

Briefing Note: Fox Lane Quieter Neighbourhoods

FOR THE ATTENTION OF:

Leader of the Council, Cllr Nesil Caliskan

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Reason for this briefing note

As part of the Statutory Review for the Fox Lane Quieter Neighbourhood project, the Claimant has submitted information about a discrepancy between baseline and post implementation traffic monitoring data. The Council have reviewed the issue raised and note that there is a discrepancy. The purpose of this briefing note is to provide further information on the issue raised, the Council's subsequent review and to then conclude on the extent to which this issue would impact the recommendations of the Officer Report.

The Background

Enfield Council Officers published a report on 26 January 2022 ("Officer Report") at the end of the trial period of the Fox Lane Area Quieter Neighbourhood (Fox Lane QN) and provided a recommendation to make the measures of the Fox Lane QN permanent by means of permanent traffic orders.

The Officer Report sets out how the project is a part of the Council's range of interventions to encourage active travel and meet long term goals set out in the wider policy context and frameworks within which the project sits. The Council prepared and published a monitoring plan in May 2021 which set out the various areas of monitoring. In addition to monitoring, the Officer Report also presents details of engagement, consultation, objections to the traffic order, equalities, and other considerations.

Monitoring of the project during the trial phase was reported within the Officer Report and provided details on:

- Traffic volumes
- Vehicle speeds

- Bus journey times
- Pedestrians
- Cycling
- Emergency services
- Crime and anti-social behaviour
- Noise
- Air Quality
- Road collisions
- Healthy Streets Indicators

Appendix 1 to the Officer Report presents traffic volumes, vehicle speeds, bus journey times, cycle flow analysis and pedestrian data and is based on different types of data as inputs to the analysis.

The issue

The analysis of traffic volumes, vehicle speeds and cycle flows presents pre and post-implementation figures based on traffic surveys conducted with Automatic Traffic Counters (ATCs).

ATCs involve placing roadside units at each survey location by an external contractor. The data collected at the roadside units is processed into excel data files and then sent to the Council. The data files were then sent to the Council's traffic consultant for their analysis.

The March 2019 data files included vehicles travelling below 10 kph (6.2mph), and the September 2021 data files did not include vehicles travelling at speeds less than 10kph (6.2mph). This is due to a default setting being changed in the software and was not known to the Council (or the contractor) until October 2022 when raised via a newly submitted witness statement of the Claimant behind a Statutory Review of making the Fox Lane QN permanent. The Contractor has explained that:

*"Following a review of the 2019 set ups versus the 2021 for the fox lane surveys, we have managed to ascertain that the reason for the 0-6mph 2019 inclusion. It appears to be linked to the MTE Exex software version which was being used in 2019 for setting up the ATCs. TSS was not made aware that a software change or version update would change or alter the settings. The settings within the software were such that they included slow moving traffic traveling between 0-6mph. A further software update to a more recent version meant that the factory profile was updated to **'Include vehicles with speeds between 6mph and 100mph'**. This explains why the 2019 fox lane locations included the slow-moving traffic below 6mph which can impact accuracy and significantly affect the calculated wheelbase and class. The system software version setting is something the site engineers would not have been aware of as they do not have access to change such settings."*

The normal convention is that very slow moving traffic is excluded from the analysis of ATC data as it can result in data inaccuracies. The manufacturer of the ATCs used in this instance explains that:

"Having the default minimum speed in the software is mainly to do with accuracy. The slower a vehicle the more likely it can significantly change its speed within the length of the vehicle, which could significantly affect the calculated wheelbase and class".

In light of this, a review of September 2021 data has been completed and is attached to this briefing note. The September 2021 data was an input to the noise assessment, air quality assessment and Healthy Streets Indicators within the Officer Report and a review of each of these has also been undertaken and are attached to this briefing note.

Our approach to traffic monitoring

ATC surveys were conducted at 48 locations for the post implementation surveys in September 2021. ATCs are a relatively affordable survey technique and therefore can provide traffic data in a large number of locations and be used to inform a 'picture' of the traffic environment in an area.

In addition to ATCs, the Council also selected to monitor bus journey times to help inform traffic conditions before and after the QN's implementation. Bus journey time data is presented based on data provided by TfL referred to as iBus data, which records the time it takes for bus services to travel between stops. By nature, the bus journey time data is impacted by vehicles traveling at speeds below 10kph (6.2mph) both before and after the QN implementation. Bus journey time data includes routes along all of the boundary roads and many surrounding roads which were surveyed via ATCs. The results of the ATC analysis within the Officer Report were consistent with the bus journey time data. The revised boundary road results remain consistent with the bus journey time data – they do not provide additional material insights to the journey times along boundary and surrounding roads.

The Council carried out Manual Classified Counts (MCCs) at certain locations as part of the suite of data collected before and after the scheme was implemented. The primary reason for collecting the MCCs prior to implementation of the scheme was to help develop the estimated traffic reassignment. MCCs were carried out post implementation so they could be used to undertake further investigation. The traffic environment at Southgate Circus, which is primarily fed by five roads, was reported within the Officer Report at Appendix 2. The data input to the analysis was via traffic surveys using MCCs and therefore is not impacted by and changes in ATC data.

Review of ATC data

September 2021 data for the boundary and surrounding roads has been reanalysed and attached at Appendix 1. It shows the difference in boundary and surrounding roads' volume and speed had the analysis been completed using September 2021 data with vehicles travelling below 10kph (6.2mph). The review concludes that there is no material change to the comments and conclusions that were previously reported.

Appendix 1 also advises the updated traffic flows did not impact the Healthy Streets scores (included within the Officer Report at Appendix 7), and provides additional commentary on the comparison between MCCs and ATCs included within the witness statement SB3, concluding that it is not considered appropriate to directly compare the data between the MCC and the ATC data and draw conclusions from any disparity.

Updated September 2021 traffic data has been reviewed by the external consultants who prepared the noise and air quality assessments within the Officer Report (at Appendices 3 and 4). Technical notes describing the updated results are included at Appendix 2 and Appendix 3 to this briefing note. As with the initial noise and air assessments in the original Officer Report, there are uncertainties associated with the modelling assessments which are described within the Technical Notes at Appendix 2 and 3.

The noise assessment technical note at Appendix 2 identifies that the inclusion of additional vehicles leads to slightly larger changes in absolute noise levels, however, the impact in road noise level as summarised within the assessment in the original assessment remain unchanged.

The air quality assessment technical note at Appendix 3 identifies that the inclusions of the additional vehicles leads to slightly larger changes in absolute concentrations, however, the impact descriptors, determined using industry standard guidance, remain the same at all locations except for one where an additional slight adverse impact has been predicted on Green Lanes.

CONCLUSIONS

This issue has arisen from an incorrect default setting applied to the Contractor's equipment when the baseline data was collected in 2019. To enable a like for like comparison, as part of this review this nonstandard setting has been retrospectively applied to the 2021 post implementation data.

The analyses included within the appendices shows that when including data of those vehicles below 10kph (6.2mph), there is uplift in the overall volume of traffic, although this is not considered material. Even with the increases in volume on these roads as reported within the technical note at Appendix 1 by taking this nonstandard industry approach, the increase in traffic volumes on the reported boundary and surrounding roads, the Council remains of the opinion, as set out in the original Officer Report, that the traffic data does not suggest that the trial should not be made permanent.

Furthermore, iBus data provides a further reference point for increases in journey time as a result of additional motor traffic reassigned to boundary roads from unclassified roads. The Officer Report sets out these increases in bus journey times, which are not influenced by ATC data.

The subsequent review of the updated traffic data on the air quality assessment concluded that the results of the updated assessment are not considered to represent a significant effect on local air quality and the conclusions of the original Officer Report remain valid. It is noted that out of 117 modelled receptors, each of the sites remain as having an impact described as negligible, with the exception of one site which has now changed to slight adverse. Two of the 117 sites were previously identified as having a slight adverse impact and remain so. The three locations are all on Green Lanes. Likewise, the updated noise assessment concluded that results of the assessment are not considered to represent a significant impact on local noise exposure, and the original conclusions remain valid.

An increase of traffic on boundary roads was expected following the scheme's implementation. This was demonstrated in a report published¹ in July 2020 prior to the implementation of the trial, which presented an estimate of traffic reassignment and potential traffic volumes on the boundary roads post implementation. The assessment, completed based on traffic data surveyed in October 2019, estimated that traffic volumes on boundary roads could, in a worse case scenario, increase by 20 - 30%. Increases to this extent have not been seen with the monitoring to date.

The Officer Report stated (at paragraph 4) that

"it is considered the factors in favour of making the experimental traffic orders permanent outweigh the disbenefits and/or disadvantages of removing the trial".

Considering the range of traffic data presented within the Officer Report, the scale of change presented in the attached technical note, and the wider context within the Officer Report, this review does not result in any changes to the recommendations within the Officer Report.

Attachments

- Appendix 1: Traffic data briefing note
- Appendix 2: Noise assessment technical note
- Appendix 3: Air quality technical note

ⁱ “Plan for Fox Lane Area Quieter Neighbourhood slides (July 2020)” accessed from the Document Library at <https://letstalk.enfield.gov.uk/foxlaneQN>

FOX LANE AREA QUIETER NEIGHBOURHOOD

TRAFFIC DATA BRIEFING NOTE

ENFIELD COUNCIL



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1 TRAFFIC DATA BRIEFING NOTE

1.1 Introduction

- 1.1.1 Post-scheme monitoring was undertaken for the Fox Lane Area Quieter Neighbourhood, which included analysis of the following:
- Traffic flows based on Automatic Traffic Count (ATC) data collected in March 2019 for pre-scheme data and September 2021 for post-scheme data.
 - Traffic speeds which were also based on the ATC data collected in March 2019 for pre-scheme data and September 2021 for post-scheme data.
 - Cycle flows, based on the same ATC surveys as the traffic flows and speeds.
 - Bus journey time analysis, for all routes in the local area of the Quieter Neighbourhood, using data supplied by Transport for London from September 2019 to February 2020 for pre-scheme data and September to October 2021 for post-scheme data.
 - Pedestrian data based on camera footage in July 2021.
- 1.1.2 The post-scheme monitoring analysis can be found in the '*Fox Lane Quieter Neighbourhood Post-Scheme Monitoring Data Analysis*' report published in January 2022.
- 1.1.3 The ATC data for September 2021, used to undertake the post-scheme monitoring of traffic flows, traffic speeds and cycle flows, for the Fox Lane Area Quieter Neighbourhood did not include vehicles travelling at speeds less than 10kph (6.2mph). Vehicles travelling below 10kph (6.2mph) were recorded and included in the March 2019 data used in the post-scheme monitoring assessment. The discrepancy between the March 2019 data and the September 2021 data was due to a default survey setting being incorrectly applied, which was not known about until October 2022. September 2021 survey data for the roads outside the Quieter Neighbourhood has been revised to include vehicles travelling at speeds below 10kph (6.2mph). A review based on the revised traffic flow values has been carried out on the boundary roads of the Quieter Neighbourhood and the roads on the wider network outside the Quieter Neighbourhood, namely:

Boundary Roads

- High Street
- The Bourne
- Aldermans Hill
- Green Lanes (north of Park Avenue)

Wider Network Roads

- Avenue Road
- Chase Side
- Chase Road
- Waterfall Road
- Morton Way
- Powys Lane
- Hedge Lane
- Green Lanes (south of Eaton Park Road)

- Station Road
- Winchmore Hill Road
- Broomfield Lane
- Green Lanes (south of Oakthorpe Road)
- Ashridge Gardens

1.1.4 Figure 1-1 shows the location of the ATC survey sites analysed.

Figure 1-1: ATC locations



1.2 Traffic Flow Data Analysis

1.2.1 Tables 1-1 to 1-3 provide a summary of the consequent changes in traffic flows for the 24-hour period, the AM peak hour (8:00-9:00hrs) and the PM peak hour (17:00-18:00hrs), comparing the motor vehicle traffic flow reported in the 'Fox Lane Quieter Neighbourhood-Post Scheme Monitoring' report and the revised September 2021 traffic flows including all motor vehicles.

Table 1-1: Comparison of 24-hour motor vehicle traffic flows

ATC Location		Results published in Fox Lane QN Monitoring report issued Jan 2022		Revised Results	
		Post-scheme 24hr vehicle flows (veh)	% Difference from Pre-Scheme Data	Post-scheme 24hr vehicle flows (veh)	% Difference from Pre-Scheme Data
Boundary Roads	High Street	19402	11%	20065	15%
	The Bourne	19114	6%	19351	7%
	Aldermans Hill	13305	3%	13528	4%
	Green Lanes	17705	3%	18114	5%
Wider Network Road	Avenue Road	10758	3%	10763	3%
	Chase Side	19028	-5%	19321	-4%
	Chase Road	8903	-6%	8907	-6%
	Waterfall Road	7883	-29%	7892	-29%
	Morton Way	7250	7%	7253	7%
	Powys Lane	12791	-16%	12795	-16%
	Hedge Lane	19220	-2%	19248	-2%
	Green Lanes (south of Eaton Park Rd)	15926	-4%	15942	-4%
	Station Road	7022	-26%	7030	-26%
	Winchmore Hill Road	13221	10%	13240	10%
	Broomfield Lane	10020	11%	10172	13%
	Green Lanes (south of Oakthorpe Rd)	15680	3%	15779	3%
	Ashridge Gardens	1375	49%	1382	50%

Table 1-2: Comparison of AM Peak hour motor vehicle traffic flows

ATC Location		Results published in Fox Lane QN Monitoring report issued Jan 2022		Revised Results	
		Post-scheme AM peak vehicle flows (veh)	% Difference from Pre-Scheme Data	Post-scheme AM peak vehicle flows (veh)	% Difference from Pre-Scheme Data
Boundary Roads	High Street	1391	17%	1392	17%
	The Bourne	713	-41%	812	-33%
	Aldermans Hill	1055	6%	1061	7%
	Green Lanes	896	-19%	1000	-10%
Wider Network Road	Avenue Road	903	0%	903	0%
	Chase Side	1096	-7%	1125	-4%
	Chase Road	654	-12%	654	-12%
	Waterfall Road	552	-33%	553	-33%
	Morton Way	616	28%	616	28%
	Powys Lane	701	-18%	701	-18%
	Hedge Lane	1167	-9%	1172	-9%
	Green Lanes (south of Eaton Park Rd)	951	-18%	953	-18%
	Station Road	545	-24%	545	-24%
	Winchmore Hill Road	865	-5%	879	-3%
	Broomfield Lane	789	17%	791	17%
	Green Lanes (south of Oakthorpe Rd)	878	8%	890	9%
	Ashridge Gardens	133	2%	134	2%

Table 1-3: Comparison of PM Peak hour motor vehicle traffic flows

ATC Location		Results published in Fox Lane QN Monitoring report issued Jan 2022		Revised Results	
		Post-scheme PM peak vehicle flows (veh)	% Difference from Pre-Scheme Data	Post-scheme PM peak vehicle flows (veh)	% Difference from Pre-Scheme Data
Boundary Roads	High Street	1061	-9%	1179	2%
	The Bourne	1300	4%	1302	4%
	Aldermans Hill	814	-16%	853	-12%
	Green Lanes	1145	0%	1184	4%
Wider Network Road	Avenue Road	895	2%	896	2%
	Chase Side	1103	-11%	1149	-7%
	Chase Road	619	-11%	619	-11%
	Waterfall Road	564	-40%	565	-40%
	Morton Way	613	25%	613	25%
	Powys Lane	818	-26%	818	-26%
	Hedge Lane	1185	-10%	1186	-10%
	Green Lanes (south of Eaton Park Rd)	1068	-4%	1069	-4%
	Station Road	597	-23%	597	-23%
	Winchmore Hill Road	973	8%	973	8%
	Broomfield Lane	619	11%	647	16%
	Green Lanes (south of Oakthorpe Rd)	909	-2%	913	-2%
	Ashridge Gardens	111	79%	111	79%

1.3 Traffic Flow Comments and Conclusions

1.3.1 Below shows a review of the comments and conclusions for the roads outside the Quieter Neighbourhood stated in the 'Fox Lane Quieter Neighbourhood-Post Scheme Monitoring' report published in January 2022 and identifies the recommended changes to the previous statements, in light of the revised data.

- Reported comment – *[24-hour] traffic volumes on the Quieter Neighbourhood boundary roads have increased by 6% on average, with the largest increase on High Street.*
 - Revised comment – 24-hour traffic volumes on the Quieter Neighbourhood boundary roads have increased by **8%** on average, with the largest increase on High Street.
- Reported comment – *[24-hour] traffic volumes on the wider network have reduced by 5% on average.*
 - Revised comment – 24-hour traffic volumes on the wider network have reduced by **4%** on average.
- Reported comment – *[Over 24-hours] some roads on the wider network have seen an increase including Avenue Road (3%), Morton Way (7%), Winchmore Hill Road (10%), Broomfield Lane (11%), Green Lanes (south of Oakthorpe Road) 3% and Ashridge Gardens (49%).*
 - Revised comment – Over 24 hours, some roads on the wider network have seen an increase including Avenue Road (3%), Morton Way (7%), Winchmore Hill Road (10%), Broomfield Lane (**13%**), Green Lanes (south of Oakthorpe Road) 3% and Ashridge Gardens (**50%**).
- Reported comment – *[In the AM Peak,] on the boundary roads of the Quieter Neighbourhood, increases are recorded on High Street and Aldermans Hill. Whilst The Bourne shows a reduction in recorded traffic, based on the reported traffic speeds (shown on page 28 [of the Fox Lane QN Monitoring Report]) this is likely to be a result of westbound queueing from the Southgate Circus junction reducing the number of vehicles recorded in the peak hour.*

- This statement remains unchanged, and acknowledges that there was congestion on The Bourne, with a recommendation made by officers included in the 'Fox Lane Area Quieter Neighbourhood Officer Report' published in January 2022, that short term mitigation should be considered at Southgate Circus, as well as longer-term options for town centre improvements.
- Reported comment – *[In the AM Peak,] traffic volumes on the wider network have reduced by 8% on average with increases reported on Morton Way, Broomfield Lane, and Green Lanes (south of Oakthorpe Road).*
 - Revised comment – In the AM Peak, traffic volumes on the wider network have reduced by **7%** on average with increases reported on Morton Way, Broomfield Lane, and Green Lanes (south of Oakthorpe Road) **and Ashridge Gardens.**
- Reported comment – *[In the PM Peak], on the boundary roads of the Quieter Neighbourhood an increase is recorded on The Bourne. Whilst High Street shows a reduction in recorded traffic, based on the reported traffic speeds (shown on page 28 [of the Fox Lane QN Monitoring Report]) this is likely to be a result of northbound queueing from the Southgate Circus junction reducing the number of vehicles recorded in the peak hour.*

Revised comment – In the PM Peak, on the boundary roads of the Quieter Neighbourhood increases are recorded on The Bourne, **High Street and Green Lane. Based on the reported traffic speeds for High Street (shown on page 28 [of the Fox Lane QN Monitoring Report]) there is likely to be northbound queueing from the Southgate Circus junction reducing the number of vehicles recorded in the peak hour.**
- Reported comment – *[In the PM Peak], traffic volumes on the wider network have generally reduced by 9% on average, with increases observed on Avenue Road, Morton Way, Winchmore Hill Road, Broomfield Lane, and Ashridge Gardens.*
 - Revised comment – In the PM Peak, Traffic volumes on the wider network have generally reduced by **8%** on average, with increases observed on Avenue Road, Morton Way, Winchmore Hill Road, Broomfield Lane, and Ashridge Gardens.
- Reported comment – *Over a 24-hour period, traffic volumes on the boundary roads of the Quieter Neighbourhood have all increased by an average of 6%. Increases on the boundary roads are expected, given the routes through the Quieter Neighbourhood area have been removed by the scheme. High Street has seen the greatest increase (11%).*
 - Revised comment – Over a 24-hour period, traffic volumes on the boundary roads of the Quieter Neighbourhood have all increased by an average of **8%**. Increases on the boundary roads are expected, given the routes through the Quieter Neighbourhood area have been removed by the scheme. High Street has seen the greatest increase (**15%**).
- Reported comment – *Traffic on the wider network has decreased by 5% on average, over the 24-hour period. Some roads have seen an increase including Avenue Road, Morton Way, Winchmore Hill Road, Broomfield Lane, Green Lanes (south of Oakthorpe Road) and Ashridge Gardens. The highest increase in traffic volumes is seen on Winchmore Hill Road over the 24-hour period.*
 - Revised comment – Traffic on the wider network has decreased by **4%** on average, over the 24-hour period. Some roads have seen an increase including Avenue Road, Morton Way, Winchmore Hill Road, Broomfield Lane, Green Lanes (south of Oakthorpe Road) and Ashridge Gardens. The highest increase in traffic volumes is seen on Winchmore Hill Road over the 24-hour period.
- Reported comment – *Peak hour congestion is indicated on the approaches to Southgate Circus, particularly The Bourne in the AM peak and High Street in the PM peak. Enfield Council has commissioned a review of the Southgate Circus junction to investigate mitigation measures to improve conditions for buses and general traffic.*
 - This comment remains unchanged.

1.4 Traffic Speed Analysis

- 1.4.1 Table 1-4 shows the difference in motor traffic speeds on the boundary roads, for the September 2021 motor traffic flows, between the results reported in 'Fox Lane Quieter Neighbourhood-Post Scheme Monitoring Report' published in January 2022 and the revised data which includes vehicles travelling between 0 and 10kph (6.2mph).

Table 1-4: Difference in September 2021 motor traffic speeds (mph)

Location	Direction	Difference in September 2021 speeds (mph)		
		24hr	AM Peak (8-9am)	PM Peak (5-6pm)
High Street	NB	-1	0	-1
	SB	0	0	0
The Bourne	NB	0	-3	0
	SB	0	0	0
Aldermans Hill	NB	0	0	0
	SB	0	0	-2
Green Lanes	NB	0	0	0
	SB	-1	-1	-1

1.5 Traffic Speeds Comments and Conclusions

- 1.5.1 Below shows a review of the comments and conclusions for the roads outside the Quieter Neighbourhood stated in the 'Fox Lane Quieter Neighbourhood-Post Scheme Monitoring' report published in January 2022 and identifies the recommended changes to the previous statements in light of the revised data.

- Reported statement – *Traffic speeds on the boundary roads to the Quieter Neighbourhood reduced from an average of 25 mph to an average of 23 mph over a 24-hour period.*
 - Revised statement - Traffic speeds on the boundary roads to the Quieter Neighbourhood reduced from an average of 25 mph to an average of **22 mph** over a 24-hour period.
- Reported statement - *Large decreases in speeds reported on High Street in the PM peak and The Bourne in the AM Peak are likely to be a result of congestion experienced during the peak periods.*
 - This statement remains unchanged.
- Reported comment - *On the boundary roads and wider network over the 24-hour period, traffic speeds have reduced on the majority of roads, and remain between 20-30mph, with the exception of Green Lanes (north of Park Avenue and north of Oakthorpe Road) in the southbound direction (19 mph and 17 mph respectively). Roads which experience average speeds of less than 20 mph in the AM or PM peak include High Street, The Bourne, Aldermans Hill, Chase Side and Green Lanes (north of Park Avenue and South of Oakthorpe Road).*
 - Revised statement for the boundary roads analysed - **On the boundary roads over the 24-hour period, traffic speeds have reduced on the majority of roads, and remain between 20-30mph, with the exception of Green Lanes (north of Park Avenue) in the southbound direction (18 mph). Roads which experience average speeds of less than 20 mph in the AM or PM peak include High Street, The Bourne, Aldermans Hill, and Green Lanes (north of Park Avenue).**

- Reported statement - *Reductions in speeds of 12 mph on The Bourne in the AM peak and of 10 mph on High Street in the PM peak indicate there are queues developing back from the Southgate Circus junction causing congestion on the approach to Southgate Circus. Enfield Council has commissioned a review of the Southgate Circus to investigate mitigation measures to improve conditions for buses and general traffic.*
- Revised statement - Reductions in speeds of **15 mph** on The Bourne in the AM peak and of **11 mph** on High Street in the PM peak indicate there are queues developing back from the Southgate Circus junction causing congestion on the approach to Southgate Circus. Enfield Council has commissioned a review of the Southgate Circus to investigate mitigation measures to improve conditions for buses and general traffic.

1.6 Cycle flows

- 1.6.1 Cycle flows were reported based on the ATC data. Cycle volumes for September 2021 will have been under reported in the *'Fox Lane Quieter Neighbourhood-Post Scheme Monitoring'* report because some cyclists will have been travelling at less than 10kph (6.2mph) and so not counted.

1.7 Journey time Data

- 1.7.1 Assessing journey times is a key and robust method of measuring road traffic congestion. Bus journey time data for before and after the scheme was implemented was supplied by Transport for London, with bus routes operating on all the boundary roads surrounding the Quieter Neighbourhood. The pre-scheme data used was from September 2019 to February 2020 and the post scheme data and September to October 2021 for post scheme data. The analysis reported in the *'Fox Lane Quieter Neighbourhood-Post Scheme Monitoring'* report did not rely on ATC data and therefore the comments and conclusions associated with the bus journey time analysis remain unchanged.

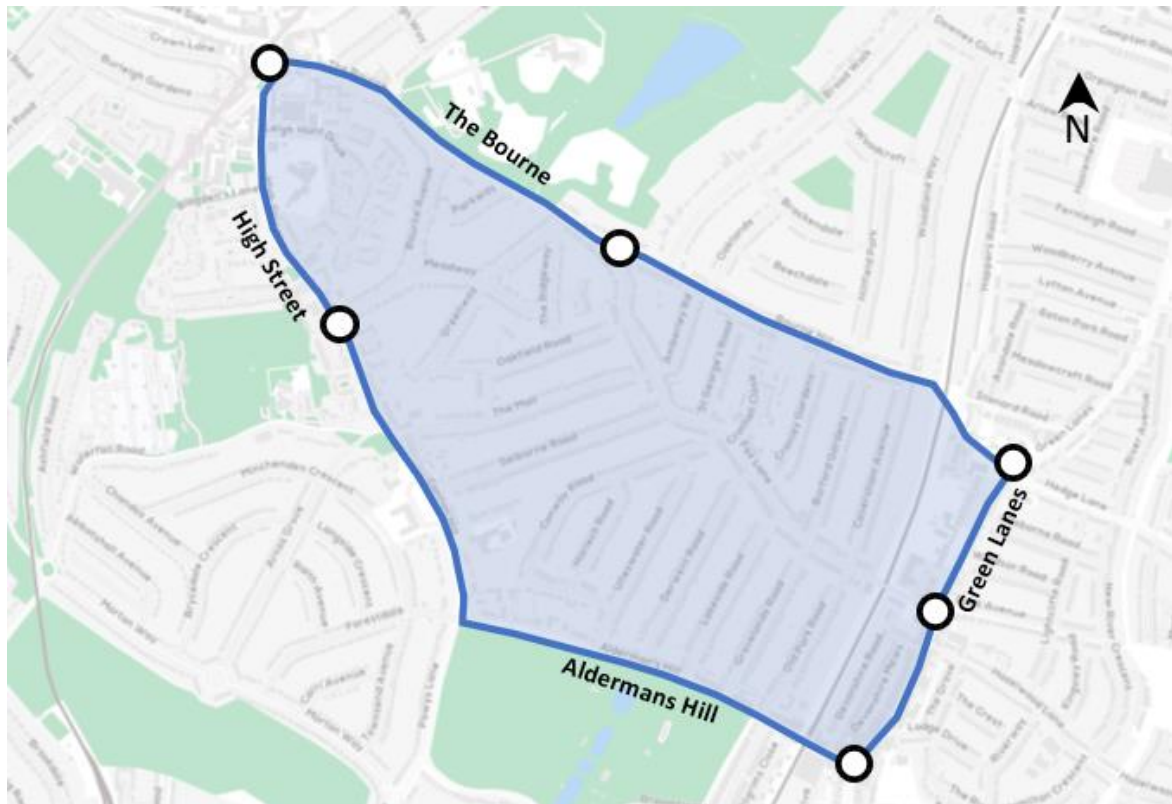
1.8 Healthy Streets Assessments

- 1.8.1 A review based on the revised ATC data has been undertaken on the Healthy Streets scores for the external roads presented in the *'Fox Lane Quieter Neighbourhood Healthy Street Review Summary'* published in January 2022, namely:
- High Street
 - The Bourne
 - Green Lanes
 - Winchmore Hill Road
- 1.8.2 The Healthy Street scores presented for all four sites remain the same.

1.9 Manual Classified Counts

- 1.9.1 Manual Classified Counts (MCCs) were undertaken at locations shown in Figure 1-2 as part of the suite of data collected before and after the scheme was implemented.

Figure 1-2: Location of MCC surveys



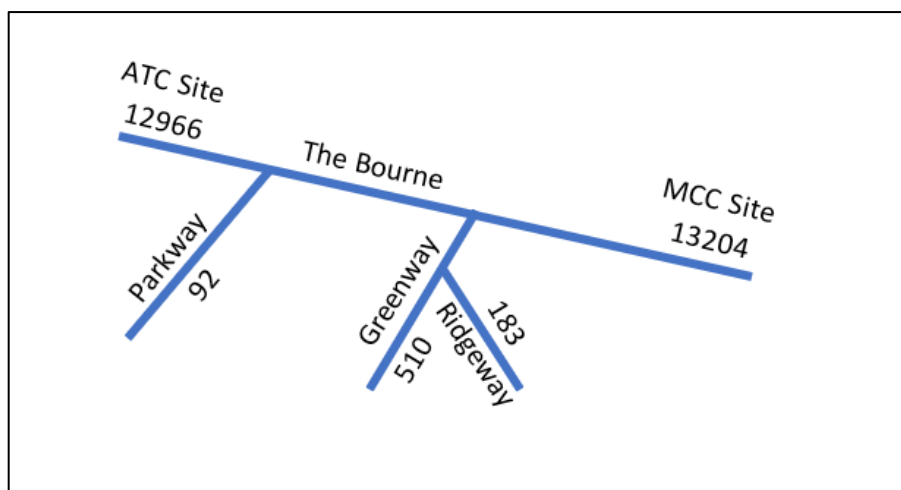
- 1.9.2 The primary reason for collecting the MCCs prior to the implementation of the scheme was to help develop the estimated traffic reassignment.
- 1.9.3 The decision was taken to undertake MCCs following the implementation so that, should the monitoring analysis using ATCs and journey times and/or consultation feedback highlight an issue at junctions surrounding the study area, the MCCs could be used to undertake further investigation. This proved to be the case at Southgate Circus, where site visits undertaken by officers and feedback from the consultation highlighted an issue and this was subsequently supported by the analysis of the ATC data and journey times as part of the monitoring. Officers took the decision to undertake a study at Southgate Circus, to investigate mitigation measures and the MCCs were used as part of that further, more detailed investigation, as reported in the *'Fox Lane Area Quieter Neighbourhood Officer Report'* published in January 2022.
- 1.9.4 Whilst it is acknowledged that MCCs are more accurate than ATCs, the cost and low additional benefit of undertaking MCCs across all the sites would be significant, and therefore ATC surveys are considered more appropriate to understand the general impacts across a wider area (48 sites for the Fox Lane Quieter Neighbourhood).

1.10 MCC and ATC comparison

- 1.10.1 In the supplied witness statement SB3, an assessment has been carried out comparing ATC surveys and MCC surveys undertaken in July 2021. Whilst it is accepted that the surveys were undertaken on the same day and on the same roads, the surveys were not undertaken at the same locations, so an accurate comparison between the two forms of traffic count cannot be made for all the sites.

- 1.10.2 In the case of the comparison of the traffic flows on The Bourne/Bourne Hill, the MCC was located at the junction with Fox Lane and the ATC was located over 300m west, with the side roads of Greenway (leading to Ridgeway) and Parkway between the MCC and ATC site locations. The assessment made in the witness statement was based over a 12-hour period (7:00-19:00hrs) with a reported value of 14276 from the MCC and 13788 from the ATC (a difference of 488 vehicles). However, a difference of 250 vehicles was reported in a single hour, 8:00hrs, which is the same period the assessment using the ATC surveys reported congestion within the *'Fox Lane Quieter Neighbourhood-Post Scheme Monitoring'* report.
- 1.10.3 If the value for 8:00hrs is removed, the difference over the remaining 11 hours is just 238 vehicles (equivalent to 1.8%), with 12966 recorded at the ATC location and 13204 at the MCC location. This is not considered to be a significant disparity. There are three ATC sites located on the side roads that are between the MCC and ATC survey locations, Parkway, Ridgeway, and Greenway. When the July 2021 surveys are assessed for those sites, over the same 11-hour period there is over 780 vehicles recorded on the side roads, as shown in Figure 1-3, which is over three times the difference between the ATC and MCC survey locations.
- 1.10.4 Therefore, because of the levels of traffic that leave or enter the network, it is not considered appropriate to directly compare the data between the MCC and the ATC and draw conclusions from any disparity.

Figure 1-3: Traffic flow comparison on The Bourne/Bourne Hill



- 1.10.5 A similar situation occurs at the second site presented, Aldermans Hill, where the survey sites are located over 450m apart with 4 sides road (Devonshire Road, Old Park Road, Groveland Road, and Lakeside Road), as well as a supermarket and station car park in between. The reported difference between the MCC and ATC over the 12-hour period is 842 vehicles, but over the same time period the recorded flows on the side roads was over 1500 vehicles. This is significantly more than the reported difference between the two sites, and again, because of the effect of traffic leaving, or entering the network, it is not considered appropriate to directly compare the data between the MCC and ATC and draw conclusions from any disparity.

1.12 Conclusions

- 1.12.1 Analysis of the additional data for motor vehicles travelling at speeds between 0-10kph (6.2mph) on the roads outside the Quieter Neighbourhood indicates that there is no material change to the comments and conclusions that were reported in the *'Fox Lane Quieter Neighbourhood Post-Scheme Monitoring'* report.
- 1.12.2 Journey time information can more accurately establish where and to what extent traffic congestion occurs, and this has been assessed as part of the monitoring and did not rely on the ATC data. Therefore, the comments and conclusions associated with the bus journey time analysis remain unchanged.

Noise Technical Note: Fox Lane Quieter Neighbourhood, Enfield

October 2022

Experts in noise and vibration
assessment and management

Document Control

Client	Enfield London Borough Council	Principal Contact	██████████
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1 Introduction

- 1.1 This technical note describes the potential noise impacts associated with the Quieter Neighbourhood Scheme at Fox Lane (the 'scheme') in Enfield. The technical note has been prepared by Noise Consultants Ltd (NCL) on behalf of the London Borough of Enfield (LBE).
- 1.2 NCL completed an assessment of the potential noise impacts in January 2022 (report reference J10/12034F/20, dated 25th January 2022), referred to as the 'original assessment' (Noise Consultants Ltd., 2021).
- 1.3 The original assessment utilised CNOSSOS-EU method to predict the effect of changes in traffic, brought about by the scheme on noise impact. The original assessment concluded that the implementation of the Quieter Neighbourhood Scheme led to broadly beneficial significant changes in road traffic noise exposure on internal roads and streets. On the surrounding road network, the assessment identified largely '*negligible*' changes in road traffic noise despite the change in traffic arising from the scheme.
- 1.4 Since the original assessment was completed, it has been identified that there was an inconsistent setting applied in the 'post-scheme implementation' traffic data collection process, which resulted in vehicles travelling under 10 kph being omitted from the traffic counts. This setting was not applied in the 'pre-scheme implementation' data collection. The omission of these vehicles will have affected the traffic data underpinning the noise assessment in two ways:
 - The post-implementation traffic total flows (as an annual average daily traffic (AADT) flow) may have been underpredicted; and
 - The average speed applied within the noise assessment may have been overpredicted.
- 1.5 NRP Limited, the transport consultants for the scheme, have reviewed the raw 'post-scheme implementation' traffic count and speed data for key external roads. Since the collection process only affects the counting of data on congested roads, data for the internal roads, which carry lower traffic volumes and are less susceptible to queuing and congestion, have not been adjusted.
- 1.6 This technical note presents the updated noise model results, based on revised traffic and speed data, at receptors located adjacent to the key external roads to determine whether the conclusions of the original assessment still apply. The modelling methodology is the same as that followed in the original assessment; thus, for conciseness, the technical note should be read in conjunction with the original assessment report (Noise Consultants Ltd., 2021).
- 1.7 Section 2 presents the updated Scheme Impact Assessment as well as a discussion relating to the uncertainty in the updated traffic data, with Appendix A1 Updated Traffic Data Summary presenting the updated data summary. Appendix A2 Modelling Results presents the full updated modelling results alongside those reported in the original assessment.

2 Scheme Impact Assessment

- 2.1 This section discusses the predicted changes of noise exposure in terms of $L_{Aeq,16hr}$, and $L_{night,8hr}$ representing daytime and night-time road traffic noise exposure in 2021 as a result of the scheme at receptors adjacent to the key external, surrounding roads. Appendix A2 Modelling Results presents the calculated noise exposure level from the original report alongside the revised level using the latest traffic data to provide a detailed comparison.
- 2.2 The tables below present summaries of the revised range of noise exposure at receptors before and after scheme along the key external roads, with the general change in noise exposure in terms of $L_{Aeq,16hr}$, and $L_{night,8hr}$ representing daytime and night-time road traffic noise exposure respectively.
- 2.3 Beneficial changes in exposure are represented by '-' and shaded green where these are considered 'significant beneficial' whilst adverse changes are represented by '+' and shaded red where these are considered 'significant adverse' followed by the criteria threshold in dB.

Table 1: Summary of Changes in Daytime Road Noise Exposure (in dB), $L_{Aeq,16hr}$

Road Name	ATC ID	Range of Noise Exposure for Receptors on Road before Scheme	Revised Range of Noise Exposure for Receptors on Road after Scheme	General Change in Exposure at Receptors	Magnitude of Change
Surrounding Roads					
Avenue Road	14	61-62	62-63	1	Negligible
Chase Road	15	61-65	61-65	0	Negligible
Chase Side	16	61-68	61-67	0	Negligible
Winchmore Hill Road	17	62-65	63-66	0	Negligible
The Bourne	28	63-67	63-67	0	Negligible
High Street	29	58-67	57-67	0	Negligible
Waterfall Road	30	62-64	59-61	-2	Minor beneficial
Morton Way	31	59-60	59-60	0	Negligible
Powys Lane	37	64-64	63-63	-1	Negligible
Aldermans Hill	38	61-66	61-66	0	Negligible
G Lanes (South of Oakthorpe Road)	42	61-65	61-65	0	Negligible
G Lanes at Park Avenue	43	63-67	62-66	0	Negligible
G Lanes at River Avenue	44	60-65	60-65	0	Negligible
Hedge Lane	45	65-67	65-67	0	Negligible

Table 2: Summary of Changes in Night-time Road Noise Exposure (in dB), L_{night}

Road Name	ATC ID	Range of Noise Exposure for Receptors on Road before Scheme	Range of Noise Exposure for Receptors on Road after Scheme	General Change in Exposure at Receptors	Magnitude of Change
Surrounding Roads					
Avenue Road	14	52-53	52-53	0	Negligible
Chase Road	15	54-58	54-58	0	Negligible
Chase Side	16	55-62	55-62	-1	Negligible
Winchmore Hill Road	17	54-58	55-58	0	Negligible
The Bourne	28	57-61	57-61	0	Negligible
High Street	29	48-58	48-58	0	Negligible
Waterfall Road	30	52-54	51-53	-1	Negligible
Morton Way	31	50-51	50-51	1	Negligible
Powys Lane	37	58-58	57-57	-1	Negligible
Aldermans Hill	38	55-60	55-60	0	Negligible
G Lanes (South of Oakthorpe Road)	42	57-60	57-60	0	Negligible
G Lanes at Park Avenue	43	56-61	56-61	0	Negligible
G Lanes at River Avenue	44	54-59	54-59	0	Negligible
Hedge Lane	45	60-61	60-61	0	Negligible

- 2.4 The revised modelled data as provided in Appendix A2 Modelling Results show that the implementation of the Quieter Neighbourhood Scheme led to both slight decreases and increases in noise exposure at receptors adjacent to the external roads, ranging between -2 dB and +1.3 dB.
- 2.5 The absolute changes in noise levels are marginally higher (for example, -2.6 dB was the greatest beneficial change for Waterfall Road in the original assessment, compared to -2.0 dB in the updated assessment), however, the impact descriptors remain unchanged at the majority of receptors adjacent to the key external roads.
- 2.6 On the surrounding roads, the calculated changes in road traffic are broadly negligible at most roads with the exception of Waterfall Road, where minor beneficial impacts are predicted. There are no significant changes in road traffic noise on the surrounding roads.
- 2.7 Overall, whilst the scheme leads to changes in noise levels, the scale of these changes in relation to total predicted levels are sufficiently small to lead to no significant effect, neither beneficial nor adverse for the surrounding roads.
- 2.8 The conclusions of the original assessment continue to apply, and the noise impact of the scheme remains 'not significant' for the surrounding roads.

Uncertainty

- 2.9 There are many components that contribute to the uncertainty of modelling predictions, which have been outlined in Paragraphs 3.22 to 3.23 of the original assessment. The same uncertainties will apply to the modelling undertaken in this update.
- 2.10 In addition to the inherent uncertainties in the modelling, it should be noted that this update has not taken account of the changes to diurnal profiles, which is an input to the model to allow for hourly variations in traffic flow specific to each modelled road. This allows for the potential capture of the scheme's impact on daily flow variation to be taken account of, as profiles specific to the pre- and post- scheme conditions were used. Data were not available in the timeframe available to update these diurnal profiles. This noise assessment, however, is primarily a relative study focused on the changes in noise levels associated with the scheme, which will not be significantly impacted by the changes to diurnal profiles. In this sense, the study is considering primarily the significance of changes in road traffic noise.
- 2.11 In addition, data from every road were not updated, and although only results from receptors close to the boundary roads are presented, some will have a minor contribution from nearby roads with less traffic flow, and this contribution may have been underestimated. In practice, any effect is likely to be extremely small and thus unlikely to alter the conclusions.

3 Summary and Conclusions

- 3.1 The assessment has been updated to account for traffic travelling at low (<10 kph) speeds on the key external roads that were omitted from the original noise assessment.
- 3.2 The updated assessment has identified that the inclusion of the additional vehicles leads to slightly larger changes in absolute noise levels, however, the impact in road noise level as summarised in **Table 5** and presented in full in **Table 8** in the original assessment, remain unchanged.
- 3.3 Overall, taking into consideration the increases and decreases in noise levels, the results of this assessment are not considered to represent a significant impact on local noise exposure, and the original conclusions remain valid.
- 3.4 There continue to be inherent uncertainties within the modelling, including the traffic data as primary input, and as such, the results should not be considered exact, but represent the best possible estimates, using the best available data at the time this modelling study was undertaken.

4 References

Noise Consultant Ltd. (2021). *J12034F1 Enfield Fox Lane Quieter Neighbourhood Noise Report*.

5 **Appendices**

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A1 Updated Traffic Data Summary

Explanation

A1.1 The Automatic Traffic Count (ATC) data for September 2021, used to calculate the 'post scheme' AADT flow and traffic speed values that were utilised within the model did not include vehicles travelling at speeds less than 10 kph. Upon reviewing the data, NRP Limited has provided the following explanation relating to the omission, and subsequent analysis of the traffic data:

- *"Vehicles travelling below 10 kph were recorded and had been included in the March 2019 data applied to the 'pre-scheme' model".* As such, these data, which, as described in Paragraph 3.12 of the original assessment were also considered appropriate to use as the '2021 without scheme' data, have not been revised.
- *"The discrepancy between the March 2019 data and the September 2021 data was due to a default survey setting being incorrectly applied, which was not known about until October 2022".* As such, the AADT flows for the 'post scheme implementation' scenario were revised to account for vehicles travelling at speeds below 10 kph by NRP Limited.
- *"Traffic speeds recorded for September 2021 have also been revised to include motor vehicles travelling at speeds less than 10 kph. To determine the effect of these vehicles with reduced speeds, the four boundary roads of the Quieter Neighbourhood (High Street, The Bourne, Aldermans Hill and Green Lanes north of Park Avenue) were analysed. The changes in average AM and PM peak speeds at these four sites were then applied, by NRP Limited, to the 2021 With Scheme data, for each of the road links. The average speed of the motor vehicles recorded travelling less than 10 kph on the four boundary roads has been applied to the total motor vehicles recorded travelling less than 10 kph, to establish estimated average AM and PM peak speeds across the wider external boundary roads (as listed in Table A1.1)".* These speeds for the post implementation scenario have been provided by NRP Limited for use within the air quality model.

Updated Traffic Data

A1.2 The updated 2021 With Scheme traffic data for key external roads used in this assessment, including vehicles travelling at speeds below 10 kph, are summarised in Table A1.1. Data for 2019 and 2021 Without Scheme have not changed and are therefore not included; similarly, data for the internal roads have not been presented. NRP Limited has advised that it is unlikely that the vehicle fleet composition will have changed, thus the percentage of Heavy Good Vehicles has not changed. For comparison, Table A1.1 also presents the original 2021 With Scheme data. Table A1.1 also provides the 2021 ID.

Table A1.1: Summary of Annualised Traffic Data used in the Assessment (AADT Flows)

Road Name	ATC ID	2021 With Scheme – Original Data		2021 With Scheme – Updated Data	
		AADT	%HGV ^a	AADT	%HGV ^a
Avenue Road	1	10,757	7.5	10,762	7.5
Chase Road	3	19,027	8.0	19,320	8.0
Chase Side	2	8,902	8.6	8,907	8.6
Winchmore Hill Road	14	13,220	7.6	13,239	7.6
Station Road	13	7,021	5.3	7,030	5.3
The Bourne	5	19,113	8.2	19,350	8.2
High Street	4	19,401	8.3	20,064	8.3
Waterfall Road	6	7,882	8.1	7,891	8.1
Morton Way	7	7,250	8.6	7,252	8.6
Powys Lane	8	12,790	8.1	12,794	8.1
Aldermans Hill	9	13,304	8.1	13,527	8.1
A105	45	15,679	6.7	15,778	6.7
Green Lanes at Park Avenue	10	17,705	8.1	18,113	8.1
Green Lanes at River Avenue	12	15,926	8.7	15,941	8.7
Hedge Lane	11	19,219	9.5	19,247	9.5

^a Data have been rounded. Percentages used within the model were calculated to more significant figures.

Assessment Methodology

- A1.3 The assessment approach and methodology remain consistent with that described in the original assessment, in Section 3 and Appendix A2.

A2 Modelling Results

A1.4 This section sets out the original and updated 2021 'Without Scheme' and 'With Scheme' results for L_{day} , L_{eve} , L_{night} and $L_{Aeq,16h}$ for receptors adjacent to the key external roads. The predicted impacts at each receptor are also described using the impact descriptors set out in Table A2.1 of the original assessment. Receptor locations and IDs are set out in Figure A3.1 to Figure A3.4 of the original assessment.

Table A2.1: Updated Absolute Noise Levels in 2021 for L_{day} . Comparison with Original Assessment

Road Name	Receptor Name	2019_before Scheme	2021_After Scheme	2021 Updated	Absolute Change	Increase/ Decrease
		L_{day}	L_{day}	L_{day}	L_{day}	
A105	21	64.6	64.6	64.5	-0.1	-
	22	61.3	61.2	61.1	-0.2	-
	23	61.4	61.3	61.3	-0.1	-
	24	63.2	63.1	63.0	-0.2	-
Aldermans Hill	25	64.4	64.2	64.1	-0.3	-
	26	63.4	63.3	63.1	-0.3	-
	27	64.7	64.6	64.4	-0.3	-
	29	66.5	66.4	66.2	-0.3	-
	31	65.0	64.9	64.7	-0.3	-
	32	64.9	64.7	64.6	-0.3	-
	33	63.6	63.4	63.2	-0.4	-
	34	62.2	61.8	61.6	-0.6	-
	35	61.7	61.6	61.4	-0.3	-
	37	61.5	61.4	61.2	-0.3	-
	38	61.5	61.4	61.2	-0.3	-
	231	64.8	64.6	64.4	-0.4	-
Avenue Road	72	62.9	63.3	63.2	0.3	+
	73	62.9	63.4	63.2	0.3	+
	74	62.1	62.6	62.4	0.3	+
	75	61.9	62.4	62.2	0.3	+
Chase Road	76	60.9	60.7	60.6	-0.3	-
	77	61.5	61.3	61.3	-0.2	-
	78	61.4	61.2	61.1	-0.3	-
	79	62.1	61.9	61.9	-0.2	-
	80	63.7	63.5	63.5	-0.2	-
	81	63.5	63.3	63.3	-0.2	-
	83	65.0	65.3	65.0	0.0	N/A
Chase Side	66	65.3	64.9	64.7	-0.6	-
	67	67.5	67.1	66.8	-0.7	-

Road Name	Receptor Name	2019_before Scheme	2021_After Scheme	2021 Updated	Absolute Change	Increase/ Decrease
		L _{day}	L _{day}	L _{day}	L _{day}	
	68	66.3	65.9	65.6	-0.7	-
	69	65.8	65.4	65.1	-0.7	-
	70	66.4	66.0	65.7	-0.7	-
	71	63.5	63.1	62.8	-0.7	-
	82	63.9	63.6	63.4	-0.5	-
	88	61.4	61.1	61.0	-0.4	-
Green Lanes at Park Avenue	11	66.5	66.1	66.0	-0.5	-
	12	62.3	62.0	61.8	-0.5	-
	13	64.8	64.4	64.3	-0.5	-
	14	65.6	64.7	64.5	-1.1	-
	15	64.9	64.3	64.1	-0.8	-
	16	66.1	65.7	65.5	-0.6	-
	17	65.3	64.9	64.7	-0.6	-
	18	66.6	66.2	66.0	-0.6	-
	19	65.2	64.9	64.7	-0.5	-
	20	64.7	64.5	64.3	-0.4	-
Green Lanes at River Avenue	1	63.7	63.5	63.5	-0.2	-
	2	64.4	64.2	64.2	-0.2	-
	3	62.9	62.7	62.7	-0.2	-
	4	60.7	60.5	60.5	-0.2	-
	5	65.1	64.9	64.9	-0.2	-
	6	64.4	64.1	64.1	-0.3	-
	7	63.4	63.2	63.2	-0.2	-
Hedge Lane	8	67.1	66.9	66.8	-0.3	-
	9	66.1	66.2	66.0	-0.1	-
	10	65.4	65.5	65.3	-0.1	-
High Street	39	58.6	58.3	59.2	0.6	+
	40	63.2	62.8	63.7	0.5	+
	41	66.3	65.9	66.8	0.5	+
	57	58.9	57.6	58.4	-0.5	-
	58	62.6	62.3	63.1	0.5	+
	59	65.1	64.8	65.6	0.5	+
	60	67.5	66.9	67.7	0.2	+
	61	65.5	64.0	64.9	-0.6	-
	62	68.1	67.7	68.6	0.5	+
	63	64.0	63.7	64.6	0.6	+
	64	65.9	65.6	66.5	0.6	+
	65	64.8	64.5	65.2	0.4	+
Morton Way	48	60.3	60.1	60.3	0.0	N/A
	49	59.5	59.4	59.5	0.0	N/A
	50	60.3	60.2	60.3	0.0	N/A

Road Name	Receptor Name	2019_before Scheme	2021_After Scheme	2021 Updated	Absolute Change	Increase/ Decrease
		L _{day}	L _{day}	L _{day}	L _{day}	
	51	60.8	60.6	60.8	0.0	N/A
	52	60.6	60.5	60.6	0.0	N/A
	53	60.1	59.9	60.1	0.0	N/A
	54	60.9	60.7	60.9	0.0	N/A
	55	60.9	60.8	60.9	0.0	N/A
Powys Lane	56	63.5	62.7	62.7	-0.8	-
The Bourne	89	64.6	64.2	64.4	-0.2	-
	90	65.9	65.5	65.5	-0.4	-
	91	64.1	63.7	63.7	-0.4	-
	92	63.1	62.6	62.7	-0.4	-
	96	65.3	64.7	64.7	-0.6	-
	98	67.4	66.9	67.0	-0.4	-
	100	64.2	63.6	63.7	-0.5	-
	102	64.0	63.5	63.5	-0.5	-
	103	64.2	63.7	63.8	-0.4	-
	105	63.9	63.4	63.4	-0.5	-
	107	64.2	63.8	63.9	-0.3	-
	108	65.3	64.8	64.9	-0.4	-
	110	64.7	64.2	64.3	-0.4	-
	112	64.5	64.0	64.1	-0.4	-
	114	64.8	64.3	64.4	-0.4	-
	116	65.8	65.3	65.4	-0.4	-
	117	66.0	65.5	65.6	-0.4	-
	118	63.4	63.0	63.0	-0.4	-
Waterfall Road	45	62.2	59.6	60.2	-2.0	-
	46	64.0	61.4	62.0	-2.0	-
	47	62.5	59.9	60.5	-2.0	-
Winchmore Hill Road	84	64.5	64.9	64.6	0.1	+
	85	62.3	62.8	62.4	0.1	+
	86	62.8	63.3	62.9	0.1	+
	87	64.7	65.1	64.8	0.1	+
	10000	65.8	66.1	65.8	0.0	N/A

^a A notion (plus / minus) has not been assigned where the change in noise levels, when rounded, is zero.

Table A2.2: Updated Absolute Noise Levels in 2021 for L_{eve}. Comparison with Original Assessment

Road Name	Receptor Name	2019_before Scheme	2021_After Scheme	2021 Updated	Absolute Change	Increase/ Decrease
		L _{eve}	L _{eve}	L _{eve}	L _{eve}	
A105	21	64.9	64.9	64.9	0.0	N/A

Road Name	Receptor Name	2019_before Scheme	2021_After Scheme	2021 Updated	Absolute Change	Increase/ Decrease
		Leve	Leve	Leve	Leve	
	22	61.6	61.6	61.6	0.0	N/A
	23	62.0	62.0	62.0	0.0	N/A
	24	63.7	63.6	63.7	0.0	N/A
Aldermans Hill	25	64.5	64.4	64.4	-0.1	-
	26	63.2	63.1	63.2	0.0	N/A
	27	64.3	64.2	64.3	0.0	N/A
	29	65.9	65.7	65.8	-0.1	-
	31	64.4	64.3	64.4	0.0	N/A
	32	64.3	64.1	64.2	-0.1	-
	33	63.0	62.8	62.9	-0.1	-
	34	61.7	61.3	61.4	-0.3	-
	35	61.3	61.1	61.2	-0.1	-
	37	61.1	60.9	61.0	-0.1	-
	38	61.0	60.9	61.0	0.0	N/A
	231	64.2	64.0	64.1	-0.1	-
Avenue Road	72	61.3	61.9	61.7	0.4	+
	73	61.7	62.2	62.1	0.4	+
	74	60.6	61.2	61.0	0.4	+
	75	60.4	60.9	60.8	0.4	+
Chase Road	76	60.7	60.6	60.5	-0.2	-
	77	61.4	61.2	61.2	-0.2	-
	78	61.6	61.4	61.3	-0.3	-
	79	62.3	62.1	62.1	-0.2	-
	80	63.5	63.3	63.3	-0.2	-
	81	63.3	63.1	63.0	-0.3	-
	83	64.8	65.0	64.7	-0.1	-
Chase Side	66	65.3	64.9	64.9	-0.4	-
	67	67.9	67.5	67.5	-0.4	-
	68	66.3	65.9	65.9	-0.4	-
	69	65.7	65.3	65.3	-0.4	-
	70	66.8	66.4	66.4	-0.4	-
	71	63.5	63.1	63.1	-0.4	-
	82	63.8	63.5	63.5	-0.3	-
	88	61.5	61.1	61.2	-0.3	-
Green Lanes at Park Avenue	11	66.4	66.0	66.1	-0.3	-
	12	62.7	62.2	62.4	-0.3	-
	13	64.9	64.4	64.6	-0.3	-
	14	65.5	64.6	64.8	-0.7	-
	15	64.9	64.2	64.4	-0.5	-
	16	66.1	65.7	65.8	-0.3	-
	17	65.7	65.3	65.4	-0.3	-

Road Name	Receptor Name	2019_before Scheme	2021_After Scheme	2021 Updated	Absolute Change	Increase/ Decrease
		Leve	Leve	Leve	Leve	
	18	67.1	66.7	66.8	-0.3	-
	19	65.2	64.8	65.0	-0.2	-
	20	64.8	64.5	64.6	-0.2	-
Green Lanes at River Avenue	1	63.5	63.2	63.2	-0.3	-
	2	63.9	63.7	63.7	-0.2	-
	3	62.7	62.4	62.4	-0.3	-
	4	60.2	59.9	59.9	-0.3	-
	5	64.9	64.7	64.7	-0.2	-
	6	63.9	63.6	63.6	-0.3	-
	7	62.9	62.7	62.7	-0.2	-
Hedge Lane	8	66.7	66.6	66.5	-0.2	-
	9	65.3	65.3	65.1	-0.2	-
	10	64.9	65.0	64.7	-0.2	-
High Street	39	57.4	57.1	58.0	0.6	+
	40	62.0	61.6	62.5	0.5	+
	41	65.2	64.8	65.7	0.5	+
	57	57.7	56.3	57.2	-0.5	-
	58	61.4	61.0	61.9	0.5	+
	59	63.7	63.2	64.2	0.5	+
	60	66.0	65.3	66.2	0.2	+
	61	64.4	62.8	63.7	-0.7	-
	62	66.5	66.1	67.0	0.5	+
	63	62.6	62.2	63.1	0.5	+
	64	64.4	64.0	65.0	0.6	+
	65	63.9	63.5	64.3	0.4	+
Morton Way	48	58.8	58.6	58.7	-0.1	-
	49	57.8	57.6	57.7	-0.1	-
	50	58.5	58.3	58.5	0.0	N/A
	51	59.3	59.1	59.3	0.0	N/A
	52	59.2	58.9	59.1	-0.1	-
	53	58.3	58.1	58.3	0.0	N/A
	54	59.4	59.2	59.3	-0.1	-
	55	59.1	58.9	59.1	0.0	N/A
Powys Lane	56	63.9	63.2	63.2	-0.7	-
The Bourne	89	64.2	63.7	63.8	-0.4	-
	90	65.9	65.3	65.4	-0.5	-
	91	63.8	63.2	63.3	-0.5	-
	92	63.0	62.4	62.5	-0.5	-
	96	64.9	64.2	64.3	-0.6	-
	98	66.9	66.4	66.4	-0.5	-
	100	63.8	63.2	63.3	-0.5	-

Road Name	Receptor Name	2019_before Scheme	2021_After Scheme	2021 Updated	Absolute Change	Increase/ Decrease
		Leve	Leve	Leve	Leve	
	102	63.7	63.0	63.1	-0.6	-
	103	63.9	63.3	63.4	-0.5	-
	105	63.5	63.0	63.0	-0.5	-
	107	63.9	63.4	63.5	-0.4	-
	108	65.2	64.7	64.8	-0.4	-
	110	64.3	63.8	63.8	-0.5	-
	112	64.1	63.6	63.6	-0.5	-
	114	64.8	64.2	64.3	-0.5	-
	116	65.7	65.2	65.3	-0.4	-
	117	65.6	65.1	65.1	-0.5	-
	118	63.1	62.6	62.7	-0.4	-
Waterfall Road	45	61.1	58.4	59.1	-2.0	-
	46	63.2	60.5	61.2	-2.0	-
	47	61.4	58.7	59.4	-2.0	-
Winchmore Hill Road	84	64.1	64.5	64.2	0.1	+
	85	61.9	62.3	62.0	0.1	+
	86	62.1	62.6	62.2	0.1	+
	87	63.9	64.4	64.0	0.1	+
	10000	65.1	65.5	65.1	0.0	N/A

^a A notion (plus / minus) has not been assigned where the change in noise levels, when rounded, is zero.

Table A2.3: Updated Absolute Noise Levels in 2021 for L_{night}. Comparison with Original Assessment

Road Name	Receptor Name	2019_before Scheme	2021_After Scheme	2021 Updated	Absolute Change	Increase/ Decrease
		L _{night}	L _{night}	L _{night}	L _{night}	
A105	21	60.1	60.2	59.7	-0.4	-
	22	56.8	57.0	56.5	-0.3	-
	23	56.9	57.1	56.6	-0.3	-
	24	58.4	58.5	58.0	-0.4	-
Aldermans Hill	25	58.4	58.5	58.0	-0.4	-
	26	57.0	57.1	56.7	-0.3	-
	27	58.0	58.1	57.8	-0.2	-
	29	59.6	59.8	59.4	-0.2	-
	31	58.1	58.3	57.9	-0.2	-
	32	58.0	58.1	57.8	-0.2	-
	33	56.7	56.7	56.4	-0.3	-
	34	55.1	55.1	54.8	-0.3	-
	35	54.9	55.0	54.7	-0.2	-
	37	54.7	54.8	54.5	-0.2	-

Road Name	Receptor Name	2019_before Scheme	2021_After Scheme	2021 Updated	Absolute Change	Increase/ Decrease
		L _{night}	L _{night}	L _{night}	L _{night}	
	38	54.6	54.7	54.4	-0.2	-
	231	57.9	58.0	57.7	-0.2	-
Avenue Road	72	52.8	52.9	52.7	-0.1	-
	73	52.9	53.0	52.8	-0.1	-
	74	52.0	52.2	52.0	0.0	N/A
	75	51.9	52.0	51.8	-0.1	-
Chase Road	76	53.8	53.5	53.5	-0.3	-
	77	54.4	54.2	54.1	-0.3	-
	78	54.3	54.0	54.0	-0.3	-
	79	55.1	54.8	54.7	-0.4	-
	80	56.6	56.4	56.3	-0.3	-
	81	56.4	56.2	56.1	-0.3	-
	83	57.7	57.8	57.5	-0.2	-
Chase Side	66	59.7	59.5	59.0	-0.7	-
	67	61.9	61.7	61.2	-0.7	-
	68	60.7	60.5	60.0	-0.7	-
	69	60.1	59.9	59.4	-0.7	-
	70	60.7	60.5	60.0	-0.7	-
	71	57.8	57.6	57.1	-0.7	-
	82	57.6	57.5	57.1	-0.5	-
	88	55.1	55.0	54.7	-0.4	-
Green Lanes at Park Avenue	11	60.4	60.5	60.1	-0.3	-
	12	56.3	56.5	55.8	-0.5	-
	13	58.8	59.0	58.3	-0.5	-
	14	59.2	59.1	58.4	-0.8	-
	15	58.7	58.8	58.1	-0.6	-
	16	60.1	60.2	59.5	-0.6	-
	17	59.3	59.4	58.7	-0.6	-
	18	60.6	60.7	60.0	-0.6	-
	19	59.2	59.3	58.7	-0.5	-
	20	58.9	59.0	58.4	-0.5	-
Green Lanes at River Avenue	1	57.5	57.4	57.4	-0.1	-
	2	58.2	58.1	58.1	-0.1	-
	3	56.7	56.5	56.5	-0.2	-
	4	54.5	54.3	54.3	-0.2	-
	5	58.9	58.8	58.8	-0.1	-
	6	58.2	58.0	58.0	-0.2	-
	7	57.3	57.1	57.1	-0.2	-
Hedge Lane	8	61.4	61.3	61.2	-0.2	-
	9	60.8	60.7	60.5	-0.3	-
	10	60.1	60.0	59.8	-0.3	-

Road Name	Receptor Name	2019_before Scheme	2021_After Scheme	2021 Updated	Absolute Change	Increase/ Decrease
		L _{night}	L _{night}	L _{night}	L _{night}	
High Street	39	48.1	48.5	49.4	1.3	+
	40	52.6	53.1	53.9	1.3	+
	41	55.7	56.1	57.0	1.3	+
	57	48.6	48.2	49.0	0.4	+
	58	52.0	52.5	53.4	1.4	+
	59	54.6	55.0	55.9	1.3	+
	60	56.9	57.1	58.0	1.1	+
	61	54.8	54.2	55.1	0.3	+
	62	57.5	58.0	58.8	1.3	+
	63	53.5	53.9	54.8	1.3	+
	64	55.4	55.8	56.7	1.3	+
	65	55.5	55.8	56.4	0.9	+
Morton Way	48	50.4	50.8	50.9	0.5	+
	49	49.7	50.0	50.2	0.5	+
	50	50.5	50.8	51.0	0.5	+
	51	50.9	51.3	51.4	0.5	+
	52	50.8	51.1	51.3	0.5	+
	53	50.2	50.6	50.7	0.5	+
	54	51.0	51.4	51.5	0.5	+
	55	51.1	51.4	51.6	0.5	+
Powys Lane	56	57.7	56.9	57.0	-0.7	-
The Bourne	89	58.0	58.2	58.3	0.3	+
	90	59.4	59.7	59.7	0.3	+
	91	57.7	57.9	58.0	0.3	+
	92	56.6	56.9	56.9	0.3	+
	96	58.7	58.9	58.9	0.2	+
	98	60.9	61.1	61.2	0.3	+
	100	57.7	57.9	57.9	0.2	+
	102	57.5	57.7	57.7	0.2	+
	103	57.7	58.0	58.0	0.3	+
	105	57.4	57.6	57.7	0.3	+
	107	57.8	58.0	58.1	0.3	+
	108	58.8	59.1	59.1	0.3	+
	110	58.2	58.4	58.5	0.3	+
	112	58.0	58.2	58.3	0.3	+
	114	58.3	58.6	58.6	0.3	+
	116	59.3	59.5	59.6	0.3	+
	117	59.5	59.8	59.8	0.3	+
	118	57.0	57.2	57.2	0.2	+
Waterfall Road	45	52.4	50.9	51.5	-0.9	-
	46	54.1	52.7	53.2	-0.9	-

Road Name	Receptor Name	2019_before Scheme	2021_After Scheme	2021 Updated	Absolute Change	Increase/ Decrease
		L _{night}	L _{night}	L _{night}	L _{night}	
	47	52.6	51.2	51.7	-0.9	-
Winchmore Hill Road	84	56.6	57.0	56.6	0.0	N/A
	85	54.3	54.7	54.4	0.1	+
	86	54.8	55.2	54.9	0.1	+
	87	56.7	57.1	56.8	0.1	+
	10000	58.0	58.3	58.0	0.0	N/A

^a A notion (plus / minus) has not been assigned where the change in noise levels, when rounded, is zero.

Table A2.4: Updated Absolute Noise Levels in 2021 for L_{Aeq,16hr} - Comparison with Original Assessment

Road Name	Receptor Name	2019_before Scheme	2021_After Scheme	2021 Updated	Absolute Change	Increase/ Decrease
		L _{Aeq,16hr}	L _{Aeq,16hr}	L _{Aeq,16hr}	L _{Aeq,16hr}	
A105	21	64.8	64.7	64.7	-0.1	-
	22	61.5	61.4	61.4	-0.1	-
	23	61.7	61.7	61.7	0.0	N/A
	24	63.5	63.4	63.4	-0.1	-
Aldermans Hill	25	64.5	64.3	64.3	-0.2	-
	26	63.3	63.2	63.2	-0.1	-
	27	64.5	64.4	64.3	-0.2	-
	29	66.2	66.1	66.0	-0.2	-
	31	64.7	64.6	64.5	-0.2	-
	32	64.6	64.5	64.4	-0.2	-
	33	63.3	63.1	63.1	-0.2	-
	34	62.0	61.6	61.5	-0.5	-
	35	61.5	61.3	61.3	-0.2	-
	37	61.3	61.2	61.1	-0.2	-
	38	61.3	61.1	61.1	-0.2	-
	231	64.5	64.3	64.3	-0.2	-
Avenue Road	72	62.2	62.7	62.5	0.3	+
	73	62.4	62.9	62.7	0.3	+
	74	61.4	61.9	61.8	0.4	+
	75	61.3	61.7	61.6	0.3	+
Chase Road	76	60.8	60.6	60.6	-0.2	-
	77	61.5	61.3	61.2	-0.3	-
	78	61.5	61.3	61.2	-0.3	-
	79	62.2	62.0	62.0	-0.2	-
	80	63.6	63.4	63.4	-0.2	-
	81	63.4	63.2	63.2	-0.2	-
	83	64.9	65.1	64.9	0.0	N/A

Road Name	Receptor Name	2019_before Scheme	2021_After Scheme	2021 Updated	Absolute Change	Increase/ Decrease
		L _{Aeq,16hr}	L _{Aeq,16hr}	L _{Aeq,16hr}	L _{Aeq,16hr}	
Chase Side	66	65.3	64.9	64.7	-0.5	-
	67	67.7	67.3	61.4	-0.5	-
	68	66.3	65.9	61.7	-0.6	-
	69	65.8	65.3	63.4	-0.6	-
	70	66.6	66.2	64.3	-0.6	-
	71	63.5	63.1	63.2	-0.6	-
	82	63.8	63.6	64.3	-0.4	-
	88	61.4	61.1	66.0	-0.3	-
Green Lanes at Park Avenue	11	66.5	66.1	64.5	-0.5	-
	12	62.5	62.1	64.4	-0.4	-
	13	64.8	64.4	63.1	-0.4	-
	14	65.6	64.6	61.5	-1.0	-
	15	64.9	64.3	61.3	-0.6	-
	16	66.1	65.7	61.1	-0.4	-
	17	65.5	65.1	61.1	-0.4	-
	18	66.8	66.5	64.3	-0.4	-
	19	65.2	64.9	62.5	-0.3	-
	20	64.8	64.5	62.7	-0.3	-
Green Lanes at River Avenue	1	63.6	63.4	61.8	-0.2	-
	2	64.2	63.9	61.6	-0.3	-
	3	62.8	62.5	60.6	-0.2	-
	4	60.4	60.2	61.2	-0.2	-
	5	65.0	64.8	61.2	-0.2	-
	6	64.1	63.9	62.0	-0.2	-
	7	63.2	62.9	63.4	-0.3	-
Hedge Lane	8	66.9	66.8	63.2	-0.2	-
	9	65.7	65.8	64.9	-0.1	-
	10	65.2	65.2	64.8	-0.2	-
High Street	39	58.1	57.7	67.2	0.5	+
	40	62.6	62.3	65.7	0.6	+
	41	65.7	65.4	65.2	0.6	+
	57	58.3	57.0	66.0	-0.5	-
	58	62.0	61.7	62.9	0.6	+
	59	64.5	64.1	63.4	0.5	+
	60	66.8	66.2	61.1	0.2	+
	61	65.0	63.4	66.0	-0.7	-
	62	67.3	67.0	62.1	0.6	+
	63	63.4	63.0	64.4	0.5	+
	64	65.2	64.9	64.6	0.6	+
	65	64.4	64.0	64.3	0.4	+
Morton Way	48	59.6	59.4	65.7	0.0	N/A

Road Name	Receptor Name	2019_before Scheme	2021_After Scheme	2021 Updated	Absolute Change	Increase/ Decrease
		L _{Aeq,16hr}	L _{Aeq,16hr}	L _{Aeq,16hr}	L _{Aeq,16hr}	
	49	58.7	58.6	65.1	0.0	N/A
	50	59.5	59.3	66.4	0.0	N/A
	51	60.1	59.9	64.9	0.0	N/A
	52	60.0	59.8	64.5	0.0	N/A
	53	59.3	59.1	63.4	0.0	N/A
	54	60.2	60.0	63.9	0.0	N/A
	55	60.1	59.9	62.6	0.0	N/A
Powys Lane	56	63.7	62.9	60.2	-0.8	-
The Bourne	89	64.4	64.0	64.8	-0.3	-
	90	65.9	65.4	63.9	-0.4	-
	91	64.0	63.5	62.9	-0.5	-
	92	63.0	62.5	66.7	-0.4	-
	96	65.1	64.5	65.6	-0.6	-
	98	67.2	66.6	65.0	-0.5	-
	100	64.0	63.4	58.6	-0.5	-
	102	63.9	63.3	63.2	-0.6	-
	103	64.0	63.5	66.3	-0.4	-
	105	63.7	63.2	57.8	-0.5	-
	107	64.1	63.6	62.6	-0.4	-
	108	65.3	64.8	65.0	-0.5	-
	110	64.5	64.0	67.0	-0.4	-
	112	64.3	63.8	64.3	-0.4	-
	114	64.8	64.3	67.9	-0.5	-
	116	65.8	65.2	63.9	-0.5	-
	117	65.8	65.3	65.8	-0.4	-
	118	63.2	62.8	64.8	-0.4	-
Waterfall Road	45	61.7	59.1	59.6	-2.0	-
	46	63.6	61.0	58.7	-2.0	-
	47	62.0	59.4	59.5	-2.0	-
Winchmore Hill Road	84	64.3	64.7	60.1	0.1	+
	85	62.1	62.5	60.0	0.1	+
	86	62.5	62.9	59.3	0.1	+
	87	64.3	64.7	60.2	0.1	+
	10000	65.4	65.8	60.1	0.1	+

^a A notion (plus / minus) has not been assigned where the change in noise levels, when rounded, is zero.

A3 Professional Experience

██████████, BSc (Hons) MIOA MEnvSc

██████████ is the Managing Director at NCL. He holds a First-Class Bachelor of Science degree in Acoustics from Salford University and is a Full Corporate Member of the Institute of Acoustics and a Member of the Institution of Environmental Sciences. He has over 17 years' experience working exclusively in the field of environmental noise delivering high profile projects in both the public and private sector. His experience includes technical leadership roles, policy and research work, and delivery of strategic noise mapping and action planning projects and major EIA. He has been involved in noise mapping projects since 2003 and contributed to some of the earliest UK feasibility studies for the deliver of Directive 2002/49/EC. He has developed techniques, coding solutions, QA procedures and systems to allow the scalability of noise calculations.

██████████, MIOA MSc

██████████ is a Consultant with NCL, having joined the company in September 2021. Prior to joining, he completed an MSc degree in Environmental and Architectural Acoustic Engineering from Polytechnic University of Madrid, Spain. Prior to joining NCL she worked for more than 3 years at Ineco, SA. She is experienced in airport noise assessment and consultancy work for Strategic Noise Mapping, Action Plans and Airspace Change, and has also supported aircraft noise modelling and GIS modelling and air quality assessment.



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**Air Quality Technical
Note:**
Fox Lane Quieter
Neighbourhood, Enfield

October 2022

Document Control

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Document Status and Review Schedule

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1 Introduction

- 1.1 This technical note describes the potential air quality impacts associated with the Quieter Neighbourhood Scheme at Fox Lane (the 'scheme') in Enfield using updated traffic data. The technical note has been prepared by Air Quality Consultants Ltd (AQC) on behalf of the London Borough of Enfield (LBE).
- 1.2 AQC completed an assessment of the potential air quality impacts of the scheme in January 2022 (report reference J10/12034I/10/1/F2, dated 24th January 2022), referred to as the 'original assessment'. The original assessment utilised dispersion modelling to predict the effect of changes in traffic, brought about by the scheme, on local air quality. The original assessment concluded that for the majority of assessed receptors and pollutants (nitrogen dioxide (NO₂), and particulate matter, (PM₁₀ and PM_{2.5})) the impacts would be described as '*negligible*'. The exception was for two locations along Green Lanes, at the boundary of the scheme, where '*slight adverse*' impacts were predicted, and at the junctions of Meadway/High Street and Fox Lane/Amberley Road, where '*slight beneficial*' impacts were predicted. Overall, it was concluded that the scheme lead to no significant effect on air quality.
- 1.3 Since the original assessment was completed, it has been identified that there was an inconsistent setting applied in the 'post-scheme implementation' traffic data collection process which resulted in vehicles travelling under 10 kph being omitted from the traffic counts. This setting was not applied in the 'pre-scheme implementation' data collection. The omission of these vehicles will have affected the traffic data underpinning the air quality assessment in two ways:
 - The total post-implementation flows may have been underpredicted; and
 - The average post-implementation speed applied within the air quality assessment may have been overpredicted.
- 1.4 NRP Limited, the transport consultants for the scheme, have reviewed the raw 'post-scheme implementation' traffic count and speed data for key external roads.
- 1.5 This technical note presents the updated dispersion model results, based on revised traffic and speed data, at receptors located adjacent to the key external roads to determine whether the conclusions of the original assessment still apply. The modelling methodology is the same as that followed in the original assessment; thus, for conciseness, the technical note should be read in conjunction with the original assessment. Section 2 presents the updated Scheme Impact Assessment as well as a discussion relating to the uncertainty in the updated traffic data, whilst Appendix A1 presents the updated traffic data summary, and Appendix A2 presents the full modelling results.

2 Scheme Impact Assessment

- 2.1 This section discusses the predicted changes in 2021 annual mean pollutant concentrations as a result of the scheme at receptors adjacent to the key external roads. The full suite of results for the receptors adjacent to key external roads, including total concentrations, percentage changes and associated impact descriptors, compared to the original assessment, are presented in Appendix A2.
- 2.2 The modelled data show that the implementation of the Quieter Neighbourhood Scheme led to both slight decreases and increases in annual mean NO₂ concentrations at receptors adjacent to the external roads, ranging between -2.8 µg/m³ and +2.0 µg/m³. Such changes correspond to -7.0 % and +5.0 % of the annual mean objective value (40 µg/m³), at most¹. These absolute changes in concentrations are marginally higher than presented in the original assessment (for example, +1.7 µg/m³ was the greatest change in the original assessment).
- 2.3 While NO₂ concentrations are heavily influenced by local vehicle emissions, PM concentrations are influenced by a wider range of sources, and thus are less influenced by local vehicular emissions. Therefore, changes in PM₁₀ and PM_{2.5} concentrations follow a similar pattern to those of NO₂, but the changes are smaller, with predicted changes in concentrations at receptors adjacent to the external roads ranging between -0.5 and +0.4 µg/m³ for PM₁₀, and between -0.3 and +0.2 µg/m³ for PM_{2.5}. Such changes correspond to -1.6 % and +1.1% of the annual mean PM₁₀ criterion (32 µg/m³²), and -1.2 % and +0.8 % of the PM_{2.5} objective value (25 µg/m³). As for NO₂, these absolute changes in concentrations are marginally higher than presented in the original assessment (for example, +0.3 µg/m³ was the greatest change in PM₁₀ concentrations the original assessment).
- 2.4 Using industry standard guidance (Moorcroft and Barrowcliffe et al, 2017), absolute changes in pollutant concentrations are considered in conjunction with the associated predicted long-term concentrations (see Paragraph 2.33 of the original assessment). The full results are presented in Appendix A2, and show that in 2021, the predicted changes in annual mean PM₁₀ and PM_{2.5} pollutant concentrations result in '*negligible*' impacts at all receptors adjacent to the boundary roads. These impact descriptors are the same as presented in the original assessment.
- 2.5 With regards to annual mean NO₂ concentrations, impacts are described as '*negligible*' at most receptors, with the exception of three receptors (Receptors 17, 18 and 19, located along Green Lanes, to the southeast of the scheme, close to the junction with Aldermans Hill) where '*slight adverse*' impacts are predicted and at one receptor (Receptor 61, located at the junction of Meadway/High Street), where a '*slight beneficial*' impact is predicted. These impact descriptors

¹ Calculated by dividing the change in NO₂ concentration by the annual mean objective value of 40 µg/m³; e.g. (2.8 / 40) x 100 = 7.0% (when rounded).

² While the annual mean PM₁₀ objective is 40 µg/m³, 32 µg/m³ is the annual mean concentration above which an exceedance of the 24-hour mean PM₁₀ objective is possible, as outlined in LAQM.TG22 (Defra, 2022). A value of 32 µg/m³ is thus used as a proxy to determine the likelihood of exceedance of the 24-hour mean PM₁₀ objective, as recommended in EPUK & IAQM guidance (Moorcroft and Barrowcliffe et al, 2017).

remain broadly consistent with the original assessment, albeit an additional *slight adverse* receptor is predicted in the updated assessment on Green Lanes, which is located in close proximity to other receptors previously identified as '*slight adverse*'. The extent of the slight adverse impacts therefore continues to affect only a small number of receptors.

- 2.6 Whilst the scheme leads to changes in pollutant concentrations, the scale of these changes is not materially different to those presented in the original assessment. In relation to total predicted concentrations, the changes remain sufficiently small to lead to no significant effect, thus the conclusions of the original assessment continue to apply, and the air quality effect of the scheme remains 'not significant'.

Uncertainty

- 2.7 There are many components that contribute to the uncertainty of modelling predictions, which have been outlined in the original assessment in Paragraphs 3.15 to 3.20. The same uncertainties will apply to the modelling undertaken in this update.
- 2.8 In addition to the inherent uncertainties in the predictions, it should be noted that the relative diurnal flow profiles have not been updated from those calculated previously, meaning that these relative profiles remain based on the previous data. In general, emissions released during night-time have a greater effect on concentrations than those released during the day. This is because the atmospheric boundary layer is lower at night, limiting dispersion. Conversely, average vehicle speeds tend to be higher at night, meaning that average emissions are lower. On balance, using diurnal flow profiles derived from the previous traffic dataset make it most likely that the effect of the scheme has been overstated, albeit marginally³. This approach will not, therefore, have affected the conclusions of no significant effect.
- 2.9 In addition, data from every road were not updated, and although only results from receptors close to the boundary roads are presented (which are largely dependent on emissions from the closest road link), some will have a minor contribution from nearby internal roads for which the traffic data may be lower than in reality, and this contribution to emissions may have been underestimated. In practice, any effect is likely to be extremely small and thus unlikely to alter the conclusions.
- 2.10 Further, the analysis of the omitted vehicles has not included a review of the fleet mix. NRP Limited has advised that there is no reason to believe that the fleet mix of the omitted vehicles were in different proportions to the fleet mix of vehicles that were counted originally and the ATC supplier has stated that the slower moving vehicles are more likely to change their speed within the length of the vehicle, which could have a greater effect on the calculated wheelbase and class, increasing uncertainty in the classification of vehicles and thus no changes were made to the percentage of Heavy Duty Vehicles applied within the dispersion model. Whilst it is possible that there were

³ i.e. previously-omitted vehicles are most likely to have been recorded during the day time, but are assumed to have occurred equally during both day and night, thus exaggerating their effect on concentrations.

variations in the fleet mix, since the omitted vehicles were a small proportion of the total AADT flows, it is unlikely that the overall conclusions would be affected.

3 Summary and Conclusions

- 3.1 The assessment has been updated to account for traffic travelling at low (<10 kph) speeds on the key external roads that were omitted from the original air quality assessment.
- 3.2 The updated assessment has identified that the inclusion of the additional vehicles leads to slightly larger changes in absolute concentrations. The scale of the changes to pollutant concentrations are described by industry standard guidance as *negligible* at all receptors adjacent to the key external roads for PM₁₀ and PM_{2.5} concentrations, and at most receptors for NO₂ concentrations. The exceptions for NO₂ are three locations along Green Lanes where *slight adverse* impacts are predicted, and at the junction of Meadway/High Street, where a *slight beneficial* impact continues to be predicted. These conclusions are broadly similar to those reached in the original assessment.
- 3.3 Overall, taking into consideration the increases and decreases in concentrations relative to the original assessment, the results of the updated assessment are not considered to represent a significant effect on local air quality. The original conclusions thus remain valid.
- 3.4 There continue to be inherent uncertainties within the modelling, including the traffic data as primary input, and as such, the results should not be considered exact, but represent best estimates using data available at the time this modelling update was undertaken.

4 References

Defra (2022) *Review & Assessment: Technical Guidance LAQM.TG22 August 2022 Version*, [Online].

Moorcroft and Barrowcliffe et al (2017) *Land-Use Planning & Development Control: Planning For Air Quality v1.2*, IAQM, London, Available: <http://iaqm.co.uk/guidance/>.

5 Appendices

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A1 Updated Traffic Data Summary

Explanation

A1.1 The Automatic Traffic Count (ATC) data for September 2021, used to calculate the 'post scheme' AADT flow and traffic speed values that were utilised within the model did not include vehicles travelling at speeds less than 10 kph. Upon reviewing the data, NRP Limited has provided the following explanation relating to the omission, and subsequent analysis of the traffic data:

- *"Vehicles travelling below 10 kph were recorded and had been included in the March 2019 data applied to the 'pre-scheme' model". As such, these data, which, as described in Paragraph 3.7 of the original assessment were also considered appropriate to use as the '2021 without scheme' data, have not been revised.*
- *"The discrepancy between the March 2019 data and the September 2021 data was due to a default survey setting being incorrectly applied, which was not known about until October 2022". As such, the AADT flows for the 'post scheme implementation' scenario were revised to account for vehicles travelling at speeds below 10 kph by NRP Limited.*
- *"Traffic speeds recorded for September 2021 have also been revised to include motor vehicles travelling at speeds less than 10 kph. To determine the effect of these vehicles with reduced speeds, the four boundary roads of the Quieter Neighbourhood (High Street, The Bourne, Aldermans Hill and Green Lanes north of Park Avenue) were analysed. The changes in average AM and PM peak speeds at these four sites were then applied, by NRP Limited, to the 2021 With Scheme data, for each of the road links. The average speed of the motor vehicles recorded travelling less than 10 kph on the four boundary roads has been applied to the total motor vehicles recorded travelling less than 10 kph, to establish estimated average AM and PM peak speeds across the wider external boundary roads (as listed in Table A1.1)". These speeds for the post implementation scenario have been provided by NRP Limited for use within the air quality model.*

Updated Traffic Data

A1.2 The updated 2021 With Scheme traffic data for key external roads used in this assessment, including vehicles travelling at speeds below 10 kph, are summarised in Table A1.1. Data for 2019 and 2021 Without Scheme have not changed and are therefore not included; similarly, data for the internal roads have not been presented. NRP Limited has advised that it is unlikely that the vehicle fleet composition will have changed, thus the percentage of Heavy Duty Vehicles has not changed. For comparison, Table A1.1 also presents the original 2021 With Scheme data. Table A1.1 also provides the 2021 ATC ID.

Table A1.1: Summary of Annualised Traffic Data used in the Assessment (AADT Flows)

Road Name	ATC ID	2021 With Scheme – Original Data		2021 With Scheme – Updated Data	
		AADT	%HDV ^a	AADT	%HDV ^a
Avenue Road	1	10,757	7.5	10,762	7.5
Chase Road	3	19,027	8.0	19,320	8.0
Chase Side	2	8,902	8.6	8,907	8.6
Winchmore Hill Road	14	13,220	7.6	13,239	7.6
Station Road	13	7,021	5.3	7,030	5.3
The Bourne	5	19,113	8.2	19,350	8.2
High Street	4	19,401	8.3	20,064	8.3
Waterfall Road	6	7,882	8.1	7,891	8.1
Morton Way	7	7,250	8.6	7,252	8.6
Powys Lane	8	12,790	8.1	12,794	8.1
Aldermans Hill	9	13,304	8.1	13,527	8.1
A105	45	15,679	6.7	15,778	6.7
Green Lanes at Park Avenue	10	17,705	8.1	18,113	8.1
Green Lanes at River Avenue	12	15,926	8.7	15,941	8.7
Hedge Lane	11	19,219	9.5	19,247	9.5

^a Data have been rounded. Percentages used within the model were calculated to more significant figures.

Assessment Methodology

- A1.3 The assessment approach and methodology remain consistent with that described in the original assessment, in Section 3 and Appendix A4, and should therefore be reviewed alongside this technical note.

A2 Modelling Results

A2.1 This section sets out the original and updated 2021 'Without Scheme' and 'With Scheme' results for NO₂, PM₁₀ and PM_{2.5} for receptors adjacent to the key external roads. The predicted impacts at each receptor are also described using the impact descriptors set out in Table A2.1 of the original assessment. Receptor locations and IDs are set out in Figure A5.1 to Figure A5.4 of the original assessment.

Table A2.1: Updated Predicted Impacts on 2021 Annual Mean NO₂ Concentrations and Comparison with Original Assessment

Receptor ID	Original			Updated				
	Without Scheme Concentration (µg/m ³)	With Scheme Concentration (µg/m ³)	Impact Descriptor	With Scheme Concentration (µg/m ³)	Absolute Change in Concentration (µg/m ³)	Change (% of AQAL) ^a	Increase/ Decrease ^b	Impact Descriptor
1	19.5	18.9	Negligible	18.9	-0.5	-1	-	Negligible
2	19.8	20.0	Negligible	20.0	0.1	0	N/A	Negligible
3	19.2	19.3	Negligible	19.3	0.1	0	N/A	Negligible
4	21.1	21.3	Negligible	21.3	0.2	0	N/A	Negligible
5	23.1	23.4	Negligible	23.4	0.3	1	+	Negligible
6	22.4	22.7	Negligible	22.7	0.3	1	+	Negligible
7	22.8	23.3	Negligible	23.4	0.5	1	+	Negligible
8	25.6	26.9	Negligible	26.9	1.3	3	+	Negligible
9	23.8	24.3	Negligible	24.3	0.5	1	+	Negligible
10	24.3	24.8	Negligible	24.8	0.5	1	+	Negligible
11	25.4	26.3	Negligible	26.5	1.1	3	+	Negligible
12	21.7	22.2	Negligible	22.4	0.7	2	+	Negligible
13	23.3	24.2	Negligible	24.4	1.1	3	+	Negligible
14	26.8	27.6	Negligible	27.7	0.9	2	+	Negligible
15	25.9	26.7	Negligible	26.9	1.0	3	+	Negligible
16	25.5	26.8	Negligible	27.1	1.6	4	+	Negligible
17	28.9	30.2	Negligible	30.4	1.5	4	+	Slight Adverse
18	32.3	34.1	Slight Adverse	34.4	2.0	5	+	Slight Adverse
19	30.2	31.7	Slight Adverse	31.9	1.7	4	+	Slight Adverse
20	21.1	21.2	Negligible	21.3	0.2	1	+	Negligible

Receptor ID	Original			Updated				
	Without Scheme Concentration (µg/m ³)	With Scheme Concentration (µg/m ³)	Impact Descriptor	With Scheme Concentration (µg/m ³)	Absolute Change in Concentration (µg/m ³)	Change (% of AQAL) ^a	Increase/ Decrease ^b	Impact Descriptor
21	25.5	26.1	Negligible	26.2	0.7	2	+	Negligible
22	22.9	23.3	Negligible	23.3	0.4	1	+	Negligible
23	22.5	22.7	Negligible	22.8	0.3	1	+	Negligible
24	25.9	26.6	Negligible	26.6	0.7	2	+	Negligible
25	23.5	24.1	Negligible	24.2	0.7	2	+	Negligible
26	23.8	24.5	Negligible	24.6	0.8	2	+	Negligible
27	25.3	26.3	Negligible	26.5	1.1	3	+	Negligible
28	24.8	25.7	Negligible	25.9	1.0	3	+	Negligible
29	25.1	26.0	Negligible	26.1	1.1	3	+	Negligible
30	21.1	20.7	Negligible	20.7	-0.4	-1	-	Negligible
31	23.3	23.8	Negligible	24.0	0.7	2	+	Negligible
32	22.7	23.2	Negligible	23.3	0.7	2	+	Negligible
33	20.8	21.0	Negligible	21.0	0.2	0	N/A	Negligible
34	20.7	20.8	Negligible	20.8	0.1	0	N/A	Negligible
35	21.1	21.4	Negligible	21.5	0.4	1	+	Negligible
36	20.7	20.9	Negligible	21.0	0.3	1	+	Negligible
37	20.8	21.0	Negligible	21.1	0.4	1	+	Negligible
38	20.9	21.2	Negligible	21.2	0.4	1	+	Negligible
39	20.6	21.2	Negligible	21.3	0.7	2	+	Negligible
40	20.9	21.6	Negligible	21.7	0.8	2	+	Negligible
41	22.5	23.5	Negligible	23.8	1.3	3	+	Negligible
44	21.5	21.5	Negligible	21.7	0.2	1	+	Negligible
45	19.6	19.3	Negligible	19.3	-0.2	-1	-	Negligible
46	20.4	20.1	Negligible	20.1	-0.3	-1	-	Negligible
47	19.7	19.4	Negligible	19.4	-0.2	-1	-	Negligible
48	18.5	18.6	Negligible	18.6	0.1	0	N/A	Negligible
49	19.4	19.7	Negligible	19.7	0.3	1	+	Negligible
50	20.5	21.0	Negligible	21.0	0.5	1	+	Negligible
51	20.1	20.5	Negligible	20.5	0.4	1	+	Negligible
52	20.1	20.5	Negligible	20.5	0.4	1	+	Negligible
53	20.5	21.0	Negligible	21.0	0.5	1	+	Negligible

Receptor ID	Original			Updated				
	Without Scheme Concentration (µg/m ³)	With Scheme Concentration (µg/m ³)	Impact Descriptor	With Scheme Concentration (µg/m ³)	Absolute Change in Concentration (µg/m ³)	Change (% of AQAL) ^a	Increase/ Decrease ^b	Impact Descriptor
54	19.8	20.0	Negligible	20.0	0.3	1	+	Negligible
55	20.3	20.6	Negligible	20.6	0.3	1	+	Negligible
56	22.5	22.4	Negligible	22.4	-0.1	0	N/A	Negligible
57	19.0	19.0	Negligible	19.1	0.1	0	N/A	Negligible
58	19.1	19.4	Negligible	19.5	0.4	1	+	Negligible
59	20.7	21.4	Negligible	21.6	0.9	2	+	Negligible
60	24.8	26.3	Negligible	26.7	1.9	5	+	Negligible
61	22.5	19.6	Slight Beneficial	19.8	-2.8	-7	-	Slight Beneficial
62	23.0	24.4	Negligible	24.7	1.7	4	+	Negligible
63	19.8	20.5	Negligible	20.6	0.9	2	+	Negligible
64	21.9	23.2	Negligible	23.5	1.6	4	+	Negligible
65	22.5	23.6	Negligible	24.0	1.3	3	+	Negligible
66	21.6	21.8	Negligible	26.3	0.6	2	+	Negligible
67	23.2	23.5	Negligible	29.9	0.7	2	+	Negligible
68	21.2	21.4	Negligible	26.3	0.5	1	+	Negligible
69	19.7	19.8	Negligible	23.4	0.4	1	+	Negligible
70	20.3	20.4	Negligible	24.6	0.4	1	+	Negligible
71	18.0	18.1	Negligible	20.3	0.3	1	+	Negligible
72	18.4	18.7	Negligible	18.8	0.2	1	+	Negligible
73	17.9	18.1	Negligible	18.1	0.2	0	N/A	Negligible
74	17.3	17.4	Negligible	17.4	0.1	0	N/A	Negligible
75	17.4	17.6	Negligible	17.5	0.2	0	N/A	Negligible
76	19.3	19.4	Negligible	17.4	0.0	0	N/A	Negligible
77	19.3	19.3	Negligible	17.5	0.0	0	N/A	Negligible
78	20.9	21.0	Negligible	18.4	0.1	0	N/A	Negligible
79	22.5	22.6	Negligible	19.6	0.1	0	N/A	Negligible
80	20.5	20.5	Negligible	18.5	0.0	0	N/A	Negligible
81	21.3	21.2	Negligible	19.1	0.0	0	N/A	Negligible
82	19.3	19.6	Negligible	19.9	0.4	1	+	Negligible
83	20.8	21.4	Negligible	21.0	0.6	1	+	Negligible

Receptor ID	Original			Updated				
	Without Scheme Concentration (µg/m ³)	With Scheme Concentration (µg/m ³)	Impact Descriptor	With Scheme Concentration (µg/m ³)	Absolute Change in Concentration (µg/m ³)	Change (% of AQAL) ^a	Increase/ Decrease ^b	Impact Descriptor
84	21.8	22.8	Negligible	22.8	1.0	3	+	Negligible
85	17.7	18.0	Negligible	18.0	0.3	1	+	Negligible
86	18.2	18.4	Negligible	18.4	0.3	1	+	Negligible
87	23.1	24.3	Negligible	24.4	1.3	3	+	Negligible
88	24.0	25.2	Negligible	26.2	1.4	3	+	Negligible
89	23.8	25.0	Negligible	25.6	1.4	4	+	Negligible
90	26.4	28.1	Negligible	28.4	1.9	5	+	Negligible
91	19.1	19.7	Negligible	19.8	0.6	2	+	Negligible
92	18.4	18.8	Negligible	18.9	0.4	1	+	Negligible
93	18.4	18.4	Negligible	18.4	0.0	0	N/A	Negligible
94	18.9	18.9	Negligible	19.0	0.1	0	N/A	Negligible
95	18.9	18.9	Negligible	19.0	0.1	0	N/A	Negligible
96	19.0	19.1	Negligible	19.2	0.3	1	+	Negligible
97	18.6	18.4	Negligible	18.5	-0.1	0	N/A	Negligible
98	21.5	22.3	Negligible	22.5	1.0	2	+	Negligible
100	20.1	20.5	Negligible	20.7	0.5	1	+	Negligible
101	19.8	18.8	Negligible	18.8	-1.0	-2	-	Negligible
102	20.4	20.8	Negligible	21.0	0.5	1	+	Negligible
103	21.0	21.6	Negligible	21.7	0.7	2	+	Negligible
104	19.2	19.0	Negligible	19.1	-0.1	0	N/A	Negligible
105	18.9	19.0	Negligible	19.1	0.2	0	N/A	Negligible
106	19.2	19.0	Negligible	19.1	-0.2	0	N/A	Negligible
107	20.9	21.5	Negligible	21.6	0.8	2	+	Negligible
108	22.2	23.1	Negligible	23.2	1.1	3	+	Negligible
109	22.0	22.8	Negligible	23.0	1.0	3	+	Negligible
110	21.1	21.7	Negligible	21.9	0.8	2	+	Negligible
111	19.1	19.2	Negligible	19.3	0.1	0	N/A	Negligible
112	21.1	21.8	Negligible	21.9	0.8	2	+	Negligible
113	19.5	19.5	Negligible	19.5	0.1	0	N/A	Negligible
114	22.7	23.6	Negligible	23.8	1.1	3	+	Negligible
115	20.3	20.1	Negligible	20.2	-0.2	0	N/A	Negligible

Receptor ID	Original			Updated				
	Without Scheme Concentration ($\mu\text{g}/\text{m}^3$)	With Scheme Concentration ($\mu\text{g}/\text{m}^3$)	Impact Descriptor	With Scheme Concentration ($\mu\text{g}/\text{m}^3$)	Absolute Change in Concentration ($\mu\text{g}/\text{m}^3$)	Change (% of AQAL) ^a	Increase/ Decrease ^b	Impact Descriptor
116	21.6	22.2	Negligible	22.4	0.8	2	+	Negligible
117	21.9	22.7	Negligible	22.8	0.9	2	+	Negligible
118	22.5	23.2	Negligible	23.3	0.9	2	+	Negligible
184	18.7	18.5	Negligible	18.6	-0.2	0	N/A	Negligible
231	23.2	23.6	Negligible	23.7	0.5	1	+	Negligible
Objective	40		-	40	-			

^a % changes are relative to the objective and have been rounded to the nearest whole number.

^b A notion (plus / minus) has not been assigned where the percentage change in concentration, when rounded, is zero.

Table A2.2: Updated Predicted Impacts on 2021 Annual Mean PM₁₀ Concentrations and Comparison with Original Assessment

Receptor ID	Original			Updated				
	Without Scheme Concentration ($\mu\text{g}/\text{m}^3$)	With Scheme Concentration ($\mu\text{g}/\text{m}^3$)	Impact Descriptor	With Scheme Concentration ($\mu\text{g}/\text{m}^3$)	Absolute Change in Concentration ($\mu\text{g}/\text{m}^3$)	Change (% of AQAL) ^a	Increase/ Decrease ^b	Impact Descriptor
1	17.0	16.9	Negligible	16.9	-0.1	0	-	Negligible
2	17.2	17.3	Negligible	17.3	0.0	0	N/A	Negligible
3	17.1	17.2	Negligible	17.2	0.0	0	N/A	Negligible
4	17.7	17.7	Negligible	17.7	0.1	0	N/A	Negligible
5	18.3	18.4	Negligible	18.4	0.1	0	N/A	Negligible
6	18.2	18.3	Negligible	18.3	0.1	0	N/A	Negligible
7	18.1	18.2	Negligible	18.2	0.1	0	N/A	Negligible
8	18.7	18.8	Negligible	18.8	0.2	1	+	Negligible
9	18.6	18.8	Negligible	18.8	0.2	0	N/A	Negligible
10	18.8	19.0	Negligible	19.0	0.2	1	+	Negligible
11	18.6	18.7	Negligible	18.8	0.2	1	+	Negligible

Receptor ID	Original			Updated				
	Without Scheme Concentration (µg/m ³)	With Scheme Concentration (µg/m ³)	Impact Descriptor	With Scheme Concentration (µg/m ³)	Absolute Change in Concentration (µg/m ³)	Change (% of AQAL) ^a	Increase/ Decrease ^b	Impact Descriptor
12	18.0	18.1	Negligible	18.1	0.1	0	N/A	Negligible
13	18.4	18.5	Negligible	18.5	0.1	0	N/A	Negligible
14	19.0	19.1	Negligible	19.2	0.1	0	N/A	Negligible
15	18.9	19.0	Negligible	19.0	0.2	0	N/A	Negligible
16	19.1	19.3	Negligible	19.3	0.2	1	+	Negligible
17	19.6	19.8	Negligible	19.8	0.3	1	+	Negligible
18	20.3	20.6	Negligible	20.6	0.4	1	+	Negligible
19	19.9	20.1	Negligible	20.2	0.3	1	+	Negligible
20	18.2	18.2	Negligible	18.2	0.0	0	N/A	Negligible
21	19.1	19.2	Negligible	19.2	0.1	0	N/A	Negligible
22	18.7	18.7	Negligible	18.7	0.1	0	N/A	Negligible
23	18.6	18.6	Negligible	18.6	0.0	0	N/A	Negligible
24	19.1	19.2	Negligible	19.2	0.1	0	N/A	Negligible
25	18.6	18.7	Negligible	18.7	0.1	0	N/A	Negligible
26	18.7	18.8	Negligible	18.8	0.1	0	N/A	Negligible
27	18.9	19.1	Negligible	19.1	0.2	1	+	Negligible
28	19.0	19.2	Negligible	19.2	0.2	1	+	Negligible
29	19.1	19.2	Negligible	19.3	0.2	1	+	Negligible
30	18.0	18.0	Negligible	18.0	-0.1	0	N/A	Negligible
31	18.5	18.7	Negligible	18.7	0.1	0	N/A	Negligible
32	18.3	18.4	Negligible	18.4	0.1	0	N/A	Negligible
33	17.9	17.9	Negligible	17.9	0.0	0	N/A	Negligible
34	17.8	17.8	Negligible	17.8	0.0	0	N/A	Negligible
35	17.9	18.0	Negligible	18.0	0.1	0	N/A	Negligible
36	17.8	17.8	Negligible	17.8	0.0	0	N/A	Negligible
37	17.7	17.8	Negligible	17.8	0.1	0	N/A	Negligible
38	17.7	17.8	Negligible	17.8	0.1	0	N/A	Negligible
39	17.5	17.6	Negligible	17.6	0.1	0	N/A	Negligible
40	17.4	17.5	Negligible	17.6	0.1	0	N/A	Negligible
41	17.7	17.9	Negligible	17.9	0.2	1	+	Negligible
44	17.2	17.2	Negligible	17.2	0.0	0	N/A	Negligible

Receptor ID	Original			Updated				
	Without Scheme Concentration (µg/m ³)	With Scheme Concentration (µg/m ³)	Impact Descriptor	With Scheme Concentration (µg/m ³)	Absolute Change in Concentration (µg/m ³)	Change (% of AQAL) ^a	Increase/ Decrease ^b	Impact Descriptor
45	16.9	16.9	Negligible	16.9	-0.1	0	N/A	Negligible
46	17.2	17.0	Negligible	17.0	-0.1	0	N/A	Negligible
47	17.0	16.9	Negligible	16.9	-0.1	0	N/A	Negligible
48	16.9	17.0	Negligible	17.0	0.0	0	N/A	Negligible
49	17.2	17.2	Negligible	17.2	0.1	0	N/A	Negligible
50	17.5	17.5	Negligible	17.5	0.1	0	N/A	Negligible
51	17.4	17.4	Negligible	17.4	0.1	0	N/A	Negligible
52	17.4	17.5	Negligible	17.5	0.1	0	N/A	Negligible
53	17.5	17.6	Negligible	17.6	0.1	0	N/A	Negligible
54	17.5	17.6	Negligible	17.6	0.1	0	N/A	Negligible
55	17.7	17.8	Negligible	17.8	0.1	0	N/A	Negligible
56	18.4	18.4	Negligible	18.4	0.0	0	N/A	Negligible
57	16.7	16.7	Negligible	16.7	0.0	0	N/A	Negligible
58	16.7	16.8	Negligible	16.8	0.1	0	N/A	Negligible
59	17.1	17.2	Negligible	17.3	0.1	0	N/A	Negligible
60	18.1	18.3	Negligible	18.4	0.3	1	+	Negligible
61	17.3	16.8	Negligible	16.8	-0.5	-2	-	Negligible
62	17.6	17.9	Negligible	17.9	0.3	1	+	Negligible
63	16.8	16.9	Negligible	17.0	0.1	0	N/A	Negligible
64	17.3	17.5	Negligible	17.5	0.3	1	+	Negligible
65	17.1	17.3	Negligible	17.3	0.2	1	+	Negligible
66	16.9	16.9	Negligible	17.7	0.1	0	N/A	Negligible
67	17.2	17.2	Negligible	18.4	0.1	0	N/A	Negligible
68	16.8	16.9	Negligible	17.8	0.1	0	N/A	Negligible
69	16.5	16.6	Negligible	17.2	0.0	0	N/A	Negligible
70	16.7	16.7	Negligible	17.4	0.1	0	N/A	Negligible
71	16.3	16.3	Negligible	16.7	0.0	0	N/A	Negligible
72	16.4	16.4	Negligible	16.5	0.1	0	N/A	Negligible
73	16.2	16.3	Negligible	16.3	0.1	0	N/A	Negligible
74	16.0	16.1	Negligible	16.1	0.1	0	N/A	Negligible
75	16.0	16.1	Negligible	16.1	0.1	0	N/A	Negligible

Receptor ID	Original			Updated				
	Without Scheme Concentration (µg/m ³)	With Scheme Concentration (µg/m ³)	Impact Descriptor	With Scheme Concentration (µg/m ³)	Absolute Change in Concentration (µg/m ³)	Change (% of AQAL) ^a	Increase/ Decrease ^b	Impact Descriptor
76	16.4	16.4	Negligible	16.0	0.0	0	N/A	Negligible
77	16.5	16.5	Negligible	16.1	0.0	0	N/A	Negligible
78	16.9	16.9	Negligible	16.3	0.0	0	N/A	Negligible
79	17.3	17.4	Negligible	16.6	0.0	0	N/A	Negligible
80	16.8	16.8	Negligible	16.4	0.0	0	N/A	Negligible
81	17.0	17.0	Negligible	16.5	0.0	0	N/A	Negligible
82	16.5	16.5	Negligible	16.6	0.1	0	N/A	Negligible
83	16.8	16.8	Negligible	16.8	0.1	0	N/A	Negligible
84	16.9	17.1	Negligible	17.1	0.2	1	+	Negligible
85	16.1	16.2	Negligible	16.2	0.1	0	N/A	Negligible
86	16.3	16.4	Negligible	16.4	0.1	0	N/A	Negligible
87	17.2	17.4	Negligible	17.4	0.2	1	+	Negligible
88	17.3	17.5	Negligible	17.7	0.2	1	+	Negligible
89	17.3	17.5	Negligible	17.6	0.2	1	+	Negligible
90	17.8	18.1	Negligible	18.2	0.3	1	+	Negligible
91	16.6	16.7	Negligible	16.7	0.1	0	N/A	Negligible
92	16.4	16.5	Negligible	16.5	0.1	0	N/A	Negligible
93	16.4	16.4	Negligible	16.4	0.0	0	N/A	Negligible
94	16.6	16.6	Negligible	16.6	0.0	0	N/A	Negligible
95	16.6	16.6	Negligible	16.6	0.0	0	N/A	Negligible
96	16.6	16.6	Negligible	16.6	0.0	0	N/A	Negligible
97	16.5	16.5	Negligible	16.5	0.0	0	N/A	Negligible
98	17.2	17.4	Negligible	17.4	0.2	1	+	Negligible
100	16.9	17.0	Negligible	17.0	0.1	0	N/A	Negligible
101	16.9	16.7	Negligible	16.7	-0.2	-1	-	Negligible
102	17.1	17.2	Negligible	17.2	0.1	0	N/A	Negligible
103	17.3	17.4	Negligible	17.4	0.1	0	N/A	Negligible
104	16.9	16.8	Negligible	16.8	0.0	0	N/A	Negligible
105	16.8	16.8	Negligible	16.8	0.0	0	N/A	Negligible
106	16.9	16.8	Negligible	16.8	0.0	0	N/A	Negligible
107	17.3	17.5	Negligible	17.5	0.1	0	N/A	Negligible

Receptor ID	Original			Updated				
	Without Scheme Concentration ($\mu\text{g}/\text{m}^3$)	With Scheme Concentration ($\mu\text{g}/\text{m}^3$)	Impact Descriptor	With Scheme Concentration ($\mu\text{g}/\text{m}^3$)	Absolute Change in Concentration ($\mu\text{g}/\text{m}^3$)	Change (% of AQAL) ^a	Increase/ Decrease ^b	Impact Descriptor
108	17.7	17.9	Negligible	17.9	0.2	1	+	Negligible
109	17.7	17.9	Negligible	17.9	0.2	1	+	Negligible
110	17.5	17.6	Negligible	17.6	0.1	0	N/A	Negligible
111	17.0	17.0	Negligible	17.0	0.0	0	N/A	Negligible
112	17.6	17.7	Negligible	17.7	0.1	0	N/A	Negligible
113	17.2	17.2	Negligible	17.2	0.0	0	N/A	Negligible
114	18.0	18.2	Negligible	18.2	0.2	1	+	Negligible
115	17.4	17.4	Negligible	17.4	0.0	0	N/A	Negligible
116	17.8	17.9	Negligible	17.9	0.1	0	N/A	Negligible
117	18.0	18.1	Negligible	18.1	0.1	0	N/A	Negligible
118	18.1	18.2	Negligible	18.3	0.1	0	N/A	Negligible
184	16.7	16.7	Negligible	16.7	0.0	0	N/A	Negligible
231	18.5	18.6	Negligible	18.6	0.1	0	N/A	Negligible
Objective	32 ^c		-	32 ^c				

^a % changes are relative to the objective and have been rounded to the nearest whole number.

^b A notion (plus / minus) has not been assigned where the percentage change in concentration, when rounded, is zero.

^c While the annual mean PM₁₀ objective is 40 $\mu\text{g}/\text{m}^3$, 32 $\mu\text{g}/\text{m}^3$ is the annual mean concentration above which an exceedance of the 24-hour mean PM₁₀ objective is possible, as outlined in LAQM.TG22 (Defra, 2022). A value of 32 $\mu\text{g}/\text{m}^3$ is thus used as a proxy to determine the likelihood of exceedance of the 24-hour mean PM₁₀ objective, as recommended in EPUK & IAQM guidance (Moorcroft and Barrowcliffe et al, 2017).

Table A2.3: Updated Predicted Impacts on 2021 Annual Mean PM_{2.5} Concentrations and Comparison with Original Assessment

Receptor ID	Original			Updated				
	Without Scheme Concentration (µg/m ³)	With Scheme Concentration (µg/m ³)	Impact Descriptor	With Scheme Concentration (µg/m ³)	Absolute Change in Concentration (µg/m ³)	Change (% of AQAL) ^a	Increase/ Decrease ^b	Impact Descriptor
1	11.4	11.3	Negligible	11.3	-0.1	0	N/A	Negligible
2	11.6	11.6	Negligible	11.6	0.0	0	N/A	Negligible
3	11.5	11.5	Negligible	11.5	0.0	0	N/A	Negligible
4	11.8	11.8	Negligible	11.8	0.0	0	N/A	Negligible
5	12.2	12.2	Negligible	12.2	0.0	0	N/A	Negligible
6	12.1	12.1	Negligible	12.1	0.0	0	N/A	Negligible
7	12.1	12.1	Negligible	12.1	0.0	0	N/A	Negligible
8	12.4	12.5	Negligible	12.5	0.1	0	N/A	Negligible
9	12.4	12.4	Negligible	12.4	0.1	0	N/A	Negligible
10	12.5	12.6	Negligible	12.6	0.1	0	N/A	Negligible
11	12.3	12.4	Negligible	12.4	0.1	0	N/A	Negligible
12	12.0	12.0	Negligible	12.0	0.1	0	N/A	Negligible
13	12.2	12.3	Negligible	12.3	0.1	0	N/A	Negligible
14	12.6	12.6	Negligible	12.6	0.1	0	N/A	Negligible
15	12.5	12.5	Negligible	12.6	0.1	0	N/A	Negligible
16	12.6	12.7	Negligible	12.7	0.1	1	+	Negligible
17	12.9	13.0	Negligible	13.0	0.1	1	+	Negligible
18	13.3	13.4	Negligible	13.5	0.2	1	+	Negligible
19	13.0	13.2	Negligible	13.2	0.2	1	+	Negligible
20	12.0	12.0	Negligible	12.0	0.0	0	N/A	Negligible
21	12.5	12.6	Negligible	12.6	0.1	0	N/A	Negligible
22	12.3	12.3	Negligible	12.3	0.0	0	N/A	Negligible
23	12.2	12.3	Negligible	12.3	0.0	0	N/A	Negligible
24	12.6	12.6	Negligible	12.6	0.1	0	N/A	Negligible
25	12.3	12.3	Negligible	12.3	0.1	0	N/A	Negligible
26	12.3	12.4	Negligible	12.4	0.1	0	N/A	Negligible
27	12.5	12.6	Negligible	12.6	0.1	0	N/A	Negligible
28	12.5	12.6	Negligible	12.6	0.1	0	N/A	Negligible
29	12.5	12.6	Negligible	12.7	0.1	0	N/A	Negligible
30	11.9	11.9	Negligible	11.9	0.0	0	N/A	Negligible

Receptor ID	Original			Updated				
	Without Scheme Concentration (µg/m ³)	With Scheme Concentration (µg/m ³)	Impact Descriptor	With Scheme Concentration (µg/m ³)	Absolute Change in Concentration (µg/m ³)	Change (% of AQAL) ^a	Increase/ Decrease ^b	Impact Descriptor
31	12.2	12.3	Negligible	12.3	0.1	0	N/A	Negligible
32	12.1	12.2	Negligible	12.2	0.1	0	N/A	Negligible
33	11.8	11.8	Negligible	11.8	0.0	0	N/A	Negligible
34	11.8	11.8	Negligible	11.8	0.0	0	N/A	Negligible
35	11.8	11.9	Negligible	11.9	0.0	0	N/A	Negligible
36	11.8	11.8	Negligible	11.8	0.0	0	N/A	Negligible
37	11.8	11.8	Negligible	11.8	0.0	0	N/A	Negligible
38	11.7	11.8	Negligible	11.8	0.0	0	N/A	Negligible
39	11.6	11.7	Negligible	11.7	0.1	0	N/A	Negligible
40	11.6	11.7	Negligible	11.7	0.1	0	N/A	Negligible
41	11.8	11.9	Negligible	11.9	0.1	1	+	Negligible
44	11.5	11.5	Negligible	11.5	0.0	0	N/A	Negligible
45	11.3	11.3	Negligible	11.3	-0.1	0	N/A	Negligible
46	11.4	11.4	Negligible	11.4	-0.1	0	N/A	Negligible
47	11.3	11.3	Negligible	11.3	-0.1	0	N/A	Negligible
48	11.3	11.3	Negligible	11.3	0.0	0	N/A	Negligible
49	11.4	11.5	Negligible	11.5	0.0	0	N/A	Negligible
50	11.6	11.7	Negligible	11.7	0.0	0	N/A	Negligible
51	11.6	11.6	Negligible	11.6	0.0	0	N/A	Negligible
52	11.6	11.6	Negligible	11.6	0.0	0	N/A	Negligible
53	11.6	11.7	Negligible	11.7	0.0	0	N/A	Negligible
54	11.6	11.7	Negligible	11.7	0.0	0	N/A	Negligible
55	11.7	11.8	Negligible	11.8	0.0	0	N/A	Negligible
56	12.1	12.1	Negligible	12.1	0.0	0	N/A	Negligible
57	11.2	11.2	Negligible	11.2	0.0	0	N/A	Negligible
58	11.2	11.2	Negligible	11.2	0.0	0	N/A	Negligible
59	11.4	11.5	Negligible	11.5	0.1	0	N/A	Negligible
60	12.0	12.1	Negligible	12.2	0.2	1	+	Negligible
61	11.6	11.2	Negligible	11.3	-0.3	-1	-	Negligible
62	11.7	11.9	Negligible	11.9	0.2	1	+	Negligible
63	11.3	11.3	Negligible	11.3	0.1	0	N/A	Negligible
64	11.5	11.6	Negligible	11.7	0.2	1	+	Negligible

Receptor ID	Original			Updated				
	Without Scheme Concentration (µg/m ³)	With Scheme Concentration (µg/m ³)	Impact Descriptor	With Scheme Concentration (µg/m ³)	Absolute Change in Concentration (µg/m ³)	Change (% of AQAL) ^a	Increase/ Decrease ^b	Impact Descriptor
65	11.4	11.5	Negligible	11.6	0.1	0	N/A	Negligible
66	11.3	11.3	Negligible	11.8	0.0	0	N/A	Negligible
67	11.5	11.5	Negligible	12.2	0.1	0	N/A	Negligible
68	11.3	11.3	Negligible	11.8	0.0	0	N/A	Negligible
69	11.1	11.1	Negligible	11.5	0.0	0	N/A	Negligible
70	11.2	11.2	Negligible	11.6	0.0	0	N/A	Negligible
71	10.9	10.9	Negligible	11.2	0.0	0	N/A	Negligible
72	11.0	11.0	Negligible	11.0	0.0	0	N/A	Negligible
73	10.9	10.9	Negligible	10.9	0.0	0	N/A	Negligible
74	10.8	10.8	Negligible	10.8	0.0	0	N/A	Negligible
75	10.8	10.8	Negligible	10.8	0.0	0	N/A	Negligible
76	11.0	11.0	Negligible	10.8	0.0	0	N/A	Negligible
77	11.1	11.1	Negligible	10.8	0.0	0	N/A	Negligible
78	11.3	11.3	Negligible	11.0	0.0	0	N/A	Negligible
79	11.5	11.6	Negligible	11.2	0.0	0	N/A	Negligible
80	11.3	11.3	Negligible	11.0	0.0	0	N/A	Negligible
81	11.4	11.4	Negligible	11.1	0.0	0	N/A	Negligible
82	11.1	11.1	Negligible	11.1	0.0	0	N/A	Negligible
83	11.2	11.3	Negligible	11.2	0.0	0	N/A	Negligible
84	11.3	11.4	Negligible	11.4	0.1	0	N/A	Negligible
85	10.9	10.9	Negligible	10.9	0.0	0	N/A	Negligible
86	11.0	11.0	Negligible	11.0	0.0	0	N/A	Negligible
87	11.5	11.6	Negligible	11.6	0.1	0	N/A	Negligible
88	11.6	11.7	Negligible	11.8	0.1	1	+	Negligible
89	11.6	11.7	Negligible	11.7	0.1	1	+	Negligible
90	11.9	12.0	Negligible	12.1	0.2	1	+	Negligible
91	11.1	11.2	Negligible	11.2	0.1	0	N/A	Negligible
92	11.0	11.1	Negligible	11.1	0.0	0	N/A	Negligible
93	11.0	11.0	Negligible	11.0	0.0	0	N/A	Negligible
94	11.1	11.1	Negligible	11.1	0.0	0	N/A	Negligible
95	11.1	11.1	Negligible	11.1	0.0	0	N/A	Negligible
96	11.1	11.2	Negligible	11.2	0.0	0	N/A	Negligible

Receptor ID	Original			Updated				
	Without Scheme Concentration (µg/m ³)	With Scheme Concentration (µg/m ³)	Impact Descriptor	With Scheme Concentration (µg/m ³)	Absolute Change in Concentration (µg/m ³)	Change (% of AQAL) ^a	Increase/ Decrease ^b	Impact Descriptor
97	11.1	11.1	Negligible	11.1	0.0	0	N/A	Negligible
98	11.5	11.6	Negligible	11.6	0.1	0	N/A	Negligible
100	11.3	11.4	Negligible	11.4	0.0	0	N/A	Negligible
101	11.3	11.2	Negligible	11.2	-0.1	0	N/A	Negligible
102	11.5	11.5	Negligible	11.5	0.0	0	N/A	Negligible
103	11.6	11.6	Negligible	11.6	0.1	0	N/A	Negligible
104	11.3	11.3	Negligible	11.3	0.0	0	N/A	Negligible
105	11.3	11.3	Negligible	11.3	0.0	0	N/A	Negligible
106	11.3	11.3	Negligible	11.3	0.0	0	N/A	Negligible
107	11.6	11.7	Negligible	11.7	0.1	0	N/A	Negligible
108	11.8	11.9	Negligible	11.9	0.1	0	N/A	Negligible
109	11.8	11.9	Negligible	11.9	0.1	0	N/A	Negligible
110	11.7	11.8	Negligible	11.8	0.1	0	N/A	Negligible
111	11.4	11.4	Negligible	11.4	0.0	0	N/A	Negligible
112	11.7	11.8	Negligible	11.8	0.1	0	N/A	Negligible
113	11.5	11.5	Negligible	11.5	0.0	0	N/A	Negligible
114	12.0	12.1	Negligible	12.1	0.1	0	N/A	Negligible
115	11.6	11.6	Negligible	11.6	0.0	0	N/A	Negligible
116	11.8	11.9	Negligible	11.9	0.1	0	N/A	Negligible
117	12.0	12.1	Negligible	12.1	0.1	0	N/A	Negligible
118	12.1	12.1	Negligible	12.1	0.1	0	N/A	Negligible
184	11.2	11.2	Negligible	11.2	0.0	0	N/A	Negligible
231	12.2	12.2	Negligible	12.2	0.0	0	N/A	Negligible
Objective	25 ^c		-	25 ^c	-			

^a % changes are relative to the objective and have been rounded to the nearest whole number.

^b A notion (plus / minus) has not been assigned where the percentage change in concentration, when rounded, is zero.

^c The PM_{2.5} objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it.

A3 Professional Experience

██████████, BSc (Hons) PhD CSci MEnvSc MIAQM

██████████ is the Director of Air Quality Modelling and Assessment at AQC and has over 20 years' relevant experience. He has been responsible for air quality and greenhouse gas assessments of road schemes, rail schemes, airports, power stations, waste incinerators, commercial developments and residential developments in the UK and abroad. He has acted as expert witness at public inquiries, where he has presented evidence on health-related air quality impacts, the impacts of air quality on sensitive ecosystems, and greenhouse gas impacts. He has developed a range of widely-used air quality models and contributed to the development of best practice. ██████████ has provided support and advice to foreign governments, Highways England, Transport Scotland, Transport for London, Greater London Authority, the Joint Nature Conservation Committee, the Environment Agency, and numerous local authorities. He is a Member of the Institute of Air Quality Management and a Chartered Scientist. He currently advises the UK Government on air quality as part of its Air Quality Expert Group (AQEG), where his specific area of expertise relates to air quality assessment in the development control process.

██████████, BSc (Hons) MSc PhD CSci MEnvSc MIAQM

██████████ is an Associate Director with AQC, with more than 20 years' relevant experience. She has been involved in air quality management and assessment, and policy formulation in both an academic and consultancy environment. She has prepared air quality review and assessment reports, strategies and action plans for local authorities and has developed guidance documents on air quality management on behalf of central government, local government and NGOs. She has led on the air quality inputs into Clean Air Zone feasibility studies and has provided support to local authorities on the integration of air quality considerations into Local Transport Plans and planning policy processes. ██████████ has appraised local authority air quality assessments on behalf of the UK governments, and provided support to the Review and Assessment helpdesk. She has carried out numerous assessments for new residential and commercial developments, including the negotiation of mitigation measures where relevant. She has also acted as an expert witness for both residential and commercial developments. She has carried out BREEAM assessments covering air quality for new developments. ██████████ has also managed contracts on behalf of Defra in relation to allocating funding for the implementation of air quality improvement measures. She is a Member of the Institute of Air Quality Management, Institution of Environmental Sciences and is a Chartered Scientist.

██████████, MSci PhD MEnvSc MIAQM

██████████ is a Principal Consultant with AQC with over eight years' relevant experience. Prior to joining AQC, she spent four years carrying out postgraduate research into atmospheric aerosols at

the University of Bristol. [REDACTED] has experience preparing air quality assessments for a range of projects, including residential and commercial developments, road traffic schemes, energy centres, energy from waste schemes and numerous power generation schemes. She has experience in producing air quality assessments for EIA schemes, and has also assessed the impacts of Local Plans on designated ecological areas, prepared Annual Status Reports for Local Authorities, and undertaken diffusion tube monitoring studies. She is a Member of both the Institute of Air Quality Management and the Institution of Environmental Sciences.