Gatwick Airport Northern Runway Project

Environmental Statement
Appendix 14.9.4: Road Traffic Noise Modelling

Book 5

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1 Introduction

1.1 General

1.1.1 This document forms Appendix 14.9.4 of the Environmental Statement (ES) prepared on behalf of Gatwick Airport Limited (GAL) for the proposal to make best use of Gatwick Airport's existing runways and infrastructure (referred to within this report as 'the Project'). The results are summarised in **ES Chapter 14: Noise and Vibration** (Doc Ref. 5.1).

1.1.2 This appendix has been prepared for the specific purpose of assessing the road traffic noise impact of the proposed road scheme according to the Design Manual for Roads and Bridges (DMRB) – UK guidance. This ES Appendix assesses these impacts and identifies mitigation measures where required during the construction and operational phases of the development. The key aspects considered are the changes in noise from traffic on roads that are physically changed by the Project. The effect of traffic changes on nearby roads is also taken into account in accordance with the guidance. DMRB also requires the assessment of construction noise which has also been undertaken, whereas an assessment of operational vibration is not required under the new guidance as it is expected a maintained road surface will be free of irregularities as part of Project design and under general maintenance so will not have the potential to lead to any significant effects.

1.1.3 This Appendix considers traffic changes during operation and construction phases, its associated noise emissions, and impacts, in the context of the existing baseline, and on this basis identifies the potential for significant impacts.

1.1.4 This document presents the road traffic noise modelling methodology and the results of the assessment that has been carried out for the Project.

2 Noise Standards

2.1 LOAEL and SOAEL Values

2.1.1 The key metric used for the assessment of operational road traffic noise during the day in the UK is the $L_{A10,\ 18\ hour}$ which is referred to in the Design Manual for Roads and Bridges (DMRB)[1] and the Noise Insulation Regulations[2], and which is predicted using the methodology in the Calculation of Road Traffic Noise (CRTN)[3] guidance document (Department of Transport, Welsh Office, 1988). The DMRB also refers to the $L_{night,\ outside}$, which is effectively equivalent to a free-field $L_{eq,\ 8\ hour}$.

2.1.2 The DMRB specifies values to define the Lowest Observable Adverse Effect Level (LOAEL) for operational road traffic noise for daytime and night-time. The LOAEL value for the day is 55 dB $L_{A10,\ 18\ hour}$ at the façade[4] of the building to protect from effects of annoyance. A LOAEL of 40 dB $L_{night,\ outside}$ free-field[5] (effectively $L_{Aeq,\ 8\ hour\ night}$) has been adopted based on DMRB to protect residents inside a building from sleep disturbance.

2.1.3 The Significant Observable Adverse Effect Level (SOAEL value in DMRB for daytime road traffic noise is 68 dB $L_{A10,\ 18\ hour}$ at the façade based on the Noise Insulation Regulations, where this noise level is the trigger level for insulation at residential properties (subject to other conditions being met).

2.1.4 The SOAEL value for night-time road traffic noise is consistent with the interim target of the WHO Night Noise Guidelines 2018[6] at 55 dB $L_{night,\ outside}$ free-field to protect from sleep disturbance.

2.1.5 The LOAELs and SOAELs for road traffic noise are summarised in Table 2.1.1. The DMRB notes that specific variations may be required (e.g. where upgraded noise insulation has been fitted to a property, or where buildings such as schools are not occupied at night).

2.1.6 Construction noise standards are set out in Section 3.3.3.

Table 2.1.1: Noise Standards for LOAEL and SOAEL

Time Period	Averaging Period	LOAEL	SOAEL
Day	(06.00-24.00)	55 dB $L_{A10,\ 18\ hour}$ at the façade	68 dB $L_{A10,\ 18\ hour}$ at the facade
Night	(23.00-07.00)	40 dB $L_{night,\ outside}$ free-field	55 dB $L_{night,\ outside}$ free-field
Source: DMRB			

2.2 Significance of Effects

2.2.1 The DMRB procedures for establishing significance based on considering LOAEL and SOAEL values and other factors have been adopted for the road traffic noise assessment. It is noted that DMRB is intended for use on all projects involving construction, improvement and maintenance of motorways and all-purpose trunk roads.

2.2.2 For road links requiring consideration in assessing significant effects, the DMRB sets out an initial procedure for assessment based on the noise change. There are two sets of noise magnitude criteria in the DMRB which apply to people's reaction to road noise changes following the opening of a road, and to the situation when the road has been open for some time and has become an established part of the noise environment. The more stringent approach to assessing significant effects is to consider reactions when the road has just opened, and more stringent criteria are applied for this short-term reaction to traffic noise change.

2.2.3 To assess the change in the noise above LOAEL the following magnitudes of noise change are used for the short term (i.e. the comparison in the year of opening), drawn from the DMRB, as shown in Table 2.2.1:

[1] Design Manual for Roads and Bridges, LA111 Noise and Vibration Revision 2, Highways England, Transport Scotland, the Welsh Government, Department for Infrastructure (NI), May 2020.
[2] The Noise Insulation Regulations 1975 and Noise Insulation (Amendment) Regulations 1988.
[3] Calculation of Road Traffic Noise, Department of Transport, Welsh Office, HMSO, 1988.
[4] i.e. 1 metre from the façade of the building to take account of acoustic reflections from the facade.
[5] i.e. excluding acoustic reflections from the façade.
[6] Night Noise Guidelines for Europe, WHO, 2009.

Table 2.2.1: Magnitude of Change – Short Term

Short Term Impact Magnitude	Short Term Noise Change
Major	Greater than or equal to 5.0
Moderate	3.0 to 4.9
Minor	1.0 to 2.9
Negligible	Less than 1.0
Source: DMRB	

2.2.4 To assess the change in the noise above LOAEL the following magnitudes of noise change are used for the long term (i.e. the comparison 15 years after opening), drawn from the DMRB, as shown in Table 2.2.2:

Table 2.2.2: Magnitude of Change – Long Term

Long Term Impact Magnitude	Long Term Noise Change
Major	Greater than or equal to 10.0
Moderate	5.0 to 9.9
Minor	3.0 to 4.9
Negligible	Less than less than 3.0
Source: DMRB	

2.2.5 The DMRB indicates that impacts of moderate or major magnitude are more likely to give rise to significant effects. However, other factors are considered to determine the final operational significance level. These include:

-
- whether the noise change is close to a boundary between two impact magnitude ratings (e.g. whether it is close to the boundary between a minor and a moderate impact);
- whether the change in the long term is similar to the short-term change (and therefore whether the difference may not be due to the Project);
- the location of noise sensitive parts of the receptor[7];
- changes in acoustic context (including effects on acoustic character of an area); and
- whether the Project results in obvious changes in the landscape or setting of a receptor which make it likely that noise level change would be more acutely perceived.

2.2.6 These factors can affect the point at which noise changes are considered likely to give rise to a likely significant effect.

2.2.7 A final factor is considered if the 'with Project' noise level exceeds the SOAEL, and this is to consider noise change in the short term of 1 dB or over as resulting in a likely significant effect. This is more stringent than when noise levels are below SOAEL and noise changes in the short term of 3 dB or over are classed as more likely to be significant (i.e. moderate effects and above).

2.2.8 Where adverse effects may arise as above the LOAEL, mitigation measures have been identified to reduce these as far as practicable. Opportunities to reduce noise levels from the baseline case and identify improvements to the noise environment have been explored.

3 Assessment Methodology

3.1 Introduction

3.1.1 The noise assessment for both the construction and operational phases have been undertaken as a two-step process: Step 1 is a simple scoping process based upon DMRB guidance; and Step 2 is a detailed assessment for the construction phase and detailed noise modelling and assessment for the operational phase.

3.1.2 The CRTN method was utilised for the calculation method and to determine Basic Noise Levels (BNLs) at individual road links where it calculates either an $L_{10,\ 18\ hour}$ or $L_{10,\ 1\ hour}$ value depending on the inputs.

3.1.3 For the purposes of this assessment, the TRL Method 1 for Converting the UK Traffic Noise Index $L_{A10,18h}$ to EU Noise Indices for Noise Mapping was utilised to convert the noise indices generated by CRTN from a L_{10} to L_{eq} value to derive an L_{night} value required for the night-time noise assessment. DMRB describes TRL's Method 1 as the most reliable method of assessment where the proportion of night-time traffic to daytime traffic is atypical such as those serving a facility such as an airport.

3.2 Step 1: Scoping

Construction

3.2.1 Step 1: Comprised a scoping procedure which determined whether further comparison should be undertaken. This procedure consisted of whether construction traffic noise generated by the Project may have the potential to adversely affect any noise sensitive receptors within 300 metres of receptors. If the test criteria is met, a detailed assessment is required. In the case of the Project, the test is met, and therefore a detailed assessment of construction traffic noise impacts is included.

Operation

3.2.2 Step 1: Also comprised of a scoping procedure which determined whether further comparison should be undertaken. This procedure consists of two acoustic tests relating to noise change, and non-acoustic tests to determine whether new road links (or roads physically changed by the Project) would be within 600 metres of receptors, or an area within 50 metres of other road links on the wider road network with potential to experience a short term basic noise level (BNL) change of more than 1 dB(A) as a result of the Project. If any of the test criteria are met, a detailed assessment is required. In the case of the Project all the tests are met, therefore, a detailed operational assessment of noise impacts has been included.

[7] A receptor is a location or building that is sensitive to noise. Examples include dwellings, hospitals, healthcare facilities, education facilities, community facilities, Environmental Noise Directive (END) quiet areas or potential END quiet areas, international and national or statutorily designated sites, public rights of way and cultural heritage assets.

3.3 Step 2: Detailed Road Traffic Assessment

Construction Noise Assessment Scenarios

3.3.1 Step 2: Changes in road traffic noise levels resulting from the construction of the Project on the wider road network are calculated using the CRTN methodology.

3.3.2 The construction traffic assessment considers all NSRs within a 50 metre width from the kerb line of public roads where there is a potential increase in basic noise level of 1 dB(A) or more as a result of the additional construction traffic to existing traffic levels.

3.3.3 Construction traffic noise is defined as constituting a significant effect where a moderate or major magnitude of impact (as per Table 2.1.1) of 10 or more days or nights in any 15 consecutive days, or nights or a total number of days exceeding 40 in any 6 consecutive months is determined.

3.3.4 This assessment has assessed three main scenarios where peak levels of construction traffic noise are expected for the defined durations:

- a comparison in 2029: Do Minimum vs Peak Airfield Construction and associated traffic changes;
- a comparison in 2029: Do Minimum vs Peak Highway Traffic Management and associated traffic changes; and
- a comparison in 2029: Do Minimum vs Peak Highway Traffic Management measures on Airport Way and associated traffic changes.

3.3.5 Therefore, noise changes of 3 dB(A) or above (moderate magnitude) will be identified as a significant effect in either of the above scenarios as outlined by the DMRB discussed in Section 2.1.5. This corresponds to the smallest change in environmental noise that is noticeable under normal conditions.

Operational Noise Assessment Scenarios

Predictive Noise Model

3.3.6 Step 2: Detailed modelling of traffic noise emissions has been undertaken utilising noise modelling software where roads physically changed by the Project are within 600 metres of receptors. A separate modelling exercise of the road traffic noise baseline situation in 2018 was also undertaken to inform the ground noise and construction noise assessments, covering the ground noise and construction noise study area surrounding the airport perimeter (see Figure 14.4.1). Given the ground and construction noise study area is much larger than the traffic noise study area for the highway scheme, the model was simplified in terms of the buildings and terrain datasets that have been used. The traffic data are consistent between all modelling scenarios. The resulting day and night traffic noise contours are shown at a lower resolution to reflect this in Figures 14.6.33 and 14.6.34.

3.3.7 To assess the impact of the proposed highway scheme the three traffic noise change scenarios are considered:

- a comparison in the Short Term in 2032: Do Minimum (DMOY) (i.e. the opening year without the Project) vs Do Something (DSOY) (i.e. the situation during the opening year with the Project and associated traffic changes);
- a comparison in the Long Term: Do Minimum (DMOY) (i.e. the situation in 2032 on the date that the Project opens without the Project) vs Do Something (DSFY) (i.e. the situation 15 years after opening in 2047 with the Project and associated traffic changes); and
- non-project noise change: Do Minimum Future Year (DMFY) (i.e. the situation in 2047 which is 15 years after the Project opens without the Project) compared against DMOY.

3.3.8 The models of the Do Minimum and Do Something scenarios are used to determine the net change in noise due to the Project. The difference in these cases is then used to determine the overall impact and the significance taking into account the advice in DMRB, as set out in Section 2.2. The assessment takes into account the effect of mitigation outlined in Section 5 agreed with GAL.

Calculations of Basic Noise Level change

3.3.9 Step 2: where changes in road traffic noise levels indirectly resulting from the operation of the Project on the wider road network (i.e. outside the Operational Study Area defined in Section 3.2.2) are calculated using the same methodology described for the Step 2 of the construction traffic noise assessment.

3.3.10 Similarly, NSRs within 50 metres of other road links on the wider road network with a potential to experience a short-term basic noise level (BNL) change of more than 1 dB(A), or 3 dB(A) change in the long term as a result of the Project are considered.

3.3.11 Noise changes constituting a significant effect are similarly defined as where a moderate or major magnitude is determined. These are defined in Table 2.2.1 in the short term, and Table 2.2.2 in the long term.

Traffic Data and Model Inputs

3.3.12 Outputs from the Strategic Model traffic model were utilised within both the construction noise assessment and operational noise model. The outputs include traffic data for the roads physically changed as a result of the Project and roads several kilometres beyond this in each direction.

3.3.13 Eighteen-hour annual average weekday traffic (AAWT) flows, percentage of heavy goods vehicles (HGVs), and average speed (in km/h) were used to calculate the basic noise level of each road in both the Do-minimum case and the situation with the Do-something case for daytime. Whereas individual hourly annual average traffic flows, percentage of HGVs, and average speed were utilised for night-time calculations as required by the TRL Method 1 calculation described above.

3.3.14 LiDAR 10-metre grid height points were used in the operational noise model to interpolate the height information inside the Project site boundary. Height data for all the Project roads were provided in CAD format by the design team. The data were also used to calculate the CRTN gradient noise level correction for the road noise sources.

3.3.15 All roads in the operational noise model were assumed to have a bitumen surface with a texture depth of 1.5 mm, and source noise level elevation of 0.5 metres, following the guidance in CRTN with the exception of roads to the east end of the scheme on the M23 which were modelled with a low-noise thin surface in all cases. Due to the lower speeds on the A23 and other surrounding roads (<75 kph), applying any low noise surface to the roads would not provide any additional reduction in noise to the roads, therefore, no additional low-noise surface correction was applied to future scenarios.

3.3.16 Furthermore, information on local topography in the operational noise model (based on OS Master Map data) and screening to realistically simulate the features that affect noise propagation from the road were utilised.

3.3.17 All locations within the operational noise model study area were assumed to have acoustically hard (reflective) ground, with the exception of the Riverside Garden Park region which had a soft ground correction to account for the additional acoustic ground absorption in the area.

3.3.18 Noise sensitive receptor locations in the operational noise model were placed on each noise-sensitive building and at heights representing every floor at residential and non-residential

locations above the ground, and at 1.5 metres (human height) within the Riverside Garden Park amenity area.

3.3.19 OS Address Base Plus database information, which contained addresses in the operational noise model, was also used in order to count the number of receptors within the study area and categorise the sensitivity of the receptors in line with the DMRB

3.4 Operational Road Traffic Noise Modelling

Software and Calculation Method

3.4.1 In order to model the impacts of the Project, Predictor V2022 software was used to complete the road traffic noise model. The Predictor software package allows topographic details to be combined with ground regions, water, foliage, significant building structures and receptor locations, to create a detailed representation of the road system and the surrounding area, realistically simulating the site-specific conditions that affect noise propagation from the road. The noise model allowed for the quantification of noise levels from multiple road links to predict the contributed noise levels from the road traffic at the nearest potentially affected receivers for various operating scenarios.

3.4.2 The model implemented the prediction methodology based on the CRTN, a guidance document (Department of Transport, Welsh Office, 1988) typically used for noise impact assessments of road projects. The key metric used in UK for the assessment of road traffic noise during daytime is the $L_{A10\ 18\ hour}$ and L_{night}, outside for night-time, both referred to in the DMRB. The CRTN method allows for direct calculation of the $L_{A10\ 18\ hour}$ daytime noise level using the 18 hour traffic flow data. For night-time noise calculations the L_{night}, outside has been calculated using "Method 1" of the three methods that have been developed by TRL. As described above, as traffic flows are expected to be atypical (e.g. as they might be on roads serving facilities operating 24 hours a day such as ports or airports), this method has been chosen to give the most robust results, therefore, "Method 1" has been considered to be the most appropriate for this assessment.

4 Noise sensitive receptors

4.1 Introduction

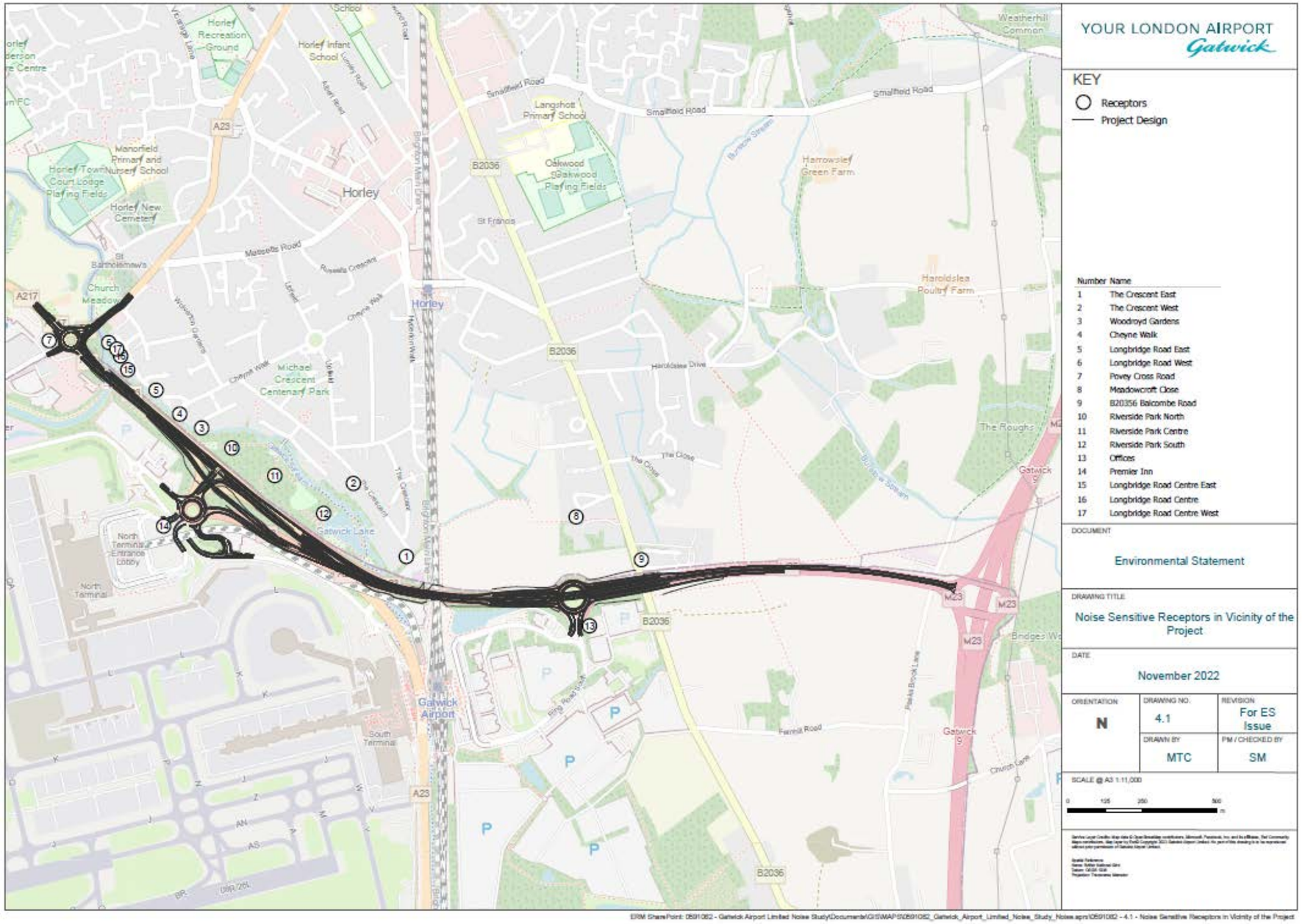
4.1.1 Following DMRB guidance, all noise-sensitive buildings within 600 metres of new road links physically changed by the Project have been assessed. The location of the Noise Sensitive Receptors (NSRs) in the Study Area are shown below in Figure 4.1.1.

4.1.2 At the PEIR stage of the Project, a selection of NSRs were identified based on their close proximity to the Project and noise sensitivity for the initial assessment. They included the residential properties nearest to the new or altered road links, non-residential locations, and the amenity area in the Riverside Garden Park adjacent to the A23 and M23 roads. Since the PEIR stage additional assessment work in 2022 was undertaken where the effectiveness of mitigation proposed in PEIR was assessed which is discussed in Section 5. Following this study, additional NSRs with a close proximity to the Project (NSR15–NSR17) were also assessed so have been included for continuity:

- NSR1 The Crescent East;
- NSR2 The Crescent West;
- NSR3 Woodroyd Gardens;
- NSR4 Cheyne Walk;
- NSR5 Longbridge Road East;
- NSR6 Longbridge Road West;
- NSR7 Povey Cross Road;
- NSR8 Meadowcroft Close
- NSR9 B2036 Balcombe Road;
- NSR10 Riverside Garden Park north;
- NSR11 Riverside Garden Park centre;
- NSR12 Riverside Garden Park south;
- NSR13 First Point office building;
- NSR14 Premier Inn;
- NSR15 Longbridge Road Centre East;
- NSR16 Longbridge Road Centre; and
- NSR17 Longbridge Road Centre West.

4.1.3 The NSRs listed above were assessed at the PEIR stage and have been included for reporting at the ES stage for direct comparison with the previous assessment studies. However, it is worth noting for the DMRB operational assessment that all NSRs within 600 m of the roads physically changed by the Project are considered as part of the assessment.

Figure 4.1.1: Noise Sensitive Receptors in Vicinity of the Project



4.2 Outputs and Contours

4.2.1 $L_{A10,18hr}$ and $L_{eq,\ night}$ noise levels were calculated at all noise-sensitive receptor locations as outlined in Figure 4.1.1. The contribution to the overall level from each road was also calculated for analysis.

4.2.2 Noise contours were calculated at a height of 4.5 metres above the ground (representative of the first-floor height), and from grid of prediction points with a resolution of 50 metres within the entirety of the study area.

5 Mitigation

5.1.1 Noise mitigation options were discussed both before the PEIR and following. These discussions included representatives from various members of the design, environmental and client team, and local planning and highways authorities, to enable consideration of engineering and urban design issues. All available mitigation options were considered including:

- alignment changes through optioneering of the road scheme design;
- noise barriers;
- traffic management;
- speed limits; and
- low noise surfacing.

5.1.2 Several options for the road scheme were discussed prior to a single frozen design being agreed upon following the PEIR and prior to the ES study. The final road scheme design required consideration of many factors including engineering and other environmental issues.

5.1.3 Noise barriers were identified as mitigation to address significant noise impacts at the PEIR stage based on strategic traffic modelling for the highway scheme proposed in the PEIR in September 2021. At the PEIR stage, noise barriers were proposed adjacent to the Riverside Garden Park (2 metres high), and on both the North and South Terminal Roundabout flyovers (1 metre high). In order to inform the design process for the ES stage, additional noise modelling was carried out for the revised highways scheme and revised strategic modelling to investigate the extent to which the noise barrier adjacent to the Riverside Garden Park would provide a benefit to nearby noise sensitive receptors and subsequently a Noise Barrier Note was produced and shared with the local highways and planning authorities in August 2022.

5.1.4 Studies looking into the traffic management and speed reductions were undertaken by the transport team with findings incorporated into the design of the scheme. Speed limits changing from 50 mph to 40 mph were incorporated into the design for several roads including the A23, Airport Way and adjoining slip roads which subsequently reduced the noise levels generated by these roads in the Do-something scenario.

5.1.5 Low noise road surfaces were also considered as an additional form of mitigation. However, part of the M23 spur had already been treated with a low noise surface and the lack of noise performance at the design speeds of the relevant roads and other performance issues led to the decision that this would not be a suitable and effective form of noise mitigation.

5.1.6 Table 5.1.1 reproduces the summary of the Noise Barrier Note, which comprises an assessment of the Riverside Garden Park barrier's effectiveness during daytime at selected NSRs in the short term, where:

- Scenario 1 included barriers running along the A23 Riverside Garden Park edge (at 2 m), and North and South Terminal roundabout flyovers (at 1 m); and
- Scenario 2 included noise barriers on the North and South Terminal roundabout flyovers as per the PEIR (1 m) but without the barrier along the A23 Riverside Garden Park edge.

5.1.7 All other mitigation described above was included in both scenarios.

5.1.8 Figure 5.1.1 below shows the Scheme design, roads from the strategic traffic model output, noise barriers (including the Riverside Garden Park barrier option as per Scenario 1), and noise-sensitive receptor locations at which traffic noise was predicted in the Study Area for the Noise Barrier Note study. The diagram also shows Noise Important Areas which are defined by Defra as locations where the highest 1% of noise levels at residential locations can be found, and where action to reduce noise should be focused. Under the Noise Action Plan for each Noise Important Area (shaded in blue in Figure 5.1.1), the highway authority are required to identify proposed actions that will meet the vision and aims set out in the Government's policy on noise, unless they are satisfied that no further action can or needs to be taken in order to meet this objective. Meetings were held with National Highways and the local highways authorities to investigate how the Project design could best align with their plans to comply with this policy requirement.

Table 5.1.1 Predicted Road Traffic Noise Levels Daytime in the Short Term

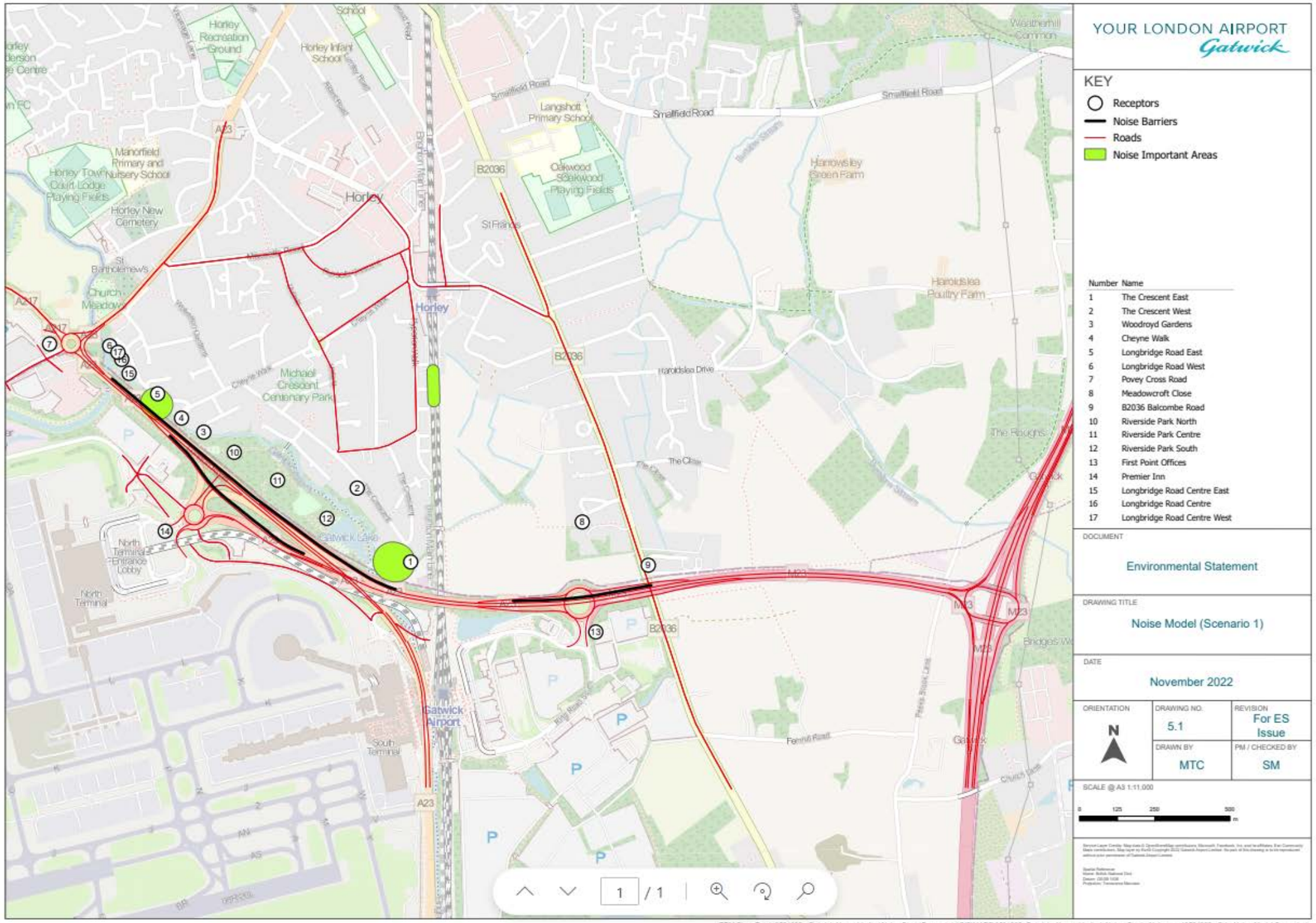
Scenario	Receptor ID / Description, $L_{A10,18hr}$ dB Results (Façade)																
	NSR1 – The Crescent East	NSR2 – The Crescent West	NSR3 – Woodroyd Gardens	NSR4 – Cheyne Walk	NSR5 – Longbridge Road East	NSR6 – Longbridge Road West	NSR7 – Povey Cross Road	NSR8 – Meadowcroft Close	NSR9 – B2036 Balcombe Road	NSR10 – Riverside Garden Park North(1)	NSR11 – Riverside Garden Park Centre(1)	NSR12 – Riverside Garden Park South(1)	NSR13 – Offices (1)	NSR14 – Premier Inn(1)	NSR15 – Longbridge Road Centre East	NSR16 – Longbridge Road Centre	NSR17 – Longbridge Road Centre West
Baseline 2018	69.9	65.2	69.0	70.9	70.5	70.2	70.4	67.4	73.7	63.0	62.8	64.2	69.7	69.3	71.2	70.1	69.8
Business As Usual 2032	70.5	65.9	70.2	72.1	71.6	71.2	71.2	67.9	74.2	64.0	63.5	64.9	69.8	69.7	72.3	71.2	70.9
With Scheme 2032 Scenario 1	67.3	63.2	64.8	65.9	65.6	69.9	71.3	65.9	73.0	60.1	61.4	61.6	68.1	69.9	67.8	68.4	68.9
With Scheme 2032 Scenario 2	69.1	65.2	69.3	71.1	70.5	70.5	71.3	66.1	73.0	64.4	64.1	64.3	68.1	69.9	70.6	69.8	69.8
Reduction Due to Park Barrier	1.8	2.0	4.5	5.2	4.9	0.6	0.0	0.2	0.0	4.3	2.7	2.7	0.0	0.0	2.8	1.4	0.9
Comparison of BAU against Scenario 1	-3.2	-2.7	-5.4	-6.2	-6.0	-1.3	0.1	-2.0	-1.2	-3.9	-2.1	-3.3	-1.7	0.2	-4.5	-2.8	-2.0
Comparison of BAU against Scenario 2	-1.4	-0.7	-0.9	-1.0	-1.1	-0.7	0.1	-1.8	-1.2	0.4	0.6	-0.6	-1.7	0.2	-1.7	-1.4	-1.1

(1) Noise-sensitive receptors represent open park areas or non-residential receptors, and results are presented as free-field values.

5.1.9 The Scenario 2 noise modelling showed that significant effects could be avoided without a noise barrier along Riverside Garden Park and small reductions in noise would be achieved at most locations including all parts of the Noise Important Areas compared to the do-minimum scenario, as a result of the combination of mitigation options as discussed above and the reduction in the number of vehicles travelling past the park due to the new exit arrangements for traffic from the airport which allow traffic to turn right out of the airport. Turning right reduces the number of movements past the park as in the current situation traffic turns left, passing the park northwards before returning southwards and again passing the park. Furthermore, the noise barrier adjacent to the Riverside Garden Park had other constraints such as engineering, visual and ecological impacts so was, therefore, not taken forward as a part of the ES assessment.

5.1.10 This assessment provided the dimensions of the required noise barriers that were incorporated into the ongoing engineering design. Following the assessment stage, it is normal practice for the specifications to be subject to refinement during detailed design and prior to delivery.

Figure 5.1.1: Noise Model (Scenario 1)



6 Assessment Results

6.1 Introduction

6.1.1 The following section describes the outputs from both the construction and operational noise assessment studies with the application of the mitigation described in Section 5 i.e. Scenario 2, without a barrier running along the Riverside Garden Park.

6.2 DMRB Construction Assessment

Introduction

6.2.1 Construction traffic on public highways has the potential to create noise disturbance. The extent of noise impact would depend on the numbers of NSRs along the relevant routes, and the extent to which noise levels on routes is increased, which depends on the numbers of construction vehicles and diverted traffic compared to base flows during the day and night. As described in Section 3.3, all road links where a potential increase of basic noise level of greater than 1 dB were considered in both day and nighttime periods.

Scoping Results

6.2.2 From the scenarios identified in Section 3.3.4, where peak airfield and highway construction traffic changes are expected, traffic passes along the following routes where a greater than 1 dB change in basic noise level was calculated. Changes of greater than 1 dB are reported as a scoping level, noting that changes generally have to be above 3 dB to be significant. The road links where a change in noise of more than 1 dB was calculated, are reported in the following paragraphs, along with the period of the day in which it occurs. No changes of more than 1 dB were calculated to occur at night in any of the scenarios. Following this, the predicted changes in noise are discussed, and any changes in noise of greater than 3 dB are highlighted and assessed.

Peak Airfield Construction 2029

Increase in Noise Level – Daytime:

- M23 Southbound slip road onto the M23 roundabout with no nearby NSRs.
- Longbridge Roundabout with a few nearby NSRs.

Peak Highway Construction 2029

Increase in Noise Level – Daytime:

- South Terminal Roundabout southbound into the airport terminal with a few nearby NSRs.
- Gatwick Way northbound onto the North Terminal Roundabout with a few nearby NSRs.
- Several road links on the Reigate Road southbound the junction onto Povey Cross Road with nearby NSRs.
- Southbound road links from Charlwood down Lowfield Heath Road and Bonnetts Lane towards Langley Green.
- Westbound road in Horley on Lee Street towards Mill Lane.

Decrease in Noise Level – Daytime

- Several road links on the M23 westbound towards the South Terminal roundabout with generally a few nearby NSRs.
- Several road links on Airport Way westbound towards the North Terminal roundabout with generally a few nearby NSRs.
- Several road links on the A23 westbound towards the Longbridge roundabout with generally a few nearby NSRs.
- Several road links on the A217 eastbound towards the Longbridge roundabout with generally a few nearby NSRs.

Highway Construction Traffic Management Measures On Airport Way 2029

Increase in Noise Level – Daytime:

- South Terminal Roundabout southbound into the airport terminal with a few nearby NSRs.
- B2036 Southbound from Brighton Road to Smallfield Road with several nearby NSRs.
- Several road links on the Reigate Road southbound the junction onto Povey Cross Road with nearby NSRs.
- Southbound road links from Charlwood down Lowfield Heath Road and Bonnetts Lane towards Langley Green.

Decrease in Noise Level – Daytime

- Several road links on the M23 westbound towards the South Terminal roundabout with generally a few nearby NSRs.
- Several road links on the M23 northbound towards the M23 roundabout with generally a few nearby NSRs.
- Several road links on Airport Way westbound towards the North Terminal roundabout with generally a few nearby NSRs.
- Several road links on the A23 westbound towards the Longbridge roundabout with generally a few nearby NSRs.
- Several road links on the A217 eastbound towards the Longbridge roundabout with generally a few nearby NSRs.
- Several road links on the A23 eastbound towards the South Terminal Roundabout with generally a few nearby NSRs.
- Several road links on the London Road westbound towards the North Terminal Roundabout with generally a few nearby NSRs.
- Gatwick Way southbound towards Perimeter Road North.

Construction Traffic Noise Assessment

6.2.3 For the Peak Airfield Construction scenario, on the M23 slip road exiting onto the M23 roundabout, an increase in basic noise level of 4.1 dB was calculated equivalent to a moderate magnitude. However, given that there are no NSRs within 50m of the road link there is no significant effect in terms of DMRB, and given the traffic flow of the road link is low compared to adjacent links on the M23 it is unlikely there would be any perceivable change in total noise at any NSRs. At road links on Longbridge Roundabout, up to 1.9 dB noise changes were calculated, which is equivalent to a minor magnitude. There are several noise sensitive receptors within 50 metres of the links, however, given the change in noise is of minor significance, there is no significant effect in terms of DMRB. No changes in noise greater than 1 dB were calculated at night-time and no decreases in noise of greater than 1 dB during day or night were calculated.

6.2.4 For the Peak Highway Construction scenario during the daytime, increases in basic noise levels on road links calculated on Gatwick Way Northbound, Reigate Road southbound, southbound road links from Charlwood, or westbound road in Horley on Lee Street are all less than 3dB and so not significant in terms of DMRB as a minor magnitude was calculated. There are several NSRs within 50 metres of the road where some receptors may be subject to some temporary disturbance as a result of construction traffic movements. The road link located on the South Terminal Roundabout southbound into the south airport terminal is calculated as a major magnitude equivalent to a significant change in noise. The road link is within 50 metres of the Amadeus offices in Buckingham Gate and would be a temporary significant effect in terms of DMRB. However, given the traffic flow of the road link is lower than several of the adjacent links on the A23 and surrounding roads on the South Terminal Roundabout, it is unlikely there would be any significant change in total noise at the Amadeus offices.

6.2.5 For the Peak Highway Traffic Management measures on Airport Way during daytime, increases in basic noise levels on road links calculated on the B2036 Southbound, Reigate Road southbound, or southbound road links from Charlwood are all less than 3dB and so not significant in terms of DMRB as a minor magnitude was calculated. There are several NSRs within 50 metres of the road where some receptors may be subject to some temporary disturbance as a result of construction traffic movements. The road link located on the South Terminal Roundabout southbound into the south airport terminal was similarly calculated as a major significant change in noise and would be a temporary significant effect in terms of DMRB on the Amadeus offices in Buckingham Gate. However similarly, traffic flow of the road link is lower than several of the surrounding road links and would therefore be unlikely to give rise to any significant change in total noise that is perceivable at the Amadeus offices.

6.2.6 Decreases in basic noise levels on road links were also calculated for the Peak Highway Construction scenario during the daytime. These include minor positive changes along several links on the M23 westbound towards the South Terminal roundabout, Airport Way westbound towards the North Terminal roundabout, and the A23 westbound towards the Longbridge roundabout. Furthermore, moderate positive changes were calculated on road links on the A217 eastbound towards the Longbridge roundabout which is equivalent to a significant positive effect.

6.3 Operational Assessment

Noise Changes at Selected NSRs

6.3.1 As described in Section 4.1.2, a selection of NSRs were identified based on their close proximity to the Project and noise sensitivity in the PEIR. Predicted noise levels and changes due to the Project were modelled at these locations as part of the ES stage. The results are given in Table 6.3.1 and Table 6.3.2.

Table 6.3.1 Predicted Road Traffic Noise Levels Daytime

Scenario	Receptor ID / Description, $L_{A10,18hr}$ dB Results (Façade)																
	NSR1 – The Crescent East	NSR2 – The Crescent West	NSR3 – Woodroyd Gardens	NSR4 – Cheyne Walk	NSR5 – Longbridge Road East	NSR6 – Longbridge Road West	NSR7 – Povey Cross Road	NSR8 – Meadowcroft Close	NSR9 – B2036 Balcombe Road	NSR10 – Riverside Garden Park North[(1)]	NSR11 – Riverside Garden Park Centre[(1)]	NSR12 – Riverside Garden Park South[(1)]	NSR13 – Offices [(1)]	NSR14 – Premier Inn[(1)]	NSR15 – Longbridge Road Centre East	NSR16 – Longbridge Road Centre	NSR17 – Longbridge Road Centre West
Baseline 2018	69.1	63.7	68.6	70.6	70.2	69.3	69.6	65.5	73.4	62.8	62.5	64.0	68.9	69.0	70.9	69.3	68.6
Do-minimum 2032	69.7	64.4	70.0	71.9	71.3	70.4	70.4	65.9	73.7	63.7	63.2	64.6	68.9	69.4	72.0	70.4	69.7
Do-something 2032	68.7	63.8	68.9	70.8	70.0	69.5	70.6	63.6	72.3	64.1	63.8	64.0	67.1	69.6	70.0	68.7	68.1
DMRB short term change	-1.0	-0.6	-1.1	-1.1	-1.3	-0.9	0.2	-2.3	-1.4	0.4	0.6	-0.6	-1.8	0.2	-2.0	-1.7	-1.6
Do-something 2047	69.0	64.2	69.2	71.1	70.4	69.8	70.9	64.0	72.8	64.4	64.1	64.3	67.5	69.9	70.4	69.0	68.4
DMRB long term change	-0.7	-0.2	-0.8	-0.8	-0.9	-0.6	0.5	-1.9	-0.9	0.7	0.9	-0.3	-1.4	0.5	-1.6	-1.4	-1.3
Do-minimum 2047	70.0	64.6	70.3	72.2	71.6	70.6	70.7	66.2	74.2	64.0	63.5	64.9	69.2	69.8	72.3	70.7	69.9
DMRB non-project change	0.3	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.5	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.2

[(1)] Noise-sensitive receptors represent open park areas or non-residential receptors, and results are presented as free-field values.

Table 6.3.2 Predicted Road Traffic Noise Levels Night-time

Scenario	Receptor ID / Description, $L_{Aeq,night}$ dB Results (free-field)																
	NSR1 – The Crescent East	NSR2 – The Crescent West	NSR3 – Woodroyd Gardens	NSR4 – Cheyne Walk	NSR5 – Longbridge Road East	NSR6 – Longbridge Road West	NSR7 – Povey Cross Road	NSR8 – Meadowcroft Close	NSR9 – B2036 Balcombe Road	NSR10 – Riverside Garden Park North	NSR11 – Riverside Garden Park Centre	NSR12 – Riverside Garden Park South	NSR13 – Offices	NSR14 – Premier Inn	NSR15 – Longbridge Road Centre East	NSR16 – Longbridge Road Centre	NSR17 – Longbridge Road Centre West
Baseline 2018	55.4	51.3	57.3	59.2	58.6	58.6	60.5	53.2	63.0	53.7	53.0	53.9	57.1	57.9	59.5	58.3	57.7
Do-minimum 2032	56.1	52.0	58.4	60.1	59.4	59.3	60.9	53.6	63.3	54.5	53.7	54.6	57.6	58.4	60.2	58.9	58.3
Do-something 2032	54.5	50.9	57.3	59.3	58.6	58.9	61.0	51.2	61.8	54.4	53.6	53.5	54.6	56.5	58.9	57.8	57.2
DMRB short term change	-1.6	-1.1	-1.1	-0.8	-0.8	-0.4	0.1	-2.4	-1.5	-0.1	-0.1	-1.1	-3.0	-1.9	-1.3	-1.1	-1.1
Do-something 2047	54.9	51.2	57.6	59.5	58.9	59.1	61.2	51.7	62.1	54.6	53.8	53.8	55.1	56.6	59.1	58.1	57.5
DMRB long term change	-1.2	-0.8	-0.8	-0.6	-0.5	-0.2	0.3	-1.9	-1.2	0.1	0.1	-0.8	-2.5	-1.8	-1.1	-0.8	-0.8
Do-minimum 2047	56.3	52.1	58.4	60.1	59.4	59.3	61.0	53.9	63.4	54.6	53.8	54.7	57.7	58.4	60.2	59.0	58.3
DMRB non-project change	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.0

6.3.2 Comparing the predicted traffic noise levels from the Project in 2032 and 2047 to the future baseline scenario in 2032 for both day and night, reductions are predicted at the majority of residential receptors. Where increases are predicted they are all less than 1dB and can be described as negligible. Changes as a result of non-Scheme traffic increases have also been predicted for these years, but the predicted increases were found not to have a significant influence on the results, and the predicted reductions were shown to be as a result of the Project. A full assessment of potential effects is also presented in the following sections in line with DMRB requirements.

Tables of Noise Changes

6.3.3 The number of receptors significantly affected by noise from the Project in the short and long term scenarios, according to DMRB has been predicted, as required by DMRB (see Table 6.3.3 and Table 6.3.4). The results take into account the effect of the embedded mitigation. The analysis has considered changes as a result of non-project traffic increases (*DMFY* vs *DMOY* as described in Section 3.3.6) which were found not to have a significant influence on the results. As described in Section 3.3.18, noise levels were predicted at each façade and each floor height in line with DMRB requirements. DMRB also requires the reported noise changes are those with the greatest magnitude of increase (or minimum decrease) and highest do-something noise level at each NSR facade and floor height, where in a number of cases more than 20 facades more than 12 floor heights were predicted at for some larger buildings. It should be noted that this method leads to a highly conservative assessment because it emphasises noise increases and de-emphasises noise reductions.

6.3.4 The property counts are split into residential dwellings and other noise sensitive properties as required by the DMRB methodology. For dwellings, each address point is counted as one property below. For instance, where a building contains several flats, the number of flats are included in the counts. The other noise sensitive buildings include only those that are likely to be sensitive to noise such as schools, village halls, medical facilities, banks and offices. Whilst it would not be practical to check details on the use of each building, the list has been reviewed to ensure that buildings that are largely not noise sensitive, such as supermarkets, have been excluded.

Table 6.3.3 Operational Noise Assessment Short Term

Project: Gatwick Northern Runway Project					
Scenario/Comparison: Short term comparison					
		Day		**Night**	
Change in noise level dB(A)		**Number of dwellings**	**Number of other noise sensitive receptors**	**Number of dwellings**	**Number of other noise sensitive receptors**
Increase in noise levels dB LA10, 18hour/Lnight	<1.0	1296	343	1168	275
	1.0 – 2.9	57	91	37	8
	3 – 4.9	0	0	0	0
	>5	0	0	0	0
No Change	0	3374	348	3473	484
Decrease in noise levels dB LA10, 18hour/Lnight	<1.0	38	1	97	16
	1.0 – 2.9	12	2	2	1
	3 – 4.9	0	0	0	1
	>5	0	0	0	0

6.3.5 The same table has been produced for the long-term assessment in line with the DMRB.

Table 6.3.4 Operational Noise Assessment Long Term

Project: Gatwick Northern Runway Project					
Scenario/Comparison: Long term comparison					
		Day		**Night**	
Change in noise level dB(A)		**Number of dwellings**	**Number of other noise sensitive receptors**	**Number of dwellings**	**Number of other noise sensitive receptors**
Increase in noise levels dB $L_{A10, 18hour}/L_{night}$	<3	2224	513	2044	283
	3.0 – 4.9	0	0	2	0
	5 – 9.9	0	0	0	0
	>10+	0	0	0	0
No Change	0	2519	269	2713	499
Decrease in noise levels dB $L_{A10, 18hour}/L_{night}$	<3	34	3	18	3
	3.0 – 4.9	0	0	0	0
	5 – 9.9	0	0	0	0
	>10+	0	0	0	0

Noise Change Contours

6.3.6 The DMRB noise assessment also requires identification of where the predicted noise changes occur and noise contours have been produced to illustrate this. The figures, included in Volume 2 of this ES, show the following scenarios.

- A comparison in the *Short Term in 2032: Do Minimum (DMOY)* (i.e. the opening year without the Project) **vs** *Do Something (DSOY)* (i.e. the situation during the opening year with the Project and associated traffic changes) see Figure 14.9.33 for daytime and Figure 14.9.34 for night.
- A comparison in the *Long Term: Do Minimum (DMOY)* (i.e. the situation in 2032 on the date that the Project opens without the Project) **vs** *Do Something (DSFY)* (i.e. the situation 15 years after opening in 2047 with the Project and associated traffic changes), see Figure 14.9.51 for daytime and Figure 14.9.52 for night.
- Non-project noise change: *Do Minimum Future Year (DMFY*) (i.e. the situation in 2047 which is 15 years after the Project opens without the Project) compared against *DMOY*, see Figure 14.9.53 for daytime and Figure 14.9.54 for night.

Calculations of BNL Change on Wider Road Network

6.3.7 Changes in road traffic noise levels indirectly resulting from the operation of the Project on the wider road network were calculated. The results of these predictions identified some small noise changes as a result of the Project.

6.3.8 Several traffic links were calculated in the short term with a BNL change of more than 1 dB(A), and more than 3 dB(A) change in the long term, as a result of the Project i.e., a minor magnitude. However, no road links were calculated to have a change in noise attributing to a moderate magnitude or greater impact (i.e., >3dB in the short term and greater than 5dB in the long term) so there are therefore no significant impacts in DMRB terms.

6.3.9 In the short term the majority of the links identified as having a minor magnitude of change were of a significant distance from the vicinity of the Study Area as outputs from the strategic model span tens of kilometres and are unlikely to be a direct effect from the Scheme.

6.3.10 In the long term, despite some roads being calculated to have a minor magnitude impact, the road links were also identified to have similar changes in noise in both the long term and non-project scenarios which DMRB states in these cases is not likely an indication of any significant effect in any case and are more likely to be of negligible effect.

Summary of Noise Impacts

6.3.11 Figure 14.9.55 shows locations that would experience potentially significant noise increases from the Project. Figure 14.9.55 shows the worst-case noise impact magnitude predicted under the DMRB scenarios. These locations are listed below and the likely significance of impacts at each is then discussed in view of the other factors outlined in Section 2.2.7:

- Premier Inn London Gatwick Airport hotel Longbridge Way, Horley, Gatwick RH6 0NX;
- Premier Inn London Gatwick Airport North Terminal Northway, Horley, Gatwick RH6 0GQ;
- Gatwick Airport Police Station, Perimeter Road N, Horley, Gatwick, RH6 0PH;

6.3.12 All of these receptors are non-residential and have been designed to take into account existing noise levels including the application of good noise insulation. Therefore, they are likely to be less sensitive to traffic noise and significant effects are not expected.

Estimate of Noise Insulation Qualifiers and Locations

6.3.13 The receptors that meet the numerical criteria to be eligible to qualify for noise insulation are included in Table 6.3.5:. However, it is noted that the Noise Insulation Regulations stipulate that only residential properties within 300 metres of the Project could be eligible for noise insulation. Therefore, none of the identified buildings would qualify under the noise statute as they are not residential.

Table 6.3.5: Summary of Locations Where Noise Levels Are Meet Eligibility Requirements for Noise Insulation

NSR	Comments
Premier Inn London Gatwick Airport (A23 Airport Way) hotel	Non-residential therefore not eligible for statutory noise insulation. Already fitted with effective sound insulation.
Premier Inn London Gatwick Airport (North Terminal) hotel	Non-residential therefore not eligible for statutory noise insulation. Already fitted with effective sound insulation.
Gatwick Airport Police Station	Non-residential therefore not eligible for statutory noise insulation. Already fitted with effective sound insulation.

7 TAG Assessment

7.1 Results

7.1.1 The economic appraisal of the Project is reported in Chapter 17. The cost benefit analysis the Project's operational traffic noise impacts have been evaluated using the TAG (Transport Appraisal Guidance) Unit A3 - Environmental Impact Appraisal tools which are provided for this purpose. For each one decibel change in average noise level, a monetary value is assigned for the change in the following health impacts: amenity (annoyance), acute myocardial infarction, dementia, stroke, and sleep disturbance. The guidance[8] indicates that noise levels for daytime should be quantified in $L_{Aeq,\ 16\ hr}$ in the year of opening (2032) and in an assessment year, in this case 2047. Since, the calculations for road traffic noise are carried out in terms of $L_{A10,18\ hour}$, a conversion factor is provided (of -2 dB). For this assessment, properties have been reported where daytime noise levels are predicted to be at or above the LOAEL value that has been adopted in this assessment. Whilst it is accepted that a small percentage of the population may experience health effects below this level, the dose-response functions are uncertain at low noise levels as are predicted changes in noise levels (especially

[8] TAG Unit 3, Environmental Appraisal, Department for Transport, May 2022 version accessed at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1102784/tag-unit-a3-environmental-impact-appraisal.pdf

over large distances). The results of the calculation are provided in Table 7.1.1.

Table 7.1.1 Summary TAG Assessment for Operational Traffic Noise

NSR	Net Present Value (£) (Note Positive Values Represent Benefits)
Net Present Value of Change in Noise (£)	£700, 573
Net Present Value of Impact on Sleep Disturbance (£)	£460,585
Net Present Value of Impact on Amenity (£)	£170,298
Net Present Value of Impact on acute myocardial infarction (AMI (£)	£-6,988
Net Present Value of Impact on Stroke (£)	£30,513
Net Present Value of Impact on Dementia (£)	£46,165
Quantitative Results	
Households Experiencing Increased Daytime Noise in Forecast Year	54
Households Experiencing Reduced Daytime Noise in Forecast Year	205
Households Experiencing Increased Nighttime Noise in Forecast Year	58
Households Experiencing Reduced Nighttime Noise in Forecast Year	247

8 Noise Survey

8.1 2019 Survey Details

Purpose of Survey

8.1.1 Riverside Garden Park is adjacent to the A23 (Photos 8.4.5 and 8.4.6), where changes in the highway network are proposed to accommodate the forecast increased traffic demand with the Project. It is an area used for recreation and relaxation and hence users are sensitive to noise. It is also affected by road traffic noise, ground noise from the airport, and air noise from aircraft arriving and departing from the airport, all of which are assessed in Chapter 14: Noise and Vibration of the ES. The primary purpose of the survey was to visit the Riverside Garden Park to better understand its sensitivity to noise and the relative contributions of the three types of noise.

Monitoring Locations

8.1.2 The noise monitoring locations are shown in Figure 8.3.1 and with photographs of the monitoring equipment as shown in Photo 8.4.1 and 8.4.2.

Monitoring Location 1

8.1.3 ML1 was located along Riverside North next to the Riverside Garden Park in a residential car park.

Monitoring Location 2

8.1.4 ML2 was located inside the Riverside Garden Park within the visitor's car park.

8.2 Equipment and Setup

8.2.1 Monitoring was carried out using a Bruel and Kjaer 2250L Class 1 sound level meter (SLM). A windshield was used to minimise wind effects at the microphone. The equipment was mounted on a tripod so that the microphone was installed at approximately 1.5 metres above the ground. The system was located in free-field conditions (i.e., at least 3.5 metres from the nearest hard reflective surface). The sound level meter was calibrated before the survey. Following the survey, the calibration level was checked. No significant drift (i.e., > 0.5 dB) was noted.

8.3 Data Recording

8.3.1 Sound levels were measured over 10-minute periods, the sound level meter also logged short measurements which allow for subsequent interrogation of parts of each measurement. Standard metrics including L_{Aeq}, L_{A90}, L_{A10} and L_{Amax} were recorded. In addition, third-octave band measurements were carried out and audio samples were recorded which could be listened to at a later date.

8.3.2 The survey was carried out during the daytime between 11.00 and 12.00 hours. The wind speed and direction were recorded for each measurement. During the survey, the weather was sunny with patchy cloud and no rain. Wind speeds stayed consistent and below 1.5 m/s throughout. The measurement at ML2 starting at 11.39 was affected by a loud helicopter flyover which was not typical of the underlying sound levels.

Figure 8.3.1: Measurement Locations (2019)

8.4 Riverside Garden Park Measurements, May 2019

8.4.1 Table 8.4.1 and Table 8.4.2 below, summarise the results of the noise survey for the two monitoring locations described.

Table 8.4.1 Noise Survey Results (May 2019)

Location	Start Time	Measurement Duration (Mins)	Noise Level (dBA)			
			L_{eq}	L_{90}	L_{max}	L_{10}
Residential Car Park (ML1)	11:16	10	57.3	54.7	68.7	59.4
Park Car Park (ML2)	11:39	10	60.6	51.0	81.9	60.4
	11:52	10	55.1	53.0	62.2	56.8

Table 8.4.2: Details of 2019 Noise Survey

Location	Time	Measurement Duration (Mins)	Wind		Comments
			Direction	Speed (m/s)	
Residential Car Park (ML1)	11:16	10	NE	1.5	Aircraft take-off, traffic from A23, car leaving ML noted, natural sounds notably birdsong.
Park Car Park (ML2)	11:39	10	NE	Light Breeze / Still	Same as above with the addition of wind noise in the trees, helicopter flyover, and people talking. It was noted that the park had dense foliage which acoustically screened the traffic noise. The park was mainly used by joggers and dog walkers.
	11:52	10	NE	Light Breeze / Still	Same as first sample without helicopter flyover, with the addition of wind noise in the trees and an aircraft turnaround noted.

Observations

8.4.2 After conducting sound measurements and an assessment of the park areas, the following were observed. Firstly, as noted in Table 8.4.1, it was observed that traffic, aircraft, and natural sounds were all audible at both measurement locations. It was also noted that none of the noise sources were visible due to the thick foliage and trees within the park (as shown in Photo 8.4.4). The park itself appeared to be widely used by the local community; cyclists, walkers, and dog walkers were observed during the visit (as shown in Photo 8.4.3). Despite having high measured baseline levels, the noise environment was unexpectedly relaxing mainly being dominated by continuous road traffic. It was apparent that the Riverside Garden Park is potentially sensitive to significant changes in ambient noise, given the number of users.

Photo 8.4.1 Measurement Location ML2 Noise Monitoring Setup, 2019

Photo 8.4.2: Measurement Location ML2, 2019

Photo 8.4.3: Site Photographs Riverside Garden Park Pathway, 2019

Photo 8.4.4: Riverside Garden Park Central Open Area, 2019

Photo 8.4.5: A23 Road Facing Southeast, 2019

Photo 8.4.6: A23 Road Facing Northwest, 2019