



8. Historic Environment

Technical note:

Development of Bristol Airport to Accommodate 12 Million Passengers Per Annum: Response to Historic England and North Somerset Council Comments on the Historic Environment

1. Introduction

This note has been prepared in response to comments provided by Historic England and the North Somerset Council (NSC) Archaeologist and Conservation & Heritage Officer on the planning application and supporting Environmental Statement (ES) for the proposed development of Bristol Airport to accommodate 12 million passengers per annum (mppa) (Application No. 18/P/5118/OUT). Specifically, the note responds to comments received in respect of the noise and vibration impacts of the proposed development on designated heritage assets.

2. Scope of Responses

2.1 Historic England

The response from Historic England (dated 15 January 2019) states that *"In the main, we concur with the conclusions reached in this assessment and note that none of the designated heritage assets will suffer a loss of significance that could reasonably be equated to that described in the NPPF (paragraph 193)."* However, it also states that there is an element of doubt over effects to designated heritage assets as a result of changes in noise and vibration and seeks further clarification on this matter.

This note has been prepared in order to provide the further clarification requested.

2.2 North Somerset Council

The NSC response is provided in a joint response by the Archaeologist and Conservation & Heritage Officer (dated 11 January 2019). Similarly, this response confirmed agreement with the conclusions of the ES, but also expressed support for Historic England's request for further clarification. No other additional information was requested.

3. Approach

3.1 Overall

The Noise and Vibration Chapter of the ES (Chapter 7), assesses the Noise and Vibration changes derived from the following sources:

- Construction noise (described in Appendix 7G);
- Operational ground noise - derived from ground-based operational sources other than by aircraft in flight, taking off or landing (described in Appendix 7E); and
- Air noise - derived from flights arriving and departing (described in Appendix 7D).

3.2 Construction Noise

For construction noise, the threshold for a potentially significant effect from construction noise adopted in the ES assessment was 65 dB LA_{eq,12hr} for the daytime (07.00-19.00). Predicted changes in noise were calculated for a number of residential receptors around the perimeter of the airport. Whilst these locations do not directly coincide with any of the designated heritage assets included within the ES settings assessment (Section 14.13), they are generally within 1 km of the airport boundary. As such, they can be taken together as a broad indicator of the predicted effects of construction noise within the zone in which these designated heritage assets are located, whilst recognising that construction will take place at different times over a period of up to seven years. As noted at ES Section 7G.6, the only predicted significant effects from daytime construction noise are for receptors adjacent to the A38 (Receptors C and I on ES Figure 7.2) from the A38 highway improvements. No designated heritage assets are within this area.

Construction noise was considered in the ES settings assessment (Section 14.13) and it was concluded that it would not give rise to a significant effect as a result of change to setting. The asset most likely to be affected by construction noise is Long barrow, situated 350m south-west of Cornerpool Farm (SM1008291). This is located at a similar distance from the airport boundary as Noise Receptor E, which is predicted to experience 58 dB during construction of the Extension to Silver Zone Parking (phase 2). A similar level of construction noise may be expected at Cornerpool Farm (SM1008291), and this was considered in the assessment (paragraph 14.13.21). The proposed mitigation of establishing the perimeter bund at the outset of the construction period will limit the duration of any effect.

As a result of the factors described above, no further consideration of construction noise is provided in the note.

3.3 Operational Ground Noise

For operational ground noise, as part of the EIA a series of noise contours were produced to show the 2017 Summer LA_{eq16hr} level (ES Figures 7D1-3) and calculated to describe the predicted noise levels associated with the permitted scenario of growth to 10 million passengers per annum (mppa) and for further growth 12 mppa, for which permission is being sought. Predicted noise levels (Summer LA_{eq16hr}) for assets included in the ES settings assessment have been provided by Bickerdike Allen Partners, the appointed noise consultants for the project, who completed the ES chapter on noise and vibration (Chapter 7).

ES Table 7E.3 notes that changes of up to 2 dB are considered to be '*imperceptible*', whilst those of between 2 and 3 dB are considered to be '*barely perceptible*'. As identified in Appendix 7B (paragraph 7B.6.22), a scale of this type is based on the Institute of Environmental Management and Assessment (IEMA) *Guidelines on Environmental Noise Impact Assessment*. Therefore, any change of up to 3 dB is considered not to have the potential to contribute to a change in setting.

3.4 Air Noise

For air noise, as part of the EIA a series of Summer LA_{eq16hr} noise contours were produced to show the 2017 level, predicted noise levels associated with the permitted scenario of growth to 10 mppa and for further

growth to 12 mppa, for which permission is being sought. These have been provided by Bickerdike Allen Partners.

Air noise is derived from arriving and departing aircraft and in order to provide further quantified information on whether designated heritage assets may be affected by this source, an approach has been taken following guidance set out in Historic England's Aviation Noise Metric Study¹. The guidance sets out the following steps:

- *'Step 1: Scoping – identify heritage assets with the potential for a noise impact through a process of scoping using the National Heritage List and noise contours;*
- *Step 2: Assess the sensitivity of the asset to noise related impacts – the heritage assets which are identified in the scoping exercise are categorised according to how the sound environment contributes to the significance of the heritage asset as set out in the Aviation Noise Metric. The four categories are:*
 - ▶ *A: solitude, embedded with quietness, is intrinsic to understanding the form, the function, the design intentions and the rationale for the siting of a heritage asset;*
 - ▶ *B: a non-quiet and specific existing soundscape forms part of the functional understanding of the heritage asset;*
 - ▶ *C: the abandonment of a heritage asset; a monument, building or landscape, in antiquity (or more recently), has created a perceived 'otherworldly romanticism' enabled by the absence of anthropogenic sounds (quietness); or*
 - ▶ *D: the absence of 'foreign (modern) sounds' allow an asset to be experienced at 'a very specific point in time' that is intrinsic to understanding the heritage assets significance.'*

The guidance establishes a methodology based on magnitude and frequency of noise. These are expressed through absolute measures of noise equalised over time (LAeq) and frequency of maximum noise exceeding a 60dB threshold (N60).

In order to follow Step 1 of the Aviation Noise Metric Study, all designated heritage assets within the 51 dB LAeq16hr 12mppa Summer contour have been identified. This is considered sufficient given that the Aviation Noise Metric Study identifies that as a quantitative assessment, below 54 dB LAeq *'aircraft noise is not likely to be disturbing to most people'* (Aviation Noise Metric Study, Section 5.4.4). It is therefore reasonable to assume is not likely to affect the appreciation of a heritage asset. Each of these assets was then assessed according to the criteria within Step 2 to identify whether they are 'Noise Sensitive' i.e. whether the noise environment can be identified as contributing to their heritage significance. For each noise sensitive asset, this note identifies where it falls in relation to the existing and predicted noise levels.

4. Assessment

4.1 Ground Noise

The Summer LAeq16hr operational ground noise levels for each of the assets included in the ES setting assessment is set out in Table 4.1.

¹ Temple and Cotswold Archaeology (2014). Aviation Noise Metric - Research on the Potential Noise Impacts on the Historic Environment by Proposals for Airport Expansion in England, [online]. Available at <http://content.historicengland.org.uk/images-books/publications/aviation-noise-metric/eh-aviation-noise-final-report.pdf/> [Checked 14/02/2018].

Table 4.1 Summer LA_{eq16hr} operational ground noise level¹ for assets included in the ES Settings assessment

		2017 (dB)	10 mppa (dB)	12 mppa (dB)	Perception of change
LB1158202	Windmill House	49	49	50	Imperceptible
SM1008291	Long barrow 350m southwest of Cornerpool Farm	47	47	48	Imperceptible
SM1008300	Oval barrow on Felton Hill 100m east of The Round House	47	47	48	Imperceptible
SM1008361	Two confluent bowl barrows on Felton Hill	43	43	44	Imperceptible
SM1011126 SM1011127 SM1011128 SM1011129	Redhill round barrow cemetery	43	43	43	No change

¹ Data provided by Bickerdike Allen Partners

Based on this, it is confirmed that operational ground noise will not result in any change to the settings of the designated heritage assets included in the ES Settings assessment. These are the closest designated heritage assets, all within 500m of the airport boundary and so it is clear that there are no other designated heritage assets which could be affected by operational ground noise.

4.2 Air Noise

The Summer LA_{eq16hr} air noise level contour bands for each of the assets included in the ES setting assessment is set out in Table 4.2.

Table 4.2 Change in air noise for assets included in the ES settings assessment

		2017 (dB)	10 mppa (dB)	12 mppa (dB)	Perception of change
LB1158202	Windmill House	60-63	60-63	57-60	Barely perceptible
SM1008291	Long barrow 350m southwest of Cornerpool Farm	51-54	51-54	51-54	Barely perceptible
SM1008300	Oval barrow on Felton Hill 100m east of The Round House	57-60	57-60	57-60	Barely perceptible
SM1008361	Two confluent bowl barrows on Felton Hill	57 ¹	57 ¹	57 ¹	No perceptible change
SM1011126 SM1011127 SM1011128 SM1011129	Redhill round barrow cemetery	<51	<51	<51	No perceptible change

¹ Located on the 57 dB contour

Table 4.2 identifies that any change in the average daytime air noise levels (Summer LA_{eq16}) for assets included in the ES settings assessment would be imperceptible or barely perceptible. A review of the

Summer Day N70 noise contours presented as part of the ES (ES Figures 7D.30-33) do not suggest a notable increase in the number of noise events at this level for any of these assets. With the possible exception of Long barrow, 350m south-west of Cornerpool Farm (SM1008291), these assets also currently experience noise from the A38, forming a component of their setting. It is concluded that changes in air noise will not affect the heritage significance of these assets.

All designated heritage assets within the 51 dB LA_{eq16hr} 12mppa Summer contour are set out in Table 4.3 (scheduled monuments) and Table 4.4 (listed buildings). In each case, Table 4.3 and Table 4.4 identify whether each asset meets each of the four categories required to be identified as a noise sensitive heritage asset.

Table 4.3 Scheduled monuments within 51 dB LA_{eq16hr} 12mppa Summer contour

			Category A	Category B	Category C	Category D	Noise Sensitive?	Rationale
SM1003066	Part of the linear boundary known as the Wansdyke 425m south of New Barn Farm	ST6103865517	No	No	No	No	No	Though in a rural location, comprise a low earthwork which is not readily discernible and noise or quietness are not a defining characteristic of the significance of the asset.
SM1011258	Large univallate hillfort on Cadbury Hill	ST 44153 64950	No	No	No	No	No	Within a wooded area though bordered by a large hotel.
SM1011263	Slight univallate hillfort 150m east of Cleeve Court	ST 46257 65691	No	No	No	Yes	Yes	Hillfort in isolated wooded location where relative quietness may contribute somewhat to appreciation of heritage significance.
SM1011264	Slight univallate hillfort and associated settlement remains 300m north-east of Cleeve Court	ST 46298 65908	No	No	No	Yes	Yes	Hillfort in isolated wooded location where relative quietness may contribute somewhat to appreciation of heritage significance.
SM1007009	Wansdyke: section E of Maes Knoll camp	ST 60361 65898	No	No	No	No	No	Though in a rural location, comprise a low earthwork which is not readily discernible and noise or quietness are not a defining characteristic of the significance of the asset.
SM1008291	Long barrow 350m south-west of Cornerpool Farm	ST 50057 64386	No	No	No	No	No	Noise or quietness are not a defining characteristic of the significance of the asset.
SM1008297	Bowl barrow 170m east of Poplar Farm	ST 52388 65492	No	No	No	No	No	Noise or quietness are not a defining characteristic of the significance of the asset.

			Category A	Category B	Category C	Category D	Noise Sensitive?	Rationale
SM1008300	Oval barrow on Felton Hill 100m east of The Round House	ST 51624 64906	No	No	No	No	No	Noise or quietness are not a defining characteristic of the significance of the asset.
SM1008361	Two confluent bowl barrows on Felton Hill	ST 51958 64820	No	No	No	No	No	Noise or quietness are not a defining characteristic of the significance of the asset.
SM1015508	Churchyard cross in St Mary's churchyard	ST 43128 65396	Yes	No	No	No	Yes	Churchyard location which may be expected to be a place of quiet contemplation.
SM1015875	Churchyard cross in St Mary and St Peter's churchyard	ST 54293 65005	Yes	No	No	No	Yes	Churchyard location which may be expected to be a place of quiet contemplation.

Table 4.4 Listed buildings within 51 dB LA_{eq16hr} 12mppa Summer contour

			Category A	Category B	Category C	Category D	Noise Sensitive?	
LB1137349 LB1129143 LB1137378 LB1320958	Church of St Mary and monuments within churchyard	ST 43131 65416	Yes	No	No	No	Yes	Churchyard location which may be expected to be a place of quiet contemplation.
LB1129142 LB1129144 LB1129145 LB1129146 LB1129149 LB1129150 LB1129151 LB1137428 LB1137331 LB1312263 LB1312313 LB1312329 LB1320957 LB1320959 LB1392711	Other Listed Buildings in Yatton village		No	No	No	No	No	Located within a village setting.
LB1311647	Clarence Court	ST 43935 64172	No	No	No	No	No	House in modern village setting.
LB1320915	Rhodyate House	ST 44364 64492	No	No	No	No	No	House in roadside location at edge of village.
LB1129207	Rhodyate Lodge	ST 44695 64752	No	No	No	No	No	Though in a relatively isolated location, noise or quietness are not a defining characteristic of the significance of the asset.
LB1320970	Goblin Combe Farmhouse	ST 45507 65284	No	No	No	No	No	Though in a relatively isolated location, noise or quietness are not a defining characteristic of the significance of the asset.

			Category A	Category B	Category C	Category D	Noise Sensitive?	
LB1136580	The Old Farm	ST 45538 65543	No	No	No	No	No	House in roadside location at edge of village.
LB1129095	Church Of Holy Trinity	ST 46007 66065	Yes	No	No	No	Yes	Churchyard location which may be expected to be a place of quiet contemplation.
LB1129096 LB1136522 LB1136529 LB1136554 LB1136580 LB1136588 LB1136592 LB1320969 LB1320970 LB1320971	Other Listed Buildings in Cleeve		No	No	No	No	No	Mostly farmhouses and associated structures within dispersed settlement of Cleeve, within roadside locations.
LB1129205	Parish Boundary Stone	ST 46903 64707	No	No	No	No	No	Noise or quietness are not a defining characteristic of the significance of the asset.
LB1390975	Toilet and Cottage at Goblin Coombe Campsite	ST 46869 65182	No	No	No	No	No	Within a farmyard setting where noise or quietness are not a defining characteristic of the significance of the asset.
LB1158202	Windmill House	ST 51523 64906	No	No	No	No	No	
LB1391696	The George and Dragon Public House	ST 52147 65523	No	No	No	No	No	Public house where noise or quietness are not a defining characteristic of the significance of the asset.
LB1129218 LB1129219 LB1129228 LB1245212 LB1245213	Listed Buildings in Felton							Located within a village setting.

			Category A	Category B	Category C	Category D	Noise Sensitive?	
LB1311604 LB1320919								
LB1320916	Church of St Mary and St Peter	ST 54306 65014	Yes	No	No	No	Yes	Churchyard location which may be expected to be a place of quiet contemplation.
LB1129214 LB1129215 LB1129231 LB1320916 LB1320917	Other Listed Buildings in Winford		No	No	No	No	No	Located within a village setting.
LB1129625	Manor Farmhouse and attached Gate Piers	ST 58215 65331	No	No	No	No	No	Within a farmyard setting where noise or quietness are not a defining characteristic of the significance of the asset.
LB1129481	Model Farm and Farmhouse	ST 59165 65181	No	No	No	No	No	Within a farmyard setting where noise or quietness are not a defining characteristic of the significance of the asset.
LB1365669 LB1129483	Norton Malreward Court, with Stables and Coach House	ST 59800 65081	No	No	No	No	No	Within a farmyard setting where noise or quietness are not a defining characteristic of the significance of the asset.
LB1136356	Manor Farmhouse	ST 60334 65136	No	No	No	No	No	Within a farmyard setting where noise or quietness are not a defining characteristic of the significance of the asset.
LB1320778 LB1365668	Newbarn Farmhouse and Barn to South East	ST 61008 65889	No	No	No	No	No	Within a farmyard setting where noise or quietness are not a defining characteristic of the significance of the asset.

The Summer LA_{eq16hr} air noise level contour bands for each of the noise sensitive assets is set out in Table 4.5. These are also shown on the accompanying Figures (1-3).

Table 4.5 Change in air noise for noise sensitive assets

		2017 (dB)	10 mppa (dB)	12 mppa (dB)	Perception of change
SM1011263	Slight univallate hillfort 150m east of Cleeve Court	54-57	54-57	54-57	Barely perceptible
SM1011264	Slight univallate hillfort and associated settlement remains 300m north-east of Cleeve Court	54 ¹	54 ¹	54 ¹	Imperceptible
SM1015508	Churchyard cross in St Mary's churchyard	51-54	51-54	51-54	Barely perceptible
SM1015875	Churchyard cross in St Mary and St Peter's churchyard	54-57	54-57	54-57	Barely perceptible
LB1137349 LB1129143 LB1137378 LB1320958	Church of St Mary and monuments within churchyard	51-54	51-54	51-54	Barely perceptible
LB1129095	Church Of Holy Trinity	51-54	51-54	51-54	Barely perceptible
LB1320916	Church of St Mary and St Peter	54-57	54-57	54-57	Barely perceptible

¹ Located on the 54 dB contour

Table 4.5 identifies that any change in the average daytime air noise levels (Summer LA_{eq16hr}) for noise sensitive assets would be imperceptible or barely perceptible. A review of the Summer Day N70 noise contours presented as part of the ES (ES Figures 7D.30-33) has identified that of these assets, only the Church of St. Mary and St. Peter (LB1320916) is likely to experience a notable increase in the frequency of noise events at this level. This is in an edge of village location within a rural location approximately 3.3 km east of Bristol Airport and is therefore likely to be a relatively quiet location. However, taking account of the relatively low level of average daytime air noise levels and the fact that the predicted change in average noise levels will be barely perceptible, this is not expected to result in a significant effect on the setting of this asset.

5. Conclusion

This note has been prepared in order to provide further information on the effects on the setting of heritage assets as a result of changes in noise levels resulting from the proposed expansion of Bristol Airport to accommodate 12 mppa. This additional information has been requested by Historic England and comprises specific information on predicted changes in noise levels deriving from:

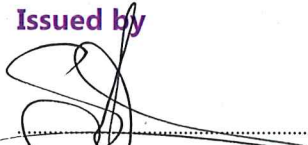
- Construction noise;
- Operational ground noise; and
- Air Noise.

Based on the information presented in this note, it is confirmed that noise from these sources will not result in a significant effect on the settings on any designated heritage asset.

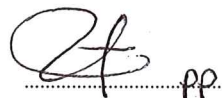
Construction noise to around 58 dB is likely to be felt around Long barrow, 350m south-west of Cornerpool Farm (SM1008291) during construction of the proposed extension to the Silver Zone Car Park (Phase 2). This was considered in the ES, with the proposed mitigation of establishing the perimeter bund at the outset of the construction period in order to limit the duration of any effect.

In addition, the Summer Day N70 noise contours suggest that the Church of St. Mary and St. Peter (LB1320916) is likely to experience an increase in the frequency of noise events at this level. However, taking account of the relatively low level of average daytime air noise levels and the fact that the predicted change in average noise levels will be barely perceptible, this is not expected to result in a significant effect on the setting of this asset.

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