APPENDIX 11.1:

GLOSSARY OF TERMS

11 AIR QUALITY CHAPTER APPENDIX

11.1 Glossary of Terms

Term	Definition
AADT	Annual Average Daily Traffic. A daily total traffic flow (24 hrs), expressed as a mean daily flow across all 365 days of the year.
Adjustment	Application of a correction factor to modelled results to account for uncertainties in the model
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality Objective).
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Ancient Woodland	This is typically a woodland that has existed since 1600 or earlier.
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year.
AQAL	Air Quality Assessment Level
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
Affected Road Network (ARN)	All roads that trigger the traffic screening criteria and adjoining roads within 200m.
AURN	Automatic Urban and Rural Network
AVDC	Aylesbury Vale District Council
Baseline	The conditions that exist in the absence of the scheme either at the time when an assessment is undertaken or in the future when the scheme is constructed, operational or decommissioned.
CEMP	Construction Environmental Management Plan
Conservative	Cautious – tending to over-predict the impact rather than under-predict.
Defra	Department for Environment, Food and Rural Affairs.
Designated site	Land designated for its wildlife interest including Ramsar sites, Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPA) and Special Areas of Conservation (SAC).
DfT	Department for Transport.
DMP	Dust Management Plan

Term	Definition
EA	Environment Agency
EFT	Emissions Factors Toolkit, a spreadsheet application periodically updated and published by Defra enabling the calculation of road vehicle emission rates of oxides of nitrogen.
Emission rate	The quantity of a pollutant released from a source over a given period of time.
EPUK	Environmental Protection United Kingdom
EU	European Union
Exceedance	A period of time where the concentrations of a pollutant is greater than the appropriate air quality standard.
HDV	Heavy Duty Vehicle, includes all vehicles over 3.5 tonnes gross weight including lorries (heavy goods vehicles), buses and coaches.
IAQM	Institute of Air Quality Management
LAQM.TG	Local Air Quality Management Technical Guidance
LDV	Light Duty Vehicle
Mitigation	The measures taken to avoid, reduce or otherwise address the potential negative effects due to air quality impacts.
MKC	Milton Keynes Council
Model adjustment	Following model verification, the process by which modelled results are amended. This corrects for systematic error.
NO_2	Nitrogen dioxide.
NO_x	Oxides of nitrogen, including nitrogen dioxide and nitric oxide.
PCM	Pollution Climate Mapping.
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
$PM_{2.5}$	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres.
Receptor	An identified location where an effect may occur.
Road link	A length of road which is considered to have the same flow of traffic along it. Usually, a link is the road from one junction to the next.
$\mu g/m^3$	Microgrammes per cubic metre. A measure of concentration in terms of mass per unit volume. A concentration of $1ug/m^3$ means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.
Uncertainty	A measure, associated with the result of a measurement, which characterizes the range of values within which the true value is expected to lie. Uncertainty is usually expressed as the range within which the true value is expected to lie with a 95%

Term	Definition
	probability, where standard statistical and other procedures have been used to evaluate this figure. Uncertainty is more clearly defined than the closely related parameter 'accuracy' and has replaced it on recent European legislation.
Validation (modelling)	Refers to the general comparison of modelled results against monitoring data carried out by model developers.
Verification (modelling)	Comparison of modelled results versus any local monitoring data at relevant locations.
WHO	World Health Organisation

APPENDIX 11.2:

IAQM CONSTRUCTION DUST ASSESSMENT METHODOLOGY

11.2 IAQM Construction Dust assessment methodology
STEP 1 – SCREENING THE NEED FOR A DETAILED ASSESSMENT

An assessment will normally be required where there are:

- 'Human receptors' within 350m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s); and/or
- 'Ecological receptors' within 50m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is "negligible".

STEP 2A – DEFINE THE POTENTIAL DUST EMISSION MAGNITUDE

The following are examples of how the potential dust emission magnitude class for different activities can be defined (note that not all the criteria need to be met for a particular magnitude class). Other criteria may be used if justified in the assessment.

Table 11.2.1 – Examples of Human Receptor Sensitivity to Construction Phase

Dust Emissions Magnitude	Activity
Large	Demolition >50,000m^3 building demolished, dusty material (e.g. concrete), on-site crushing/screening, demolition >20m above ground level
	Earthworks >10,000m^2 site area, dusty soil type (e.g. clay) >10 earth moving vehicles active simultaneously >8m high bunds formed, >100,000 tonnes material moved
	Construction >100,000m^3 building volume, on site concrete batching, sandblasting
	Trackout >50 HDVs out / day, dusty surface material (e.g. clay), >100m unpaved roads
Medium	Demolition 20,000 - 50,000m^3 building demolished, dusty material (e.g. concrete) 10-20m above ground level
	Earthworks 2,500 - 10,000m^2 site area, moderately dusty soil (e.g. silt), 5-10 earth moving vehicles active simultaneously, 4m - 8m high bunds, 20,000 -100,000 tonnes material moved
	Construction 25,000 - 100,000m^3 building volume, dusty material e.g. concrete, on site concrete batching
	Trackout 10 - 50 HDVs out / day, moderately dusty surface material (e.g. clay), 50 -100m unpaved roads
Small	Demolition <20,000m^3 building demolished, non-dusty material (e.g. metal cladding), <10m above ground level, work during wetter months

Dust Emissions Magnitude	Activity
	Earthworks <2,500m^2 site area, soil with large grain size (e.g. sand), <5 earth moving vehicles active simultaneously, <4m high bunds, <20,000 tonnes material moved, earthworks during wetter months
	Construction <25,000m^3, non-dusty material (e.g. metal cladding or timber)
	Trackout <10 HDVs out / day, non-dusty soil, < 50m unpaved roads

STEP 2B – DEFINE THE SENSITIVITY OF THE AREA

The tables below present the IAQM Construction Dust guidance assessment methodology to determine the sensitivity of the area to dust soiling, human health and ecological impacts respectively. The IAQM Construction Dust guidance provides guidance to allow the sensitivity of individual receptors to dust soiling and health effects to assist in the assessment of the overall sensitivity of the study area.

Table 11.2.2 – Sensitivity of the Area to Dust Soiling Effects

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 11.2.3 – Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration (µg/m^3)	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32	>10	High	Medium	Low	Low	Low

		1-10	Medium	Low	Low	Low	Low
	28-32	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table 11.2.4 – Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from the Source (m)	
	<20	**<50**
High	High	Medium
Medium	Medium	Low
Low	Low	Low

STEP 2C – DEFINE THE RISK OF IMPACTS

The dust emissions magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to establish the risk of impacts without mitigation applied. For those cases where the risk category is "negligible" no mitigation measures beyond those required by legislation will be required.

Table 11.2.5 – Risk of Dust Impacts

Sensitivity of Surrounding Area	Dust Emissions Magnitude		
	Large	**Medium**	**Small**
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks and Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			

High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

STEP 3 –SITE SPECIFIC MITIGATION

Having determined the risk categories for each of the four activities it is possible to determine the site-specific measures to be adopted. These measures will be related to whether the site is considered to be a low, medium or high-risk site. The IAQM Construction Dust guidance details the mitigation measures required for high, medium and low risk sites as determined in Step 2C.

STEP 4 – DETERMINE SIGNIFICANT EFFECTS

Once the risk of dust impacts has been determined in Step 2C and the appropriate dust mitigation measures identified in Step 3, the final step is to determine whether there are significant effects arising from the construction stage. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be “negligible”.

APPENDIX 11.3:

DISPERSION MODEL APPROACH AND VERIFICATION

11.3 Dispersion Model Approach and Verification Introduction

Ambient air pollution in urban areas is dominated by emissions from road vehicles. The main pollutants of concern associated with road traffic are oxides of nitrogen (NO_x/NO_2) and fine particulate matter (PM_{10} & $PM_{2.5}$), since these pollutants are most likely to approach or exceed their relevant air quality objectives in proximity to major roads.

The operation of the Proposed Development has the potential to change the total flow, distribution and characteristics of traffic movements on the affected road links, which would result in changes to emissions of the aforementioned pollutants. This local air quality assessment was completed to predict the potential impacts of these changes on ambient pollutant concentrations at identified sensitive receptors within 200m of affected roads.

The local traffic related pollution levels predicted at the receptor locations were assessed by comparing the total predicted concentrations of NO_2, PM_{10} and $PM_{2.5}$ with the current air quality objectives and considering the change (improvement or worsening) in concentrations between the 'Without' and 'With' development scenarios.

Atmospheric Dispersion Model

The predicted impacts on local air quality associated with changes to vehicle emissions as a result of the operation of the scheme were assessed using Cambridge Environmental Research Consultants Ltd (CERC) atmospheric dispersion modelling system for roads (ADMS-Roads v5.0.0.1)[1].

ADMS-Roads applies advanced algorithms for the height-dependence of wind speed, turbulence and stability to produce improved predictions of air pollutant concentrations within the given model domain. It can predict long-term and short-term concentrations, as well as calculations of percentile concentrations.

ADMS-Roads is a validated model, developed in the UK by CERC. The model validation process includes comparisons with data from the UK's Automatic Urban Rural Network (AURN) and specific verification exercises using standard field, laboratory and numerical data sets. CERC is also involved in European programmes on model harmonisation, and their models were compared favourably against other EU and U.S. Environmental Protection Agency (EPA) systems[2].

Modelling Methodology

The procedures involved in undertaking the dispersion modelling assessment are outlined below:

- Collation of input data – traffic data (including AADT flows, speeds (kph), percentage of HDVs, road network mapping, sensitive receptor coordinates and meteorological data;
- Input of data in to the ADMS-Roads model for the scenarios to be modelled;
- Development of emissions inventories for each pollutant to be assessed, using Defra's emission factor toolkit (EFT v9.0);
- Running the ADMS-Roads model for each considered scenario;
- Conversion of modelled NO_x concentrations to NO_2 concentrations using Defra's NO_x-NO_2 calculator v7.1;
- Addition of sector removed Defra background concentrations to the modelled concentrations;
- Verification and adjustment of modelled road-NO_x contributions from the assessed road network through analysing the ADMS-Roads modelled road-NO_x outputs versus monitoring data. One roadside diffusion tube

[1] https://www.cerc.co.uk/environmental-software/ADMS-Roads-model.html

[2] Further information in relation to this is available from the CERC website at https://www.cerc.co.uk/environmental-software/model-validation.html

monitoring site managed by MKC was identified within the air quality study area for use in the model verification process[3];

- Comparison of predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations at all receptors to the relevant air quality objectives in each scenario; and
- Analysis of changes in pollutant concentrations between the 'Without development' and 'With development' scenarios to assess the significance of impacts associated with the Proposed Development on local air quality.

Traffic Data

Traffic data was derived from a static spreadsheet-based model and provided by WSP Transport Modellers. The traffic data provided for the assessed road network comprised AADT flows, percentage HDVs and average vehicle speeds (kph). Appropriate assumptions were made with respect to traffic speeds on approach to and progress through roundabout junctions (i.e. lower speeds on approach and progress through junction).

Traffic flows at roundabouts and roundabout approaches (up to a distance of 50m from the junction) were reduced to 20kph, in line with guidance provided within LAQM.TG16. **Table 11.3.1** summarises the model inputs used in all scenarios for this air quality assessment. A detailed summary of the traffic data used within the assessment is provided in **Appendix 11.4**.

Table 11.3.1 – Model Inputs

Input	Notes
Traffic data and emission rates	NO_x, PM_{10} and $PM_{2.5}$ emissions data for 2019 and 2026 were obtained from Defra's Emissions Factors Toolkit (EFT), version 9.0. EFT settings: area ='England (not London)'; traffic format = 'Basic Split'; road type = 'Rural (not London)' for links within the AVDC administrative area and 'Urban (not London)' for links within the MKC administrative area. Emissions from 2026 were used for the future year scenario 2033 to ensure a conservative approach to the assessment.
Road geometry	All model links aligned to carriageway centreline, set to true road width (kerb to kerb/edge of travelled lanes), road heights set to zero.
Background concentrations	From Defra 1 x 1km mapped datasets for 2019 and 2026. The pollutant contribution of A-roads inside the 1 x 1km grid square was removed. The NO_2 contribution was removed using the NO_x sector removal tool (v7.0) published by Defra. Sector removed Defra backgrounds from 2026 were used for the future year scenario 2033 to ensure a conservative approach to the assessment.
Receptors	Discrete human receptors identified in **Table 11.3**.
Model outputs	Annual mean NO_x, PM_{10} and $PM_{2.5}$ concentrations at receptor points.
Post-processing	Verification (discussed below) with adjustment of road source contributions of annual mean NO_x, PM_{10} and $PM_{2.5}$ (to address systematic model error).
	NO_x to NO_2 conversion using Defra's calculator version 7.1 (NOx_to_NO2_Calculator_v7.1)

[3] 2019 air quality monitoring data was unavailable from MKC at the time of this assessment and will remain unavailable until June 2020. It was agreed with the Environmental Health Officer that monthly 2018 diffusion tube monitoring data and 2019 CMS monitoring data, obtained from the Automatic Urban and Rural Network, would be used for forward annualise and calculate annual mean 2019 diffusion tube data.

Meteorological Data

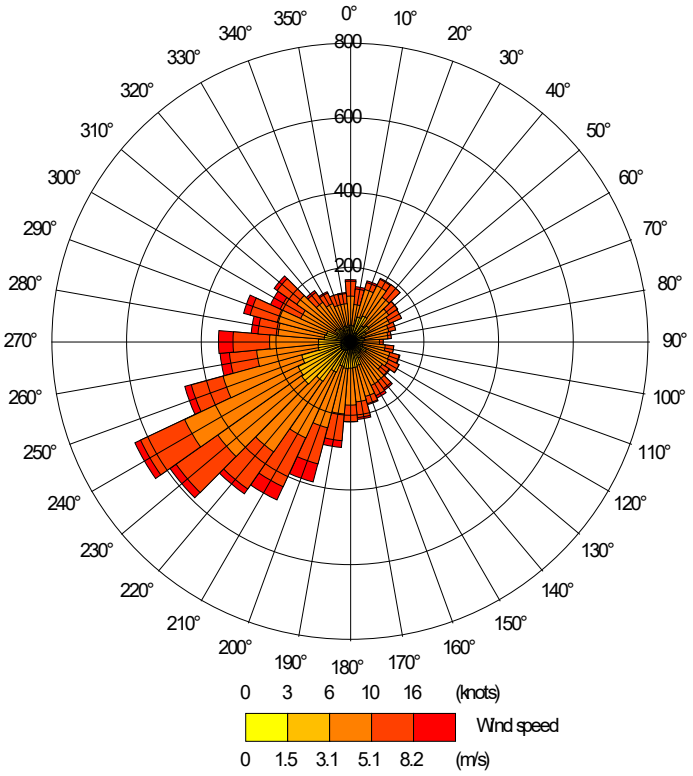
ADMS-Roads utilises hourly sequential meteorological data; including wind direction, wind speed, temperature, precipitation and cloud cover, to facilitate the prediction of pollution dispersion between source and receptor. Meteorological data input to the model were obtained from the Bedford meteorological station for 2019. The 2019 data was used to be consistent with the verification traffic year and were applied to the remaining scenarios for the local air quality assessment. The 2019 wind rose is presented as **Figure 11.3.1**.

Meteorological data parameters include, in an hourly sequential format, the Julian date, hour, wind speed (m/s), wind direction (degrees from north), cloud cover (oktas), surface temperature (degrees Celsius). Table 11.3.1 summarises the meteorological data assumptions used for all scenarios in this air quality assessment.

Table 11.3.2 – Meteorological Data Assumptions

Input	Meteorological Site	Dispersion Site
Roughness length (m)	0.2	0.5
Minimum Monin-Obukhov length (m)	Model calculated	10
Priestley-Taylor parameter	1	1
Surface Albedo	0.23	0.23
Site latitude (°)	51.98	N/A

Figure 11.3.1 – Bedford Wind Rose, 2019



Conversion of NO_X to NO_2

Oxides of nitrogen (NO_x) concentrations were predicted using the ADMS-Roads model. The modelled road contribution of NO_x (road-NO_x) at modelled receptor locations was then converted to NO_2 using the NO_x to NO_2 calculator (v7.1, April 2019[4]), in accordance with Defra guidance.

Model Validation & Verification

The ADMS-Roads dispersion model has been validated for road traffic assessments and is considered to be fit for purpose. Model validation undertaken by the software developer (CERC) is unlikely to have included validation in the vicinity of the scheme considered in this assessment. It is therefore necessary to perform a comparison of model results with local monitoring data at relevant locations.

The comparison of modelled concentrations with local monitored concentrations is a process termed 'verification'. Model verification investigates the discrepancies between modelled and measured concentrations, which can arise due to the presence of inaccuracies and/or uncertainties in model input data, modelling and monitoring data assumptions. The following are examples of potential causes of such discrepancy:

- Estimates of background pollutant concentrations;
- Meteorological data uncertainties:
- Traffic data uncertainties;
- Model input parameters such as 'roughness length; and
- Overall limitations of the dispersion model.

Full details of the model verification process specific to the Proposed Development modelling assessment are provided in the 'Assessment Verification Methodology' section below.

Model Precision

Residual uncertainty may remain after systematic error or 'model accuracy' has been accounted for in the final predictions. Residual uncertainty may be considered synonymous with the 'precision' of the model predictions, i.e. how wide the scatter or residual variability of the predicted values compare with the monitored true value, once systematic error has been allowed for. The quantification of model precision provides an estimate of how the final predictions may deviate from true (monitored) values at the same location over the same period. Suitable local monitoring data for is used for model verification.

An evaluation of model performance has been undertaken to establish confidence in model results. LAQM.TG16 identifies a number of statistical procedures that are appropriate to evaluate model performance and assess the uncertainty. The statistical parameters used in this assessment are:

- Root Mean Square Error (RMSE);
- Fractional Bias (FB); and
- Correlation Coefficient (CC).

A brief explanation of each statistic is provided in **Table 11.3.2**, and further details can be found in Defra's LAQM.TG16 guidance document.

[4] https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html#NOxNO2calc

Table 11.3.3 – Model Performance Statistics

Parameter	Description	Ideal Value
RMSE	RMSE is used to define the average error or uncertainty of the model. The units of RMSE are the same as the quantities compared. If the RMSE values are higher than 25% of the objective being assessed, it is recommended that the model inputs and verification should be revisited in order to make improvements. For example, if the model predictions are for the annual mean NO_2 objective of 40µg/m^3, if an RMSE of 10µg/m^3 or above is determined for a model it is advised to revisit the model parameters and model verification. Ideally an RMSE within 10% of the air quality objective would be derived, which equates to 4µg/m^3 for the annual mean NO_2 objective.	0.00
Fractional Bias	It is used to identify if the model shows a systematic tendency to over or under predict. FB values vary between +2 and -2 and has an ideal value of zero. Negative values suggest a model over- prediction and positive values suggest a model under- prediction.	0.00
Correlation Coefficient	It is used to measure the linear relationship between predicted and observed data. A value of zero means no relationship and a value of 1 means absolute relationship. This statistic can be particularly useful when comparing a large number of model and observed data points.	1.00

The calculations were carried out after model adjustment to provide information on the improvement of the model predictions as a result of the application of the verification adjustment factor.

Assessment Verification Methodology

The verification process involves a review of the modelled pollutant concentrations against corresponding monitoring data to determine how well the air quality model has performed. Depending on the outcome it may be considered that the model has performed adequately and that there is no need to adjust any of the modelled results LAQM.TG16.

Alternatively, the model may perform outside of the ideal performance limits as stated by LAQM.TG16 (i.e. model agrees within +/-25% of monitored equivalent, but ideally within +/-10%). There is then a need to check all the input data to ensure that it is reasonable and accurately represented in the air quality modelling process.

Where all input data, such as traffic data, emissions rates, and background concentrations have been checked and considered as reasonable, then the modelled results require adjustment to best align with the monitoring data. This may either be a single verification adjustment factor applied to the modelled concentrations across the study area, or a range of different adjustment factors to account for different zones in the study area (e.g. major roads and local roads).

Table 11.3.4 – Data Used in Model Verification before Adjustment

Monitoring Site	2019 Measured NO_2 Data (µg/m^3)*	Modelled Road-NO_x (µg/m^3) – before adjustment	Measured Road-NOx (µg/m^3) – from NO_x:NO_2 calculator	Modelled Annual Mean NO_2 Concentration (µg/m^3) – before adjustment	Difference % ([Modelled – Measured]/ Measured)
WER	20.0	5.9	12.3	16.7	-16.5

*2018 monitored data forward annualised to 2019.

The data in **Table 11.3.4** shows that the model is under predicting. Therefore, a road-NO_x adjustment factor was determined as the slope of the best fit line between the 'measured' road contribution and the model derived road contribution, forced through zero (**Figure 11.3.2**). This factor (2.09) was then applied to the modelled road-NO_x concentration to provide an adjusted modelled road-NO_x concentration (as shown in **Table 11.3.5**). The total nitrogen dioxide concentrations were determined by inputting the adjusted modelled road-NO_x concentrations and the sector removed background NO_2 concentration into the NO_x to NO_2 calculator.

Figure 11.3.2 – Comparison of Measured Road-NO_x with Unadjusted Modelled Road NOx

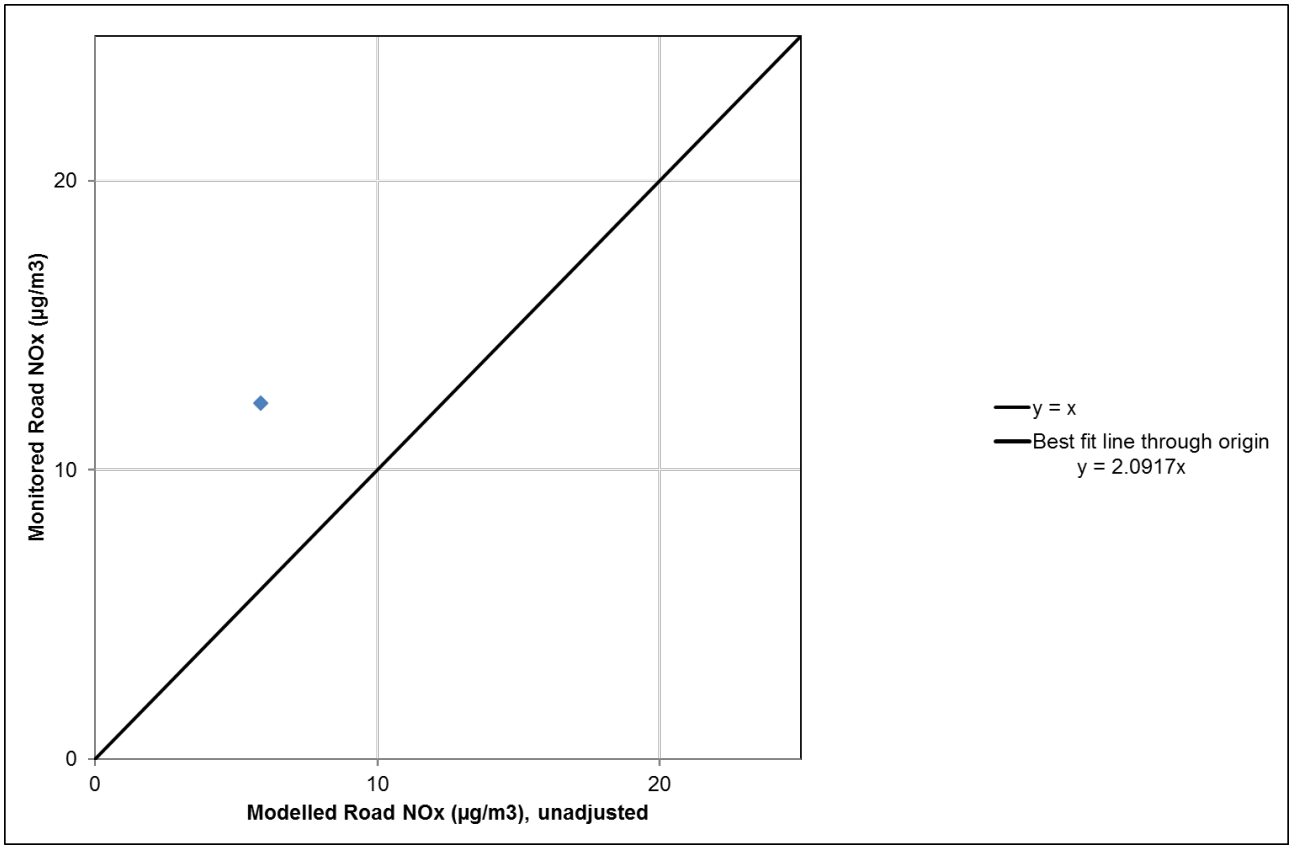


Table 11.3.5 – Model Results After Adjustment

Monitoring Site	2019 Measured NO_2 Data (µg/m^3)	Modelled Annual Mean NO_2 Concentration (µg/m^3) – after adjustment	Difference %
WER	20.0	20.0	0.0

Given the availability of only one monitoring location within the study area for use in model verification, the statistical analysis of model uncertainty cannot be calculated.

PM_{10} & $PM_{2.5}$

There are no local PM_{10} or $PM_{2.5}$ monitoring data against which the model could be verified. Consequently, the verification factor determined above for adjusting the road-NO_x contribution has been applied to the predicted road-PM_{10} and road-$PM_{2.5}$ contributions, consistent with guidance set out in LAQM.TG16.

Annualisation Calculations

In the absence of 2019 monitoring data for MKC diffusion tube site WER, monthly data collected by MKC during 2018 was used to calculate an approximate annual mean NO_2 concentration for this monitoring site for 2019 as described below.

Table 11.3.6 – Automatic Monitoring Data used for Forward Annualisation Calculations

Long-Term AURN Monitoring Site	Site Type	2019 Annual Mean NO_2 Conc. (µg/m^3) (Am)	2019 Data Capture (%)	Ratio (Am/Pm)
Borehamwood Meadow Park	Urban Background	20.7	97	0.998
Oxford St Ebbes	Urban Background	15.9	96	1.005
Leamington Spa	Urban Background	17.8	94	0.999

In order to be as consistent as possible with the MKC methodology for treating their diffusion tube data, the 2018 bias adjustment factor (0.78) reported in their 2019 Air Quality Annual Status Report was applied to the forward annualised 2019 monitoring results.

Table 11.3.7 – Summary of Bias-Adjusted and Annualised Monitoring Data

Diffusion Tube Site	2018 Unadjusted Annual Mean NO_2 Conc. (µg/m3)	Bias-adjusted 2018 Annual Mean (µg/m^3)	Annualisation Factor	Estimated 2019 Annual Mean (µg/m^3)
WER	25.6	19.97	1.001	19.98

APPENDIX 11.4:

SUMMARY OF OPERATIONAL TRAFFIC DATA USED IN THE ASSESSMENT

11.4 Summary of Operational Traffic Data used in the Assessment

Table 11.4.1, **Table 11.4.2**, **Table 11.4.3, Table 11.4.4** and **Table 11.4.5** below summarise the traffic data and emissions rates used within the air quality modelling assessment.

Table 11.4.1 – 2019 Traffic Flows

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
1_2	Buckingham Road	7.7	39.0	3902.7	0.02404	0.00184	0.00110
2_1	Buckingham Road	8.2	40.5	4094.9	0.02770	0.00213	0.00127
3_4	Buckingham Road	8.2	27.3	3731.0	0.00978	0.00065	0.00041
4_3	Buckingham Road	9.8	28.5	4157.7	0.01048	0.00069	0.00043
5_6	Bletchley Road	6.7	36.7	1851.5	0.01586	0.00101	0.00063
6_5	Bletchley Road	7.5	35.6	1917.6	0.01746	0.00104	0.00066
7_8	Stoke Road	8.7	32.0	2673.1	0.00825	0.00049	0.00031
8_7	Stoke Road	9.1	27.9	2707.7	0.00740	0.00043	0.00028
9_10	Drayton Road	9.2	27.1	1259.0	0.01335	0.00096	0.00060
10_9	Drayton Road	6.7	26.5	1191.3	0.01415	0.00097	0.00061
11_12	Whaddon Road	11.0	41.4	2458.5	0.00283	0.00019	0.00012
12_11	Whaddon Road	8.9	38.4	2613.7	0.00211	0.00014	0.00009
13_14	Whaddon Road	11.4	43.5	2613.0	0.00169	0.00013	0.00008
14_13	Whaddon Road	9.0	44.3	2488.8	0.00170	0.00012	0.00008
15_16	A421	10.0	40.0	12271.5	0.00287	0.00020	0.00013
16_15	A421	9.1	40.4	12358.0	0.00467	0.00032	0.00020
17_18	Whaddon Road	6.7	44.5	2184.4	0.05567	0.00405	0.00251
18_17	Whaddon Road	7.7	46.1	2076.7	0.05259	0.00397	0.00245

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
19_20	Unnamed Road Adjacent to A421 and Warren Road	13.5	36.3	459.5	0.00350	0.00019	0.00012
20_19	Unnamed Road Adjacent to A421 and Warren Road	12.1	35.1	346.2	0.00380	0.00021	0.00013
21_22	Nash Road	10.8	35.1	2441.0	0.01676	0.00095	0.00060
22_21	Nash Road	9.9	36.5	2135.3	0.01875	0.00103	0.00066
23_24	A421	12.7	41.0	8833.0	0.02993	0.00231	0.00137
24_23	A421	12.3	46.9	9105.7	0.03369	0.00246	0.00147
25_26	Winslow Road	10.7	43.7	644.1	0.06481	0.00486	0.00289
26_25	Winslow Road	9.6	39.8	652.0	0.06199	0.00470	0.00280
27_28	Coddimoor Lane	9.6	47.1	694.6	0.04100	0.00309	0.00184
28_27	Coddimoor Lane	7.6	44.0	725.8	0.04360	0.00331	0.00197
29_30	V1 Snelshall Street	7.1	42.5	4009.7	0.02240	0.00166	0.00099
30_29	V1 Snelshall Street	6.9	43.3	4493.2	0.02253	0.00170	0.00101
33_34	Little Horwood Road	11.4	44.6	321.4	0.05988	0.00476	0.00282
34_33	Little Horwood Road	10.9	43.2	320.7	0.05831	0.00450	0.00267
35_36	Warren Road	11.3	39.5	511.7	0.01392	0.00103	0.00064
36_35	Warren Road	9.4	37.3	839.8	0.01254	0.00092	0.00057
37_38	A421	10.5	40.9	10617.5	0.05763	0.00582	0.00337
38_37	A421	8.4	37.6	10403.4	0.05796	0.00611	0.00352
39_40	A421	11.3	42.2	10304.1	0.02629	0.00246	0.00144
40_39	A421	10.8	46.0	10296.3	0.02812	0.00256	0.00150
43_44	Westbrook End	6.3	23.1	535.1	0.02041	0.00186	0.00109

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
44_43	Westbrook End	6.9	21.8	555.1	0.02128	0.00197	0.00115
45_46	Whaddon Road	8.6	24.3	2452.8	0.02631	0.00242	0.00141
46_45	Whaddon Road	8.7	23.0	2662.2	0.02953	0.00265	0.00155
47_48	Hayton Way	7.9	28.1	706.9	0.01937	0.00159	0.00094
48_47	Hayton Way	12.0	28.7	744.0	0.02243	0.00178	0.00106
49_50	Snelshall Street	8.3	43.6	5423.4	0.05728	0.00582	0.00337
50_49	Snelshall Street	5.8	43.4	5922.2	0.05120	0.00532	0.00307
51_52	Chaffron Way	7.1	35.6	6162.9	0.03882	0.00254	0.00155
52_51	Chaffron Way	8.1	34.5	5065.5	0.04382	0.00266	0.00162
57_58	Snelshall Street	9.2	42.0	5008.2	0.02904	0.00263	0.00154
58_57	Snelshall Street	9.0	39.6	5218.6	0.02931	0.00247	0.00145
59_60	Tattenhoe Street	6.4	39.2	5264.9	0.09048	0.00832	0.00487
60_59	Tattenhoe Street	6.5	37.1	5719.7	0.08190	0.00758	0.00444
61_62	Tattenhoe Lane	5.6	29.5	3458.8	0.04544	0.00397	0.00233
62_61	Tattenhoe Lane	8.6	29.7	3595.1	0.08099	0.00641	0.00379
63_64	Fulmer Street	6.6	37.7	5665.0	0.03129	0.00301	0.00175
64_63	Fulmer Street	9.3	33.9	4937.1	0.03314	0.00311	0.00181
65_66	Watling Street	7.8	43.9	6360.0	0.09755	0.00926	0.00538
66_65	Watling Street	10.2	42.4	6165.4	0.08214	0.00816	0.00473
67_68	Watling Street	4.8	33.7	8914.5	0.06442	0.00592	0.00347
68_67	Watling Street	11.5	30.9	12085.7	0.06562	0.00585	0.00343

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
69_70	Sherwood Drive	4.4	24.5	5136.7	0.10316	0.00953	0.00558
70_69	Sherwood Drive	6.1	22.9	5186.6	0.10515	0.00974	0.00570
71_72	Buckingham Road	9.7	26.9	9448.9	0.08905	0.00818	0.00479
72_71	Buckingham Road	7.2	25.9	9717.5	0.09164	0.00843	0.00494
73_74	Buckingham Road	7.0	25.4	6415.5	0.06154	0.00542	0.00318
74_73	Buckingham Road	7.6	26.2	6771.1	0.06116	0.00553	0.00324
79_80	Shenley Road	8.0	25.3	3359.3	0.00343	0.00026	0.00016
80_79	Shenley Road	10.2	27.6	3280.5	0.00357	0.00026	0.00016
81_82	Queensway	6.3	28.1	10140.9	0.01050	0.00076	0.00047
82_81	Queensway	7.0	26.8	9375.1	0.01002	0.00074	0.00046
83_84	Water Eaton Road	6.6	25.3	3541.8	0.06656	0.00469	0.00292
84_83	Water Eaton Road	9.0	26.7	3221.0	0.06546	0.00462	0.00287
89_90	Shenley Road	3.4	15.0	5623.8	0.05630	0.00383	0.00239
90_89	Shenley Road	7.9	16.0	5189.0	0.05746	0.00410	0.00254
91_92	Buckingham Road	13.8	112.0	15142.5	0.00338	0.00025	0.00015
92_91	Buckingham Road	14.3	112.0	13650.9	0.00351	0.00025	0.00015
93_94	Standing Way	14.2	112.0	17211.4	0.01445	0.00096	0.00060
94_93	Standing Way	14.3	112.0	17519.0	0.01214	0.00082	0.00051
95_96	V6 Grafton Street	10.5	112.0	10567.0	0.05567	0.00405	0.00251
96_95	V6 Grafton Street	12.5	112.0	10335.3	0.05285	0.00399	0.00246
97_98	Standing Way	13.7	112.0	14909.1	0.04982	0.00360	0.00223

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
98_97	Standing Way	13.8	112.0	15329.4	0.04737	0.00364	0.00224
99_100	V6 Grafton Street	13.8	112.0	10781.1	0.03311	0.00291	0.00170
100_99	V6 Grafton Street	11.5	112.0	11178.5	0.02857	0.00245	0.00144
101_102	A421	8.0	48.8	12263.7	0.02722	0.00261	0.00152
102_101	A421	8.7	54.3	12728.6	0.02759	0.00267	0.00155
103_104	A421	8.9	47.3	16834.0	0.00443	0.00035	0.00021
104_103	A421	11.9	43.9	17715.3	0.00531	0.00040	0.00024
105_106	A421	8.6	49.6	12113.4	0.01966	0.00187	0.00109
106_105	A421	8.7	52.4	11065.4	0.02171	0.00209	0.00121
107_108	A421	11.3	42.2	10304.1	0.02236	0.00169	0.00101
108_107	A421	10.8	46.0	10347.4	0.02158	0.00163	0.00097
13_15R	Roundabout between A421 and Whaddon Road	8.7	20.0	12902.7	0.10025	0.00662	0.00400
15_101R	Roundabout between A421 and Whaddon Road	9.6	20.0	13599.5	0.10958	0.00714	0.00432
13_101R	Roundabout between A421 and Whaddon Road	8.8	20.0	14583.8	0.11390	0.00751	0.00454
105_1R	Roundabout between A421, B4034 and Snelshall Street	8.6	20.0	17006.5	0.13154	0.00870	0.00526
1_101R	Roundabout between A421, B4034 and Snelshall Street	8.6	20.0	15718.7	0.12175	0.00805	0.00487
101_57R	Roundabout between A421, B4034 and Snelshall Street	8.5	20.0	17526.1	0.13514	0.00895	0.00541
57_105R	Roundabout between A421, B4034 and Snelshall Street	8.5	20.0	16110.1	0.12419	0.00823	0.00497
97_99R	Roundabout between A421 and Grafton Street	13.2	20.0	27151.5	0.25054	0.01558	0.00947
99_93R	Roundabout between A421 and Grafton Street	13.1	20.0	25995.7	0.23838	0.01486	0.00902
95_97R	Roundabout between A421 and Grafton Street	13.2	20.0	26717.4	0.24656	0.01533	0.00932

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
93_95R	Roundabout between A421 and Grafton Street	13.4	20.0	27977.2	0.25986	0.01613	0.00980
24_25R	Roundabout between A421, B4033 and Winslow Road	12.0	20.0	10790.4	0.09033	0.00464	0.00299
21_23R	Roundabout between A421, B4033 and Winslow Road	11.1	20.0	10898.7	0.08895	0.00458	0.00296
25_107R	Roundabout between A421, B4033 and Winslow Road	12.1	20.0	10363.8	0.08692	0.00446	0.00288
107_21R	Roundabout between A421, B4033 and Winslow Road	11.1	20.0	12211.3	0.09959	0.00513	0.00331
15_17R	Roundabout between A421, Coddimoor Lane and Whaddon Road	9.3	20.0	14152.1	0.10932	0.00567	0.00366
27_15R	Roundabout between A421, Coddimoor Lane and Whaddon Road	9.2	20.0	11842.9	0.09116	0.00473	0.00305
37_27R	Roundabout between A421, Coddimoor Lane and Whaddon Road	9.2	20.0	12344.6	0.09502	0.00493	0.00318
17_37R	Roundabout between A421, Coddimoor Lane and Whaddon Road	9.5	20.0	12779.3	0.09915	0.00514	0.00332
65_93R	Roundabout between A421 and Watling Street	10.3	20.0	24825.2	0.20615	0.01329	0.00805
93_66R	Roundabout between A421 and Watling Street	12.0	20.0	26533.5	0.23431	0.01479	0.00897
66_103R	Roundabout between A421 and Watling Street	11.6	20.0	24905.1	0.21684	0.01375	0.00834
103_65R	Roundabout between A421 and Watling Street	10.5	20.0	26535.3	0.22190	0.01427	0.00865
89_91R	Roundabout between A421, Fulmer Street and Shenley Road	10.0	20.0	21019.1	0.17230	0.01116	0.00676
91_63R	Roundabout between A421, Fulmer Street and Shenley Road	11.5	20.0	21345.6	0.18492	0.01175	0.00712
63_103R	Roundabout between A421, Fulmer Street and Shenley Road	11.4	20.0	19496.4	0.16861	0.01072	0.00650
103_89R	Roundabout between A421, Fulmer Street and Shenley Road	9.9	20.0	22887.5	0.18703	0.01213	0.00734
61_105R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	11.7	20.0	17616.6	0.15392	0.00975	0.00591
91_61R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	11.9	20.0	18955.4	0.16659	0.01053	0.00639
59_91R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	8.6	20.0	15976.4	0.12365	0.00818	0.00494

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
105_59R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	9.2	20.0	17654.6	0.14009	0.00918	0.00555
29_51R	Roundabout between V1 Snelshall Street and Hayton Way	7.2	20.0	7785.5	0.05688	0.00384	0.00232
51_49R	Roundabout between V1 Snelshall Street and Hayton Way	7.4	20.0	8143.5	0.06002	0.00404	0.00244
47_29R	Roundabout between V1 Snelshall Street and Hayton Way	7.2	20.0	8250.9	0.06032	0.00408	0.00246
49_47R	Roundabout between V1 Snelshall Street and Hayton Way	7.3	20.0	8553.2	0.06272	0.00423	0.00255
13_14Q	Whaddon Road	11.4	20.0	2613.0	0.00541	0.00028	0.00018
14_13Q	Whaddon Road	9.0	20.0	2488.8	0.00532	0.00028	0.00018
101_102Q	A421 Standing Way	8.0	20.0	12263.7	0.02151	0.00111	0.00071
102_101Q	A421 Standing Way	8.7	20.0	12728.6	0.01903	0.00099	0.00064
106_105Q	A421 Standing Way	8.7	20.0	11065.4	0.09279	0.00619	0.00374
105_106Q	A421 Standing Way	8.6	20.0	12113.4	0.09909	0.00654	0.00395
95_96Q	V6 Grafton Street	10.5	20.0	10567.0	0.08612	0.00568	0.00344
96_95Q	V6 Grafton Street	12.5	20.0	10335.3	0.09374	0.00620	0.00375
101_102QQ	A421 Standing Way	8.0	20.0	12263.7	0.08812	0.00567	0.00344
102_101QQ	A421 Standing Way	8.7	20.0	12728.6	0.09294	0.00583	0.00354
107_108Q	A421 Standing Way	11.3	20.0	10304.1	0.09279	0.00619	0.00374
108_107Q	A421 Standing Way	10.8	20.0	10347.4	0.09909	0.00654	0.00395
25_26Q	Winslow Road	10.7	20.0	644.1	0.08441	0.00435	0.00281
26_25Q	Winslow Road	9.6	20.0	652.0	0.08348	0.00431	0.00278
21_22Q	Nash Road	10.8	20.0	2441.0	0.00519	0.00027	0.00017

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
22_21Q	Nash Road	9.9	20.0	2135.3	0.00507	0.00026	0.00017
23_24Q	A421	12.7	20.0	8833.0	0.01969	0.00102	0.00066
24_23Q	A421	12.3	20.0	9105.7	0.01681	0.00087	0.00056
17_18Q	Whaddon Road	6.7	20.0	2184.4	0.07538	0.00386	0.00249
18_17Q	Whaddon Road	7.7	20.0	2076.7	0.07688	0.00394	0.00255
27_28Q	Coddimoor Lane	9.6	20.0	694.6	0.01551	0.00081	0.00053
28_27Q	Coddimoor Lane	7.6	20.0	725.8	0.01526	0.00080	0.00051
37_38Q	A421	10.5	20.0	10617.5	0.08497	0.00439	0.00283
38_37Q	A421	8.4	20.0	10403.4	0.07798	0.00406	0.00262
15_16QQ	A421	10.0	20.0	12271.5	0.09685	0.00501	0.00323
16_15QQ	A421	9.1	20.0	12358.0	0.09493	0.00493	0.00318
16_15Q	A421	9.1	20.0	12358.0	0.09493	0.00493	0.00318
15_16Q	A421	10.0	20.0	12271.5	0.09685	0.00501	0.00323
57_58Q	Snelshall Street	9.2	20.0	5008.2	0.03976	0.00261	0.00158
58_57Q	Snelshall Street	9.0	20.0	5218.6	0.04107	0.00270	0.00163
1_2Q	Buckingham Road	7.7	20.0	3902.7	0.02914	0.00195	0.00118
2_1Q	Buckingham Road	8.2	20.0	4094.9	0.03116	0.00207	0.00125
49_50Q	Snelshall Street	8.3	20.0	5423.4	0.04157	0.00276	0.00167
50_49Q	Snelshall Street	5.8	20.0	5922.2	0.04053	0.00281	0.00169
51_52Q	Chaffron Way	7.1	20.0	6162.9	0.04474	0.00303	0.00183
52_51Q	Chaffron Way	8.1	20.0	5065.5	0.03836	0.00256	0.00154

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
29_30Q	V1 Snelshall Street	7.1	20.0	4009.7	0.02911	0.00197	0.00119
30_29Q	V1 Snelshall Street	6.9	20.0	4493.2	0.03239	0.00220	0.00133
47_48Q	Hayton Way	7.9	20.0	706.9	0.00531	0.00036	0.00021
48_47Q	Hayton Way	12.0	20.0	744.0	0.00658	0.00041	0.00025
92_91Q	Buckingham Road	14.3	20.0	13650.9	0.13057	0.00803	0.00488
91_92Q	Buckingham Road	13.8	20.0	15142.5	0.14226	0.00880	0.00535
61_62Q	Tattenhoe Lane	5.6	20.0	3458.8	0.02345	0.00163	0.00098
62_61Q	Tattenhoe Lane	8.6	20.0	3595.1	0.02785	0.00184	0.00111
59_60Q	Tattenhoe Street	6.4	20.0	5264.9	0.03703	0.00254	0.00153
60_59Q	Tattenhoe Street	6.5	20.0	5719.7	0.04050	0.00277	0.00167
106_105QQ	A421 Standing Way	8.7	20.0	11065.4	0.08612	0.00568	0.00344
105_106QQ	A421 Standing Way	8.6	20.0	12113.4	0.09374	0.00620	0.00375
92_91QQ	Buckingham Road	14.3	20.0	13650.9	0.13057	0.00803	0.00488
91_92QQ	Buckingham Road	13.8	20.0	15142.5	0.14226	0.00880	0.00535
89_90Q	Shenley Road	3.4	20.0	5623.8	0.03426	0.00249	0.00150
90_89Q	Shenley Road	7.9	20.0	5189.0	0.03898	0.00261	0.00157
63_64Q	Fulmer Street	6.6	20.0	5665.0	0.04022	0.00275	0.00166
64_63Q	Fulmer Street	9.3	20.0	4937.1	0.03940	0.00258	0.00156
103_104Q	A421 Standing Way	8.9	20.0	16834.0	0.13182	0.00868	0.00525
104_103Q	A421 Standing Way	11.9	20.0	17715.3	0.15573	0.00984	0.00597
103_104QQ	A421 Standing Way	8.9	20.0	16834.0	0.13182	0.00868	0.00525

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
104_103QQ	A421 Standing Way	11.9	20.0	17715.3	0.15573	0.00984	0.00597
67_68Q	Watling Street	4.8	20.0	8914.5	0.05826	0.00412	0.00248
68_67Q	Watling Street	11.5	20.0	12085.7	0.10472	0.00665	0.00403
94_93Q	Standing Way	14.3	20.0	17519.0	0.16786	0.01031	0.00627
93_94Q	Standing Way	14.2	20.0	17211.4	0.16390	0.01009	0.00613
65_66Q	Watling Street	7.8	20.0	6360.0	0.04759	0.00319	0.00192
66_65Q	Watling Street	10.2	20.0	6165.4	0.05097	0.00329	0.00199
99_100Q	V6 Grafton Street	13.8	20.0	10781.1	0.10130	0.00626	0.00381
100_99Q	V6 Grafton Street	11.5	20.0	11178.5	0.09680	0.00615	0.00373
94_93QQ	Standing Way	14.3	20.0	17519.0	0.16786	0.01031	0.00627
93_94QQ	Standing Way	14.2	20.0	17211.4	0.16390	0.01009	0.00613
97_98Q	Standing Way	13.7	20.0	14909.1	0.13984	0.00865	0.00526
98_97Q	Standing Way	13.8	20.0	15329.4	0.14431	0.00892	0.00542

Table 11.4.2 – 2026 Without Development Traffic Flows and Emission Rates

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
1_2	Buckingham Road	6.3	39.0	4868.8	0.01370	0.00205	0.00114
2_1	Buckingham Road	6.7	40.5	5069.2	0.01516	0.00233	0.00129
3_4	Buckingham Road	6.6	27.3	4680.5	0.00547	0.00065	0.00038
4_3	Buckingham Road	8.1	28.5	5138.2	0.00581	0.00069	0.00040
5_6	Bletchley Road	6.2	36.7	2031.6	0.00891	0.00102	0.00060
6_5	Bletchley Road	7.0	35.6	2113.8	0.00966	0.00105	0.00062
7_8	Stoke Road	7.7	32.0	3062.4	0.00446	0.00048	0.00028
8_7	Stoke Road	8.1	27.9	3098.0	0.00413	0.00043	0.00025
9_10	Drayton Road	8.3	27.1	1404.3	0.00754	0.00099	0.00058
10_9	Drayton Road	6.1	26.5	1330.4	0.00813	0.00101	0.00059
11_12	Whaddon Road	9.5	41.4	2873.3	0.00145	0.00019	0.00011
12_11	Whaddon Road	7.8	38.4	3040.5	0.00110	0.00014	0.00008
13_14	Whaddon Road	10.2	43.5	2966.6	0.00090	0.00012	0.00007
14_13	Whaddon Road	8.0	44.3	2832.2	0.00091	0.00012	0.00007
15_16	A421	8.8	40.0	14157.3	0.00152	0.00020	0.00012
16_15	A421	8.1	40.4	14214.8	0.00252	0.00031	0.00018
17_18	Whaddon Road	6.0	44.5	2491.3	0.03000	0.00403	0.00236
18_17	Whaddon Road	6.9	46.1	2374.9	0.02869	0.00397	0.00232
19_20	Unnamed Road Adjacent to A421 and Warren Road	12.5	36.3	504.2	0.00193	0.00019	0.00011
20_19	Unnamed Road Adjacent to A421 and Warren Road	11.2	35.1	379.8	0.00207	0.00020	0.00012

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
21_22	Nash Road	9.9	35.1	2693.0	0.00945	0.00096	0.00057
22_21	Nash Road	9.2	36.5	2353.5	0.01047	0.00104	0.00062
23_24	A421	11.6	41.0	9848.9	0.01635	0.00232	0.00130
24_23	A421	11.2	46.9	10151.0	0.02088	0.00289	0.00163
25_26	Winslow Road	9.9	43.7	706.7	0.03353	0.00502	0.00280
26_25	Winslow Road	8.8	39.8	715.4	0.03349	0.00489	0.00274
27_28	Coddimoor Lane	8.9	47.1	762.2	0.02226	0.00323	0.00181
28_27	Coddimoor Lane	7.1	44.0	796.4	0.02339	0.00344	0.00192
29_30	V1 Snelshall Street	6.1	42.5	4752.4	0.01136	0.00165	0.00092
30_29	V1 Snelshall Street	6.0	43.3	5248.6	0.01107	0.00168	0.00094
33_34	Little Horwood Road	10.6	44.6	352.7	0.03162	0.00477	0.00266
34_33	Little Horwood Road	10.1	43.2	351.9	0.03027	0.00449	0.00251
35_36	Warren Road	10.5	39.5	561.5	0.00763	0.00104	0.00061
36_35	Warren Road	8.7	37.3	921.5	0.00712	0.00094	0.00055
37_38	A421	9.6	40.9	11824.9	0.03183	0.00615	0.00339
38_37	A421	7.6	37.6	11593.2	0.03193	0.00644	0.00354
39_40	A421	10.3	42.2	11481.0	0.01450	0.00265	0.00146
40_39	A421	9.8	46.0	11475.7	0.01541	0.00274	0.00151
43_44	Westbrook End	5.8	23.1	587.1	0.01201	0.00209	0.00116
44_43	Westbrook End	6.4	21.8	609.1	0.01236	0.00220	0.00122
45_46	Whaddon Road	7.5	24.3	2867.0	0.01442	0.00250	0.00139

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
46_45	Whaddon Road	7.6	23.0	3093.6	0.01606	0.00273	0.00151
47_48	Hayton Way	2.1	28.1	2755.0	0.01044	0.00160	0.00090
48_47	Hayton Way	3.3	28.7	2759.2	0.01141	0.00178	0.00099
49_50	Snelshall Street	7.2	43.6	6426.7	0.03023	0.00594	0.00327
50_49	Snelshall Street	5.0	43.4	6982.9	0.02723	0.00544	0.00299
51_52	Chaffron Way	5.6	35.6	7963.6	0.02140	0.00255	0.00145
52_51	Chaffron Way	6.2	34.5	6737.2	0.02186	0.00260	0.00147
57_58	Snelshall Street	7.9	42.0	5957.7	0.01556	0.00267	0.00148
58_57	Snelshall Street	7.7	39.6	6166.7	0.01485	0.00248	0.00137
59_60	Tattenhoe Street	5.8	39.2	5900.2	0.04856	0.00828	0.00453
60_59	Tattenhoe Street	5.9	37.1	6401.5	0.04346	0.00751	0.00410
61_62	Tattenhoe Lane	5.1	29.5	3808.7	0.02499	0.00403	0.00224
62_61	Tattenhoe Lane	7.9	29.7	3958.0	0.03928	0.00634	0.00352
63_64	Fulmer Street	6.1	37.7	6236.3	0.01667	0.00308	0.00170
64_63	Fulmer Street	8.6	33.9	5437.9	0.01690	0.00315	0.00174
65_66	Watling Street	7.1	43.9	7058.0	0.04849	0.00934	0.00513
66_65	Watling Street	9.4	42.4	6845.8	0.04311	0.00834	0.00459
67_68	Watling Street	4.5	33.7	9781.7	0.03493	0.00594	0.00325
68_67	Watling Street	10.6	30.9	13261.4	0.03648	0.00589	0.00323
69_70	Sherwood Drive	4.0	24.5	5636.4	0.05522	0.00949	0.00519
70_69	Sherwood Drive	4.7	22.9	6892.3	0.05566	0.00963	0.00527

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
71_72	Buckingham Road	8.5	26.9	10954.6	0.04717	0.00806	0.00441
72_71	Buckingham Road	6.3	25.9	11238.8	0.04848	0.00831	0.00454
73_74	Buckingham Road	6.1	25.4	7440.3	0.03380	0.00536	0.00294
74_73	Buckingham Road	6.7	26.2	7833.8	0.03283	0.00546	0.00299
79_80	Shenley Road	7.5	25.3	3686.0	0.00187	0.00026	0.00015
80_79	Shenley Road	9.4	27.6	3599.6	0.00199	0.00026	0.00015
81_82	Queensway	5.8	28.1	11127.4	0.00616	0.00078	0.00046
82_81	Queensway	6.5	26.8	10287.2	0.00582	0.00076	0.00045
83_84	Water Eaton Road	6.2	25.3	3886.4	0.03750	0.00481	0.00282
84_83	Water Eaton Road	8.3	26.7	3534.4	0.03723	0.00473	0.00277
89_90	Shenley Road	3.2	15.0	6211.9	0.03127	0.00383	0.00225
90_89	Shenley Road	7.2	16.0	5734.1	0.03120	0.00409	0.00239
91_92	Buckingham Road	12.6	112.0	16835.4	0.00181	0.00025	0.00014
92_91	Buckingham Road	13.1	112.0	15095.4	0.00190	0.00024	0.00014
93_94	Standing Way	12.9	112.0	19165.8	0.00768	0.00094	0.00055
94_93	Standing Way	13.2	112.0	19339.7	0.00653	0.00081	0.00047
95_96	V6 Grafton Street	9.7	112.0	11595.0	0.03000	0.00403	0.00236
96_95	V6 Grafton Street	11.6	112.0	11340.7	0.02883	0.00399	0.00233
97_98	Standing Way	12.7	112.0	16359.5	0.02637	0.00357	0.00209
98_97	Standing Way	12.8	112.0	16820.7	0.02539	0.00364	0.00212
99_100	V6 Grafton Street	12.5	112.0	12104.9	0.02024	0.00337	0.00187

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
100_99	V6 Grafton Street	10.4	112.0	12546.0	0.01752	0.00290	0.00161
101_102	A421	7.1	48.8	14120.6	0.01523	0.00281	0.00155
102_101	A421	7.7	54.3	14596.4	0.01614	0.00290	0.00160
103_104	A421	8.1	47.3	18671.0	0.00722	0.00107	0.00060
104_103	A421	10.9	43.9	19634.4	0.00737	0.00111	0.00062
105_106	A421	7.9	49.6	13399.6	0.01124	0.00203	0.00112
106_105	A421	8.0	52.4	12247.8	0.01231	0.00223	0.00123
107_108	A421	10.3	42.2	11481.1	0.01165	0.00169	0.00094
108_107	A421	9.8	46.0	11531.8	0.01081	0.00161	0.00090
13_15R	Roundabout between A421 and Whaddon Road	7.7	20.0	14821.3	0.05144	0.00673	0.00379
15_101R	Roundabout between A421 and Whaddon Road	8.5	20.0	15644.5	0.05537	0.00724	0.00407
13_101R	Roundabout between A421 and Whaddon Road	7.8	20.0	16741.8	0.05827	0.00762	0.00429
105_1R	Roundabout between A421, B4034 and Snelshall Street	7.6	20.0	19458.9	0.06742	0.00882	0.00497
1_101R	Roundabout between A421, B4034 and Snelshall Street	7.6	20.0	17990.3	0.06237	0.00816	0.00459
101_57R	Roundabout between A421, B4034 and Snelshall Street	7.5	20.0	20243.3	0.06989	0.00915	0.00515
57_105R	Roundabout between A421, B4034 and Snelshall Street	7.4	20.0	18688.6	0.06446	0.00844	0.00475
97_99R	Roundabout between A421 and Grafton Street	12.2	20.0	29984.3	0.11590	0.01507	0.00845
99_93R	Roundabout between A421 and Grafton Street	12.0	20.0	28748.9	0.11066	0.01439	0.00807
95_97R	Roundabout between A421 and Grafton Street	12.2	20.0	29575.3	0.11425	0.01486	0.00833
93_95R	Roundabout between A421 and Grafton Street	12.3	20.0	30982.2	0.12014	0.01562	0.00876

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
24_25R	Roundabout between A421, B4033 and Winslow Road	11.0	20.0	12005.7	0.04621	0.00444	0.00266
21_23R	Roundabout between A421, B4033 and Winslow Road	10.2	20.0	12131.7	0.04601	0.00440	0.00263
25_107R	Roundabout between A421, B4033 and Winslow Road	11.0	20.0	11535.4	0.04444	0.00427	0.00256
107_21R	Roundabout between A421, B4033 and Winslow Road	10.2	20.0	13588.7	0.05152	0.00493	0.00295
15_17R	Roundabout between A421, Coddimoor Lane and Whaddon Road	8.3	20.0	16212.5	0.05935	0.00561	0.00336
27_15R	Roundabout between A421, Coddimoor Lane and Whaddon Road	8.4	20.0	13257.9	0.04861	0.00460	0.00275
37_27R	Roundabout between A421, Coddimoor Lane and Whaddon Road	8.4	20.0	13815.0	0.05066	0.00479	0.00287
17_37R	Roundabout between A421, Coddimoor Lane and Whaddon Road	8.4	20.0	14628.1	0.05368	0.00508	0.00304
65_93R	Roundabout between A421 and Watling Street	9.5	20.0	27465.8	0.09972	0.01302	0.00731
93_66R	Roundabout between A421 and Watling Street	11.0	20.0	29373.1	0.11052	0.01439	0.00808
66_103R	Roundabout between A421 and Watling Street	10.7	20.0	27545.7	0.10281	0.01340	0.00752
103_65R	Roundabout between A421 and Watling Street	9.7	20.0	29366.3	0.10705	0.01397	0.00785
89_91R	Roundabout between A421, Fulmer Street and Shenley Road	9.2	20.0	23274.9	0.08386	0.01095	0.00615
91_63R	Roundabout between A421, Fulmer Street and Shenley Road	10.5	20.0	23634.9	0.08793	0.01146	0.00643
63_103R	Roundabout between A421, Fulmer Street and Shenley Road	10.5	20.0	21586.0	0.08023	0.01046	0.00587
103_89R	Roundabout between A421, Fulmer Street and Shenley Road	9.1	20.0	25349.0	0.09117	0.01191	0.00669
61_105R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	10.7	20.0	19550.5	0.07306	0.00952	0.00534
91_61R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	10.9	20.0	21026.0	0.07885	0.01027	0.00577
59_91R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	7.9	20.0	17715.2	0.06177	0.00808	0.00455
105_59R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	8.4	20.0	19577.9	0.06923	0.00905	0.00509

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
29_51R	Roundabout between V1 Snelshall Street and Hayton Way	5.6	20.0	10296.2	0.03382	0.00444	0.00250
51_49R	Roundabout between V1 Snelshall Street and Hayton Way	5.5	20.0	11134.8	0.03654	0.00480	0.00270
47_29R	Roundabout between V1 Snelshall Street and Hayton Way	5.6	20.0	10779.8	0.03548	0.00466	0.00263
49_47R	Roundabout between V1 Snelshall Street and Hayton Way	5.5	20.0	11467.6	0.03765	0.00495	0.00279
13_14Q	Whaddon Road	10.2	20.0	2966.6	0.00282	0.00027	0.00016
14_13Q	Whaddon Road	8.0	20.0	2832.2	0.00285	0.00027	0.00016
101_102Q	A421 Standing Way	7.1	20.0	14120.6	0.01126	0.00108	0.00065
102_101Q	A421 Standing Way	7.7	20.0	14596.4	0.01032	0.00097	0.00058
106_105Q	A421 Standing Way	8.0	20.0	12247.8	0.04829	0.00633	0.00356
105_106Q	A421 Standing Way	7.9	20.0	13399.6	0.05073	0.00664	0.00373
95_96Q	V6 Grafton Street	9.7	20.0	11595.0	0.04286	0.00561	0.00315
96_95Q	V6 Grafton Street	11.6	20.0	11340.7	0.04674	0.00612	0.00344
101_102QQ	A421 Standing Way	7.1	20.0	14120.6	0.04228	0.00552	0.00310
102_101QQ	A421 Standing Way	7.7	20.0	14596.4	0.04324	0.00563	0.00316
107_108Q	A421 Standing Way	10.3	20.0	11481.1	0.04829	0.00633	0.00356
108_107Q	A421 Standing Way	9.8	20.0	11531.8	0.05073	0.00664	0.00373
25_26Q	Winslow Road	9.9	20.0	706.7	0.04363	0.00418	0.00250
26_25Q	Winslow Road	8.8	20.0	715.4	0.04344	0.00415	0.00248
21_22Q	Nash Road	9.9	20.0	2693.0	0.00267	0.00025	0.00015
22_21Q	Nash Road	9.2	20.0	2353.5	0.00265	0.00025	0.00015

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
23_24Q	A421	11.6	20.0	9848.9	0.01016	0.00097	0.00058
24_23Q	A421	11.2	20.0	10151.0	0.00876	0.00083	0.00050
17_18Q	Whaddon Road	6.0	20.0	2491.3	0.03831	0.00370	0.00221
18_17Q	Whaddon Road	6.9	20.0	2374.9	0.03925	0.00378	0.00226
27_28Q	Coddimoor Lane	8.9	20.0	762.2	0.00872	0.00081	0.00049
28_27Q	Coddimoor Lane	7.1	20.0	796.4	0.00847	0.00079	0.00048
37_38Q	A421	9.6	20.0	11824.9	0.04435	0.00423	0.00253
38_37Q	A421	7.6	20.0	11593.2	0.04192	0.00394	0.00236
15_16QQ	A421	8.8	20.0	14157.3	0.05237	0.00497	0.00297
16_15QQ	A421	8.1	20.0	14214.8	0.05184	0.00489	0.00293
16_15Q	A421	8.1	20.0	14214.8	0.05184	0.00489	0.00293
15_16Q	A421	8.8	20.0	14157.3	0.05237	0.00497	0.00297
57_58Q	Snelshall Street	7.9	20.0	5957.7	0.02077	0.00272	0.00153
58_57Q	Snelshall Street	7.7	20.0	6166.7	0.02143	0.00280	0.00158
1_2Q	Buckingham Road	6.3	20.0	4868.8	0.01631	0.00214	0.00120
2_1Q	Buckingham Road	6.7	20.0	5069.2	0.01716	0.00225	0.00127
49_50Q	Snelshall Street	7.2	20.0	6426.7	0.02201	0.00288	0.00162
50_49Q	Snelshall Street	5.0	20.0	6982.9	0.02259	0.00297	0.00167
51_52Q	Chaffron Way	5.6	20.0	7963.6	0.02617	0.00344	0.00194
52_51Q	Chaffron Way	6.2	20.0	6737.2	0.02248	0.00295	0.00166
29_30Q	V1 Snelshall Street	6.1	20.0	4752.4	0.01583	0.00208	0.00117

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
30_29Q	V1 Snelshall Street	6.0	20.0	5248.6	0.01745	0.00229	0.00129
47_48Q	Hayton Way	2.1	20.0	2755.0	0.00820	0.00108	0.00061
48_47Q	Hayton Way	3.3	20.0	2759.2	0.00852	0.00112	0.00063
92_91Q	Buckingham Road	13.1	20.0	15095.4	0.05961	0.00774	0.00434
91_92Q	Buckingham Road	12.6	20.0	16835.4	0.06566	0.00853	0.00479
61_62Q	Tattenhoe Lane	5.1	20.0	3808.7	0.01237	0.00163	0.00092
62_61Q	Tattenhoe Lane	7.9	20.0	3958.0	0.01383	0.00181	0.00102
59_60Q	Tattenhoe Street	5.8	20.0	5900.2	0.01950	0.00256	0.00144
60_59Q	Tattenhoe Street	5.9	20.0	6401.5	0.02123	0.00279	0.00157
106_105QQ	A421 Standing Way	8.0	20.0	12247.8	0.04286	0.00561	0.00315
105_106QQ	A421 Standing Way	7.9	20.0	13399.6	0.04674	0.00612	0.00344
92_91QQ	Buckingham Road	13.1	20.0	15095.4	0.05961	0.00774	0.00434
91_92QQ	Buckingham Road	12.6	20.0	16835.4	0.06566	0.00853	0.00479
89_90Q	Shenley Road	3.2	20.0	6211.9	0.01910	0.00252	0.00142
90_89Q	Shenley Road	7.2	20.0	5734.1	0.01968	0.00258	0.00145
63_64Q	Fulmer Street	6.1	20.0	6236.3	0.02077	0.00273	0.00154
64_63Q	Fulmer Street	8.6	20.0	5437.9	0.01932	0.00252	0.00142
103_104Q	A421 Standing Way	8.1	20.0	18671.0	0.06553	0.00857	0.00482
104_103Q	A421 Standing Way	10.9	20.0	19634.4	0.07366	0.00960	0.00539
103_104QQ	A421 Standing Way	8.1	20.0	18671.0	0.06553	0.00857	0.00482
104_103QQ	A421 Standing Way	10.9	20.0	19634.4	0.07366	0.00960	0.00539

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
67_68Q	Watling Street	4.5	20.0	9781.7	0.03119	0.00410	0.00232
68_67Q	Watling Street	10.6	20.0	13261.4	0.04945	0.00644	0.00362
94_93Q	Standing Way	13.2	20.0	19339.7	0.07649	0.00993	0.00557
93_94Q	Standing Way	12.9	20.0	19165.8	0.07533	0.00979	0.00549
65_66Q	Watling Street	7.1	20.0	7058.0	0.02415	0.00316	0.00178
66_65Q	Watling Street	9.4	20.0	6845.8	0.02477	0.00323	0.00182
99_100Q	V6 Grafton Street	12.5	20.0	12104.9	0.04708	0.00612	0.00343
100_99Q	V6 Grafton Street	10.4	20.0	12546.0	0.04651	0.00606	0.00340
94_93QQ	Standing Way	13.2	20.0	19339.7	0.07649	0.00993	0.00557
93_94QQ	Standing Way	12.9	20.0	19165.8	0.07533	0.00979	0.00549
97_98Q	Standing Way	12.7	20.0	16359.5	0.06398	0.00831	0.00466
98_97Q	Standing Way	12.8	20.0	16820.7	0.06593	0.00857	0.00480

Table 11.4.3 – 2026 With Development Traffic Flows and Emission Rates

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
1_2	Buckingham Road	4.9	39.0	6305.9	0.01585	0.00236	0.00132
2_1	Buckingham Road	4.2	40.5	8153.1	0.01723	0.00263	0.00147
3_4	Buckingham Road	5.6	27.3	5527.2	0.00547	0.00065	0.00038
4_3	Buckingham Road	6.9	28.5	5967.0	0.00581	0.00069	0.00040
5_6	Bletchley Road	6.2	36.7	2031.6	0.00930	0.00106	0.00063
6_5	Bletchley Road	7.0	35.6	2113.8	0.01007	0.00109	0.00064
7_8	Stoke Road	7.3	32.0	3211.4	0.00465	0.00050	0.00030
8_7	Stoke Road	7.7	27.9	3243.3	0.00433	0.00045	0.00027
9_10	Drayton Road	8.0	27.1	1472.9	0.00827	0.00107	0.00063
10_9	Drayton Road	5.8	26.5	1400.1	0.00887	0.00109	0.00064
11_12	Whaddon Road	8.6	41.4	3174.9	0.00145	0.00019	0.00011
12_11	Whaddon Road	7.1	38.4	3336.3	0.00110	0.00014	0.00008
13_14	Whaddon Road	7.5	43.5	4047.4	0.00090	0.00012	0.00007
14_13	Whaddon Road	7.1	44.3	3217.7	0.00091	0.00012	0.00007
15_16	A421	8.5	40.0	14622.5	0.00152	0.00020	0.00012
16_15	A421	7.8	40.4	14689.1	0.00252	0.00031	0.00018
17_18	Whaddon Road	5.6	44.5	2645.3	0.03075	0.00412	0.00240
18_17	Whaddon Road	6.5	46.1	2532.4	0.02943	0.00406	0.00237
19_20	Unnamed Road Adjacent to A421 and Warren Road	12.5	36.3	504.2	0.00193	0.00019	0.00011
20_19	Unnamed Road Adjacent to A421 and Warren Road	11.2	35.1	379.8	0.00207	0.00020	0.00012

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
21_22	Nash Road	9.7	35.1	2755.6	0.01032	0.00104	0.00062
22_21	Nash Road	8.9	36.5	2417.2	0.01134	0.00112	0.00067
23_24	A421	11.3	41.0	10097.4	0.01635	0.00232	0.00130
24_23	A421	11.0	46.9	10404.1	0.02094	0.00290	0.00163
25_26	Winslow Road	9.9	43.7	706.7	0.03568	0.00533	0.00297
26_25	Winslow Road	8.8	39.8	715.4	0.03563	0.00520	0.00291
27_28	Coddimoor Lane	8.9	47.1	762.2	0.02375	0.00344	0.00192
28_27	Coddimoor Lane	7.1	44.0	796.4	0.02487	0.00365	0.00204
29_30	V1 Snelshall Street	5.2	42.5	5500.8	0.01136	0.00165	0.00092
30_29	V1 Snelshall Street	5.3	43.3	5983.4	0.01107	0.00168	0.00094
33_34	Little Horwood Road	10.6	44.6	352.7	0.03162	0.00477	0.00266
34_33	Little Horwood Road	10.1	43.2	351.9	0.03027	0.00449	0.00251
35_36	Warren Road	10.5	39.5	561.5	0.01021	0.00132	0.00078
36_35	Warren Road	8.7	37.3	921.5	0.00803	0.00104	0.00061
37_38	A421	9.3	40.9	12136.1	0.03360	0.00646	0.00356
38_37	A421	7.4	37.6	11910.0	0.03691	0.00732	0.00403
39_40	A421	10.0	42.2	11792.2	0.01647	0.00298	0.00165
40_39	A421	9.5	46.0	11792.5	0.01731	0.00305	0.00169
43_44	Westbrook End	5.8	23.1	587.1	0.01523	0.00262	0.00145
44_43	Westbrook End	6.4	21.8	609.1	0.01919	0.00332	0.00184
45_46	Whaddon Road	6.8	24.3	3168.6	0.01461	0.00253	0.00140

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
46_45	Whaddon Road	6.9	23.0	3389.4	0.01626	0.00276	0.00153
47_48	Hayton Way	2.1	28.1	2755.0	0.01063	0.00163	0.00091
48_47	Hayton Way	3.3	28.7	2759.2	0.01160	0.00181	0.00101
49_50	Snelshall Street	6.4	43.6	7197.7	0.03610	0.00697	0.00384
50_49	Snelshall Street	4.5	43.4	7740.6	0.03295	0.00645	0.00355
51_52	Chaffron Way	5.6	35.6	7963.6	0.02172	0.00259	0.00147
52_51	Chaffron Way	6.2	34.5	6737.2	0.02217	0.00264	0.00150
57_58	Snelshall Street	6.8	42.0	6860.3	0.01568	0.00269	0.00149
58_57	Snelshall Street	6.8	39.6	7018.1	0.01497	0.00250	0.00138
59_60	Tattenhoe Street	5.7	39.2	5985.1	0.05659	0.00924	0.00507
60_59	Tattenhoe Street	5.8	37.1	6485.0	0.05133	0.00846	0.00463
61_62	Tattenhoe Lane	5.0	29.5	3886.7	0.02502	0.00404	0.00225
62_61	Tattenhoe Lane	7.8	29.7	4035.7	0.03931	0.00635	0.00352
63_64	Fulmer Street	6.0	37.7	6289.3	0.01667	0.00308	0.00170
64_63	Fulmer Street	8.5	33.9	5490.6	0.01690	0.00315	0.00174
65_66	Watling Street	7.1	43.9	7058.0	0.05379	0.01024	0.00563
66_65	Watling Street	9.4	42.4	6845.8	0.04840	0.00924	0.00509
67_68	Watling Street	4.5	33.7	9794.0	0.03578	0.00604	0.00330
68_67	Watling Street	10.6	30.9	13273.7	0.03734	0.00599	0.00329
69_70	Sherwood Drive	4.0	24.5	5636.4	0.06274	0.01040	0.00569
70_69	Sherwood Drive	4.6	22.9	6915.0	0.06303	0.01052	0.00576

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
71_72	Buckingham Road	7.9	26.9	11801.3	0.05163	0.00860	0.00471
72_71	Buckingham Road	5.9	25.9	12067.6	0.05286	0.00883	0.00484
73_74	Buckingham Road	5.7	25.4	8015.2	0.03600	0.00562	0.00309
74_73	Buckingham Road	6.2	26.2	8411.3	0.03499	0.00572	0.00313
79_80	Shenley Road	7.5	25.3	3686.0	0.00187	0.00026	0.00015
80_79	Shenley Road	9.4	27.6	3599.6	0.00199	0.00026	0.00015
81_82	Queensway	5.8	28.1	11127.4	0.00652	0.00082	0.00048
82_81	Queensway	6.5	26.8	10287.2	0.00619	0.00080	0.00047
83_84	Water Eaton Road	6.2	25.3	3886.4	0.03864	0.00493	0.00289
84_83	Water Eaton Road	8.3	26.7	3534.4	0.03839	0.00486	0.00285
89_90	Shenley Road	3.1	15.0	6314.7	0.03206	0.00391	0.00230
90_89	Shenley Road	7.1	16.0	5835.3	0.03195	0.00417	0.00244
91_92	Buckingham Road	10.9	112.0	19497.2	0.00181	0.00025	0.00014
92_91	Buckingham Road	11.2	112.0	17705.7	0.00190	0.00024	0.00014
93_94	Standing Way	11.4	112.0	21659.5	0.00784	0.00096	0.00056
94_93	Standing Way	11.7	112.0	21783.9	0.00669	0.00083	0.00048
95_96	V6 Grafton Street	9.1	112.0	12326.2	0.03075	0.00412	0.00240
96_95	V6 Grafton Street	10.9	112.0	12055.1	0.02957	0.00408	0.00238
97_98	Standing Way	11.6	112.0	17837.2	0.02697	0.00364	0.00213
98_97	Standing Way	11.8	112.0	18270.9	0.02598	0.00370	0.00216
99_100	V6 Grafton Street	12.2	112.0	12384.4	0.02024	0.00337	0.00187

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
100_99	V6 Grafton Street	10.1	112.0	12830.7	0.01752	0.00290	0.00161
101_102	A421	6.7	48.8	14972.1	0.01690	0.00309	0.00171
102_101	A421	6.6	54.3	17027.4	0.01778	0.00317	0.00176
103_104	A421	7.2	47.3	21177.0	0.00722	0.00107	0.00060
104_103	A421	9.7	43.9	22090.8	0.00737	0.00111	0.00062
105_106	A421	6.5	49.6	16224.4	0.01288	0.00230	0.00127
106_105	A421	6.5	52.4	15019.4	0.01390	0.00250	0.00138
107_108	A421	10.0	42.2	11792.2	0.01165	0.00169	0.00094
108_107	A421	9.5	46.0	11848.6	0.01081	0.00161	0.00090
13_15R	Roundabout between A421 and Whaddon Road	6.9	20.0	16454.4	0.05601	0.00734	0.00413
15_101R	Roundabout between A421 and Whaddon Road	8.0	20.0	16551.8	0.05791	0.00757	0.00426
13_101R	Roundabout between A421 and Whaddon Road	7.0	20.0	18711.5	0.06378	0.00836	0.00470
105_1R	Roundabout between A421, B4034 and Snelshall Street	6.3	20.0	23653.6	0.07915	0.01038	0.00585
1_101R	Roundabout between A421, B4034 and Snelshall Street	6.3	20.0	21965.5	0.07349	0.00964	0.00543
101_57R	Roundabout between A421, B4034 and Snelshall Street	6.3	20.0	23822.9	0.07991	0.01048	0.00590
57_105R	Roundabout between A421, B4034 and Snelshall Street	6.3	20.0	22140.9	0.07412	0.00972	0.00548
97_99R	Roundabout between A421 and Grafton Street	11.3	20.0	32433.9	0.12275	0.01598	0.00897
99_93R	Roundabout between A421 and Grafton Street	11.2	20.0	30823.8	0.11647	0.01517	0.00851
95_97R	Roundabout between A421 and Grafton Street	11.2	20.0	32113.0	0.12135	0.01580	0.00887
93_95R	Roundabout between A421 and Grafton Street	11.3	20.0	33790.5	0.12799	0.01666	0.00935

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
24_25R	Roundabout between A421, B4033 and Winslow Road	10.7	20.0	12293.8	0.04710	0.00452	0.00270
21_23R	Roundabout between A421, B4033 and Winslow Road	9.9	20.0	12445.9	0.04698	0.00449	0.00269
25_107R	Roundabout between A421, B4033 and Winslow Road	10.8	20.0	11821.6	0.04532	0.00435	0.00260
107_21R	Roundabout between A421, B4033 and Winslow Road	9.9	20.0	13944.3	0.05262	0.00502	0.00301
15_17R	Roundabout between A421, Coddimoor Lane and Whaddon Road	8.0	20.0	16771.8	0.06107	0.00576	0.00345
27_15R	Roundabout between A421, Coddimoor Lane and Whaddon Road	8.1	20.0	13664.3	0.04987	0.00471	0.00282
37_27R	Roundabout between A421, Coddimoor Lane and Whaddon Road	8.1	20.0	14220.4	0.05191	0.00490	0.00294
17_37R	Roundabout between A421, Coddimoor Lane and Whaddon Road	8.1	20.0	15099.6	0.05514	0.00520	0.00312
65_93R	Roundabout between A421 and Watling Street	8.7	20.0	29825.4	0.10632	0.01389	0.00781
93_66R	Roundabout between A421 and Watling Street	10.1	20.0	32128.3	0.11823	0.01542	0.00866
66_103R	Roundabout between A421 and Watling Street	9.9	20.0	29750.8	0.10898	0.01422	0.00799
103_65R	Roundabout between A421 and Watling Street	8.9	20.0	31971.7	0.11434	0.01494	0.00840
89_91R	Roundabout between A421, Fulmer Street and Shenley Road	8.3	20.0	25775.1	0.09086	0.01188	0.00668
91_63R	Roundabout between A421, Fulmer Street and Shenley Road	9.4	20.0	26395.3	0.09565	0.01249	0.00702
63_103R	Roundabout between A421, Fulmer Street and Shenley Road	9.4	20.0	24079.9	0.08721	0.01138	0.00640
103_89R	Roundabout between A421, Fulmer Street and Shenley Road	8.2	20.0	28135.7	0.09896	0.01294	0.00728
61_105R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	9.4	20.0	22259.6	0.08064	0.01053	0.00591
91_61R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	9.5	20.0	23948.0	0.08703	0.01136	0.00638
59_91R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	6.9	20.0	20295.8	0.06899	0.00904	0.00509
105_59R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	7.3	20.0	22545.8	0.07753	0.01015	0.00571

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
29_51R	Roundabout between V1 Snelshall Street and Hayton Way	5.1	20.0	11193.1	0.03633	0.00477	0.00269
51_49R	Roundabout between V1 Snelshall Street and Hayton Way	5.3	20.0	11692.7	0.03810	0.00501	0.00282
47_29R	Roundabout between V1 Snelshall Street and Hayton Way	5.2	20.0	11570.1	0.03769	0.00495	0.00279
49_47R	Roundabout between V1 Snelshall Street and Hayton Way	5.2	20.0	12282.2	0.03993	0.00525	0.00296
13_14Q	Whaddon Road	7.5	20.0	4047.4	0.00282	0.00027	0.00016
14_13Q	Whaddon Road	7.1	20.0	3217.7	0.00285	0.00027	0.00016
101_102Q	A421 Standing Way	6.7	20.0	14972.1	0.01460	0.00137	0.00082
102_101Q	A421 Standing Way	6.6	20.0	17027.4	0.01151	0.00108	0.00065
106_105Q	A421 Standing Way	6.5	20.0	15019.4	0.05067	0.00664	0.00374
105_106Q	A421 Standing Way	6.5	20.0	16224.4	0.05753	0.00754	0.00425
95_96Q	V6 Grafton Street	9.1	20.0	12326.2	0.05061	0.00664	0.00374
96_95Q	V6 Grafton Street	10.9	20.0	12055.1	0.05465	0.00717	0.00404
101_102QQ	A421 Standing Way	6.7	20.0	14972.1	0.04433	0.00579	0.00325
102_101QQ	A421 Standing Way	6.6	20.0	17027.4	0.04523	0.00589	0.00331
107_108Q	A421 Standing Way	10.0	20.0	11792.2	0.05067	0.00664	0.00374
108_107Q	A421 Standing Way	9.5	20.0	11848.6	0.05753	0.00754	0.00425
25_26Q	Winslow Road	9.9	20.0	706.7	0.04459	0.00426	0.00255
26_25Q	Winslow Road	8.8	20.0	715.4	0.04442	0.00423	0.00253
21_22Q	Nash Road	9.7	20.0	2755.6	0.00267	0.00025	0.00015
22_21Q	Nash Road	8.9	20.0	2417.2	0.00265	0.00025	0.00015

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
23_24Q	A421	11.3	20.0	10097.4	0.01036	0.00099	0.00059
24_23Q	A421	11.0	20.0	10404.1	0.00896	0.00085	0.00051
17_18Q	Whaddon Road	5.6	20.0	2645.3	0.03908	0.00376	0.00225
18_17Q	Whaddon Road	6.5	20.0	2532.4	0.04003	0.00385	0.00230
27_28Q	Coddimoor Lane	8.9	20.0	762.2	0.00920	0.00085	0.00051
28_27Q	Coddimoor Lane	7.1	20.0	796.4	0.00895	0.00083	0.00050
37_38Q	A421	9.3	20.0	12136.1	0.04531	0.00431	0.00258
38_37Q	A421	7.4	20.0	11910.0	0.04290	0.00403	0.00242
15_16QQ	A421	8.5	20.0	14622.5	0.05381	0.00509	0.00305
16_15QQ	A421	7.8	20.0	14689.1	0.05331	0.00502	0.00301
16_15Q	A421	7.8	20.0	14689.1	0.05331	0.00502	0.00301
15_16Q	A421	8.5	20.0	14622.5	0.05381	0.00509	0.00305
57_58Q	Snelshall Street	6.8	20.0	6860.3	0.02330	0.00305	0.00172
58_57Q	Snelshall Street	6.8	20.0	7018.1	0.02381	0.00312	0.00176
1_2Q	Buckingham Road	4.9	20.0	6305.9	0.02033	0.00267	0.00151
2_1Q	Buckingham Road	4.2	20.0	8153.1	0.02579	0.00340	0.00192
49_50Q	Snelshall Street	6.4	20.0	7197.7	0.02417	0.00317	0.00179
50_49Q	Snelshall Street	4.5	20.0	7740.6	0.02471	0.00325	0.00183
51_52Q	Chaffron Way	5.6	20.0	7963.6	0.02617	0.00344	0.00194
52_51Q	Chaffron Way	6.2	20.0	6737.2	0.02248	0.00295	0.00166
29_30Q	V1 Snelshall Street	5.2	20.0	5500.8	0.01792	0.00235	0.00133

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
30_29Q	V1 Snelshall Street	5.3	20.0	5983.4	0.01951	0.00256	0.00145
47_48Q	Hayton Way	2.1	20.0	2755.0	0.00820	0.00108	0.00061
48_47Q	Hayton Way	3.3	20.0	2759.2	0.00852	0.00112	0.00063
92_91Q	Buckingham Road	11.2	20.0	17705.7	0.06691	0.00871	0.00489
91_92Q	Buckingham Road	10.9	20.0	19497.2	0.07310	0.00952	0.00535
61_62Q	Tattenhoe Lane	5.0	20.0	3886.7	0.01259	0.00166	0.00093
62_61Q	Tattenhoe Lane	7.8	20.0	4035.7	0.01405	0.00184	0.00103
59_60Q	Tattenhoe Street	5.7	20.0	5985.1	0.01973	0.00259	0.00146
60_59Q	Tattenhoe Street	5.8	20.0	6485.0	0.02146	0.00282	0.00159
106_105QQ	A421 Standing Way	6.5	20.0	15019.4	0.05061	0.00664	0.00374
105_106QQ	A421 Standing Way	6.5	20.0	16224.4	0.05465	0.00717	0.00404
92_91QQ	Buckingham Road	11.2	20.0	17705.7	0.06691	0.00871	0.00489
91_92QQ	Buckingham Road	10.9	20.0	19497.2	0.07310	0.00952	0.00535
89_90Q	Shenley Road	3.1	20.0	6314.7	0.01938	0.00256	0.00144
90_89Q	Shenley Road	7.1	20.0	5835.3	0.01996	0.00261	0.00147
63_64Q	Fulmer Street	6.0	20.0	6289.3	0.02092	0.00274	0.00155
64_63Q	Fulmer Street	8.5	20.0	5490.6	0.01947	0.00254	0.00143
103_104Q	A421 Standing Way	7.2	20.0	21177.0	0.07254	0.00950	0.00535
104_103Q	A421 Standing Way	9.7	20.0	22090.8	0.08053	0.01051	0.00590
103_104QQ	A421 Standing Way	7.2	20.0	21177.0	0.07254	0.00950	0.00535
104_103QQ	A421 Standing Way	9.7	20.0	22090.8	0.08053	0.01051	0.00590

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
67_68Q	Watling Street	4.5	20.0	9794.0	0.03122	0.00411	0.00232
68_67Q	Watling Street	10.6	20.0	13273.7	0.04949	0.00645	0.00362
94_93Q	Standing Way	11.7	20.0	21783.9	0.08333	0.01084	0.00608
93_94Q	Standing Way	11.4	20.0	21659.5	0.08230	0.01071	0.00601
65_66Q	Watling Street	7.1	20.0	7058.0	0.02415	0.00316	0.00178
66_65Q	Watling Street	9.4	20.0	6845.8	0.02477	0.00323	0.00182
99_100Q	V6 Grafton Street	12.2	20.0	12384.4	0.04787	0.00622	0.00349
100_99Q	V6 Grafton Street	10.1	20.0	12830.7	0.04731	0.00617	0.00346
94_93QQ	Standing Way	11.7	20.0	21783.9	0.08333	0.01084	0.00608
93_94QQ	Standing Way	11.4	20.0	21659.5	0.08230	0.01071	0.00601
97_98Q	Standing Way	11.6	20.0	17837.2	0.06811	0.00886	0.00497
98_97Q	Standing Way	11.8	20.0	18270.9	0.06998	0.00911	0.00511

Table 11.4.4 – 2033 Without Development Traffic Flows and Emission Rates

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
1_2	Buckingham Road	5.9	39.0	5182.3	0.01447	0.00216	0.00121
2_1	Buckingham Road	6.3	40.5	5394.8	0.01599	0.00245	0.00136
3_4	Buckingham Road	6.2	27.3	4982.2	0.00582	0.00068	0.00040
4_3	Buckingham Road	7.6	28.5	5468.1	0.00615	0.00072	0.00043
5_6	Bletchley Road	5.8	36.7	2169.4	0.00942	0.00107	0.00063
6_5	Bletchley Road	6.5	35.6	2246.2	0.01020	0.00110	0.00065
7_8	Stoke Road	7.2	32.0	3254.9	0.00470	0.00050	0.00030
8_7	Stoke Road	7.6	27.9	3292.7	0.00437	0.00045	0.00027
9_10	Drayton Road	7.9	27.1	1491.8	0.00798	0.00104	0.00061
10_9	Drayton Road	5.8	26.5	1413.4	0.00861	0.00106	0.00062
11_12	Whaddon Road	9	41.4	3054.9	0.00153	0.00020	0.00011
12_11	Whaddon Road	7.3	38.4	3232.4	0.00116	0.00014	0.00008
13_14	Whaddon Road	9.4	43.5	3231.6	0.00095	0.00013	0.00008
14_13	Whaddon Road	7.4	44.3	3090.3	0.00096	0.00013	0.00008
15_16	A421	8.3	40.0	15014.8	0.00160	0.00021	0.00012
16_15	A421	7.6	40.4	15078.6	0.00266	0.00033	0.00019
17_18	Whaddon Road	5.6	44.5	2647.6	0.03172	0.00422	0.00247
18_17	Whaddon Road	6.5	46.1	2524.1	0.03036	0.00416	0.00243
19_20	Unnamed Road Adjacent to A421 and Warren Road	11.8	36.3	535.4	0.00203	0.00020	0.00012
20_19	Unnamed Road Adjacent to A421 and Warren Road	10.5	35.1	403.4	0.00218	0.00021	0.00013

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
21_22	Nash Road	9.3	35.1	2859.9	0.00997	0.00101	0.00060
22_21	Nash Road	8.6	36.5	2504	0.01105	0.00110	0.00065
23_24	A421	10.9	41.0	10463.2	0.01727	0.00245	0.00138
24_23	A421	10.6	46.9	10784.1	0.02244	0.00311	0.00175
25_26	Winslow Road	9.3	43.7	750.5	0.03529	0.00528	0.00294
26_25	Winslow Road	8.3	39.8	759.8	0.03532	0.00515	0.00288
27_28	Coddimoor Lane	8.4	47.1	809.4	0.02347	0.00340	0.00190
28_27	Coddimoor Lane	6.7	44.0	845.8	0.02465	0.00362	0.00202
29_30	V1 Snelshall Street	5.7	42.5	5081.8	0.01196	0.00174	0.00097
30_29	V1 Snelshall Street	5.6	43.3	5609.8	0.01163	0.00176	0.00098
33_34	Little Horwood Road	10	44.6	374.6	0.03335	0.00503	0.00281
34_33	Little Horwood Road	9.5	43.2	373.7	0.03190	0.00473	0.00264
35_36	Warren Road	9.9	39.5	596.3	0.00827	0.00111	0.00065
36_35	Warren Road	8.2	37.3	978.7	0.00773	0.00101	0.00059
37_38	A421	9	40.9	12562.1	0.03364	0.00647	0.00356
38_37	A421	7.2	37.6	12316.1	0.03378	0.00677	0.00372
39_40	A421	9.7	42.2	12196.9	0.01542	0.00281	0.00155
40_39	A421	9.2	46.0	12191.3	0.01639	0.00290	0.00160
43_44	Westbrook End	5.5	23.1	623.6	0.01271	0.00221	0.00122
44_43	Westbrook End	6	21.8	646.9	0.01308	0.00232	0.00128
45_46	Whaddon Road	7	24.3	3048.3	0.01527	0.00264	0.00146

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
46_45	Whaddon Road	7.2	23.0	3288.9	0.01700	0.00288	0.00160
47_48	Hayton Way	1.8	28.1	3183.4	0.01102	0.00169	0.00094
48_47	Hayton Way	2.9	28.7	3183.1	0.01201	0.00187	0.00104
49_50	Snelshall Street	6.7	43.6	6887.3	0.03194	0.00624	0.00343
50_49	Snelshall Street	4.6	43.4	7479.2	0.02879	0.00572	0.00314
51_52	Chaffron Way	5.1	35.6	8613.9	0.02258	0.00269	0.00153
52_51	Chaffron Way	5.7	34.5	7308.6	0.02292	0.00273	0.00155
57_58	Snelshall Street	7.3	42.0	6381.7	0.01644	0.00281	0.00156
58_57	Snelshall Street	7.2	39.6	6606.5	0.01564	0.00260	0.00144
59_60	Tattenhoe Street	5.4	39.2	6281	0.05174	0.00866	0.00474
60_59	Tattenhoe Street	5.6	37.1	6813.7	0.04633	0.00785	0.00430
61_62	Tattenhoe Lane	4.8	29.5	4044.1	0.02642	0.00426	0.00237
62_61	Tattenhoe Lane	7.5	29.7	4202.7	0.04127	0.00664	0.00368
63_64	Fulmer Street	5.7	37.7	6621.9	0.01761	0.00324	0.00179
64_63	Fulmer Street	8.1	33.9	5774	0.01781	0.00331	0.00182
65_66	Watling Street	6.7	43.9	7490.9	0.05114	0.00979	0.00538
66_65	Watling Street	8.8	42.4	7265.5	0.04558	0.00876	0.00482
67_68	Watling Street	4.2	33.7	10388.5	0.03721	0.00621	0.00340
68_67	Watling Street	10	30.9	14084.1	0.03884	0.00617	0.00339
69_70	Sherwood Drive	3.8	24.5	5986.1	0.05882	0.00992	0.00543
70_69	Sherwood Drive	4.3	22.9	7476.1	0.05933	0.01007	0.00551

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
71_72	Buckingham Road	8	26.9	11645.5	0.05023	0.00843	0.00462
72_71	Buckingham Road	5.9	25.9	11947.1	0.05163	0.00869	0.00475
73_74	Buckingham Road	5.8	25.4	7908.4	0.03597	0.00562	0.00309
74_73	Buckingham Road	6.3	26.2	8326.3	0.03495	0.00572	0.00313
79_80	Shenley Road	7	25.3	3914.7	0.00198	0.00027	0.00016
80_79	Shenley Road	8.9	27.6	3822.9	0.00211	0.00027	0.00016
81_82	Queensway	5.5	28.1	11817.7	0.00652	0.00082	0.00048
82_81	Queensway	6.1	26.8	10925.3	0.00617	0.00080	0.00047
83_84	Water Eaton Road	5.8	25.3	4127.5	0.03960	0.00503	0.00295
84_83	Water Eaton Road	7.8	26.7	3753.6	0.03934	0.00496	0.00291
89_90	Shenley Road	3	15.0	6594.7	0.03308	0.00402	0.00236
90_89	Shenley Road	6.8	16.0	6087.3	0.03299	0.00428	0.00251
91_92	Buckingham Road	11.8	112.0	17889	0.00191	0.00026	0.00015
92_91	Buckingham Road	12.4	112.0	16047	0.00201	0.00025	0.00015
93_94	Standing Way	12.2	112.0	20360.2	0.00811	0.00099	0.00058
94_93	Standing Way	12.4	112.0	20554.7	0.00691	0.00085	0.00050
95_96	V6 Grafton Street	9.1	112.0	12314.3	0.03172	0.00422	0.00247
96_95	V6 Grafton Street	10.9	112.0	12044.2	0.03051	0.00418	0.00244
97_98	Standing Way	12	112.0	17374.4	0.02786	0.00374	0.00218
98_97	Standing Way	12	112.0	17864.2	0.02687	0.00380	0.00221
99_100	V6 Grafton Street	11.7	112.0	12861.2	0.02174	0.00361	0.00200

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
100_99	V6 Grafton Street	9.8	112.0	13329.7	0.01886	0.00310	0.00172
101_102	A421	6.7	48.8	14991.6	0.01623	0.00298	0.00164
102_101	A421	7.3	54.3	15499.7	0.01722	0.00308	0.00170
103_104	A421	7.6	47.3	19839.7	0.00830	0.00123	0.00069
104_103	A421	10.2	43.9	20862.7	0.00843	0.00127	0.00071
105_106	A421	7.4	49.6	14224.2	0.01196	0.00215	0.00119
106_105	A421	7.5	52.4	13001	0.01309	0.00237	0.00131
107_108	A421	9.7	42.2	12196.9	0.01228	0.00178	0.00099
108_107	A421	9.2	46.0	12250.8	0.01137	0.00169	0.00094
13_15R	Roundabout between A421 and Whaddon Road	7.2	20.0	15759.9	0.05406	0.00708	0.00399
15_101R	Roundabout between A421 and Whaddon Road	8	20.0	16637.5	0.05815	0.00761	0.00428
13_101R	Roundabout between A421 and Whaddon Road	7.3	20.0	17829.6	0.06131	0.00803	0.00452
105_1R	Roundabout between A421, B4034 and Snelshall Street	7.2	20.0	20692.8	0.07087	0.00928	0.00522
1_101R	Roundabout between A421, B4034 and Snelshall Street	7.2	20.0	19137.1	0.06558	0.00859	0.00483
101_57R	Roundabout between A421, B4034 and Snelshall Street	7	20.0	21524.3	0.07347	0.00963	0.00542
57_105R	Roundabout between A421, B4034 and Snelshall Street	7	20.0	19877.5	0.06779	0.00888	0.00500
97_99R	Roundabout between A421 and Grafton Street	11.5	20.0	31850.7	0.12112	0.01576	0.00885
99_93R	Roundabout between A421 and Grafton Street	11.3	20.0	30538.4	0.11567	0.01506	0.00845
95_97R	Roundabout between A421 and Grafton Street	11.4	20.0	31419.2	0.11941	0.01554	0.00872
93_95R	Roundabout between A421 and Grafton Street	11.6	20.0	32914.5	0.12554	0.01634	0.00917

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
24_25R	Roundabout between A421, B4033 and Winslow Road	10.3	20.0	12754.9	0.04852	0.00465	0.00278
21_23R	Roundabout between A421, B4033 and Winslow Road	9.6	20.0	12888.5	0.04835	0.00461	0.00276
25_107R	Roundabout between A421, B4033 and Winslow Road	10.4	20.0	12255.5	0.04666	0.00447	0.00267
107_21R	Roundabout between A421, B4033 and Winslow Road	9.6	20.0	14436.8	0.05414	0.00516	0.00309
15_17R	Roundabout between A421, Coddimoor Lane and Whaddon Road	7.8	20.0	17202.6	0.06240	0.00588	0.00352
27_15R	Roundabout between A421, Coddimoor Lane and Whaddon Road	7.9	20.0	14083.3	0.05116	0.00482	0.00289
37_27R	Roundabout between A421, Coddimoor Lane and Whaddon Road	7.9	20.0	14674.4	0.05331	0.00502	0.00301
17_37R	Roundabout between A421, Coddimoor Lane and Whaddon Road	7.9	20.0	15520.5	0.05643	0.00532	0.00319
65_93R	Roundabout between A421 and Watling Street	8.9	20.0	29177.1	0.10451	0.01365	0.00767
93_66R	Roundabout between A421 and Watling Street	10.4	20.0	31204.5	0.11565	0.01508	0.00847
66_103R	Roundabout between A421 and Watling Street	10	20.0	29261	0.10761	0.01403	0.00788
103_65R	Roundabout between A421 and Watling Street	9.1	20.0	31196.4	0.11217	0.01465	0.00823
89_91R	Roundabout between A421, Fulmer Street and Shenley Road	8.6	20.0	24727.5	0.08793	0.01149	0.00646
91_63R	Roundabout between A421, Fulmer Street and Shenley Road	9.9	20.0	25111.3	0.09206	0.01201	0.00675
63_103R	Roundabout between A421, Fulmer Street and Shenley Road	9.9	20.0	22933.9	0.08400	0.01096	0.00616
103_89R	Roundabout between A421, Fulmer Street and Shenley Road	8.6	20.0	26931.4	0.09560	0.01249	0.00702
61_105R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	10.1	20.0	20778.3	0.07649	0.00998	0.00560
91_61R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	10.2	20.0	22345	0.08254	0.01076	0.00604
59_91R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	7.4	20.0	18819.7	0.06486	0.00849	0.00478
105_59R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	7.9	20.0	20799.2	0.07265	0.00950	0.00535

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
29_51R	Roundabout between V1 Snelshall Street and Hayton Way	5.1	20.0	11166.5	0.03625	0.00476	0.00269
51_49R	Roundabout between V1 Snelshall Street and Hayton Way	5.1	20.0	12100.9	0.03924	0.00516	0.00291
47_29R	Roundabout between V1 Snelshall Street and Hayton Way	5.2	20.0	11688.5	0.03802	0.00500	0.00282
49_47R	Roundabout between V1 Snelshall Street and Hayton Way	5.1	20.0	12433.3	0.04035	0.00530	0.00299
13_14Q	Whaddon Road	9.4	20.0	3231.6	0.04905	0.00642	0.00361
14_13Q	Whaddon Road	7.4	20.0	3090.3	0.04496	0.00589	0.00331
101_102Q	A421 Standing Way	6.7	20.0	14991.6	0.01208	0.00115	0.00069
102_101Q	A421 Standing Way	7.3	20.0	15499.7	0.01112	0.00104	0.00063
106_105Q	A421 Standing Way	7.6	20.0	15078.6	0.05072	0.00665	0.00374
105_106Q	A421 Standing Way	8.3	20.0	15014.8	0.05325	0.00697	0.00393
95_96Q	V6 Grafton Street	6.7	20.0	14991.6	0.05451	0.00513	0.00307
96_95Q	V6 Grafton Street	7.3	20.0	15499.7	0.05502	0.00520	0.00312
101_102QQ	A421 Standing Way	7.3	20.0	6381.7	0.05072	0.00665	0.00374
102_101QQ	A421 Standing Way	7.2	20.0	6606.5	0.05325	0.00697	0.00393
107_108Q	A421 Standing Way	7.5	20.0	13001	0.02196	0.00288	0.00162
108_107Q	A421 Standing Way	7.4	20.0	14224.2	0.02266	0.00297	0.00167
25_26Q	Winslow Road	5.9	20.0	5182.3	0.04496	0.00589	0.00331
26_25Q	Winslow Road	6.3	20.0	5394.8	0.04905	0.00642	0.00361
21_22Q	Nash Road	5.4	20.0	6281	0.01719	0.00226	0.00127
22_21Q	Nash Road	5.6	20.0	6813.7	0.01808	0.00237	0.00134

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
23_24Q	A421	11.8	20.0	17889	0.02056	0.00270	0.00152
24_23Q	A421	12.4	20.0	16047	0.02238	0.00294	0.00166
17_18Q	Whaddon Road	4.8	20.0	4044.1	0.06860	0.00893	0.00501
18_17Q	Whaddon Road	7.5	20.0	4202.7	0.06227	0.00810	0.00454
27_28Q	Coddimoor Lane	7.4	20.0	14224.2	0.01303	0.00171	0.00097
28_27Q	Coddimoor Lane	7.5	20.0	13001	0.01451	0.00190	0.00107
37_38Q	A421	3	20.0	6594.7	0.02017	0.00266	0.00150
38_37Q	A421	6.8	20.0	6087.3	0.02067	0.00271	0.00152
15_16QQ	A421	7.6	20.0	19839.7	0.06880	0.00900	0.00507
16_15QQ	A421	10.2	20.0	20862.7	0.07710	0.01005	0.00565
16_15Q	A421	5.7	20.0	6621.9	0.02185	0.00287	0.00162
15_16Q	A421	8.1	20.0	5774	0.02026	0.00265	0.00149
57_58Q	Snelshall Street	11.8	20.0	17889	0.06860	0.00893	0.00501
58_57Q	Snelshall Street	12.4	20.0	16047	0.06227	0.00810	0.00454
1_2Q	Buckingham Road	4.2	20.0	10388.5	0.03289	0.00433	0.00244
2_1Q	Buckingham Road	10	20.0	14084.1	0.05176	0.00675	0.00379
49_50Q	Snelshall Street	12.2	20.0	20360.2	0.07867	0.01023	0.00574
50_49Q	Snelshall Street	12.4	20.0	20554.7	0.07989	0.01039	0.00582
51_52Q	Chaffron Way	6.7	20.0	7490.9	0.02536	0.00332	0.00187
52_51Q	Chaffron Way	8.8	20.0	7265.5	0.02595	0.00339	0.00191
29_30Q	V1 Snelshall Street	10.2	20.0	20862.7	0.07710	0.01005	0.00565

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
30_29Q	V1 Snelshall Street	7.6	20.0	19839.7	0.06880	0.00900	0.00507
47_48Q	Hayton Way	11.7	20.0	12861.2	0.04920	0.00640	0.00359
48_47Q	Hayton Way	9.8	20.0	13329.7	0.04870	0.00635	0.00357
92_91Q	Buckingham Road	12.2	20.0	20360.2	0.07867	0.01023	0.00574
91_92Q	Buckingham Road	12.4	20.0	20554.7	0.07989	0.01039	0.00582
61_62Q	Tattenhoe Lane	12	20.0	17374.4	0.06682	0.00869	0.00488
62_61Q	Tattenhoe Lane	12	20.0	17864.2	0.06885	0.00895	0.00502
59_60Q	Tattenhoe Street	9.1	20.0	12314.3	0.04429	0.00578	0.00325
60_59Q	Tattenhoe Street	10.9	20.0	12044.2	0.04520	0.00589	0.00331
106_105QQ	A421 Standing Way	5.6	20.0	2647.6	0.00921	0.00085	0.00051
105_106QQ	A421 Standing Way	6.5	20.0	2524.1	0.00893	0.00083	0.00050
92_91QQ	Buckingham Road	8.3	20.0	15014.8	0.05502	0.00520	0.00312
91_92QQ	Buckingham Road	7.6	20.0	15078.6	0.05451	0.00513	0.00307
89_90Q	Shenley Road	7.2	20.0	12316.1	0.04415	0.00414	0.00248
90_89Q	Shenley Road	9	20.0	12562.1	0.04662	0.00443	0.00265
63_64Q	Fulmer Street	9.3	20.0	750.5	0.00280	0.00027	0.00016
64_63Q	Fulmer Street	8.3	20.0	759.8	0.00278	0.00026	0.00016
103_104Q	A421 Standing Way	9.3	20.0	2859.9	0.01068	0.00102	0.00061
104_103Q	A421 Standing Way	8.6	20.0	2504	0.00923	0.00087	0.00052
103_104QQ	A421 Standing Way	9.7	20.0	12196.9	0.04584	0.00437	0.00262
104_103QQ	A421 Standing Way	9.2	20.0	12250.8	0.04566	0.00434	0.00260

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (g/km/s)	PM_{10} Emission Rate (g/km/s)	$PM_{2.5}$ Emission Rate (g/km/s)
67_68Q	Watling Street	10.9	20.0	10463.2	0.04021	0.00386	0.00231
68_67Q	Watling Street	10.6	20.0	10784.1	0.04120	0.00395	0.00236
94_93Q	Standing Way	5.1	20.0	8613.9	0.02798	0.00368	0.00207
93_94Q	Standing Way	5.7	20.0	7308.6	0.02408	0.00316	0.00178
65_66Q	Watling Street	6.7	20.0	6887.3	0.02330	0.00305	0.00172
66_65Q	Watling Street	4.6	20.0	7479.2	0.02397	0.00315	0.00178
99_100Q	V6 Grafton Street	1.8	20.0	3183.4	0.00940	0.00124	0.00070
100_99Q	V6 Grafton Street	2.9	20.0	3183.1	0.00970	0.00128	0.00072
94_93QQ	Standing Way	5.7	20.0	5081.8	0.01675	0.00220	0.00124
93_94QQ	Standing Way	5.6	20.0	5609.8	0.01846	0.00242	0.00137
97_98Q	Standing Way	12	20.0	17374.4	0.06682	0.00869	0.00488
98_97Q	Standing Way	12	20.0	17864.2	0.06885	0.00895	0.00502

Table 11.4.5 – 2033 With Development Traffic Flows and Emission Rates

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (/km/s)	PM_{10} Emission Rate (/km/s)	$PM_{2.5}$ Emission Rate (/km/s)
1_2	Buckingham Road	5.9	39.0	5182.3	0.01661	0.00247	0.00138
2_1	Buckingham Road	6.3	40.5	5394.8	0.01805	0.00275	0.00153
3_4	Buckingham Road	6.2	27.3	4982.2	0.00582	0.00068	0.00040
4_3	Buckingham Road	7.6	28.5	5468.1	0.00615	0.00072	0.00043
5_6	Bletchley Road	5.8	36.7	2169.4	0.00981	0.00111	0.00066
6_5	Bletchley Road	6.5	35.6	2246.2	0.01060	0.00114	0.00068
7_8	Stoke Road	7.2	32.0	3254.9	0.00489	0.00052	0.00031
8_7	Stoke Road	7.6	27.9	3292.7	0.00456	0.00047	0.00028
9_10	Drayton Road	7.9	27.1	1491.8	0.00871	0.00112	0.00066
10_9	Drayton Road	5.8	26.5	1413.4	0.00934	0.00114	0.00067
11_12	Whaddon Road	9	41.4	3054.9	0.00153	0.00020	0.00011
12_11	Whaddon Road	7.3	38.4	3232.4	0.00116	0.00014	0.00008
13_14	Whaddon Road	9.4	43.5	3231.6	0.00095	0.00013	0.00008
14_13	Whaddon Road	7.4	44.3	3090.3	0.00096	0.00013	0.00008
15_16	A421	8.3	40.0	15014.8	0.00160	0.00021	0.00012
16_15	A421	7.6	40.4	15078.6	0.00266	0.00033	0.00019
17_18	Whaddon Road	5.6	44.5	2647.6	0.03247	0.00430	0.00252
18_17	Whaddon Road	6.5	46.1	2524.1	0.03111	0.00424	0.00248
19_20	Unnamed Road Adjacent to A421 and Warren Road	11.8	36.3	535.4	0.00203	0.00020	0.00012
20_19	Unnamed Road Adjacent to A421 and Warren Road	10.5	35.1	403.4	0.00218	0.00021	0.00013

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (/km/s)	PM_{10} Emission Rate (/km/s)	$PM_{2.5}$ Emission Rate (/km/s)
21_22	Nash Road	9.3	35.1	2859.9	0.01085	0.00109	0.00065
22_21	Nash Road	8.6	36.5	2504	0.01192	0.00118	0.00070
23_24	A421	10.9	41.0	10463.2	0.01727	0.00245	0.00138
24_23	A421	10.6	46.9	10784.1	0.02250	0.00312	0.00175
25_26	Winslow Road	9.3	43.7	750.5	0.03744	0.00559	0.00312
26_25	Winslow Road	8.3	39.8	759.8	0.03745	0.00546	0.00306
27_28	Coddimoor Lane	8.4	47.1	809.4	0.02496	0.00361	0.00202
28_27	Coddimoor Lane	6.7	44.0	845.8	0.02613	0.00383	0.00214
29_30	V1 Snelshall Street	5.7	42.5	5081.8	0.01196	0.00174	0.00097
30_29	V1 Snelshall Street	5.6	43.3	5609.8	0.01163	0.00176	0.00098
33_34	Little Horwood Road	10	44.6	374.6	0.03335	0.00503	0.00281
34_33	Little Horwood Road	9.5	43.2	373.7	0.03190	0.00473	0.00264
35_36	Warren Road	9.9	39.5	596.3	0.01084	0.00139	0.00082
36_35	Warren Road	8.2	37.3	978.7	0.00864	0.00111	0.00065
37_38	A421	9	40.9	12562.1	0.03542	0.00677	0.00373
38_37	A421	7.2	37.6	12316.1	0.03875	0.00765	0.00421
39_40	A421	9.7	42.2	12196.9	0.01740	0.00313	0.00173
40_39	A421	9.2	46.0	12191.3	0.01829	0.00321	0.00178
43_44	Westbrook End	5.5	23.1	623.6	0.01594	0.00273	0.00151
44_43	Westbrook End	6	21.8	646.9	0.01992	0.00344	0.00191
45_46	Whaddon Road	7	24.3	3048.3	0.01546	0.00267	0.00148

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (/km/s)	PM_{10} Emission Rate (/km/s)	$PM_{2.5}$ Emission Rate (/km/s)
46_45	Whaddon Road	7.2	23.0	3288.9	0.01720	0.00291	0.00161
47_48	Hayton Way	1.8	28.1	3183.4	0.01121	0.00172	0.00096
48_47	Hayton Way	2.9	28.7	3183.1	0.01220	0.00190	0.00106
49_50	Snelshall Street	6.7	43.6	6887.3	0.03782	0.00726	0.00400
50_49	Snelshall Street	4.6	43.4	7479.2	0.03451	0.00672	0.00370
51_52	Chaffron Way	5.1	35.6	8613.9	0.02289	0.00273	0.00156
52_51	Chaffron Way	5.7	34.5	7308.6	0.02323	0.00277	0.00157
57_58	Snelshall Street	7.3	42.0	6381.7	0.01656	0.00283	0.00157
58_57	Snelshall Street	7.2	39.6	6606.5	0.01576	0.00262	0.00145
59_60	Tattenhoe Street	5.4	39.2	6281	0.05977	0.00963	0.00528
60_59	Tattenhoe Street	5.6	37.1	6813.7	0.05420	0.00880	0.00483
61_62	Tattenhoe Lane	4.8	29.5	4044.1	0.02645	0.00426	0.00237
62_61	Tattenhoe Lane	7.5	29.7	4202.7	0.04130	0.00665	0.00369
63_64	Fulmer Street	5.7	37.7	6621.9	0.01761	0.00324	0.00179
64_63	Fulmer Street	8.1	33.9	5774	0.01781	0.00331	0.00182
65_66	Watling Street	6.7	43.9	7490.9	0.05644	0.01068	0.00588
66_65	Watling Street	8.8	42.4	7265.5	0.05086	0.00967	0.00533
67_68	Watling Street	4.2	33.7	10388.5	0.03806	0.00631	0.00346
68_67	Watling Street	10	30.9	14084.1	0.03970	0.00628	0.00344
69_70	Sherwood Drive	3.8	24.5	5986.1	0.06634	0.01083	0.00594
70_69	Sherwood Drive	4.3	22.9	7476.1	0.06670	0.01096	0.00601

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (/km/s)	PM_{10} Emission Rate (/km/s)	$PM_{2.5}$ Emission Rate (/km/s)
71_72	Buckingham Road	8	26.9	11645.5	0.05469	0.00897	0.00492
72_71	Buckingham Road	5.9	25.9	11947.1	0.05600	0.00921	0.00505
73_74	Buckingham Road	5.8	25.4	7908.4	0.03817	0.00589	0.00324
74_73	Buckingham Road	6.3	26.2	8326.3	0.03711	0.00598	0.00328
79_80	Shenley Road	7	25.3	3914.7	0.00198	0.00027	0.00016
80_79	Shenley Road	8.9	27.6	3822.9	0.00211	0.00027	0.00016
81_82	Queensway	5.5	28.1	11817.7	0.00689	0.00086	0.00051
82_81	Queensway	6.1	26.8	10925.3	0.00654	0.00084	0.00049
83_84	Water Eaton Road	5.8	25.3	4127.5	0.04074	0.00516	0.00302
84_83	Water Eaton Road	7.8	26.7	3753.6	0.04049	0.00509	0.00298
89_90	Shenley Road	3	15.0	6594.7	0.03387	0.00410	0.00241
90_89	Shenley Road	6.8	16.0	6087.3	0.03374	0.00436	0.00255
91_92	Buckingham Road	11.8	112.0	17889	0.00191	0.00026	0.00015
92_91	Buckingham Road	12.4	112.0	16047	0.00201	0.00025	0.00015
93_94	Standing Way	12.2	112.0	20360.2	0.00827	0.00101	0.00059
94_93	Standing Way	12.4	112.0	20554.7	0.00707	0.00087	0.00051
95_96	V6 Grafton Street	9.1	112.0	12314.3	0.03247	0.00430	0.00252
96_95	V6 Grafton Street	10.9	112.0	12044.2	0.03125	0.00426	0.00249
97_98	Standing Way	12	112.0	17374.4	0.02846	0.00380	0.00222
98_97	Standing Way	12	112.0	17864.2	0.02746	0.00387	0.00225
99_100	V6 Grafton Street	11.7	112.0	12861.2	0.02174	0.00361	0.00200

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (/km/s)	PM_{10} Emission Rate (/km/s)	$PM_{2.5}$ Emission Rate (/km/s)
100_99	V6 Grafton Street	9.8	112.0	13329.7	0.01886	0.00310	0.00172
101_102	A421	6.7	48.8	14991.6	0.01789	0.00326	0.00180
102_101	A421	7.3	54.3	15499.7	0.01886	0.00335	0.00186
103_104	A421	7.6	47.3	19839.7	0.00830	0.00123	0.00069
104_103	A421	10.2	43.9	20862.7	0.00843	0.00127	0.00071
105_106	A421	7.4	49.6	14224.2	0.01359	0.00242	0.00134
106_105	A421	7.5	52.4	13001	0.01469	0.00263	0.00146
107_108	A421	9.7	42.2	12196.9	0.01228	0.00178	0.00099
108_107	A421	9.2	46.0	12250.8	0.01137	0.00169	0.00094
13_15R	Roundabout between A421 and Whaddon Road	7.2	20.0	15759.9	0.05863	0.00769	0.00433
15_101R	Roundabout between A421 and Whaddon Road	8	20.0	16637.5	0.06069	0.00794	0.00447
13_101R	Roundabout between A421 and Whaddon Road	7.3	20.0	17829.6	0.06681	0.00876	0.00493
105_1R	Roundabout between A421, B4034 and Snelshall Street	7.2	20.0	20692.8	0.08261	0.01084	0.00611
1_101R	Roundabout between A421, B4034 and Snelshall Street	7.2	20.0	19137.1	0.07670	0.01007	0.00567
101_57R	Roundabout between A421, B4034 and Snelshall Street	7	20.0	21524.3	0.08349	0.01096	0.00617
57_105R	Roundabout between A421, B4034 and Snelshall Street	7	20.0	19877.5	0.07745	0.01017	0.00573
97_99R	Roundabout between A421 and Grafton Street	11.5	20.0	31850.7	0.12797	0.01668	0.00936
99_93R	Roundabout between A421 and Grafton Street	11.3	20.0	30538.4	0.12147	0.01583	0.00889
95_97R	Roundabout between A421 and Grafton Street	11.4	20.0	31419.2	0.12651	0.01649	0.00926
93_95R	Roundabout between A421 and Grafton Street	11.6	20.0	32914.5	0.13340	0.01738	0.00976

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (/km/s)	PM_{10} Emission Rate (/km/s)	$PM_{2.5}$ Emission Rate (/km/s)
24_25R	Roundabout between A421, B4033 and Winslow Road	10.3	20.0	12754.9	0.04941	0.00472	0.00283
21_23R	Roundabout between A421, B4033 and Winslow Road	9.6	20.0	12888.5	0.04932	0.00469	0.00281
25_107R	Roundabout between A421, B4033 and Winslow Road	10.4	20.0	12255.5	0.04755	0.00455	0.00272
107_21R	Roundabout between A421, B4033 and Winslow Road	9.6	20.0	14436.8	0.05524	0.00526	0.00315
15_17R	Roundabout between A421, Coddimoor Lane and Whaddon Road	7.8	20.0	17202.6	0.06413	0.00603	0.00361
27_15R	Roundabout between A421, Coddimoor Lane and Whaddon Road	7.9	20.0	14083.3	0.05241	0.00493	0.00296
37_27R	Roundabout between A421, Coddimoor Lane and Whaddon Road	7.9	20.0	14674.4	0.05456	0.00513	0.00308
17_37R	Roundabout between A421, Coddimoor Lane and Whaddon Road	7.9	20.0	15520.5	0.05789	0.00545	0.00327
65_93R	Roundabout between A421 and Watling Street	8.9	20.0	29177.1	0.11111	0.01453	0.00817
93_66R	Roundabout between A421 and Watling Street	10.4	20.0	31204.5	0.12336	0.01610	0.00905
66_103R	Roundabout between A421 and Watling Street	10	20.0	29261	0.11378	0.01485	0.00835
103_65R	Roundabout between A421 and Watling Street	9.1	20.0	31196.4	0.11946	0.01562	0.00878
89_91R	Roundabout between A421, Fulmer Street and Shenley Road	8.6	20.0	24727.5	0.09492	0.01242	0.00699
91_63R	Roundabout between A421, Fulmer Street and Shenley Road	9.9	20.0	25111.3	0.09978	0.01303	0.00733
63_103R	Roundabout between A421, Fulmer Street and Shenley Road	9.9	20.0	22933.9	0.09098	0.01188	0.00668
103_89R	Roundabout between A421, Fulmer Street and Shenley Road	8.6	20.0	26931.4	0.10339	0.01353	0.00761
61_105R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	10.1	20.0	20778.3	0.08408	0.01098	0.00617
91_61R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	10.2	20.0	22345	0.09072	0.01185	0.00666
59_91R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	7.4	20.0	18819.7	0.07208	0.00945	0.00532
105_59R	Roundabout between A421, Tattenhoe Street and Tattenhoe Lane	7.9	20.0	20799.2	0.08095	0.01061	0.00597

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (/km/s)	PM_{10} Emission Rate (/km/s)	$PM_{2.5}$ Emission Rate (/km/s)
29_51R	Roundabout between V1 Snelshall Street and Hayton Way	5.1	20.0	11166.5	0.03876	0.00510	0.00287
51_49R	Roundabout between V1 Snelshall Street and Hayton Way	5.1	20.0	12100.9	0.04081	0.00537	0.00303
47_29R	Roundabout between V1 Snelshall Street and Hayton Way	5.2	20.0	11688.5	0.04023	0.00529	0.00298
49_47R	Roundabout between V1 Snelshall Street and Hayton Way	5.1	20.0	12433.3	0.04264	0.00561	0.00316
13_14Q	Whaddon Road	9.4	20.0	3231.6	0.05695	0.00747	0.00421
14_13Q	Whaddon Road	7.4	20.0	3090.3	0.05272	0.00692	0.00390
101_102Q	A421 Standing Way	6.7	20.0	14991.6	0.01542	0.00144	0.00087
102_101Q	A421 Standing Way	7.3	20.0	15499.7	0.01231	0.00115	0.00069
106_105Q	A421 Standing Way	7.6	20.0	15078.6	0.05311	0.00697	0.00392
105_106Q	A421 Standing Way	8.3	20.0	15014.8	0.06006	0.00788	0.00444
95_96Q	V6 Grafton Street	6.7	20.0	14991.6	0.05597	0.00526	0.00315
96_95Q	V6 Grafton Street	7.3	20.0	15499.7	0.05646	0.00533	0.00319
101_102QQ	A421 Standing Way	7.3	20.0	6381.7	0.05311	0.00697	0.00392
102_101QQ	A421 Standing Way	7.2	20.0	6606.5	0.06006	0.00788	0.00444
107_108Q	A421 Standing Way	7.5	20.0	13001	0.02449	0.00321	0.00181
108_107Q	A421 Standing Way	7.4	20.0	14224.2	0.02504	0.00328	0.00185
25_26Q	Winslow Road	5.9	20.0	5182.3	0.05272	0.00692	0.00390
26_25Q	Winslow Road	6.3	20.0	5394.8	0.05695	0.00747	0.00421
21_22Q	Nash Road	5.4	20.0	6281	0.02121	0.00279	0.00157
22_21Q	Nash Road	5.6	20.0	6813.7	0.02670	0.00352	0.00198

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (/km/s)	PM_{10} Emission Rate (/km/s)	$PM_{2.5}$ Emission Rate (/km/s)
23_24Q	A421	11.8	20.0	17889	0.02080	0.00273	0.00154
24_23Q	A421	12.4	20.0	16047	0.02262	0.00297	0.00167
17_18Q	Whaddon Road	4.8	20.0	4044.1	0.07605	0.00991	0.00557
18_17Q	Whaddon Road	7.5	20.0	4202.7	0.06957	0.00907	0.00509
27_28Q	Coddimoor Lane	7.4	20.0	14224.2	0.01325	0.00174	0.00098
28_27Q	Coddimoor Lane	7.5	20.0	13001	0.01473	0.00193	0.00109
37_38Q	A421	3	20.0	6594.7	0.02045	0.00270	0.00153
38_37Q	A421	6.8	20.0	6087.3	0.02095	0.00275	0.00155
15_16QQ	A421	7.6	20.0	19839.7	0.07581	0.00994	0.00559
16_15QQ	A421	10.2	20.0	20862.7	0.08397	0.01096	0.00616
16_15Q	A421	5.7	20.0	6621.9	0.02199	0.00289	0.00163
15_16Q	A421	8.1	20.0	5774	0.02041	0.00267	0.00150
57_58Q	Snelshall Street	11.8	20.0	17889	0.07605	0.00991	0.00557
58_57Q	Snelshall Street	12.4	20.0	16047	0.06957	0.00907	0.00509
1_2Q	Buckingham Road	4.2	20.0	10388.5	0.03292	0.00433	0.00245
2_1Q	Buckingham Road	10	20.0	14084.1	0.05179	0.00675	0.00379
49_50Q	Snelshall Street	12.2	20.0	20360.2	0.08564	0.01116	0.00626
50_49Q	Snelshall Street	12.4	20.0	20554.7	0.08673	0.01129	0.00634
51_52Q	Chaffron Way	6.7	20.0	7490.9	0.02536	0.00332	0.00187
52_51Q	Chaffron Way	8.8	20.0	7265.5	0.02595	0.00339	0.00191
29_30Q	V1 Snelshall Street	10.2	20.0	20862.7	0.08397	0.01096	0.00616

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (/km/s)	PM_{10} Emission Rate (/km/s)	$PM_{2.5}$ Emission Rate (/km/s)
30_29Q	V1 Snelshall Street	7.6	20.0	19839.7	0.07581	0.00994	0.00559
47_48Q	Hayton Way	11.7	20.0	12861.2	0.04998	0.00651	0.00365
48_47Q	Hayton Way	9.8	20.0	13329.7	0.04950	0.00646	0.00363
92_91Q	Buckingham Road	12.2	20.0	20360.2	0.08564	0.01116	0.00626
91_92Q	Buckingham Road	12.4	20.0	20554.7	0.08673	0.01129	0.00634
61_62Q	Tattenhoe Lane	12	20.0	17374.4	0.07095	0.00924	0.00519
62_61Q	Tattenhoe Lane	12	20.0	17864.2	0.07290	0.00949	0.00533
59_60Q	Tattenhoe Street	9.1	20.0	12314.3	0.04634	0.00606	0.00340
60_59Q	Tattenhoe Street	10.9	20.0	12044.2	0.04720	0.00615	0.00346
106_105QQ	A421 Standing Way	5.6	20.0	2647.6	0.00968	0.00090	0.00054
105_106QQ	A421 Standing Way	6.5	20.0	2524.1	0.00941	0.00088	0.00053
92_91QQ	Buckingham Road	8.3	20.0	15014.8	0.05646	0.00533	0.00319
91_92QQ	Buckingham Road	7.6	20.0	15078.6	0.05597	0.00526	0.00315
89_90Q	Shenley Road	7.2	20.0	12316.1	0.04513	0.00423	0.00253
90_89Q	Shenley Road	9	20.0	12562.1	0.04759	0.00451	0.00270
63_64Q	Fulmer Street	9.3	20.0	750.5	0.00280	0.00027	0.00016
64_63Q	Fulmer Street	8.3	20.0	759.8	0.00278	0.00026	0.00016
103_104Q	A421 Standing Way	9.3	20.0	2859.9	0.01087	0.00103	0.00062
104_103Q	A421 Standing Way	8.6	20.0	2504	0.00942	0.00089	0.00053
103_104QQ	A421 Standing Way	9.7	20.0	12196.9	0.04680	0.00446	0.00267
104_103QQ	A421 Standing Way	9.2	20.0	12250.8	0.04664	0.00443	0.00265

ID	Road	HGV (%)	Speed (kph)	AADT	NO_x Emission Rate (/km/s)	PM_{10} Emission Rate (/km/s)	$PM_{2.5}$ Emission Rate (/km/s)
67_68Q	Watling Street	10.9	20.0	10463.2	0.04098	0.00393	0.00235
68_67Q	Watling Street	10.6	20.0	10784.1	0.04198	0.00402	0.00241
94_93Q	Standing Way	5.1	20.0	8613.9	0.02798	0.00368	0.00207
93_94Q	Standing Way	5.7	20.0	7308.6	0.02408	0.00316	0.00178
65_66Q	Watling Street	6.7	20.0	6887.3	0.02546	0.00334	0.00188
66_65Q	Watling Street	4.6	20.0	7479.2	0.02609	0.00344	0.00194
99_100Q	V6 Grafton Street	1.8	20.0	3183.4	0.00940	0.00124	0.00070
100_99Q	V6 Grafton Street	2.9	20.0	3183.1	0.00970	0.00128	0.00072
94_93QQ	Standing Way	5.7	20.0	5081.8	0.01884	0.00248	0.00140
93_94QQ	Standing Way	5.6	20.0	5609.8	0.02052	0.00270	0.00152
97_98Q	Standing Way	12	20.0	17374.4	0.07095	0.00924	0.00519
98_97Q	Standing Way	12	20.0	17864.2	0.07290	0.00949	0.00533

APPENDIX 11.5:

SUMMARY OF BACKGROUND CONCENTRATIONS USED IN THE ASSESSMENT

11.5 Summary of Background Concentrations used in the Assessment

Table 11.5.1 - Defra Background Concentrations (µg/m^3) with Sector Removal

Receptor	2019 NO_2 (µg/m^3)	2019 PM_{10} (µg/m^3)	2019 $PM_{2.5}$ (µg/m^3)	2026 NO_2 (µg/m^3)	2026 PM_{10} (µg/m^3)	2026 $PM_{2.5}$ (µg/m^3)
R1	10.5	16.0	10.2	8.3	16.0	9.3
R2	8.8	14.9	9.5	7.1	13.9	8.7
R3	10.0	14.9	9.6	7.9	14.9	8.8
R4	10.5	16.0	10.2	8.3	16.0	9.3
R5	10.4	14.9	9.9	8.3	14.0	9.1
R6	11.5	15.6	10.3	9.0	15.6	9.5
R7	11.5	15.6	10.3	9.0	15.6	9.5
R8	11.5	15.6	10.3	9.0	15.6	9.5
R9	9.9	15.0	9.6	7.8	14.1	8.8
R10	10.4	14.9	9.9	8.3	14.0	9.1
R11	9.5	15.3	9.8	7.7	14.3	9.0
R12	9.5	15.3	9.8	7.7	14.3	9.0
R13	9.5	15.3	9.8	7.7	14.3	9.0
R14	13.2	15.5	10.7	10.3	15.5	9.9
R15	13.2	15.5	10.7	10.3	15.5	9.9
R16	13.7	15.1	10.4	10.7	15.1	9.6
R17	12.0	15.3	10.6	9.4	15.3	9.8
R18	12.0	15.3	10.6	9.4	15.3	9.8
R19	12.7	15.6	10.8	10.0	15.6	10.0
R20	8.7	14.7	9.4	7.0	13.8	8.6
R21	8.6	13.6	9.1	7.0	12.7	8.4
R22	8.6	14.5	9.4	6.9	13.6	8.6
R23	8.5	14.6	9.4	6.8	13.6	8.6
R101	8.8	14.4	9.3	7.1	13.4	8.5
R102	9.7	15.1	9.6	7.8	14.2	8.8

Receptor	2019 NO_2 (µg/m^3)	2019 PM_{10} (µg/m^3)	2019 $PM_{2.5}$ (µg/m^3)	2026 NO_2 (µg/m^3)	2026 PM_{10} (µg/m^3)	2026 $PM_{2.5}$ (µg/m^3)
R103	9.7	15.1	9.6	7.8	14.2	8.8
R104	9.7	15.1	9.6	7.8	14.2	8.8
R105	9.9	15.0	9.6	7.8	14.1	8.8
R106	9.9	15.0	9.6	7.8	14.1	8.8

APPENDIX 11.6:

ATMOSPHERIC DISPERSION MODELLING RESULTS

11.6 Atmospheric Dispersion Modelling Results

Table 11.6.1 – Predicted Annual Mean NO_2 Concentrations (µg/m^3)

Receptor	2019 Base (µg/m^3)	2026 Without Dev (µg/m^3)	2026 With Dev (µg/m^3)	Change (µg/m^3)	%Change relative to objective	Impact	2033 Without Dev (µg/m^3)	2033 With Dev (µg/m^3)	Change (µg/m^3)	%Change relative to objective	Impact
R1	16.2	11.4	11.9	0.5	1.0	Negligible	11.6	12.1	0.5	1.0	Negligible
R2	23.9	15.8	16.1	0.3	1.0	Negligible	16.3	16.6	0.3	1.0	Negligible
R3	14.8	10.6	10.9	0.3	1.0	Negligible	10.9	11.1	0.2	1.0	Negligible
R4	15.1	10.9	11.2	0.3	1.0	Negligible	11.1	11.4	0.3	1.0	Negligible
R5	15.8	11.5	12.6	1.1	3.0	Negligible	11.6	12.7	1.1	3.0	Negligible
R6	15.8	11.5	12.4	0.9	2.0	Negligible	11.7	12.5	0.8	2.0	Negligible
R7	18.5	13.1	14.6	1.5	4.0	Negligible	13.4	14.8	1.4	4.0	Negligible
R8	20.0	13.9	14.7	0.8	2.0	Negligible	14.1	15.0	0.9	2.0	Negligible
R9	13.2	9.7	10.2	0.5	1.0	Negligible	9.8	10.4	0.6	2.0	Negligible
R10	14.9	10.9	11.8	0.9	2.0	Negligible	11.1	11.9	0.8	2.0	Negligible
R11	13.0	9.7	9.9	0.2	1.0	Negligible	9.8	10.0	0.2	1.0	Negligible
R12	15.2	10.9	11.2	0.3	1.0	Negligible	11.1	11.3	0.2	1.0	Negligible
R13	15.2	10.9	11.0	0.1	0.0	Negligible	11.0	11.2	0.2	1.0	Negligible
R14	19.9	14.0	14.3	0.3	1.0	Negligible	14.2	14.5	0.3	1.0	Negligible
R15	29.0	19.0	19.4	0.4	1.0	Negligible	19.4	19.8	0.4	1.0	Negligible
R16	22.3	15.5	15.8	0.3	1.0	Negligible	15.7	16.0	0.3	1.0	Negligible
R17	25.1	16.3	17.0	0.7	2.0	Negligible	17.8	18.5	0.7	2.0	Negligible
R18	24.4	15.9	16.7	0.8	2.0	Negligible	15.8	16.4	0.6	2.0	Negligible

Receptor	2019 Base (µg/m^3)	2026 Without Dev (µg/m^3)	2026 With Dev (µg/m^3)	Change (µg/m^3)	%Change relative to objective	Impact	2033 Without Dev (µg/m^3)	2033 With Dev (µg/m^3)	Change (µg/m^3)	%Change relative to objective	Impact
R19	21.5	14.5	14.9	0.4	1.0	Negligible	14.4	14.8	0.4	1.0	Negligible
R20	20.8	13.9	14.1	0.2	1.0	Negligible	14.4	14.6	0.2	1.0	Negligible
R21	17.1	11.6	11.7	0.1	0.0	Negligible	11.9	12.0	0.1	0.0	Negligible
R22	18.6	12.4	12.5	0.1	0.0	Negligible	12.7	12.9	0.2	1.0	Negligible
R23	19.9	13.1	13.2	0.1	0.0	Negligible	13.5	13.6	0.1	0.0	Negligible
R101	10.5	8.0	8.1	N/A	N/A	N/A	8.1	8.2	N/A	N/A	N/A
R102	11.6	8.9	9.1	N/A	N/A	N/A	9.0	9.1	N/A	N/A	N/A
R103	12.7	9.5	9.7	N/A	N/A	N/A	9.5	9.7	N/A	N/A	N/A
R104	12.8	9.6	9.7	N/A	N/A	N/A	9.7	9.9	N/A	N/A	N/A
R105	11.0	8.4	8.5	N/A	N/A	N/A	8.5	8.5	N/A	N/A	N/A
R106	12.0	9.0	9.2	N/A	N/A	N/A	9.0	9.3	N/A	N/A	N/A

Table 11.6.2 – Predicted Annual Mean PM_{10} Concentrations (µg/m^3)

Receptor	2019 Base (µg/m^3)	2026 Without Dev (µg/m^3)	2026 With Dev (µg/m^3)	Change (µg/m^3)	%Change relative to objective	Impact	2033 Without Dev (µg/m^3)	2033 With Dev (µg/m^3)	Change (µg/m^3)	%Change relative to objective	Impact
R1	17.0	17.1	17.2	0.1	0.0	Negligible	17.1	17.3	0.2	1.0	Negligible
R2	16.9	16.0	16.1	0.1	0.0	Negligible	16.1	16.2	0.1	0.0	Negligible
R3	15.8	15.8	15.9	0.1	0.0	Negligible	15.9	16.0	0.1	0.0	Negligible
R4	16.8	16.8	16.9	0.1	0.0	Negligible	16.9	17.0	0.1	0.0	Negligible
R5	15.9	15.0	15.3	0.3	1.0	Negligible	15.0	15.4	0.4	1.0	Negligible
R6	16.3	16.4	16.6	0.2	1.0	Negligible	16.4	16.7	0.3	1.0	Negligible
R7	16.8	16.9	17.4	0.5	1.0	Negligible	17.0	17.4	0.4	1.0	Negligible
R8	16.9	17.0	17.2	0.2	1.0	Negligible	17.1	17.3	0.2	1.0	Negligible
R9	15.6	14.7	14.8	0.1	0.0	Negligible	14.7	14.9	0.2	1.0	Negligible
R10	15.7	14.8	15.1	0.3	1.0	Negligible	14.8	15.1	0.3	1.0	Negligible
R11	15.8	14.8	14.9	0.1	0.0	Negligible	14.8	14.9	0.1	0.0	Negligible
R12	16.0	15.0	15.0	0.0	0.0	Negligible	15.0	15.1	0.1	0.0	Negligible
R13	16.0	15.0	15.0	0.0	0.0	Negligible	15.0	15.1	0.1	0.0	Negligible
R14	16.4	16.5	16.5	0.0	0.0	Negligible	16.5	16.6	0.1	0.0	Negligible
R15	17.9	17.9	18.1	0.2	1.0	Negligible	18.1	18.2	0.1	0.0	Negligible
R16	16.4	16.4	16.5	0.1	0.0	Negligible	16.5	16.6	0.1	0.0	Negligible
R17	17.2	17.2	17.4	0.2	1.0	Negligible	17.6	17.8	0.2	1.0	Negligible
R18	17.2	17.2	17.4	0.2	1.0	Negligible	17.1	17.3	0.2	1.0	Negligible
R19	17.1	17.1	17.2	0.1	0.0	Negligible	17.0	17.1	0.1	0.0	Negligible

Receptor	2019 Base (µg/m^3)	2026 Without Dev (µg/m^3)	2026 With Dev (µg/m^3)	Change (µg/m^3)	%Change relative to objective	Impact	2033 Without Dev (µg/m^3)	2033 With Dev (µg/m^3)	Change (µg/m^3)	%Change relative to objective	Impact
R20	16.3	15.4	15.5	0.1	0.0	Negligible	15.5	15.6	0.1	0.0	Negligible
R21	14.8	13.8	13.9	0.1	0.0	Negligible	13.9	13.9	0.0	0.0	Negligible
R22	15.9	15.0	15.0	0.0	0.0	Negligible	15.0	15.0	0.0	0.0	Negligible
R23	16.2	15.2	15.3	0.1	0.0	Negligible	15.3	15.3	0.0	0.0	Negligible
R101	14.6	13.6	13.7	N/A	N/A	N/A	13.7	13.7	N/A	N/A	N/A
R102	15.4	14.4	14.5	N/A	N/A	N/A	14.5	14.5	N/A	N/A	N/A
R103	15.6	14.6	14.7	N/A	N/A	N/A	14.6	14.7	N/A	N/A	N/A
R104	15.7	14.7	14.8	N/A	N/A	N/A	14.8	14.8	N/A	N/A	N/A
R105	15.2	14.2	14.3	N/A	N/A	N/A	14.3	14.3	N/A	N/A	N/A
R106	15.4	14.4	14.5	N/A	N/A	N/A	14.4	14.5	N/A	N/A	N/A

Table 11.6.3 – Predicted 24-hour Mean PM_{10} Exceedances (No. Days PM_{10} >50µg/m^3)

Receptor	2019 Base	2026 Without Dev	2026 With Dev	2033 Without Dev	2033 With Dev
R1	1	1	1	1	1
R2	1	0	0	0	0
R3	0	0	0	0	0
R4	1	1	1	1	1
R5	0	0	0	0	0
R6	0	0	1	0	1
R7	1	1	1	1	1
R8	1	1	1	1	1
R9	0	0	0	0	0
R10	0	0	0	0	0
R11	0	0	0	0	0
R12	0	0	0	0	0
R13	0	0	0	0	0
R14	0	0	1	0	1
R15	1	1	1	1	2
R16	0	0	1	1	1
R17	1	1	1	1	1
R18	1	1	1	1	1
R19	1	1	1	1	1
R20	0	0	0	0	0

Receptor	2019 Base	2026 Without Dev	2026 With Dev	2033 Without Dev	2033 With Dev
R21	0	0	0	0	0
R22	0	0	0	0	0
R23	0	0	0	0	0
R101	0	0	0	0	0
R102	0	0	0	0	0
R103	0	0	0	0	0
R104	0	0	0	0	0
R105	0	0	0	0	0
R106	0	0	0	0	0

Table 11.6.4 – Predicted Annual Mean $PM_{2.5}$ concentrations (µg/m^3)

Receptor	2019 Base (µg/m^3)	2026 Without Dev (µg/m^3)	2026 With Dev (µg/m^3)	Change (µg/m^3)	%Change relative to objective	Impact	2033 Without Dev (µg/m^3)	2033 With Dev (µg/m^3)	Change (µg/m^3)	%Change relative to objective	Impact
R1	10.8	9.9	10.0	0.1	0.0	Negligible	10.0	10.1	0.1	0.0	Negligible
R2	10.8	9.9	10.0	0.1	0.0	Negligible	10.0	10.0	0.0	0.0	Negligible
R3	10.1	9.3	9.3	0.0	0.0	Negligible	9.3	9.4	0.1	0.0	Negligible
R4	10.6	9.8	9.9	0.1	0.0	Negligible	9.8	9.9	0.1	0.0	Negligible
R5	10.4	9.6	9.8	0.2	1.0	Negligible	9.7	9.9	0.2	1.0	Negligible
R6	10.7	9.9	10.1	0.2	1.0	Negligible	9.9	10.1	0.2	1.0	Negligible
R7	11.0	10.2	10.5	0.3	1.0	Negligible	10.2	10.5	0.3	1.0	Negligible
R8	11.0	10.3	10.4	0.1	0.0	Negligible	10.3	10.4	0.1	0.0	Negligible
R9	9.9	9.1	9.2	0.1	0.0	Negligible	9.2	9.2	0.0	0.0	Negligible
R10	10.3	9.5	9.7	0.2	1.0	Negligible	9.6	9.7	0.1	0.0	Negligible
R11	10.1	9.3	9.3	0.0	0.0	Negligible	9.3	9.3	0.0	0.0	Negligible
R12	10.2	9.4	9.4	0.0	0.0	Negligible	9.4	9.5	0.1	0.0	Negligible
R13	10.3	9.4	9.4	0.0	0.0	Negligible	9.4	9.4	0.0	0.0	Negligible
R14	11.3	10.4	10.4	0.0	0.0	Negligible	10.4	10.5	0.1	0.0	Negligible
R15	12.1	11.2	11.3	0.1	0.0	Negligible	11.3	11.4	0.1	0.0	Negligible
R16	11.2	10.3	10.4	0.1	0.0	Negligible	10.4	10.4	0.0	0.0	Negligible
R17	11.8	10.9	11.0	0.1	0.0	Negligible	11.1	11.2	0.1	0.0	Negligible
R18	11.8	10.9	11.0	0.1	0.0	Negligible	10.8	10.9	0.1	0.0	Negligible
R19	11.7	10.8	10.9	0.1	0.0	Negligible	10.8	10.9	0.1	0.0	Negligible

Receptor	2019 Base (µg/m^3)	2026 Without Dev (µg/m^3)	2026 With Dev (µg/m^3)	Change (µg/m^3)	%Change relative to objective	Impact	2033 Without Dev (µg/m^3)	2033 With Dev (µg/m^3)	Change (µg/m^3)	%Change relative to objective	Impact
R20	10.4	9.6	9.6	0.0	0.0	Negligible	9.7	9.7	0.0	0.0	Negligible
R21	9.9	9.0	9.0	0.0	0.0	Negligible	9.1	9.1	0.0	0.0	Negligible
R22	10.2	9.4	9.4	0.0	0.0	Negligible	9.4	9.4	0.0	0.0	Negligible
R23	10.4	9.5	9.5	0.0	0.0	Negligible	9.6	9.6	0.0	0.0	Negligible
R101	9.5	8.7	8.7	N/A	N/A	N/A	8.7	8.7	N/A	N/A	N/A
R102	9.8	9.0	9.0	N/A	N/A	N/A	9.0	9.0	N/A	N/A	N/A
R103	9.9	9.1	9.1	N/A	N/A	N/A	9.1	9.1	N/A	N/A	N/A
R104	10.0	9.1	9.2	N/A	N/A	N/A	9.2	9.2	N/A	N/A	N/A
R105	9.7	8.9	8.9	N/A	N/A	N/A	8.9	8.9	N/A	N/A	N/A
R106	9.8	9.0	9.0	N/A	N/A	N/A	9.0	9.0	N/A	N/A	N/A

APPENDIX 11.7:

CONSTRUCTION STAGE DUST MITIGATION MEASURES

11.7 Construction Stage Dust Mitigation Measures

The following is a set of measures were identified as 'highly recommended' and 'desirable' for a medium risk site and should be incorporated into the specification for the works or site-specific DMP/CEMP:

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before and during work on site;
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environmental manager/engineer or the site manager; and
- Display the head or regional office contact information.

Dust Management Plan

- Develop and implement a Dust Management Plan (DMP) approved by the Local Authority which documents the mitigation measures to be applied, and the procedures for their implementation and management.

Site Management

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Make the complaints log available to the local authority when asked; and
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book.

Monitoring

- Undertake daily on-site and off-site inspections where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the Local Authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of the site boundary, with cleaning to be provided if necessary;
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the Local Authority when asked; and
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Preparing and Maintaining the Site

- Plan the site layout so that machinery and dust-causing activities are located away from receptors, as far as is possible;
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Avoid site runoff of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below; and
- Cover, seed, or fence stockpiles to prevent wind whipping.

Operating Vehicle/Machinery and Sustainable Travel

- Ensure all vehicles switch off their engines when stationary – no idling vehicles;
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery-powered equipment where practicable;
- Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate); and
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials; and
- Implement a Travel Plan that supports and encourages sustainable staff travel (public transport, cycling, walking, and car-sharing).

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate;
- Use enclosed chutes, conveyors and covered skips; minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- Use Hessian, mulches or tackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable; and
- Only remove the cover from small areas during work, not all at once.

Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces), if possible;
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery; and
- For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.

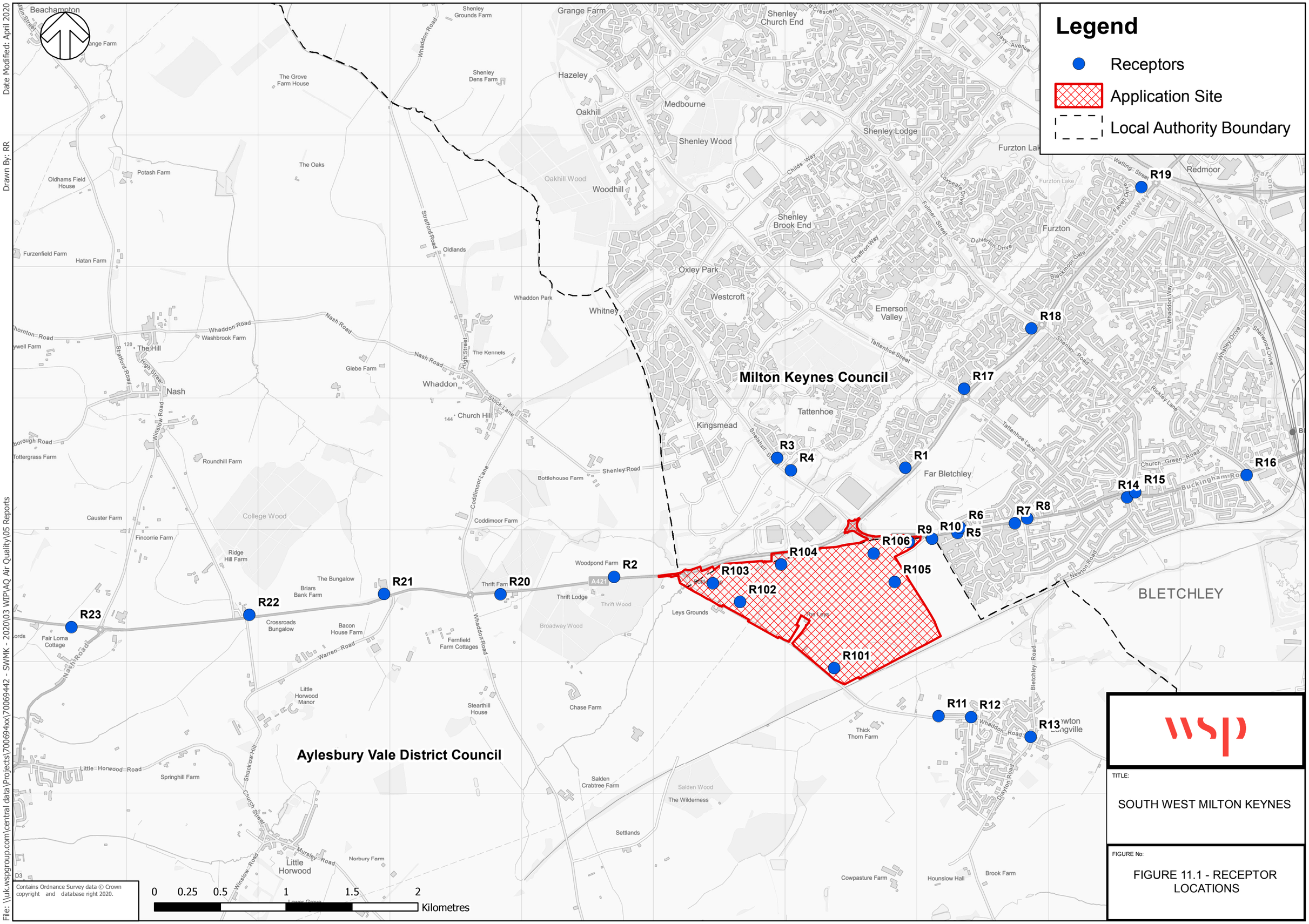
Measures Specific to Trackout

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use;
- Avoid dry sweeping of large areas;
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport; Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;
- Record all inspections of haul routes and any subsequent action in a site log book;
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems or mobile water bowsers, and regularly cleaned;
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable);
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits; and
- Access gates should be located at least 10m from receptors, where possible.

Detailed mitigation measures to control construction traffic should be discussed with AVDC to establish the most suitable access and haul routes for the site traffic. The most effective mitigation will be achieved by ensuring that construction traffic does not pass along sensitive roads (residential roads, congested roads, via unsuitable junctions, etc.) where possible, and that vehicles are kept clean (through the use of wheel washers, etc.) and sheeted when on public highways. Timing of large-scale vehicle movements to avoid peak hours on the local road network will also be beneficial.

APPENDIX 11.8:

FIGURES



TITLE:

SOUTH WEST MILTON KEYNES

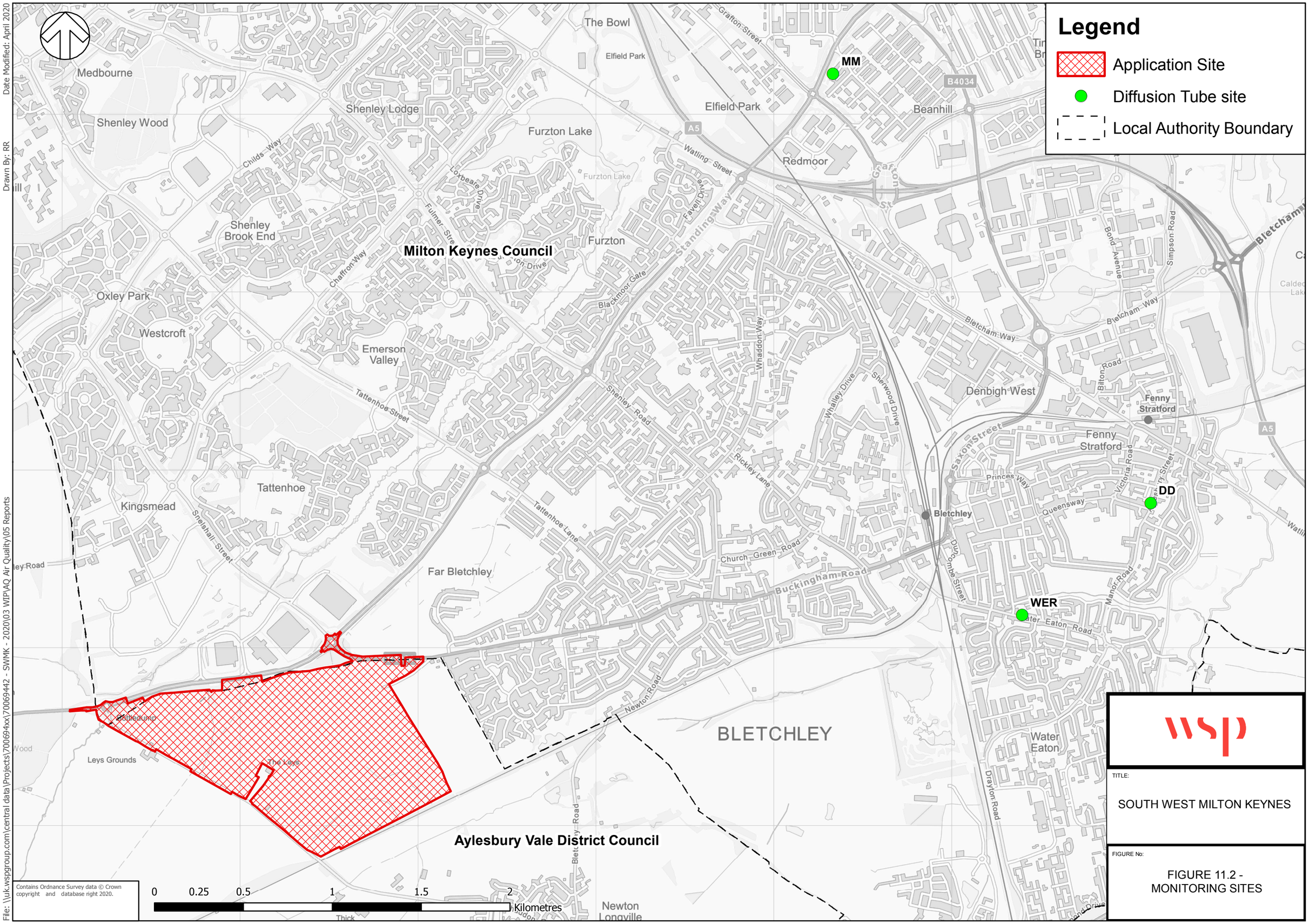
FIGURE No:

FIGURE 11.1 - RECEPTOR LOCATIONS

Date Modified: April 2020

Drawn By: RR

File: \\uk.wspgroup.com\central data\Projects\70069442xx\70069442 - SWMK - 2020\03 WIP\AQ Air Quality\05 Reports



TITLE:

SOUTH WEST MILTON KEYNES

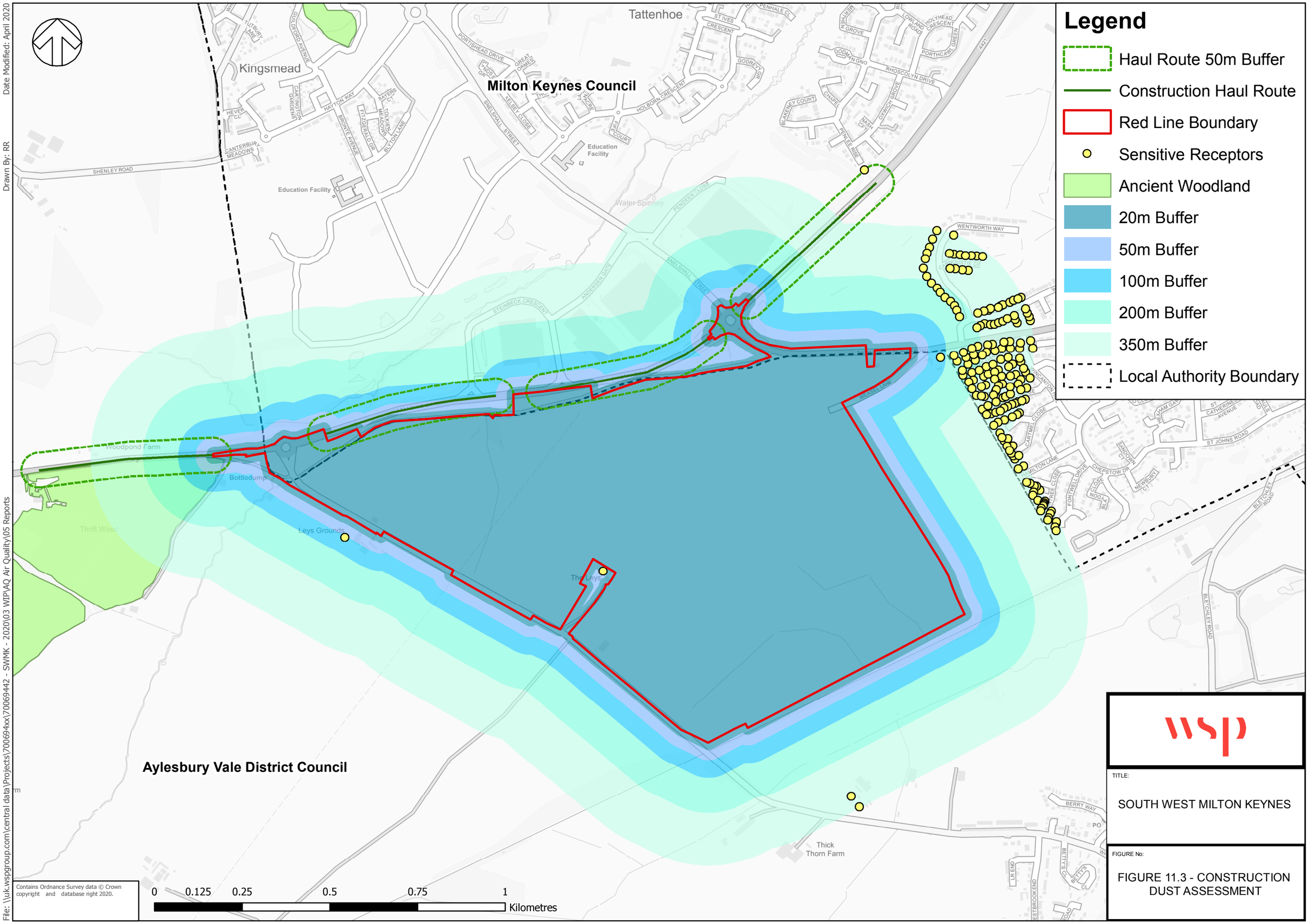
FIGURE No:

FIGURE 11.2 - MONITORING SITES

Date Modified: April 2020

Drawn By: RR

File: \\uk.wspgroup.com\central data\Projects\700694xx\70069442 - SWMK - 2020\03 WIP\AQ Air Quality\05 Reports



wsp

TITLE:

SOUTH WEST MILTON KEYNES

FIGURE No:

FIGURE 11.3 - CONSTRUCTION DUST ASSESSMENT

Date Modified: April 2020

Drawn By: RR

File: \\uk.wspgroup.com\central data\Projects\70069442 - SWMK - 2020\03 WIP\AQ Air Quality\05 Reports