

15. Air Quality

Appendix 15.1 PM2.5 Target Interim Guidance

Appendix 15.1 PM_{2.5} Target Interim Guidance

With regards to the interim planning guidance relating to the new PM_{2.5} targets (as outlined in section 15.19), the Proposed Development includes the following measures to minimise PM_{2.5} emissions and exposure:

- Locating commercial use spaces on the ground floor of residential buildings to minimize the impact of traffic emissions from the Mancunian Way and Hoyle Street to residents;
- Use of heat pumps as for the heating and hot water strategy of Proposed Development, minimizing emissions from energy generation;
- During construction, best practice mitigation measures will be adopted to minimise PM_{2.5} emissions. The mitigation measures will be informed by the construction dust risk assessment in Appendix 15.2;
- During construction a Travel Plan will be in place for construction workers to promote and encourage use of sustainable travel to the EIA Site;
- Limited parking space, which would likely encourage use of public and active transport, minimizing traffic emissions around the EIA Site;
- All external parking spaces shall be provided with electric vehicle charging; and
- A Framework Travel Plan will be in place which will encourage and enable residents to travel by sustainable modes.

Appendix 15.2 Construction Dust Risk Assessment

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Assessment of construction dust impacts have been scoped out of the ES. However, a construction dust risk assessment has been carried out in order to determine the mitigation measures that should be applied in order to ensure that residual effects arising from construction dust are negligible.

The IAQM assessment methodology recommends that significance criteria are only assigned to the identified risk of dust impacts occurring from a construction activity with appropriate mitigation measures in place. The reason for this is that for almost all construction activities, the application of effective mitigation should prevent any Significant effects from occurring to existing sensitive receptors, and therefore the residual effect will likely be Negligible.

Predicting the impacts due to construction dust is difficult as it is dependent on a number of factors, particularly the weather during specific works. This cannot be predicted, and therefore the assessment methodology uses a risk-based approach to identify appropriate mitigation measures. The assessment, whilst adopting some conservative assumptions, assumes that the mitigation measures will be fully implemented. It should be noted that there may be periods where there is visible dust, but this is likely to be infrequent and insufficient to negatively impact on amenity.

Methodology

Methodology for determining impact magnitude

The dust emission magnitude is based on the scale of the anticipated works and should be classified as Small, Medium, or Large.

Demolition: Example definitions for demolition are:

- Large: Total building volume > 75,000 m³, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities > 12 m above ground level;

- Medium: Total building volume 12,000 m³ – 75,000 m³, potentially dusty construction material, demolition activities 6-12 m above ground level; and
- Small: Total building volume <12,000 m³ construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities.

Earthworks: Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. This may also involve levelling the site and landscaping. Example definitions for earthworks are:

- Large: Total site area >110,000 m², potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height;
- Medium: Total site area 18,000 m² – 110,000 m², moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3m - 6m in height; and
- Small: Total site area <18,000 m², soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <3 m in height.

Construction: The key issues when determining the potential dust emission magnitude during the construction phase include the size of the building(s) / infrastructure, method of construction, construction materials, and duration of build. Example definitions for construction are:

- Large: Total building volume >75, 000 m³, on site concrete batching, sandblasting;
- Medium: Total building volume 12,000 m³– 75,000 m³, potentially dusty construction material (e.g. concrete), on site concrete batching; and
- Small: Total building volume <12,000 m³, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout: Factors which determine the dust emission magnitude are vehicle size, vehicle speed, vehicle numbers, geology and duration. As with all other potential sources, professional judgement must be applied when classifying trackout into one of the dust emission magnitude categories. Example definitions for trackout are:

- Large: >50 HDV (>3.5t) outward movements¹ in any one day², potentially dusty surface material (e.g. high clay content), unpaved road length >100 m;
- Medium: 20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m; and
- Small: <20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m.

These numbers are for vehicles that leave the EIA Site after moving over unpaved ground, where they will accumulate mud and dirt that can be tracked out onto the public highway.

Methodology for determining sensitivity

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 PM₁₀, 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.

Examples of sensitivities of various receptors to dust soiling, elevated PM₁₀ and ecological effects are shown in Table 1.

For the sensitivity of people and their property to soiling, the IAQM recommends that the air quality practitioner uses professional judgement to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the general principles in the table below.

For the sensitivity of people to the health effects of PM₁₀, the IAQM recommends that the air quality practitioner assumes that there are three sensitivities based on whether or not the

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¹ A vehicle movement is a one way journey. i.e. from A to B, and excludes the return journey.

² HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average.

receptor is likely to be exposed to elevated concentrations over a 24-hour period, consistent with the Defra's advice for local air quality management.

With regards to ecological effects, it is advised to seek the advice of an ecologist to determine the need for an assessment of dust impacts on sensitive habitats and plants. Professional judgement is required to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the likely effect and the value of the ecological asset. A habitat may be highly valuable but not sensitive, alternatively it may be less valuable but more sensitive to dust deposition. Consequently, specialist ecological advice should also be sought to determine the sensitivity of the ecological receptors to dust impacts. In general, most receptors will either be of high sensitivity or low sensitivity i.e. either sensitive or not to dust deposition.

Table 1 Examples of receptor sensitivities for various construction effects.

Receptor sensitivity	Effects		
	Assessing the risk of dust impacts	Assessing the risk of dust impacts	Assessing the risk of dust impacts
High	Users can reasonably expect a enjoyment of a high level of amenity. 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, museum and other culturally important collections, medium and long term car parks and car showrooms.	Locations where 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 this assessment.	Locations with an international or national designation and the designated features may be affected by dust soiling; or location where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain. An indicative example is a Special Area of Conservation (SAC) designated for acid heathlands adjacent to the demolition of a large site containing concrete (alkali) buildings or for the presence of lichen.
Medium	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	Locations where the 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 may include office and shop workers, but will	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 examples include a Site of Special Scientific Interest

	as part of the normal pattern of use of the land. Indicative examples include parks and places of work.	generally not include workers occupationally exposed to PM10, as protection is covered by Health and Safety at Work legislation.	(SSSI) with dust sensitive features.
Low	The enjoyment of amenity would not reasonably be expected; or there is property that 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.	Locations where human exposure is transient. Indicative examples public footpaths, playing fields, parks and shopping streets.	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.

Appendix 15.3 Traffic Data

Appendix 15.3 Supplied Traffic Data

Traffic data provided by the project transport consultant (Civic) was provided on 18/11/2024. The data included the locations presented in Figure 1. The full traffic data supplied by the project transport consultant is presented in Table 1.

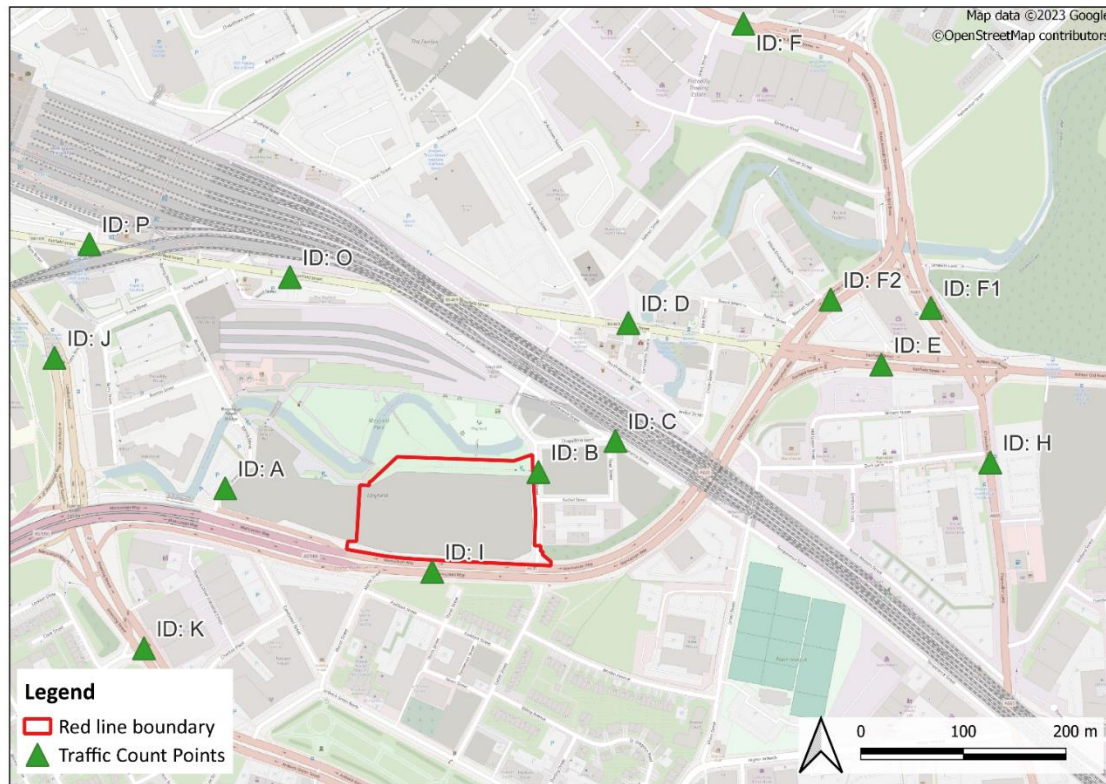


Figure 1 Traffic data point ID locations.

Table 1 Traffic data (AADT) supplied by the project traffic consultant.

ID	Location	2023 existing baseline		2026 peak construction year - Do Minimum (DM)		2026 peak construction year - Do Something (DS)		2029 first operational year - Do Minimum (DM)		2029 first operational year - Do Something (DS)		Trip generation due to Proposed Development - construction		Trip generation due to Proposed Development - operation	
		Total	HDV	Total	HDV	Total	HDV	Total	HDV	Total	HDV	Total	HDV	Total	HDV
A	Baring Street	301	1	301	1	301	1	301	1	2992	24	0	0	204	23
B	Hoyle Street	2242	2	2242	2	2454	33	2242	2	2446	25	212	31	204	23
C	Temperance Street	1629	11	1629	11	1629	11	1629	11	1629	11	0	0	0	0
D	Fairfield Street west	5183	100	5183	100	5396	131	5183	100	5375	126	212	31	229	26
E	Fairfield Street east	19476	796	19476	796	19547	806	19476	796	20362	808	71	10	102	11
F	Great Ancoats Street	19476	796	19476	796	19547	806	19540	797	18597	803	71	10	51	6
G	Ashton Old Road	24391	737	24391	737	24462	747	24455	738	24540	744	71	10	51	6
H	Chancellor Lane	19621	226	19621	226	19621	226	19749	227	19833	234	0	0	51	6
I	Mancunian Way (at Hoyle St)	40089	1244	40089	1244	40160	1254	40089	1244	40547	1255	71	10	76	9
J	A6 London Road north	12518	212	12518	212	12518	212	12676	214	16229	222	0	0	76	9

ID	Location	2023 existing baseline		2026 peak construction year - Do Minimum (DM)		2026 peak construction year - Do Something (DS)		2029 first operational year - Do Minimum (DM)		2029 first operational year - Do Something (DS)		Trip generation due to Proposed Development - construction		Trip generation due to Proposed Development - operation	
		Total	HDV	Total	HDV	Total	HDV	Total	HDV	Total	HDV	Total	HDV	Total	HDV
K	A6 Downing Street, Ardwick Green South	22118	536	22118	536	22118	536	22593	541	21637	547	0	0	51	6
L	Princess Street	6858	83	6858	83	6858	83	6963	84	7082	91	0	0	51	6
M	Upper Brook Street	16862	285	16862	285	16862	285	16967	286	17288	298	0	0	51	6
N	Oxford Road north	16862	285	16862	285	16862	285	16967	286	17018	292	0	0	51	6
F1	Great Ancoats Street East	9738	398	9738	398	9773	403	9770	398	9299	402	35	5	25	3
F2	Great Ancoats Street West	9738	398	9738	398	9773	403	9770	398	9299	402	35	5	25	3
O	Fairfield St between Hoyle Street and Baring Street	5183	100	5183	100	5183	100	5183	100	5273	115	0	0	127	14
P	Fairfield St west of Baring Street	5183	100	5183	100	5183	100	5183	100	5324	120	0	0	178	20

Appendix 15.4 Air Quality Dispersion Modelling Methodology

Appendix 15.4 Traffic Emissions Modelling Methodology

The impact of emissions from nearby road links has been predicted at sensitive receptor locations, in proximity to impacted roads, using the dispersion model ADMS-Roads (v5)¹.

Dispersion Model Set Up and Parameters

Hourly sequential meteorological data from Manchester Airport for 2023 has been input into the model. The dataset provides hourly temperature, wind speed, wind direction and cloud cover. Data was obtained from the NOAA Integrated Surface Database², via the wormlet R package. This meteorological station is 14 km to the southwest of the EIA Site, so is deemed to be representative of conditions on-site. Due to there being low cloud cover data availability at Manchester Airport, the cloud cover has been gap filled using data from Rostherne meteorological station. This ensures that data availability is high (>92%) for all key parameters. A wind rose at this station in 2023 is presented in Figure 1.

¹CERC. (2020). ADMS-Roads: Comprehensive software for modelling road traffic pollution.

<https://www.cerc.co.uk/environmental-software/ADMS-Roads-model.html>

²NOAA. (2024). Global Hourly - Integrated Surface Database (ISD). <https://www.ncei.noaa.gov/products/land-based-station/integrated-surface-database>

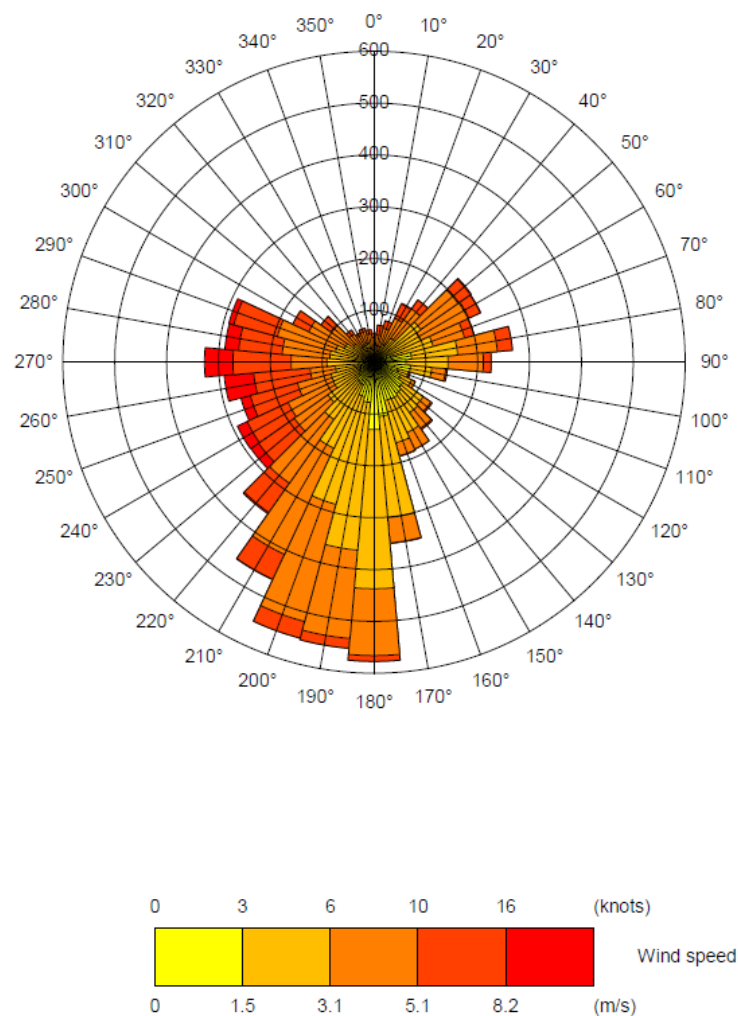


Figure 1 Windrose for Manchester Airport 2023.

Surface roughness represents the extent of mechanical turbulence in the atmosphere caused by the roughness of the ground over which the air is passing. A surface roughness of 0.8 m has been used for the EIA Site, which is a rule of thumb approximation of value between suburbia and large city centre, and 0.5 at the meteorological site, a rule of thumb value for open suburbia and parkland.

The Monin-Obukhov length represents the stability of the atmosphere. In urban areas, there is a significant amount of heat generated by buildings and traffic which warms the air above the city creating an effect called urban heat island. This additional heat prevents the atmosphere from becoming very stable in urban areas, meaning the Obukhov length will never fall below a certain value in stable conditions. A minimum Obukhov length of 30 m was used for the EIA Site, which is a rule of thumb value for cities and large towns.

Background concentrations

Defra model grid background concentrations across the UK on 1km x 1km grid squares, utilising a base year of 2021³. Estimated pollutant concentrations for the existing baseline year 2023 in the OS grid square in which the EIA Site lies (centred at 385500,397500) are shown in Table 1.**Error! Reference source not found.**

Sector removal was applied to the concentrations to account for the contribution of the motorways and A roads within the grid square (Table 1). As all motorways and A roads within the grid square were included in the model domain, sector removal prevents 'double counting' of these emissions. Sector removal for NO₂ was carried out using the Defra NO₂ Adjustment for NOx Sector Removal Tool v9.0⁴. The final concentrations used are shown in Table 2.

Defra modelled concentrations were compared to two nearby monitoring stations that are representative of urban background (locations shown in Figure 2). The urban background monitoring station MA72NO is located 50 m south of the Mancunian Way and recorded NO₂ concentrations comparable with Defra modelled concentrations without sector removal applied. The roadside station MA112BNO is located within a residential area far from major roads and concentrations are comparable to Defra modelled concentrations post sector removal.

³ Defra. (2024). Background Mapping data for local authorities. <https://uk-air.defra.gov.uk/data/laqm-background-home>

⁴ Defra. (2024). NO₂ Adjustment for NOx Sector Removal Tool. <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/no2-adjustment-for-nox-sector-removal-tool/>

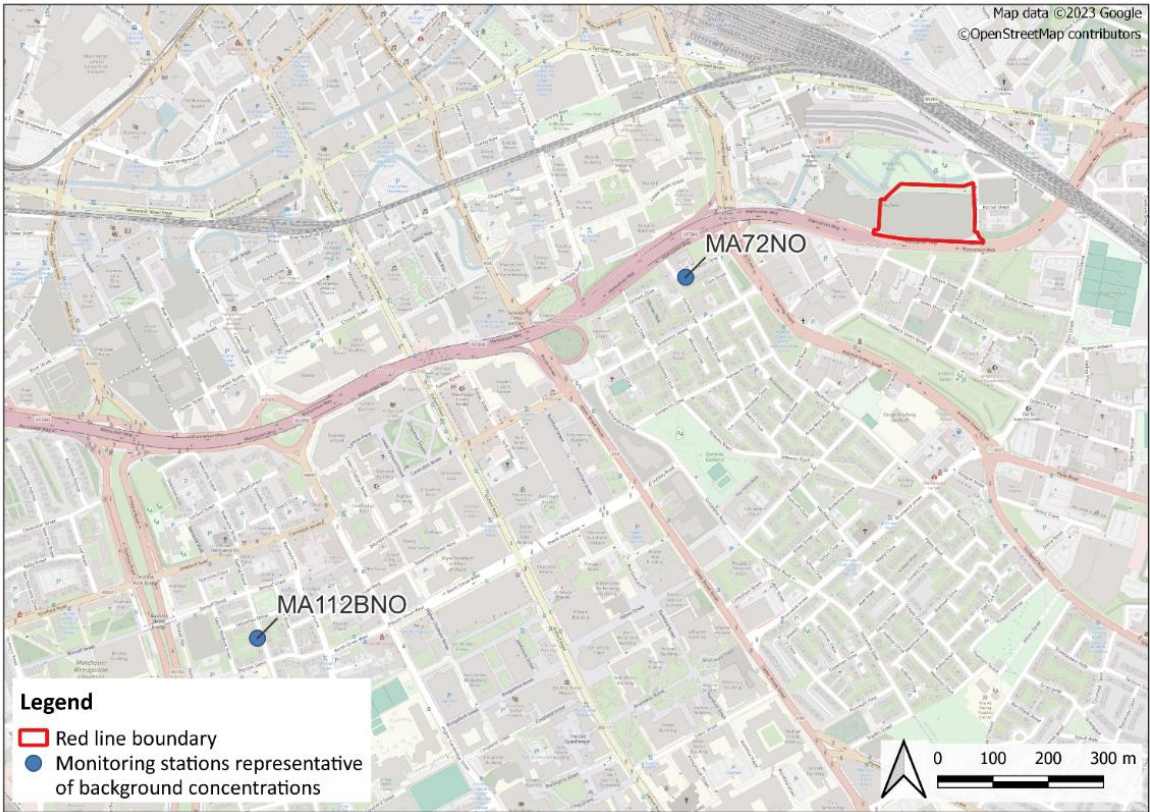


Figure 2 Monitoring sites representative of background concentrations in proximity to the EIA Site.

Table 1 Raw Defra modelled background NO₂ and NO_x annual concentrations compared with background monitoring stations.

2023 modelled annual mean background concentration comparison (µg/m ³)				
Air pollutant	Defra modelled	Post sector removal	MA72NO	MA112BNO
NO ₂	23.4	19.6	24.3	19.8
NO _x	34.5	27.9	-	-

Table 2 Defra modelled background concentrations that will be utilised in the assessment.

2023 annual mean background concentrations used (µg/m ³)			
NO ₂	NO _x	PM ₁₀	PM _{2.5}
19.6	27.9	11.6	7.8

Model Input Parameters

The model input parameters are summarised in Table 3.

Table 3 Model Input Parameters

Parameter	Description	Input Variable
Surface Roughness	Surface roughness of the modelling domain as a function of land use	A surface roughness length (z_0) of 0.8m was used for the dispersion site and 0.5 m at the meteorological site. These values are considered appropriate for the surface roughness of the dispersion modelling assessment.
Road Source Emissions	Source of the emission factors used	EFT v.12.1
Verification Year	Modelling year used to calculate verification factor for the traffic emissions	2023 for the verification year and all future years.
NO_x to NO₂ Conversion	Conversion from NO _x concentrations to NO ₂ concentrations	NO _x to NO ₂ calculator v9.1. General inputs – Manchester, All other urban UK traffic.
Road Type	Road type within the EFT emission database	Urban (not London)
Elevation of Road	Height of the road link above ground level	Road elevations were set to 0, 3, 7 and 10 m where applicable. Measured in Google Earth ⁵ .
Road Width	Width of the road link	Road width measured from satellite imagery.
Road Speed	Road speed in km/h	As provided by Civic, speeds reduced at junctions in line with LAQM TG22 guidance.
Meteorology	Representative hourly sequential meteorological data	Manchester Airport 2023. Cloud clover gap filled with data from Rostherne 2023.

⁵ Google. (2024). Google Earth. <https://earth.google.com/web/>

Parameter	Description	Input Variable
Background	Background pollutant concentration considered during the modelling	2023 Defra background maps 1km x 1km grid squares as set out in Table 6D.2.
Output	Output as gridded or specified points	At specified points as detailed in Appendix 6F Error! Reference source not found..
Pollutant Output	Pollutants modelled and averaging time	NO ₂ , PM ₁₀ and PM _{2.5} annual mean

Emissions factors

Emissions were calculated using the most recent version of the Emissions Factor Toolkit (EFT) v12.1. The traffic data was entered into the EFT in order to calculate a combined emission rate for each of the road links in the modelled network.

To understand whether air quality is improving in Manchester, a five-year regression analysis has been undertaken on average annual mean NO₂ concentrations recorded at all roadside and kerbside monitoring locations in MCC's administrative area between 2019 and 2023, as shown in Figure 3. When calculating the trends, 2020 and 2021 were excluded due to the impact of COVID-19 restrictions on concentrations in these years.

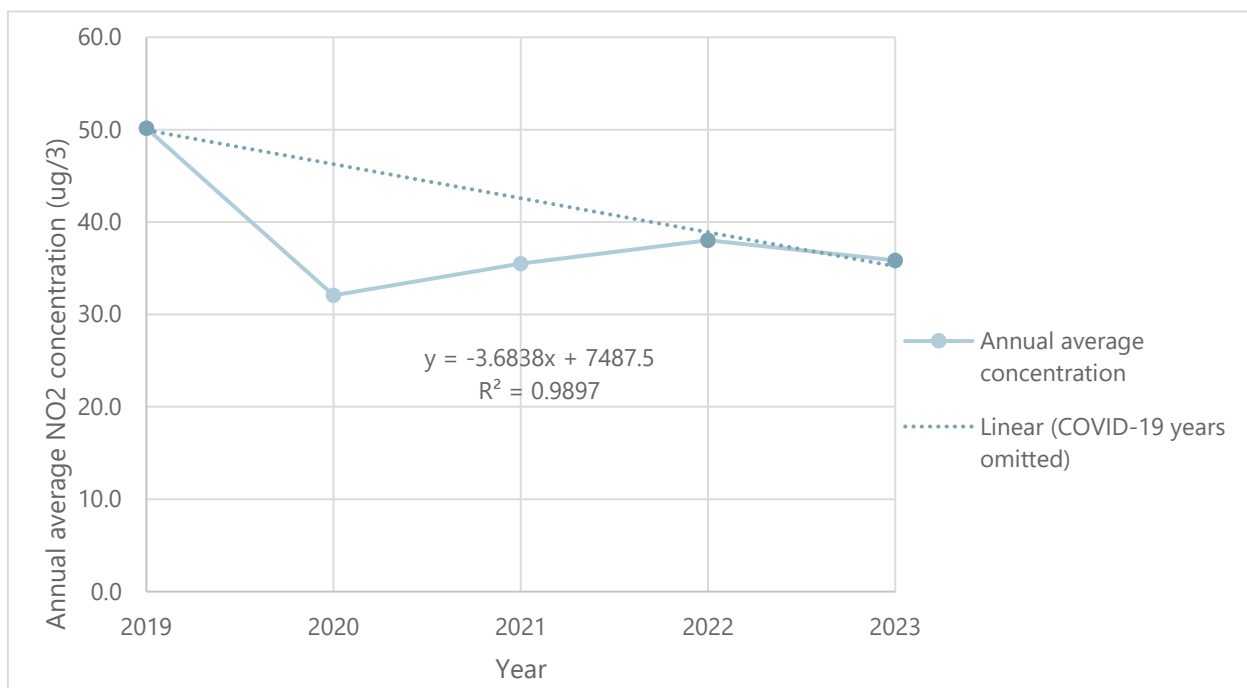


Figure 3 Five-year linear regression analysis for roadside monitoring locations in MCC's administrative area.

The regression analysis indicates that NO₂ concentrations recorded at roadside monitoring locations in Manchester over the last five years have been reducing at an average rate of 3.7 µg/m³ per year. This trend is statistically significant (R^2 value of 0.99) and therefore suggests a significant improvement in air quality has been recorded across Manchester over the last five years. Therefore, it is deemed robust to utilise emissions factors for future years.

Appendix 15.5 Model Verification

Appendix 15.5 Model Verification

The roads within the ADMS model have undergone a detailed adjustment and verification process which followed the methodology set out in Defra LAQM TG(22) Box 7-17 and 7-18.

The roads, drawn in QGIS, were adjusted following a detailed review of the road layout using satellite imagery and mapping software. The drawn road layout considers:

- Road width;
- Layout and expected slow-down at junctions; and
- Speed adjustment where queuing is expected.

The verification process follows the following steps:

- Identify all roadside monitoring sites within a relevant proximity to road links within the modelled domain;
- Appraise monitoring sites using Google Streetview and ensure the location and height given in the Clean Air Plan hub by Greater Manchester Combined Authority (GMCA) are as accurate as possible;
- Remove sites that are not suitable for model verification (i.e. located in close proximity to a bus stop, inappropriate diffusion tube siting, poor data capture, etc.);
- Calculate adjustment factor and check difference between modelled and monitored NO₂ concentrations; and
- If the modelled and monitored concentrations are not within 25% of each other at all sites, reassess model set up and assumptions.

Modelled results have been verified against monitored concentrations from GMCA Clean Air Plan monitoring stations in proximity to the EIA Site. The verification sites used in the assessment are presented in Figure 1. The sites are all duplicate or triplicate diffusion tubes. These sites were selected based on the availability of traffic data on surrounding roads, high availability of air quality data in the verification year and being representative of modelled receptor locations.

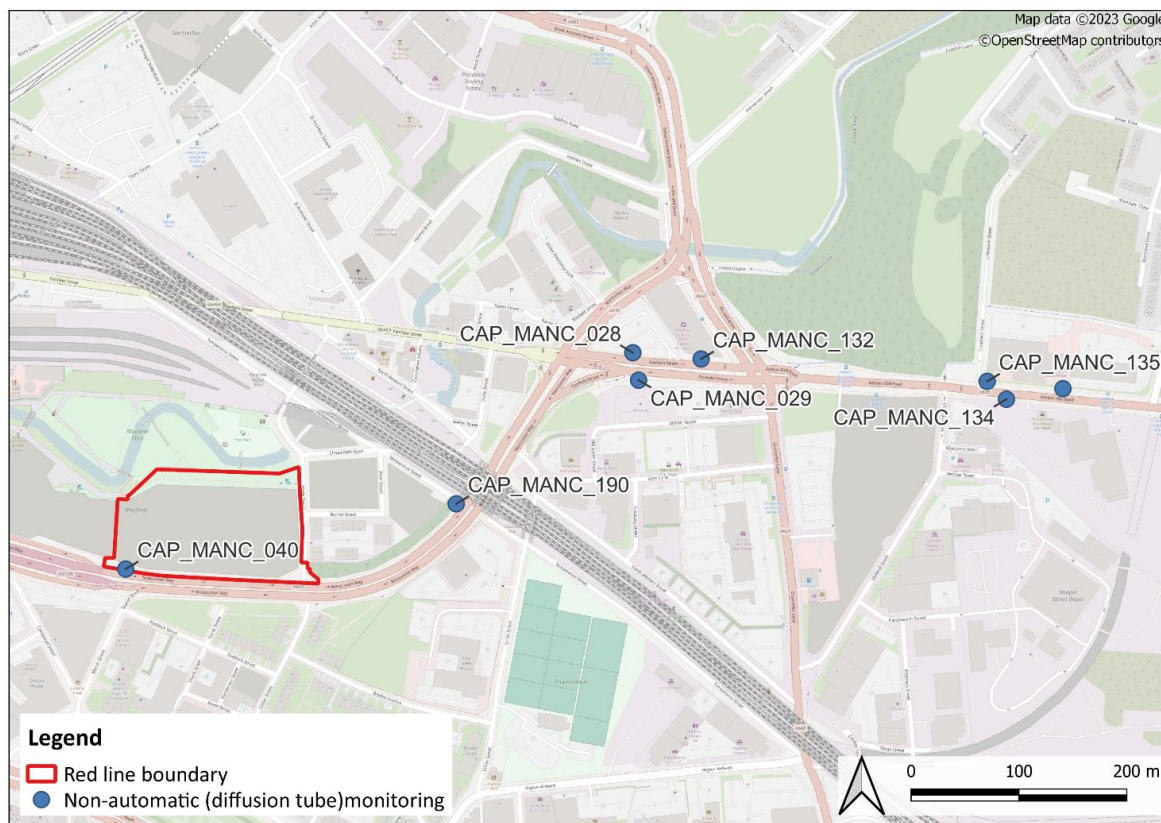


Figure 1 Monitoring sites used in model verification.

Due to the differences in road types and concentrations measured along Fairfield Street and the Mancunian Way, two adjustment factors have been derived. A factor derived from stations CAP_MANC_040 and CAP_MANC_190 (along the Mancunian Way) have been used for operational on-site receptor exposure results adjustment. A factor derived from the other six monitoring stations, along Fairfield Street, have been used for construction and operational off-site receptor results adjustment.

Mancunian Way verification – applied to on-site receptors

Comparison of modelled and monitored NO₂ concentrations at verification sites along the Mancunian Way are presented Table 1. The total NO₂ modelled by the dispersion model is plotted against the total NO₂ monitored by diffusion tubes in Figure 2. This shows that the model slightly under-predicts the total NO₂ concentrations. Therefore, to achieve higher accuracy, it is necessary to apply an adjustment factor of 1.54 (derived from the gradient of the line of best fit of the modelled and monitored road contribution NO_x) in order to obtain more accurate modelled concentrations.

The adjustment factor has subsequently been applied to all modelled NO₂ concentrations (Table 2). Adjusted NO₂ plotted against monitored NO₂ is presented in Figure 3. The adjusted total modelled NO₂ is within 25% of the monitored at all sites.

The root mean square error (RMSE) in the modelled NO₂ is 0.41 µg/m³, which equates to an error percentage of 1% of the annual average NO₂ objective. Defra LAQM TG22 states that ideally the RMSE will be within 10% of air quality objective. Therefore, the level of error complies with this quality check, indicating that the model performs well at these locations when the verification factor is applied.

Table 1 Unadjusted modelled NO₂ compared to monitored NO₂.

Monitoring Site ID	Modelled total NO ₂ (µg/m ³)	Monitored total NO ₂ (µg/m ³)	% Difference
CAP_MANC_040	28.7	33.4	14.0
CAP_MANC_190	26.7	29.7	10.1

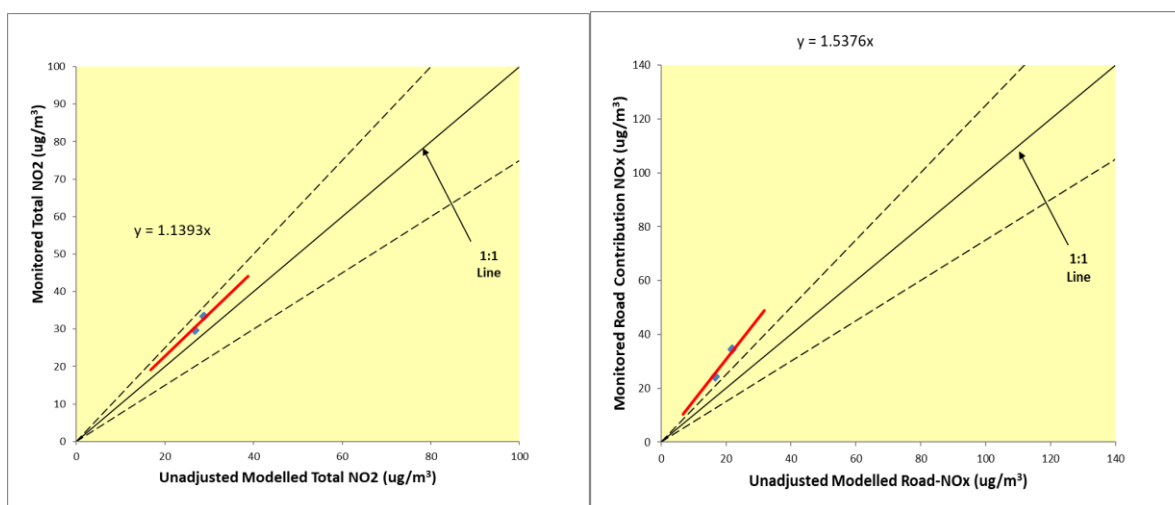


Figure 2 Monitored and unadjusted modelled road NO₂ and road NO_x along the Mancunian Way.

Table 2 Adjusted modelled NO_x and NO₂ concentrations for stations along the Mancunian Way.

Monitoring Site ID	Background (µg/m ³)		Monitored road NO ₂ (µg/m ³)	Monitored Road NO _x (µg/m ³)	Modelled Road NO _x (µg/m ³)	Adjusted Modelled Road NO _x (µg/m ³)	Adjusted modelled total NO ₂ (µg/m ³)	Total NO ₂ % Difference after adjustment	NO ₂ RMSE (µg/m ³)
	NO _x	NO ₂							

CAP_MA NC_040	27.9	19.6	33.4	34.5	21.8	33.6	33.06	1.0	0.41
CAP_MA NC_190	27.9	19.6	29.7	24.4	16.7	25.6	30.17	-1.6	

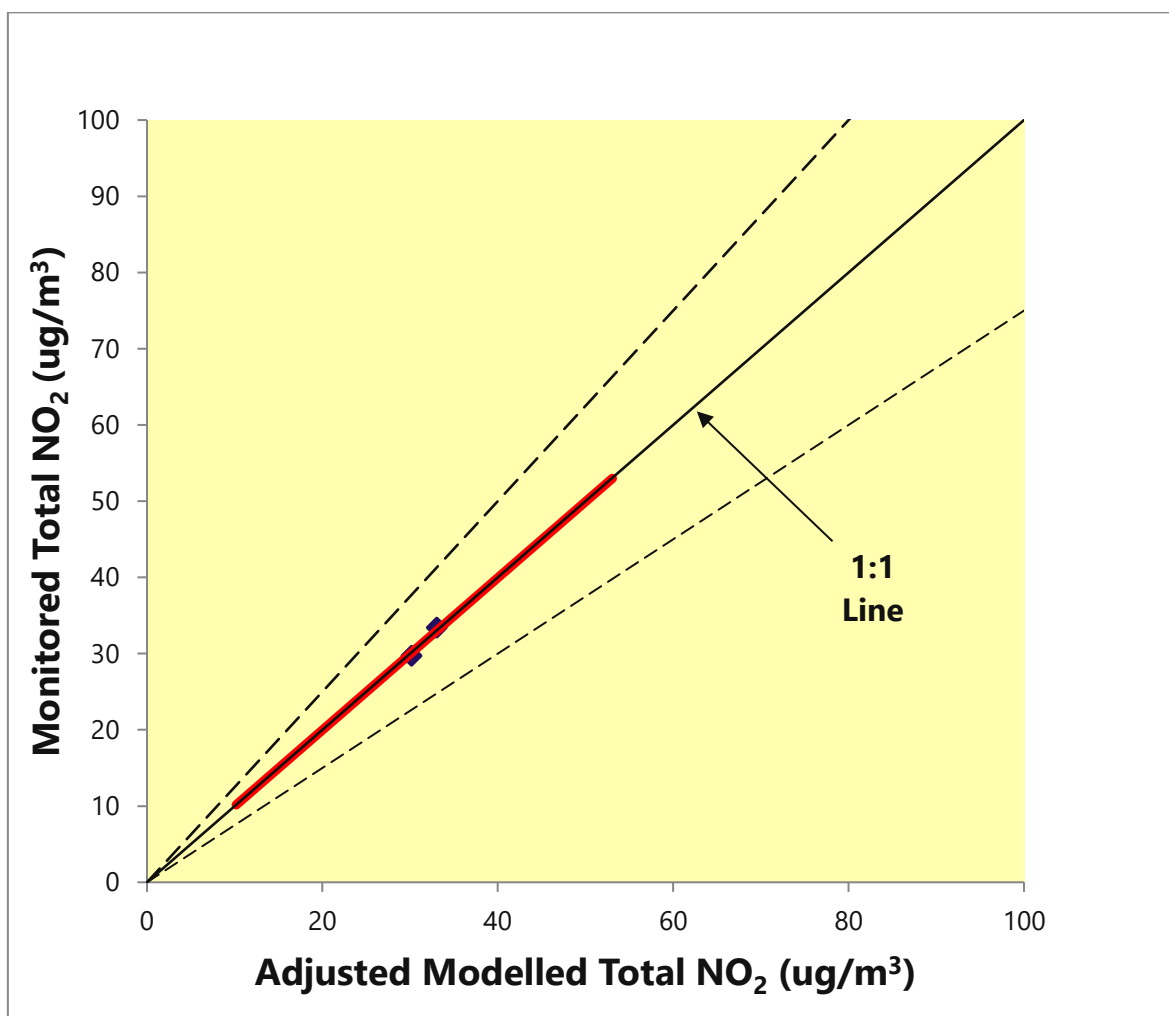


Figure 3 Monitored and modelled road NO₂ with verification factor applied to modelled concentrations along the Mancunian Way.

Fairfield Street Verification – applied to offsite receptors

Comparison of modelled and monitored NO₂ concentrations at verification sites along Fairfield Street are presented Table 3. The total NO₂ modelled by the dispersion model is plotted against the total NO₂ monitored by diffusion tubes in Figure 4. This shows that the model under-predicts the total NO₂ concentrations. Therefore, it is necessary to apply an adjustment factor of 3.47 (derived from the gradient of the line of best fit of the modelled

and monitored road contribution NO_x) in order to obtain more accurate modelled concentrations.

The adjustment factor has subsequently been applied to all modelled NO₂ concentrations (Table 4). Adjusted NO₂ plotted against monitored NO₂ is presented in Figure 5. The adjusted total modelled NO₂ is within 25% of the monitored at all sites.

The root mean square error (RMSE) in the modelled NO₂ is 3.63 µg/m³, which equates to an error percentage of 9.1% of the annual average NO₂ objective. Defra LAQM TG22 states that ideally the RMSE will be within 10% of air quality objective. Therefore, the level of error complies with this quality check, indicating that the model performs well at these locations when the verification factor is applied.

Table 3 Unadjusted modelled NO₂ compared to monitored NO₂.

Monitoring Site ID	Modelled total NO ₂ (µg/m ³)	Monitored total NO ₂ (µg/m ³)	% Difference
CAP_MANC_029	23.2	36.3	36.0
CAP_MANC_134	24.0	37.4	35.9
CAP_MANC_028	27.4	37.9	27.7
CAP_MANC_135	26.4	38.4	31.3
CAP_MANC_132	25.4	41.1	38.2
CAP_MANC_133	24.8	35.3	29.8

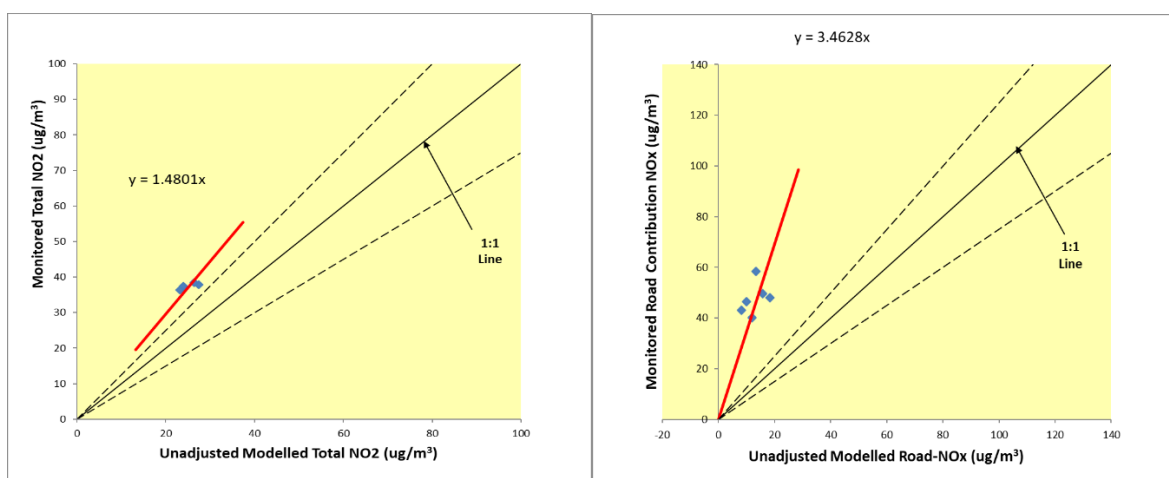


Figure 4 Monitored and unadjusted modelled road NO₂ and road NO_x along Fairfield Street.

Table 4 Adjusted modelled NO_x and NO₂ concentrations.

Monitoring Site ID	Background (µg/m ³)		Monitored road NO ₂ (µg/m ³)	Monitored Road NO _x (µg/m ³)	Modelled Road NO _x (µg/m ³)	Adjusted Modelled Road NO _x (µg/m ³)	Adjusted modelled total NO ₂ (µg/m ³)	Total NO ₂ % Difference after adjustment	NO ₂ RMSE (µg/m ³)
	NO _x	NO ₂							
CAP_MANC_029	27.9	19.6	36.3	43.1	8.3	28.6	31.3	13.9	3.63
CAP_MANC_134	27.9	19.6	37.4	46.4	10.1	34.9	33.5	10.3	
CAP_MANC_028	27.9	19.6	37.9	48.0	18.5	63.9	42.7	-12.7	
CAP_MANC_135	27.9	19.6	38.4	49.6	15.8	54.8	40.0	-4.2	
CAP_MANC_132	27.9	19.6	41.1	58.4	13.5	46.8	37.5	8.7	
CAP_MANC_133	27.9	19.6	35.3	40.1	11.9	41.3	35.7	-1.2	

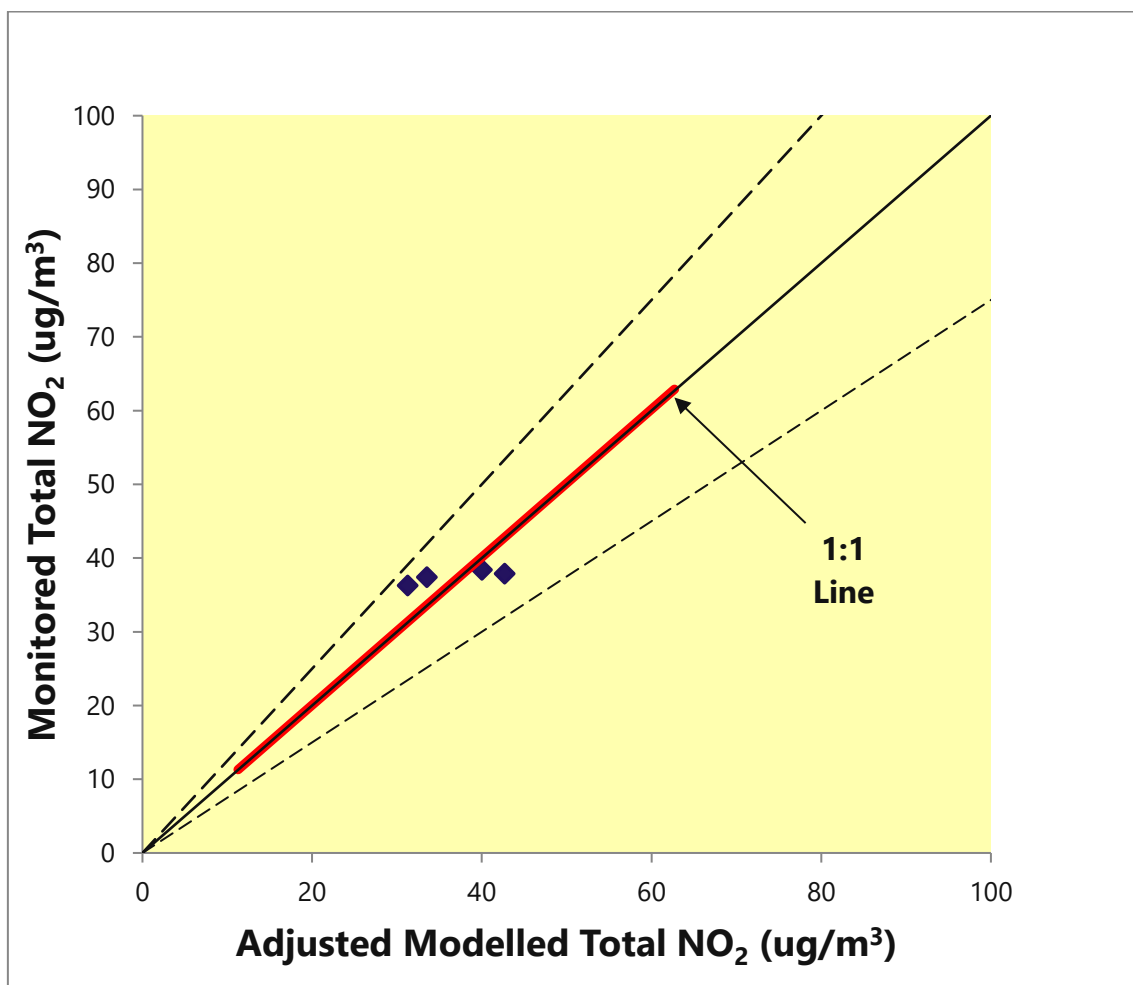


Figure 5 Monitored and modelled road NO₂ with verification factor applied to modelled concentrations along Fairfield Street.

PM₁₀ and PM_{2.5}

The model outputs of road-PM have been adjusted by applying the adjustment factor calculated for road NO_x in line with LAQM.TG(22) as there is no suitable PM₁₀ or PM_{2.5} monitoring data suitable for model verification within the vicinity of the EIA Site.

Appendix 15.6 Modelled Receptor Locations

Appendix 15.6 Modelled Receptor Locations

Pollutant concentrations were predicted at human receptor locations adjacent to roads predicted to experience an increase in AADT flows above the IAQM screening criteria for detailed assessment. Human receptors include current and future residential blocks, student accommodation and a primary school.

The locations of all receptors are shown in Figure 1. The Ordinance Survey grid references, address and height of the modelled existing receptors are presented in Table 1, for construction impacts, and Table 2, for operational impacts. The receptors differ due to the route used for Site access during construction (CR1 and CR2 are identical with OR4 and OR5). The receptors have been modelled at 1.5 m to represent approximate breathing height.

On-site receptors have been modelled at regular intervals up the building facades. The Ordinance Survey grid reference, maximum and minimum heights and vertical separation of on-site modelled receptors is presented in Table 3.

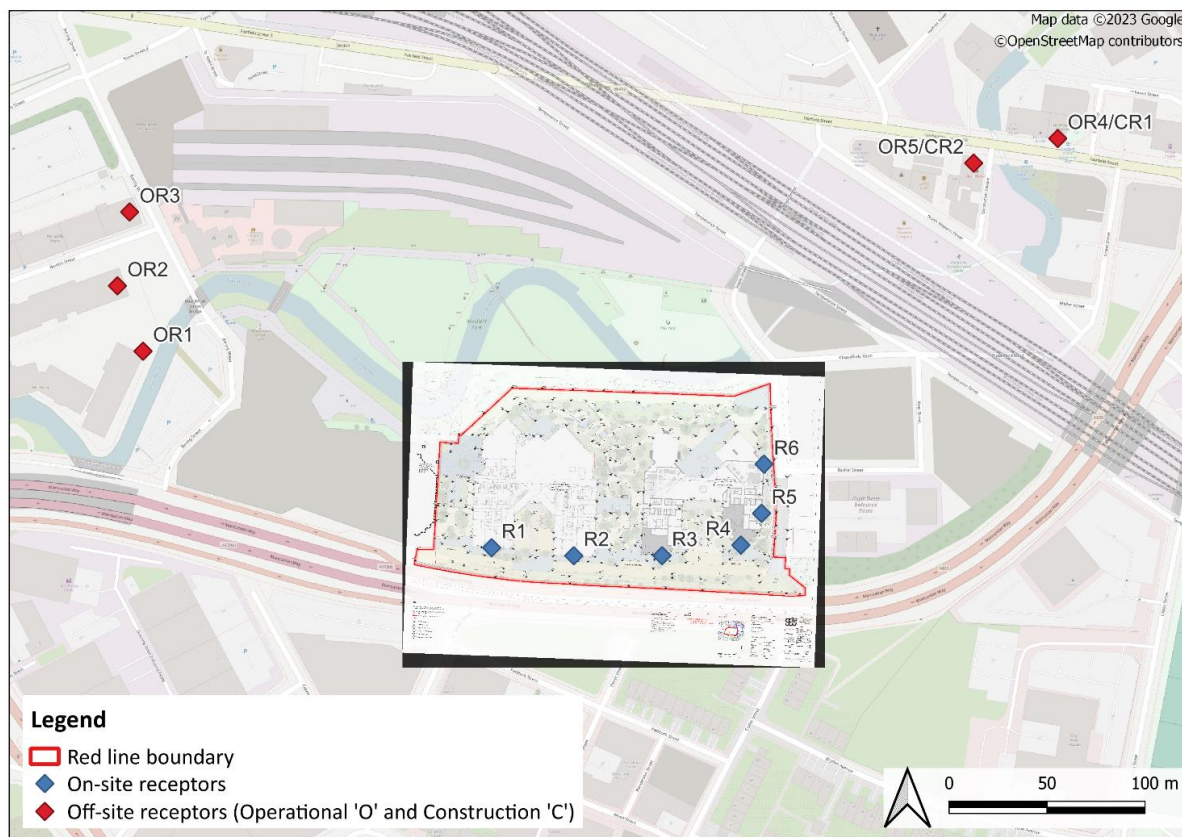


Figure 1 Locations of on-site and off-site receptors included in the ADMS model.

Table 1 Location of off-site receptors impacted by the construction of the Proposed Development.

Construction ID	X (m)	Y (m)	Height (m)	Address
CR1	385428	397679	1.5	Sol Academy, 115 Fairfield Street Manchester, Piccadilly Station, 117 Fairfield St, Manchester M12 6EL
CR2	385385	397667	1.5	104 Fairfield St, Manchester M1 2WR

Table 2 Location of off-site receptors impacted by the operation of the Proposed Development.

Operation ID	X (m)	Y (m)	Height (m)	Address
OR1	384961	397571	1.5	Liberty Living Plc, 29 Berry St, Manchester M1 2AR
OR2	384948	397604	1.5	Liberty Living Plc, 29 Berry St, Manchester M1 2AR
OR3	384954	397642	1.5	23 Berry St, Manchester M1 2AD

OR4	385428	397679	1.5	Sol Academy, 115 Fairfield Street Manchester, Piccadilly Station, 117 Fairfield St, Manchester M12 6EL
OR5	385385	397667	1.5	104 Fairfield St, Manchester M1 2WR

Table 3 Location of on-site receptors within the Proposed Development. The ground level at each receptor is occupied by commercial use and is modelled at 1.5 m height.

ID	Min height (m)	Max height (m)	Vertical separation (m)
R1 - Commercial	1.5	1.5	-
R1 – Residential	5.8	59.8	3
R2 - Commercial	1.5	1.5	-
R2 – Residential	5.8	83.8	3
R3 – Commercial	1.5	1.5	-
R3 – Residential	5.4	68.9	3
R4 – Commercial	1.5	1.5	-
R4 – Residential	5.4	51.6	3
R5 – Commercial	1.5	1.5	-
R5 – Residential	5.4	51.6	3
R6 - Commercial	1.5	1.5	-
R6 – Residential	5.4	26.4	3

Appendix 15.7 Air Quality Dispersion Modelled Results

Appendix 15.7 Modelled Results

Modelled changes in concentrations of NO₂, PM₁₀ and PM_{2.5} for the 2026 peak construction year of the Proposed Development are presented in Table 1, Table 2 and Table 3, respectively.

Modelled changes in concentrations of NO₂, PM₁₀ and PM_{2.5} for the 2029 operation year of the Proposed Development are presented in Table 4, Table 5 and Table 6, respectively.

At some receptors the change between Do nothing and Do something scenario is very minimal and rounds down to 0%.

Modelled concentrations at on-site receptor locations are presented in Table 7.

All presented modelling utilizes 2023 background concentrations, which is a worst case assumption as Defra modelled background concentrations are predicted to decrease in future years.

Construction

Table 1 Modelled change in annual average NO₂ concentrations at human receptors due to the construction of the Proposed Development.

ID	Annual average NO ₂ concentration (µg/m ³)					
	Baseline (2023)	Do nothing (2026)	Do something (2026)	% of AQO	% Change	IAQM impact descriptor
CR1	27.5	25.2	25.3	63.3	0.375	Negligible
CR2	24.5	23.0	23.1	57.7	0.175	Negligible

Table 2 Modelled change in annual average PM₁₀ concentrations at human receptors due to the construction of the Proposed Development.

ID	Annual average PM ₁₀ concentration (µg/m ³)					
	Baseline (2023)	Do nothing (2026)	Do something (2026)	% of AQO	% Change	IAQM impact descriptor
CR1	16.2	17.0	17.1	42.8	0.224	Negligible

ID	Annual average PM ₁₀ concentration (µg/m ³)					
	Baseline (2023)	Do nothing (2026)	Do something (2026)	% of AQO	% Change	IAQM impact descriptor
CR2	15.3	15.8	15.8	39.5	0.088	Negligible

Table 3 Modelled change in annual average PM_{2.5} concentrations at human receptors due to the construction of the Proposed Development.

ID	Annual average PM _{2.5} concentration (µg/m ³)					
	Baseline (2023)	Do nothing (2026)	Do something (2026)	% of AQO	% Change	IAQM impact descriptor
CR1	9.21	9.61	9.65	48.3	0.238	Negligible
CR2	8.72	8.96	8.98	44.9	0.094	Negligible

Operation

Table 4 Modelled change in annual average NO₂ concentrations at human receptors due to the operation of the Proposed Development.

ID	Annual average NO ₂ concentration (µg/m ³)					
	Baseline (2023)	Do nothing (2029)	Do something (2029)	% of AQO	% Change	IAQM impact descriptor
OR1	24.1	21.7	22.0	55.0	0.900	Negligible
OR2	23.6	21.5	21.8	54.4	0.775	Negligible
OR3	23.2	21.3	21.9	54.9	1.550	Negligible
OR4	27.5	23.3	23.4	58.5	0.250	Negligible
OR5	24.5	21.9	21.9	54.8	0.125	Negligible

Table 5 Modelled change in annual average PM₁₀ concentrations at human receptors due to the operation of the Proposed Development.

ID	Annual average PM ₁₀ concentration (µg/m ³)					
	Baseline (2023)	Do nothing (2029)	Do something (2029)	% of AQO	% Change	IAQM impact descriptor
OR1	15.2	15.6	15.8	39.6	0.656	Negligible
OR2	15.0	15.4	15.6	39.0	0.582	Negligible

ID	Annual average PM ₁₀ concentration (µg/m ³)					
	Baseline (2023)	Do nothing (2029)	Do something (2029)	% of AQO	% Change	IAQM impact descriptor
OR3	14.9	15.2	15.7	39.3	1.140	Negligible
OR4	16.2	17.0	17.0	42.6	0.221	Negligible
OR5	15.3	15.7	15.8	39.4	0.104	Negligible

Table 6 Modelled change in annual average PM_{2.5} concentrations at human receptors due to the operation of the Proposed Development.

ID	Annual average PM _{2.5} concentration (µg/m ³)					
	Baseline (2023)	Do nothing (2029)	Do something (2029)	% of AQO	% Change	IAQM impact descriptor
OR1	8.66	8.85	8.98	44.9	0.677	Negligible
OR2	8.58	8.75	8.87	44.3	0.602	Negligible
OR3	8.52	8.67	8.91	44.5	1.177	Negligible
OR4	9.21	9.56	9.61	48.0	0.233	Negligible
OR5	8.72	8.93	8.95	44.8	0.109	Negligible

On-site exposure

Table 7 Modelled NO₂ at on-site receptor locations for the 2029 operational year.

Receptor	X	Y	Modelled NO ₂ Annual mean concentration (µg/m ³)	Annual mean as % of Air Quality Objective	Within 10% of limit?
			2029 Operation		
R1 - Commercial	385139	397470	22.5	56.3%	N
R1(5.84)	385139	397470	21.8	54.6%	N
R1(8.84)	385139	397470	20.9	52.4%	N
R1(11.84)	385139	397470	20.5	51.2%	N
R1(14.84)	385139	397470	20.2	50.6%	N
R1(17.84)	385139	397470	20.1	50.2%	N
R1(20.84)	385139	397470	20.0	50.0%	N
R1(23.84)	385139	397470	19.9	49.8%	N
R1(26.84)	385139	397470	19.9	49.7%	N

Receptor	X	Y	Modelled NO ₂ Annual mean concentration (µg/m ³)	Annual mean as % of Air Quality Objective	Within 10% of limit?
			2029 Operation		
R1(29.84)	385139	397470	19.8	49.6%	N
R1(32.84)	385139	397470	19.8	49.5%	N
R1(35.84)	385139	397470	19.8	49.4%	N
R1(38.84)	385139	397470	19.7	49.3%	N
R1(41.84)	385139	397470	19.7	49.3%	N
R1(44.84)	385139	397470	19.7	49.2%	N
R1(47.84)	385139	397470	19.7	49.2%	N
R1(50.84)	385139	397470	19.7	49.2%	N
R1(53.84)	385139	397470	19.7	49.1%	N
R1(56.84)	385139	397470	19.6	49.1%	N
R2 - Commercial	385181	397466	22.5	56.2%	N
R2(5.84)	385181	397466	21.8	54.5%	N
R2(8.84)	385181	397466	20.9	52.3%	N
R2(11.84)	385181	397466	20.5	51.1%	N
R2(14.84)	385181	397466	20.2	50.5%	N
R2(17.84)	385181	397466	20.1	50.2%	N
R2(20.84)	385181	397466	20.0	49.9%	N
R2(23.84)	385181	397466	19.9	49.8%	N
R2(26.84)	385181	397466	19.9	49.6%	N
R2(29.84)	385181	397466	19.8	49.5%	N
R2(32.84)	385181	397466	19.8	49.4%	N
R2(35.84)	385181	397466	19.7	49.4%	N
R2(38.84)	385181	397466	19.7	49.3%	N
R2(41.84)	385181	397466	19.7	49.3%	N
R2(44.84)	385181	397466	19.7	49.2%	N
R2(47.84)	385181	397466	19.7	49.2%	N
R2(50.84)	385181	397466	19.7	49.2%	N
R2(53.84)	385181	397466	19.7	49.1%	N
R2(56.84)	385181	397466	19.6	49.1%	N
R2(59.84)	385181	397466	19.6	49.1%	N
R2(62.84)	385181	397466	19.6	49.1%	N
R2(65.84)	385181	397466	19.6	49.1%	N
R2(68.84)	385181	397466	19.6	49.1%	N
R2(71.84)	385181	397466	19.6	49.1%	N
R2(74.84)	385181	397466	19.6	49.0%	N
R2(77.84)	385181	397466	19.6	49.0%	N
R2(80.84)	385181	397466	19.6	49.0%	N

Receptor	X	Y	Modelled NO ₂ Annual mean concentration (µg/m ³)	Annual mean as % of Air Quality Objective	Within 10% of limit?
			2029 Operation		
R2(83.84)	385181	397466	19.6	49.0%	N
R3 - Commercial	385226	397466	22.3	55.6%	0%
R3(5.4)	385226	397466	21.9	54.7%	N
R3(8.4)	385226	397466	21.0	52.5%	N
R3(11.4)	385226	397466	20.5	51.3%	N
R3(14.4)	385226	397466	20.2	50.6%	N
R3(17.4)	385226	397466	20.1	50.2%	N
R3(20.4)	385226	397466	20.0	50.0%	N
R3(23.4)	385226	397466	19.9	49.8%	N
R3(26.4)	385226	397466	19.9	49.6%	N
R3(29.4)	385226	397466	19.8	49.5%	N
R3(32.4)	385226	397466	19.8	49.4%	N
R3(35.4)	385226	397466	19.7	49.4%	N
R3(38.4)	385226	397466	19.7	49.3%	N
R3(41.4)	385226	397466	19.7	49.3%	N
R3(44.4)	385226	397466	19.7	49.2%	N
R3(47.4)	385226	397466	19.7	49.2%	N
R3(50.4)	385226	397466	19.7	49.2%	N
R3(53.4)	385226	397466	19.7	49.1%	N
R3(56.4)	385226	397466	19.6	49.1%	N
R3(59.4)	385226	397466	19.6	49.1%	N
R3(62.4)	385226	397466	19.6	49.1%	N
R3(65.4)	385226	397466	19.6	49.1%	N
R3(68.4)	385226	397466	19.6	49.1%	N
R4 - Commercial	385267	397472	21.8	54.6%	N
R4(5.4)	385267	397472	21.7	54.3%	N
R4(8.4)	385267	397472	21.0	52.5%	N
R4(11.4)	385267	397472	20.5	51.3%	N
R4(14.4)	385267	397472	20.2	50.6%	N
R4(17.4)	385267	397472	20.1	50.2%	N
R4(20.4)	385267	397472	20.0	49.9%	N
R4(23.4)	385267	397472	19.9	49.8%	N
R4(26.4)	385267	397472	19.8	49.6%	N
R4(29.4)	385267	397472	19.8	49.5%	N
R4(32.4)	385267	397472	19.8	49.4%	N
R4(35.4)	385267	397472	19.7	49.4%	N

Receptor	X	Y	Modelled NO ₂ Annual mean concentration (µg/m ³)	Annual mean as % of Air Quality Objective	Within 10% of limit?
			2029 Operation		
R4(38.4)	385267	397472	19.7	49.3%	N
R4(41.4)	385267	397472	19.7	49.3%	N
R4(44.4)	385267	397472	19.7	49.2%	N
R4(47.4)	385267	397472	19.7	49.2%	N
R4(50.4)	385267	397472	19.7	49.2%	N
R5 - Commercial	385277	397488	21.4	53.4%	N
R5(5.4)	385277	397488	21.4	53.4%	N
R5(8.4)	385277	397488	20.9	52.3%	N
R5(11.4)	385277	397488	20.6	51.4%	N
R5(14.4)	385277	397488	20.3	50.7%	N
R5(17.4)	385277	397488	20.1	50.3%	N
R5(20.4)	385277	397488	20.0	50.0%	N
R5(23.4)	385277	397488	19.9	49.8%	N
R5(26.4)	385277	397488	19.9	49.6%	N
R5(29.4)	385277	397488	19.8	49.5%	N
R5(32.4)	385277	397488	19.8	49.4%	N
R5(35.4)	385277	397488	19.7	49.4%	N
R5(38.4)	385277	397488	19.7	49.3%	N
R5(41.4)	385277	397488	19.7	49.3%	N
R5(44.4)	385277	397488	19.7	49.2%	N
R5(47.4)	385277	397488	19.7	49.2%	N
R5(50.4)	385277	397488	19.7	49.2%	N
R6 - Commercial	385278	397513	21.0	52.5%	N
R6(5.4)	385278	397513	21.0	52.6%	N
R6(8.4)	385278	397513	20.7	51.9%	N
R6(11.4)	385278	397513	20.5	51.3%	N
R6(14.4)	385278	397513	20.3	50.8%	N
R6(17.4)	385278	397513	20.1	50.4%	N
R6(20.4)	385278	397513	20.0	50.1%	N
R6(23.4)	385278	397513	19.9	49.8%	N
R6(26.4)	385278	397513	19.9	49.7%	N

Table 8 Modelled PM₁₀ at on-site receptor locations for the 2029 operational year.

Receptor	X	Y	Modelled PM ₁₀ Annual mean concentration (µg/m ³) 2029 Operation	Annual mean as % of Air Quality Objective	Within 10% of limit?
R1 - Commercial	385139.3	397470.3	16.7	41.6%	N
R1(5.84)	385139.3	397470.3	15.5	38.8%	N
R1(8.84)	385139.3	397470.3	14.9	37.1%	N
R1(11.84)	385139.3	397470.3	14.5	36.3%	N
R1(14.84)	385139.3	397470.3	14.3	35.8%	N
R1(17.84)	385139.3	397470.3	14.2	35.6%	N
R1(20.84)	385139.3	397470.3	14.2	35.4%	N
R1(23.84)	385139.3	397470.3	14.1	35.3%	N
R1(26.84)	385139.3	397470.3	14.1	35.2%	N
R1(29.84)	385139.3	397470.3	14.1	35.1%	N
R1(32.84)	385139.3	397470.3	14.0	35.1%	N
R1(35.84)	385139.3	397470.3	14.0	35.0%	N
R1(38.84)	385139.3	397470.3	14.0	35.0%	N
R1(41.84)	385139.3	397470.3	14.0	34.9%	N
R1(44.84)	385139.3	397470.3	14.0	34.9%	N
R1(47.84)	385139.3	397470.3	14.0	34.9%	N
R1(50.84)	385139.3	397470.3	13.9	34.9%	N
R1(53.84)	385139.3	397470.3	13.9	34.9%	N
R1(56.84)	385139.3	397470.3	13.9	34.8%	N
R2 - Commercial	385181.2	397466.3	16.6	41.6%	N
R2(5.84)	385181.2	397466.3	15.5	38.7%	N
R2(8.84)	385181.2	397466.3	14.8	37.1%	N
R2(11.84)	385181.2	397466.3	14.5	36.3%	N
R2(14.84)	385181.2	397466.3	14.3	35.8%	N
R2(17.84)	385181.2	397466.3	14.2	35.6%	N
R2(20.84)	385181.2	397466.3	14.2	35.4%	N
R2(23.84)	385181.2	397466.3	14.1	35.3%	N
R2(26.84)	385181.2	397466.3	14.1	35.2%	N
R2(29.84)	385181.2	397466.3	14.0	35.1%	N
R2(32.84)	385181.2	397466.3	14.0	35.1%	N
R2(35.84)	385181.2	397466.3	14.0	35.0%	N
R2(38.84)	385181.2	397466.3	14.0	35.0%	N
R2(41.84)	385181.2	397466.3	14.0	34.9%	N
R2(44.84)	385181.2	397466.3	14.0	34.9%	N
R2(47.84)	385181.2	397466.3	14.0	34.9%	N
R2(50.84)	385181.2	397466.3	13.9	34.9%	N
R2(53.84)	385181.2	397466.3	13.9	34.9%	N

Receptor	X	Y	Modelled PM ₁₀ Annual mean concentration (µg/m ³) 2029 Operation	Annual mean as % of Air Quality Objective	Within 10% of limit?
R2(56.84)	385181.2	397466.3	13.9	34.8%	N
R2(59.84)	385181.2	397466.3	13.9	34.8%	N
R2(62.84)	385181.2	397466.3	13.9	34.8%	N
R2(65.84)	385181.2	397466.3	13.9	34.8%	N
R2(68.84)	385181.2	397466.3	13.9	34.8%	N
R2(71.84)	385181.2	397466.3	13.9	34.8%	N
R2(74.84)	385181.2	397466.3	13.9	34.8%	N
R2(77.84)	385181.2	397466.3	13.9	34.8%	N
R2(80.84)	385181.2	397466.3	13.9	34.8%	N
R2(83.84)	385181.2	397466.3	13.9	34.8%	N
R3 - Commercial	385226.3	397466.3	16.4	41.0%	N
R3(5.4)	385226.3	397466.3	15.5	38.9%	N
R3(8.4)	385226.3	397466.3	14.9	37.3%	N
R3(11.4)	385226.3	397466.3	14.5	36.4%	N
R3(14.4)	385226.3	397466.3	14.3	35.9%	N
R3(17.4)	385226.3	397466.3	14.2	35.6%	N
R3(20.4)	385226.3	397466.3	14.2	35.4%	N
R3(23.4)	385226.3	397466.3	14.1	35.3%	N
R3(26.4)	385226.3	397466.3	14.1	35.2%	N
R3(29.4)	385226.3	397466.3	14.0	35.1%	N
R3(32.4)	385226.3	397466.3	14.0	35.1%	N
R3(35.4)	385226.3	397466.3	14.0	35.0%	N
R3(38.4)	385226.3	397466.3	14.0	35.0%	N
R3(41.4)	385226.3	397466.3	14.0	34.9%	N
R3(44.4)	385226.3	397466.3	14.0	34.9%	N
R3(47.4)	385226.3	397466.3	14.0	34.9%	N
R3(50.4)	385226.3	397466.3	13.9	34.9%	N
R3(53.4)	385226.3	397466.3	13.9	34.9%	N
R3(56.4)	385226.3	397466.3	13.9	34.8%	N
R3(59.4)	385226.3	397466.3	13.9	34.8%	N
R3(62.4)	385226.3	397466.3	13.9	34.8%	N
R3(65.4)	385226.3	397466.3	13.9	34.8%	N
R3(68.4)	385226.3	397466.3	13.9	34.8%	N
R4 - Commercial	385266.5	397471.7	16.0	40.0%	N
R4(5.4)	385266.5	397471.7	15.4	38.6%	N
R4(8.4)	385266.5	397471.7	14.9	37.3%	N
R4(11.4)	385266.5	397471.7	14.6	36.4%	N
R4(14.4)	385266.5	397471.7	14.4	35.9%	N

Receptor	X	Y	Modelled PM ₁₀ Annual mean concentration (µg/m ³) 2029 Operation	Annual mean as % of Air Quality Objective	Within 10% of limit?
R4(17.4)	385266.5	397471.7	14.2	35.6%	N
R4(20.4)	385266.5	397471.7	14.2	35.4%	N
R4(23.4)	385266.5	397471.7	14.1	35.3%	N
R4(26.4)	385266.5	397471.7	14.1	35.2%	N
R4(29.4)	385266.5	397471.7	14.0	35.1%	N
R4(32.4)	385266.5	397471.7	14.0	35.0%	N
R4(35.4)	385266.5	397471.7	14.0	35.0%	N
R4(38.4)	385266.5	397471.7	14.0	35.0%	N
R4(41.4)	385266.5	397471.7	14.0	34.9%	N
R4(44.4)	385266.5	397471.7	14.0	34.9%	N
R4(47.4)	385266.5	397471.7	14.0	34.9%	N
R4(50.4)	385266.5	397471.7	13.9	34.9%	N
R5 - Commercial	385277.1	397487.9	15.5	38.9%	N
R5(5.4)	385277.1	397487.9	15.2	37.9%	N
R5(8.4)	385277.1	397487.9	14.8	37.1%	N
R5(11.4)	385277.1	397487.9	14.6	36.4%	N
R5(14.4)	385277.1	397487.9	14.4	36.0%	N
R5(17.4)	385277.1	397487.9	14.3	35.6%	N
R5(20.4)	385277.1	397487.9	14.2	35.4%	N
R5(23.4)	385277.1	397487.9	14.1	35.3%	N
R5(26.4)	385277.1	397487.9	14.1	35.2%	N
R5(29.4)	385277.1	397487.9	14.0	35.1%	N
R5(32.4)	385277.1	397487.9	14.0	35.1%	N
R5(35.4)	385277.1	397487.9	14.0	35.0%	N
R5(38.4)	385277.1	397487.9	14.0	35.0%	N
R5(41.4)	385277.1	397487.9	14.0	34.9%	N
R5(44.4)	385277.1	397487.9	14.0	34.9%	N
R5(47.4)	385277.1	397487.9	14.0	34.9%	N
R5(50.4)	385277.1	397487.9	13.9	34.9%	N
R6 - Commercial	385278.3	397513	15.2	38.0%	N
R6(5.4)	385278.3	397513	14.9	37.3%	N
R6(8.4)	385278.3	397513	14.7	36.8%	N
R6(11.4)	385278.3	397513	14.5	36.3%	N
R6(14.4)	385278.3	397513	14.4	36.0%	N
R6(17.4)	385278.3	397513	14.3	35.7%	N
R6(20.4)	385278.3	397513	14.2	35.5%	N
R6(23.4)	385278.3	397513	14.1	35.3%	N
R6(26.4)	385278.3	397513	14.1	35.2%	N

Table 9 Modelled PM_{2.5} at on-site receptor locations for the 2029 operational year.

Receptor	X	Y	Modelled PM _{2.5} Annual mean concentration (µg/m ³)	Annual mean as % of Air Quality Objective	Within 10% of limit?
			2029 Operation		
R1 - Commercial	385139.3	397470.3	9.41	37.7%	N
R1(5.84)	385139.3	397470.3	8.81	35.3%	N
R1(8.84)	385139.3	397470.3	8.47	33.9%	N
R1(11.84)	385139.3	397470.3	8.29	33.2%	N
R1(14.84)	385139.3	397470.3	8.20	32.8%	N
R1(17.84)	385139.3	397470.3	8.15	32.6%	N
R1(20.84)	385139.3	397470.3	8.11	32.5%	N
R1(23.84)	385139.3	397470.3	8.09	32.4%	N
R1(26.84)	385139.3	397470.3	8.07	32.3%	N
R1(29.84)	385139.3	397470.3	8.05	32.2%	N
R1(32.84)	385139.3	397470.3	8.04	32.2%	N
R1(35.84)	385139.3	397470.3	8.03	32.1%	N
R1(38.84)	385139.3	397470.3	8.02	32.1%	N
R1(41.84)	385139.3	397470.3	8.01	32.1%	N
R1(44.84)	385139.3	397470.3	8.01	32.0%	N
R1(47.84)	385139.3	397470.3	8.00	32.0%	N
R1(50.84)	385139.3	397470.3	8.00	32.0%	N
R1(53.84)	385139.3	397470.3	7.99	32.0%	N
R1(56.84)	385139.3	397470.3	7.99	32.0%	N
R2 - Commercial	385181.2	397466.3	9.41	37.6%	N
R2(5.84)	385181.2	397466.3	8.80	35.2%	N
R2(8.84)	385181.2	397466.3	8.46	33.9%	N
R2(11.84)	385181.2	397466.3	8.29	33.2%	N
R2(14.84)	385181.2	397466.3	8.20	32.8%	N
R2(17.84)	385181.2	397466.3	8.14	32.6%	N
R2(20.84)	385181.2	397466.3	8.11	32.4%	N
R2(23.84)	385181.2	397466.3	8.09	32.3%	N
R2(26.84)	385181.2	397466.3	8.07	32.3%	N
R2(29.84)	385181.2	397466.3	8.05	32.2%	N
R2(32.84)	385181.2	397466.3	8.04	32.2%	N
R2(35.84)	385181.2	397466.3	8.03	32.1%	N
R2(38.84)	385181.2	397466.3	8.02	32.1%	N

Receptor	X	Y	Modelled PM _{2.5} Annual mean concentration (µg/m ³)	Annual mean as % of Air Quality Objective	Within 10% of limit?
			2029 Operation		
R2(41.84)	385181.2	397466.3	8.01	32.0%	N
R2(44.84)	385181.2	397466.3	8.01	32.0%	N
R2(47.84)	385181.2	397466.3	8.00	32.0%	N
R2(50.84)	385181.2	397466.3	8.00	32.0%	N
R2(53.84)	385181.2	397466.3	7.99	32.0%	N
R2(56.84)	385181.2	397466.3	7.99	32.0%	N
R2(59.84)	385181.2	397466.3	7.99	32.0%	N
R2(62.84)	385181.2	397466.3	7.99	31.9%	N
R2(65.84)	385181.2	397466.3	7.99	31.9%	N
R2(68.84)	385181.2	397466.3	7.98	31.9%	N
R2(71.84)	385181.2	397466.3	7.98	31.9%	N
R2(74.84)	385181.2	397466.3	7.98	31.9%	N
R2(77.84)	385181.2	397466.3	7.98	31.9%	N
R2(80.84)	385181.2	397466.3	7.98	31.9%	N
R2(83.84)	385181.2	397466.3	7.98	31.9%	N
R3 - Commercial	385226.3	397466.3	9.29	37.1%	N
R3(5.4)	385226.3	397466.3	8.83	35.3%	N
R3(8.4)	385226.3	397466.3	8.50	34.0%	N
R3(11.4)	385226.3	397466.3	8.31	33.2%	N
R3(14.4)	385226.3	397466.3	8.21	32.8%	N
R3(17.4)	385226.3	397466.3	8.15	32.6%	N
R3(20.4)	385226.3	397466.3	8.11	32.4%	N
R3(23.4)	385226.3	397466.3	8.08	32.3%	N
R3(26.4)	385226.3	397466.3	8.07	32.3%	N
R3(29.4)	385226.3	397466.3	8.05	32.2%	N
R3(32.4)	385226.3	397466.3	8.04	32.1%	N
R3(35.4)	385226.3	397466.3	8.03	32.1%	N
R3(38.4)	385226.3	397466.3	8.02	32.1%	N
R3(41.4)	385226.3	397466.3	8.01	32.0%	N
R3(44.4)	385226.3	397466.3	8.01	32.0%	N
R3(47.4)	385226.3	397466.3	8.00	32.0%	N
R3(50.4)	385226.3	397466.3	8.00	32.0%	N
R3(53.4)	385226.3	397466.3	7.99	32.0%	N
R3(56.4)	385226.3	397466.3	7.99	32.0%	N
R3(59.4)	385226.3	397466.3	7.99	32.0%	N

Receptor	X	Y	Modelled PM _{2.5} Annual mean concentration (µg/m ³)	Annual mean as % of Air Quality Objective	Within 10% of limit?
			2029 Operation		
R3(62.4)	385226.3	397466.3	7.99	32.0%	N
R3(65.4)	385226.3	397466.3	7.99	31.9%	N
R3(68.4)	385226.3	397466.3	7.98	31.9%	N
R4 - Commercial	385266.5	397471.7	9.07	36.3%	N
R4(5.4)	385266.5	397471.7	8.77	35.1%	N
R4(8.4)	385266.5	397471.7	8.50	34.0%	N
R4(11.4)	385266.5	397471.7	8.32	33.3%	N
R4(14.4)	385266.5	397471.7	8.21	32.8%	N
R4(17.4)	385266.5	397471.7	8.15	32.6%	N
R4(20.4)	385266.5	397471.7	8.11	32.4%	N
R4(23.4)	385266.5	397471.7	8.08	32.3%	N
R4(26.4)	385266.5	397471.7	8.06	32.2%	N
R4(29.4)	385266.5	397471.7	8.05	32.2%	N
R4(32.4)	385266.5	397471.7	8.04	32.1%	N
R4(35.4)	385266.5	397471.7	8.03	32.1%	N
R4(38.4)	385266.5	397471.7	8.02	32.1%	N
R4(41.4)	385266.5	397471.7	8.01	32.0%	N
R4(44.4)	385266.5	397471.7	8.01	32.0%	N
R4(47.4)	385266.5	397471.7	8.00	32.0%	N
R4(50.4)	385266.5	397471.7	8.00	32.0%	N
R5 - Commercial	385277.1	397487.9	8.83	35.3%	N
R5(5.4)	385277.1	397487.9	8.63	34.5%	N
R5(8.4)	385277.1	397487.9	8.46	33.8%	N
R5(11.4)	385277.1	397487.9	8.32	33.3%	N
R5(14.4)	385277.1	397487.9	8.23	32.9%	N
R5(17.4)	385277.1	397487.9	8.16	32.6%	N
R5(20.4)	385277.1	397487.9	8.12	32.5%	N
R5(23.4)	385277.1	397487.9	8.09	32.3%	N
R5(26.4)	385277.1	397487.9	8.06	32.3%	N
R5(29.4)	385277.1	397487.9	8.05	32.2%	N
R5(32.4)	385277.1	397487.9	8.04	32.1%	N
R5(35.4)	385277.1	397487.9	8.03	32.1%	N
R5(38.4)	385277.1	397487.9	8.02	32.1%	N
R5(41.4)	385277.1	397487.9	8.01	32.0%	N
R5(44.4)	385277.1	397487.9	8.01	32.0%	N

Receptor	X	Y	Modelled PM _{2.5} Annual mean concentration (µg/m ³)	Annual mean as % of Air Quality Objective	Within 10% of limit?
			2029 Operation		
R5(47.4)	385277.1	397487.9	8.00	32.0%	N
R5(50.4)	385277.1	397487.9	8.00	32.0%	N
R6 - Commercial	385278.3	397513	8.64	34.6%	N
R6(5.4)	385278.3	397513	8.50	34.0%	N
R6(8.4)	385278.3	397513	8.40	33.6%	N
R6(11.4)	385278.3	397513	8.31	33.2%	N
R6(14.4)	385278.3	397513	8.23	32.9%	N
R6(17.4)	385278.3	397513	8.17	32.7%	N
R6(20.4)	385278.3	397513	8.13	32.5%	N
R6(23.4)	385278.3	397513	8.09	32.4%	N
R6(26.4)	385278.3	397513	8.07	32.3%	N

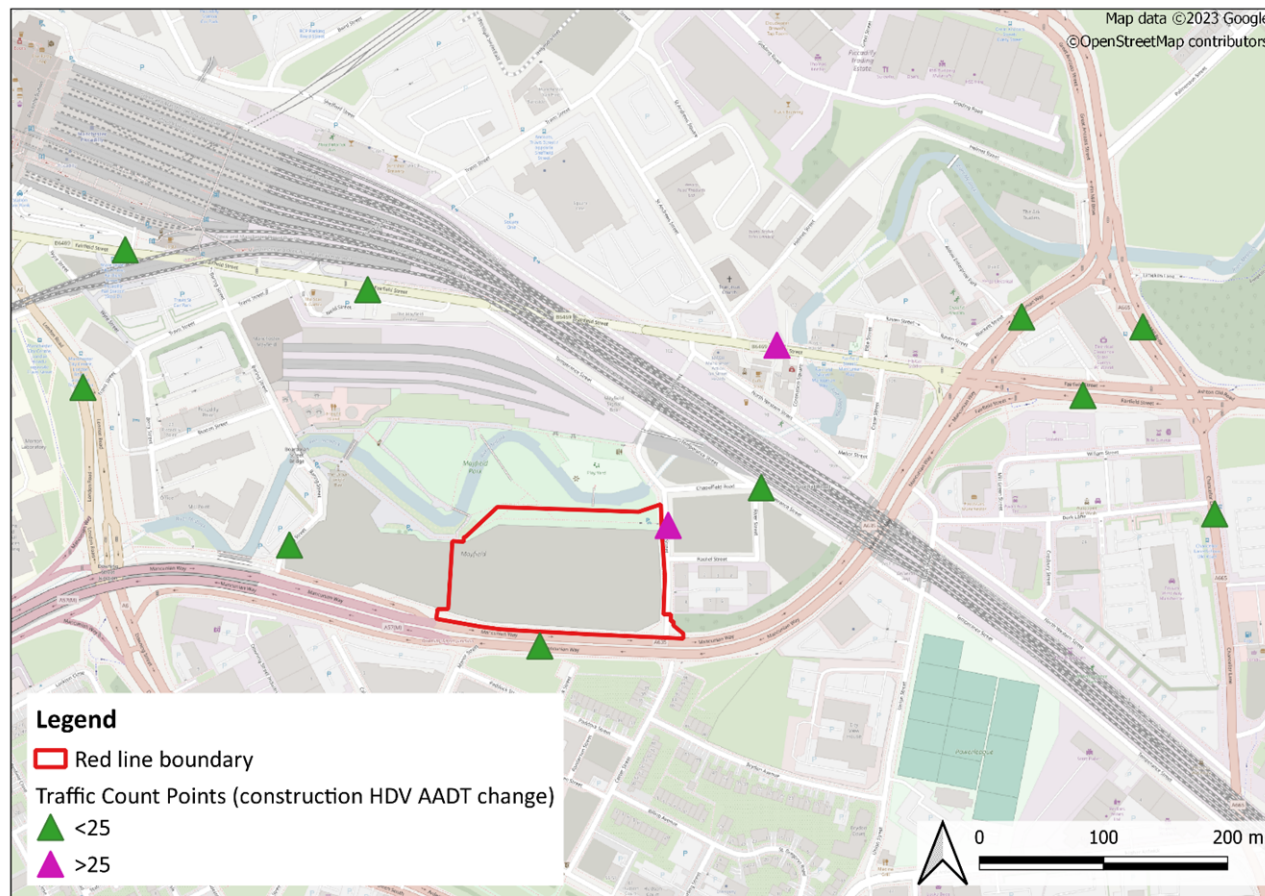
Appendix 15.8 Glossary of Terms

Appendix 15.8 Glossary of terms

Term	Definition
AADT	Annual average daily traffic
AQA	Air Quality Assessment
AQAP	Air Quality Action Plan
AQFA	Air Quality Focus Area
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
ASR	Annual Status Report
CAP	Clean Air Plan
EPUK	Environmental Protection UK
GMCA	Greater Manchester Combined Authority
HDV	Heavy Duty Vehicles
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LDV	Light Duty Vehicles
LPA	Local planning authority
MCC	Manchester City Council
NAEI	National Atmospheric Emissions Inventory
NO ₂	Nitrogen dioxide

Term	Definition
NO _x	Nitrogen oxides
NPPF	National Planning Policy Framework
PfE	Places for Everyone Joint Development Plan 2022 to 2039
PM	Particulate matter
PPG	Planning Practice Guidance

Figure 15.1

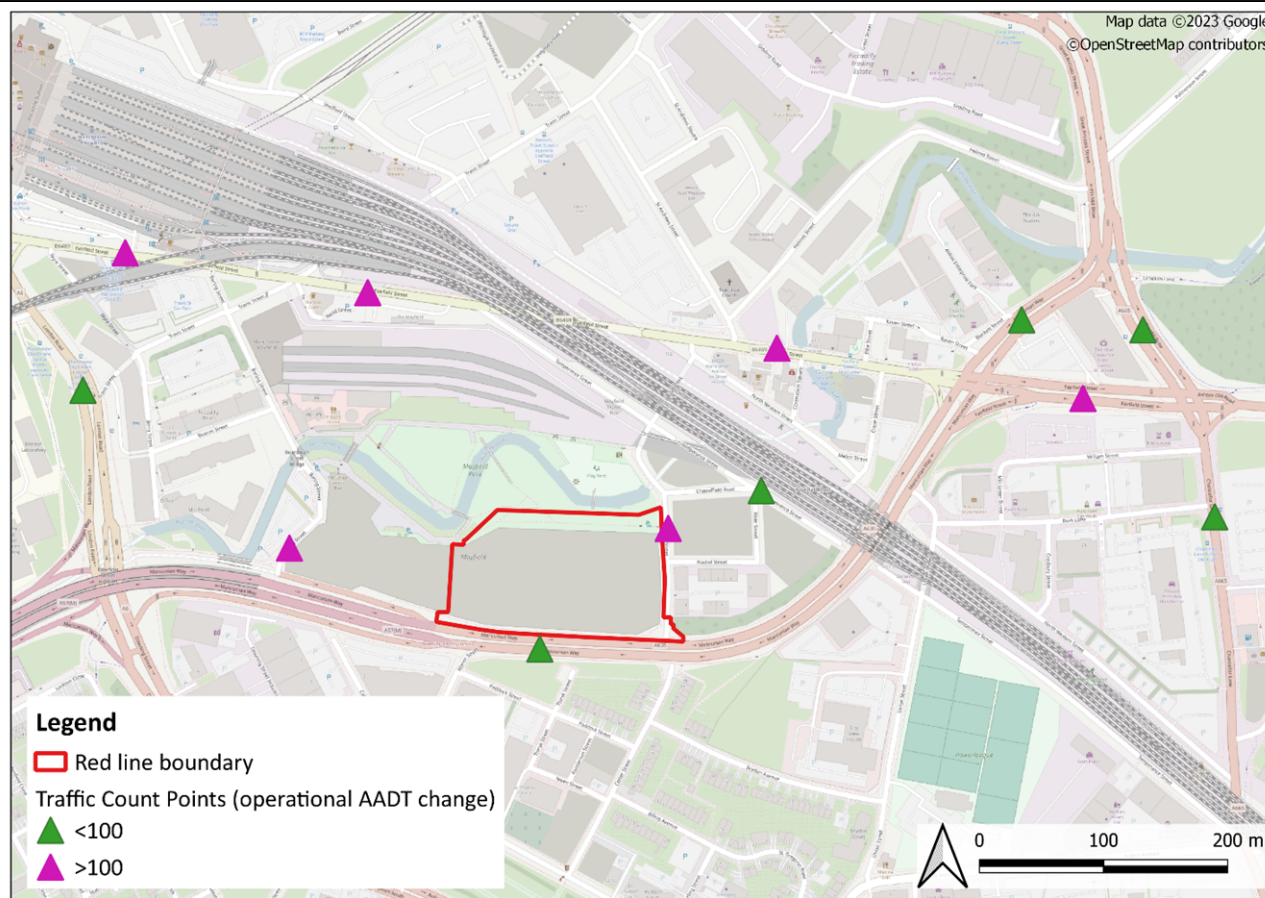


Traffic count points, showing exceedances of the construction traffic HDV AADT screening criteria.

To Scale

Date: 06/12/2024

Figure 15.2

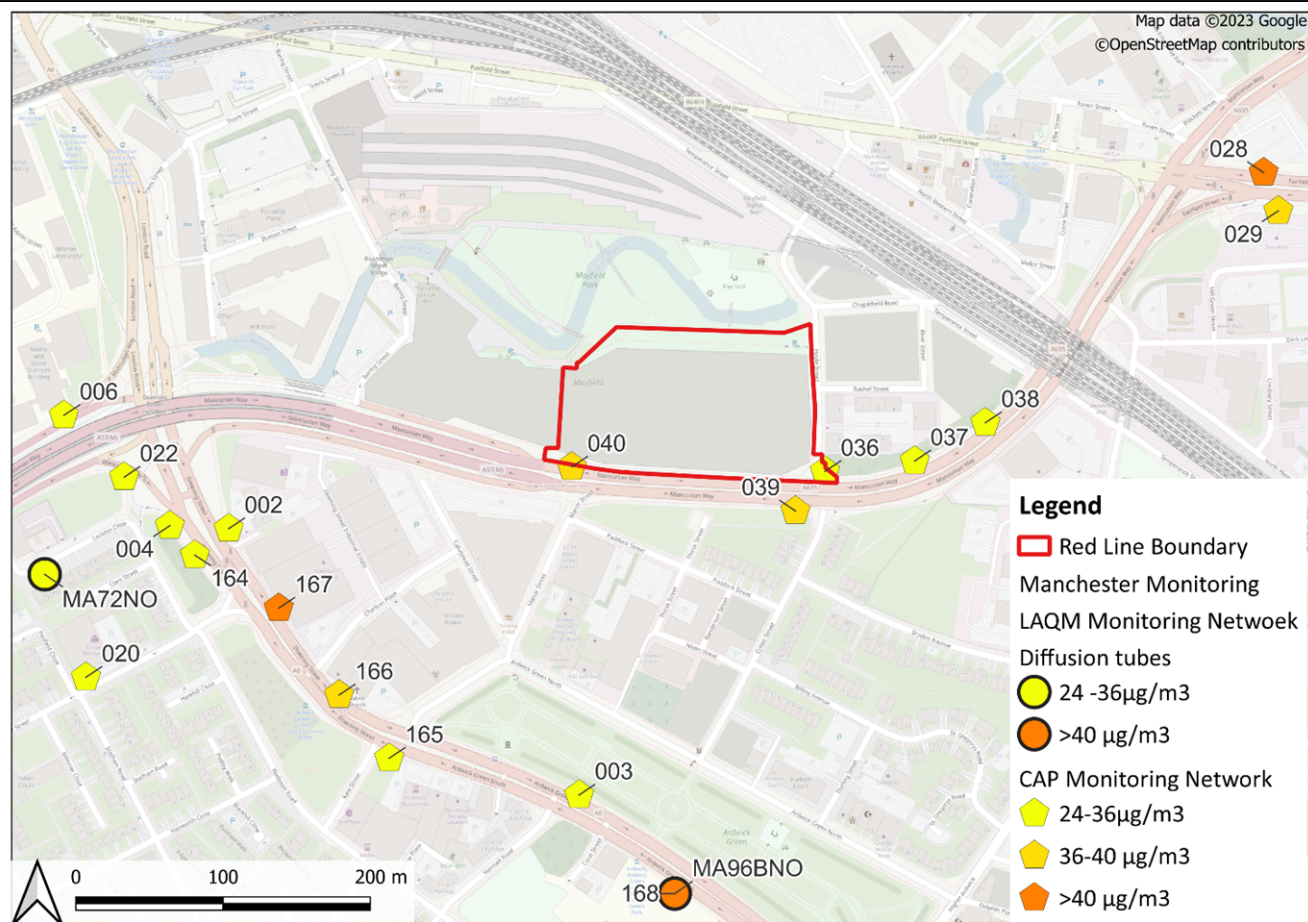


Traffic count points, showing exceedances of the operational traffic AADT screening criteria.

To Scale

Date: 06/12/2024

Figure 15.3

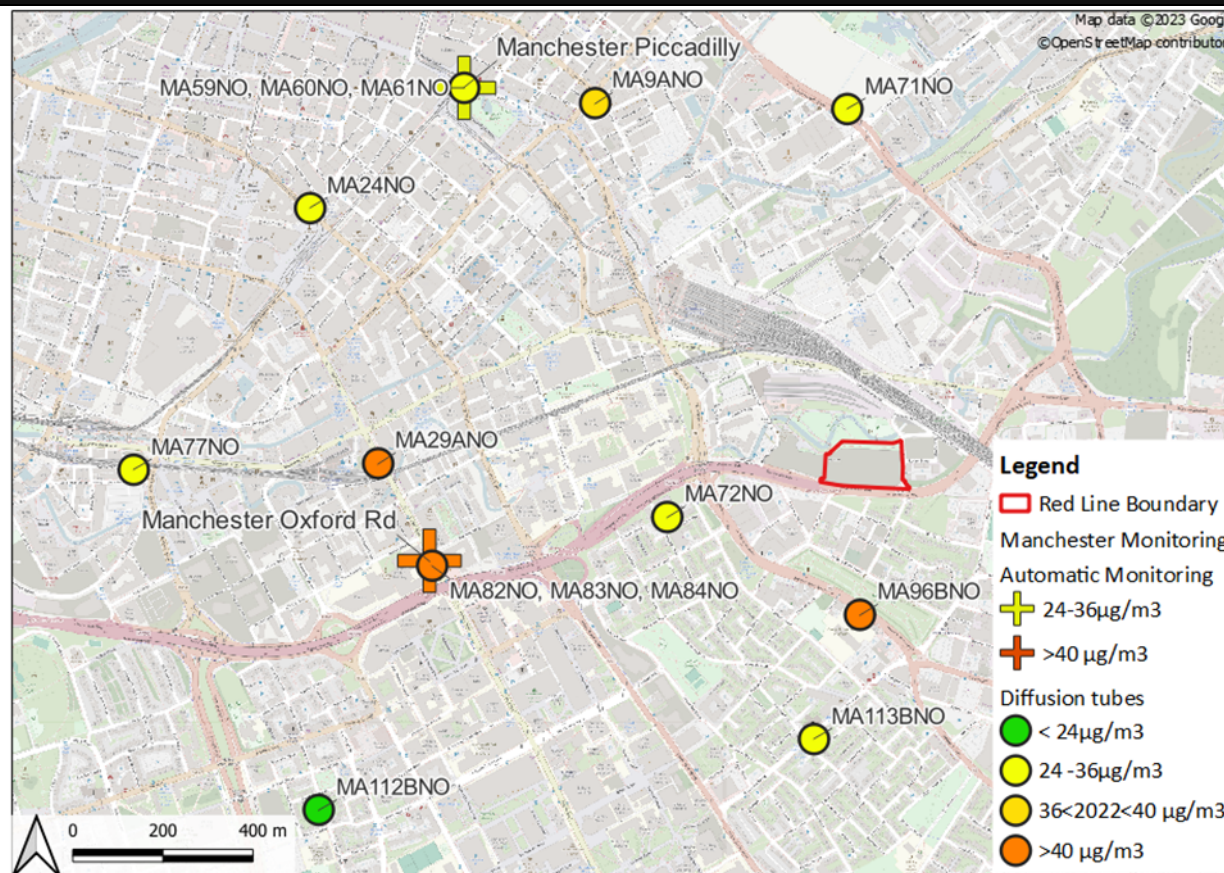


GMCA Clean Air Plan diffusion tube monitoring sites in proximity to the EIA Site

To Scale

Date: 06/12/2024

Figure 15.4



GMCA Local Air Quality Management automatic and diffusion tube monitoring sites in proximity to the EIA Site

To Scale

Date: 06/12/2024

Figure 15.5

