# M60/M62/M66 Simister Island Interchange

## TR010064

# ENVIRONMENTAL STATEMENT
# CHAPTER 5 AIR QUALITY

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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**The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009**

# M60/M62/M66 Simister Island Interchange

Development Consent Order 202[ ]

## ENVIRONMENTAL STATEMENT
## CHAPTER 5 AIR QUALITY

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# 5 Air quality

## 5.1 Introduction

5.1.1 This chapter presents the information required by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 to be provided in the Environmental Statement for the M60/M62/M66 Simister Island Interchange (the 'Scheme') in respect of air quality. Air pollution is associated with adverse health impacts and is recognised as a contributing factor in the onset of conditions such as heart disease and cancer. Furthermore, in certain circumstances air pollution may adversely affect ecosystems through elevated nitrogen deposition.

5.1.2 The air quality assessment has been undertaken in line with the Design Manual for Roads and Bridges (DMRB) LA 105: Air quality (Highways England, 2019), and considers the following matters:

- Baseline air quality – a review and assessment of existing air quality conditions within the defined study area for the assessment.
- Assessment of construction dust – an assessment of the potential risk of construction dust impacts.
- Assessment of construction traffic – modelling the potential impact of the construction of the Scheme on air quality at representative sensitive human health receptors for the worst-case construction scenario.
- Detailed assessment of local air quality – modelling the potential impacts of the operation of the Scheme on air quality at representative sensitive human health receptors.
- Assessment of ecological habitats – identifying the potential impact of air quality changes on designated habitats and local wildlife sites within the Scheme study area for both construction and operation.
- Compliance risk assessment – modelling the potential risk of the Scheme affecting air quality Limit Value compliance for both construction and operation.

5.1.3 This chapter is supported by the following Environmental Statement Figures (TR010064/APP/6.2):

- Figure 5.1: Air Quality Construction Study Area
- Figure 5.2: Air Quality Operational Study Area
- Figure 5.3: Air Quality Baseline Conditions
- Figure 5.4: Modelled Human Health Receptors
- Figure 5.5: Modelled Ecological Receptors
- Figure 5.6: Modelled Compliance Risk Assessment Receptors

- Figure 5.7: Construction Dust Results
- Figure 5.8: Construction Human Health Assessment Results
- Figure 5.9: Construction Ecological Assessment Results
- Figure 5.10: Operational Human Health Assessment Results
- Figure 5.11: Operational Ecological Assessment Results.

5.1.4 This chapter is supported by the following Environmental Statement Appendices (TR010064/APP/6.3):

- Appendix 5.1: Air Quality Methodology
- Appendix 5.2: Air Quality Results.

## 5.2 Competent expert evidence

5.2.1 The assessment has been undertaken and reported by a team of competent air quality specialists. The competent expert for air quality has over 25 years of experience working in air quality in either consultancy or academia and holds a Bachelor of Engineering for Communication and Control Engineering and a Doctor of Philosophy (Ph.D.) in Air Pollution Modelling and Artificial Neural Networks. The competent expert for air quality is a member of the Institute of Engineering and Technology, a member of the US Transportation Research Board (TRB) Aviation Environment Committee and was previously on the Executive Board of the US TRB Aviation Group. The competent expert for air quality has provided evidence for road transport schemes for Air Quality at public inquiries.

5.2.2 The team have over 30 years of combined experience of undertaking Air Quality Environmental Impact Assessments (EIA) for major infrastructure and linear projects, including highways.

## 5.3 Legislative and policy framework

### Legislation

5.3.1 This section and Table 5.1 provide a summary of the relevant air quality legislation and standards that have been referenced as part of this assessment.

**Table 5.1 Legislation relevant to the air quality assessment**

| Legislation | Relevance to the Scheme | How this legislation is addressed in the assessment |
|---|---|---|
| Environmental Protection Act 1990; amended by the Pollution Prevention and Control Act 1999. | Part III provides statutory nuisance provisions for dust. | The potential for dust nuisance effects have been identified as part of the construction dust assessment. |

| Legislation | Relevance to the Scheme | How this legislation is addressed in the assessment |
|---|---|---|
| Environment Act 1995, Part IV. | Introduced a system of Local Air Quality Management (LAQM) in the UK. This requires local authorities to review and assess air quality within their boundaries regularly and systematically against Air Quality Objectives (AQOs), appraise development and transport plans against these assessments and make plans to meet the AQOs where these are exceeded. | The potential for exceedances of relevant AQOs as a result of the Scheme has been considered in this assessment, demonstrating the potential interaction with the LAQM process being undertaken by local authorities. |
| The Air Quality (England) Regulations 2000 and The Air Quality (England) Amendment Regulations 2002. | Legislate for the AQOs for pollutants set out in the 2000 Air Quality Strategy, which was revised in 2007 (Defra, 2007). AQOs exist for a variety of pollutants including nitrogen oxides ($NO_X$), nitrogen dioxide ($NO_2$), and particulate matter with an aerodynamic diameter less than 10µm ($PM_{10}$) and less than 2.5µm ($PM_{2.5}$). These are established for the both the protection of human health and of vegetation and ecosystems (refer to Table 5.4 for AQOs relevant to this assessment). | This air quality assessment makes a comparison between the predicted concentrations of these pollutants resulting from the Scheme against their relevant AQOs, taking existing levels into account. |
| The Air Quality Standards Regulations 2010 | Transposes the formalised Limit Values set out in the European Union (EU) Ambient Air Quality Directive 2008/50/EC to United Kingdom (UK) law. The UK Government is responsible for ensuring that it complies with the provisions of EU Directives. On the UK Government's behalf, the Department for Transport (DfT) and Department for Environment, Food and Rural Affairs (Defra) have Public Service Agreements relating to EU Limit Values. | The potential for exceedance of the relevant Limit Values has been considered as part of the compliance risk assessment. |
| The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 | Includes an amended Limit Value for $PM_{2.5}$ of 20µg/$m^3$. | $PM_{2.5}$ has been assessed in line with the 20µg/$m^3$ Limit Value. |

| Legislation | Relevance to the Scheme | How this legislation is addressed in the assessment |
|---|---|---|
| Environment Act 2021, Part 4 | Requirement for the UK Government to set legally binding targets for air quality (e.g. the $PM_{2.5}$ targets below). | The assessment has been assessed against the relevant UK air quality objectives/Limit Values.<br>This air quality assessment has not assessed concentrations of $PM_{2.5}$ as a result of the Scheme against the targets. This is discussed further in paragraphs 5.3.3 to 5.3.5. |
| The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 | In accordance with the framework outlined in the Environment Act 2021, establishes two legally binding particulate matter targets for $PM_{2.5}$. | This air quality assessment has not assessed concentrations of $PM_{2.5}$ as a result of the Scheme against the targets. This is discussed further in paragraphs 5.3.3 to 5.3.5. |

5.3.2 EU Directive 2008/50/EC Ambient Air Quality and Cleaner Air for Europe (European Union, 2008) was published to consolidate previous European directives on ambient air quality. These European directives form the basis for UK air quality legislation. The Air Quality Standards Regulations 2010 transposes the EU directives into UK law.

5.3.3 Since production of the Preliminary Environmental Information Report (PEIR) (provided in Annex L of the Consultation Report Annexes (TR010064/APP/5.2)), new UK particulate matter targets have been published for $PM_{2.5}$. Under The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 the environmental targets for $PM_{2.5}$ are as follows:

- Annual mean concentration target (AMCT) of 10µg/$m^3$ across England (i.e. the annual mean level of $PM_{2.5}$ in ambient air must be less or equal to 10µg/$m^3$), and is not to be exceeded at any relevant monitoring station, by 31 December 2040. The reporting date (section 6(1) of the Environment Act 2021) for the AMCT is 15 July 2041.

- Population exposure reduction target (PERT) of 35% by the 31 December 2040, (as compared with the average population exposure in the three-year period from 1 January 2016 to 31 December 2018 (the baseline period)). The reporting date (section 6(1) of the Environment Act 2021) for the PERT is 15 July 2041.

5.3.4 In addition, the Government has published interim AMCT and PERT in the Environmental Improvement Plan (Defra, 2023a). These interim targets are not legally binding but are set to show progress towards the 2040 legally binding targets in the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 legislation. The interim targets are set out below:

- Interim AMCT of 12µg/$m^3$ to be met by the end of January 2028.
- Interim PERT to reduce population exposure by 22% by the end of January 2028.

5.3.5 However, as stated in the Applicant's response to the Examining Authority's Second Written Questions for the A12 Chelmsford to A120 Widening Scheme (a Nationally Significant Infrastructure Project (NSIP) being delivered by National Highways) (National Highways, 2023) on the new $PM_{2.5}$ targets (refer to question 2.2.3), the legislation is quoted as only applying at relevant $PM_{2.5}$ monitoring stations that existed immediately before the targets came into force (early 2023). The nearest $PM_{2.5}$ monitoring stations are the Defra managed Salford Eccles and Manchester Piccadilly sites and the local authority managed Salford M60 and Rochdale Queensway sites (located 6.8km, 7.0km, 7.3km and 7.8km from the Scheme area, respectively). None of these sites are affected by this Scheme and therefore the new $PM_{2.5}$ 2040 targets (and the interim targets) do not apply.

## National policy

### National Policy Statement for National Networks

5.3.6 The National Policy Statement for National Networks (NPS NN) (DfT, 2014) sets out the Government's policies relating to the development of NSIPs on the national road and rail networks in England. The Secretary of State (SoS) uses the NPS NN as the primary basis for making decisions on DCO applications.

5.3.7 Table 0.1 summarises the policy requirements from the NPS NN relating to the Applicant's assessment and mitigation requirements for air quality and how these requirements have been addressed in the assessment. See also the NPS NN Accordance Tables (TR010064/APP/7.2) for an assessment of the Scheme's compliance with the NPS NN.

**Table 5.2 NPS NN requirements for air quality**

| Paragraph reference | Applicant's assessment/mitigation requirement | How this is addressed in the assessment |
|---|---|---|
| 5.6 | *'Where the impacts of the project (both on and off-scheme) are likely to have significant air quality effects in relation to meeting EIA requirements and / or affect the UKs ability to comply with the Air Quality Directive, the applicant should undertake an assessment of the impacts of the proposed project as part of the environmental statement.'* | The assessment has taken account of both Limit Values and AQOs, with potential breaches reported in Section 5.10. |
| 5.7 | *'The environmental statement should describe:*<br>• *existing air quality levels;*<br>• *forecasts of air quality at the time of opening, assuming that the scheme is not built (the future baseline) and taking account of the impact of the scheme; and*<br>• *any significant air quality effects, their mitigation and any residual effects, distinguishing between the construction and operation stages and taking account of the impact of road traffic generated by the project.'* | Emissions for the affected road network (ARN) are presented in Section 5.10 of this chapter. Air quality concentrations and impacts are presented in Section 5.10 of this chapter and in Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3). |
| 5.8 | *'Defra publishes future national projections of air quality based on evidence of future emissions, traffic and vehicle fleet. Projections are updated as the evidence base changes. Applicant's assessment should be consistent with this but may include more detailed modelling to demonstrate local impacts.'* | Defra background future projections data, projected PCM data and National Highways' Speed Band emission factors (version 4.3) have been used in this assessment as discussed in Section 5.7. |
| 5.9 | *'In addition to information on the likely significant effects of a project in relation to EIA, the Secretary of State must be provided with a judgement on the risk as to whether the project would affect the UK's ability to comply with the Air Quality Directive.'* | The assessment has taken account of both Limit Values and AQOs, with potential breaches reported in Section 5.10. |

| Paragraph reference | Applicant's assessment/mitigation requirement | How this is addressed in the assessment |
|---|---|---|
| 5.14 | *'The Secretary of State should consider whether mitigation measures put forward by the applicant are acceptable. A management plan may help codify mitigation at this stage. The proposed mitigation measures should ensure that the net impact of a project does not delay the point at which a zone will meet compliance timescales.'* | Mitigation measures are described in Section 5.9 of this chapter. An Outline Air Quality and Dust Management Plan (Appendix A of the First Iteration Environmental Management Plan (EMP) (TR010064/APP/6.5)) has been submitted with the DCO application. |
| 5.15 | *'Mitigation measures may affect the project design, layout, construction, operation and/or may comprise measures to improve air quality in pollution hotspots beyond the immediate locality of the scheme. Measures could include, but are not limited to, changes to the route of the new scheme, changes to the proximity of vehicles to local receptors in the existing route, physical means including barriers to trap or better disperse emissions, and speed control. The implementation of mitigation measures may require working with partners to support their delivery.'* | |

### Draft National Policy Statement for National Networks

5.3.8 The Government published a draft replacement of the NPS NN in March 2023 (DfT, 2023). The consultation closed in June 2023 and the draft NPS NN has not yet been designated. However, it is potentially capable of being an important and relevant consideration in the decision-making process. The Environmental Statement continues to reference the 2014 NPS NN though, as it remains the relevant Government policy. Notwithstanding that position, Table 5.3 summarises the policy requirements from the draft NPS NN relating to the Applicant's assessment and mitigation requirements for air quality and how these have been addressed in the assessment. See also the Draft NPS NN Accordance Tables (TR010064/APP/7.3) for an assessment of the Scheme's compliance with the draft NPS NN.

**Table 5.3 Draft NPS NN requirements for air quality**

| Paragraph reference | Applicant's assessment/mitigation requirement | How this is addressed in the assessment |
|---|---|---|
| 5.11 | *'Where a project is likely to have adverse effects on air quality and/or where a project could lead to a deterioration in air quality in an area or lead to a new area where air quality breaches any national air quality limits or statutory air quality objectives, the applicant should undertake an assessment as part of their Development Consent Order application.'* | The assessment has taken account of both Limit Values and AQOs, with potential breaches reported in Section 5.10. |
| 5.12 | *'The assessment should describe:*<br>*• any air pollutant emissions, that would lead to a deterioration in air quality and their mitigation, distinguishing between the project stages, including construction and operation and taking account of emissions such as from any road traffic generated by the project*<br>*• the predicted absolute emission levels of the proposed project after mitigation methods have been applied*<br>*• existing air quality levels, how they are monitored and the relative change in air quality from existing levels*<br>*• any potential impacts on nearby protected habitats from air pollutant emissions'* | Emissions for the ARN are presented in Section 5.10 of this chapter. Air quality concentrations and impacts are presented in Section 5.10 of this chapter and in Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3). |
| 5.13 | *'Defra publishes future projections of UK air pollutant emissions based on evidence of future emissions, traffic and vehicle fleet. Projections are updated as the evidence base changes. The applicant's assessment should be consistent with this but may include more detailed modelling to demonstrate local impacts. If the latest future projections do not reflect the latest available evidence base at the assessment stage, applicants should still provide an assessment using the latest future projections published by Defra. If an applicant believes they have robust additional supporting evidence that is likely to change the projected emissions, they should include this in their representations to the Examining Authority.'* | Defra background future projections data, projected PCM data and National Highways' Speed Band emission factors (version 4.3) have been used in this assessment as discussed in Section 5.7. |

| Paragraph reference | Applicant's assessment/mitigation requirement | How this is addressed in the assessment |
|---|---|---|
| 5.14 | *'Mitigation measures may affect the project design, layout, construction, operation and/or may consist of measures to improve air quality in pollution hotspots beyond the immediate locality of the scheme. Measures could include, but are not limited to, changes to the route of the new scheme, changes to the proximity of vehicles to local receptors in the existing route, physical means including barriers to trap or better disperse emissions, and/or speed control. Applicants should routinely look for opportunities within the design of the proposed development to embed nature-based solutions, such as urban woodlands and trees to assist with pollutant reduction and dispersal along major transport corridors. In addition to avoiding further greenhouse gas emissions when compared with some more traditional approaches, nature-based solutions can also result in biodiversity benefits as well as increasing absorption of carbon dioxide from the atmosphere (see also paragraphs 5.171 to 5.195 on the role of green infrastructure).'* | The Scheme design has evolved over time to aim to accommodate, where practical, environmental mitigation as discussed in Chapter 3: Assessment of Alternatives of this Environmental Statement (TR010064/APP/6.1). Potentially significant ecological sites and any associated mitigation are discussed in Chapter 8: Biodiversity of this Environmental Statement (TR010064/APP/6.1). |
| 5.15 | *'The Secretary of State should consider whether mitigation measures are needed both for operational and construction emissions over and above any which may form part of the project application. In doing so the Secretary of State should have regard to the Air Quality Strategy or any successor to it and should consider relevant advice within Local Air Quality Management guidance.'* | This assessment concludes in Section 5.10 that there are no significant effects at modelled human health receptors and on Limit Value compliance receptors from road transport for both construction and operation, with the exception of potential significant effects for biodiversity, which are considered in Chapter 8: Biodiversity of this Environmental Statement (TR010064/APP/6.1).<br><br>For dust this assessment concludes that there are no significant effects resulting from construction dust with standard construction phase mitigation measures in place. These measures are included in the Outline Air Quality and Dust Management Plan, which is Appendix A of the First Iteration EMP (TR010064/APP/6.5). |
| 5.16 | *'The proposed mitigation measures should ensure that the net impact of a project does not delay the point at which a zone will meet compliance timescales.'* | |

### Additional national policy

5.3.9 The National Planning Policy Framework (Department for Levelling Up, Housing and Communities, 2023) prescribes that new and existing developments should not contribute to unacceptable levels of air pollution (paragraph 180). In addition, planning decisions should take into account Air Quality Management Areas (AQMAs) and Clean Air Zones (CAZs), be consistent with any local air quality action plan and assess the cumulative impact from individual sites in local areas (paragraph 192). The cumulative impact of road traffic has been taken into account in the traffic model, as discussed in the Transport Assessment (TR010064/APP/7.4), and as such is therefore included in the air quality modelling presented in this chapter, as it is based on the traffic modelling. The Greater Manchester CAZ and AQMAs are discussed further in paragraphs 5.3.18 – 5.3.20 and 5.7.12 respectively.

5.3.10 The Clean Air Strategy 2019 (Defra, 2019a) sets out plans for dealing with all sources of air pollution. This strategy is focused on tackling air pollution in England, but also highlights action being taken across the wider UK. The strategy is focused largely on the pollutant $PM_{2.5}$. A draft revised Air Quality Strategy (Defra, 2023b) has just finished consultation with an aim to be published later this year. In the context of this assessment, this draft strategy focusses on ammonia ($NH_3$), as well as $NO_X$ and $PM_{2.5}$.

5.3.11 The National Air Pollution Control Programme (NAPCP) (Defra, 2019b) is a UK-wide document that sets out measures and technical analysis which demonstrate how legally binding 2020 and 2030 emission reduction commitments can be met across the UK.

### National Air Quality Objectives

5.3.12 National Air Quality Objectives (AQOs) are defined in the Air Quality (England) Regulations 2000, the Air Quality (England) (Amendment) Regulations 2002. The EU Ambient Air Quality Directive (2008/50/EU) formed the basis for UK air quality legislation and the EU Limit Values were transposed into UK law by the Air Quality Standards (England) Regulations 2010 and The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020. The AQOs/Limit Values for $NO_X$, $NO_2$ and $PM_{10}$ are shown in Table 5.4. The Limit Value for $PM_{2.5}$ is also listed, $PM_{2.5}$ is a finer fraction (i.e. smaller particle size) than $PM_{10}$ with an aerodynamic diameter less than 2.5µm, and is linked to serious respiratory illnesses.

**Table 5.4 AQOs and Limit Values for $NO_X$, $NO_2$, $PM_{10}$ and $PM_{2.5}$**

| Pollutant | Concentration | Averaging period |
|---|---|---|
| $NO_X$ | 30µg/m$^3$ | Annual mean |
| $NO_2$ | 200µg/m$^3$ not to be exceeded more than 18 times a year[1] | 1-hour mean |
| | 40µg/m$^3$ | Annual mean |
| $PM_{10}$ | 50µg/m$^3$, not to be exceeded more than 35 times a year | 24-hour mean |

| Pollutant | Concentration | Averaging period |
|---|---|---|
| | 40µg/m$^3$ | Annual mean |
| $PM_{2.5}$ | 20µg/m$^3$ | Annual mean |

[1] Exceedances of the $NO_2$ 1-hour mean objective may occur if the annual mean is above 60µg/m$^3$ (Defra, 2022).

5.3.13 The UK is currently failing to meet the annual mean $NO_2$ AQO and air quality Limit Value in many areas across the country. The first Air Quality Plan for $NO_2$ in the UK (Defra, 2015) outlined how air quality in the UK would be improved by reducing $NO_2$ emissions in towns and cities. A revised UK Air Quality Plan was published in July 2017 (Defra and DfT, 2017), but the most recent ruling from the High Court in February 2018 (ClientEarth (No.3) versus SoSEFRA (2018)) concluded that this plan was insufficient to bring compliance with the air quality Limit Values within the soonest timeframe possible. In May 2018, Defra released a consultation draft of the Clean Air Strategy 2018, outlining actions to tackle emissions from a range of pollutant sources. The consultation on this draft informed the final Clean Air Strategy (Defra, 2019a) and National Air Pollution Control Programme (Defra, 2019b), which were published in January 2019 and March 2019 respectively.

5.3.14 Compliance with air quality Limit Values is determined via the national monitoring network and national model (the Pollution Climate Mapping (PCM) model), and there are a number of important differences between this, and the monitoring/modelling carried out by local authorities to determine achievement of AQOs. Some of these differences are summarised in Table 5.5.

**Table 5.5 Comparison between national and local approaches**

| Exposure type | National | Local |
|---|---|---|
| Relevant exposure | Limit Values apply everywhere there is public access, within 15m of the running land/kerbside. However, paths running perpendicular to the road are excluded. | Annual mean objectives only apply at locations where public exposure is relevant to the averaging period, e.g. at residential building façades. |
| Treatment of junctions | Monitoring is not carried out within 25m of a junction and the same constraint is applied to the modelling. | Junctions are specifically considered in both monitoring and modelling. |
| Microscale | Excludes micro-environments and focuses on locations representative of 100m lengths of roads. | Focuses on “hot-spot” locations. |
| Roadside | Modelled concentrations apply to a distance of 4m from kerbside of the national road network. Local roads are excluded from the model. | Focus is on concentrations at the building façade, whatever distance from the kerb and alongside any road. |

| Exposure type | National | Local |
|---|---|---|
| Monitoring | Restricted to monitoring stations in the national network, operated to meet the Data Quality Objectives of the Directive. | Principally based on local authority monitoring, including both automatic and passive diffusion samplers. |

5.3.15 Because of these differences, there are many locations across the UK where national compliance with the Limit Values, and local achievement of the AQOs, are not in agreement. For the purpose of this assessment, they are treated separately. This is consistent with the guidance in DMRB LA 105.

## Local policy

5.3.16 In addition to the national policy set out in the NPS NN, the Scheme must also have regard to relevant legislation and local plans and policy.

5.3.17 Local policy related to this air quality assessment are detailed in Table 5.6.

**Table 5.6 Local policy relevant to air quality**

| Plan / policy document | Key requirements and objectives | How this has been considered/addressed in the assessment |
|---|---|---|
| Greater Manchester Clear Air Plan (Clean Air Greater Manchester, 2023). | The Greater Manchester Combined Authority (GMCA) and Transport for Greater Manchester (TfGM) are currently in the process of developing plans following a new Government directive for Greater Manchester to meet air quality legal limits of $NO_2$ by 2026. | The residual potential effect of the Scheme to exceed relevant Limit Values is detailed in Section 5.10 of this chapter. Further details of the plan are discussed below this table. |
| Air Quality Plan for tackling roadside nitrogen dioxide concentrations in Greater Manchester Urban Area (UK0003) (Defra and DfT, 2017). | This document aims to provide a plan for tackling $NO_2$ concentrations in the Greater Manchester Urban Area agglomeration zone (UK0003) as well as to develop infrastructure with a minimal environmental impact. | The residual effects of the Scheme on air quality, are detailed in Section 5.10 of this chapter. |
| Core Strategy Development Plan Document (Manchester City Council, July 2012). | Policy EN 16: Air Quality<br>'*Developers will be expected to take measures to minimise and mitigate the local impact of emissions from traffic generated by the development*…' | Mitigation required to address the potential impacts of the Scheme on air quality are addressed in Section 5.9 of this chapter. |

| Plan / policy document | Key requirements and objectives | How this has been considered/addressed in the assessment |
|---|---|---|
| Adopted Bury Unitary Development Plan Part 2 – Chapter 6: Environment (Bury Metropolitan Borough Council, August 1997). | EN7/1: Atmospheric Pollution<br>'*In seeking to limit atmospheric pollution the Council will not permit development which: i) would result in unacceptable levels of atmospheric pollution; and/or ii) is not compatible with the achievement of the Council's long-term air quality standards*.' | The residual effects of the Scheme on air quality are detailed in Section 5.10 of this chapter. |
| Joint Core Strategy and Development Management Policies<br>(Oldham Metropolitan Borough Council, November 2011). | Policy 9: Local Environment<br>*'The council will protect and improve local environmental quality and amenity by ensuring development… does not result in unacceptable level of pollutants or exposure of people in the locality or wider area*'. | The residual effects of the Scheme on air quality are detailed in Section 5.10 of this chapter. |
| Rochdale Unitary Development Plan (Rochdale Borough Council, June 2006). | Policy EM/2: Pollution<br>'*If the emission of pollutants from a proposed development cannot be controlled by other environmental legislation, such development will not be permitted where it would be likely to result in an increase in air (…) pollution which would be harmful to the environment and (…) land users in the area.*' | The potential of the Scheme to impact on modelled $NO_2$ concentrations at human-health receptors within and not within the GMCA AQMA are considered in this assessment, with residual effects reported in Section 5.10 of this chapter. |
| Rochdale Core Strategy (Rochdale Borough Council, February 2017). | Policy G9: Reducing the Impact of Pollution, Contamination and Land Instability<br>'*Focusing on measures that reduce air pollution in AQMAs, and other roads where pollution levels are unacceptable, particularly around motorways and main roads.*'<br>Policy DM1: General Development Requirements | The potential of the Scheme to impact on modelled $NO_2$ concentrations at human-health receptors within and not within the GMCA AQMA are considered in this assessment, with residual effects reported in Section 5.10 of this chapter. |

| Plan / policy document | Key requirements and objectives | How this has been considered/addressed in the assessment |
|---|---|---|
| | '*…will be expected to demonstrate that they… Do not have an adverse impact on health, through its impact or the effect of existing problems e.g. …poor air quality.*' | |
| Salford Unitary Development Plan (Salford City Council, June 2006). | Policy EN 17: Pollution Control<br>'*Development proposals that would be likely to cause or contribute towards a significant increase in pollution to the air (including dust pollution) will not be permitted unless they include mitigation measures commensurate with the scale and impact of the development.*' | Mitigation required to address the potential impacts of the Scheme on air quality are addressed in Section 5.9 of this chapter. |
| Salford Local Plan: Development Management Policies and Designations (Salford City Council, 2023) | Policy PH1: Pollution Control<br>'*Development shall minimise and mitigate pollution during both the construction and operational phases of development. Development will not be permitted where it would result in unacceptable levels of pollution, either individually or cumulatively with other existing or proposed developments, or would itself be subject to unacceptable levels of pollution*' | The residual effects of the Scheme on air quality are detailed in Section 5.10 of this chapter. |
| Places For Everyone (PfE) (GMCA, 2023)[1] | Policy JP-S 6<br>'*A comprehensive range of measures will be taken to support improvements in air quality, focusing particularly on locations where people live, where children learn and play, where there are impacts on the green infrastructure network and where air quality targets are not being met…*' | The potential of the Scheme to impact on modelled pollutant concentrations at human-health receptors are considered in this assessment, with residual effects reported in Section 5.10 of this chapter. |

[1] The emerging Places for Everyone Plan may become an adopted plan during the period that this application for development consent is being examined and/or determined (see Section 6.5 of the Case for the Scheme (TR010064/APP/7.1) for further details).

### Greater Manchester Clean Air Plan

5.3.18 In Greater Manchester, the 10 local authorities, GMCA and TfGM are working together to develop a Clean Air Plan to tackle exceedances of the annual mean $NO_2$ Limit Value in the shortest possible time, herein referred to as the Greater Manchester Clean Air Plan (GM CAP). Modelling undertaken to inform the development of the GM CAP (GMCA, 2022) indicates that the annual mean $NO_2$ Limit Value is currently exceeded within the air quality study area adjacent to the A56, immediately to the north of M60 J17, and that compliance is unlikely to be achieved at this location until 2025 (in the absence of any other action).

5.3.19 The original GM CAP included a Greater Manchester-wide category C charging CAZ (applicable to buses, coaches, taxis, private hire vehicles, heavy duty vehicles, vans and minibuses), which was designed to comply with a legal direction from Government issued before the COVID-19 pandemic. Since then, there have been significant vehicle supply chain issues, particularly for vans, and the cost of living has increased. This means that the original GM CAP was considered unworkable as it would not have met the obligations in the direction to achieve compliance with the $NO_2$ Limit Value by 2024 and could have caused significant financial hardship for people affected.

5.3.20 In February 2022, the Government agreed to lift the legal direction that Greater Manchester should achieve compliance with the $NO_2$ Limit Value in the shortest possible time and by 2024 at the latest. It has since issued a new direction for compliance in the shortest possible time and by 2026 at the latest. As a result, the first phase of the planned Greater Manchester CAZ did not go ahead on 30 May 2022. Greater Manchester local authorities have submitted the case for a new GM CAP, with a no charging CAZ, to Government, and currently, further modelling evidence has been requested by Government to support this case. Due to this current uncertainty, no CAZ has been incorporated in the assessment of the Scheme. In addition, it is also unlikely that a CAZ would still be in place by the opening year of 2029 due to the natural turnover of the fleet meaning that enforcing EURO 4 (petrol) and EURO VI (diesel) vehicles would be obsolete (as most vehicle would already meet these standards).

## 5.4 Assessment methodology

### Assessment scope

#### Scoping Opinion

5.4.1 Table 5.7 summarises the key responses from the Planning Inspectorate's Scoping Opinion (TR010064/APP/6.7) as relevant to the scope of the air quality assessment, and identifies any matters scoped out of the assessment as agreed with the Planning Inspectorate and other stakeholders. This table also explains any changes to the assessment methodology as a result of this engagement.

## Table 5.7 Scoping Opinion feedback for air quality

| Stakeholder | Scoping Opinion comment | Response |
|---|---|---|
| Planning Inspectorate | ID 4.1.1: '*Paragraph 6.2.1 states "it is assumed that road traffic assessment of changes in road traffic during construction is scoped out".*<br><br>*Paragraph 6.4.2 appears to be contradictory, stating that "construction traffic screening will be undertaken for the worst-case construction year as per DMRB LA 105…it is unlikely that any road will meet the screening criteria and therefore further assessment is likely to be scoped out". The same paragraph also states that "a construction traffic assessment should be completed if the construction duration is longer than 2 years".*<br><br>*For the avoidance of doubt (and as the construction traffic screening exercise remains to be carried out), the inspectorate does not agree that this matter can be scoped out of the assessment at this stage.'* | The most recent traffic data for all five years of construction of the Scheme was screened with reference to the traffic scoping criteria in paragraph 2.1 of DMRB LA 105, as part of the Environmental Statement. The traffic scoping criteria were triggered for four of the five years and as such further assessment has been undertaken within this Environmental Statement for the worst-case construction year. |
| | ID 4.1.2: '*The Inspectorate agrees that the assessment of construction dust effects on human and ecological receptors is, by definition, limited to the construction phase and that this matter can be scoped out.'* | Noted. Effects of dust on human and ecological receptors during operation is scoped out. |
| | ID 4.1.3: *'The Applicant states that as per Design Manual for Roads and Bridges (DMRB) LA 105 paragraph 2.21.4, it is not proposed to model particulate matter less than 2.5µm in diameter ($PM_{2.5}$) concentrations. The DMRB paragraph in question states that "modelling of $PM_{10}$ can be used to demonstrate the project does not impact on the $PM_{2.5}$ air quality threshold".'* | For this Environmental Statement, concentrations of $PM_{10}$ have been used in the local air quality and compliance risk assessments for comparison against the $PM_{2.5}$ Limit Value of 20µg/m$^3$. |

| Stakeholder | Scoping Opinion comment | Response |
|---|---|---|
| | ID 4.1.4: '*Figure 6.1 appears to show the alignment of the "Stage 2 Affected Road Network" nodes being somewhat distant from the actual alignments of the road as shown on the base map. This then potentially affects the inclusion / identification of receptors within the 200m buffer zone.*<br><br>*The ES should present how the modelled nodes are more accurately representative of the road network and sensitive / representative human health and ecological receptors depicted on the same plan.'* | Figure 6.1 of the Environmental Scoping Report (TR010064/APP/6.6) showed the Stage 2 ARN over a simplified road network for illustrative purposes only. The ARN has been redefined for this Environmental Statement based on the most recent traffic modelling. The geographical representation of the operational ARN is more accurate and is shown in relation to sensitive receptors on Figure 5.4: Modelled Human Health Receptors, Figure 5.5: Modelled Ecological Receptors and Figure 5.6: Modelled Compliance Risk Assessment Receptors of the Environmental Statement Figures (TR010064/APP/6.2). Similarly, the construction ARNs are shown on Figure 5.1: Air Quality Construction Study Area of the Environmental Statement Figures (TR010064/APP/6.2). |
| | ID 4.1.5: *'The ES should clearly present and define the extents of both the Traffic Reliability Area (TRA) (extent of the traffic model) and the ARN, particularly where the ARN extends beyond the TRA. The additional traffic data used to screen in additional links into the assessment of air quality effects (i.e. the ARN) should be referenced and justified as being fit for purpose in effectively necessitating and supporting an extension to the TRA.*<br><br>*These additional ARN links should be considered in terms of sensitive human health and ecological receptors.'* | The ARN does not extend outside the TRA – work was undertaken during the PEIR (Annex L of the Consultation Report Annexes (TR010064/APP/5.2)), in conjunction with the project's traffic modellers, to extend the TRA to ensure this issue did not occur. The extents of both the TRA and operational ARN are shown on Figure 5.2: Air Quality Operational Study Area of the Environmental Statement Figures (TR010064/APP/6.2). The construction ARNs are shown on Figure 5.1: Air Quality Construction Study Area of the Environmental Statement Figures (TR010064/APP/6.2). |

| Stakeholder | Scoping Opinion comment | Response |
|---|---|---|
| | ID 4.1.6: *'Figure 6.3 shows an "AQMA study area" which is not defined in the text. It appears to show the extent of the ARN within the Air Quality Management Area (AQMA) but does not show the AQMA in its entirety.*<br>*The "AQMA study area" should be separately defined in the Environmental Statement (ES) and the extents of the Greater Manchester AQMA shown in the context of the ARN and the DCO application site boundary as part of the assessment of significance of effects on the AQMA.'* | The extents of the operational ARN, air quality study area and Order Limits in relation to the Greater Manchester AQMA are shown on Figure 5.2: Air Quality Operational Study Area of the Environmental Statement Figures (TR010064/APP/6.2). |
| Natural England | Appendix 2, Natural England response letter<br>*'6. Air Quality*<br>*The list of baseline air quality condition sources in chapter 6.3.1 would benefit from the inclusion of Air Pollution Information System (APIS) to access the site relevant critical loads.'* | Site relevant critical loads obtained from the APIS website are included in Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3), and background rates of nitrogen deposition obtained from APIS are detailed in Table 5.17. |

### Technical engagement

5.4.2 Stakeholder engagement has been undertaken verbally and via email with Bury Metropolitan Borough Council (BMBC) Environmental Health department. This earlier engagement was undertaken in April 2021 and focussed on:

- Outlining the air quality assessment methodology
- Co-location of Scheme-specific monitoring sites
- If the Scheme was likely to interfere with the aims of the proposed Greater Manchester charging CAZ, which was concluded as unlikely due to the Opening year of the Scheme being beyond the likely scope of the CAZ
- Potential residential developments that may occur next to the Scheme

### Statutory consultation

5.4.3 Table 5.8 identifies the key feedback received from statutory bodies during the statutory consultation. All comments raised during the statutory consultation, as well as the Applicant's responses, are included in Annex Q of the Consultation Report Annexes (TR010064/APP/5.2).

**Table 5.8 Key statutory consultation feedback for air quality**

| Stakeholder | Comment | Response |
|---|---|---|
| BMBC | Construction Phase - Have the effects of traffic diversions during construction been assessed i.e. the increase in traffic on other roads that the traffic is diverted to? | Yes, construction traffic was assessed and included diversions. The likely significant effects of this are discussed in Section 5.10. |
| | Have the commercial/industrial developments proposed for the Northern Gateway development been included in the Transport Assessment? | The traffic modelling, used to underpin the air quality assessment, was produced following TAG guidance and using an uncertainty log. The modelling only includes sites that are 'Near Certain' and 'More Than Likely', as described in the Transport Assessment (TR010064/APP/7.4).<br>As the details of the Places for Everyone (PfE) plan and the associated sites (which also include the Northern Gateway sites) are still under development (GMCA, 2023), the development sites and areas contained within it are omitted from the core traffic modelling and are therefore not reported in the Transport Assessment (TR010064/APP/7.4). |
| | *The following is required for submission:*<br>*'Updated Air Quality Risk Assessment'* | This chapter is the updated risk assessment for air quality. |
| | Concern about verification factors that are less than 1. | Further detail of the verification process has been included in Appendix 5.1: Air Quality Methodology of the Environmental Statement Appendices (TR010064/APP/6.3), details of the traffic modelling and its validation are included in the Transport Assessment (TR010064/APP/7.4). Where the verification factor was less than 1, a verification factor of 1 has been used. The use of 1 as a verification factor is likely to lead to an over prediction of results between M60 junctions 17 and 18 (i.e. the actual concentrations in reality would be lower). |

| Stakeholder | Comment | Response |
|---|---|---|
| | Comment on the PEIR Table 6.8: '*Are these all potential exceedance locations, or just worst case and might represent other similar exceedances that are unreported?'* | All receptors that were likely to exceed and worsen due to the Scheme were modelled and included in Appendix 6.2 of the PEIR (Annex L of the Consultation Report Annexes (TR010064/APP/5.2)), however, only those exceeding the AQO/Limit Values were included in Table 6.8 of the PEIR. Similarly, in this chapter the tables in Section 5.10 provide results for worst-case receptors and the full results are in Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3). |
| | *'Given the unusual air quality modelling adjustment factors, there is concern that the emissions data used in the Base / Do Minimum modelling is not robust. One plausible explanation would be that motorway speeds and driving behaviour has been underestimated. Heavy congestion is not regularly observed for the full 6 hours of the interpeak for example. If this is the case, the emissions benefits predicted by the proposed scheme alleviating congestion would not occur. If the motorway did then increase the flow by 8000 vehicles per day (only east bound at +4000 AADT is described) but under free flow conditions this would in fact lead to a worsening in air quality, as opposed to the improvement predicted. There are 8 receptors predicted to be in exceedance in the Do Min (2027), which experience a benefit as a result of the scheme but could in fact be in exceedance and worsened.*<br><br>*Please can National Highways provide evidence of the nature of traffic speeds and behaviour on a 15-minute or 1 hourly period across the weekday, specifically on the M60 J17-18 by direction.'* | As discussed in Section 5.4 of this chapter, the air quality modelling was based on modelling the individual traffic modelled periods as opposed to Annual Average Daily Traffic (AADT) and therefore should reflect the different levels of congestion (or lack of) at different times of a typical day based on the traffic modelling. Details of the traffic modelling used to underpin this chapter are provided in the Transport Assessment (TR010064/APP/7.4). National Highways also provided an explanation as requested in our formal statutory consultation response. |

## General approach

5.4.4 The baseline conditions described in Section 5.7 have been used to define the receiving environment sensitivity with reference to the criteria in Table 2.11a/b of DMRB LA 105. The sensitivity of the receiving environment is considered to be high, for the following reasons:

- Monitored exceedances of the AQO for $NO_2$ within the study area (in 2018 (Base year) and other years, refer to Appendix 5.1: Air Quality Methodology of the Environmental Statement Appendices (TR010064/APP/6.3)).
- The Scheme being situated entirely within the GMCA AQMA.
- Concentrations modelled at sensitive receptors in the PEIR (Annex L of the Consultation Report Annexes (TR010064/APP/5.2)), which were close to or exceeding the AQO in the Opening year.
- The potential exceedance of lower critical load thresholds through nitrogen deposition at the designated ecological sites identified within 200m of affected roads.

5.4.5 Therefore, a detailed environmental assessment of air quality has been undertaken in accordance with DMRB LA 105. By using the DMRB LA 105 standard, it is considered that the Scheme can be measured against the NPS NN policy requirements. The following aspects have been assessed:

- Baseline air quality, including data collection of key pre-existing air quality information in the study area, air quality modelling for Base year 2018 road traffic, including model verification against monitored air pollution data.
- Construction dust.
- Construction worst-case year (2028) air quality modelling.
- Opening year (2029) air quality modelling.

## Construction dust

5.4.6 A construction dust assessment has been undertaken in accordance with DMRB LA 105. It identified all sensitive receptors (human health and designated ecological sites) within 50m, 50–100m and 100–200m of all construction activity bounded by the Order Limits. The proximity of nearby receptors were considered in combination with the likely magnitude of construction activities to inform a qualitative assessment of the dust risk potential of the Scheme to the receiving environment as per Table 5.9 and Table 5.10 (replicated from DMRB LA 105 Tables 2.58a and 2.58b). The resulting risk potential was then used to inform the proposed mitigation measures included in this chapter.

**Table 5.9 Construction dust risk potentials (replicated from DMRB LA 105 Table 2.58a)**

| Risk | Construction dust risk potential |
|---|---|
| Large | Large motorway scheme, bypass and major motorway junction improvements. |
| Small | Junction congestion relief scheme (i.e. small junction improvements), signalling changes. Short smart motorway scheme. |

**Table 5.10 Receiving environment sensitivity to construction dust (replicated from DMRB LA 105 Table 2.58b)**

| Construction dust risk potential | Distance from construction activities | | |
|---|---|---|---|
| | 0-50m | 50-100m | 100-200m |
| Large | High | High | Low |
| Small | High | Low | Low |

## Construction traffic

5.4.7 Paragraph 2.60 of DMRB LA 105 states that a construction traffic assessment should be completed where construction activities are programmed to last more than two years. The construction phase of the Scheme is currently planned for 2025 to 2029, so would meet this criterion. Construction traffic movements were provided by the traffic modelling team, taking into account rerouting and diversions. Traffic scoping was undertaken for all five years of construction with reference to the traffic scoping criteria in paragraph 2.1 of DMRB LA 105 and as discussed in the Study area section below.

## Air quality modelling

5.4.8 Additional information on the air quality modelling methodology can be found in Appendix 5.1: Air Quality Methodology of the Environmental Statement Appendices (TR010064/APP/6.3). It should be noted that as per DMRB LA 105 paragraph 2.21.4, concentrations of $PM_{10}$ have been used in the local air quality and compliance risk assessments for comparison against the $PM_{2.5}$ Limit Value of 20µg/$m^3$.

### Study area

5.4.9 The study area for the construction and operational local air quality assessments were defined following the traffic screening process outlined within DMRB LA 105, which identifies the ARN based on predicted changes in traffic between the Do-Minimum (DM) (without Scheme / construction) and Do-Something (DS) (with Scheme / construction) scenarios.

5.4.10 Roads within the traffic model were included in the ARN where any of the following criteria were met between the DM and DS:

- Daily traffic flows change by more than or equal to 1,000 annual average daily traffic (AADT)

- Heavy duty vehicle (HDV, greater than 3.5 tonnes) flows change by more than or equal to 200 AADT
- A change in speed band
- Horizontal road alignment changes by 5m or more.

5.4.11 The traffic screening process was applied to the TRA, which is the area covered by the traffic model that the competent expert for traffic has identified as reliable for inclusion in the environmental assessment (see the Transport Assessment (TR010064/APP/7.4) for further details). The TRA was extended in discussion with the traffic modellers to ensure all roads that triggered the screening process were included. The TRA is shown on Figure 5.1: Air Quality Construction Study Area and Figure 5.2: Air Quality Operational Study Area of the Environmental Statement Figures (TR010064/APP/6.2).

5.4.12 A representative number of worst-case human health, compliance risk and ecological receptors were then selected within 200m of the ARNs (i.e. the distance over which perceptible impacts on air quality have the potential to occur). The modelled roads within the study area were then defined as the ARN plus all roads within 200m of these sensitive receptors.

**Traffic data**

5.4.13 Traffic data for the modelling scenarios has been provided from the project traffic modellers (see the Transport Assessment (TR010064/APP/7.4) for further details). The base year air quality modelling uses traffic data, pollution measurements and meteorological measurements from 2018.

5.4.14 Traffic data which represents the average conditions occurring in specific time periods were provided for the periods specified in Table 5.11.

**Table 5.11 Annual average time periods used**

| Traffic Period | | Time Period |
|---|---|---|
| Annual Average Daily Traffic (AADT) | | 00:00 – 24:00 |
| Annual Average Weekday Traffic (AAWT) | AM Peak (AM) | 07:00 – 10:00 |
| | Inter-Peak (IP) | 10:00 – 16:00 |
| | PM Peak (PM) | 16:00 – 19:00 |
| | Off Peak (OP) | 19:00 – 07:00 |

5.4.15 For each time period, the following traffic data parameters were provided:

- Total traffic flow, defined as vehicles/hour
- Percentage HDV
- Vehicle speed, in kilometres per hour (km/h)
- Speed band.

### Emissions calculations for peak and interpeak/off peak periods

5.4.16 The dispersion modelling process takes into account the emissions produced by Light Duty Vehicles (LDVs, less than 3.5 tonnes) and HDVs travelling at a certain speed along a section of road over an average hour for the period considered and predicts the dispersion of these emissions. Emissions for LDVs and HDVs were derived using the National Highways Speed Band emission factors (version 4.3) (National Highways, 2022a) using the AM, IP, PM and OP traffic data.

### Dispersion modelling

5.4.17 Annual mean concentrations of $NO_X$ and $PM_{10}$ ($PM_{2.5}$ emission factors are not available for National Highways speed band emission factors) were modelled at selected receptors using the latest version of Atmospheric Dispersion Model Software (ADMS)-Roads for total traffic flows per hour and for HDVs per hour. Version 5.0 was used for this assessment (Cambridge Environmental Research Consultants (CERC), 2022). The $PM_{2.5}$ impact from modelled road traffic was assumed to be the same as $PM_{10}$, a worst-case assumption as $PM_{2.5}$ is a subset of $PM_{10}$. Meteorological inputs were included based on 2018 data from a meteorological site in Manchester, Manchester Airport, located approximately 22km to the south of the Scheme. Modelled concentrations were added to background concentrations and are discussed further in Appendix 5.1: Air Quality Methodology of the Environmental Statement Appendices (TR010064/APP/6.3).

### Distance correction

5.4.18 The monitoring results at locations within the modelled study area that were exceeding the AQO in 2018 were adjusted based on distance to the edge of the nearest modelled road using the $NO_2$ Fall Off With Distance Calculator tool (Defra, 2016) to establish potential representative receptor exceedances, of the $NO_2$ AQO at the nearest sensitive receptor.

### Verification

5.4.19 Base year 2018 modelled road $NO_X$ concentrations were compared to monitored road $NO_X$ to account for any systematic bias in the air quality dispersion modelling approach, following the methodology described in LAQM Technical Guidance (Defra, 2022) (hereafter referred to as LAQM TG(22)). The verification process resulted in the application of three model adjustment factors: 1.00, 1.44 and 1.36, which were applied to raw modelled road $NO_X$ and $PM_{10}$ concentrations within distinct zones within the air quality study area, as shown on Figure 5.4: Modelled Human Health Receptors of the Environmental Statement Figures (TR010064/APP/6.2). This is discussed further in Appendix 5.1: Air Quality Methodology of the Environmental Statement Appendices (TR010064/APP/6.3).

### Post-processing/adjustment

5.4.20 The $NO_X$ to $NO_2$ conversion tool v8.1 (Defra, 2020a) was then used, along with the adjusted and sector-removed mapped background $NO_2$ concentrations (Defra, 2020b), to calculate annual mean $NO_2$ concentrations at sensitive human health, compliance risk and ecological receptors. Long Term Trend (LTT) adjustment factors, derived from Defra's roadside $NO_2$ projection factors (Defra, 2023c), were applied to annual mean $NO_X$ and $NO_2$ concentrations at human health and ecological receptors in accordance with the gap analysis methodology described in paragraphs 2.47 to 2.53 of DMRB LA 105, the choice of LTT factors is discussed further in Appendix 5.1: Air Quality Methodology of the Environmental Statement Appendices (TR010064/APP/6.3).

5.4.21 Following the application of the model adjustment factors in verification, modelled road $PM_{10}$ concentrations were added to the adjusted and sector-removed mapped background $PM_{10}$ concentrations (Defra, 2020b); no further adjustments were made.

### Compliance risk assessment

5.4.22 The Pollution Climate Mapping (PCM) model is a collection of models provided by Defra (Defra, 2020c). This has been developed to report on compliance with the air quality Limit Values and is run by Ricardo Energy & Environment (on behalf of Defra).

5.4.23 Total $NO_2$ and $PM_{10}$ concentrations at PCM compliance risk receptors were processed as described in the section above. However, as per paragraph 5.54 of DMRB LA 105, Defra LTT adjustment factors are not applicable to PCM compliance risk receptors and were therefore not applied to the modelled $NO_2$ concentrations at the PCM receptors considered in this assessment. As per Figure 2.79 of DMRB LA 105, total concentrations were compared to the Opening year Defra-modelled concentrations at PCM Census IDs and any risks to the $NO_2$, $PM_{10}$ or $PM_{2.5}$ Limit Values (40µg/m$^3$, 40µg/m$^3$ and 20µg/m$^3$, respectively) identified.

### Nitrogen deposition

5.4.24 Following identification of ecological sites with the potential to be affected by the Scheme, the competent expert for biodiversity was consulted to confirm the presence of nitrogen-sensitive habitats within these sites and the locations of appropriate transects for modelling purposes. Baseline nitrogen deposition rates and critical loads were obtained from the Air Pollution Information System website (APIS; UK Centre for Ecology and Hydrology, 2023). Modelled DM and DS road $NO_2$ concentrations (verification and Defra LTT adjusted) were converted to the dry nutrient nitrogen deposition rate (kg N/ha/yr). The following conversion rates were used as recommended by DMRB LA 105:

- Grassland and similar habitats: 1µg/m$^3$ of $NO_2$ = 0.14kg N/ha/yr
- Forests and similar habitats: 1µg/m$^3$ of $NO_2$ = 0.29kg N/ha/yr

5.4.25 In accordance with a recent National Highways recommendation, the ammonia ($NH_3$) contribution to the total nitrogen deposition was calculated for all modelled ecological receptors using the Draft Ammonia N Deposition Tool (v3) (National Highways, 2022b). Annual mean $NO_X$ concentrations for LDV and HDV were modelled separately and used as inputs, post verification adjustment, in the tool which calculates ammonia nitrogen deposition contribution, dependant on $NO_X$ to $NH_3$ conversion factors specific to the assessment year and dominant nearby road classification (urban, rural or motorway).

5.4.26 The total nitrogen deposition rate at each modelled ecological receptor was then calculated by combining the nitrogen deposition rates derived from $NO_2$ and $NH_3$ sources with the relevant background nitrogen deposition.

5.4.27 Modelling was undertaken in advance of any site visits and therefore the appropriate habitat type to be modelled was discussed in advance with the competent expert for biodiversity. By reference to the citations for the sites and to aerial imagery, it was possible that some of the designated sites support more than one nitrogen-sensitive habitat. Therefore, modelling and assessment of both habitats was undertaken as a precautionary approach in this chapter, and all results passed to the competent expert for biodiversity.

## Assessment criteria

### Magnitude of impact (change)

5.4.28 The significance of the environmental impact for the individual matters considered (i.e. ecological/human health/compliance risk) has been determined following the DMRB LA 105 criteria described below.

5.4.29 For the local air quality assessment at human health and compliance risk assessment receptors, Table 5.12 shows the guideline bands for receptors experiencing a ‘small’ to ‘large’ change in $NO_2$ (which also applies to $PM_{10}$) that inform a judgement of significant air quality effects (taken from Table 2.92N of DMRB LA 105). As per paragraph 2.89 of DMRB LA 105, these criteria have only been applied for those sensitive receptors where there are modelled exceedances of the relevant AQO (or Limit Value), either with or without the Scheme, in the Scheme Opening year.

5.4.30 The significance of the project for human health and compliance risk was determined based on these guideline bands, in combination with professional judgement of any potential risks.

**Table 5.12 Air quality magnitude of change criteria (derived from DMRB LA 105 Table 2.91 and associated text)**

| Magnitude of change | DM to DS change in annual mean (µg/m$^3$) |
|---|---|
| | $NO_2$ and $PM_{10}$ (40µg/m$^3$) |
| Imperceptible | <0.4 |
| Small | >0.4 |
| Medium | >2 |
| Large | >4 |

5.4.31 The number of receptors modelled to experience a small, medium or large magnitude of change were counted where they were above (i.e. exceeding) the relevant AQO/Limit Value. Any receptors classed as imperceptible are not included in the assessment of significance.

**Significance of effect**

5.4.32 For human health receptors, Table 2.92N of DMRB LA 105 provides guidance on the number of receptors in each magnitude of change category that could constitute a significant effect. The significance categories and guideline receptor numbers are replicated in Table 5.13. These are guideline values based on the considered opinion of National Highways and are intended to help provide consistency across road scheme assessments. The number of receptors in each guideline band have been used to inform professional judgement on the likely significance of the effect of the Scheme on human health.

**Table 5.13 Guideline to the number of receptors constituting a significant effect (replicated from DMRB LA 105 Table 2.92N)**

| Magnitude of change in pollutant concentration | Number of receptors with: | |
|---|---|---|
| | Worsening of AQO already above objective or creation of a new exceedance | Improvement of an AQO already above objective or the removal of an existing exceedance |
| Large | 1 to 10 | 1 to 10 |
| Medium | 10 to 30 | 10 to 30 |
| Small | 30 to 60 | 30 to 60 |

5.4.33 For the local air quality assessment at ecological receptors, the air quality assessment identified receptors where there was potential for significant effects, with significance then being assessed by the competent expert for biodiversity. As per DMRB LA 105, air quality effects on ecological receptors are considered significant if:

- The total nitrogen deposition rate is larger than the minimum critical load for the relevant habitat; and

- An increase in nitrogen deposition rate with the Scheme equivalent to more than 1% of the minimum critical load; and
- An increase in nitrogen deposition rate of more than 0.4kg N/ha/yr. The threshold of 0.4kg N/ha/yr is set out in DMRB LA 105, above which the competent expert for biodiversity should confirm if the site is to restore or maintain and update the assessment if required.

5.4.34 For PCM compliance risk, a significant effect is concluded if the Scheme is assessed to create a risk of delaying the UK's reported ability to comply with the Limit Value (e.g. 40µg/$m^3$ for $NO_2$ at qualifying features) in the shortest possible time or result in a zone becoming non-compliant. When this occurs, a Project Air Quality Action Plan is produced outlining mitigation with the aim of reducing this risk. Significance is then reassessed as per the criteria outlined in Figure 2.79 in DMRB LA 105.

## 5.5 Assessment assumptions and limitations

5.5.1 All reported 2018 Base year monitoring data has either over 75% data capture (i.e. has nine or more months' worth of data for the represented year) or has been annualised where data capture is less than 75%. Where this is not stated in the source (i.e. some of the older local authority data), data capture is assumed to be greater than 75%. The local authorities have been contacted to obtain the data capture where this is not publicly available.

5.5.2 The modelling process includes atmospheric dispersion modelling, which provides an estimate of concentrations arising from input emissions and historical meteorological data.

5.5.3 It should be noted that air quality modelling, like all modelling, is inherently uncertain, but it is the most reliable, reasonable and robust tool available to assess whether the Scheme has the potential to have a significant effect on air quality. In order to help manage uncertainty in air quality modelling, verification was carried out following the methodology described in LAQM TG(22) by comparing monitoring results to modelling results. As discussed in Section 5.7, the verification results produced three factors, each representing a distinct zone within the modelled study area.

5.5.4 Sensitive receptors have been determined using the Ordnance Survey AddressBase Plus (AB+) dataset and information provided by BMBC on a potential housing development. There may in some cases be properties, such as those recently built, which are not yet present within these data sources.

5.5.5 Requirements and advice on assessing nitrogen deposition from road transport ammonia sources are not included in the DMRB LA 105 standard. However, a methodology recently developed by National Highways (2022b) was applied for this assessment. This approach is currently in draft form, and hence the results calculated are subject to the assumptions applied by the tool, therefore nitrogen deposition results with and without ammonia are presented in Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3).

5.5.6 The air quality modelling, relating to road traffic, has been based on the preliminary scheme design, presented at the statutory consultation, which was available at the time of the modelling. The main updates since this design, which was previously assessed in the PEIR (Annex L of the Consultation Report Annexes (TR010064/APP/5.2)), are non-road alignment changes; such as permanent access locations, gantry locations and pond locations (see Section 3.4 of Chapter 3: Assessment of Alternatives of this Environmental Statement (TR010064/APP/6.1) for further details regarding key design changes since the PEIR). These changes would not affect the conclusions of the air quality assessment for road traffic-related air pollution concentrations. Any further changes to the traffic running lane alignments are limited in the limits of deviation (as shown on the Works Plans (TR010064/APP/2.2)) for the main line traffic lanes for up to 2 metres and up to 5 metres for slip roads. These levels of change are considered minor and would not change the conclusion of the road traffic related assessment reported in this chapter, based on DMRB LA 105 criteria, paragraph 2.1, for screening of road traffic, which assumes that changes to the carriageway of less than 5 metres are unlikely to significantly affect air quality.

5.5.7 The dust assessment has been undertaken for the Scheme design (as shown on Figure 2.2: Scheme Design of the Environmental Statement Figures (TR010064/APP/6.2)) and assumes a reasonable worst-case basis afforded by the limits of deviation (see Section 2.5 of Chapter 2: The Scheme of this Environmental Statement (TR010064/APP/6.1) for further details). While the limits of deviation (as shown on the Works Plans (TR010064/APP/2.2)) could result in minor changes in the numbers of reported receptors in Table 5.21, this would not change the conclusions of the dust assessment reported in this chapter.

## 5.6 Study area

5.6.1 Figure 5.1: Air Quality Construction Study Area of the Environmental Statement Figures (TR010064/APP/6.2) shows the extent of the ARN for construction and Figure 5.2: Air Quality Operational Study Area of the Environmental Statement Figures (TR010064/APP/6.2) for operation. Both of the construction and operational ARNs are situated within the jurisdiction of five local authorities: BMBC, Manchester City Council (MCC), Oldham Metropolitan Borough Council (OMBC), Rochdale Borough Council (RBC), and Salford City Council (SCC). The study area for construction dust is shown in Figure 5.7: Construction Dust Results of the Environmental Statement Figures (TR010064/APP/6.2).

## Construction

5.6.2 The outputs of the screening assessment indicated that most of the affected roads (i.e. all roads where the traffic scoping criteria paragraph 2.1 of DMRB LA 105 are exceeded) are associated with reductions in traffic flows, resulting from traffic diversions during construction of the Scheme, primarily away from the Scheme area and onto a number of minor roads rather than one particular route. This widespread rerouting means that the traffic scoping criteria has not triggered on these minor roads (i.e. it is a level of change in traffic unlikely to affect air quality. Increases in traffic flows are predicted, however, along some sections of the M60 to differing degrees across the assessment years, as traffic is diverted away from the Scheme's slip roads and traffic lanes onto other sections of the motorways and slip roads. These increases are, specifically, the outer lane of the M60 that separates from the mainline before Simister Island leading to and including the slip road off the M60 onto the M66 northbound; the slip road off the M60 junction 17 roundabout going onto the mainline westbound; and a section of the slip road off the M62 onto the M60 southbound. Increases in traffic on at least one section of road were predicted for all assessment years except 2025.

5.6.3 The screening outputs for each of the construction years are presented in Figure 5.1: Air Quality Construction Study Area of the Environmental Statement Figures (TR010064/APP/6.2). Table 5.14, below, shows the links with increases in AADTs exceeding the traffic scoping criteria (>1,000 AADT) for the relevant construction years.

**Table 5.14 Traffic links in exceedance of the AADT scoping criteria (>1,000 AADT) across the construction years**

| Traffic Link | Traffic AADT (vehicles/day) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | DM | Construction | | | | | | | |
| | | 2026 | 2026-DM | 2027 | 2027-DM | 2028 | 2028-DM | 2029 [1] | 2029-DM |
| Outermost lane off the M60 eastbound approaching J18 | 14,996 | 17,192 | 2,196 | - | - | 19,103 | 4,107 | 17,042 | 2,047 |
| Bypass slip from M62 onto M60 southbound at M60 J18 | 10,175 | - | - | - | - | 11,259 | 1,084 | - | - |
| Slip road off M62 at M60 J18 | 15,904 | - | - | - | - | 17,626 | 1,722 | - | - |
| Section of slip road onto M60 at J17 | 16,900 | - | - | - | - | 17,994 | 1,094 | - | - |
| Section of outermost lane merging onto M66 mainline north of M60 J18 | 14,815 | 17,248 | 2,433 | 16,073 | 1,258 | 16,105 | 1,290 | - | - |
| Bypass slip between M60 and M66 northbound at M60 J18 | 13,436 | 15,170 | 1,734 | - | - | - | - | - | - |

Note: '-' denotes a link at which the change in traffic AADT did not exceed the AADT scoping criteria (>1,000 AADT).

[1] 2029 construction traffic up to and including February 2029

5.6.4 Table 5.14 shows that the highest increase in traffic flows occur for most links in 2028. Those links where the highest increase in traffic flows occur in 2026 are not close to many existing receptors. For example, for the section of outermost lane merging onto M66 mainline north of M60 J18, along which the largest increase in traffic is predicted to occur in 2026, there is a single existing receptor approximately 40m from this section, with all other existing receptors at more than 100m in distance. Therefore, a construction air quality assessment has been undertaken for 2028. The construction traffic air quality assessment has been conducted using the same methodology as the operational traffic air quality assessment; further details can be found in Appendix 5.1: Air Quality Methodology of the Environmental Statement Appendices (TR010064/APP/6.3).

5.6.5 The worst-case 2028 construction ARN contains links within the operational ARN but for a smaller coverage. The extents of the smaller worst-case construction ARN are along the M60, between J15 and J19, M62 between J18 and J20 and a small section between the M66 J3 and J4. The worst-case 2028 construction ARN and study area are shown on Figure 5.1: Air Quality Construction Study Area of the Environmental Statement Figures (TR010064/APP/6.2).

### Operation

5.6.6 The roads considered likely to be ‘affected’ by the Scheme in operation, shown on Figure 5.2: Air Quality Operational Study Area of the Environmental Statement Figures (TR010064/APP/6.2), are predominantly located along the M60, between J15 and J22, the M62 between J18 and J21 as well as a small section between the M66 J3 and J4, and the A627(M) between Thornham and Slattocks Interchanges.

5.6.7 Unless specified otherwise, discussion of the ARN or study area from this point onwards within this report is in reference to the larger operational ARN and study area.

## 5.7 Baseline conditions

### Baseline sources

5.7.1 Local authorities regularly review, assess and report air quality measured within their areas. GMCA and SCC (SCC also publish monitoring data separately to GMCA) undertake air quality monitoring as part of their LAQM duties across the entirety of Greater Manchester, and this is carried out using a combination of both continuous monitoring stations and passive (diffusion tube) analysers.

5.7.2 A review of the baseline air quality conditions in the area around the Scheme has been undertaken based on information from the following sources:

- Defra background maps (Defra, 2020b)
- Defra PCM Census ID projections (Defra, 2020c)
- Ecological site baseline data (APIS baseline data acquired for 2019 – 2021 period) and critical loads (UK Centre for Ecology and Hydrology, 2023)

- Ecological site open data (Natural England, 2023)
- GMCA 2019 Air Quality Annual Status Report (ASR) (GMCA, 2020)
- GMCA 2021 Air Quality ASR (GMCA, 2021)
- Highways England monitoring data (Highways England, 2020)
- Monitoring for the Scheme (National Highways, 2021)
- Ordnance Survey AB+ data (2021)
- Ordnance Survey Topography maps of the surrounding area (2021)
- SCC monitoring data (SCC, 2021)
- TfGM monitoring data (Clean Air Greater Manchester, 2022)

5.7.3 All data used in the baseline assessment are publicly available, with the exception of the Ordnance Survey AB+ data, Highways England (now National Highways) and Scheme-specific monitoring data, which have been obtained for use within the assessment.

5.7.4 The annual mean $NO_2$ data was collected between 2015 and 2021 for the monitoring locations within the modelled study area and are detailed in Appendix 5.1: Air Quality Methodology of the Environmental Statement Appendices (TR010064/APP/6.3). The locations of all of the monitoring locations within the air quality study area are shown in Figure 5.3: Air Quality Baseline Conditions of the Environmental Statement Figures (TR010064/APP/6.2) (all values are in $\mu g/m^3$). Monitoring data for 2020, whilst still reported, have not been considered within this assessment as pollutant concentrations in this year are considered likely to have been substantially reduced due to the impact of COVID-19 travel restrictions resulting in reduced road traffic flows. Additionally, until such time as 2022 monitoring data are available, it is currently unclear how representative 2021 data are of current air quality conditions. Monitoring data for this assessment has been supplemented by Highways England survey data for across the same period.

**Scheme-specific monitoring**

5.7.5 Due to previously identified spatial gaps in the existing monitoring, an additional six-month monitoring survey was undertaken by members of the project team around the vicinity of the Scheme and wider area, such as along the M60, M62 and M66 motorway corridors (National Highways, 2021). This was completed to generate a more comprehensive baseline dataset, and to support the necessary verification of the assessment results and stakeholder engagement. Scheme-specific monitoring was undertaken at 22 locations between 28 April 2021 and 13 October 2021, shown on Figure 5.3: Air Quality Baseline Conditions of the Environmental Statement Figures (TR010064/APP/6.2).

**Bias-adjustment and annualisation**

5.7.6 For the purposes of verification, for those monitoring sites within the modelled study area with data capture greater than 75% and with data available for 2017 or 2019 only, the available data was bias-adjusted (where required) and the $NO_2$ projection factor applied to convert to the 2018 Base year (to take account of changes in vehicle emissions). For those sites with a data capture less than 75%, an additional step was applied whereby the bias-adjusted data was annualised to the 2018 Base year. The same approach was applied to the Scheme-specific monitoring from 2021. This was done in accordance with the guidance provided in LAQM TG(22), the related supplementary FAQ 139 (Defra, 2023d) and related $NO_2$ projection factors (Defra, 2023c), with greater detail on this approach provided in Appendix 5.1: Air Quality Methodology of the Environmental Statement Appendices (TR010064/APP/6.3).

5.7.7 In regard to the local authority monitoring, the 2019 data for sites BU15, BU16, BU17, BU19 and MAN98 were adjusted to the 2018 Base year. Similarly, for the TfGM monitoring data, 2019 data for the eight sites BUR-A1 – 5 and BUR-B1 – 3 were adjusted to the 2018 Base year.

5.7.8 For the Highways England (now National Highways) data, a portion of the monitoring data in the study area was available for 2018 but, due to a low data capture (less than 75%), was annualised and then bias-adjusted. Specifically, this was done for M60_Oldham_2A/B/C, M60_Oldham_12A/B/C and M60_Oldham_18A/B/C. Additionally, a further set of Highways England data of three sites: Manchester_Tube 5 (1)/(2), Manchester_Tube 6 and Manchester_Tube 22, due to having no 2018 base year data, were also adjusted to 2018.Appendix 5.1: Air Quality Methodology.

5.7.9 The 2021 Scheme-specific monitoring data was also bias-adjusted and annualised to the 2018 Base year. The Scheme-specific sites annualised from 2021 to 2018, that were co-located with local authority sites, were compared to co-located local authority monitored data from 2018. This comparison was undertaken to confirm that the approach for the Scheme-specific monitoring provided appropriate values for 2018.

5.7.10 The full set of monitoring and annualised and adjusted data is shown in Table 1.4 of Appendix 5.1: Air Quality Methodology of the Environmental Statement Appendices (TR010064/APP/6.3) and those sites within the modelled study area are displayed on Figure 5.3: Air Quality Baseline Conditions of the Environmental Statement Figures (TR010064/APP/6.2). The full monitoring data used in this assessment, including the annualised data, is shown in Table 1.5 of Appendix 5.1: Air Quality Methodology of the Environmental Statement Appendices (TR010064/APP/6.3).

## Verification

5.7.11 The verification process resulted in three verification factors, based on a comparison of the monitored and modelled data for the baseline: 1.00, 1.44 and 1.36, and these were applied to the raw modelled road $NO_X$ concentrations with each representing a distinct zone within the modelled study area, shown on Figure 5.4: Modelled Human Health Receptors of the Environmental Statement Figures (TR010064/APP/6.2) (see Appendix 5.1: Air Quality Methodology of the Environmental Statement Appendices (TR010064/APP/6.3) for further details). As there were no $PM_{10}$ analysers within the study area to enable model verification, the three road $NO_X$ adjustment factors were applied to modelled $PM_{10}$ road contributions, following guidance in LAQM TG(22).

## Baseline information

### AQMAs

5.7.12 Local authorities review current and future air quality to assess whether or not AQOs are being achieved or are likely to be achieved. Where it is anticipated that an AQO will not be met, it is a requirement that an AQMA is declared. Where an AQMA is declared, the local authority is obligated to produce an Action Plan in pursuit of the achievement of the AQOs. The Scheme is located almost entirely in the Bury AQMA (as seen in Figure 5.2: Air Quality Operational Study Area of the Environmental Statement Figures (TR010064/APP/6.2)), which forms part of the GMCA AQMA located within the BMBC area and was declared for exceedances of the $NO_2$ annual mean AQO in 2016.

### Baseline monitoring

5.7.13 Across the local authority, Highways England, Scheme-specific and TfGM bias-adjusted and annualised datasets (where required), there were exceedances of the $NO_2$ annual mean AQO within the modelled study area measured in 2018. These exceedances are shown in Table 5.15 and on Figure 5.3: Air Quality Baseline Conditions of the Environmental Statement Figures (TR010064/APP/6.2).

**Table 5.15 2018 monitored $NO_2$ concentrations at locations exceeding the $NO_2$ annual mean AQO**

| Local authority | Site ID | 2018 monitored $NO_2$ concentration ($\mu g/m^3$) |
|---|---|---|
| Bury | BU15 | 48.9 |
| | BU16 | 49.1 |
| | BU19 | 44.2 |
| | DT14 | 42.4 |
| | DT15 | 43.6 |
| | J_001 | 47.2 |
| | J_002 | **74.8** |

| Local authority | Site ID | 2018 monitored $NO_2$ concentration ($\mu g/m^3$) |
|---|---|---|
| | J_004 | 53.6 |
| | J_005 | 47.8 |
| | J_006 | 42.3 |
| | J_007 | **127.3** |
| | J_009 | 40.6 |
| | J_011 | 45.7 |
| | J_012 | 45.9 |
| | J_013 | 40.3 |
| | J_014 | 52.7 |
| | BUR-A1 | 52.0 |
| | BUR-A2 | **62.0** |
| | BUR-A3 | 50.9 |
| | BUR-A4 | **64.5** |
| | BUR-A5 | 58.0 |
| | BUR-B2 | 47.1 |
| Manchester | BUR-B1 | **65.2** |
| Rochdale | RO6A | 41.9 |

Note: values in **bold** type denote potential exceedances of the $NO_2$ 1-hour mean ($60\mu g/m^3$).

5.7.14 As shown in Table 1.5 of Appendix 5.1: Air Quality Methodology of the Environmental Statement Appendices (TR010064/APP/6.3), other years show similar locations with exceedances. For example, in 2019, monitored exceedances were similarly measured at the same monitoring locations across the Bury, Manchester and Rochdale local authorities, where monitoring data is available.

5.7.15 There is no $PM_{10}$ monitoring within 1km of the ARN. The nearest continuous monitoring stations that monitor $PM_{10}$, and have monitoring data for the 2018 Base year, are BUR2 (Bury Prestwich) and BURY (Bury Whitefield), which are 1.6km and 1.8km from the ARN, respectively. All of the annual mean concentrations (17.5 – $20\mu g/m^3$ for BUR2 and 15 – $18\mu g/m^3$ for BURY) were below the $PM_{10}$ annual mean AQO of $40\mu g/m^3$ between 2015 and 2021 at both of these monitoring locations.

5.7.16 There is also no $PM_{2.5}$ monitoring within 1km of the ARN. The nearest continuous monitoring station for this pollutant that has monitoring data in the 2018 Base year, however, is Salford M60 located approximately 3.0km from the ARN. All of the annual mean concentrations at this site (9 – 10µg/m$^3$) were below the $PM_{2.5}$ Limit Value of 20µg/m$^3$ between 2017 and 2021.

### Distance correction

5.7.17 The monitoring results at locations within the modelled study area that were exceeding the AQO in 2018 were adjusted and exceedances were predicted at the nearest sensitive receptors to: BU16 (42.1µg/m$^3$), BU19 (40.2µg/m$^3$), J_009 (40.3µg/m$^3$), J_011 (46.3µg/m$^3$), J_012 (42.3µg/m$^3$), J_014 (44.8µg/m$^3$), BUR-A2 (45.5µg/m$^3$), BUR-A3 (43.4µg/m$^3$), BUR-A4 (51.9µg/m$^3$) and BUR-A5 (51.5µg/m$^3$).

### Background concentrations

5.7.18 Defra provides background maps for a range of pollutants for all years from 2018 to 2030, which show predicted background pollutant concentrations for 1km x 1km grid squares across the UK (Defra, 2020b).

5.7.19 The range of Base year (2018), construction worst-case year (2028), and Opening year (2029) background concentrations for the grid squares that cover the ARN (see Table 5.16) are all within the AQOs/Limit Values for annual mean $NO_2$, $NO_X$ and $PM_{10}$ in the Opening year, although there are exceedances of $NO_X$ concentrations in the Base year.

**Table 5.16 Defra background concentrations in study area (2018, 2028 and 2029)**

| Pollutant | Mapped annual mean background concentration (µg/m$^3$) | | | | | |
|---|---|---|---|---|---|---|
| | 2018 | | 2028 | | 2029 | |
| | Minimum | Maximum | Minimum | Maximum | Minimum | Maximum |
| $NO_X$ | 21.2 | 49.4 | 13.7 | 26.2 | 13.4 | 25.0 |
| $NO_2$ | 15.5 | 31.8 | 10.4 | 18.6 | 10.2 | 17.8 |
| $PM_{10}$ | 11.2 | 14.9 | 10.3 | 13.8 | 10.3 | 13.8 |
| $PM_{2.5}$ | 7.5 | 9.8 | 6.8 | 9.0 | 6.8 | 9.0 |

### Human health receptors

5.7.20 Locations that are sensitive to air quality include residential properties and buildings used by the young, elderly and other susceptible populations, such as schools and hospitals (as defined in DMRB LA 105). There are numerous receptors (residential properties and schools) in areas such as Simister, Whitefield and Prestwich located within the air quality study area.

5.7.21 As per paragraph 2.20 of DMRB LA 105, sensitive receptors were included in the local air quality assessment if they were deemed to be at risk of exceedance, or to represent relevant ARN links, with additional sensitive receptors included following expansion of the area of interest due to consultation comments.

5.7.22 A total of 557 worst-case human health receptor locations were modelled in this assessment, which included a transect directly north-west of M60 J18 to represent the possible locations of potential housing. Additionally, all receptors within 50m of either side of the M60 between J17 and J18 were modelled. The placement of human health receptors was focussed on areas near the ARN, where traffic modelling indicated that emissions were likely to increase or decrease, and/or where the highest concentrations were expected to occur i.e. on the nearest façade of the building to the road. The locations of these receptors are shown on Figure 5.4: Modelled Human Health Receptors of the Environmental (TR010064/APP/6.2). As the construction ARN coverage was of similar but smaller area to the operational ARN, 415 of the wider 557 worst-case human health receptor locations have been included in the construction traffic assessment.

***Modelled Base year concentrations***

5.7.23 Annual Mean $NO_2$ and $PM_{10}$ concentrations at sensitive human health receptors were modelled for the 2018 Base year, with results provided in full in Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3) and on Figure 5.4: Modelled Human Health Receptors of the Environmental Statement Figures (TR010064/APP/6.2).

5.7.24 The results indicate that exceedances of the annual mean $NO_2$ AQO (40µg/$m^3$) have the potential to occur at sensitive receptors across the modelled study area, in particular within the vicinity of M60 J16, J17, J18, J19, J20, J21 and J22 and M62 J19 and J20.

5.7.25 Modelled annual mean $PM_{10}$ concentrations are modelled to be well within the $PM_{10}$ AQO (40µg/$m^3$) at all receptors with a maximum modelled $PM_{10}$ concentration in the Base year of 19.2µg/$m^3$. Using $PM_{10}$ as a proxy, $PM_{2.5}$ concentrations are therefore estimated to be well within the respective annual mean Limit Value (20µg/$m^3$) in the Base year.

**Ecological receptors**

5.7.26 Nitrogen deposition can damage vegetation directly or affect plant health and productivity. DMRB LA 105 states that designated habitats are '*internationally, nationally and locally designated sites of ecological conservation importance for protected species and for habitats and other species identified as being of principal importance for the conservation of biodiversity*'. Designated habitats, as defined within DMRB LA 105 include Ramsar sites, Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Sites of Special Scientific Interest (SSSIs), Local Nature Reserves (LNRs), Local Wildlife Sites (LWSs) (which includes Sites of Biological Importance (SBIs) – within Greater Manchester LWSs are typically referred to as SBIs), Nature Improvement Areas (NIAs), Ancient Woodlands (AWs) and veteran trees.

5.7.27 Figure 5.5: Modelled Ecological Receptors of the Environmental Statement Figures (TR010064/APP/6.2) shows a summary of the designated habitats within 200m of the operational ARN which were deemed to contain nitrogen sensitive habitats, which included AWs, LNRs, LWSs (i.e. SBIs), SACs and SSSIs. A single veteran tree was identified within 200m of the operational ARN, however, as it is positioned within the Philips Park Local Nature Reserve, it was included within this assessment as part of that site. A full list and definitions of sites are provided in Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3). As the construction ARN coverage was of similar but smaller area to the operational ARN, only those within 200m of the construction ARN from the list of nitrogen sensitive habitats have been included in the construction traffic assessment.

5.7.28 Transects were modelled within all nitrogen sensitive habitats within 200m of the operational ARN, regardless of whether traffic modelling indicated increases or decreases in traffic in their vicinity. These transects were drawn 200m from the modelled road edge at worst-case locations, starting where the habitat site boundary is closest to the ARN. On consultation with the competent expert for biodiversity, it was agreed that due to the thin and winding structure of the Rochdale Canal SAC/SSSI, Rochdale Canal (Scowcroft to Warland) LWS/SBI and Rochdale Canal – Lock at Scowcroft Farm to Stott's Lane LWS/SBI designated habitats, it was not feasible to construct transects representative of worst-case conditions across the sites. As such, ecological receptors were instead positioned at 10m intervals along the boundary line, closest to the ARN, for each of these respective sites. Baseline nitrogen deposition values from APIS (UK Centre for Ecology and Hydrology, 2023) at worst-case habitats, and additional habitats where present, are shown for each designated site in Table 5.17. It should be noted that all sites already exceed their critical load for the baseline in Table 5.17, critical loads are shown in Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3).

**Table 5.17 Baseline deposition values from APIS at each designated site**

| Site ID | Site name (note LWS is also used to denote SBIs) | Baseline deposition from APIS (kg N/ha/yr) | |
|---|---|---|---|
| | | Worst-case habitat | Additional habitat |
| AW_CW | Clifton Wood (AW) | 32.87 | - |
| AW_MC | Mere Clough (AW) | 32.90 | - |
| AW_NW | North Wood (AW) | 32.86 | - |
| AW_PW | Philips Wood (AW) | 32.90 | - |
| LNR_AW | Alkrington Woods (LNR) | 32.67 | - |
| LNR_CCP | Clifton Country Park (LNR) | 32.88 | - |
| LNR_MC | Mere Clough (LNR) | 32.90 | - |
| LNR_PP | Philips Park (LNR) | 32.89 | - |
| LWS_A627M | A627M by Tandle Hill (LWS) | 32.03 | 20.37 |

| Site ID | Site name (note LWS is also used to denote SBIs) | Baseline deposition from APIS (kg N/ha/yr) | |
|---|---|---|---|
| | | Worst-case habitat | Additional habitat |
| LWS_AWRL | Alkrington Woods and Rhodes Lodges (LWS) | 32.67 | - |
| LWS_BB | Boardman Brook (LWS) | 32.67 | - |
| LWS_CCP | Clifton Country Park (LWS) | 32.87 | - |
| LWS_CMS | Clifton Moss (South) (LWS) | 20.48 | 32.98 |
| LWS_GW | Gerrard Wood (LWS) | 32.03 | 20.37 |
| LWS_HW | Hazlitt Wood (LWS) | 32.91 | - |
| LWS_PPNW | Philips Park and North Wood (LWS) | 32.86 | - |
| LWS_RC | Rochdale Canal (Scowcroft to Warland) (LWS) | 20.55 - 20.63 | - |
| LWS_RFSW | Rhodes Farm Sewage Works (LWS) | 32.88 | - |
| LWS_RWE | Ringley Woods (East) (LWS) | 32.89 | - |
| LWS_SB | Sudden Brook (West) (LWS) | 31.12 | 20.01 |
| RC_Boundary | Rochdale Canal site boundaries | 20.05 - 20.63 | - |
| SAC_SSSI_RC | Rochdale Canal (SAC/SSSI) | 20.55 | - |

5.7.29 A total of 577 ecological receptors across 29 ecological transects and three site boundaries have been modelled to represent the 22 designated sites listed in Table 5.17; these sites are considered to have the potential to contain features which are sensitive to nitrogen deposition.

**Pollution Climate Mapping model**

5.7.30 The PCM model has been reviewed to assess whether any PCM links correspond with the ARN and if the identified links are likely to comply with the Limit Values.

5.7.31 Eight PCM model links were found to correspond to the ARN (as shown in Figure 5.6: Modelled Compliance Risk Assessment Receptors of the Environmental Statement Figures (TR010064/APP/6.2)). Data on these links is shown in Table 5.18.

**Table 5.18 Compliance risk links within the study area (2018, 2028, 2029 and 2030)**

| Census ID | Road | Projected roadside annual mean concentration (µg/m$^3$) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | $NO_2$ | | | $PM_{10}$ | | $PM_{2.5}$ | |
| | | 2018 | 2028 | 2029 | 2018 | 2030 | 2018 | 2030 |
| 802006053 | M60 (J17 to J18) | 31.3 | 17.8 | 17.1 | 15.6 | 14.3 | 10.0 | 9.1 |
| 802017924 | A56 (at M60 J17) | **40.1** | 22.9 | 21.8 | 16.9 | 15.8 | 10.3 | 9.4 |
| 802046572 | A56 (at M60 J17) | 32.5 | 19.0 | 18.2 | 16.5 | 15.3 | 10.4 | 9.5 |
| 802074589 | M60 (J22 to J23) | 36.2 | 20.5 | 19.5 | - | - | - | - |
| 802074590 | M60 (J20 to J21) | **43.8** | 24.3 | 23.1 | 16.3 | 15.0 | 10.0 | 9.0 |
| 802077006 | M60 (J21 to J22) | **44.3** | 24.9 | 23.8 | 17.3 | 15.9 | 10.8 | 9.8 |
| 802077007 | M60 (J21 to J22) | **45.0** | 25.3 | 24.1 | 17.6 | 16.2 | 10.9 | 9.9 |
| 802099614 | M60 (J20 to J21) | **45.5** | 25.9 | 24.7 | 16.5 | 15.1 | 10.2 | 9.2 |

Note: values in **bold** type denote exceedances of annual mean $NO_2$ Limit Value (40µg/m$^3$).

5.7.32 The 2018 Base year projected roadside annual mean $NO_2$ concentrations adjacent to these PCM links are predicted to be between 31.3µg/m$^3$ and 45.5µg/m$^3$, meaning that that the annual mean $NO_2$ Limit Value (40µg/m$^3$) is projected to be exceeded inyes that the 2018 Base year. Based on Defra's PCM projections, however, concentrations are predicted to be between 17.8µg/m$^3$ and 25.9µg/m$^3$ in the 2028 worst-case construction year, and between 17.1µg/m$^3$ and 24.7µg/m$^3$ in the 2029 Opening year, and therefore compliant with the Limit Value. As shown in Table 5.18, the projected roadside $PM_{10}$ and $PM_{2.5}$ concentrations are predicted to be well within the respective Limit Values of 40µg/m$^3$ and 20µg/m$^3$ in the 2018 Base and 2029 Opening years (note that PM PCM projections are only available for five year intervals).

5.7.33 A compliance risk assessment has been undertaken, as per DMRB LA 105, whereby any qualifying features (i.e. public access (e.g. footpaths) and sensitive receptors (e.g. residential properties within 15m of the running lane or kerbside and 25m away from any junctions) along PCM links that coincide with the construction and operation ARNs have been considered.

5.7.34 Modelling undertaken to inform the development of the GM CAP (GMCA, 2022) indicates that the annual mean $NO_2$ Limit Value is currently exceeded within the air quality study area adjacent to the A56 (PCM link 802017924) immediately to the north of M60 J17 and that compliance is unlikely to be achieved at this location until 2025 (in the absence of any other action), however, this link is not part of the ARN and has therefore not been assessed for compliance, in line with DMRB LA 105.

### National Highways modelling

5.7.35 Monitoring and modelling have been undertaken by National Highways for those road links which form part of the Strategic Road Network (SRN) adjacent to which the PCM model suggests the annual mean $NO_2$ Limit Value has the potential to be exceeded (National Highways, 2022c). The purpose of which is to determine if additional management solutions are needed to achieve compliance with the Limit Value in the shortest possible time.

5.7.36 Of those SRN links that coincide with the ARN, modelling was undertaken by National Highways for PCM links 802074590, 802077007 and 802099614, which, as shown in Table 5.19, indicate that whilst the annual mean $NO_2$ Limit Value was potentially exceeded in 2018 adjacent to PCM link 802099614, by 2026 (the latest modelled year), roadside annual mean $NO_2$ concentrations are modelled to be well within the Limit Value adjacent to all three links.

**Table 5.19 National Highways modelled roadside annual mean $NO_2$ concentrations at PCM links corresponding to the ARN**

| Census ID | Road | Modelled roadside annual mean $NO_2$ concentration (µg/m$^3$) | |
|---|---|---|---|
| | | 2018 | 2026 |
| 802074590 | M60 (J20 to J21) | 36 | 23 |
| 802077007 | M60 (J21 to J22) | 38 | 25 |
| 802099614 | M60 (J20 to J21) | **41** | 27 |

Note: values in **bold** type denote exceedances of annual mean $NO_2$ Limit Value (40µg/m$^3$).

## Future baseline

5.7.37 The worst-case construction year (2028) and Opening year (2029) baseline conditions were modelled following the methodology outlined in Section 5.4 of this chapter based on a DM traffic scenario. For the purposes of this assessment, the same DM traffic scenario was modelled for the 2028 worst-case construction and 2029 Opening year, and is representative of the predicted growth in traffic, accounting for local and regional development. Opening year vehicle emission estimates used fleet proportions for 2029 as per the latest National Highways Speed Band emission factors (version 4.3) (National Highways, 2022a).

5.7.38 The modelled DM results are displayed in Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3) and the seven receptors with modelled concentrations of $NO_2$ in exceedance of the annual mean $NO_2$ AQO (40µg/m$^3$) in the worst-case construction DM and Opening year DM are shown in Table 5.20.

**Table 5.20 Modelled 2028 and 2029 DM $NO_2$ and $PM_{10}$ at selected receptors**

| Receptor ID | Location | | Modelled DM Concentration (µg/m$^3$) | | | |
|---|---|---|---|---|---|---|
| | | | 2028 Construction year | | 2029 Opening year | |
| | X | Y | $NO_2$ | $PM_{10}$ | $NO_2$ | $PM_{10}$ |
| R3 | 381504 | 405238 | **44.2** | 18.1 | **42.4** | 18.1 |
| R81 | 381558 | 405276 | **42.4** | 17.8 | **40.7** | 17.8 |
| R441 | 381500 | 405235 | **44.3** | 18.2 | **42.5** | 18.1 |
| R447 | 381531 | 405257 | **43.4** | 18.0 | **41.6** | 18.0 |
| R599 | 381500 | 405236 | **43.9** | 18.1 | **42.1** | 18.1 |
| R600 | 381527 | 405254 | **43.1** | 17.9 | **41.4** | 17.9 |
| R601 | 381554 | 405273 | **42.3** | 17.8 | **40.6** | 17.8 |

Note: values in **bold** type denote exceedances of annual mean $NO_2$ AQO (40µg/m$^3$).

5.7.39 As shown in Table 5.20, the highest $NO_2$ concentration in the worst-case construction year and Opening year without the Scheme (DM) scenario is modelled at R441 (44.3µg/m$^3$ and 42.5µg/m$^3$ respectively). This receptor, as with all seven receptors in Table 5.20, is positioned on Kensington Street which backs on to the M60 between J17 and J18. Additionally, the highest $PM_{10}$ concentration in the worst-case construction year and Opening year DM scenario is also modelled at R441 (18.2µg/m$^3$ and 18.1µg/m$^3$ respectively). Similar concentrations of $PM_{10}$ are also modelled to occur at R3 and R599.

### Value / sensitivity of receptors

5.7.40 The baseline conditions described above have been used to define the receiving environment sensitivity as discussed in paragraph 5.4.4 with the sensitivity of the receiving environment being considered to be high.

5.7.41 All receptors are considered to be of equally high value.

## 5.8 Potential impacts

5.8.1 The potential impacts reported in this section were assessed in line with the approach set out in Section 5.4 and detailed further in Appendix 5.1: Air Quality Methodology of the Environmental Statement Appendices (TR010064/APP/6.3).

## Construction

### Construction dust

5.8.2 Construction activities can give rise to emissions of dust, which could cause damage to vegetation or annoyance associated with the soiling of surfaces. Construction dust emissions can also elevate airborne particulate matter concentrations at off-site locations, which may affect human health if mitigation measures are not implemented. There is potential for adverse impacts to arise from the deposition of construction dust at sensitive receptors.

5.8.3 The level and distribution of construction dust emissions would depend on where within the Order Limits the dust raising activity takes place, the nature of the activity and controls, and weather conditions. The number of receptors within the outlined distance bands are presented in Table 5.21 and shown on Figure 5.7: Construction Dust Results of the Environmental Statement Figures (TR010064/APP/6.2), including the five designated sites identified within 200m of construction activities:

- Hollins Vale LNR
- Hollins Vale LWS (SBI)
- Hollins Plantation LWS (SBI)
- Hazlitt Wood LWS (SBI)
- Philips Park & North Wood LWS (SBI)

**Table 5.21 Distance-banded receptor counts within 200m of construction activities**

| Type of receptor | Distance from construction activities (m) | | |
|---|---|---|---|
| | **0 – 50** | **50 – 100** | **100 – 200** |
| Human health | 570 | 576 | 1,174 |
| Designated habitat: LNR | 1 | 0 | 0 |
| Designated habitat: LWS/SBI | 2 | 0 | 2 |
| **Total:** | 573 | 576 | 1,176 |

5.8.4 Based on the number of receptors within the distance bands and the large potential for dust emissions to occur during the construction activities associated with the Scheme, the construction dust risk is considered to be ‘high’ in accordance with DMRB LA 105.

### Construction traffic

5.8.5 There is potential for construction traffic associated with the Scheme to impact air quality at sensitive human health receptors and designated ecological sites or impinge on the UK’s reported ability to comply with the Air Quality Directive, as construction activities are programmed to last more than two years.

5.8.6 Therefore, as per DMRB LA 105 and the study area definition in Section 5.6, receptors within 200m of the construction ARN in 2028 have been assessed, with the likely significant effects presented in Section 5.10. PCM receptors have also been modelled in this construction traffic assessment as ARN roads were identified to be located on PCM Census ID roads with qualifying features. Additionally, ecological receptors were modelled as some of the ecological sites are located within 200m of the construction traffic ARN. The results are outlined in Section 5.10 of this chapter.

### Operation

5.8.7 There is potential for the Scheme to adversely influence (i.e. increase) pollutant concentrations at sensitive human health receptors and designated ecological sites. Therefore, as per DMRB LA 105 and the study area definition in Section 5.6 of this chapter, human and ecological receptors within 200m of the operational ARN have been assessed, with the likely significant effects presented in Section 5.10 of this chapter.

5.8.8 In accordance with DMRB LA 105, PCM receptors have been modelled for the Limit Value compliance risk assessment where any ARN road is located on a PCM Census ID road with qualifying features. The results from the compliance risk assessment are outlined in Section 5.10 of this chapter.

## 5.9 Design, mitigation and enhancement measures

5.9.1 Mitigation is included in the Register of Environmental Actions and Commitments (REAC), contained within the First Iteration EMP (TR010064/APP/6.5) The First Iteration EMP will be developed into the Second Iteration EMP for implementation during construction and is secured by Requirement 4 of the draft DCO (TR010064/APP/3.1).

### Embedded mitigation

5.9.2 The environment team has worked in close collaboration with the infrastructure design team to avoid or reduce environmental impacts through the Scheme design. This is referred to as embedded (or design) mitigation. Chapter 3: Assessment of Alternatives of this Environmental Statement (TR010064/APP/6.1) details the design alternatives that have been considered, including the environmental factors which have influenced the decision-making. Further embedded mitigation is described in Chapter 2: The Scheme of this Environmental Statement (TR010064/APP/6.1).

5.9.3 There is no embedded mitigation specific to air quality.

### Essential mitigation

5.9.4 Essential mitigation would occur as a matter of course due to legislative requirements or standard sector practices.

5.9.5 The REAC, contained within the First Iteration EMP (TR010064/APP/6.5), details the following high-level commitments:

- Commitment AQ1 – the Principal Contractor will agree with the relevant planning authorities appropriate best practice dust mitigation prior to

construction, such as those outlined in the Institute of Air Quality Management (IAQM) Guidance on the assessment of dust from demolition and construction (IAQM, 2023).

- Commitment AQ2 – the Principal Contractor will implement dust mitigation in accordance with the Air Quality and Dust Management Plan in the Second Iteration EMP (to be developed from the Outline Air Quality and Dust Management Plan in the First Iteration EMP (TR010064/APP/6.5)) during construction.

5.9.6 The First Iteration EMP (TR010064/APP/6.5) includes an Outline Air Quality and Dust Management Plan in Appendix A. This document contains measures to control fugitive dust (and hence avoid or reduce potential impacts) in compliance with DMRB LA 105. The Principal Contractor would enter into pre-works discussions with affected local authorities to agree the method of works and appropriate dust mitigation measures outlined within the First Iteration EMP (TR010064/APP/6.5). Mitigation measures would include the dampening down of surfaces, planning the site layout so that machinery and dust-causing activities occur as far from receptors as possible, erecting screens or barriers around the dust-causing activities or the site boundary, covering stockpiles to prevent entrainment by wind and undertaking regular monitoring. Examples of best practice mitigation are provided in IAQM Guidance on the assessment of dust from demolition and construction (IAQM, 2023).

### Enhancement

5.9.7 There are no opportunities for enhancement identified in this assessment.

## 5.10 Assessment of likely significant effects

5.10.1 This section summarises the likely significant residual effects of the Scheme on air quality during construction and operation. All effects have been quantitatively assessed based on the application of the DMRB LA 105 significance criteria.

5.10.2 Where effects have been identified, these would be reduced where practicable by implementing the mitigation measures outlined in Section 5.9 and by ensuring that the construction of the Scheme responds to the national regulatory or policy standards and local policy requirements relevant to this aspect. The residual effects detailed in this chapter assume the implementation of this mitigation.

5.10.3 The results presented throughout this section are based on the values predicted using the gap analysis methodology detailed in Appendix 5.1: Air Quality Methodology of the Environmental Statement Appendices (TR010064/APP/6.3), for all receptors apart from the compliance risk assessment receptors.

5.10.4 For ecological receptors, nitrogen deposition calculations were undertaken in line with DMRB LA 105 and the National Highways Draft Ammonia N Deposition Tool (v3) (National Highways, 2022b) for the added ammonia contribution, for all modelled ecological receptors.

5.10.5 Emissions for the respective ARNs have been provided for the Base year; worst-case construction scenario; and Opening year, along with the change in emissions (where an increase is presented as a positive number), in Table 5.22.

**Table 5.22 $NO_X$ and $PM_{10}$ ARN emissions and percentage change for construction and operational scenarios**

| Scenario | Emissions (T/yr) | |
|---|---|---|
| | $NO_X$ | $PM_{10}$ |
| **Construction ARN** | | |
| Base 2018 | 513.9 | 30.8 |
| DM 2028 | 206.7 | 30.5 |
| DS 2028 | 204.0 | 30.2 |
| Change (DS-DM 2028) | -2.6 | -0.3 |
| Percentage Change (%) | -1.3 | -1.1 |
| **Operational ARN** | | |
| Base 2018 | 745.7 | 43.5 |
| DM 2029 | 265.9 | 42.5 |
| DS 2029 | 270.0 | 43.4 |
| Change (DS-DM 2029) | 4.1 | 0.8 |
| Percentage Change (%) | 1.5 | 1.9 |

5.10.6 Pollutant emissions are expected to decrease during the worst-case construction scenario (2028), as shown in Table 5.22, due to a predicted net reduction in traffic flows across the ARN as traffic is diverted away from the Scheme area and onto the surrounding road network, including due to some additional changes in speed band due to traffic management.

## Construction

### Human health

5.10.7 A total of 415 worst-case human health receptors were included in the modelling for the construction traffic assessment. The full results from the assessment can be found in Table 1.1 of Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3) and Figure 5.8: Construction Human Health Assessment Results of the Environmental Statement Figures (TR010064/APP/6.2).

5.10.8 The results show there are predicted exceedances of the $NO_2$ AQO in both the DM and worst-case construction year (2028) scenario at seven receptors. The results are shown in Table 5.23, for the seven receptors with the highest concentrations for $NO_2$, as well as those with the largest change in $NO_2$, (construction year 2028 – DM).

**Table 5.23 Modelled annual mean $NO_2$ results at selected worst-case receptors during construction**

| Receptor ID | Location | | Modelled 2028 construction year annual mean $NO_2$ concentration (µg/m$^3$) | | |
|---|---|---|---|---|---|
| | X | Y | DM | Construction | Change in concentration (Construction-DM) |
| R3 | 381504 | 405238 | **44.2** | **43.6** | -0.6 |
| R4 | 381642 | 405254 | 30.0 | 30.7 | 0.8 |
| R33 | 383040 | 405733 | 32.2 | 31.4 | -0.8 |
| R81 | 381558 | 405276 | **42.4** | **41.9** | -0.6 |
| R441 | 381500 | 405235 | **44.3** | **43.7** | -0.6 |
| R447 | 381531 | 405257 | **43.4** | **42.8** | -0.6 |
| R599 | 381500 | 405236 | **43.9** | **43.3** | -0.6 |
| R600 | 381527 | 405254 | **43.1** | **42.6** | -0.6 |
| R601 | 381554 | 405273 | **42.3** | **41.8** | -0.6 |

Note: values in **bold** type denote exceedances of annual mean $NO_2$ AQO (40µg/m$^3$). The concentrations are rounded to 1 decimal place. Therefore, due to rounding, the change in concentrations may appear different to that calculated using the rounded concentrations.

5.10.9 The maximum modelled annual mean $NO_2$ concentration in the worst-case 2028 construction scenario is predicted at receptor R441 (43.7µg/m$^3$). Receptor R441, and the other receptors modelled to exceed the annual mean $NO_2$ AQO (40µg/m$^3$) in both the DM and worst-case construction year (R3, R81, R447, R599, R600 and R601), are positioned on Kensington Street, which backs on to the M60 between J17 and J18. Modelled concentrations of $NO_2$ are predicted to decrease (-0.6µg/m$^3$) in this area due to reduced traffic on the M60 eastbound between J17 and J18, as traffic is rerouted to the surrounding area as a result of the construction of the Scheme. As per the magnitude criteria detailed in Table 5.12, the modelled decrease in $NO_2$ at these receptors is considered 'small' (-0.4 – -2µg/m$^3$). Note that, as none of the receptors are predicted to be above 60µg/m$^3$, there is not considered to be a risk at any receptors (based on LAQM TG(22)) of exceedances of the hourly mean $NO_2$ AQO.

5.10.10 As shown in Table 5.23, the largest increase in annual mean $NO_2$ concentrations (+0.8µg/m$^3$) is modelled to occur at R4, which is at the M60 end of Warwick Avenue. This receptor is located adjacent to the westbound mainline between M60 J17 and J18. The largest increase is predicted at this location during the construction phase as traffic is rerouted onto these links moving away from the construction area. As per the magnitude criteria detailed in Table 5.12, the modelled increase in $NO_2$ at these receptors is considered 'small' (0.4 – 2µg/m$^3$).

5.10.11 The largest decrease in annual mean $NO_2$ concentrations (-0.8µg/m$^3$) is modelled to occur at R33, which is on Simister Lane (just west of the M60). As shown on Figure 5.8: Construction Human Health Assessment Results of the Environmental Statement Figures (TR010064/APP/6.2), this receptor is positioned adjacent to the slip road between the M62 and M60 southbound at M60 J18. The largest modelled decrease in $NO_2$ is predicted at this location as traffic is rerouted away from the construction area during the construction phase and onto surrounding roads. As per the magnitude criteria detailed in Table 5.12, the modelled decrease in $NO_2$ at these receptors is considered 'small' (-0.4 to -2µg/m$^3$).

5.10.12 Overall, modelling of the construction of the Scheme showed a reduction in $NO_2$ concentrations at 317 human health receptors of which modelled reductions were deemed to be 'small' at 77 receptors and the remaining 'imperceptible'. Modelling of the construction of the Scheme also showed an increase in $NO_2$ concentrations at 88 human health receptors of which modelled increases were deemed to be 'small' at 20 receptors and the remaining 'imperceptible'.

5.10.13 Annual mean $PM_{10}$ concentrations are modelled to be well within both of the $PM_{10}$ and $PM_{2.5}$ AQO/Limit Values at all receptors (i.e. 40µg/m$^3$ and 20µg/m$^3$, respectively) with the highest $PM_{10}$ concentration predicted in either assessment scenario (i.e. DM or construction DS) to be 18.2µg/m$^3$. All of the receptors were modelled to experience an 'imperceptible' change in concentration as a result of the construction of the Scheme. Therefore, there are no predicted exceedances of the $PM_{10}$ or $PM_{2.5}$ AQO/Limit Value.

5.10.14 A table of receptors contributing to the evaluation of significant impacts has been created to establish if the construction activities are likely to result in significant effects (Table 5.24). This is based on Table 5.13 of this chapter and the criteria outlined in DMRB LA 105 Table 2.92N, where the AQO is exceeded and where the change in concentration is not classed as imperceptible.

**Table 5.24 The number of receptors with a magnitude of small, medium and large that worsen or improve AQOs during construction activities**

| Magnitude of change in pollutant concentration | Number of receptors with: | |
|---|---|---|
| | Worsening of an AQO already above objective or creation of a new exceedance | Improvement of an AQO already above objective or removal of an existing exceedance |
| Large | 0 | 0 |
| Medium | 0 | 0 |
| Small | 0 | 7 (R3, R81, R441, R447, R599, R600, R601) |

5.10.15 Changes in concentration at receptors contributing to the evaluation of significance are recorded in Table 5.24 as 'small' reductions in modelled $NO_2$ are predicted at seven human health receptors, at which exceedances of the $NO_2$ annual mean are modelled to occur in both the DM and worst-case construction scenarios. In accordance with DMRB LA 105 significance criteria in Table 5.13, the overall effect of the traffic associated with the construction of the Scheme, on air quality, is considered **not significant**.

**Ecological**

5.10.16 The results, as presented in Tables 1.3 and 1.4 of Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3), predict that four of the modelled receptors, across two ecological sites, have a predicted combined total deposition rate (i.e. combined impact from both $NO_2$ and $NH_3$) above the minimum critical load with both a predicted change in nitrogen deposition of more than 1% of the minimum critical load and of more than 0.4kg N/ha/year. These receptors are located next to the on-slip road heading west at M60 J17 (see Figure 5.9: Construction Ecological Assessment Results of the Environmental Statement Figures (TR010064/APP/6.2)):

- Philips Park and North Wood LWS (SBI)
- Philips Park LNR

5.10.17 As the results indicate ecological receptors have the potential to be affected by changes in air quality, the potential significance of these impacts has been assessed by the competent expert for biodiversity. The potential impact of the Scheme on designated habitats is discussed further in Chapter 8: Biodiversity of this Environmental Statement (TR010064/APP/6.1), in line with DMRB LA 105 standards, and the chapter concludes that there are **no significant effects** on ecological receptors from nitrogen deposition during construction.

**Compliance risk assessment**

5.10.18 A total of 69 receptors were modelled as part of the construction compliance risk assessment as outlined in Section 5.7. Of these, 42 receptors were modelled at positions 4m from the edge of PCM road links in the air quality study area and the remaining 27 receptors modelled at locations representative of sensitive locations and qualifying features; all were modelled at 2m in height. The full scope of the results of the compliance assessment can be found in Table 1.7 of Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3).

5.10.19 The modelled annual mean $NO_2$ concentrations alongside PCM links are, for the majority of cases, within the range identified by the national scale PCM model and as such annual mean $NO_2$ concentrations are still modelled to be within the Limit Value (40µg/m$^3$) adjacent to all links. The highest predicted $NO_2$ concentration was 39.1µg/m$^3$ without the Scheme and 38.4µg/m$^3$ with the construction of the Scheme. As there are no predicted exceedances of the $NO_2$ Limit Value at any of the modelled receptors or in the national scale PCM model, the traffic and local air quality modelling are considered robust, as per the guidance in DMRB LA 105.

5.10.20 The $PM_{10}$ annual means were modelled below the $PM_{10}$ and $PM_{2.5}$ Limit Values of 40µg/m$^3$ and 20µg/m$^3$, respectively, with the highest $PM_{10}$ concentration predicted to be 19.3µg/m$^3$ without the Scheme and 19.2µg/m$^3$ with the construction of the Scheme. As such, it is considered that there is no risk of the Scheme affecting the UK's reported ability to comply with the Limit Values in the shortest timescale possible and is, therefore, assessed to be **not significant**.

## Operation

### Human health

5.10.21 A total of 557 worst-case human health receptors were included in the modelling. The results from the human health assessment can be seen in Figure 5.10: Operational Human Health Assessment Results of the Environmental Statement Figures (TR010064/APP/6.2) and Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3). The receptors have been labelled with the corresponding modelled $NO_2$ concentration in the DS Opening year scenario and colour coded by the magnitude of change criteria detailed in Table 5.12.

5.10.22 The results show that exceedances of the annual mean $NO_2$ AQO are predicted to occur in the DM Opening year scenario only, at seven of the modelled worst-case human health receptors. None of the receptors are modelled to exceed in the DS Opening year scenario, however, and as such the seven exceedances in the DM scenario are predicted to be removed as a result of the Scheme. The results at these seven receptors with the associated change in $NO_2$ concentration (DS – DM) as a result of the Scheme, as well as those with the largest change in $NO_2$, are detailed in Table 5.25.

**Table 5.25 Modelled annual mean $NO_2$ results at selected worst-case receptors**

| Receptor ID | Location | | Modelled 2029 Opening year annual mean $NO_2$ concentration (µg/m$^3$) | | |
|---|---|---|---|---|---|
| | X | Y | DM | DS | Change in Concentration (DS-DM) |
| R3 | 381504 | 405238 | **42.4** | 38.4 | -4.0 |
| R81 | 381558 | 405276 | **40.7** | 37.0 | -3.7 |
| R89 | 382654 | 405965 | 24.3 | 29.3 | 5.0 |
| R160 | 382644 | 405966 | 23.7 | 26.8 | 3.1 |
| R161 | 382635 | 405967 | 23.2 | 25.5 | 2.3 |
| R162 | 382625 | 405969 | 22.7 | 24.4 | 1.7 |
| R441 | 381500 | 405235 | **42.5** | 38.5 | -4.0 |
| R447 | 381531 | 405257 | **41.6** | 37.8 | -3.9 |
| R599 | 381500 | 405236 | **42.1** | 38.2 | -4.0 |

| Receptor ID | Location | | Modelled 2029 Opening year annual mean $NO_2$ concentration (µg/m$^3$) | | |
|---|---|---|---|---|---|
| | X | Y | DM | DS | Change in Concentration (DS-DM) |
| R600 | 381527 | 405254 | **41.4** | 37.6 | -3.8 |
| R601 | 381554 | 405273 | **40.6** | 36.9 | -3.7 |

Note: values in **bold** type denote exceedances of annual mean $NO_2$ AQO (40µg/m$^3$). The concentrations are rounded to 1d.p. Therefore, due to rounding, the change in concentrations may appear different to that calculated using the rounded concentrations.

5.10.23 As shown in Table 5.25, the maximum modelled annual mean $NO_2$ concentration in the 2029 DS scenario is predicted to occur at R441. Receptor R441, and the other receptors modelled to exceed the annual mean $NO_2$ AQO (40µg/m$^3$) in the DM scenario but no longer in the DS (R3, R81, R447, R599, R600 and R601), are positioned on Kensington Street, which backs on to the M60 between J17 and J18. The largest modelled reduction in $NO_2$ (-4.0µg/m$^3$) is predicted to occur at this location (R3, R441 and R599), due to a reduction in congestion modelled to occur along the M60 between J17 and J18 as a result of the Scheme. This decrease in concentration, along with the reductions in modelled $NO_2$ at all other receptors predicted to exceed the $NO_2$ annual mean AQO in the DM but no longer in the DS scenario (-3.7µg/m$^3$ to -4.0µg/m$^3$, are classed as 'medium' (-2 to -4µg/m$^3$). Note that, as none of the receptors are predicted to be above 60µg/m$^3$, there is not considered to be a risk at any receptors (based on LAQM TG(22)) of exceedances of the hourly mean $NO_2$ AQO. Overall, the modelling of the Scheme showed a reduction in annual mean $NO_2$ concentrations (DS-DM) at 188 of the 557 human health receptors as a result of the Scheme.

5.10.24 Overall, 368 of the 557 human health receptors are modelled to experience an increase in annual mean $NO_2$ concentrations (DS-DM) as a result of the Scheme. As shown on Figure 5.10: Operational Human Health Assessment Results of the Environmental Statement Figures (TR010064/APP/6.2) and Table 5.25, the largest increases in annual mean $NO_2$ concentration are modelled to occur at receptors R89 (+5.0µg/m$^3$), R160 (+3.1µg/m$^3$), R161 (+2.3µg/m$^3$) and R162 (+1.7µg/m$^3$). These changes are classed as being of 'small' (0.4 – 2µg/m$^3$), 'medium' (2 – 4µg/m$^3$) and 'large' (>4µg/m$^3$) magnitude, in accordance with DMRB LA 105 criteria described in Table 5.12, however, modelled concentrations at these receptors are predicted to not be in exceedance of the $NO_2$ AQO. All of these receptors are situated in close proximity to M60 J18 and are the closest four receptors to the junction of the transect drawn directly to the north-west of M60 J18, modelled to represent the possible locations of potential housing (i.e. not actual existing receptors). These receptors are modelled to experience an increase in traffic flows with traffic being moved closer to them as a result of the introduction of the slip road onto the M60 southbound as part of the Scheme.

5.10.25 As shown in Table 1.2 of Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3), annual mean $PM_{10}$ concentrations are modelled to be well within both of the $PM_{10}$ and $PM_{2.5}$ AQO/Limit Values at all receptors (i.e. 40µg/m$^3$ and 20µg/m$^3$, respectively), with the highest $PM_{10}$ concentration in the Opening year DS scenario predicted to be 18.4µg/m$^3$ at R3 and R441. All of the receptors were modelled to experience either an 'imperceptible' or 'small' change in concentration as a result of the Scheme.

5.10.26 A table of receptors contributing to the evaluation of significant impacts has been created to establish if the Scheme is likely to result in significant effects (Table 5.26). This is based on Table 5.13 of this chapter and the criteria outlined in DMRB LA 105 Table 2.92N, where the AQO is exceeded and where the change in concentration is not classed as imperceptible.

**Table 5.26 The number of receptors with a magnitude of small, medium and large that worsen or improve AQOs**

| Magnitude of change in pollutant concentration | Number of receptors with: | |
|---|---|---|
| | Worsening of an AQO already above objective or creation of a new exceedance | Improvement of an AQO already above objective or removal of an existing exceedance |
| Large | 0 | 0 |
| Medium | 0 | 7 (R3, R81, R441, R447, R599, R600, R601) |
| Small | 0 | 7 (R3, R81, R441, R447, R599, R600, R601) |

5.10.27 Changes in concentration at receptors contributing to the evaluation of significance are recorded in Table 5.26 as 'medium' reductions in modelled $NO_2$ are predicted to occur at seven human health receptors, at which exceedances of the $NO_2$ annual mean are modelled to occur in the DM and no longer in the DS scenario. In accordance with DMRB LA 105 significance criteria in Table 5.13, the overall effect of the traffic associated with the operation of the Scheme, on air quality, is considered **not significant**.

5.10.28 The full results for receptors included in the human health air quality assessment can be found in Table 1.2 of Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3) and Figure 5.10: Operational Human Health Assessment Results of the Environmental Statement Figures (TR010064/APP/6.2).

### Ecological

5.10.29 The results, in Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3), predict that 32 of the modelled receptors, across eight ecological sites, have a predicted combined total deposition rate (i.e. combined impact from both $NO_2$ and $NH_3$) above the minimum critical load with both a predicted change in nitrogen deposition of more than 1% of the minimum critical load and of more than 0.4kg N/ha/year. These receptors are located in (see Figure 5.11: Operational Ecological Assessment Results of the Environmental Statement Figures (TR010064/APP/6.2)):

- Clifton Country Park LWS (SBI)
- Clifton Moss (South) LWS (SBI)
- Clifton Wood AW
- Hazlitt Wood LWS (SBI)
- Philips Park and North Wood LWS (SBI)
- Philips Park LNR
- Rhodes Farm Sewage Works LWS (SBI)
- Rochdale Canal (Scowcroft to Warland) LWS (SBI).

5.10.30 As the results indicate ecological receptors have the potential to be affected by changes in air quality, the potential significance of these impacts has been assessed by the competent expert for biodiversity. The potential impact of the Scheme on designated habitats is discussed further in Chapter 8: Biodiversity of this Environmental Statement (TR010064/APP/6.1), in line with DMRB LA 105 standards, and the chapter concludes that there are **no significant effects** on these ecological sites from nitrogen deposition during operation.

5.10.31 The full results for receptors included in the ecological air quality assessment, with and without the added contribution from ammonia sources, can be found in Tables 1.5 and 1.6 of Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3) and Figure 5.11: Operational Ecological Assessment Results of the Environmental Statement Figures (TR010064/APP/6.2).

### Compliance risk assessment

5.10.32 A total of 140 receptors were modelled as part of the compliance risk assessment as outlined in Section 5.7. Of these, 82 receptors were modelled at positions 4m from the edge of PCM road links in the air quality study area and the remaining 58 receptors were modelled at locations representative of sensitive locations and qualifying features; all were modelled at 2m in height. The full scope of the results of the compliance assessment can be found in Table 1.8 of Appendix 5.2: Air Quality Results of the Environmental Statement Appendices (TR010064/APP/6.3).

5.10.33 The modelled annual mean $NO_2$ concentrations alongside PCM links are, for the majority of cases, within the range identified by the national scale PCM model and as such annual mean $NO_2$ concentrations are still modelled to be within the Limit Value (40µg/m$^3$) adjacent to all links. The highest predicted $NO_2$ concentration was 37.2µg/m$^3$ without the Scheme and 33.4µg/m$^3$ with the Scheme. As there are no predicted exceedances of the $NO_2$ Limit Value at any of the modelled receptors or in the national scale PCM model, the traffic and local air quality modelling are considered robust, as per the guidance in DMRB LA 105.

5.10.34 The $PM_{10}$ annual means were modelled below the $PM_{10}$ and $PM_{2.5}$ Limit Values of 40µg/m$^3$ and 20µg/m$^3$, respectively, with the highest $PM_{10}$ concentration predicted to be 19.3µg/m$^3$ without the Scheme and 19.4µg/m$^3$ with the Scheme. As such, it is considered that there is no risk of the Scheme affecting the UK's reported ability to comply with the Limit Values in the shortest timescale possible and is, therefore, assessed to be **not significant**.

## 5.11 Monitoring

5.11.1 No significant effects are identified, other than potential effects on designated ecological sites that are reported in Chapter 8: Biodiversity of this Environmental Statement (TR010064/APP/6.1). Therefore, no air quality monitoring is required.

## 5.12 Summary

5.12.1 The air quality aspect of the Scheme is considered compliant with relevant national planning policy, NPS NN (DfT, 2014) and draft NPS NN (DfT, 2023).

5.12.2 In accordance with DMRB LA 105 criteria on significance, the effect of the construction of the Scheme on air quality at human health receptors and on Limit Value compliance receptors is considered to be **not significant**. Changes in nitrogen deposition during the construction of the Scheme have the potential to impact sensitive habitats within designated sites, the potential significance of which is considered further within Chapter 8: Biodiversity of this Environmental Statement (TR010064/APP/6.1). Chapter 8 concludes that there are **no significant effects** from nitrogen deposition from the construction of the Scheme. For construction dust, this assessment concludes that there would be **no significant effects** resulting from construction dust with the construction phase mitigation measures included in the First Iteration EMP (TR010064/APP/6.5) in place.

5.12.3 The effect of the operation of the Scheme on air quality at human health receptors and on Limit Value compliance receptors is considered to be **not significant**. Changes in nitrogen deposition as a result of the operation of the Scheme have the potential to impact sensitive habitats within designated ecological sites, the potential significance of which is considered further within Chapter 8: Biodiversity of this Environmental Statement (TR010064/APP/6.1). Chapter 8 concludes that there are **no significant effects** from nitrogen deposition from operation of the Scheme.

## Table 5.27 Summary of residual significant effects for air quality

| Construction | Operation |
|---|---|
| No residual significant effects identified. | No residual significant effects identified. |

# Acronyms

| Abbreviation | Term |
|---|---|
| µg | Microgram |
| AADT | Annual Average Daily Traffic |
| AAWT | Annual Average Weekday Traffic |
| AB+ | AddressBase+ |
| ADMS | Atmospheric Dispersion Modelling System |
| AM | AM Peak |
| AMCT | Annual Mean Concentration Target |
| AQMA | Air Quality Management Area |
| AQO | Air Quality Objective |
| AQS | Air Quality Strategy |
| ARN | Affected Road Network |
| ASR | Annual Status Report |
| AW | Ancient Woodland |
| BMBC | Bury Metropolitan Borough Council |
| CAZ | Clear Air Zone |
| CERC | Cambridge Environmental Research Consultants |
| DCO | Development Consent Order |
| Defra | Department of Environment, Food, and Rural Affairs |
| DfT | Department for Transport |
| DLUHC | Department for Levelling Up, Housing and Communities |
| DM | Do-Minimum |
| DMRB | Design Manual for Roads and Bridges |
| DS | Do-Something |
| EC | European Commission |
| EIA | Environmental Impact Assessment |
| EMP | Environmental Management Plan |
| EU | European Union |
| GM CAP | Greater Manchester Clear Air Plan |

| Abbreviation | Term |
|---|---|
| GMCA | Greater Manchester Combined Authority |
| HDV | Heavy Duty Vehicle |
| IAQM | Institute of Air Quality Management |
| IP | Inter-Peak |
| LAQM | Local Air Quality Management |
| LDV | Light Duty Vehicle |
| LNR | Local Nature Reserve |
| LTT | Long Term Trend |
| LWS | Local Wildlife Site |
| MCC | Manchester City Council |
| NAPCP | National Air Pollution Control Program |
| NIA | Nature Improvement Area |
| $NO_2$ | Nitrogen dioxide |
| $NO_X$ | Nitrogen oxides |
| NPS NN | National Policy Statement for National Networks |
| NSIP | Nationally Significant Infrastructure Project |
| OMBC | Oldham Metropolitan Borough Council |
| OP | Off Peak |
| PCM | Pollution Climate Mapping |
| PEIR | Preliminary Environmental Information Report |
| PERT | Population Exposure Reduction Target |
| PM | PM Peak |
| $PM_{2.5}$ / $PM_{10}$ | Particulate matter, where the number denotes the particulate size diameter in micrometres. |
| RBC | Rochdale Borough Council |
| SAC | Special Area of Conservation |
| SBI | Site of Biological Importance |
| SCC | Salford City Council |
| SoS | Secretary of State |
| SPA | Special Protection Area |

| Abbreviation | Term |
|---|---|
| SSSI | Site of Special Scientific Interest |
| TfGM | Transport for Greater Manchester |
| TG | Technical Guidance |
| TRA | Traffic Reliability Area |
| TRB | Transportation Research Board |

# Glossary

| Term | Definition |
|---|---|
| Affected Road Network | All roads that trigger the traffic screening criteria and adjoining roads within 200m. |
| Air Quality Management Area | An area declared by a local authority which has been determined will exceed the relevant air quality strategy objective. |
| Air quality threshold | Generic term to represent the relevant pollutant averaging period and concentration value described by the air quality strategy objectives or EU Limit Values. |
| Do-Minimum | The scenario that represents the situation that would occur without the project in operation (or without construction), which includes committed developments. |
| Do-Something | The scenario that represents the situation that would occur with the project in operation (or with construction), which includes committed developments. |
| Speed band | A range of categories for which outputs from the traffic model are grouped into to describe their emissions. |
| Traffic Reliability Area | The traffic scoping criteria is only be applied to the area covered by the traffic model, that the competent expert for traffic has identified as reliable for inclusion in an environmental assessment. |

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