

Appendix 12.2 Operational Phase Methodology



Appendix 12.2

OPERATIONAL PHASE ASSESSMENT METHODOLOGY

This section details the methodology and criteria used to assess the operational phase assessment in conjunction with EPUK-IAQM and LAQM.TG22 guidance.

Operational Phase Assessment

The potential impacts of the proposed development on local air quality are to be assessed through detailed dispersion modelling, which is to be undertaken to quantify NO₂, PM₁₀, and PM_{2.5} concentrations across the site and evaluate its suitability for the proposed use, using the following scenarios:

- Baseline Year, 2022 (S1);
- Completion Year Without the Development, 2036 (S2); and
- Completion Year With the Development, 2036 (S3).

The S1 scenario is representative of anticipated traffic data for a baseline year of 2022 based on data collected from Department for Transport's Traffic Count Website.

The S2 scenario is representative of anticipated traffic data with predicted variations in traffic flow patterns without the development, in 2036.

The S3 (i.e. with development) scenario is representative of anticipated traffic data with the addition of predicted variations in traffic flow patterns as a result of the proposals and committed flows from the community, for the completed development, 2036.

It should be noted that air quality is predicted to improve in the future. However, in order to provide a robust assessment, background concentrations for 2022 were utilised within the dispersion model. The use of 2036 traffic data with 2022 emission factors is considered to provide a worst-case scenario and therefore a sufficient level of confidence can be placed within the predicted pollution concentrations.

Receptors potentially sensitive to changes in NO₂, PM₁₀ and PM_{2.5} concentrations were identified within 500 m of the affected highway network in accordance with the guidance provided within the IAQM guidance on the likely limits of pollutant dispersion from road sources. LAQM.TG22 provides the following examples of where annual mean AQOs should apply:

- Residential properties;
- Schools;
- Hospitals; and
- Care homes.

A desk-top study was undertaken to identify any existing and future sensitive receptor locations in the vicinity of the site that require specific consideration during the assessment.

The sensitive receptors are identified in Section 4 and represent worst-case locations. However, this is not an exhaustive list and there may be other locations within the vicinity of the site that may experience air quality impacts as a result of the proposed development that have not been individually identified above.

The following factors may provide some assistance in determining the overall significance of a development:

- Number of properties affected by significant air quality impacts and a judgement on the overall balance;

- Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective will be relevant;
- The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors;
- Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a substantial increase or decrease; and
- The extent to which an objective is exceeded e.g. an annual mean NO₂ concentration of 41 µg/m³ should attract less significance than an annual mean of 51 µg/m³.

These factors were considered, and an overall significance determined for the impact of operational phase road traffic emissions.

It should be noted that the determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.

The criteria shown in Table C1, is adapted from the EPUK-IAQM guidance 'Land-Use Planning and Development Control: Planning for Air Quality with sensitivity descriptors included to allow comparisons of various air quality impacts.

Long Term Average Concentration	% Change in Concentration Relative to AQO			
	1	2-5	6-10	>10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76 - 94% of AQO	Negligible	Slight	Moderate	Moderate
95 - 102% of AQO	Slight	Moderate	Moderate	Substantial
103 - 109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

Table A12.2.1: Operational Traffic Exhaust Emissions – Assessment of Impacts

It should be noted that changes of up to 0.5% will be described as negligible in accordance with the EPUK-IAQM guidance.

Following the prediction of impacts at discrete receptor locations utilising the criteria in Table B1, the EPUK-IAQM document states that this framework is to be used as a starting point to make a judgement on significance of effect, but other influences might need to be accounted for.

Whilst impacts might be determined as 'slight', 'moderate' or 'substantial' at individual receptors, overall effect might not necessarily be deemed as significant in some circumstances.

The descriptors of impact significance for the annual mean concentration for both NO₂ and PM₁₀ that take account of the magnitude of changes for the proposed development based on guidance from EPUK-IAQM are shown in Table C2 below.

Total Concentration Related to Objective/Limit Value	Change in Concentration		
	Small	Medium	Large
Increase with Scheme			
Above Objective/Limit Value with Scheme (>40 µg m ⁻³)	Minor Adverse	Moderate Adverse	Major Adverse
Just Below Objective/Limit Value with Scheme (36-40 µg m ⁻³)	Minor Adverse	Moderate Adverse	Moderate Adverse
Below Objective/Limit Value with Scheme (30-36 µg m ⁻³)	Negligible	Minor Adverse	Minor Adverse

Total Concentration Related to Objective/Limit Value	Change in Concentration		
	Small	Medium	Large
Well Below Objective/Limit Value with Scheme ($<30 \mu\text{g m}^{-3}$)	Negligible	Negligible	Minor Adverse
Decrease with Scheme			
Above Objective/Limit Value with Scheme ($>40 \mu\text{g m}^{-3}$)	Minor Beneficial	Moderate Beneficial	Major Beneficial
Just Below Objective/Limit Value with Scheme ($36-40 \mu\text{g m}^{-3}$)	Minor Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/Limit Value with Scheme ($30-36 \mu\text{g m}^{-3}$)	Negligible	Minor Beneficial	Minor Beneficial
Well Below Objective/Limit Value with Scheme ($<30 \mu\text{g m}^{-3}$)	Negligible	Negligible	Minor Beneficial

Table A12.2: Impact Descriptors for Changes to Annual Mean Concentration of NO_2 and PM_{10}

Once the magnitude of the change has been established, the impact at each relevant receptor needs to be described. The impact magnitude at each receptor location can be described using the changes stated above as Negligible, Minor, Moderate or Major, as either Adverse or Beneficial, and either Temporary or Permanent.

The overall significance should be described separately for both the impact of emissions related to the proposed development on existing receptors, and for the impacts of emissions from existing source(s) on new exposure being introduced from the proposed development.

