INTERIM ADVICE NOTE 174/13

Updated advice for evaluating significant local air quality effects for users of DMRB Volume 11, Section 3, Part 1 'Air Quality (HA207/07)

Summary
This IAN provides supplementary advice to users of DMRB Volume 11, SECTION 3, PART 1 (HA207/07). Advice is provided on the evaluation of significant local air quality effects.

Instructions for Use
This guidance is supplementary to existing guidance given in DMRB Volume 11, Section 3, Part 1 (HA207/07)

Executive Summary

Introduction

This IAN provides updated advice for users of DMRB Volume 11, Section 3, Part 1 'Air Quality' (HA207/07). The advice enables air quality professionals to evaluate the significance of local air quality effects in line with the requirements of the existing EIA Directive for HA Schemes.

The Scope of this lAN includes the assessment of significant local air quality effects for public exposure and designated ecosystems only. Advice on reporting changes in regional emissions and the assessment of construction dust impacts is already described in HA207/07 and is not covered in this IAN.

Relationship

This IAN provides updated air quality advice for users of DMRB Volume 11, Section 3, Part 1 'Air Quality' (HA207/07).

Implementation

This guidance should be used forthwith on relevant projects in England, where air quality assessments are undertaken and where such projects have yet to be submitted for statutory process, including Determination of the need for a statutory Environmental Impact Assessment.

1. Background

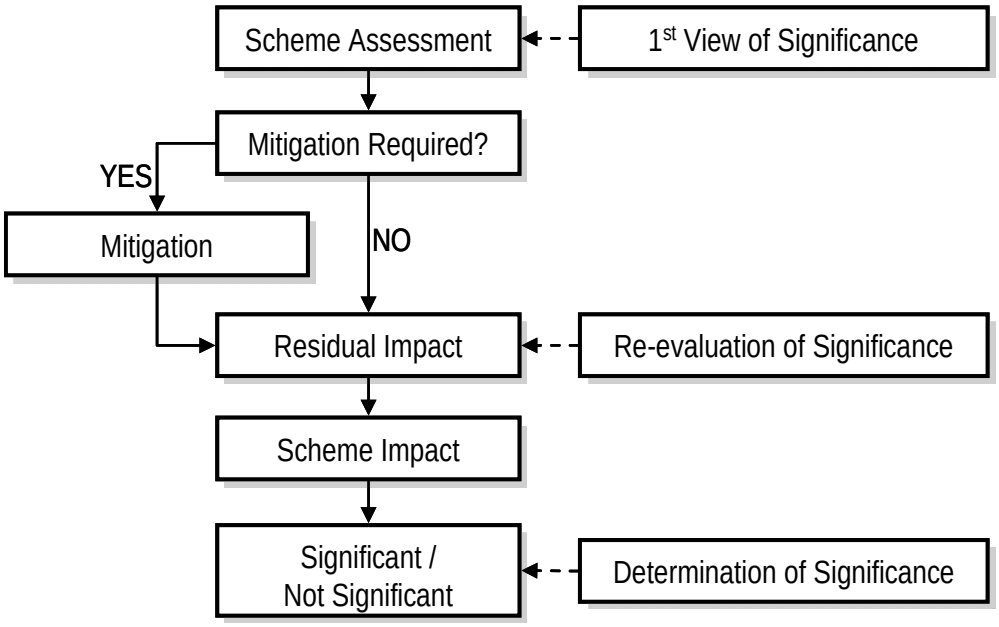
All types of projects [schemes] can have significant effects on the environment. Decision-makers need to be able to understand these effects and the Environmental Assessment process provides a way of assessing and reporting these effects in line with the requirements of the EIA Directive and planning policies.

1.1 Environmental Impact Assessment

In promoting schemes, under the EIA Directive, an assessment of the likely significant environmental effects of public and private projects must be conducted on the basis of appropriate information supplied by the developer. It is for the developer to set out whether or not a scheme is likely to have significant environmental effects.

The flow chart below (Figure 1.1) presents the key decision making points, incorporating an initial judgement on the significance of the scheme effects, and the need for mitigation where significance effects are predicted. The final judgement of significance is then undertaken on the residual effects taking into account the effectiveness of any mitigation measures. This allows for a determination of the significance of scheme effects i.e. significant or not significant. Where mitigation is not required or mitigation is not effective then the scheme assessment effects and residual effects would remain the same.

Figure 1.1 Flow Chart of Determining Significant Environmental Effects



The process of recording whether likely significant effects are likely is known as screening. This results in a determination decision which is usually reported in the Record of Determination (RoD). The RoD will be supported by a range of environmental assessments, often including an air quality assessment prepared within an Environmental Assessment Report (EAR). An EAR will often include an equivalent level of assessment to that included in an Environmental Statement (ES). Case law has confirmed that the reasoning behind the determination decision should be published. It is, therefore, important that the assessment of air quality significance is based on a sound, consistent and transparent framework.

A judgement of significance must take into account relevant selection criteria set out in Annex III of the EIA Directive. Of particular note is the requirement, described in Annex III, to have regard to, "*areas in which the environmental quality standards laid down in [European] Union legislation have already been exceeded.*"

This means that judgement of significance should take into account impacts on Limit Values (Table 1.1) set out in the EU Directive on ambient air quality as a minimum.

1.2 National Planning Policy Framework

Paragraph 124 of the National Planning Policy Framework (NPPF) published on the 27th March 2012 changed the framework for air quality in planning (Box 1.1).

Box 1.1 – Paragraph 124 from NPPF

> "Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan."

The NPPF sets out two considerations for air quality to inform the Decision Maker:

1. Consideration of the scheme air quality impacts on the EU Directive on ambient air quality and clean air for Europe (2008/50/EC)
2. Consideration of scheme air quality impacts on national objectives for pollutants

The HA's approach to evaluating significant air quality effects, presented in Section 2, reflects this change in national planning policy and the requirements of the EIA Directive.

1.3 Consideration of the EU Directive on Ambient Air

The EU Directive on Ambient Air Quality sets limit values for a range of pollutants (Table 1.1). The purpose of the Directive is to protect human health, and the environment as a whole. Defra reports annually, on behalf of the UK government, on the status of Air Quality to the European Commission.

The new compliance risk assessment test (IAN 175/13) has been developed to enable decision makers to judge a scheme's likelihood of non-compliance with the EU Directive. The compliance risk assessment test also informs the air quality significance test (Section 2.5).

1.4 Consideration of National Air Quality Objectives and AQMAs

The Highways Agency's approach to air quality assessment identifies and assesses sensitive receptors near roads where air quality might be affected. Consequently, areas where national air quality objectives (Table 1.1) might be expected to be exceeded are considered, which includes Air Quality Management Areas (AQMAs). However, the air quality assessment does not focus solely on the presence or absence of AQMAs to inform our judgement of the scheme effects, but takes them into account in the assessment process.

Where the study area includes AQMAs, the relevant measures set out in the corresponding Air Quality Action Plan should be taken into account as part of the scheme assessment. This aligns with the advice set out in the NPPF (Section 1.2).

Advice is provided in HA207/07 on how to consider AQMAs as part of an air quality assessment.

1.5 Air Quality Thresholds

Current UK air quality regulations and the EU Directive on ambient air quality set objectives and Limit Values, respectively, covering a range of pollutants. For traffic sources, the pollutants of particular concern are oxides of nitrogen (NOx and NO_2) and particulate matter (PM_{10}). However, the approach set out in this IAN for assessing significance can be applied to any pollutant. Table 1.1 lists the key traffic related air quality thresholds which have the same concentrations and measurement period for UK air quality regulations and EU Directive on ambient air quality.

Table 1.1 Objectives for Key Traffic Related Pollutants

Pollutant	Air Quality Threshold Concentrations	Measured as
Nitrogen Dioxide (NO_2)	200 µg m^{-3} not to be exceeded more than 18 times a year	1-hour mean
	40 µg m^{-3}	Annual mean
Oxides of Nitrogen (NOx)	30 µg m^{-3}	Annual mean
Particles (PM_{10}) (gravimetric)	50 µg m^{-3}, not to be exceeded more than 35 times a year	Daily mean
	40 µg m^{-3}	Annual mean

For the 1-hour mean NO_2 objective, Defra's advice in their local air quality management technical guidance (LAQM.TG(09)) is that this threshold is unlikely to be exceeded unless the annual mean exceeds 60 µg/m³. Within this guidance this same annual mean threshold is considered to represent an increased risk of 1-hour mean NO_2 objective exceedances.

Advice is provided in LAQM.TG(09) on how to calculate the 24 hour mean PM_{10} concentrations based on annual average concentrations.

$PM_{2.5}$ is not currently assessed and reported as part of the DMRB air quality assessment. Further advice concerning $PM_{2.5}$ is provided in Annex B.

2. Approach for Collating the Information to Support a Judgement of Significant Local Air Quality Effects

2.1. Introduction

Local air quality assessments should continue to be completed in accordance with the assessment methodologies set out in HA207/07, relevant published IANs and with reference to Defra's latest Local Air Quality Management technical guidance and advice where required.

This section provides guidance on how to collate the information required to support an informed professional judgement on the significance of local air quality effects for public exposure and Designated Sites.

The approach in this IAN draws on the most relevant of the seventeen criteria outlined in the European Commission's 2001 Guidance on EIA: Screening, (based on the EIA Directive Annex III criteria) to help inform professional judgement. Annex A provides further information and advice on all 17 questions, and there may be occasions when other questions are of particular relevance to inform the judgement on significance.

The key criteria for air quality are considered to be:

- Is there a risk that environmental standards will be breached?
- Is there a high probability of the effect occurring?
- Will there be a large change in environmental conditions?
- Will the effect continue for a long time?
- Will many people be affected?
- Is there a risk that protected sites, areas, or features will be affected?
- Will it be difficult to avoid, or reduce or repair or compensate for the effect?

Annex A provides further information on the requirements to help answer each of the key criteria questions listed above.

2.2. Assessing Relevant Sensitive Receptors

The air quality assessment should include all sensitive receptors[1] that have a reasonable risk of exceeding an air quality threshold. This does **not** mean modelling all receptors within 200m of road, but where the assessment indicates exceedances of an air quality threshold then the assessment should be expanded to include all receptors that are at a reasonable risk of exceeding that air quality thresholds.

This approach to assessing sensitive receptors will inform professional judgement and ensure consistency across all HA scheme assessments.

The selection of receptors for Designated Sites and associated transects should be completed as set out in HA207/07.

Modelled results and the assessment of changes in pollutant concentrations between without and with scheme scenarios should be **reported to 1 decimal place**. 24 hour mean PM_{10} concentrations results should be rounded to the nearest whole day.

[1] Receptors as defined in LAQM.TG(09) includes houses, schools and hospitals, care homes etc, and designated sites as set out in DMRB v11, s3, p1 (HA207/07

2.3. Compiling the Data to Inform the Significance Test for Public Exposure

Air quality assessments are based on the most **reasonable, robust and representative** methodologies, taking advice from published guidance. The results are verified against monitoring data and can be used to inform a professional judgement.

However, whilst the modelled results are reasonable there is still some element of residual uncertainty, hereafter referred to as Measure of Uncertainty (MoU). This is due to inherent uncertainty in air quality monitoring, modelling and the traffic data used in the assessment.

The approach to describing the MoU in the IAN is based around Defra's published advice in TG(09) on the desirability of achieving 10% verification (between modelled and monitored concentrations) where concentrations are close to or above the air quality threshold.

Table 2.1 presents the different magnitude of change criteria for any annual average NO_2 and PM_{10} concentrations, which is described as a percentage of the relevant air quality threshold. For example a small magnitude of change for annual average NO_2 would be between 1% and 5% of 40µg/m³ i.e. 0.4µg/m³ to 2µg/m³. Further information describing each of the Magnitude categories in provided in Annex A (please see Key Criteria *"Will there be a large change in environmental conditions"* ~ Checklist Question 1). The magnitude of change categories set out in Table 2.1 also apply to the assessment of designated sites e.g. 2-4 µg/m³, but recognising the relevant air quality thresholds set out in Table 1.1.

However, the magnitude of change set out in Table 2.1 could be applied to other pollutants i.e. a percentage of the air quality threshold.

Table 2.1 Magnitude of Change Criteria

Magnitude of Change in Concentration	Value of Change in Annual Average NO_2 and PM_{10}
Large (>4)	Greater than full MoU value of 10 % of the air quality objective (4µg/m³).
Medium (>2 to 4)	Greater than half of the MoU (2µg/m³), but less than the full MoU (4µg/m³) of 10% of the air quality objective.
Small (>0.4 to 2)	More than 1% of objective (0.4µg/m³) and less than half of the MoU i.e. 5% (2µg/m³). The full MoU is 10% of the air quality objective (4µg/m³).
Imperceptible (≤ 0.4)	Less than or equal to 1% of objective (0.4µg/m³).

Note: the significance of the change is greater, the higher above the air quality thresholds the changes are predicted to occur. Where it is predicted that the short term NO_2 and / or PM_{10} thresholds are exceeded, then more significance should be attributed to these effects.

The results from the local air quality assessment should be used to complete Table 2.2. Separate tables should be produced for each pollutant where required. The HA's approach to compiling the information for Table 2.2 is based on the change in pollutant concentrations due to the introduction of the scheme. The change is focused on **only those receptors exceeding the air quality thresholds** in either the 'without scheme' scenario and / or 'with scheme' scenario.

Where the difference in concentrations are less than 1% of the air quality threshold e.g. less than 0.4µg/m³ for annual average NO_2, then the change at these receptors is considered to be imperceptible and they can be scoped out of the judgement on significance.

Any changes in concentrations greater than imperceptible should be assigned to one of the six categories in Table 2.2. The total number of receptors should then be aggregated to calculate the total number of receptors in each of the six categories.

Table 2.2 Local Air Quality Receptors Informing Scheme Significance

Magnitude of Change in Annual Average NO_2 or PM_{10} (µg/m³)	Total Number of Receptors with:	
	Worsening of air quality objective already above objective or creation of a new exceedance	Improvement of an air quality objective already above objective or the removal of an existing exceedance
Large (>4)		
Medium (>2 to 4)		
Small (>0.4 to 2)		

The HA has developed a framework to guide air quality professionals with guidelines on the number of receptors for each of the magnitude criteria that might result in a significant effect. These are guideline values only, and are to be used to inform professional judgement on significant effects of the scheme (Table 2.3). The guideline bands are based on the HA's considered opinion and are intended to help provide consistency across all Highways Agency's schemes.

2.4. Interpreting the Significance Test for Public Exposure

Where the outcomes of the assessment indicates that either all modelled concentrations are less than the air quality thresholds or any changes above the air quality thresholds but where the change is imperceptible, than the scheme effect is likely to be not significant for local air quality. This information should be used to inform overall significance as set out in Section 3.

Changes that are greater than imperceptible should be compared to the guideline bands presented in Table 2.3. The guideline band ranges have been developed for each of the 6 categories, setting the upper level of likely non-significance and the lower level of likely significance. Between these two levels (Table 2.3) are the ranges where likely significance is more uncertain and therefore greater consideration of professional judgement is necessary.

Table 2.3 Guideline to Number of Properties Constituting a Significant Effect

Magnitude of Change in NO_2 (µg/m³)	Number of Receptors with:	
	Worsening of air quality objective already above objective or creation of a new exceedance	Improvement of an air quality objective already above objective or the removal of an existing exceedance
Large (>4)	1 to 10	1 to 10
Medium (>2 to 4)	10 to 30	10 to 30
Small (>0.4 to 2)	30 to 60	30 to 60

Where the total number of receptors compiled in Table 2.2 are less than the lower guideline band in all the six magnitude categories, then a consideration of the overall direction of change should be provided. The outcome of the professional judgement of the scheme effects is likely to be not significant. This information should be used to inform overall significance as set out in Section 3.

Changes in concentrations which are greater than the upper guideline band in any of the magnitude categories are likely to be considered significant.

Although, it is important to remember that the upper and lower bands presented in Table 2.3 are guidelines and not absolutes. On occasions when the number of properties affected are above the upper guideline band, then consideration should be given to all the evidence that may support or detract from a conclusion of a significant effect when coming to a concluding view. The further above the upper guideline band the more likely it is that local air quality effects would be significant.

This information should be used to inform overall significance as set out in Section 3.

Where the results reside between the lower and upper guideline bands for any of the magnitude criteria (Table 2.3) then scheme effects could be significant and a judgement is required taking into account the results for all 6 categories. This judgement will be based on the technical knowledge and experience of the air quality professional. To assist this judgement consideration should be given to (but not limited to) the following.

Scheme effects are more likely to be significant where:

- There are no / few receptors with any improvements;
- PM_{10} annual averages are also affected by small, medium or large deteriorations; and
- Short term exceedances may be caused or worsened by the Scheme for either NO_2 or PM_{10}.

Scheme effects are more likely to be not significant where:

- There are receptors with small, medium or large improvements;
- PM_{10} annual averages are not affected by small, medium or large deteriorations; and
- Short term exceedances are not caused or worsened by the Scheme for either NO_2 or PM_{10}.

This information should be used to inform overall significance as set out in Section 3.

2.5 Compliance Risk Assessment

The Compliance Risk Assessment should be completed as set out in IAN 175/13. The outcome of this assessment is a risk rating of either low or high risk of non-compliance with the EU directive on ambient air quality.

A high compliance risk is more likely to lead to a significant overall impact, whereas a low compliance risk is likely to contribute to a judgement of not significant.

This information should be used to inform overall significance as set out in Section 3.

2.6 Designated Sites

The approach to the air quality assessment of designated sites is outlined in HA207/07, Annex F. This includes the identification of any affected Designated Sites within the local air quality study area.

Once a Designated Site has been scoped in to an assessment the steps associated with the evaluation of significance follows a similar process as described for public exposure. Table 2.1 defines the magnitude categories to apply to changes in annual average NO_2, which should also be used to describe the magnitude of change in annual average NOx concentrations; which is 30µg/m³ for designated sites. Concentrations of NOx are being used as the main basis for evaluating the significant effects. Where the assessment indicates a potentially significant effect on a designated site due to changes in NOx concentrations, then changes in nutrient nitrogen deposition should be calculated as supporting information to further assist in the evaluation of significance.

Where NOx concentrations are assessed to be below their objective then significant effects are not anticipated.

If the objective is exceeded, then significant effects may occur, and further consideration should be given to the magnitude of change. The exception to this is where changes are less than 0.4µg/m³, then effects are considered to be imperceptible and unlikely to be significant.

Where changes in NOx concentrations are greater than 0.4µg/m³ then this information along with changes in nutrient nitrogen deposition should be provided to the scheme ecologist to determine the significance of effects based on their professional judgement.

Once a position on the significance of the effects on designated sites has been determined by the scheme ecologist, a brief note (no more than one side of A4 per site) setting out the key reasons for this evaluation, including supporting evidence and the magnitude of change in NOx (Table 2.1) should be prepared for consultation with Natural England.

This information should be used to inform overall significance as set out in Section 3.

3. Approach to be Adopted to Evaluate Significant Local Air Quality Effects

3.1 Forming a Professional Judgement

In coming to an overall judgement of significance the air quality professional must take into account the effects on public exposure, designated sites and the compliance risk rating as set out in Section 2. A commentary setting out how the judgement was arrived at, with supporting evidence, must be provided. The professional judgement must come to a single view, setting out whether the scheme is significant or not-significant.

The establishment of overall air quality significance for the scheme should consider, but not limited to:

- If annual average NO_2 is the key pollutant alone or if other short term averaging periods and/or pollutants also need to be taken into account;
- Whether any adverse large, medium, or small changes are predicted;
- Whether any beneficial large, medium, or small changes are predicted;
- Whether any of these exceed lower or upper guideline bands;
- The schemes ability to detract or support measures set out in Air Quality Action Plans;
- If the scheme represents a low or high compliance risk;
- The effects on any designated site(s) affected; and
- Whether, if required, mitigation can be incorporated in to the scheme design, and the effectiveness of the specified mitigation measures.

The more 'yes' answers to the checklist questions that are considered to be significant, the more likely it is that the overall judgement will be that the scheme has a significant effect.

Reference should be made to the key criteria questions (Annex A) in coming to an informed judgement on the overall significance of the scheme's effect.

3.2 Reporting on the Evaluation of Significant Effects

The concluding view on local air quality significance should be set out in the Environmental Assessment Report or Environmental Statement as applicable. This view on significance should be supported by a statement setting out how that judgement was arrived at, together with the supporting evidence. Table 3.1 outlines how the professional judgement of the air quality and supporting evidence should be presented in the report.

Table 3.1 Overall Evaluation of Local Air Quality Significance

Key Criteria Questions	Yes / No
Is there a risk that environmental standards will be breached?	
Will there be a large change in environmental conditions?	
Will the effect continue for a long time?	
Will many people be affected?	
Is there a risk that designated sites, areas, or features will be affected?	
Will it be difficult to avoid, or reduce or repair or compensate for the effect?	
On Balance is the Overall Effect Significant?	
Evidence in Support of the Professional Judgement	

3.3 Mitigation

The air quality assessment and judgement of significance is an iterative process as illustrated in Figure 1.1. Where a scheme has been determined to have a significant effect (Section 3.1) then mitigation measures need to be considered to minimise effects.

In situations where effective, viable and quantifiable mitigation measures can be incorporated into the scheme design then the air quality assessment should be updated. The proposed mitigation measures may be set out in the form of Scheme Air Quality Action Plan (SAQAP) (see IAN 175/13). The mitigation measures may also be informed by a SAQAP where developed as part of the Compliance Risk Assessment (IAN 175/13).

The air quality effects should be re-evaluated, including the mitigation measures, to determine the significance of the schemes effect.

The implications of any additional air quality mitigation measures should also be discussed with other specialists as required (e.g. landscape, noise etc) to inform their assessments.

4. Withdrawal Conditions

This IAN will be withdrawn when an updated Volume 11, Section 3, Part 1 Air Quality has been published.

5. Contacts

Any queries regarding this IAN should be addressed to either:

Andrew Bean
Principal Air Quality Advisor

Postal address: Highways Agency
Piccadilly Gate
Store Street
Manchester
M1 2WD

Email: andrew.bean@highways.gsi.gov.uk
Tel: (0161) 930 5526 or GTN 4315 5526

6. References

Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1, Air Quality (HA207/07) May 2007

Interim Advice Note (175/13), Updated air quality advice on the compliance risk assessment of the EU Directive on ambient air quality for user of DMRB Volume 11, Section 3, Part 1 Air Quality

7. Additional Reading

Department for Communities and Local Government. National Planning Policy Framework, March 2012

European Commission, Guidance on EIA Scoping, June 2001

EU Directive on ambient air quality and clean air for Europe, (2008/50/EC)

Department for Environment, Food and Rural Affairs, Local Air Quality Management Technical Guidance 2009

Design Manual for Roads & Bridges. Volume 11 Environmental assessment. Section 4. Assessment of implications on European sites. Part 1. HD44/09 Assessment of implications (of highways and/or roads projects) on European sites (including appropriate assessment).

Annex A

A.1 Checklist of Criteria for Evaluating the Significance of Air Quality Effects

The EU Scoping for EIA report sets out a checklist of 17 criteria to assist in evaluating the significance of environmental effects and are helpful to inform a judgement on the significance of scheme effects. The key questions for air quality are considered to be:

- Is there a risk that environmental standards will be breached?;
- Will there be a large change in environmental conditions?;
- Will the effect continue for a long time?;
- Will many people be affected?;
- Is there a risk that designated sites, areas, or features will be affected?
- Will it be difficult to avoid, or reduce or repair or compensate for the effect?

Further background on how the Highways Agency understood these criteria is outline in this Annex. The criteria that are not considered to be key questions or not to be applicable are also provided with a brief supporting explanation.

A.2 Key Criteria Questions

Is there a risk that environmental standards will be breached? (Checklist Question 9)
HA207/07 air quality assessments consider a wide range of receptors within 200m of affected routes (i.e. routes meeting local air quality screening criteria) that will have been modelled and verified.

It is only those receptors predicted to exceed air quality threshold for NOx, NO_2 or PM_{10} in the assessment year (e.g. scheme opening year) that should be used to inform a judgement of significance.

In practice the evaluation of significance is typically undertaken considering exceedances of NO_2 against annual average objectives and thresholds. This is because typically Highways Agency schemes are not likely to exceed the annual or short term for PM_{10}. However, if annual average PM_{10} exceedances are predicted then these can be assessed using the same approach set out in this IAN.

Will there be a large change in environmental conditions? (Checklist Question 1)
The European Commission's 2001 Guidance on EIA: Screening does not provide guidance on what change in different environmental media (air, water etc) should be considered to be large.

Various criteria have been prepared by organisations and professional bodies to describe magnitudes of change in ambient pollutant concentrations, including large changes (e.g. Institute of Air Quality Management, (IAQM)).

The magnitude of change criteria adopted by the Highways Agency to determine a 'Large' change in pollutant concentrations are presented in Table 2.1 of the main text.

A number of other criteria are also presented as the Highways Agency consider that changes that are smaller than 'Large' may also be significant. Further explanation of the rationale behind each of the different magnitude of change criteria are outlined below.

Large
Large values of change are higher than the Measure of Uncertainty (MoU) and these can be considered with the highest level of confidence. On the basis of current Long Term Trends (LTTs) (please see IAN 170/12) these levels of change would be reversible after approximately 11 to 14 years. The 'Large' banding is also consistent with that selected by the IAQM.

Medium
Medium values are still less, but approaching, the MoU. Therefore, increasing confidence should be assigned to these model outcomes. On the basis of current LTTs these levels of change would be reversible within approximately 6 to 11 years. The 'Medium' banding is also consistent with that selected by the IAQM.

Small
Small values of change are higher than screening value of 1% of air quality threshold, but less than the MoU. On the basis of current LTTs these levels of change would be reversible within approximately 2 to 6 years. The 'Small' banding is also consistent with that selected by the IAQM.

Imperceptible
Values in the 'Imperceptible' band (less than 1% of the air quality threshold) are considered to be a screening value below which changes are not considered to be significant and are not considered further. This is consistent with approaches utilised by the Environment Agency, Natural England and IAQM. Additionally, even if considered further, these levels of change would be reversible within approximately 2 years on current rates of improvements, based on long term trends (LTTs).

Will the effect continue for a long time? (Checklist Question 12)
The European Commission's 2001 Guidance on EIA: Screening does not provide guidance on what a 'long time' equates to.

The Highways Agency considers that when changes in air quality due to a scheme are anticipated to take six years or longer to return to pre-scheme concentrations (i.e. Do-Minimum) that this is a long time.

This timescale also relates to the medium change criteria of 2µg/m^3, where increasing confidence can be ascribed to changes in concentration, which is calculated to take approximately 6 years to return to pre-scheme levels (based on the long term trend rates for NO_2).

Will many people be affected? (Checklist Question 6)
The European Commission's 2001 Guidance on EIA: Screening does not provide guidance on what number of people 'many' or large equates to.

People affected are considered to be only those receptors that exceed and have small, medium or large changes. The HA has provided guideline bands (Table 2.3) for each magnitude of change criteria which indicate what reasonably represents 'many people'

Is there a risk that designated sites, areas, or features will be affected? (Checklist Question 10)
This is considered to be a key question where there are effects on designated sites, that are above the air quality threshold and have more than an imperceptible change.

The response needs to consider the air quality effects on designated sites of NOx concentrations and nutrient nitrogen deposition as outlined in Section 2.6.

Will it be difficult to avoid, or reduce or repair or compensate for the effect? (Checklist Question 17)
This is considered to be a key question and the response should consider the scheme effects, including any viable mitigation measures as outlined in Section 3.3. The proposed mitigation must provide robust evidence that it is an effective solution rather than an emerging mitigation technique where the outcomes are not proven.

A.3 Other Criteria

Is there a high probability of the effect occurring? (Checklist Question 11)
Whilst there is uncertainty in air quality monitoring and modelling (and the traffic data used in the assessment), the air quality assessment undertaken is based on the most **reasonable, robust and representative** methodologies. The context for this is that the assessment has been completed taking advice from published guidance and the results have been verified against monitoring data.

On this basis, whatever the outcomes of the air quality assessment, it can be considered to have a high probability that they will occur and the results and consequent evaluation of significance can be used to inform professional judgement accordingly.

Will new features be out-of-scale with the existing environment? (Checklist Question 2)
Not relevant as emissions from a road would not be unusual in comparison with existing road emissions. However, the introduction of a new road into a pristine environment would be important to consider in relation to this point.

Will the effect be unusual in the area or particularly complex? (Checklist Question 3)
The response should consider the context of the effects i.e. pollution next to an existing road is not unusual for that area. This is not typically considered to be a key question, but the introduction of a new road into a new locality may be and the assessor may wish consider this for bypass schemes etc.

Will the effect extend over a large area? (Checklist Question 4)
Not as relevant as the primary focus will be the total number of receptors affected as set out in Question 6. Receptors located in clusters or dispersed over the length of a scheme would have equal consideration on the significance of the scheme effects.

Will there be any potential for trans-frontier impact? (Checklist Question 5)
Not relevant as the effects will be localised.

Will many receptors of other types (fauna and flora, businesses, facilities) be affected? (Checklist Question 7)
This question is addressed in Q10.

Will valuable or scarce features or resources be affected? (Checklist Question 8)
For this to be considered, the feature or resource must have a particularly sensitivity to changes in air quality that would not be represented by a receptor[2] normally included in an air quality assessment. This is therefore not considered to be a key question.

[2] Receptors as defined in LAQM.TG(09) includes houses, schools and hospitals, care homes etc, and designated sites as set out in DMRB v11, s3, p1 (HA207/07)

Will the effect be permanent rather than temporary? (Checklist Question 9)
Permanent effects for air quality are considered within the context of the assessment period i.e. up to 15 years after opening.

The response should consider the likelihood of a scheme impact exceeding an air quality threshold 15 years after opening and also where there is an increase in concentrations with the scheme compared to without the scheme.

The creation of a new exceedance does not necessarily constitute a permanent impact.

This duration of effect is covered by 12, but comment should be made as part of Q12 if changes are anticipated to extend to period of 15 years or more.

Will the impact be continuous rather than intermittent? (Checklist Question 14)
Not relevant as traffic emissions from roads are considered to be continuous, although the emission rates will vary over the course of the day.

If it is intermittent will it be frequent rather than rare? (Checklist Question 15)
Not relevant as emissions from road vehicles not intermittent.

Will the impact be irreversible? (Checklist Question 16)
Not relevant because the premise for air quality is that all vehicle related effects are reversible.

This is based on the assumption that air quality effects are reversible through improvements in vehicle technologies (reducing vehicle emissions) and other Government wide measures which may be materialised in the short and / or long term.

Reversibility in itself is not a defence that the scheme effects are not significant as they need to be judged at the time of opening. European and UK Government measures to support reversibility are outside with the control of individual schemes.

Annex B

B.1 Supporting Advice

The following advice is presented to support the evaluation of significant local air quality effects.

Fine Particulates ($PM_{2.5}$)
Current DMRB air quality assessment guidance (HA207/07) and associated Interim Advice Notes (IANs) do not require the assessment of $PM_{2.5}$. Accordingly, the evaluation of significant $PM_{2.5}$ air quality effects is not considered in this IAN.

Health Based Objectives
The evaluation of significant air quality effects is based on exceedances of legislative health based air quality objectives and changes in concentration above these objectives. This is because these objectives have been established to be protective of all members of the population, including more sensitive sub-groups, and worse health outcomes may be anticipated above these objectives. Therefore, changes in concentration less than these thresholds, including large changes, are not considered further in the evaluation of significant air quality effects.

Sensitive Receptor
Air quality receptors are as defined in Defra LAQM.TG(09) including houses, schools, hospitals, care homes and Designated Sites (SSSIs, SACs, SPAs and RAMSAR sites). Other receptors may require consideration if short term pollutant exceedances are anticipated. Further advice on assessing sensitive receptors is provided in HA207/07.