NORTHSTOWE
PHASE 2 PLANNING APPLICATIONS

Environmental Statement (Volume II):
Appendix B Air Quality

August 2014

Homes &
Communities
Agency

Appendix B1 – Construction Dust Methodology

1. **Step 1** screens the requirement for a more detailed assessment. An assessment will normally be required where there is:

    - a 'human receptor' within 350m of the boundary of the site;
    - an 'ecological receptor' within 50m of the boundary of the site; or
    - either a human or ecological receptor within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s) for large sites, up to 200m from medium sites and 50m from small sites.

2. Should sensitive receptors not be present within the relevant distances then negligible impacts would be expected and further assessment is not necessary.

3. **Step 2** assesses the risk of potential dust impacts for each of the four types of construction activity. A site is allocated a risk category (Step 2C) based on two steps:

    - **Step 2A**: The scale and nature of the works, which determines the magnitude of potential dust emissions as small, medium or large; and
    - **Step 2B**: The sensitivity of the area to dust impacts, which is defined as low, medium or high sensitivity.

4. **Step 2A**: The magnitude of potential unmitigated dust emissions is determined based on the criteria shown in Table 1**Error! Reference source not found.**.

Table 1: IAQM Guidance for Construction Dust Magnitude of Impact[1]

Magnitude	Activity	Criteria
Large	Demolition	• Total building volume greater than 50,000m^3 • Potentially dusty construction material (e.g. concrete) • On-site crushing and screening • Demolition activities greater than 20m above ground level;
	Earthworks	• Total site area greater than 10,000m^2 • Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size)

[1] IAQM (2014) Guidance on the Assessment of Dust from Demolition and Construction

Magnitude	Activity	Criteria
		• More than ten heavy earth moving vehicles active at any one time • Formation of bunds greater than 8m in height • More than 100,000 tonnes of material moved
	Construction	• Total building volume greater than 100,000m^3 • On site concrete batching • Sandblasting
	Trackout	• Greater than 50 Heavy Duty Vehicle (HDV) (greater than 3.5 tonnes) outward movements in any one day • Potentially dusty surface material (e.g. high clay content) • Unpaved road length greater than 100m
Medium	Demolition	• Total building volume 20,000m^3 - 50,000m^3 • Potentially dusty construction material • Demolition activities 10-20m above ground level
	Earthworks	• Total site area 2,500m^2 to 10,000m^2 • Moderately dusty soil type (e.g. silt) • Five to ten heavy earth moving vehicles active at any one time • Formation of bunds 4m to 8m in height • Total material moved 20,000 tonnes to 100,000 tonnes
	Construction	• Total building volume 25,000m^3 to 100,000m^3 • Potentially dusty construction material (e.g. concrete) • On site concrete batching
	Trackout	• 10-50 HDV (greater than 3.5 tonnes) outward movements

Magnitude	Activity	Criteria
		in any one day • Moderately dusty surface material (e.g. high clay content) • Unpaved road length 50m to 100m
Small	Demolition	• Total building volume less than 20,000m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber) • Demolition activities less than 10m above ground • Demolition during wetter months
	Earthworks	• Total site area less than 2,500m^2 • Soil type with large grain size (e.g. sand) • Less than five heavy earth moving vehicles active at any one time • Formation of bunds less than 4m in height • Total material moved less than 20,000 tonnes • Earthworks during wetter months
	Construction	• Total building volume less than 25,000m^3 • Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	• Less than 10 HDV (greater than 3.5 tonnes) outward movements in any one day • Surface material with low potential for dust release • Unpaved road length less than 50m

5. **Step 2B** - The sensitivity of the area takes account of a number of factors:

- the specific sensitivities of receptors in the area;

- the proximity and number of those receptors;
- in the case of PM_{10}, the local background concentration; and
- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

6. Table 2 provides guidance on determining the sensitivity of different types of receptors to dust soiling, health effects and ecological effects.

Table 2: IAQM Guidance on the Sensitivity of Types of Receptor to Dust Soiling, Health Effects and Ecological Effects[2]

	High Sensitivity Receptor	Medium Sensitivity Receptor	Low Sensitivity Receptor
Sensitivities of People to Dust Soiling Effects	• users can reasonably expect an enjoyment of a high level of amenity; or • the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. • indicative examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms.	• users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or • the appearance, aesthetics or value of their property could be diminished by soiling; or • the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. • indicative examples include parks and places of work.	• the enjoyment of amenity would not reasonably be expected; or • property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or • there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. • indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.
Sensitivities of	• locations where	• locations where the	• locations where

[2] IAQM (2014) Guidance on the Assessment of Dust from Demolition and Construction

	High Sensitivity Receptor	Medium Sensitivity Receptor	Low Sensitivity Receptor
People to the Health Effects of PM_{10}	members of the public are exposed over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of the assessment.	people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). • indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM10, as protection is covered by Health and Safety at Work legislation.	human exposure is transient • indicative examples include public footpaths, playing fields, parks and shopping streets.
Sensitivities of Ecological Receptors to Dust Effects	• locations with an international or national designation and the designated features may be affected by dust soiling; or • locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain. • indicative examples include	• locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or • locations with a national designation where the features may be affected by dust deposition. • indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.	• locations with a local designation where the features may be affected by dust deposition. • indicative example is a local Nature Reserve with dust sensitive features.

	High Sensitivity Receptor	Medium Sensitivity Receptor	Low Sensitivity Receptor
	a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.		

7. Following identification of the receptor sensitivity, the sensitivity of the area to dust soiling, human health and ecological impacts is determined using Table 3, for each of the four activities (demolition, construction, earthworks and trackout).

Table 3: IAQM Guidance on Sensitivity of the Area in Terms of Dust Soiling, Human Health Impacts and Ecological Impacts[3]

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
Dust Soiling Effects							
High	n/a	Greater than 100	High	High	Medium	Low	Low
	n/a	10-100	High	Medium	Low	Low	Low
	n/a	1-10	Medium	Low	Low	Low	Low
Medium	n/a	Greater than 1	Medium	Low	Low	Low	Low
Low	n/a	Greater than 1	Low	Low	Low	Low	Low
Health Impacts							
High	Greater than 32	Greater than 100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low

[3] IAQM (2014) Guidance on the Assessment of Dust from Demolition and Construction

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
		1-10	High	Medium	Low	Low	Low
	28-32	Greater than 100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28	Greater than 100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	Less than 24	Greater than 100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	n/a	Greater than 10	High	Medium	Low	Low	Low
	n/a	1-10	Medium	Low	Low	Low	Low
Low	n/a	Less than 1	Low	Low	Low	Low	Low
Ecological Impacts							
High	n/a	n/a	High	Medium	n/a	n/a	n/a
Medium	n/a	n/a	Medium	Low	n/a	n/a	n/a
Low	n/a	n/a	Low	Low	n/a	n/a	n/a

8. In the case of high sensitivity receptors with high occupancy (such as schools or hospitals), receptor number is approximate of the number of people likely to be present. In the case of residential dwellings, receptor number is just the number of properties.

9. **Step 2C** - The risk of impacts with no mitigation applied is then defined based upon the interaction between the magnitude of emission and the highest level of area sensitivity (determined in Steps 2A and 2B, respectively) for each

construction activity. The matrices presented in Table 4 provide a method of assigning the level of risk for each activity.

Table 4: IAQM Risk of Dust Impacts Matrix[4]

Sensitivity of Area	Dust Emission 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		
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
	Construction Activities		
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

10. **Step 3** - Step 3 requires the identification of site specific mitigation measures to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with negligible risk, mitigation measures beyond those required by legislation are not required.

11. **Step 4** - 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 phase of a proposed development. This is based on professional judgement but takes account of the significance of the effects for each of the potential dust generating activities.

12. For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation.

[4] IAQM (2014) Guidance on the Assessment of Dust from Demolition and Construction

Appendix B2 – Model Inputs and Verification

13. The proposed development has the potential to affect local air quality as a result of road traffic exhaust emissions, such as NO_2 and PM_{10}, associated with vehicles travelling to and from the site and changes in vehicle flows on the local road network as a result of the construction of the proposed development. Dispersion modelling using ADMS-Roads was therefore undertaken to predict pollutant concentrations in the vicinity of the site both with and without the development in order to consider potential changes as a result of the proposals.

14. The dispersion model requires input data that details the following parameters:

- Assessment area;
- Traffic flow data;
- Vehicle emission factors;
- Spatial co-ordinates of emissions;
- Street width;
- Meteorological data;
- Roughness length; and
- Monin-Obukhov length.

15. Assessment inputs are described in the following subsections.

Dispersion Model

16. Dispersion modelling was undertaken using the ADMS-Roads dispersion model (version 3.2). ADMS-Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and Defra.

Traffic Flow Data

17. Traffic data used in the assessment, including 24-hour AADT flow, fleet composition as HGV proportion and average speed were provided in the Transport Assessment submitted with this planning application. Road widths were manually measured using OS mapping in MapInfo. The traffic data for each scenario is detailed in Appendix 8.3.

Emission Factors

18. Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 6.0.1) released in July 2014. The area selected was 'England (not London)' with a 'basic split' traffic format. The road

types selected for each link were either ‘rural (not London)’ or ‘motorway (not London)’.

Meteorological Data

19. Meteorological data used in this assessment was taken from Cambridge Airport over the period 1 January 2011 to 31 December 2011. Cambridge Airport is located just under 10km south-east of the site. LAQM.TG (09)[5] indicates that meteorological data from within 30km of a modelling area is suitable for detailed assessment.

20. All meteorological data used in the assessment was provided by Atmospheric Dispersion Modelling (ADM) Ltd, which is an established distributor of meteorological data within the UK.

21. Plate 1 presents a wind rose of the meteorological data used in the assessment. The wind rose indicates that the prevailing wind is from the south-west.

[5] Department for the Environment, Food and Rural Affairs (2009) Local Air Quality Management Technical Guidance LAQM.TG(09), Department for the Environment, Food and Rural Affairs

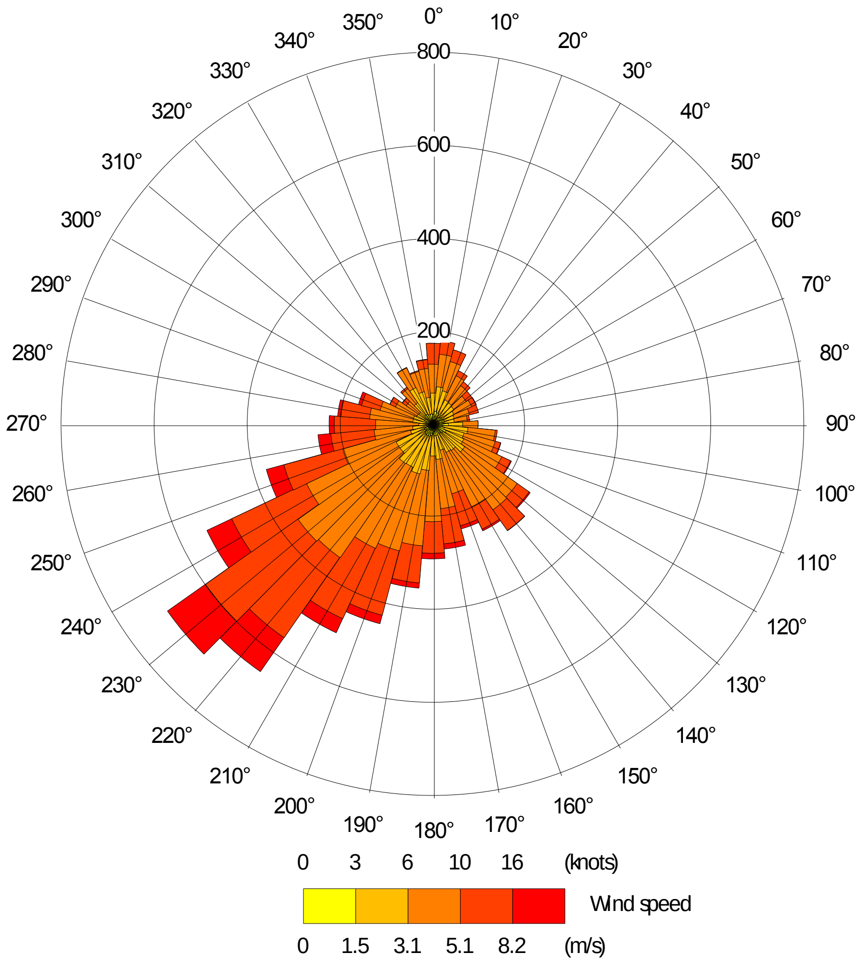

Plate 1: Wind Rose - Cambridge Airport 2011

Roughness Length

22. A roughness length of 0.3m was used in the assessment. The ADMS-Roads user guide states this is suitable for the modelling of agricultural areas. As such, this was considered the most appropriate categorisation of the nature of the dispersion modelling area.

Monin-Obukhov Length

23. A minimum Monin-Obukhov length of 10m was used in the assessment. The ADMS-Roads user guide states this is suitable for modelling areas that can be described as small towns. The categories range from large conurbations to small towns, therefore small towns was considered the most appropriate categorisation to be used for dispersion modelling.

NOx to NO_2 Conversion

24. Road vehicle exhaust emissions are modelled as NOx prior to conversion to NO_2 concentrations for comparison with the relevant AQSs. This was undertaken using

the NOx to NO_2 calculator developed by AEA on behalf of Defra, as advised in LAQM.TG (09)[6].

Background Concentrations

25. Due to the lack of representative background monitoring locations close to the site; it was decided to use the Defra 1 x 1 km mapped backgrounds for NOx and PM_{10}. The most recent issue of the background maps were produced using a base year of 2011, with the projected concentration calibrated against monitoring data collected during 2011.

26. As the background NOx and PM_{10} maps provide data for the individual pollutant sectors (e.g. motorway, trunk A-roads, primary A-roads, minor roads and industry), any components relating to road traffic that were explicitly modelled are usually removed. When the composition of the roads surrounding the site was considered, it was decided that removal of the in-grid square motorway and trunk road emissions would increase the accuracy of the results.

Annualisation

27. In instances where the data capture of the monitoring data was poor, results were annualised. The approach is based on the principle that patterns in pollutant concentrations are usually consistent across broad regions and therefore considers the relationship between annual means at monitoring stations in the same region as the site of interest.

28. 2011 and 2012 annual means from nearby background monitoring sites were compared to derive a factor, as presented in Table 5. This factor was applied to 2011 monitoring data, in order to estimate the 2011 annual mean at sites where data capture was poor.

Table 5: Annualisation of Monitoring Data

Automatic Site	2011	2012	Factor
Wicken Fen	11.5	12.8	0.9
St Ostyth	15.2	17.6	0.9
Norwich Lakenfields	13	14	0.9
Average Factor			**0.9**

Verification

29. Before performing a rigorous air quality assessment at all of the sensitive receptors identified, it is necessary to verify modelling predictions against monitoring data within the study area. This process involves a comparison between predicted and measured road-traffic contributions to pollutant concentrations in order to assess the performance of the model.

[6] Department for the Environment, Food and Rural Affairs (2009) Local Air Quality Management Technical Guidance LAQM.TG(09), Department for the Environment, Food and Rural Affairs

30. The ADMS (Roads) dispersion model was used to predict the contribution of road-traffic to NO_x concentrations at monitoring sites within the study area of this assessment for the Base Year scenario (2011). Modelled NO_2 concentrations were compared to the SCDC bias adjusted diffusion tube concentrations to determine model performance, the results are presented in Table 6.

Table 6: Initial Modelled versus Monitored NO_2 Results

Site ID	Monitored Annual Mean NO_2 (μg/m³)	Modelled Annual Mean NO_2 (μg/m³)	% Difference
SCDC1	20.6	25.3	23%
SCDC2	36.3	18.3	-50%
SCDC3	31.2	23.8	-24%
SCDC4	21.1	18.3	-13%
SCDC14	22.9	18.6	-19%
SCDC8	25.6	37.6	47%
SCDC15	37.2	44.0	18%
SCDC16	32.9	44.7	36%
SCDC17	19.7	36.8	87%
SCDC18	43.0	48.7	13%
SCDC5	25.3	33.7	33%
SCDC6	23.7	27.3	15%
SCDC7	32.6	40.2	23%
SCDC9	21.0	21.0	0%
SCDC10	22.9	24.3	6%
SCDC11	22.5	24.8	10%
SCDC12	26.3	30.3	15%
SCDC13	23.6	23.0	-2%
SCDC19	31.0	36.4	17%
SCDC20	25.0	21.2	-15%

31. Table 6 illustrates that the model generally over predicts at the monitoring locations.

32. Model verification was therefore required and was undertaken following Defra guidance in LAQM.TG(09)[7], this involved correcting the modelled road-traffic NO_x against monitored road-traffic NO_x. As diffusion tubes only measure total NO_2, the road-traffic NO_x concentration measured by each tube was estimated following the methodology outlined in Box A3.6 of LAQM.TG(09). Background NO_2 concentrations obtained from the Defra background maps were subtracted from the total NO_2 concentration measured, the road-traffic NO_2 component was then converted to NO_x using the Version 4.1 of the NO_x to NO_2 calculator developed by Defra.

33. Different factors were calculated and applied to the respective receptors close to the A14 and the surrounding minor road network area.

A14

34. Table 7 presents the modelled versus monitored road NO_x at the diffusion tubes within the study area.

Table 7: Initial Modelled versus Monitored NOx Results – A14

Site ID	Monitored Annual Mean Road NO_x ($\mu g/m^3$)	Modelled Annual Mean Road NO_x ($\mu g/m^3$)
SCDC8	24.1	52.8
SCDC15	52.3	70.8
SCDC16	41.7	73.0
SCDC17	10.8	49.9
SCDC18	66.5	83.6
SCDC5	16.7	35.7
SCDC6	13.3	20.9
SCDC7	35.1	54.2
SCDC9	7.7	7.8
SCDC10	11.6	14.5
SCDC11	10.2	15.0
SCDC12	18.2	27.2

[7] Department for the Environment, Food and Rural Affairs (2009) Local Air Quality Management Technical Guidance LAQM.TG(09), Department for the Environment, Food and Rural Affairs

SCDC13	12.5	11.3
SCDC19	32.1	54.6
SCDC20	16.1	9.6

35. The modelled and monitored road-traffic concentrations were plotted on a scatter graph and linear regression was undertaken to determine the factors to apply to the modelled road NOx, as shown in Plate 2.

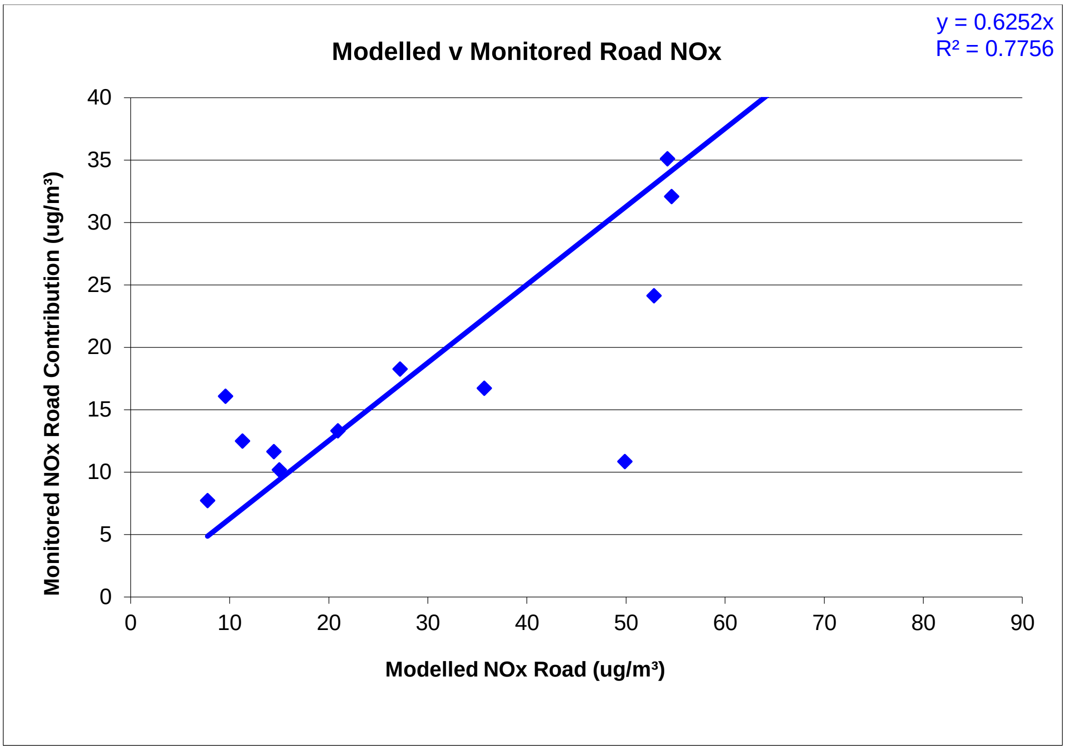

Plate 2: Modelled Road NOx versus Monitored Road NOx

36. The regression line therefore indicated that the modelled road-traffic NO_x results within 200m of the A14 required adjustment by a factor of 0.625 should be applied to the modelled road NOx. The adjusted road-traffic NO_x was then converted to NO_2 and compared against the monitoring results as presented in Table 8.

Table 8: Adjusted Modelled versus Monitored NO_2 Results

Site ID	Monitored Annual Mean NO_2 (µg/m³)	Modelled Annual Mean NO_2 (µg/m³)	% Difference
SCDC8	25.6	21.5	-16%
SCDC15	37.2	29.4	-21%
SCDC16	32.9	26.4	-20%

SCDC17	19.7	17.8	-10%
SCDC18	43.0	33.8	-22%
SCDC5	25.3	22.4	-11%
SCDC6	23.7	21.4	-10%
SCDC7	32.6	27.0	-17%
SCDC9	21.0	19.6	-7%
SCDC10	22.9	20.8	-9%
SCDC11	22.5	20.7	-8%
SCDC12	26.3	23.2	-12%
SCDC13	23.6	21.4	-9%
SCDC19	31.0	25.8	-17%
SCDC20	25.0	22.2	-11%

37. The adjusted modelled results perform better when compared to the monitored concentrations, with the modelled results within 20% of the measured concentrations.

Minor Roads

38. Table 9 presents the modelled versus monitored road NO_x at the diffusion tubes within the study area.

Table 9: Initial Modelled versus Monitored NOx Results – A14

Site ID	Monitored Annual Mean Road NO_x (μg/m³)	Modelled Annual Mean Road NO_x (μg/m³)
SCDC1	1.7	6.4
SCDC2	21.3	3.3
SCDC3	15.4	8.0
SCDC4	6.1	3.3
SCDC14	7.9	3.6

39. The modelled and monitored road-traffic concentrations were plotted on a scatter graph and linear regression was undertaken to determine the factors to apply to the modelled road NOx, as shown in Plate 3.

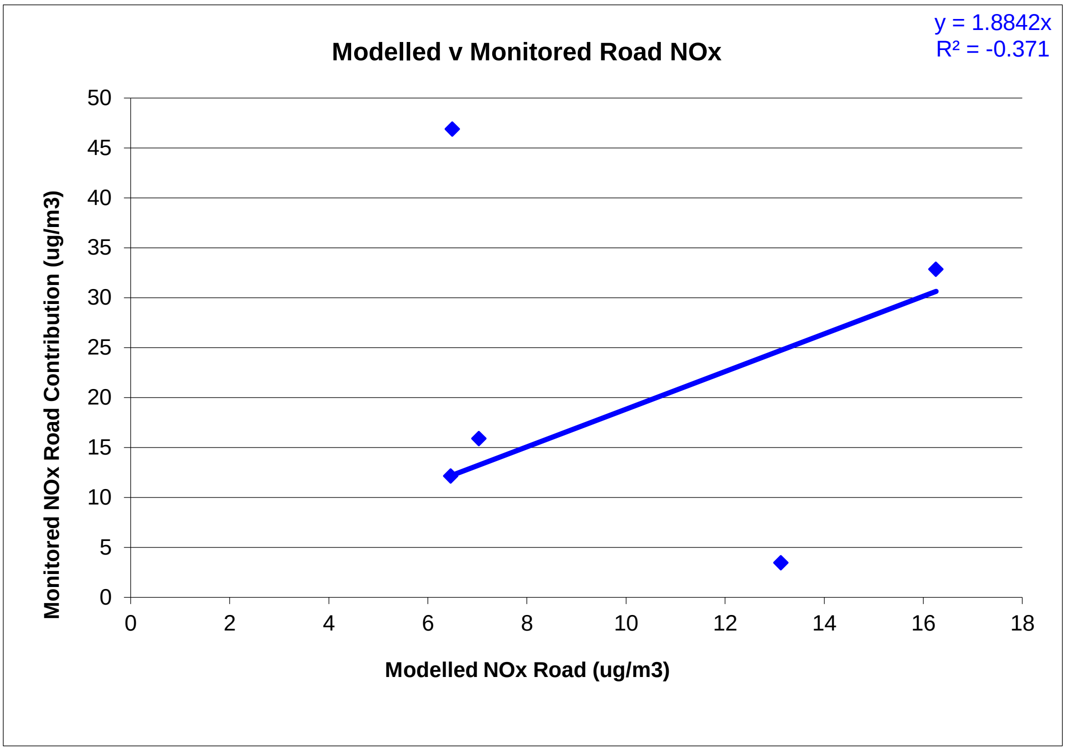

Plate 3: Modelled Road NOx versus Monitored Road NOx

40. The regression line therefore indicated that the modelled road-traffic NO_x results within 200m of minor roads required adjustment by a factor of 1.88 should be applied to the modelled road NOx. The adjusted road-traffic NO_x was then converted to NO_2 and compared against the monitoring results as presented in Table 8.

Table 10: Adjusted Modelled versus Monitored NO_2 Results

Site ID	Monitored Annual Mean NO_2 (µg/m³)	Modelled Annual Mean NO_2 (µg/m³)	% Difference
SCDC1	20.6	30.6	48%
SCDC2	36.3	21.2	-42%
SCDC3	31.2	30.3	-3%
SCDC4	21.1	21.1	0%
SCDC14	22.9	21.6	-6%

41. The adjusted modelled results perform better when compared to the monitored concentrations, with thee of the modelled sites within 6% of the measured concentrations.

PM10

42. Modelled PM_{10} concentrations were compared against the automatic monitoring results at Bar Hill and Orchard Primary School automatic monitoring stations as presented in Table 11.

Table 11: Modelled v Monitored PM_{10} Concentrations

Monitor	Modelled Road PM_{10}	Background PM_{10}	Total Modelled PM_{10}	Monitored PM_{10}	Ratio
Bar Hill	4.0	21.0	25.0	23.0	0.9
Orchard Park	0.4	20.5	20.9	23.0	1.1
				Average Factor	1.0

43. Given the average factor of the total concentrations between the modelled and monitored was 1.0 the PM_{10} concentrations were not verified as the modelled results were in good agreement with the monitored.

Appendix B3 – Traffic Data

Table 12: Traffic Data

Description	Direction	2011 Annual Averages (Vehicles)					2031 DM Annual Averages (Vehicles)					2026 DS1 Annual Averages (Vehicles)				2031 DS1 Annual Averages (Vehicles)				
		Light	Heavy	Total	% Heavy	Speed (km)	Light	Heavy	Total	% Heavy	Speed (km)	Light	Heavy	Total	% Heavy	Light	Heavy	Total	% Heavy	Speed (km)
Site 1 – B1050 Hatton's Road, north-east of A14	NB	6,634	205	6,839	3%	66	10,651	242	10,892	2%	58	9,176	235	9,412	3%	9,106	241	9,347	3%	55
	SB	6,741	361	7,101	5%	52	10,425	454	10,879	4%	56	8,474	424	8,898	5%	8,282	441	8,723	5%	10
Site 2 – Dry Drayton Road, north-east of A14	NB	5,236	151	5,387	3%	58	5,996	208	6,204	3%	56	6,238	213	6,451	3%	6,644	215	6,859	3%	57
	SB	6,259	168	6,427	3%	55	6,265	244	6,509	4%	55	6,831	232	7,064	3%	7,213	272	7,485	4%	48
Site 3 – Ramper Road, west of Longstanton Bypass roundabout	EB	2,563	75	2,639	3%	36	3,967	100	4,067	2%	36	4,441	93	4,534	2%	5,735	99	5,834	2%	34
	WB	2,172	33	2,205	2%	55	3,539	47	3,587	1%	53	4,102	38	4,141	1%	5,053	42	5,095	1%	53
Site 4 – B1050 Station Road, north of Cambridgeshire Guided Busway	NB	4,322	233	4,555	5%	38	6,644	263	6,907	4%	40	7,489	260	7,749	3%	8,365	269	8,634	3%	42
	SB	4,384	318	4,702	7%	11	5,812	391	6,203	6%	24	6,813	362	7,176	5%	7,761	374	8,136	5%	21
Site 5 – Cambridge Road, Oakington	NB	4,023	87	4,110	2%	62	4,724	110	4,833	2%	62	4,756	105	4,861	2%	4,969	110	5,079	2%	62
	SB	3,775	77	3,853	2%	63	4,722	75	4,797	2%	62	4,607	74	4,681	2%	4,729	76	4,805	2%	61
Site 6 – Rampton Road, between Rampton and Willingham	EB	1,921	41	1,961	2%	63	2,693	51	2,744	2%	61	2,488	59	2,547	2%	2,751	65	2,816	2%	59
	WB	2,472	78	2,550	3%	63	3,064	115	3,180	4%	61	3,200	123	3,323	4%	3,355	128	3,483	4%	63
Site 7 – B1050 Earith Road, north of Willingham	SB	5,189	293	5,482	5%	59	6,071	330	6,401	5%	57	6,640	310	6,949	4%	7,272	324	7,596	4%	51
	NB	5,753	232	5,985	4%	57	7,161	243	7,404	3%	55	7,696	243	7,938	3%	8,088	251	8,339	3%	54
Site 8 – A1096 Harrison Way, St. Ives	NB	12,692	696	13,388	5%	62	14,378	800	15,178	5%	47	13,946	755	14,700	5%	14,158	813	14,971	5%	35
	SB	10,591	796	11,388	7%	64	13,813	631	14,444	4%	61	13,393	553	13,947	4%	13,957	625	14,582	4%	59
Site 9 – Willingham Road, between Over and Willingham	EB	1,287	19	1,306	1%	57	1,670	14	1,684	1%	44	1,424	13	1,438	1%	1,509	15	1,524	1%	43
	WB	1,440	22	1,462	2%	77	1,807	27	1,833	1%	76	1,639	25	1,664	2%	1,618	26	1,644	2%	76
Site 10 – Longstanton Road (the airfield road), Oakington	SB	1,241	35	1,276	3%	64	1,191	49	1,239	4%	64									
	NB	826	31	857	4%	64	1,067	38	1,106	3%	64									
Site 12 - Boxworth End, Swavesey (just north of A14)	NB	3,391	40	3,431	1%	44	5,697	106	5,804	2%	40	5,618	111	5,729	2%	6,543	112	6,656	2%	42
	SB	2,872	23	2,895	1%	44	4,338	54	4,392	1%	41	4,409	47	4,456	1%	4,884	51	4,935	1%	38
Site 13 - Ramper Road, just east of Swavesey	EB	1,111	18	1,129	2%	64	2,257	29	2,286	1%	62	2,549	25	2,574	1%	3,719	28	3,746	1%	57
	WB	827	22	849	3%	64	1,857	34	1,891	2%	62	2,302	26	2,328	1%	3,075	29	3,104	1%	60
Site 14 - Longstanton High Street	NB	931	34	964	3%	40	1,210	38	1,248	3%	39	686	26	713	4%	903	27	931	3%	38
	SB	1,168	36	1,205	3%	44	1,316	41	1,357	3%	44	613	21	633	3%	819	21	841	3%	44
Site 15 - B1049, North of Cottenham	NB	4,572	206	4,778	4%	64	4,973	278	5,251	5%	63	4,912	276	5,188	5%	5,002	259	5,261	5%	72
	SB	4,705	212	4,917	4%	72	6,069	342	6,411	5%	70	5,900	320	6,219	5%	6,199	349	6,547	5%	64
Site 16 - Cottenham Road, just south of Cottenham	NB	5,746	260	6,006	4%	71	7,269	351	7,620	5%	67	6,840	322	7,162	4%	7,247	352	7,599	5%	70
	SB	4,519	186	4,705	4%	70	6,114	248	6,363	4%	69	5,910	250	6,160	4%	5,942	248	6,190	4%	63
Site 17 - Bridge Road, Histon (near A14)	NB	9,158	354	9,512	4%	51	10,980	477	11,457	4%	43	10,423	479	10,902	4%	10,817	502	11,319	4%	37
	SB	8,949	304	9,252	3%	51	13,515	452	13,967	3%	41	12,852	435	13,287	3%	13,391	444	13,835	3%	31
Site 18 - Oakington Road, Oakington (busway)	NB	3,441	120	3,561	3%	43	4,239	199	4,438	4%	43	3,593	182	3,776	5%	3,982	183	4,165	4%	43
	SB	3,872	137	4,009	3%	38	4,408	206	4,614	4%	37	4,092	188	4,280	4%	4,349	223	4,572	5%	34
Site 19 - New Road, Histon	EB	3,354	82	3,436	2%	64	5,076	86	5,163	2%	62	4,599	85	4,684	2%	4,782	88	4,870	2%	62
	WB	3,837	61	3,897	2%	51	5,199	71	5,270	1%	44	4,794	70	4,864	1%	4,878	73	4,950	1%	43
Site 20 - Butt Lane, Milton (west of A10)	EB	1,086	80	1,166	7%	52	1,722	98	1,820	5%	50	1,184	95	1,279	7%	1,668	98	1,766	6%	52

	WB	2,032	23	2,055	1%	51	2,993	62	3,055	2%	48	2,450	30	2,480	1%	2,832	62	2,894	2%	48
A14 West of Junction 28 (Swavesey) - proposed Huntingdon Southern Bypass	EB						34,383	10,205	44,588	23%	96	31,464	10,080	41,544	24%	34,675	10,126	44,800	23%	98
	WB						31,211	9,102	40,313	23%	99	29,355	8,677	38,032	23%	31,373	9,105	40,477	22%	101
A14 East of Junction 28 (Swavesey)	EB	32,491	9,436	41,927	23%	88	47,588	11,696	59,284	20%	86	45,521	11,141	56,662	20%	47,414	11,689	59,102	20%	87
	WB	34,439	9,434	43,874	22%	85	46,820	11,548	58,368	20%	87	44,833	11,103	55,936	20%	46,482	11,557	58,038	20%	91
A14 East of Junction 29 (Bar Hill)	EB	40,187	9,880	50,067	20%	93	56,658	12,327	68,985	18%	93	56,308	11,735	68,044	17%	61,070	12,302	73,372	17%	89
	WB	41,809	9,670	51,479	19%	92	55,081	11,717	66,798	18%	95	55,701	11,280	66,981	17%	59,862	11,729	71,591	16%	96
A14 East of Junction 31 (Girton)	EB	30,074	7,191	37,265	19%	80	46,969	9,135	56,104	16%	81	45,825	8,691	54,516	16%	48,034	9,127	57,161	16%	54
	WB	29,169	6,699	35,868	19%	71	50,272	8,843	59,115	15%	84	48,932	8,322	57,254	15%	51,721	8,829	60,550	15%	86
A14 East of Junction 32 (Histon)	EB	28,646	6,931	35,577	19%	54	43,845	8,848	52,692	17%	68	42,409	8,396	50,806	17%	44,098	8,842	52,940	17%	61
	WB	28,280	6,482	34,762	19%	88	48,724	8,593	57,317	15%	88	46,688	8,087	54,775	15%	49,267	8,590	57,857	15%	92
Local Access Road west of Bar Hill	EB						3,236	72	3,309	2%	83	2,641	70	2,711	3%	3,336	67	3,403	2%	84
	WB						3,198	64	3,262	2%	84	2,733	57	2,790	2%	2,981	71	3,052	2%	84
Local Access Road east of Bar Hill	EB						6,324	96	6,420	1%	70	7,400	103	7,502	1%	8,396	102	8,498	1%	69
	WB						6,888	209	7,097	3%	78	8,416	198	8,614	2%	9,542	208	9,750	2%	72
Local Access Road south of Dry Drayton	EB						1,481	51	1,532	3%	84	1,259	48	1,306	4%	1,374	57	1,430	4%	84
	WB						1,570	61	1,631	4%	65	1,432	52	1,484	3%	1,653	61	1,714	4%	65
B1050 North of Bar Hill Junction	NB	6633	205	6838	3%	66	10241	232	10473	2%	58	15723	403	16127	3%	19334	511	19845.53	3%	62
	SB	6742	361	7103	5%	52	10152	443	10595	4%	56	13852	692	14545	5%	16139	860	16999.02	5%	98
Hatton's Link Road	EB											5964	153	6116	3%	9362	248	9609	3%	90
	WB											5213	261	5473	5%	7826	417	8242	5%	88
Dry Drayton Link Road	NB																			
	SB																			
Primary Road 1 - Centre	NB											5964	153	6116	3%	9362	248	9609	3%	33
	SB											5213	261	5473	5%	7821	417	8237	5%	35
Primary Road 2 - East	NB																			46
	SB																			46
B1050 N of Hatton's Road Roundabout	NB	5064	156	5220	3%	73	8094	184	8277	2%	70	7290	187	7477	3%	6905	183	7088	3%	74
	SB	5215	279	5494	5%	69	7645	333	7978	4%	66	6671	333	7004	5%	6295	335	6630	5%	64
Hatton's Road E of B1050 and N of School Lane	NB	1252	50	1302	4%	60	1633	61	1694	4%	60	1435	52	1488	4%	1616	58	1674	3%	60
	SB	1343	54	1397	4%	61	2204	82	2287	4%	61	1760	64	1824	4%	1960	70	2030	3%	61
A14 East of Dry Drayton	EB	40234	9891	50125	20%	92	54802	11923	66724	18%	90	54663	11392	66056	17%	58276	11739	70015	17%	86
	WB	39914	9231	49145	19%	71	52391	11145	63535	18%	94	52967	10726	63693	17%	56701	11109	67810	16%	95
Cambridge Road, S of Girton	NB	1207	48	1256	4%	42	2529	94	2623	4%	40	2198	80	2278	4%	2523	90	2613	3%	36
	SB	1576	63	1639	4%	46	2858	107	2965	4%	46	2770	101	2871	4%	2968	106	3075	3%	46
High Street Willingham	NB	5009	283	5292	5%	38	6588	358	6947	5%	35	6742	314	7056	4%	6955	310	7265	4%	38
	SB	5724	231	5955	4%	32	7149	243	7391	3%	28	7415	234	7649	3%	7493	233	7725	3%	20
Junction 31 (Girton) - A14 (SB) to A14 Northern Bypass (EB)	EB	15040	3729	18769	20%	76	22915	4786	27701	17%	94	22810	4651	27460.99	17%	22954	4651	27604.85	17%	94

Junction 31 (Girton) - Huntingdon Road (NB) to A14 (NB)	NB	4986	1236	6222	20%	100	9014	1883	10896	17%	66	8708	1776	10484	17%	9929	2012	11940.37	17%	59
Junction 31 (Girton) - A14 Northern Bypass (WB) to A14 (NB)	NB	13633	3380	17012	20%	30	23634	4937	28571	17%	94	22990	4688	27678	17%	23410	4744	28154	17%	94
Junction 32 (Histon) On-Slips	EB	5741	1423	7164	20%	96	7314	1528	8842	17%	96	7548	1539	9087	17%	7731	1567	9297.948	17%	95
	WB	5397	1338	6734	20%	95	9993	2087	12081	17%	92	10128	2065	12193	17%	10683	2165	12848.16	17%	91
Junction 32 (Histon) Off-Slips	EB	8265	2049	10315	20%	25	13156	2748	15904	17%	27	13079	2667	15746	17%	15029	3045	18074.77	17%	31
	WB	5026	1246	6273	20%	28	8690	1815	10505	17%	28	8532	1740	10271	17%	7898	1600	9498.719	17%	27
Oakington Road, between Dry Drayton and A14	EB	2400	85	2485	3%	41	3520	165	3685	4%	39	3495	160	3655	4%	3652	187	3838.824	5%	38
	WB	1919	67	1986	3%	41	2993	141	3133	4%	39	2992	152	3144	5%	2831	130	2960.902	4%	39
B1050, between Ramper Road/B1050 roundabout and Station Road	EB	5536	171	5707	3%	45	9579	217	9797	2%	43	8825	226	9052	3%	8210	217	8427.179	3%	44
	WB	5040	270	5310	5%	44	8442	368	8810	4%	42	7636	382	8017	5%	8290	442	8731.772	5%	40