consistent with the target in Defra’s Clean Air Strategy to halve the number of people living in locations where concentrations of particulate matter are above 10 µg m⁻³ by 2025.”* In fact, the proposed development is making it harder to reduce the number of people living in locations where the WHO guideline is exceeded.
80. The proposed development is forecast to have a range of effects on levels of PM₁₀ and PM_{2.5}, resulting in a range of changes to PM₁₀ levels of between -1.0% of the air quality standard (i.e. an improvement in air quality) to an increase of 2.0% of the air quality standard (i.e. a worsening of air quality). The development would result in a range of changes to PM_{2.5} levels

of between -2.2% of the WHO guideline to 4.9% of the WHO guideline. An improvement in air quality is forecast at only four of the 133 locations for which data are provided in Tables 7A.3 and 7A.3. At 124 locations, the proposed development would result in a worsening of air quality (no change is forecast at five locations). As with nitrogen dioxide, these forecasts are subject to uncertainty linked to factors such as the difficulties of forecasting the types of aircraft that will use Bristol Airport in the future, and the difficulties of knowing when the forecast increases in passenger numbers will occur, as described in the evidence of Mr Folley.

81. The effects of PM_{2.5} on mortality are described by Defra as follows (CD8.18):

"Inhalation of particulate pollution can have adverse health impacts, and there is understood to be no safe threshold below which no adverse effects would be anticipated. The biggest impact of particulate air pollution on public health is understood to be from long-term exposure to PM_{2.5}, which increases the age-specific mortality risk, particularly from cardiovascular causes. Several plausible mechanisms for this effect on mortality have been proposed, although it is not yet clear which is the most important. Exposure to high concentrations of PM (e.g. during short-term pollution episodes) can also exacerbate lung and heart conditions, significantly affecting quality of life, and increase deaths and hospital admissions. Children, the elderly and those with predisposed respiratory and cardiovascular disease, are known to be more susceptible to the health impacts from air pollution."

82. COMEAP specifically investigated mortality risks of PM_{2.5}, and concluded (CD8.16 page 1 para iii):

"We are left with little doubt that long-term exposure to air pollutants has an effect on mortality and thus decreases life expectancy."

83. A subsequent statement by COMEAP (CD8.17 page 1) confirmed: *"There is good evidence that PM_{2.5} plays a causal role in shortening life."* The Government's August 2020 Policy Paper on Environmental Targets in support of the Environment Bill (CD8.19) also highlights the benefits for public health of improving air quality in areas which already comply with the national air quality standards, as follows:

"Reducing the annual mean level of fine particulate matter (PM_{2.5}) in ambient air (as required by the Environment Bill) ... Whilst a new concentration 'threshold' target will be challenging to meet in certain parts of the country (especially in densely populated urban areas), it will not drive action to improve air quality in parts of the country which already achieve the threshold value. Such a target will also not drive action once that threshold level has been achieved. Therefore, a concentration 'threshold' target alone is unlikely to result in the greatest public health benefit. Public Health England estimate that just a 1µg/m³ reduction in PM_{2.5} concentrations this year could prevent 50,000 new cases of coronary heart disease and 9,000 new cases of asthma by 2035."

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84. COMEAP indicates that most or all of the health effects associated with PM₁₀ are due to exposure to PM_{2.5} (CD8.16 page 19 paragraph 3): “... *PM₁₀ appears to have a weaker effect on the relative risk of death from all-causes than PM_{2.5} (i.e. the evidence was strongest for PM_{2.5}). The evidence as a whole points to PM_{2.5} as the most satisfactory index of particulate air pollution to use in quantitative assessments.*”
85. In summary, increasing exposure to PM_{2.5} even at levels which comply with national air quality standards will have a range of effects on health which include increasing the risk of mortality. COMEAP made the following comments in relation to the possible existence of a threshold for these effects (CD8.16 page 31):
- “In general, it is accepted on the basis of time-series studies that no threshold of the effect of particulate matter on mortality can be defined for the population as a whole. This has caused some difficulties for toxicologists asked to explain effects at very low concentrations, but the likely distributions of exposure, together with the sensitivity of some individuals across large populations, make it plausible that there is some risk to some individuals even at very low background concentrations. ... We found that no evidence of a threshold has been produced – nor is there any sign of the line representing the association decreasing in slope as it approaches very low concentrations.”*
86. COMEAP advised that increased exposure to PM_{2.5} would result in an increase of 1.04 to 1.08 in mortality rate per 10 µg/m³ of PM_{2.5} (CD8.17 paragraph 3) with no apparent threshold for this effect.
87. On the basis of the information set out above, from the perspective of adverse health impacts it is not sufficient to conclude that because air quality standards or objectives are met with the proposed development, that there would be no adverse health impact arising from the development. The proposed development will result in an increase in emissions of PM_{2.5} compared to the position if the development did not occur, and is forecast to increase PM_{2.5} concentrations at two locations where levels are forecast to continue to exceed the WHO guideline for PM_{2.5}. Even though impacts may be classified as “negligible” at individual receptors, the proposed development will give rise to an adverse change in exposure to PM_{2.5} in the local population at almost every location considered in the ES and ESA, with a consequent increase risk to mortality and of other health effects.
88. I conclude that the effects of the proposed development on PM₁₀ and PM_{2.5} concentrations would not contribute to improving the health and well-being of the local population. In fact, increases in exposure to PM₁₀ and PM_{2.5} would result in increased risks to health, principally an increase in mortality in the local population. This would be the case even though levels of PM₁₀ and PM_{2.5} are forecast to be within the current air quality standards, and largely (though not entirely) within the WHO guidelines. While it is not possible to quantify precisely the precise extent of these increased risks, the information provided with the application demonstrates that

the development would result in an increase in risks to health, contrary to the requirements of national aviation and planning policy, and Policies CS3, CS23 and CS26 of the North Somerset Core Strategy 2017.

5.3 Ultrafine particulate matter

89. Particles with a diameter of less than 0.1 microns ($PM_{0.1}$) are often referred to as “ultrafine particles” (UFP). A report published by Defra’s Air Quality Expert Group in July 2018 (CD8.12 section 1.5 page 18) summarised the health impacts of UFP as follows:

“UFP penetrate deep into the respiratory system, allowing interactions with lung tissue and potential translocation into the blood stream. This, together with the hypothesis that the toxicity of particulate matter is governed by the surface area of the particles rather than their mass, has led to suggestions that ultrafine particles may be particularly harmful to health (HEI, 2013).

Recent authoritative reviews (WHO, 2013; HEI, 2013) have noted that few epidemiological studies investigating concentration-effect relationships for UFP are available, because of insufficient measurements of UFP metrics such as particle number concentration. The World Health Organization (WHO, 2013) concluded that the epidemiological data are currently too scarce to evaluate or to use as the basis for recommending an air quality guideline for UFP.

Nonetheless, in the light of evidence that UFP act (in part) through mechanisms not shared with larger particles and can contribute to the health effects of PM, they recommended that efforts to reduce the numbers of UFP in engine emissions should continue (WHO, 2013). The Health Effects Institute (HEI, 2013) considered that the current evidence did not convincingly support the suggestion that UFPs alone can account in substantial ways for the adverse effects that have been associated with ambient pollutants such as $PM_{2.5}$. However, they noted that independent effects of UFP could not be ruled out, given the limitations of the current evidence base.”

90. The importance of airports as a source of UFP is highlighted in the DfT Aviation 2050 Green Paper (CD6.5) section 3.127. The Government’s Air Quality Expert Group (AQEG) report included specific consideration of the effects of aviation on levels of ultrafine particles, finding significant increases in the vicinity of airports and a growing contribution from airports and aviation sources to airborne ultrafine particles into the future. This report (CD8.12 section 4.4 page 67) states:

“There have been several measurement campaigns at or close to airports that have reported UFP concentrations. These studies generally report relatively high PN [particle number] concentrations can be found close to airports, which can often exceed the concentrations of PN close to nearby roads.”

91. No information on ultrafine particulates was provided in the ES or during the determination process that would have enabled consideration of the risks posed by ultrafine particles.

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- Because of this, there was no identification of suitable measures that may be required to ensure that local residents are not exposed to an increase in risk to health due to ultrafine particles associated with the proposed development, or to assess the scale of risks due to increased exposure to UFP resulting from the proposed development.
92. The ESA marginally improved on the position in the ES by acknowledging the reference to UFP in Aviation 2050 (CD2.20.1 para 7.2.6), but did not go on to make any quantitative or qualitative evaluation of the potential effect of the proposed development on UFP or the effects that UFP could have on health. As a result, the potential effect of the proposed development upon health associated with emissions of UFP were not included in the health chapters of the ES or the ESA.
93. The connection between UFP and impacts on health is recognised in current policy and guidance. UFPs are a component of PM_{2.5}, but because of their small size have unique and unquantifiable impacts on health. These may exceed the impacts associated with PM_{2.5}, and may be more associated with the number of particles than the mass of particles. AQEG notes that this has *“led to suggestions that ultrafine particles may be particularly harmful to health”* (CD8.12 section 1.5). This indicates that a small change in exposure to UFPs may have a greater health impact than a larger change in exposure to PM_{2.5}. The methods and data needed to carry out a quantitative assessment of these effects are not currently available. However, that does not mean that potential impacts from UFP should not be considered, taken into account, addressed, and where possible mitigated. Although evidence is limited, as with PM_{2.5}, there is no reason to consider that there is a threshold for the effects of UFPs on health.
94. In this situation where the quantity of UFP emissions and their associated impact on health cannot be quantified, I consider that one approach to minimise the risk of adverse impacts due to ultrafine particulate matter could be to ensure that the proposed development gives rise, if anything, to a reduction in levels of fine particulate matter, PM_{2.5}. This would not be a fully robust approach to addressing UFP because of the uncertainty in links between PM_{2.5} and UFP, but would give confidence that appropriate measures are being used to minimise the impacts resulting from the proposed development. This would be consistent with the national policy approach of reducing exposure to PM_{2.5}. This would also enable further evaluations of the potential health impacts of UFPs to be carried out following the development of assessment tools, methods and data that are likely to be evolved in the coming years, as greater attention is focused on the risks posed by UFPs in general, and the contribution of airports and aviation to UFP emissions to air and the associated risks to health and the environment.
95. In my view, the proposed development would be likely to result in an increase in exposure to UFP. This increase would be expected to result in associated increased risks to health which would be at least partly additional to the risks posed by PM_{2.5}. It is currently not possible to quantify the precise extent of these increased risks. This combination of an unknown, unquantifiable risk with potentially serious effects on health which lies outside the control of

those affected has many of the features of a risk that would give rise to a high level of concern or fear among members of the public. These factors include (adapted from CD8.20):

- (a) **Origin.** People are less concerned about risks they incur themselves than the ones that others impose on them.
- (b) **Control.** Perceived control over outcomes also matters.
- (c) **Nature.** Dangers in nature are perceived as relatively benign, whereas man-made harms are more menacing.
- (d) **Imagination.** When threats are invisible or hard to understand, people become confused about the nature of the risk, and the event becomes scarier.
- (e) **Age affected.** Risks are more frightening when they affect children.
- (f) **Uncertainty.** Events inspire more fear when officials don't communicate what is known — or when the risks are simply unknown.
- (g) Absence of enjoyment from the activity incurring risk

96. Although the risks cannot be quantified, the information provided with the application demonstrates that the development would result in an increase in risks to health due to UFP, contrary to the requirements of national policy on aviation and air quality, and Policies CS3, CS23 and CS26 of the North Somerset Core Strategy 2017.

5.4 Inter-related effects

97. The ES and ESA include an assessment of inter-related effects of the proposed development. The ESA found that there would be no inter-related effects including air quality impacts. However, that conclusion was reached on the premise that no significant health risks would arise since relevant air quality standard/objective thresholds would be met with the proposed development in place as at 2030. As I have explained, however, that premise is not compatible with national and local policy, which require the proposed development to deliver an improvement in air quality and health impacts. The proposed development will give rise to an increased risk of adverse health effects and will not contribute to improved air quality compared to the position if planning permission were refused.
98. Furthermore, the assessment does not consider whether the combined effects of factors such as increased air pollution and noise could result in an impact which is greater than the individual effects. In the absence of any such assessment, and in the light of the increase in air pollution and associated health effects resulting from the proposed development, I conclude that there remains the potential for inter-related effects on the health of the local population due to the proposed development. This would be contrary to Policies CS3, CS23 and CS26 of the North Somerset Core Strategy 2017.

5.5 Uncertainty in fleet mix forecasts

99. It is important to be aware that the calculated impacts set out in the ES and ESA are subject to uncertainty. These uncertainties mean that forecast air quality and resulting health impacts could be greater than those set out in the ES and ESA. Two key areas of uncertainty are the timing of future increases in passenger numbers using the airport, and the future fleet composition.
100. A sensitivity case highlighting the potential effects of increased numbers of flights by Jet2 is set out in the evidence of Mr Folley. An increase in the proportion of passengers carried by Jet2 would result in an increase in emissions to air because of the typically older aircraft fleet used by Jet2. Preliminary calculations using the data in my Appendix 1 indicate that a higher proportion of flights by Jet2 compared to the mix of operators used to support the air quality assessments in the ES and ESA could result in an increase in emissions to air of particulate matter from the aircraft LTO cycle of approximately 16% in 2030, compared to the forecasts used in the ES Addendum. Emissions of oxides of nitrogen would also increase, although to a lesser extent. Thus the fleet mix change that is likely to result from the commencement of operations by Jet2 is likely to result in an increase in the air quality impact above that assessed in the ES/ESA.
101. These increases in emissions would add to the air pollution and health burden resulting from airport activities, and would be likely to require further investments and commitments in order for the proposed development to deliver an improvement in air quality.
102. This reinforces the conclusion that the development would result in an increase in risks to health due to increases in levels of nitrogen dioxide and particulate matter (PM₁₀, PM_{2.5} and UFP), contrary to the requirements of national policy on aviation and air quality, and Policies CS3, CS23 and CS26 of the North Somerset Core Strategy 2017.

5.6 Conclusions

103. To assess whether the proposed development would give rise to an improvement in air quality, the correct test is to compare the future situation if the proposed development goes ahead with the future situation if the proposed development does not go ahead. Applying this test, I conclude that the proposed development would give rise to increases in air pollution. I do not disagree with the description of these increases within the terms of guidance relevant for the EIA process, but these increases in air pollution will result in increases in health burdens for the local population. This is because the air pollutants under consideration (in particular, nitrogen dioxide and PM_{2.5}) present risks to health at levels below the currently applicable air quality standards. Furthermore, because of uncertainty in the timing of the airport development and in the aircraft fleet composition, the forecast impacts are subject to uncertainty, and could be greater than those set out in the ES.

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104. Additionally, the impacts of increased emissions of ultrafine particles (UFP) on the health of local populations are unknown. While these impacts could potentially be mitigated by ensuring that the proposed development results in an improvement in air quality, this step has not been taken. As a result the potential effects of UFP remain an unquantified risk resulting from the proposed development.

6 Mitigation measures

105. In this chapter, I consider the mitigation measures proposed by BAL, and whether they can be viewed as “*innovative solutions and incentives against ambitious targets*,” as envisaged in Aviation 2050 (CD6.5). I go on to consider whether the mitigation measures proposed by BAL would be effective in ensuring that the proposed development would result in an improvement in air quality. Finally, I consider whether additional measures could be considered which would comprise innovative solutions and incentives against ambitious targets, and whether these additional measures could result in an improvement in air quality.

6.1 Section 106 Agreement

106. A number of mitigation measures potentially relevant to the impact of the proposed development on air quality were included in the Section 106 Agreement which was before the February and March 2020 planning committee meetings (CD4.13 Appendix 3 pages 269 – 280). These were as follows.

6.1.1 Airport Surface Access Strategy

107. An Airport Surface Access Strategy would be designed to progressively increase the proportion of passenger travel carried out using public transport from 15% to 17.5% over a five year period. The Regulation 25 document submitted by BAL (CD3.4.10 section 3.6) refers to “*an ambitious public transport modal share target of 15% for passengers*.” However, equivalent figures for other airports include 50% (Gatwick), 44% (Luton), 21% (Manchester) and 52% (Stansted), and even Bristol itself is reported as 22%.⁵ In this context, a proportion of 15%, 17.5% or even 22%, is low and could not be viewed as ambitious. This is addressed in more detail in the Proof of Evidence of Mr Colles.
108. This target would be supported by payments into a Public Transport Fund/Public Transport Improvement Fund totalling £875,000 over a five year period. This fund would be spent on measures such as:
- (a) Continuation of local and strategic bus services

⁵ Civil Aviation Authority, “2019 Passenger Survey Report” <https://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Consumer-research/Departing-passenger-survey/2019-Passenger-survey-report/>

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- (b) Improvements to the Bristol Temple Meads interchange;
 - (c) Worle Station Improvements (study);
 - (d) Bus to rail integration/ticketing information
 - (e) Bath Spa interchange improvements
109. I have no reason to doubt that these improvements would be welcome, but the sum available, and consequently the scope of the proposed measures, appears limited. Some of the measures identified are described as supporting the “continuation” of existing services, and so cannot be considered as ambitious or innovative.
110. Further measures include an annual public transport marketing programme, improvement of the BAL website, a feasibility study to review integration of the A1 Bristol Flyer service with the Metrobus network, enhancements to the Weston Flyer bus service “subject to viability,” new bus services to Clevedon and Nailsea using low or ultra-low emission buses, improvements to express coach services, and a pricing review. Again, such measures would be welcome, but do not constitute a commitment to an ambitious programme that would deliver air quality improvements.

6.1.2 Staff Travel Plan

111. CD4.13 outlines a new Travel Plan with the aim of 30% of staff using “sustainable modes” to access the airport. The draft Travel Plan (CD2.10 section 0.1.3) indicates that as of 2017, 84% of staff travel to the airport using single occupancy vehicles, and includes a target to reduce that to 75% with all other modes of transport described as “sustainable modes” (CD2.10 section 0.3.1). No details of the measures to be included in this plan were identified in CD4.13, other than a suggestion of an Employee Travelcard Scheme. The detail would be developed as part of an updated Airport Surface Access Strategy (CD2.10 section 1.2.2). While this Travel Plan might deliver improvements in air quality, because of the lack of detail, it is not possible to have confidence that the Travel Plan will be effective, or to evaluate any benefits that might result from the implementation of a plan.

6.1.3 Ultra-low emission strategy

112. This strategy would consider how ultra-low emitting vehicles could be incorporated into the Surface Access Strategy. The measures highlighted for inclusion in this strategy comprise an “implementation plan,” at least 10 additional electric vehicle (EV) parking bays for passengers, additional EV infrastructure to reflect the fleet composition, and a strategy to implement EVs into the contracted taxi fleet. Up to 31,000 passenger vehicles would travel to and from the airport per day, of which 5,200 would be new vehicles associated with the proposed development (CD20.20.3 Table 3.20). In this context, a commitment to provide 10 additional EV parking bays is minimal and would have no significant benefits in offsetting the increase in emissions resulting from the proposed development. Provision of additional EV infrastructure

to reflect fleet composition is linked to business as usual, and would not do anything to offset the air quality impacts of the proposed development. Again, while these measures are welcome, they would not result in an improvement in air quality.

6.1.4 Car parking

113. An increase in car parking capacity is envisaged, which would tend to work against delivering reductions in emissions and improvements to air quality. Measures to make drop-off less attractive are also envisaged. This would be welcome, but with no firm commitment to this measure, it is not possible to be confident that it would deliver a material benefit for air quality.

6.1.5 Highway improvements

114. Highway improvements at A38/Downside Road/West Lane are already taken into account in the air quality impact assessment. A feasibility study for future strategic improvements at the A370 junction with the South Bristol Link is also envisaged. At this stage, it is not clear whether any such improvements would improve or worsen air quality.

6.1.6 Air Quality Action Plan

115. An Air Quality Action Plan is envisaged, which would “*detail the initiatives to monitor and improve air quality at the airport.*” No specific measures to improve air quality are identified: the Section 106 Agreement only covers measures relating to air quality monitoring. Measures to improve air quality appear to be anticipated only if monitoring indicates a significant deterioration in air quality. This does not constitute an ambitious target for improving air quality: it is no more than a backstop to be applied if air quality deteriorates significantly and even then contains no specific measures designed to reduce emissions.

6.1.7 Airport Environmental and Amenity Improvement Fund

116. This fund would be available for use only to mitigate unforeseen adverse environmental impacts or adverse impacts on the amenity of the local community. Again, this fund is a backstop measure, and does not constitute a resource for delivering emissions reductions and/or improvements to local air quality.

6.2 Effectiveness of proposed mitigation measures

117. The proposed mitigation measures set out in Section 6.1 would be welcome. For the reasons set out in Section 4, the relevant issue for consideration in the context of the effect of the proposed development on air quality, and consequently on health, is whether these measures would be effective in delivering an improvement in air quality.
118. The proposed measures can be categorised as set out in the following table.

Table 2: Categorisation of proposed mitigation measures

Category	Measures
Would deliver a quantifiable improvement in air quality	No measures have been identified which would achieve this objective.
Would deliver an improvement in air quality which cannot be quantified and/or is not guaranteed	Airport surface access strategy Staff travel plan
Would deliver an improvement in air quality which is likely to be so small as to be insignificant	Ultra-low emission strategy
Would not deliver an improvement in air quality	Air quality action plan Airport Environmental and Amenity Improvement Fund
Would deliver a worsening in air quality	Car parking provision and increase in flights
Not possible to evaluate effect on air quality	Highway improvements

119. I conclude that the measures set out in the draft Section 106 Agreement at the time the planning application was considered would have a variable and unquantifiable effect on air quality, which may in some respects be adverse. These measures could not be considered to comprise “*innovative solutions and incentives against ambitious targets.*” The measures proposed to date do not engage with the requirement to deliver improvements in air quality, and for airports to take the opportunities available to achieve this.

6.3 Additional measures

120. National planning and aviation policy directs that airport development should, wherever possible, help to improve local environmental conditions such as air quality. There are additional or alternative measures available which would enable the airport to improve air quality. Such measures can be designed and evaluated so as to deliver an improvement in air quality that would offset the adverse effects of the proposed development set out in Section 5, and deliver an improvement in air quality rather than a worsening of air quality. This would be consistent with national and local policies, including North Somerset Core Strategy Policy CS26 which envisages that “*the development will contribute to improving the health and well being of the local population.*” These measures could potentially be delivered within the framework of a substantially improved Air Quality Action Plan.

121. I suggest that the following measures should be considered to comprise a programme of innovative solutions and incentives against ambitious targets for this proposed development. These measures are already deployed at UK airports, and/or are developed from recommendations made by the aviation industry (CD8.21 “UK Aviation and Air Quality”, Sustainable Aviation 2017).
122. If permission should be granted for the proposed development, NSC has proposed that an Air Quality Action Plan which contains ambitious measures to deliver improvements in air quality should form part of the permission, either through condition or through an updated Section 106 Agreement.

6.3.1 Surface access

- (a) A substantial increase in the proportion of passengers accessing the airport by public transport. At other airports, 20% to 50% or more of passengers use public transport. In contrast, figures for Bristol Airport are in the range 15% to 22%, with an ambition to achieve a proportion of 17.5% of passengers. Because of the importance of surface access on air quality, a step change in public transport provision and uptake is required in order to deliver an improvement in the impact of the airport on air quality, which would not be delivered by increasing public transport usage from 15% to 17.5% of passengers. As a starting point, it would be possible for the airport to analyse the forecast air quality impacts to determine what increase in public transport would deliver improvements in air quality at the locations most at risk of air pollution due to traffic accessing the airport. This could then be used as the basis for setting a more ambitious target which would deliver an improvement in air quality and public health, and thereby conform with national and local policy.
- (b) Specify measures for ensuring that the air quality implications of transport initiatives are considered, with a pre-requisite that such initiatives should as a minimum deliver air quality improvements
- (c) Consider the benefits of a Low Emission Zone at Bristol Airport (as planned for Heathrow Airport) and implement such a zone if likely to be effective.
- (d) Increase the number of EV charging points to support the transition of the taxi fleet into 100% electric by 12mpps
- (e) Increase the number of EV charging points and provide additional incentives and measures to support Workplace Travel Plan modal share target of 30% of employees using sustainable travel. Increase this target if possible – e.g. the equivalent figure at Stansted Airport in 2019 was 52%.⁵
- (f) Increase the number of proposed EV charging points for passengers to encourage and enable usage of electric vehicles ahead of wider market trends. In view of the rapid

changes in the vehicle fleet envisaged up to 2030 (after which no new petrol/diesel cars will be sold) and beyond, early and substantial expansion of EV charging points will be needed.

6.3.2 Aircraft operation management

- (g) Improve the management of emissions from movement of aircraft, for example by reducing taxi and hold times, and/or using Reduced Engine Taxi.
- (h) Work with airlines to reduce take-off thrust settings
- (i) Evaluate and implement emission-related charging for aircraft using the airport. By 2017, approximately 60% of the busiest EU28+EFTA airports had implemented environmental charges.⁶
- (j) Provide electrical power supplies to all aircraft stands, requiring aircraft to use these power supplies where practicable, and discontinue the use of Auxiliary Power Units.

6.3.3 Airside and landside vehicle fleet management

- (k) Carry out vehicle emission tests and require improvement in performance where necessary
- (l) Specify minimum emissions standards for ground handling equipment
- (m) Increase the number of alternative fuelled vehicles at the airport, including electric vehicles

6.3.4 Fixed point sources

- (n) Manage and minimise emissions from heat, power and cooling plant at the airport, using low- or zero-emitting technologies where available, and ensure that new developments and upgraded plant and equipment use the lowest emitting technologies available.
- (o) Undertake a process of review to identify opportunities to reduce the air quality impact of point sources. This could cover aspects such as improving energy efficiency, replacing combustion processes with alternative technologies, use of lower emitting plant where available.

7 Conclusions

7.1 The effects of the proposed development

123. As set out in Section 4.4, to assess whether the proposed development would give rise to an improvement in air quality, the correct test is to compare the future situation if the proposed

⁶ <https://www.easa.europa.eu/eaer/climate-change/airports>

development goes ahead with the future situation if the proposed development does not go ahead..

124. I conclude from the information set out in Section 5 that the proposed development would give rise to increases in air pollution. While these increases do not result in new exceedances of existing air quality standards/objectives, they would nevertheless constitute a worsening of air quality, and would result in increased health burdens for the local population. This is because the air pollutants under consideration (in particular, nitrogen dioxide and PM_{2.5}) have adverse effects on health at levels below the currently applicable air quality standards. Furthermore, because of uncertainty in the timing of the airport development and in the aircraft fleet, the forecast impacts are subject to uncertainty. In particular, the impacts are likely to be greater than those set out in the ES because of the planned commencement of operations by Jet2.com using older and more polluting aircraft than other operators, as explained in the evidence of Mr Folley.
125. Additionally, the impacts of increased emissions of ultrafine particles (UFP) on the health of local populations, while not quantifiable, are likely to present an increased risk to health for local people. While these impacts could be mitigated by ensuring that the proposed development results in an improvement in air quality, this step has not been taken. As a result the potential effects of UFP remain an unquantified risk to health resulting from the proposed development.

7.2 Assessment of proposed development against policy

7.2.1 National policy

126. The National Planning Policy Framework requires that development should, wherever possible, help to improve local environmental air quality conditions (CD5.8 para. 170(e)). Opportunities to improve air quality or mitigate impacts should be identified (CD5.8 para. 181; see Section 4.4 above). These aspects of national planning policy derive from international priorities to avoid, prevent and reduce emissions of harmful air pollutants (Section 4.1 above). In contrast to these obligations, the proposed development will result in a worsening of air quality. No effort has been made to evaluate whether the proposed development could deliver an improvement in air quality, or to characterise the benefits that would result from any of the proposed mitigation measures.
127. The Aviation Policy Framework states that airports are expected to work with the Government, its agencies and local authorities to improve air quality. Aviation 2050 indicates that airports should “*provide innovative solutions and incentives against ambitious targets*” in order to “*improve air quality.*”
128. It is anticipated that the emissions associated with aircraft and ground-based transport will improve over time. As a result, the communities around Bristol Airport can expect that, in the absence of expansion of the airport, local air quality will improve compared to the current day.

However, this does not fulfil the obligation of the appellant to deliver improvements in air quality resulting from the proposed development.

129. National policy for aviation ("Making Best Use of Existing Runways" CD6.4) envisages that increasing airport capacity will be achieved by increasing the use of existing infrastructure. However, it does not provide carte blanche for this process to result in a worsening of environmental conditions. It requires impacts to be mitigated, effectively requiring a balance to be struck between making use of existing infrastructure and the environmental costs to do so. In the context of multiple policy initiatives mandating improvements in air quality, a development which reduces or eliminates an improvement in air quality that would otherwise occur must be seen as an adverse impact to be weighed in the balance between increasing capacity and environmental costs and impacts.
130. Specifically, Aviation 2050 requires the specification of "*ambitious targets to improve air quality*." I do not consider that ambitious targets have been set for the proposed development that relate to improving air quality. As a result, the proposed development will result in a worsening of air quality.
131. I conclude that the proposed development is contrary to national aviation policy and the NPPF.

7.2.2 Local policy

132. The North Somerset Vision is for "*Sustainable, inclusive, safe, healthy, prosperous communities thriving in a quality environment*," with a shared priority of "*Improving health and wellbeing*," of which reducing traffic emissions is an important part. Because the proposed development would result in an increase in traffic pollution, and would result in a worsening of health, I conclude that it does not conform with the North Somerset Vision.
133. Core Strategy policy CS26 requires a health assessment to be undertaken which identifies how development will contribute to improving health and well-being. It is implicit in this policy that a development will make a positive contribution to improving health and well-being. As described in Sections 5 and 7.1 above, the air pollutants emitted from Bristol Airport include oxides of nitrogen, fine particulate matter (PM₁₀ and PM_{2.5}) and ultrafine particulate matter. These pollutants do not have any known thresholds for their effects, and it is well established that exposure to these pollutants, even at levels which comply with national air quality standards, has adverse effects on health which include increased mortality, coronary heart disease and asthma. The proposed development does not deliver improvements but rather increases risks to health arising from these pollutants. One key aim of this policy is to identify the potential health gains that could result from new development. However, the application does not consider or identify gains that could be made in relation to the air quality impact of the proposed development. I conclude that the proposed development does not achieve the policy objective of CS26.

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134. Policy CS3 confirms that new development will only be permitted if the resulting air pollution or harm to amenity or health would be mitigated to an “*acceptable level*”. Policy CS23 requires the “*satisfactory resolution*” of environmental issues relating to development of Bristol Airport, and makes specific reference to the impact of airport growth on surrounding communities.
135. I consider that Policies CS3 and CS23 need to be read in the context of Policy CS26 and national policy. As I have explained, at a national policy level, airports are required to deliver improvements to air quality via the adoption of ambitious targets and innovative solutions. The proposed development does not achieve these policy aims: rather it will lead to an increase in risk to health. The proposed development fails to take available steps to reduce emissions. These are factors which weigh against the grant of planning permission. Further, they mean that the proposed development is contrary to Policies CS3, CS23 and CS26 of the Development Plan.

7.2.3 Conclusions

136. As highlighted above, the proposed development would result in increases in air pollution. These increases would present increased risks to health.
137. The mitigation proposals proposed by the Appellant as part of the planning application do not meet the policy requirements to improve air quality and do not consider the range of the opportunities available to reduce emissions. As set out in Table 2, I consider that none of the proposed measures would deliver a quantifiable improvement in air quality. Instead, the proposed measures deliver improvements which are unquantifiable, not guaranteed, negligible or ineffective.
138. In Section 6.3, I have set out a range of measures that could be viewed as more ambitious, and which would assist in working towards delivering an improvement in air quality. However, because BAL has not been ambitious in its approach to delivering improvements in air quality and has not provided a carefully evaluated programme of ambitious targets and innovative solutions, the extent of the benefit of these proposals remains unassessed and unquantified.
139. I conclude that national and local policy requires new airport development to deliver an improvement in air quality, and an improvement in the health and wellbeing of the local population wherever possible. This is to be achieved by the adoption of ambitious targets and innovative solutions. In my view, the proposed development does not achieve these policy objectives.
140. The proposed development will not contribute to improving the health and well-being of the local population. Rather, it will result in an increase in emissions of air pollutants and consequential increased risk to health. This would be contrary to Policy CS3, CS23 and CS26 of the Core Strategy, contrary to the National Planning Policy Framework, and contrary to policy for airport development, as set out in the Aviation Policy Framework (CD6.1) and Aviation 2050 (CD6.5).



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