Baldock Air Quality Paper

1 Introduction

1.1 This short paper provides further information relating to air quality in Baldock, particularly in relation to the proposed developments around the town in the emerging Local Plan for North Hertfordshire.

1.2 This paper sets out an explanation of the information currently held by the Council, the key findings of relevant transport evidence – as a main contributor towards current and potential future air quality issues, and how it is anticipated that the policy framework in the plan will be applied in relation to air quality issues.

1.3 It is considered that, in combination, this provides an appropriate level of information and future safeguarding to ensure that air quality issues in the town are appropriately addressed.

2 Background

2.1 A new Local Plan for North Hertfordshire is being prepared. This will cover the period to 2031 and contains land allocations for development along with detailed policies that will be used to determine planning applications.

2.2 The plan contains a number of land allocations in and around Baldock. This includes the single largest allocation in the plan on land to the north of the town (Policy SP14: Site BA1 – North of Baldock). This site will see a new neighbourhood of approximately 2,800 homes, of which 2,500 are anticipated to be built within the plan period.

2.3 Two sites of approximately 200 homes apiece are proposed to the south of the town (sites BA2 – Land west of Clothall Road and BA3 – Land south of Clothall Common). There are five further housing allocations in the plan.

2.4 Taken in total, along with completions and permissions since the start of the plan period, 3,290 additional homes are identified.

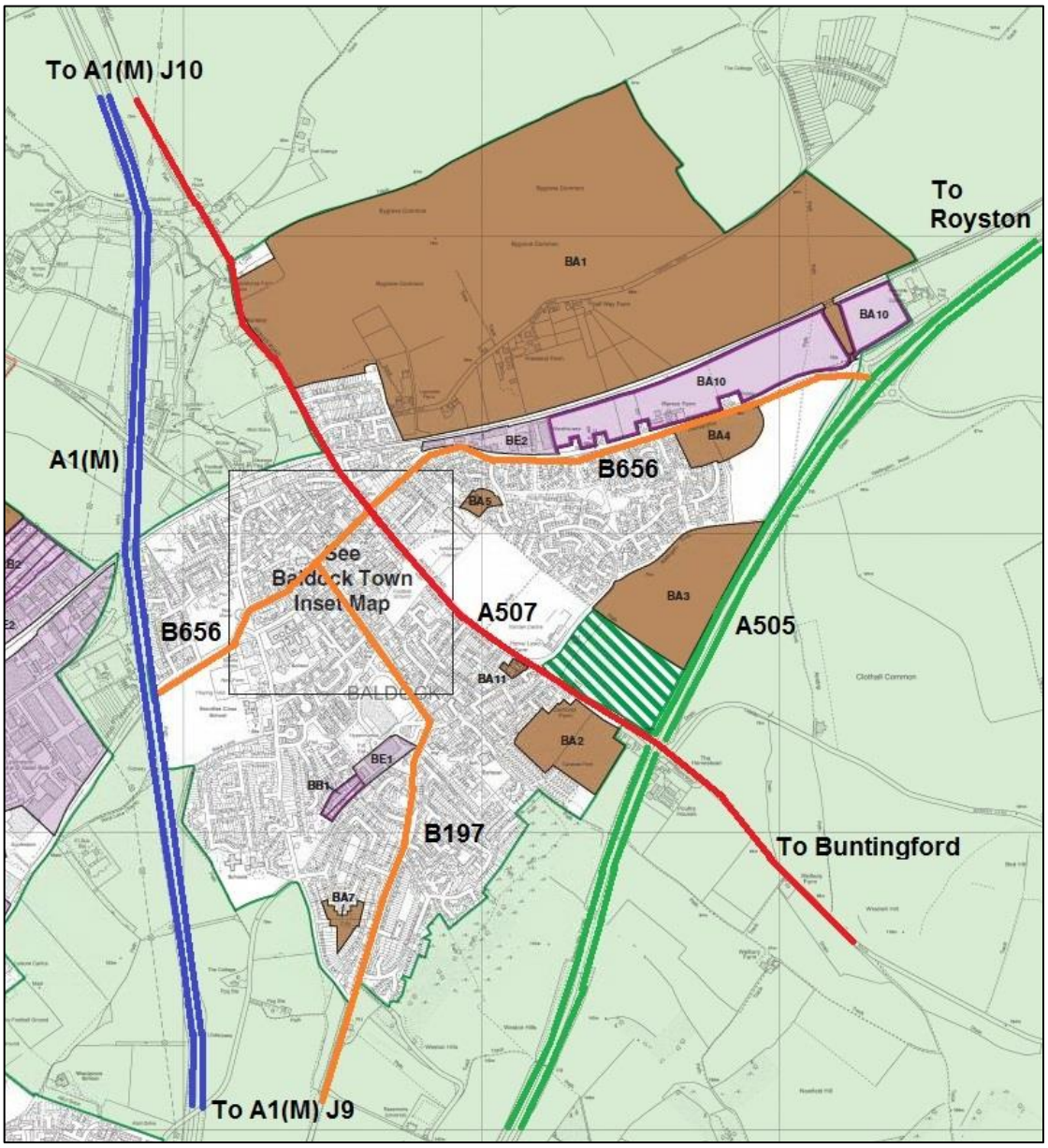
2.5 In addition to new housing, a substantial new employment allocation (BA10) covering almost 20 hectares is proposed along the B656 Royston Road between the existing town and the eastern end of the A505 bypass.

2.6 The A505 bypass opened in 2006. Prior to this the A505 routed through the town carrying significant levels of traffic.

2.7 The junction of the former A505 (now B656) and A507 is a known local ‘pinch point’. The junction itself is closely bounded by built development, including listed buildings, which limits the scope for major physical highway interventions.

2.8 A map detailing the main elements of the road network and proposed development allocations in Baldock is shown on the following page.

Map 1: Extract from Proposed Submission Local Plan Proposals Maps with main elements of Baldock road network overlain



2.9 The natural topography of Baldock and the surrounding area – whereby the town sites in a shallow 'bowl' with higher ground particularly to the north and south – has previously been highlighted as a factor influencing the natural dispersal of pollutants.

2.10 Concerns have been raised that the quantum of new development proposed for Baldock could raise air pollution levels within the town back to, or exceed, pre-bypass levels and / or in excess of air quality exceedance levels.

2.11 Local authorities in the UK have a responsibility under Local Air Quality Management (LAQM) legislation to review air quality. Where concentrations exceed national objectives an Air Quality Management Area (AQMA) is required and measures should be put in place to reduce emissions, and be reported in the local Air Quality Action Plan (AQAP).

2.12 The main source of air pollution in North Hertfordshire is from traffic. Objectives set out in the Air Quality Regulations 2010 identify a level of pollutants for which there would be no, or low risk to health. North Hertfordshire District Council monitors against these objectives and if exceeded, more detailed monitoring action would be required, which may highlight the need to take locally targeted action to improve the air quality. Air quality reports are published regularly on the Council website.

2.13 There are currently two Air Quality Management Areas within North Hertfordshire. These are both within Hitchin. There are no AQMAs within Baldock, although the Council monitors air quality at a number of sites across the district in order to satisfy its responsibilities to keep this issue under review.

3 Existing air quality data for Baldock

Nitrogen Dioxide (NO2)

Monitoring location	Code	2010	2011	2012	2013	2014	2015
Hitchin St (bus stop)	NH70	30.9	30	28.2	27.4	28.2	25.3
Clothall Road	NH59	32.2	31.7	31.1	30.6	29.1	26.4
Church Street	NH88	ID	47.7	44.4	38.4	42.4	39.0
Whitehorse St	NH72	42.1	38.2	36.9	31.8	32.7	30.4
Hitchin St (town hall)	NH61	43.6	36.1	36.3	35.1	33.5	29.2
Town Hall Hitchin St	NH5	32	32	39	ND	ND	ND

ID = insufficient data ND: no data – monitoring location discontinued

3.1 NO2 monitoring data for six locations in Baldock since 2010 is detailed in the table above.

3.2 The data provided was measured using diffusion tubes and the results are reported as measured at the location of the diffusion tube. In all but one location (NH88), the diffusion tubes were/are attached at lamp-posts or street signs located 1m or more from the kerb of the nearest road; this is in line with DEFRA guidance.

3.3 NH88 is located 0.5m from the kerbside and so is considered a worst-case location in that there is less opportunity for the gases emitted from vehicle exhausts to disperse.

3.4 None of the locations are positioned at the facades of residential properties. The results reported will therefore be higher than those which would be present at the façade of the nearest residential property, which is the appropriate receptor for the mean annual average, for which the Air Quality Objective for NO2 is 40mg/m3.

3.5 Notwithstanding the comments above on tube location, recorded concentrations are generally below this objective. It can therefore be reasonably anticipated that concentrations at the façade of the nearest lower residential property would generally be slightly lower.

3.6 It can be seen that there has been a general decline in NO2 concentrations at these locations over the period since 2010, indicating an improvement in air quality against this indicator.

Particulate matter[1]

3.7 Monitoring of particulate matter in North Hertfordshire is focused upon those areas where air quality has consistently been the poorest. This means that monitoring resources have primarily been directed to Hitchin.

3.8 There has been no monitoring of PM2.5 (fine particulate matter) in North Hertfordshire, nor in much of the rest of the County, prior to 2016. Therefore, there is no first hand monitoring data available for Baldock. However, DEFRA provide data on estimated air pollution levels at roadside locations and can be searched on a road by road basis[2].

3.9 The estimated PM2.5 concentration at the Clothall Road/Station Road junction is between 10 and 12.5ug/m3. For PM10, concentration is estimated to be between 17 and 20ug/m3. For context the NO2 concentration at that junction is estimated to be between 20 and 30ug/m3 and the annual average NO2 concentration measure by the diffusion tube in 2015 was 26.4ug/m3.

3.10 Since 2016, and as a result of joint working with Hertfordshire County Council's Public Health department, a PM2.5 analyser has been purchased by North Hertfordshire. The analyser is a real-time automatic analyser and so is a fixed location piece of equipment. This is deployed at the side of Stevenage Road, Hitchin where there is an Air Quality Management Area. The analyser is located alongside a PM10 analyser.

3.11 NHDC resources have been focussed at the location where nitrogen dioxide concentrations have been consistently above the national Air Quality Objective.

3.12 Particulate matter air pollution is a complicated issue, not least because a proportion of the particulate matter that is present at a given location does not originate from local sources. Nevertheless, Environmental Health personnel are aware of the likely local sources and of health effects, both established and potentially emerging, associated with PM2.5 air pollution.

3.13 North Hertfordshire District Council has not yet identified any measures targeted specifically at reducing PM2.5. Instead it is anticipated that measures to reduce emissions of NOx will be the primary means of reducing PM2.5 levels:

- Encouraging a move away from internal combustion engine vehicles to ultra low emission vehicles (ULEV) will reduce PM2.5 emissions from exhausts; while
- Measures to reduce road travel altogether will reduce PM2.5 emissions from brake and tyre wear and dust re-suspension.

[1] Particulate matter refers to solid or liquid particles suspended in the atmosphere. DEFRA identify that their potential for causing health problems is directly linked to the size of the particles. Research suggests that smaller particles, in particular PM less than 2.5 µm in diameter (PM2.5), is more closely associated with adverse health effects than other metrics such as coarser PM10 particles.

[2] https://uk-air.defra.gov.uk/data/gis-mapping

4 Assessment of likely future transport impacts

4.1 As set out above, the polluting impacts of road traffic are seen as the key influence upon air quality levels in the district. The likely future impacts of development upon the road network is therefore of particular importance in assessing potential future air quality issues.

4.2 In particular, potential incidences of increased junction delay or queuing traffic, whereby vehicles are idling in standing traffic or travelling at slow speed due to congestion, are more likely to have an impact.

4.3 The evidence base supporting the Local Plan includes transport modelling which assesses the likely impact of the proposed development sites in the plan on the road network in concert with anticipated background growth in traffic growth[3].

4.4 This identifies the Station Road / Royston Road / Clothall Road (B656 / A507) junction as a problem location under the 'Do Minimum' scenario. These are the baseline conditions that would arise on the highway network before 2031 before additional growth associated with the Local Plan or any mitigation measures are added.

4.5 Delays at this junction are a key influence on the operation of the town's wider highway network.

4.6 It is also worth noting that this scenario identifies delays at Junction 9 of the A1(M), known locally as Letchworth Gate. This is of relevance to Baldock as some traffic routes through Baldock to join the A505 at the eastern end of the bypass in preference to travelling via this junction.

4.7 A potential mitigation scheme is identified within the transport modelling to help alleviate impacts. This suggests the installation of 'MOVA' traffic signals at the junction with associated works[4]. The transport modelling identifies that MOVA performs particularly well, and appears to give above average benefits, at smaller heavily congested junctions, which this location is.

4.8 However, even with proposed mitigation the model testing suggests that junction delay would increase by 2031 once the growth associated with the Local Plan is factored in. This would suggest there could be a deterioration in air quality both here and, consequentially, at other locations within Baldock as a result of the delays and / or traffic re-directing to alternative routes.

4.9 Notwithstanding this, it should be noted from the air quality monitoring data above it appears likely that there would need to be relatively significant deterioration in quality before Air Quality Objective levels were exceeded at the façade of residential properties.

[3] *See* North Hertfordshire Local Plan Model Testing (2016) at https://www.north-herts.gov.uk/planning/planning-policy/emerging-local-plan/local-plan-supporting-evidence/transport-and

[4] Microprocessor Optimised Vehicle Actuation. These respond to actual traffic conditions at a junction by continuously assessing and updating the signal cycle / timings to optimise traffic movements.

4.10 This assessment is based upon traffic from the proposed Baldock developments 'loading' onto the existing road network.

4.11 The emerging proposals and policy requirements for the sites in Baldock envisage the creation of two link roads to service new development. To the south of the town, a link road will connect Wallington Road to the B656 Royston Road. To the north of the town a link road will connect the A507 London Road to the A505 Baldock bypass including a new bridge across the railway.

4.12 This provides the opportunity for different patterns of travel into, around and across the town. A further transport model run examining the potential impact of these link roads has been completed and forms part of the published evidence base[5].

4.13 This identifies that, with the addition of the link roads, the junction of the B656 / A507 sees reduced delays in 2031 by comparison to the modelling which does not include these roads. The addition of the two new links roads alleviates some of the traffic that was travelling via the junction and therefore freeing up some capacity, but the need for mitigation at the junction would still be required. The report shows that, with the introduction of the link roads, predicted delays in this location at 2031 with Local Plan growth more than halve from 126 to 60 seconds in the morning peak and from 122 to 52 seconds in the afternoon peak.

4.14 In order to obtain like-for-like comparison with the Local Plan Model Testing report, AECOM have also provided figures for the delay on the link on the approach arms of the junction (worst performing arm recorded). These results are summarised in the table below.

	AM Delay (Station Rd)			PM Delay (Royston Road)		
	2013	2031 no link	2031 with link	2013	2031 no link	2031 with link
HM3 Station Rd / Royston Rd / Clothall Rd	116	167	89	190	385	25

4.15 It can be seen that, with the provision of the link roads, the delays experienced are substantially reduced with the model predicting shorter delays than in the 2013 base year.

4.16 These results indicate a positive change in the predicted performance of the local highway network in Baldock. Taken in concert with the air quality monitoring data above (including the interrelationship between NO2 and particulate pollution), this gives comfort that relevant Air Quality Objectives should not be exceeded as a consequence of planned growth.

Limitations to transport modelling approach

4.17 Some care needs to be taken in the use and interpretation of the above information.

[5] *See* Baldock Link Road Testing (2016) at https://www.north-herts.gov.uk/ planning/planning-policy/emerging-local-plan/local-plan-supporting-evidence/transport-and

4.18 Transport modelling is a useful tool in preparing local plans as it identifies packages of highway mitigation measures that can help alleviate the transport impacts of proposed growth. However, the results also need to be viewed in context of any broader transport strategy.

4.19 Hertfordshire County Council (HCC), as highway authority, have recently consulted upon their 'Transport Vision 2050'. This envisages a shift in focus away from purely highway-focussed solutions to growth towards measures that will encourage the use of more sustainable transport modes such as walking, cycling and public transport. The consultation marked the early stages in the preparation of a new Local Transport Plan for the County.

4.20 Transport models, such as the one employed above, are not always calibrated to respond to such interventions or changes in policy focus and should therefore not be viewed as 'absolute' in terms of their predictions or preferred mitigation measures.

4.21 The District Council and HCC have agreed to jointly prepare a Transport Strategy for the North Hertfordshire which explores these issues further. This will include further consideration of how future transport measures can positively contribute to wider objectives, including air quality. It will identify a programme of works to support the implementation of the Local Plan and will be updated over the plan's lifetime. This strategy will be prepared in time to inform the hearing sessions of any future examination of the plan.

4.22 In this particular instance, care also needs to be taken to ensure that the provision of link roads does not lead to 'unintended consequences' in terms of transport provision. The Baldock link road analysis suggests that the provision of any such route could create a short-cut for traffic travelling from the A1(M) junction 10 to the A505 eastbound towards Royston and vice versa. This is perceived to be a major factor behind the significant improvement in performance on the Royston Road approach to the A507 / B656 junction in the link road modelling exercise.

4.23 The preferred route for longer distance and strategic traffic movements is to use the primary network of the A1(M) to Junction 9 and the A505 Baldock bypass. This is an additional issue which can be explored through the transport strategy and / or detailed design of the link roads and / or any junction mitigation measures at the A507 / B656 junction.

5 Policy requirements for air quality

5.1 The Proposed Submission Local Plan contains a number of policy requirements aimed, either directly or indirectly, at ensuring air quality does not exceed relative objectives as a consequence of growth.

5.2 **Policy D4** sets out the Council's approach to air quality considerations. It states that development proposals will be required (as appropriate) to give consideration to air quality during both construction and final occupation and use; propose mitigation measures to minimise (the effects of) emissions; and carry out air pollution impact assessments.

5.3 Given the specific issues identified above, the cumulative impacts of the development of the largest sites in Baldock (i.e. sites BA1, BA2 and BA3 and the proposed employment allocation) will need to be assessed.

5.4 A number of further policies or requirements are also of relevance to this issue:

5.5 **Policy SP1** requires the securing of any necessary mitigation measures that reduce the impact of development, including on climate change;

5.6 **Policy SP6** provides the District Council's overarching ambitions in relation to sustainable transport provision including the requirement for the early implementation of sustainable travel infrastructure on Strategic Housing Sites (which includes site BA1);

5.7 **Policy SP7** establishes the approach to infrastructure provision and developer contributions;

5.8 **Policy SP14** sets out a range of detailed requirements for the land north of Baldock including the provision of the link road from the A507 London Road to the A505 Baldock Bypass and a range of sustainable transport measures;

5.9 **Policy T1** identifies that planning permission will be granted where development proposals are accompanied by appropriate transport assessments and the provision of public transport and safe, direct and convenient routes for pedestrians and cyclists; while

5.10 **Policy HS1** states that Local Housing Allocations (which include the remaining proposed allocations in Baldock) must address identified site-specific considerations. For sites BA3 and BA4 this includes the provision of a southern link road connecting Wallington Road to the B656 Royston Road.

5.11 Any future development proposals will need to demonstrate that the relevant policy requirements of the plan have been, or will be satisfied before permission can be granted.

6 Conclusions

6.1 This paper sets out a range of information relating to air quality in Baldock, how predicted future traffic growth - as the main contributory factor to air quality in the district – has been assessed and the policy framework in the Proposed Submission Local Plan that will ensure these issues are appropriately addressed in the consideration of any future development proposals. In summary:

- Substantial levels of future growth are planned for Baldock in the new Local Plan for the district over the period to 2031;
- The District Council has a statutory responsibility to review air quality and act where concentrations exceed national objectives;
- The main source of air pollution in North Hertfordshire is from traffic;
- NO2 monitoring locations in Baldock generally show concentrations below national objective levels. This generally takes places closer to the highway than the façade of the nearest residential property which is the appropriate receptor for the mean annual average;

- It is anticipated that the management of PM pollution will generally be achieved as a secondary impact of managing NO_x levels;
- The Station Road / Royston Road / Clothall Road (B656 / A507) junction is identified as a location requiring mitigation in transport modelling carried out to support the Local Plan;
- Even with mitigation, delays at this junction would increase by 2031 if predicted traffic from the new developments at Baldock are loaded onto the existing highway network;
- Further modelling has examined the impact of providing proposed link roads to the north and south of the town. With the implementation of these, there is a significant improvement in the performance of the junction;
- The District Council, in conjunction with Hertfordshire County Council, has committed to the preparation of a Transport Strategy to sit alongside the Local Plan. This will consider how transport measures can contribute to wider objectives including air quality;
- The emerging Local Plan contains a detailed policy framework against which development proposals will be assessed. As well as a specific air quality policy, it includes a range of measures to ensure the implementation of site-specific infrastructure as well as broader consideration of (sustainable) transport issues.