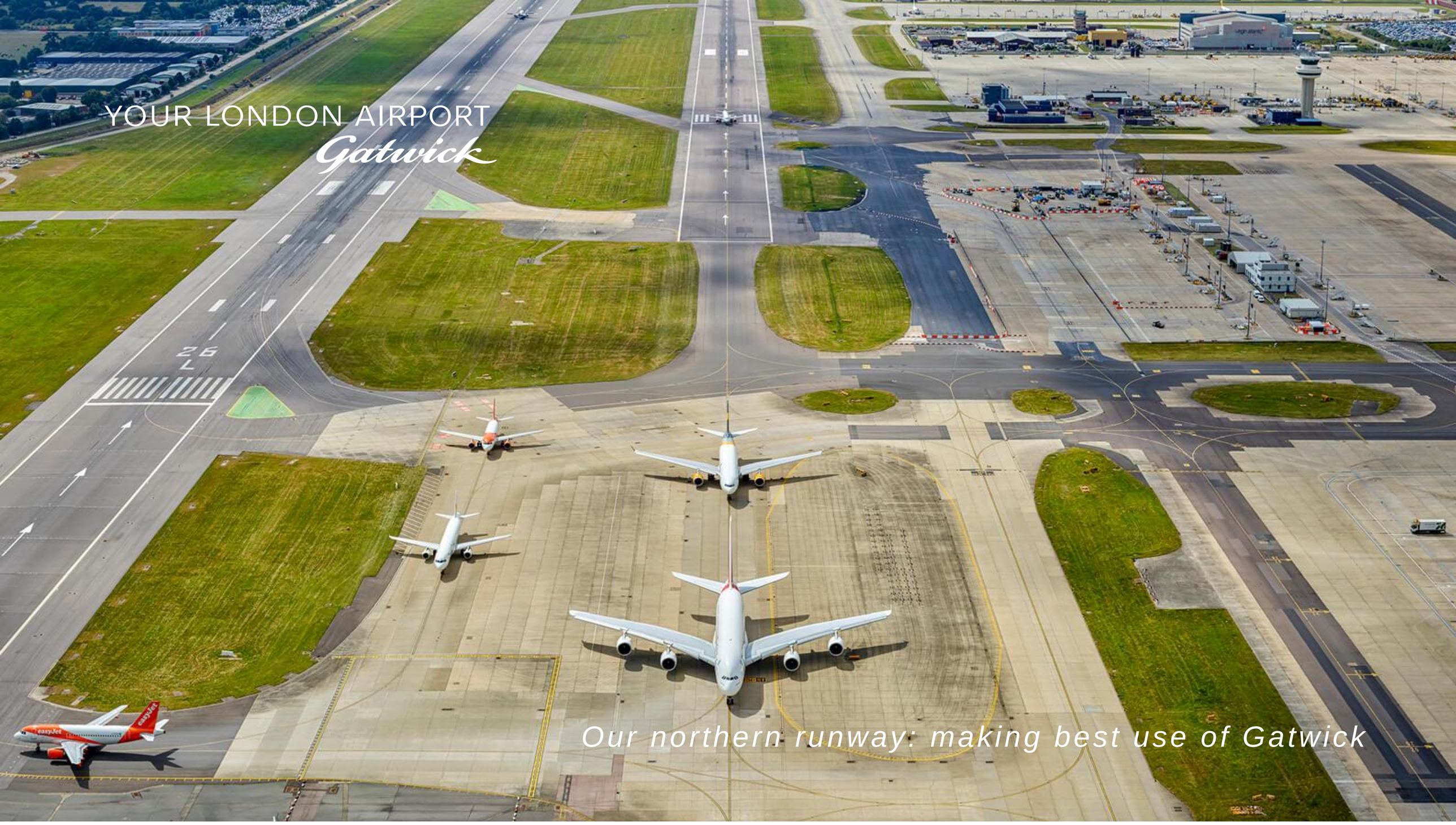


Preliminary Environmental Information Report
Appendix 14.9.4: Road Traffic Noise

September 2021

Table of Contents

1 Introduction

1.1 General

1.1.1 This document forms Appendix 14.9.4 of the Preliminary Environmental Information Report (PEIR) prepared on behalf of Gatwick Airport Limited (GAL). The PEIR presents the preliminary findings of the Environmental Impact Assessment (EIA) process for the proposal to make best use of Gatwick Airport's existing runways (referred to within this report as 'the Project'). The Project involves alterations to the existing northern runway which, together with the lifting of the current restrictions on its use, would enable dual runway operations. The Project includes the development of a range of infrastructure and facilities which, with the alterations to the northern runway, would enable the airport passenger and aircraft operations to increase. Further details regarding the components of the Project can be found in Chapter 5: Project Description.

1.1.2 This document describes the road traffic noise modelling methodology and the results of noise predictions that have been carried out for the Project.

2 Methodology

2.1 Road Traffic Noise Modelling

Software and Calculation Method

2.1.1 Predictor V2021 software was used to complete the road traffic noise model. The model implemented the Calculation of Road Traffic Noise (CRTN) calculation method to predict noise levels.

Traffic Data and Model Inputs

2.1.2 Strategic Model traffic data outputs were used within the model. Eighteen hour traffic flows, the 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 (or Business as Usual) case and the situation with the Project.

2.1.3 LiDAR 10-metre accuracy height points were used to interpolate the height information inside the Project site boundary. The data were also used to calculate the CRTN gradient noise level correction for the road noise sources in the existing situation.

2.1.4 All roads were assumed to have a bitumen surface with a texture depth of 1.5 mm, with a width of 7 metres, and source noise level elevation of 0.5 metres, following the guidance in CRTN. No additional low-noise surface correction was applied to future scenarios to be conservative.

2.1.5 All locations within the 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.

2.1.6 Noise sensitive receptor locations were assumed to be 4 metres above the ground representing the first floor at residential and non-residential locations, and at 1.5 metres (human height) within the Riverside Garden Park.

Outputs and Contours

2.1.7 $L_{A10,18hr}$ noise levels were calculated at 14 noise-sensitive receptor locations as stated in Table 4.5.4. The contribution to the overall level from each road was also calculated for analysis.

2.1.8 Noise contours were calculated at a height of 4 metres above the ground, and from a grid of prediction points with a resolution of 50 metres within the entirety of the study area.

3 Assessment Results

3.1 Road Traffic Noise Results

3.1.1 Table 4.5.4 shows predicted traffic noise levels at all receptor locations in 2032 (the year of opening of the highway works) and 2047 (the year 15 years after opening as required for the assessment by the DMRB). The table includes the predicted noise levels for the do-minimum situation (which is referred to Business as Usual) and the situation with the Project for both assessment years.

4 Baseline

4.1 2019 Survey Details

Purpose of Survey

4.1.1 Riverside Garden Park is adjacent to the A23, 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 addressed in Chapter 14: Noise and Vibration of the PEIR. 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. The secondary objective was to measure baseline levels to assist in calibrating the traffic noise model.

Monitoring Locations

4.1.2 The noise monitoring locations are shown in Diagram 4.3.1 and a photograph of the monitoring equipment is shown in Diagram 4.5.3

Monitoring Location 1

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

Monitoring Location 2

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

4.2 Equipment and Setup

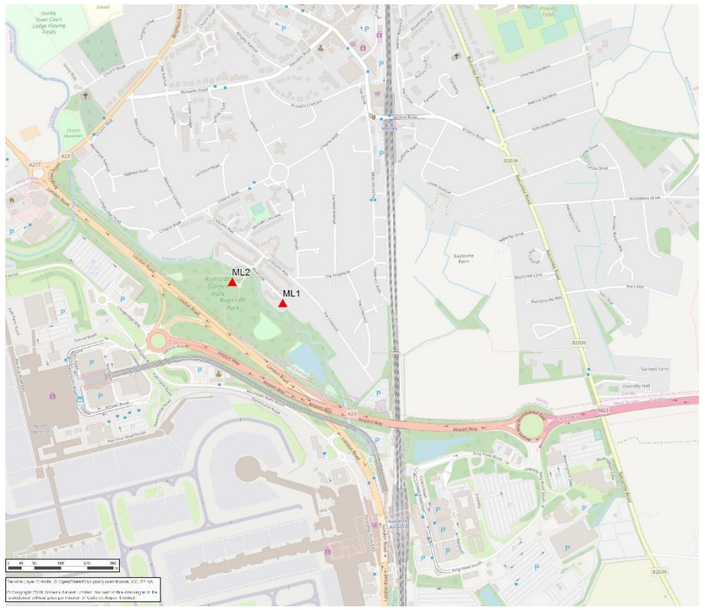
4.2.1 Monitoring was carried out using a Bruel and Kjaer 2250L Class 1 sound level meter (SLM). A windshield was used to minimise wind effects at the microphone. The equipment was mounted on a tripod so that the microphone was installed at approximately 1.5 metres above the ground. The system was located 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.

4.3 Data Recording

4.3.1 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 at a later date.

4.3.2 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.

Diagram 4.3.1: Measurement Locations (2019)



4.4 Riverside Garden Park Measurements 2019

4.4.1 Table 4.4.1 below, and Table 4.5.3 summarise the results of the noise survey for the two monitoring locations described.

Table 4.4.1: 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

Observations

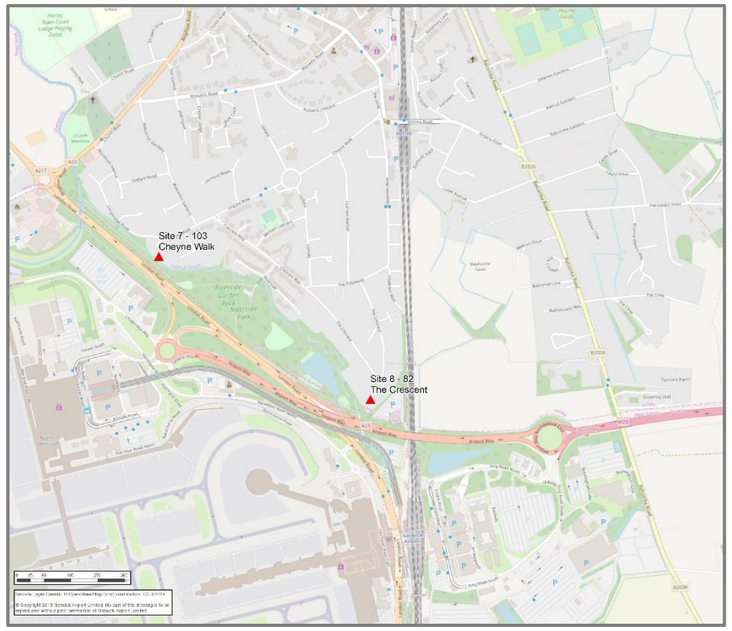
4.4.2 After conducting sound measurements and an assessment of the park areas, the following were observed. Firstly, as noted in Table 4.5.3, it was observed that traffic, aircraft and natural sounds were all audible at both measurement locations. It was also noted that none of the noise sources were visible due to the thick foliage and trees within the park (as shown in Diagram 4.5.6). 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 Diagram 4.5.5). 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.

4.5 2016 Survey

2016 Baseline Measurements

4.5.1 The results of the survey which was conducted in 2016 by Hayes McKenzie to inform the ground noise assessment have also been used to calibrate the noise model. Two monitoring sites were identified in the survey that represented residential receptors which back onto Riverside Garden Park and which are in the traffic noise study area. These were Site 7 and Site 8 in Diagram 4.5.1 below.

Diagram 4.5.1: Monitoring Locations (Haynes McKenzie) 2016



4.5.2 Table 4.5.1 shows the noise levels measured at both sites during the same time of day in scenarios with flights taking off in both easterly (08) and westerly (26) runway (R/W) directions.

Table 4.5.1: 2016 Baseline Measurement Results

Location	Time	Measurement Duration (Mins)	Noise Level (L_{eq} dB)			
			Leq R/W 08	L90 R/W 08	Leq R/W 26	L90 R/W 26
Site 7 – 103 Cheyne Walk	11:00	60	60.3	54.1	61.0	57.2
	12:00	60	59.0	54.1	61.0	57.7
Site 8 – 82 The Crescent	11:00	60	63.1	52.0	60.3	57.4
	12:00	60	61.6	51.8	60.5	58.1

Modelled 2018 Baseline Results

4.5.3 Using initial traffic flow data from the traffic model for the 2018 baseline, a noise model was created, shown below in Diagram 4.5.2. Seven receptors were chosen at similar locations to where the 2016 baseline and the 2019 Riverside Garden Park measurements were taken. For ease of reference, Diagram 4.5.2 also shows the position of the monitoring locations in the 2019 survey (ML1 and ML2), Sites 7 and 8 from the 2016 survey and the locations at which traffic noise was predicted in this area using the noise model (locations NSR1, NSR2, NSR4, NSR6, NSR7 and NSR8). The predicted results are shown in Table 4.5.2.

Diagram 4.5.2: 2018 Noise Model and Measurement Locations

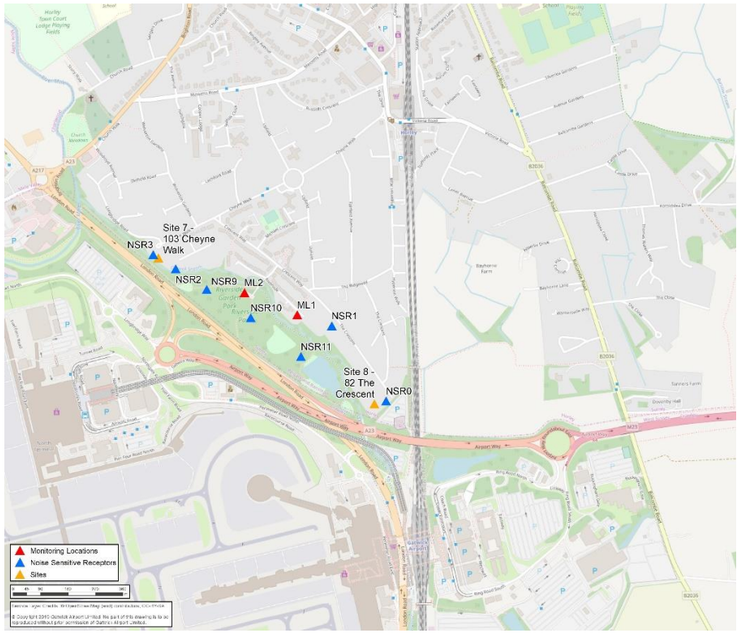


Table 4.5.2: Predicted Road Traffic Noise Levels

Receptor ID	Predicted Noise Level ($L_{A10,18\ hour}$ Free-field - dBA)	Height
NSR4	66.2	4 metres above terrain
NSR3	64.8	4 metres above terrain
NSR2	61.6	4 metres above terrain
NSR1	65.4	4 metres above terrain
NSR10	61.6	1.5 metres above terrain
NSR11	61.8	1.5 metres above terrain
NSR12	63.2	1.5 metres above terrain

Summary

4.5.4 The predicted 2018 baseline L_{A10} levels at NSR3 and NSR4, which represent the 2016 baseline Site 7 most accurately, show an $L_{10,\ 18\ hr}$ level of approximately five to six decibels greater than the baseline measured L_{Aeq} levels. The predicted L_{A10} levels at NSR1, representing measurement Site 8, show a level of approximately two to three decibels more than the measured level in 2016. The difference between the L_{Aeq} and L_{A10} metrics accounts for most of the difference in measured and modelled values. Also, the model does not take into account any screening that the measurement location may be subject to, and the predicted 2018 noise level may have a greater traffic flow than in 2016. Therefore, higher noise levels would be expected in general. Taking these factors into account the predicted noise levels agree reasonably well with the measured noise levels.

4.5.5 The 2018 predicted noise (L_{A10}) levels at NSR2, which represents the 2019 measured levels at ML1 in Riverside Garden Park most closely, are approximately two decibels higher than the measured baseline L_{A10} values. Predicted noise levels, therefore, agree reasonably well with the measured noise levels.

4.5.6 The 2018 predicted noise (L_{10}) levels at NSR11, which represents the 2019 measured levels at ML2 in Riverside Garden Park most closely, are approximately five decibels higher than the measured L_{10} values. However, the modelled receptors are closer to the road than ML2, which is likely to account for most of the difference.

4.5.7 Noise levels were measured at Site 8 in the 2016 baseline survey which is the closest baseline location to that of ML1 from the 2019 survey. The L_{Aeq} levels at Site 8 are three or four decibels higher than the levels measured in 2019 at ML1. However, Site 8 is closer to the road than ML1 and was measured 4 metres above the ground rather than 1.5 metres above the ground, and so is likely to have a less obstructed view of the road and therefore be subject to higher noise levels. Also, ML1 was located behind (northeast of) the park and so was subject to some additional screening by the thick layers of trees and foliage between it and the road. It is also worth noting that on ERM's site visit 10-minute short measurements were taken on a single day, whereas full 24-hour baseline measurements were taken for two weeks during the 2016 survey. Taking these factors into account the measured noise levels agree reasonably.

Diagram 4.5.3: Measurement Location ML2

Diagram 4.5.4: Measurement Location ML2

Diagram 4.5.5: Site Photographs Riverside Garden Park Pathway

Diagram 4.5.6: Riverside Garden Park Central Open Area

Diagram 4.5.7: A23 Road Facing South East

Diagram 4.5.8: A23 Road Facing North West

Table 4.5.3: Summary of 2019 Noise Survey

Location	Time	Measurement Duration (Mins)	Wind		Comments
			Direction	Speed (m/s)	Leq
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 with the addition of wind noise in the trees and an aircraft turnaround noted.

Table 4.5.4: Predicted Road Traffic Noise Levels

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 (2)	NSR11 - Riverside Garden Park Centre (2)	NSR12 - Riverside Garden Park South(2)	NSR13 - Offices	NSR14 - Premier Inn
Business As Usual 2032	69.2	64.9	69.8	71.4	70.5	70.0	69.8	67.6	74.3	63.6	63.0	64.0	72.1	71.1
Business As Usual 2047	69.5	65.2	70.1	71.6	70.7	70.3	70.2	67.8	74.5	63.7	63.2	64.3	72.3	71.6
With Project 2032	71.0	66.7	71.2	72.8	72.0	70.7	70.6	68.6	73.9	66.2	65.6	65.8	71.7	72.1
With Project 2047	71.3	67.0	71.5	73.1	72.3	71.0	70.9	68.9	74.2	66.5	65.9	66.1	71.9	72.5
With Project 2032 - Business As Usual 2032 Comparison	1.8	1.8	1.4	1.4	1.5	0.7	0.8	1.0	-0.4	2.6	2.6	1.8	-0.4	1.0

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 (2)	NSR11 - Riverside Garden Park Centre (2)	NSR12 - Riverside Garden Park South(2)	NSR13 - Offices	NSR14 - Premier Inn
With Project 2047 - Business As Usual 2032 Comparison	2.1	2.1	1.7	1.7	1.8	1.0	1.1	1.3	-0.1	2.9	2.9	2.1	-0.2	1.4
With Project 2032(1)	69.3	64.7	66.7	68.9	71.0	70.4	70.6	67.1	72.8	61.5	62.3	63.5	71.7	72.0
With Project 2047(1)	69.6	65.0	66.9	69.2	71.4	70.7	71.0	67.3	73.0	61.8	62.6	63.8	72.0	72.4
With Project 2032(1) - Business As Usual 2032 Comparison	0.1	-0.2	-3.1	-2.5	0.5	0.4	0.8	-0.5	-1.5	-2.1	-0.7	-0.5	-0.4	0.9
With Project 2047(1) - Business As Usual 2032 Comparison	0.4	0.1	-2.9	-2.2	0.9	0.7	1.2	-0.3	-1.3	-1.8	-0.4	-0.2	-0.1	1.3
Business As Usual 2047 - Business As Usual 2032 Comparison	0.3	0.3	0.3	0.2	0.2	0.3	0.4	0.2	0.2	0.1	0.2	0.3	0.2	0.5

(1) Scenario contains noise mitigation.

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