



# NO<sub>x</sub>/NO<sub>2</sub>: Concerns within the Development Planning Process



# Introduction

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Planning Officers are looking for certainty about the significance of air quality effects, when making recommendations on planning applications to decision makers.

- The current lack of confidence in official forecasting information translates into:
  - greater doubt about the reliability of predicted impacts,
  - additional delays while assessment methods are agreed between all parties; and
  - additional cost to those trying to demonstrate future impacts on local air quality at the project level.
- This presentation considers some alternative ways forward until new forecasting information is made available, and
- hopefully prompts some further discussion.

# Emerging Evidence

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## Trends in NO<sub>x</sub> and NO<sub>2</sub> emissions and ambient measurements in the UK, Carslaw et al., 2011

Central estimate of total urban road transport NO<sub>x</sub> emissions reductions

- Inner London 3.0 % per year
- Outer London 2.6 % per year
- Other UK urban areas 4.2% per year

Local trends reflect local conditions, with increases at some locations.

# Emerging Evidence

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## Trends in NO<sub>x</sub> and NO<sub>2</sub> emissions and ambient measurements in the UK, Carslaw et al., 2011

Some evidence that:

- HDV emissions are under-predicted for real world urban driving conditions;
- emission controls on petrol vehicles as a whole are less effective than previously thought
- the age profile for cars in UK may not be as young as assumed

However,

- Euro 6 & VI related data for future years has not been challenged (yet).

# Guidance

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“Local Air Quality Management Helpdesk, September 2010

**Measured nitrogen oxides (NO<sub>x</sub>) and/or nitrogen dioxide (NO<sub>2</sub>) concentrations in my local authority area do not appear to be declining in line with national forecasts. Should I take this into account in my Review and Assessment work?**

*... Defra and the devolved administrations are currently investigating these issues, ... However, the preliminary findings would suggest that the Euro standards will deliver only marginal, if any, reductions in NO<sub>x</sub> and NO<sub>2</sub> concentrations until the Euro 6 emission standards begin, as is currently forecast, to play a major role (i.e. circa post-2015).*

*Where existing forecasting information is used for decision making or review and assessment and action planning work, local authorities may wish to take account of the emerging findings on the performance of different vehicle types, the performance of Euro standards overall, and the expected effect on forecast background concentrations”.*

# What LAQM forecasting tools are affected

Tool	Information used by tool			
	Fleet Composition Forecast	Emission rate data	f-NO <sub>2</sub>	Background Concentration Forecasts
Emission Factor Toolkit (EFT)	yes	yes	yes	no
NO <sub>x</sub> to NO <sub>2</sub> conversion tool	yes	yes	yes	yes

For most impact assessments the additional uncertainty relates to the use made of three tools: background concentration maps, EFT and the NO<sub>x</sub> to NO<sub>2</sub> conversion tool.

# Scoping/Consultation Opinions

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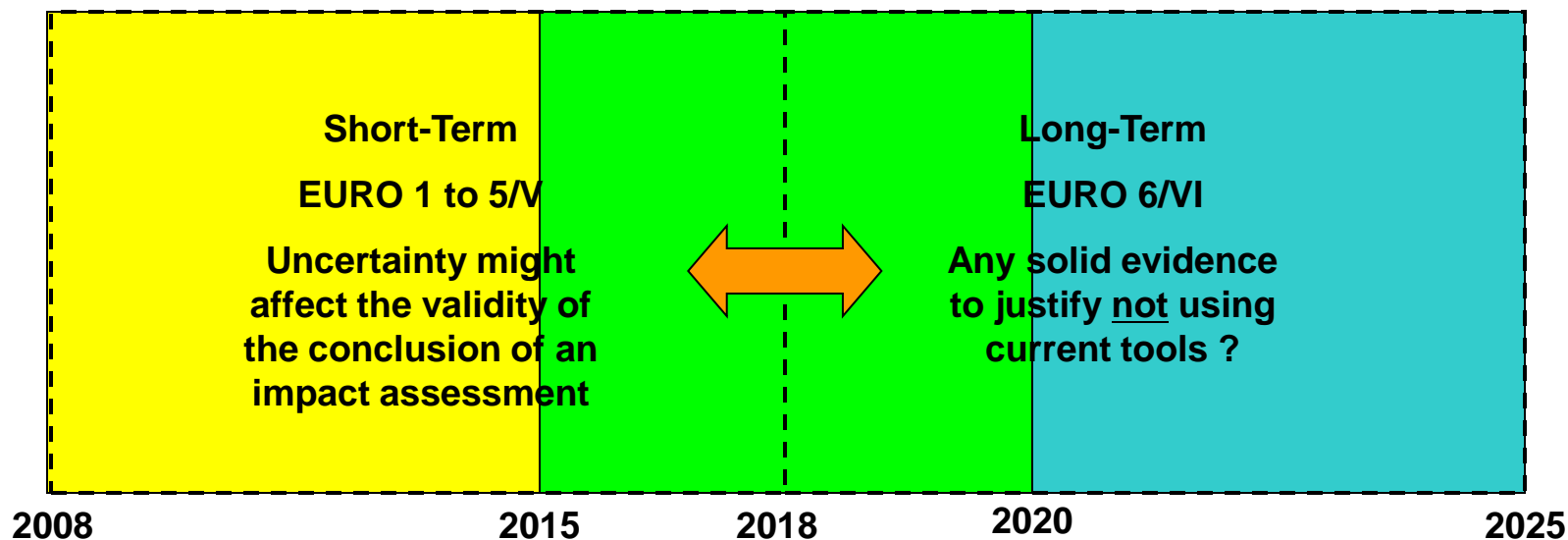
- *“The assessment should take account of uncertainty about rates of reductions in NO<sub>2</sub> concentrations in future years.”*
- *“Current monitoring data does not show any trend of improvement in annual mean concentrations of nitrogen dioxide. No such improvement should be modelled for future assessment years”.*
- *“The approach to determining future concentrations should be agreed with ...”*
- *“...must provide a realistic assessment of future air quality.”*

# Question

**Q. Could the additional uncertainty materially affect the validity of a planning decision ?**

**A. Short term – Yes, but only in some cases.**

**Long term – Increasingly unlikely with time.**



# Some alternative approaches

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**For assessments of impacts in the short-term**

**Option 1: Report values based strictly on use of ‘official’ tools.**

**Option 2: Assume no change in background concentrations and vehicle emission rates in scenarios set after dispersion model verification year.**

**Option 3: Report as option 1, and include an alternative more conservative set of scenarios based on a defined change to the method.**

**Option 4: Report as option 1 and include a sensitivity analysis.**

# Option 1 – no change to assessment method

## Pros

- Assessment method is known.
- Reported impacts can be compared to other recent assessments
- For locations with annual mean NO<sub>2</sub> that is well below objective value, can argue that assessment is adequate.

## Cons

- Unless local monitoring is supportive of trend of improvement, conclusions would be open to challenge from local authority or 3<sup>rd</sup> parties.
- Potential for delay while agreeing assessment method with local authority
- If changes in vehicle flows are large, the magnitude of impact and absolute conc.s are both likely be under-estimates.

## Option 2 – no future year reductions

### Pros

- **Assessment method is clear and easy to understand.**
- **Reported impacts can be compared to other recent assessments**
- **Predicted impacts will be conservative.**

### Cons

- **Method and conclusions would be open to challenge from developer, if air quality grounds for refusal.**
- **Becomes increasingly conservative as assessment year moves into future.**
- **In effect scenarios are NOx emissions at year X rates, regardless of any external factors except proposed development.**

# Option 3 – main assessment and alternative scenario

## Pros

- **Assessment method is known.**
- **Reported impacts can be compared to other recent assessments**
- **Method and purpose of alternative clearly defined and set in context.**
- **Unless new or additional exceedances reported, likely to provide adequate information for decision making.**

## Cons

- **Potential for delay while agreeing alternative assessment scenario with local authority**
- **Potential for different reported values to be misunderstood, without clear explanation.**
- **Some additional cost compared to options 1 or 2.**

# Option 4 – main assessment with sensitivity analysis

## Pros

- Main assessment method is known.
- Reported impacts can be compared to other recent assessments
- Robust assessment of uncertainties if implemented well.

## Cons

- Time required to develop meaningful scenarios for sensitivity analysis.
- Risk of reducing confidence of decision makers in conclusions of assessment if not presented well.
- Possibly not cost effective if air quality is not considered a critical issue for the application.

# Summary

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**Until updated future forecasting tools are available for use in LAQM, that can once again be borrowed to support air quality impact assessments, the current lack of confidence in predicted pollutant concentrations is likely to remain.**

**Emerging evidence indicates that a range of factors are likely to account for the observed differences between predicted and measured concentrations of NO<sub>2</sub>.**

**This in turn requires the scenarios adopted to represent future air pollutant concentrations within impact assessments, to be revisited on a planning application by planning application basis.**