Future trends in NO_2 concentrations – implications for LAQM and planning applications

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Background

- Previous presentations have highlighted the disparity between what the emissions forecasts tell us should have been happening and what the measured concentrations of both NOx and NO_2 show
- For almost all site types and locations, concentrations of both NOx and NO_2 have been approximately constant for the past 6 to 8 years
- Within Inner London, there is evidence of slight upward trend in NOx, and stronger upward trend in NO_2

Background

- Questions have been put to the R&A Helpdesk by several local authorities on the implications of this in carrying out Review and Assessments
- *"Measured NOx and NO_2 concentrations in my local authority area do not appear to be declining in line with national forecasts. How should I treat NOx and NO_2 concentrations in future years when completing my Review and Assessment work?"*

Background

- LAQM.TG(09) sets out recommended approaches for local authorities carrying out their LAQM duties
- Makes reference to
  - 1x1 km background maps up to 2020; these are also used as the basis for adjusting measured concentrations to a future year
  - Emissions Factor Toolkit (revised to include new DfT emissions factors)
  - Approaches to project forwards monitoring data at roadside sites
- There is nothing “wrong” with TG(09) – the various tools and recommended approaches are founded on the most up-to-date UK projections
- Are those projections correct?

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Big Questions

- We know historically that the projections for declining NO_2 concentrations have been wrong over the past 6-8years
- Are the future year projections from 2010 correct?
- If they are wrong
  - How long are they wrong for?
  - By how much are they wrong?
- We don't really know!
- What advice do we give the local authorities?

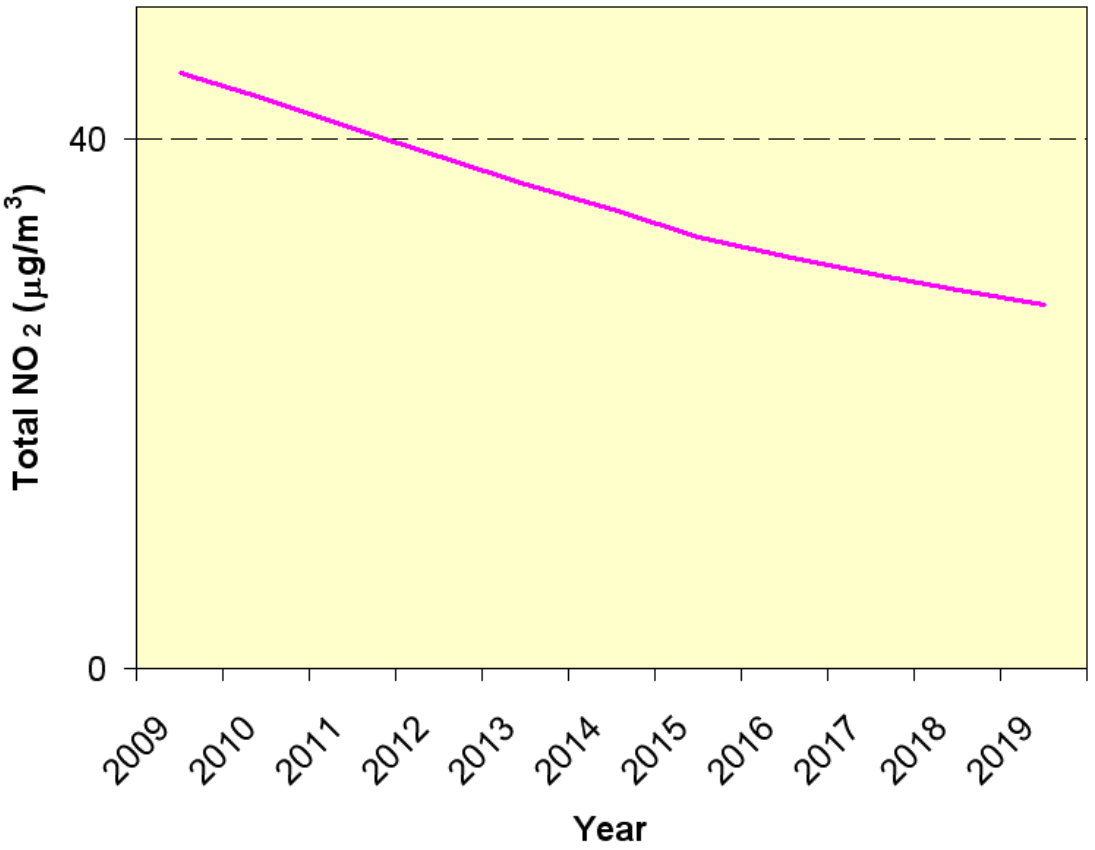
Other Issues

- LAQM.TG(09) has been prepared on behalf of Defra and the devolved administrations to provide guidance to local authorities in carrying out their LAQM duties
- It is not “officially” intended to do anything else
- In the absence of any other guidance, TG(09) approaches are often used by practitioners engaged in other areas of work
  - By developers (or their consultants) in carrying out air quality assessments for new schemes
  - By planning authorities in evaluating the impact of schemes
- Revised LAQM guidance issued by Defra and devolved administrations on future projections has likely implications for other users

Current Projections

Example:

- Assume roadside NO_2 concentration of 45 $\mu g/m^3$ in 2009
- Background NO_2 is 35 $\mu g/m^3$
- Based on EFTv4.2 and background maps, NO_2 concentrations are predicted to decline as shown
- Objective achieved by 2012
- Do we believe it??



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Implications

- For Review and Assessment work it potentially means that local authorities may:
  - Be expecting to revoke existing AQMAs
  - Not develop and implement Action Plans as effectively as they might
- For air quality assessments, impacts are unlikely to be identified post 2012-2015, and certainly not beyond that
  - Potentially we are introducing new exposure into areas of poor air quality where it has not been predicted
  - Potentially we are adding to a future problem that has not been correctly identified

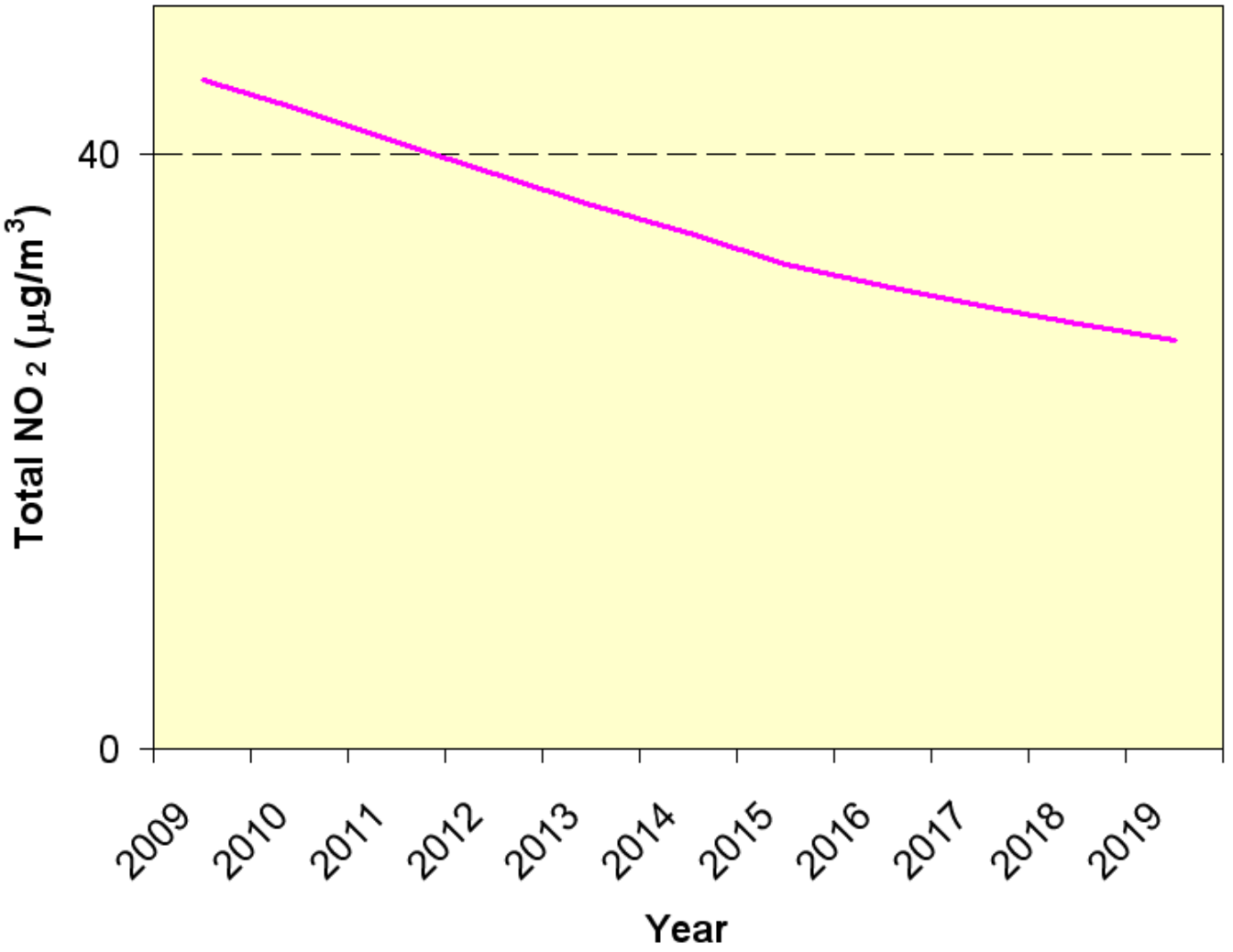
Options

- For LAQM Review and Assessment work it is relatively simple:
- Issue an FAQ: Unless a local authority can provide robust evidence of a significant downward trend in concentrations within its area, then it is required to present its Review and Assessment reports based on two approaches:
  1. Using the projected decline in concentrations as set out in TG(09)
  2. Assuming there would be no further reduction (or a modified reduction) in the foreseeable future (e.g. next 4 or 5 years)

Options for Assessment of Future Roadside NO_2

- 4 Scenarios considered as examples
  - 'Official' Guidance: Both road traffic emissions and background concentrations decline according to official guidance (EFT v4.2 and Background Maps)
  - No Reduction: Future road traffic emission factors and background concentrations stay constant at 2009 values. 1% per annum increase in traffic flow.
  - Background Reduction: Background concentrations reduce, but constant 2009 emission factors for road traffic.
  - Road Traffic Reduction: Road traffic emission factors reduce, but constant 2009 background concentration.

‘Official’ Guidance



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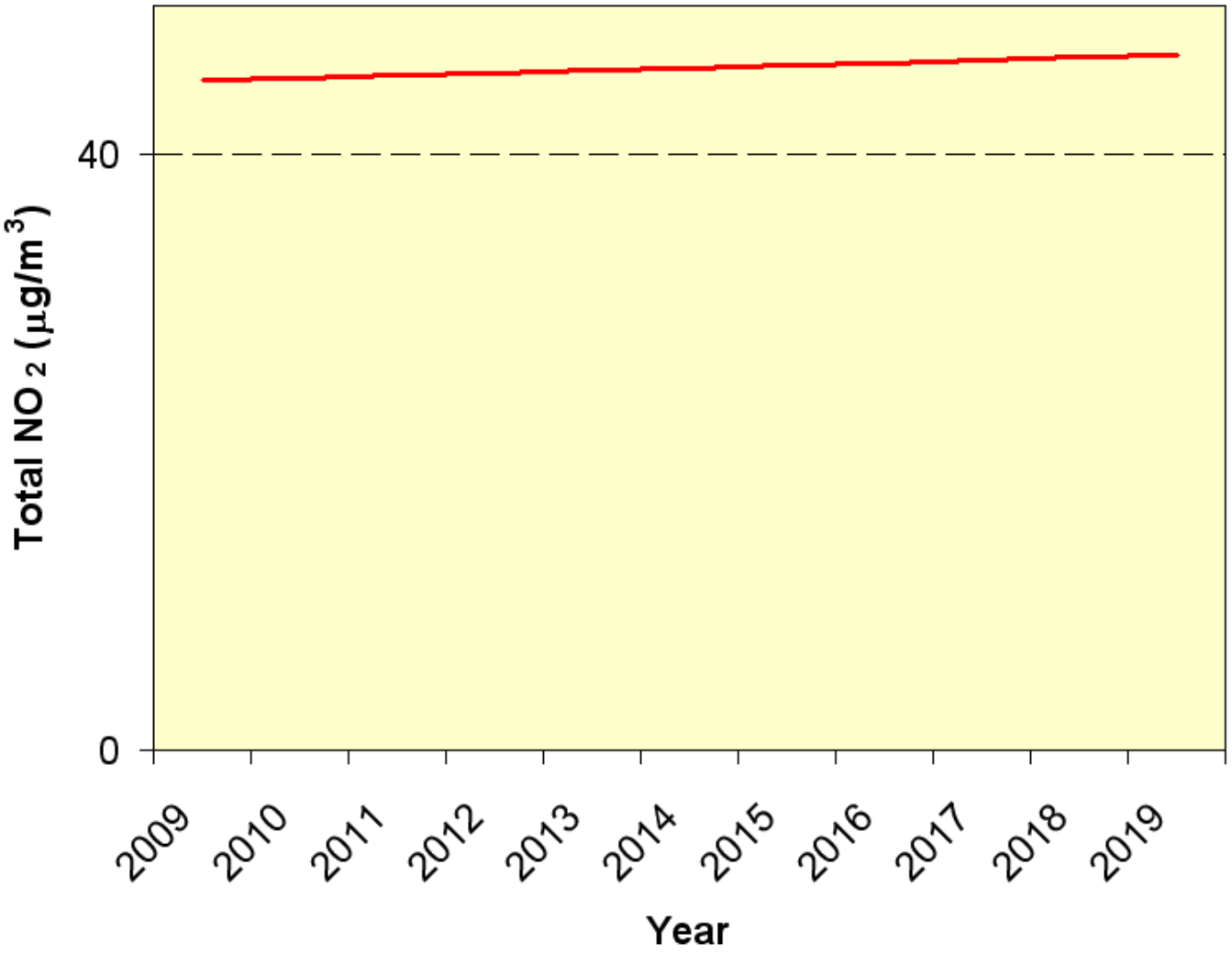
No Reduction



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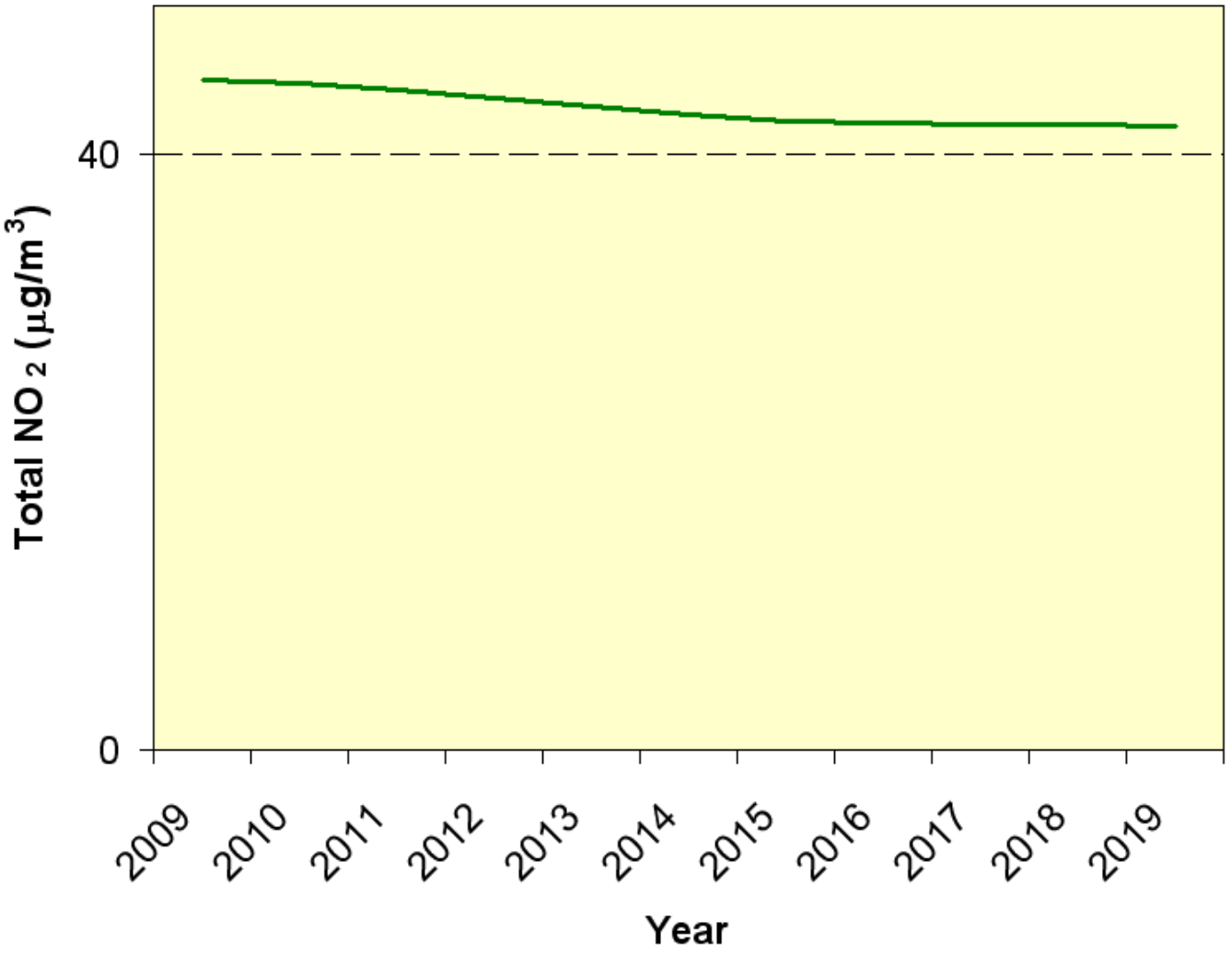
Background Reduction



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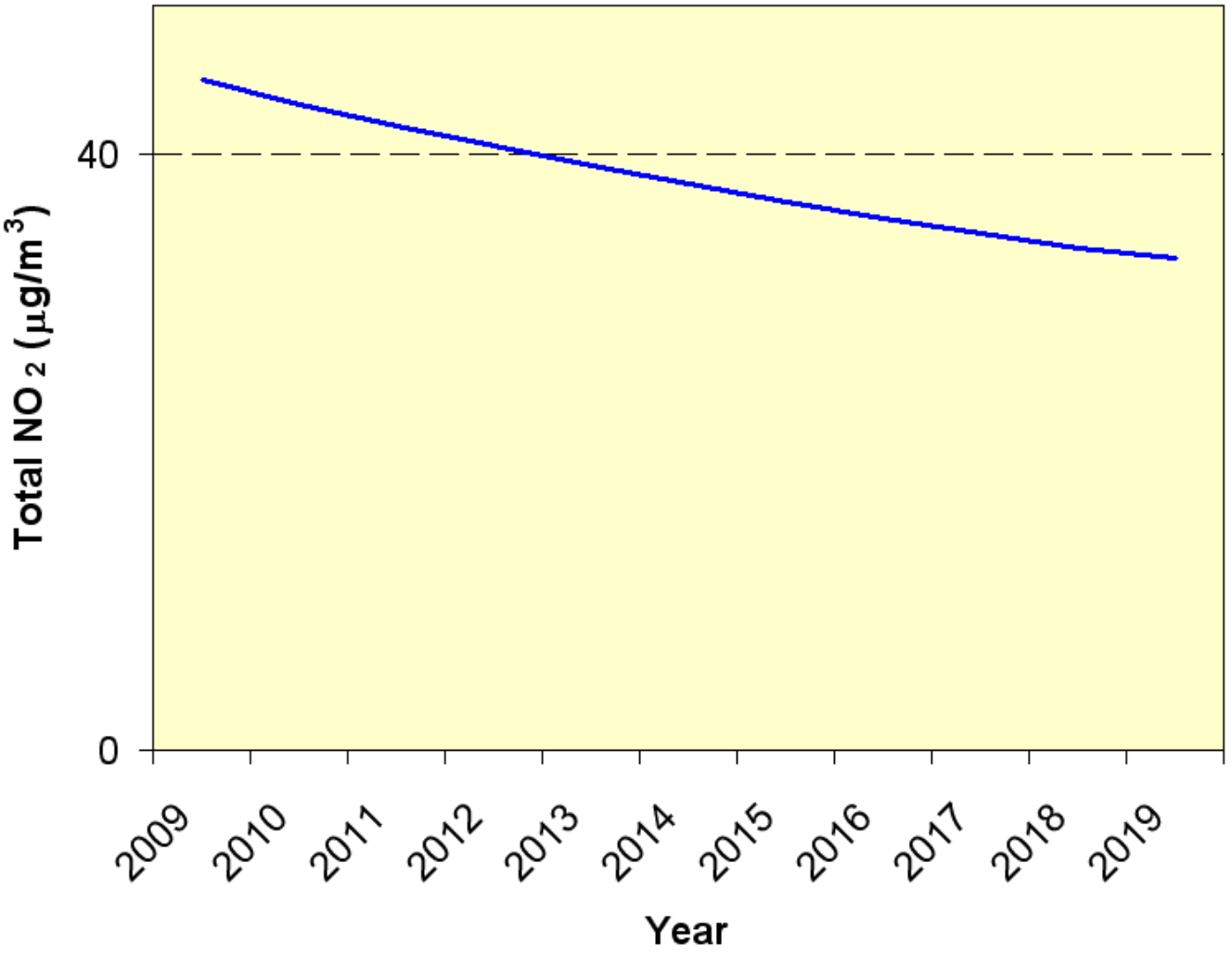
Road Traffic Reduction



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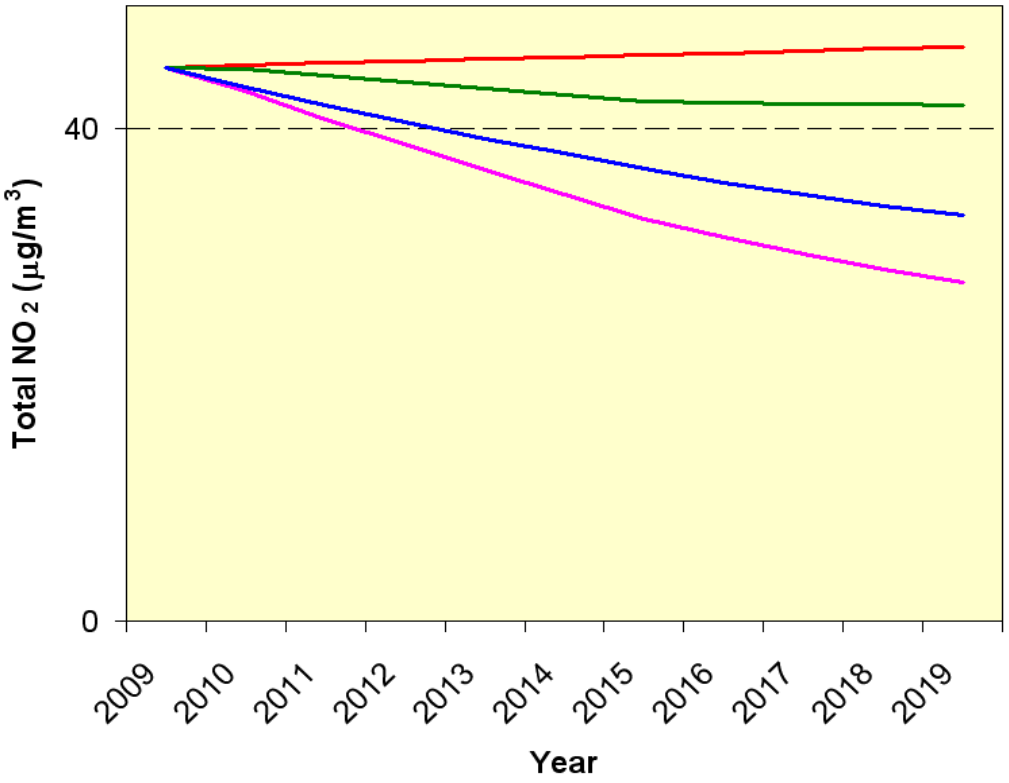
Options



- Current understanding would suggest the actual future year concentration lies between the red and purple lines
- Case to support a general reduction in the background, so maybe somewhere between the green and purple lines is more realistic

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Options

- For Review and Assessment it is possible to recommend that a precautionary approach be favoured for projections over the next few (4-5) years, with decisions based on a worst-case option
- For air quality assessment work, such an approach is more difficult:
  - How do you make a planning decision with two options?
  - Air quality assessments can be carried out over a wide range of years (anything from 2012 to 2020+). If we assume a “flat line” approach, how long do we assume it for, and what happens after?