

Sustainable Development Study:

Air Quality

September 2012

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1.0

Introduction

- 1.1 The Council's Air Quality Supplementary Planning Document (SPD) requires an air quality assessment to be submitted with a development proposal where a significant change in air quality is expected. The need for an assessment may depend on the scale of the development and the changes in traffic flows predicted. The assessment must consider the baseline air quality, the predicted future air quality without the development, and the predicted air quality with the development. If the development would bring about a significant reduction in air quality, the assessment must consider the options for, and effectiveness of, pollution reducing, mitigation or compensating factors.
- 1.2 Since the SPD was adopted in 2008, research on air quality issues has developed. The use of previous air quality guidance and the nationwide implementation of air quality policies have shown an emerging pattern of cumulative impacts on air quality being ignored. Assessments are currently required to identify onsite sources of pollutants; the changes expected as a result of developing the site; and identify local receptors such as residential properties likely to be affected. A proposal judged as having no significant impact on air quality in the immediate vicinity is unlikely to incorporate measures to lower emissions. Cumulatively, these 'insignificant' emissions result in higher residual road transport emissions. The current guidance from the Low Emission Strategies (LES) Partnership advocates a 'mass emissions' approach, assessing the impact to residual road transport emissions in the local area.
- 1.3 The LES Partnership has developed a low emission toolkit which allows the user to input baseline data, then predicts the residual emission change. Measures can then be selected which mitigate the impact, such as electrical vehicle charging points. Many measures are inexpensive to incorporate, but deliver a significant reduction in greenhouse gas (GHG) emissions. The benefit of this approach is that all applicable developments are expected actively to reduce their GHG emissions.

2.0

Background and policy context

- 2.1 The National Planning Policy Framework has replaced previous national policy and guidance on delivering sustainable development and responding to climate change. It puts emphasis on the cumulative impacts of development on local air quality, rather than case-by-case significance.

National Planning Policy Framework – paragraph 124

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.

- 2.2 Air quality in parts of Mid Devon is a cause for concern, as poor air quality is recognised as being damaging to health and quality of life. There are two designated Air Quality Management Areas (AQMAs), at Crediton and Cullompton. The Local Plan (Core Strategy and Allocations & Infrastructure Development Plan Document) commits the Council to supporting improvements in local air quality levels, including a requirement for low emission strategies for large-scale development allocations.
- 2.3 The National Air Quality Strategy sets out targets for eight pollutants. Local authorities are required to meet seven of these targets.

The pollutants are:

- Benzene
- 1,3-butadiene
- Carbon monoxide
- Lead
- Nitrogen dioxide (NO₂)
- Particles (PM₁₀)
- Sulphur dioxide

- 2.4 Nitrogen dioxide and particulates cause the most concern in Mid Devon, resulting in the designation of the two AQMAs in 2004 and 2006. Crediton and Cullompton each have an Air Quality Action Plan with short, medium and long term actions for improving air quality.

2.5 The Air Quality SPD enables the Planning Authority to collect developer contributions to pay for the implementation of the Action Plans. Cost per development is assessed according to site area or floorspace. The SPD's policies are summarised as follows:

- AQ1: Requirement for an air quality assessment, determined by site area/gross floor area and other criteria.
- AQ2: Determination of a proposed development will depend on the significance of the air quality impact.
- AQ3: New development in or adjoining Crediton and defined settlements which will worsen air quality must contribute to the implementation of the Air Quality Action Plans (specific contributions set out).
- AQ4: New development in or adjoining Cullompton and defined settlements which would worsen air quality must contribute to the implementation of the Air Quality Action Plan.
- AQ5: Any future areas designed as AQMAs will incur the same obligations as settlements under Policies AQ3 and AQ4.

2.6 The Council intends to adopt the Community Infrastructure Levy (CIL) by the end of 2012. While Section 106 Agreements will still be used to ensure provision of onsite infrastructure, affordable housing and regulate other matters as necessary, CIL will replace Section 106 Agreements as the funding mechanism for general improvements in local air quality. When CIL is adopted, the Air Quality SPD will become obsolete and will be revoked.

Crediton

2.7 Crediton is designated as an AQMA due to the levels of Nitrogen Dioxide at the High Street and both Nitrogen Dioxide (NO₂) and particulate matter (PM₁₀) at Exeter Road. The low air quality in these areas is primarily caused by queuing traffic, exacerbated by the street canyon nature of the roads. The Action Plan includes measures to reduce queuing and delays in the High Street, resurface Exeter Road and extend the availability of public transport.

2.8 Planning permission has been granted and works programmed for a new road to link the Lords Meadow Industrial Estate with the A377, bypassing Exeter Road. While this will not solve all traffic problems in Crediton, it should significantly improve air quality on Exeter Road. The link road is expected to reduce traffic on Exeter Road by 23% (all traffic) and 33% for HGVs.

2.9 The amount of development land allocated in Crediton is small compared to Tiverton and Cullompton, reducing the risk of increased emissions directly associated with new development.

Cullompton

2.10 Cullompton is designated as an AQMA due to the levels of Nitrogen Dioxide in Station Road, Higher Street and Fore Street. The town has a long-standing problem with traffic congestion. Recent development has funded some planned improvements to Junction 28 of the M5. Development is intended to pay for the Eastern Relief Road, which will provide a route for traffic travelling between Station Road to the north of the town and Meadow Lane to the south, as an alternative to going through the town centre. The allocated Northwest Urban Extension will also provide a road through the site, linking Tiverton Road to Willand Road. Again, this allows access to the motorway and nearby villages without going through the centre of Cullompton.

2.11 There is an opportunity for road traffic to be further reduced by the re-opening of the Cullompton railway station. Network Rail controls the land in question, and AIDPD Policy AL/CU/19 protects the adjoining car park from alternative uses. Devon County Council is pursuing this scheme, in partnership with Network Rail and the train operating companies. The Devon Local Transport Plan (2011-2026) estimates the reopening of Cullompton railway station to have a long-term cost of £4 – £5.9 million.

3.0

How to predict an air quality impact

3.1 There are several methodologies available for assessing GHG emissions and the impact on local air quality. As explained in the introduction, the current Mid Devon approach follows the established guidance, requiring air quality improvement measures only where an impact is judged to be significant. The Air Quality SPD accepts that there is no set method for conducting an assessment due to continuous improvements in methodology. Instead the SPD requires the methodology to be agreed with a planning officer in advance, to allow an assessment that is proportionate to the development. Three possibilities are listed:

- Screening methods – quick to apply, generic, simple approach, suitable for flat free-flowing/open roads (non-congested, non-street canyons without inclines); only to be used in areas where air quality is not approaching or exceeding air quality objectives
- Local scale dispersion models – detailed, specialist method, with broad range of local input variables; most suitable for assessment of local development proposals, unless assessment area is very large
- Regional scale dispersion models – similar to local scale but designed to model sources over a very wide area; rarely used for local proposals and only used where area is very large

3.2 The LES Partnership guidance on producing low emission strategies now proposes ‘LEAM’ – the Low Emissions Assessment Method. This includes the following steps:

Assessment steps	Assessment activity	Notes
Step 1	Establish the appropriate assessment based on development criteria and the relevant pollutants and years of concern [define]	Pre-application discussion to agree the scope of the assessment.
Step 2	Evaluate the residual road transport emissions baseline after trip rates have been reduced as far as reasonably practicable.	Determine ‘business as usual’ for both current and specified future years of interest.
Step 3	Evaluate the impact on the residual emissions by applying low emission strategy mitigation scenarios to the proposed development scheme plans, both on and off-site, for specified years of interest. [check meaning]	Use low emission toolkit or other agreed techniques.
Step 4	Quantify the remaining, residual road transport emissions arising from the scheme, following the application of agreed	Use low emission toolkit or other agreed techniques.

	mitigation measures, either on or off-site.	
Step 4a	Option: continue to apply mitigation measures, both on and off-site, until a specified emission reduction target has been achieved.	Method may be used as part of a Low Emission Scheme Classification System.
Step 5	Establish the damage costs resulting from the remaining residual emissions.	Based on pollutant emission per annum.
Step 6a	Option a: waive payment of damage cost compensation due to weighting of mitigation measures applied, according to local formula.	Non-tariff system – refer to offsetting formula
Step 6b	Option b: require payment of a ratio of the damage costs, according to local formula.	Offset-tariff system (developer contribution).
Step 7	Final emissions data balance should be recorded in a database.	A Low Emissions Strategy Database should be kept by the planning authority and made publically available.

3.3 The LES Partnership recommends that the LEAM be used to assess residual emissions from development over a certain threshold, depending on the use class of the development. The LES Partnership does not recommend an assessment for development it defines as ‘minor’. It recommends that the Low Emission Assessment (LEA) be integrated with an Environmental Impact Assessment for major development schemes. Medium, large and major development schemes may also include air quality exposure modelling that is integrated with the LEA, depending on local air quality policies and action plans. The thresholds as defined by the LES Partnership are shown below:

Classification	Medium	Large	Major
A1 Food Retail	200-500m ²	500-800m ²	>800m ²
A1 Non-food	200-800m ²	800-1500m ²	>1500m ²
A2 Finance/professional	201m ² -1000m ²	1001m ² -2500m ²	>2501m ²
A3 Restaurant/café	-	200/250m ² - 2500m ²	>2500m ²
A4 Drinking establishment	-	200/250m ² -600m ²	>600m ²
A5 Takeaway	-	200/250m ² -500m ²	>500m ²

B1 Business	201m2-1000m2	1001m2-2500m2	>2501m2
B2 General industry	500-1000m2	1000-2500m2	>2500m2
B8 Storage and distribution	200-2000m2	2000-5000m2	>5000m2
C1 Hotels	10-30 rooms	30-70 rooms	>70 rooms
C2 Residential institutions	-	All other institutions	Hospitals
C3 Dwellinghouses	10-30 dwellings	30-50 dwellings	>50 dwellings
Other uses with parking*	50-100 parking spaces	100-200 parking spaces	>200 parking spaces

* This category supplements the categories recommended by the LES Partnership, to ensure D1, D2 and sui generis developments are included if they generate significant movement.

- 3.4 Using the LEAM and the LES toolkit, all developments within the above thresholds should submit an LEA that includes all the necessary information to assess the change in residual emissions and demonstrate sufficient measures to reduce, mitigate or compensate for emissions.

4.0

Conclusion

4.1 The LEAM is not entirely consistent with the Council’s emerging plans. For instance, a tariff-based SPD or offsetting arrangement through Section 106 Agreements will not be deliverable once CIL is adopted. Onsite measures may be controlled through Section 106 Agreements but any contributions towards offsite improvements identified in the Air Quality Action Plans must be subsumed with within the developer’s standard payment of CIL. Guidance for developers submitting an LEA should be adapted to achieve both ‘mass emission’ assessments and site-specific air quality exposure modelling in a CIL environment.

4.2 Example LEA Procedure:

Steps	Information required	Notes
Step 1	<ul style="list-style-type: none">• Overview of development proposal.• Summary of pre-application discussions.• Identify boundaries of the assessment according to the proximity to an Air Quality Management Area, expected routes of travel, properties most affected and years of interest.• Set out the assessment methodology used to comply with criterion a) of Policy DM/6, including sources of data and assumptions used.	Years of interest will be influenced by the anticipated operational commencement and lifespan of the development; the timescale to achieve specified national targets for emissions; and the availability of robust emissions data projected forward to 2020 or beyond.
Step 2	<ul style="list-style-type: none">• Using the Low Emission Toolkit (or equivalent), calculate the baseline residual road transport emissions from the development, for the first operational year and specified future years after development trips have been reduced as far as possible. The calculation should be based on ‘business as usual’ scenarios, not including any low emission mitigation measures.• Summarise: all impacts (during and post-construction) on identified properties or other local receptor locations; any exceedences of the air quality objectives resulting from the development; any effect on the delivery of the relevant Air Quality Action Plan; the significance of the results; and the options for measures to reduce, mitigate or compensate an air quality impact.	Display data as annual emissions.
Step 3	<ul style="list-style-type: none">• Using the Low Emission Toolkit (or equivalent),	

Steps	Information required	Notes
	<p>evaluate the impact on residual road transport emissions of applying low emission mitigation measures, both on and offsite, against 'business as usual' baseline levels, for the specified years of interest.</p> <ul style="list-style-type: none"> • Evaluate any trade-offs that occur as a result of mitigation measures, for instance where one pollutant would decrease but another increase. • Summarise the effect that mitigation measures will have on: identified properties or other local receptor locations; any exceedences of the air quality objectives resulting from the development; and any effect on the delivery of the relevant Air Quality Action Plan. 	
Step 4	<ul style="list-style-type: none"> • Calculate the remaining residual road transport emissions after mitigation measures have been incorporated. 	<p>The Local Planning Authority may wish to negotiate further/alternative mitigation measures, requiring a revised LEA to be submitted.</p>
Step 5	<ul style="list-style-type: none"> • Translate the calculated remaining residual road transport emissions into damage costs for the pollutants of concern. (Information on calculating damage costs is available from DEFRA: http://www.defra.gov.uk/environment/quality/air/air-quality/economic/damage/) 	<p>If damage costs are significant, the Local Planning Authority will consider whether a Section 106 Agreement is required to make the development acceptable in planning terms, to deliver a cost-equivalent air quality improvement identified in the relevant Air Quality Action Plan. In this case the identified project would be excluded from the Council's list of infrastructure funded by the Community Infrastructure Levy (CIL). CIL would remain payable for all other generic offsite infrastructure.</p>

4.3 An LEA submitted in accordance with the steps above should be subject to negotiation while a planning application is being considered. The applicant’s LEA is a starting point for negotiation and may need reviewing if the Council considers that alternative measures should be included.

4.4 The Low Emission Toolkit allows both developers and the Council to assess the impacts of different measures aimed at lowering emissions. The following table is adapted from the LES Partnership guidance and shows how mitigation measures might apply to different development types.

Mitigation measures		Residential	Commercial	Industrial	Notes
Construction phase	On-road vehicle specification	✓	✓	✓	Vehicles: electric/hybrid/bi-fuel/dual-fuel/CNG/LPG/fuel cell/LNG/H2 ICE
	Recharge/refuel infrastructure	✓	✓	✓	
Operational phase	Differential parking levy	✓	✓		Charge levied on off-street parking
	Priority parking	✓	✓		Off-street parking provision
	Emission specified parking	✓	✓	✓	Off-street parking provision
	EV dedicated parking	✓	✓	✓	Off-street parking provision
	Alternative fuel infrastructure	✓	✓	✓	Onsite infrastructure such as electrical charging points, bio-fuelling facilities, LPG.
	Fleet emission specification		✓	✓	Vehicles: electric/hybrid/bi-fuel/dual-fuel/CNG/LPG/fuel cell/LNG/H2 ICE
	Fleet emission strategy		✓	✓	Vehicles: electric/hybrid/bi-fuel/dual-fuel/CNG/LPG/fuel cell/LNG/H2 ICE
	Procurement strategy		✓	✓	See table – Low Emission Technologies: Availability. Required by contract/covenant.
	Bicycle/e-bike rental or purchase scheme	✓	✓	✓	Onsite provision. Consider as part of Section 106 Agreement for role of management company / support fund for

Mitigation measures		Residential	Commercial	Industrial	Notes
					occupiers.
	Car club	✓	✓	✓	Onsite scheme. Consider as part of Section 106 Agreement for role of management company / support fund for occupiers.

4.5 The mitigation measures shown above only include measures that might be put in place by the developer. Other options, such as information for Mid Devon residents on making sustainable transport choices, would be the Council's responsibility in partnership with others. Once CIL is adopted, the Council will no longer be able to negotiate funding via Section 106 Agreements for community-based measures, such as low emission public transport provision. All developer-led mitigation measures should be proposed within the site. For offsite reductions in GHG emissions, it will be the Council's responsibility to provide air quality improvements as identified in the Air Quality Management Action Plans, from CIL or other funds. As explained in Step 5 of the LEA procedure, an exception may be made if a development is likely to cause significant degradation of air quality.

4.6 The following table is adapted from the LES Partnership guidance and outlines the current availability of low emission technologies and their applicability to different scenarios.

Low emission technologies		Mass market	Fleet demonstration	Prototype	Applicability / Notes
Low emission vehicles	Bicycle	✓			Provision of dedicated routes
	Electric bicycle	✓	✓		Recharge/refuel infrastructure
	Fuel cell bicycle			✓	Rental schemes, supported purchase
	Electric scooter	✓			Supported purchase
	Fuel cell motorcycle			✓	Supported purchase
	Electric car (EV)	✓	✓	✓	Car clubs, supported purchase, priority or differential parking
	Range extended EV			✓	Recharge/refuel infrastructure, priority or differential parking
	Hybrid electric car (HEV)	✓			Priority or differential parking

Low emission technologies		Mass market	Fleet demonstration	Prototype	Applicability / Notes
	Plug-in HEV (PHEV)		✓	✓	Priority or differential parking
	Flex-fuel car (liquid bio-fuel)	✓	✓	✓	Rental schemes, supported purchase
	Bi-fuel car (CNG/petrol)	✓	✓	✓	Supported retro-fit
	CNG car	✓	✓	✓	Supported purchase
	LPG car	✓			Supported purchase/retro-fit
	H2 ICE car		✓	✓	?
Low emission fuels	EV recharging	✓	✓	✓	
	Compressed bio/natural gas (CBG/CNG)		✓		Established worldwide network, except UK
	Liquified bio/natural gas (LBG/LNG)	✓	✓	✓	Limited to HGV network in UK
	Liquid petroleum gas (LPG)	✓			
	Ethanol		✓		Limited regional availability
	30% bio-diesel		✓		Limited regional availability
	100% bio-diesel		✓		Limited regional availability
Low emission abatement technology	Catalytic converter	✓			
	Diesel particulate filter (DPF)	✓			Consider for construction phase vehicles
	Exhaust gas recirculation		✓		

4.7 The LES Partnership has recommended levels of provision for electric vehicles within new developments. This refers to the necessary infrastructure for single, 3-phase or accelerated electricity supply. The necessary infrastructure will depend on the prevailing vehicle technology

requirements, but capacity should also be built into new development to allow for upgrading and advances in technology. Cabling to 40/50% of parking space provision is recommended, to allow for future requirements. Known as ‘future proofing’, this sort of provision allows for long-term climate change mitigation and is not only a matter of local air quality.

4.8 The LES Partnership guidance recommends the following provision of EV recharging infrastructure for new development. These targets might be included in a Local Plan policy on parking standards and low emission requirements.

Development type		Basic	Standard	Advanced
Residential	House with off-road parking	Single phase 1 point per unit	Single phase 1 point per unit	Single phase 1 point per unit
	House with on-road parking	Single phase 1 point per 10 units	Single phase 1 point per 10 units	Single phase 3+ points per 10 units
	Flats/ apartments	Single phase 1 point per 10 parking spaces (or per 10 units)	Single phase 2 points per 10 parking spaces (or per 10 units)	Single phase 3+ points per 10 parking spaces (or per 10 units)
Commercial	Leisure / retail	Single/3 phase 1 point per 200m ²	Single/3 phase/ accelerated 2 points per 200m ²	Single/3 phase/ accelerated 3+ points per 200m ²
	Business, general industry,* higher education and hospitals	Single/3 phase 1 point per 200m ²	Single/3 phase/ accelerated 2 point per 200m ²	Single/3 phase/ accelerated 3+ points per 200m ²
	Hotels & residential institutions	Single/3 phase 1 point per 30 rooms or per 10 parking spaces	Single/3 phase/ accelerated 2 points per 30 rooms or per 10 parking spaces	Single/3 phase/ accelerated 3+ points per 30 rooms or per 10 parking spaces
Industrial	Distribution & storage	Single/3 phase/ accelerated	Single/3 phase/ accelerated	Single/3 phase/ accelerated

Development type		Basic	Standard	Advanced
		1 point per 10 parking spaces (employees/visitors) Commercial vehicle recharging provision as required.	2 points per 10 parking spaces (employees/visitors) Commercial vehicle recharging provision as required.	3 points per 10 parking spaces (employees/visitors) Commercial vehicle recharging provision as required.

* Category supplements LES Partnership guidance, which does not include the B2 use class. The likely level of EV infrastructure required within B2 development is considered broadly equivalent to other commercial uses rather than B8 (storage and distribution) which has a more significant transport implication.

- 4.9 This document provides background information about air quality considerations and the potential direction of local plan policy. Policy formulation on transport and air quality, pollution and parking has been critically assessed by the Council’s consultants, Green Sphere.

Glossary

AQMA: Air Quality Management Area

LEAM: Low Emission Assessment Methodology

LES: Low Emission Strategies

LESP: Low Emission Strategies Partnership

References

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