

Submission to Air Quality

The submission will deal with the subject using Knebworth as the example and basing statements on the ED70 document supplied by the council.

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Review of Air Quality¹

Very few areas of the UK are safe from air pollution. Pollution levels exceed Government health standards all over the country on many days every year, even in rural areas. The impact of this pollution is huge: even the Government now accepts that between 12,000 and 24,000 people die prematurely every year as a result of air pollution.

Road transport is a major source of air pollution in the UK (75-85%) with other sources (other forms of transport, energy production, industry and domestic sources) to emissions of five key pollutants: particulates (fine dust and soot particles - PM), carbon monoxide (CO), nitrogen oxides (NOx), benzene and hydrocarbons (HCs) making up the rest ¹.

Review of Document. ED70

The use of averages within the document needs clarification.

¹ https://friendsoftheearth.uk/sites/default/files/downloads/road_air_pollution_health.pdf

Recent research has proven that the distribution of levels of pollutants follows a power law distribution rather than a normal distribution and the use of averages significantly underestimates the level of potential pollution.²

The document does not take the implications of the study into practice.

The use of averages is also very dependent on the time scale that the average is taken.

An example is Carbon Monoxide within domestic premises. The same principles apply to the known pollutants.

Carbon monoxide levels that will set off your alarm³

Carbon Monoxide Level	Alarm Response Time
40 PPM	10 hours
50 PPM	8 hours
70 PPM	1 to 4 hours
150 PPM	10 to 50 minutes
400 PPM	4 to 15 minutes

² [Environmental Modeling & Assessment](#) January 2016 Volume 21, Power Laws and Air Pollution Nicholas Z. Muller

³ Kidde Carbon Monoxide Levels that Sound the Alarm

Carbon monoxide levels and their symptoms

IMPORTANT: If your carbon monoxide alarm sounds, or you suspect you are experiencing symptoms of carbon monoxide poisoning, you should immediately leave your home and call 9-1-1.

For carbon monoxide levels and their symptoms, refer to the following:

50 PPM	None for healthy adults. According to the Occupational Safety & Health Administration (OSHA), this is the maximum allowable concentration for continuous exposure for healthy adults in any eight-hour period.
200 PPM	Slight headache, fatigue, dizziness, and nausea after two to three hours.
400 PPM	Frontal headaches with one to two hours. Life threatening after three hours.
800 PPM	Dizziness, nausea, and convulsions within 45 minutes. Unconsciousness within two hours. Death within two to three hours.
1,600 PPM	Headache, dizziness and nausea within 20 minutes. Death within one hour.

In order to protect the householder, the timescale for reporting of carbon monoxide is clearly four minutes which is the safest safety limit. Inclusion of times where the level is less than 200PPM must to be excluded as clearly the average would be zero over the previous 24 hours if these periods are included.

The results would show banding of a range of pollutant levels and the number of occurrences at that level.

A better measure is to use the maximum observed or more accurately average plus 3 sigma.⁴

This is the value used everywhere and is the best a measure in Mediocristan⁵. Unfortunately, pollution lies in Extremistan⁶, and therefore a more accurate measure is to use the power law estimate method as discussed above.

[Place of Measurement](#)

The base level needs to be where pollution is worst:

- Taken 5-6ft from ground level in areas where the public has access(e.g.shopping streets)

⁴ Any school statistics book

⁵ Antifragile. Taleb

⁶ Antifragile Taleb

- Taken when traffic is heaviest (e.g. school run)
- Taken in foggy weather
- Taken in dips in the geographical layout
- Taken next to major roads
- Taken where heavy goods vehicle numbers increase or change route.
- Taken near the edge of the pavement. NHS Choices has stated that there may be a link between Alzheimer's disease and traffic. They recommend that "Avoiding pollution is sensible for health reasons if you can manage it – for example, **by walking away from the edge of a busy road or cycling through back streets** – but it's not always possible."⁷

Best Practice

Defra has provided documents that suggest the approach to "Air Quality"⁸ but I will base much on Mid Devon Council as it is a rural area similar to North Hertfordshire.⁹

Principles and Approaches

PPS 23: Planning and Pollution Control sets out ten principles and approaches.

The following are particularly relevant to the consideration of planning and pollution control:

1. putting people at the centre;
2. taking a long-term perspective;
3. taking account of costs and benefits;
4. respecting environmental limits;
5. applying the precautionary principle;
6. using scientific knowledge;
7. following procedures which are based on transparency,
8. access to information, effective participation by stakeholders and access to justice; and
9. **making the polluter pay.**

2.0. AIR QUALITY ASSESSMENTS

THE NEED FOR AN ASSESSMENT

2.1 An air quality assessment will be required where a significant change in air quality is expected. This change comprises both construction and operational

⁷ NHS choices Pollution particles in the brain 'linked to Alzheimer's disease' 7th Sep 2016

⁸ Defra Low Emission Strategies Good Practice Guide Jan 2010

⁹ Mid Devon Council Supplementary Planning Document on Air Quality and Development adopted May 2008

impacts in addition to new exposure. The criteria for determining if an assessment is required can be based upon the scale of the development or changes in traffic flows predicted. In Mid Devon where many developments are of a smaller scale the clearest approach is to use scale of development as the criteria. This obviates the need to predict traffic flows before it can be determined if an assessment is required.

2.2 Air Quality Assessments will be required for developments if either of the criteria are met in the following policy:

[Policy AQ1](#)

An Air Quality Assessment may be required if any of the following criteria are met:

Development type	Site	Area	Gross Floor Area or Units
Retail	Food	0.2 Ha	1000m ²
Retail	Non food	0.8 Ha	1000m ²
Office (B1)	0.8 Ha 2500m ²	0.8 Ha ²	2500m ²
Industry (B2/B8)	2.0 Ha 6000m ²	2.0 Ha	6000m ²
Residential			75 Units
Other			60 + additional vehicle movements in any hour

- 1 An assessment may be required if either the site area or gross floor area is exceeded.
2. Any industrial or commercial activity requiring regulation under Pollution Prevention and Control Regulations (PPC) (unless a draft PPC Permit is already in place following a PPC application prior of planning application).
3. Proposals for new developments with 100 parking spaces or more or an increase in existing parking provision of 100 spaces or more.
4. Proposals which significantly alter the composition of traffic such that adverse air quality impacts may arise.
5. Proposals which may result in increased congestion and lower vehicle speeds than is present on the existing network.
6. Proposals for any new developments in areas of air quality objective exceedances within current or potential air quality management areas, where people would be exposed for significant periods of the day.
7. Any other development proposal within or adjacent to an Air Quality Management Area (AQMA) and not listed above which may, in the professional opinion of the officer, be significant in terms of air quality impact and/or may impact on the working of measures detailed in an AQMA Air Quality Action Plan.

In principle, the intention of an air quality assessment is to demonstrate the likely changes in air quality or exposure to air pollutants, as a result of a proposed development. Some quantitative assessment will be required. The

basis of assessments will be to compare the existing situation with that following completion of the development and three basic steps are required:

- Assess the existing air quality (baseline)
 - Predict future air quality without the development (future baseline)
 - Predict future air quality with the development (with development)
- Supplementary Planning Document on Air Quality and Development
- The Council can usually assist with the first two parts and information may be available from one of the Council's own air quality Review and Assessment reports.

2.6 The air quality assessment report will normally be required to detail the following:

- Details of proposed development, including the following;
 - An overview of the development proposal;
 - Identification of on-site sources of pollutants;
 - An overview of expected traffic changes or changes in emissions from the site for a specified year; and
 - Identification of local receptors including residential properties, other sensitive properties, ecologically sensitive areas and any specific locations where people are likely to be exposed for the appropriate averaging time (dependant on the air quality objective being assessed against).
 - Evidence of a site visit and assessment of local issues (as discussed above);
 - Set out the relevant air quality standards and objectives (these would normally be UK Air Quality Objectives and/or EU Air Quality Limit Values);
 - An overview of the development proposal in the context of any local air quality issues (e.g. within an AQMA or area undergoing a Detailed Assessment), a review of the most recent Updating and Screening or Progress Reports or other Review and Assessment reports published by the Council is therefore essential;
 - A justification of which pollutants require an assessment;
 - Set out the assessment methodology, including the following local input data and assumptions;
 - Traffic data used in the assessment;
 - Emission data (point source and road traffic);
 - Meteorological data;
 - Baseline pollutant concentrations;
 - Choice of baseline year and whether it is a low, typical or high pollution year (including an examination of any available long-term local air quality monitoring data for trend)
 - NO_x:NO₂ relationship used; and

- Other relevant input parameters used.
- Set out the results and provide a summary, including the following as a minimum;
- Details of the model verification including a comparison of predicted versus measured concentrations used to derive adjustment factors to account of systematic errors;
- Impacts of the construction phase of the development at local receptor locations;
- Impacts that changes in emissions will have on ambient air quality at local receptor locations;
- Any exceedences of the air quality objectives brought about by the development, or any worsening of a current breach (including their geographical extent); and
- Whether any measures or actions specified in an Air Quality Action Plan will be directly compromised or rendered inoperative by the development proposal.

In the some cases the following additional information may be required;

- Source apportionment (the contribution of specific sources and vehicle classes to the overall contribution)
- Longer-term air quality predictions (e.g. an assessment for 2010 air quality objectives and against EU Limit Values)
- A wider/more detailed assessment scope which takes into account other permitted major development proposal(s) in the same area
- Consideration of potential impact upon neighbouring local authorities
- Set out the significance of the results
- Consider the options for, and effectiveness of, pollution reducing, mitigation or compensating measures.

Agreement of data and assessment methodology

2.7 Prior to undertaking an air quality assessment, it is important that whomever undertakes the assessment obtains an agreement over the scope and methodology. This will include an agreement on appropriate datasets such as local air quality data, meteorological data to be used, background concentrations, traffic flows/trip generation data, model type and verification procedures etc.

Influencing Factors

Ideas of what needs to be assessed in the future state as the plan covers 20 years+:

1. Temporary closure of the A1 making the B197 a major source of traffic
2. Increase in traffic due to driverless cars
3. Decrease in NO₂ due to move from Diesel
4. Increase in CO/CO₂ due to increase in Petrol

5. Increase in traffic and traffic movements
6. Superbugs requiring separation of areas of population
7. Effect on Green Space recognised as a major factor in reducing pollution
8. Effect of prospective biosecurity risk¹⁰ The paper shows that disease like swine flu across areas adjacent to roads.

Alternative Strategies

There is an alternative that would greatly improve the level of air quality which would also require an assessment no matter what the assessment shows.

Building a bypass of the village to the east would significantly reduce the pollution levels throughout the village and reduce the pollution suffered by the new occupants.

The option will provide further travel benefits by encouraging use of other forms of easily provided transport as there is a trainline running from Letchworth to London nearby.

Conclusions

Clearly the development proposed in the current plan would require an assessment to be performed as would the alternative strategy proposed for Knebworth.

The ED70 report recognises that the traffic plan would need input from other public authorities to ensure that there is integration in the data presented.

Failure to use best practice may have severe implications on the Council and the rate payers. Perhaps consideration of placing funds in Escrow if the assessment does not take place.

¹⁰ Helijon The simulated air flow pattern around a moving transport vehicle as the basis for a prospective biosecurity risk assessment Jens Seedorf et al