Henbury Parish Council – Objection to Planning Applications 17/4034M, 17/4277M, 18/0294M

Please note: Henbury Parish Council has already submitted detailed objections to this Planning Application – those documents still stand. The existing submissions contain detailed objections related to infrastructure and biodiversity.

This document has been produced to respond to the additional documents submitted by the developers relating to cumulative impacts on Air Quality and Traffic.

August 2018

Summary

We believe that the new documents presented by the developers to support these planning applications are deeply flawed.

The BWB Air Quality report which purports to model the cumulative effect of the developments on Air Quality in the Broken Cross AQMA, draws a conclusion that there will be little or no impact. However, it is based on questionable location of the diffusion tube monitors, "bias-corrected" input data from CEC from inaccurate diffusion tube monitors, invalid traffic flow modelling and dubious verification techniques.

CEC's Environmental Health Officer points out that "taking into account the uncertainties with modelling, the impacts of the development could be significantly worse than expected".

In addition, we are deeply disappointed in the role of CEC in relation to managing the AQMA at Broken Cross.

- No Action Plan has been produced
- Appropriate monitoring has not been carried out. Defra guidelines (LAQM TG16) state that automatic monitors can supplement diffusion tubes to provide more accurate results. Why aren't CEC using an automatic monitor in a declared AQMA? Instead they are placing inaccurate diffusion tubes in new locations, where they might expect the readings to be lower than those recorded in previous years.
- The Local Authority should be carrying out proper independent modelling themselves, rather than accepting flawed modelling reports, produced with the objective of pushing through developments of hundreds of houses.
- We are concerned that Cheshire East appear to be failing to safeguard the health of the residents that they represent.

HPC submit that monitoring should be re-instated at 36-56 Broken Cross and the AQA for these developments must be made to take account of the results. At present the modelling has taken no account of this critical area.

The Transport Assessment contains misleading statements, has blatantly ignored valid information obtained previously, and is based on non-representative traffic and pedestrian flows. Again we would ask whether the relevant CEC officers have critically assessed this report. This report underpins the Air Quality Assessment.

1 Comments on Air Quality Assessment

1.1 Queries relating to CEC Data

Cheshire East have published dramatically reduced diffusion tube monitor readings for NO2, relating to 2017. These appear to be far lower than any reading from 2014 – 2016. See table below.

The annual figures for Broken Cross AQMA (monitor CE91) from 2014 to 2016 remained fairly stable around 45µg/m3 (exceeding government limit of 40). This information formed the basis for declaring an AQMA. That monitor was removed, but the nearby monitor which replaced it (CE257), apparently produced a final annual result of 28.54µg/m3 in 2017. What accounts for this dramatic 40% reduction? Certainly not an Air Quality Action Plan, which CEC have so far failed to produce. Residents have not noticed a reduction in traffic volumes, in fact the reverse is true.

Further review of the available data suggests that this huge reduction is due to the choice of new monitoring locations to replace CE91.

CEC Diffusion tube monitor locations		Final bias-corrected, distance-adjusted, published figures declared by CEC				Approx distance of monitor from façade of building (metres)	Actual monitored annual average	Bias-corrected figures used by BWB
		2014	**2015**	**2016**	**2017**		**2017**	**2017**
CE 252	17 Fallibroome Road				**25.61**	0.2	30.11	26.19
CE 254	175 Broken Cross				**32.46**	0.1	37.31	32.46
CE 255	31 Broken Cross				**26.87**	0.1	30.88	26.87
CE 256	15 Chelford Road				**25.65**	7.5	41.76	36.32
CE 257	64 Broken Cross				**28.54**	6.0	45.26	39.37
CE 91	50 Broken Cross	**46.2**	**44.31**	**47.42**		0.1		

Note 1: all figures in table are NO2 in µg/m3.

CE91 was outside 50 Broken Cross, one of a row of terraced houses (36-56 Broken Cross) that front directly onto the pavement. The new monitors have been placed either on the façade of houses offset from the road, or outside houses where a large distance correction is made on the raw data from the monitors in order to *estimate* the NO2 readings at the façade of the house.

The actual raw average annual value for monitor CE257 (nearest to CE91), in 2017 was 45.26. Corresponding closely to the 2014 - 2016 readings for CE91 (46.2,44.3,47.42).

> *Note that CE 257 is the only diffusion tube monitor with missing readings for 2017 (Sept and Nov). Winter readings are expected to be higher.*

However, Cheshire East have reduced the raw data figure by a factor of 36.94% to produce a reported value of 28.54. This adjustment includes bias-adjustment (as diffusion tubes are known to be inaccurate), and then a distance adjustment. The location has been chosen

such that the monitor is sited on the pavement outside a house with a significant front garden, which requires a large adjustment to estimate NO2 levels at the façade of the house.

NO2 levels reduce with distance from the source (road traffic). A calculator is available to estimate the value, however **the accuracy is limited**, and decreases with increasing distance from the monitor.

Had the new monitor been positioned on any of the houses fronting directly onto the road (around no 50 Broken Cross), we can expect the adjusted figure would still have been of the order of 45μg/m3 (in line with all previous years). Regardless of what the modelling says, it is highly likely that the people living in that terrace of houses will continue to be exposed to NO2 levels exceeding the legal limit, even without the developments. Selecting houses further back from the road for monitoring purposes, appears to be avoiding the issue.

1.2 Anomalies in the modelling carried out by BWB

1. We note that BWB initially submitted a report that utilised the "distance-adjusted" figures for NO2 from Cheshire East. This was then hastily withdrawn and replaced with a new report based on the figures that are just bias-corrected. This changed every modelled result. No explanation was offered and no proper version control was available to explain the changes.
2. In the BWB Air Quality Report, **all** the modelled results for 2017, on the south side of Broken Cross (Receptors R13 to R22) are **around half the bias-adjusted actual monitored value** on that side of Broken Cross. Why?
3. It is difficult to understand why the modelled values of NO2 for the south side of Broken Cross are significantly lower than those modelled for the north side. Heavy queuing traffic occurs regularly on the south side, in an uphill direction, and would be expected to cause much higher levels of pollution than the free-moving traffic on the north side of the road, travelling downhill.
4. DEFRA guidance in LAQM TG16 to determine model uncertainty suggests using an RMSE value (as there are a small number of actual monitored results). The RMSE for the modelled vs actual NO2 readings has not been quoted by BWB, but can be calculated as a value of 6.4μg/m3. DEFRA guidance advises that the RMSE value should equate to 4μg/m3 or below **in order to have confidence in the results**.
5. It is noted that CE257 results have been omitted from the model verification process in the BWB report, due to the large discrepancy between modelled and monitored results. The modelled results greatly under-predict the actual measurement. In this case, if this was included in the RMSE calculation, the value would be 10.1 μg/m3 **implying even greater uncertainty re the validity of the model**.
6. It is very clear why BWB have chosen to exclude the actual results from the most significant monitor, in their conclusions. Notably, on first iteration of this report, BWB excluded a different monitor.

As regards point 5 above, and referring to LAQM TG.16:

7.521 Dispersion models may perform differently at kerbside, roadside and background sites. For example, models may predict reasonable concentrations towards background sites, ***but under-predict at locations closer to the roadside****. In most cases, local authorities are* ***concerned with the predictions closer to roadside sites*** *as these are at more risk of exceeding the air quality objectives and* ***model verification is generally based on these locations****.*

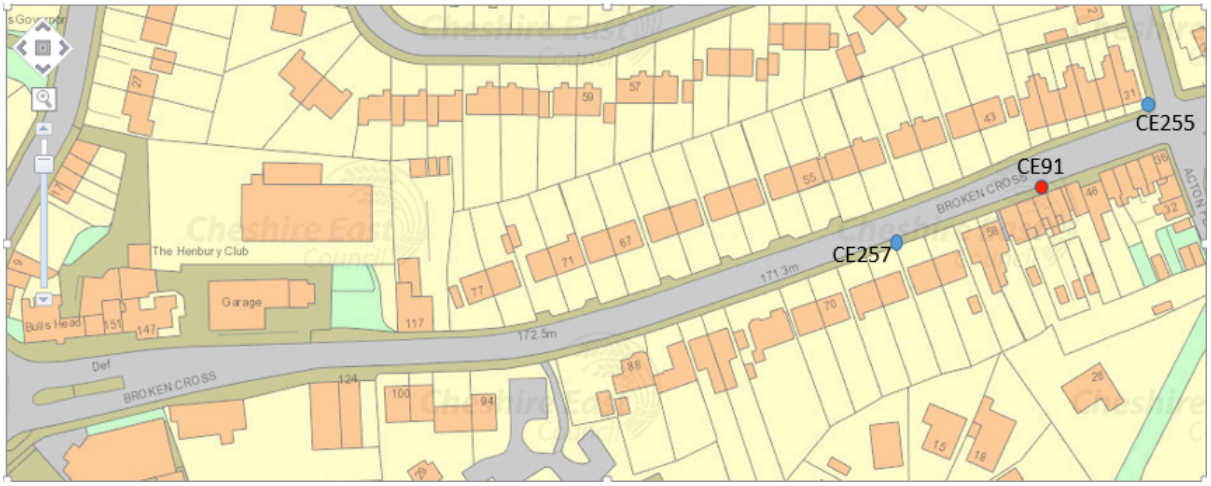
The guidance therefore states that rather than developing a model that is biased away from the roadside locations (by removing CE257), it should instead be focused on exactly these locations as this is where the pollution levels will be highest.

Also, from TG16, referring to Box 7.15 and model verification:

"This information may help identify sites which ***may be performing differently than others****.* ***These sites can then be investigated*** *and inputs to the model may be varied to improve the performance of these sites Alternatively, these ratios can be used to* ***separate locations which may be street canyons, from more open or typical urban sites****, e.g. the ratio is often* ***much higher*** *at sites which could be considered street canyons (as they have limited dispersion) and separate adjustments may be required"*

Again, the guidance is not to ignore those under-predicting sites (that are likely to be street-canyon in nature) but rather investigate why they deviate and develop suitable models accordingly. The work by BWB has completely ignored this guidance. In their response to CEC Environmental Health querying discrepancies (published in the CEC Environmental Health submission to the planning portal) they state:
"it is important to note that differences between distance from the road, wind direction e.g. being upwind or downwind of the pollutant source, leeward or windward direction, angle from pollutant source, ***building effects (which are not included in the ADMS-Roads model)****, distance from queuing sections and other road sources will all greatly affect predicted concentrations"* indicating that little confidence is available in the modelling for some of the Broken Cross area which is not open in nature and heavily constrained by buildings..

BWB have used receptor R17 at the approximate location of CE91. The modelled NO2 value is shown to be **21.35** μg/m3 for 2017, and 17.89 μg/m3 for 2020 (without development). The actual 2016 annual reading for CE91 was **47.42** μg/m3, which highlights just how poor the modelling is in relation to this area of high pollution, presumably largely because of the building effects. A map of the relevant section of road and the tube locations is below:



The removed CE91 tube is in an area that can be considered a street canyon. See the picture below. 36-56 Broken Cross is the row of terraced houses to the right that directly front the pavement.

The replacement tubes, CE257 and CE255, are in slightly more open areas, although still close to this section, where pollution dispersal will remain inhibited. As such, following TG16 guidance, these should be dealt with separately to the remainder of the AQMA. Being at levels above 40 μg/m3 means that any change in level will be treated with a higher priority to increases at levels below this limit, and thus alter the way the applications are perceived. For example, a 2% increase in NO2 at a level <30 μg/m3 is classed as a **negligible** impact, but at >44 μg/m3 (CE91 levels) it would be classed as a **substantial** impact (see Table 3.2 in BWB submission). Such a shift can simply be produced by moving a receptor from a building fronting the road to a location where the property frontage is a few metres from the road, and distance-correcting, effectively what has been done in moving from CE91 to CE255/CE257.

HPC therefore argue that monitoring should be reinstated at 36-56 Broken Cross and the AQA for these developments must be made to take account of the results. The modelling simply has taken no account of this key area.

1.3 Other points:

Why have BWB modelled figures for the Air Quality Assessment based on the "Manchester" weather station? The Met Office state that there is no weather station at Manchester - Rostherne is the station used for Manchester. The Met Office also state that the nearest weather station for Macclesfield is Leek.

Section 3.6 The queuing traffic has been modelled at **10 kph below speed limit**. In CEC's most recent AQ Annual Status Report (approved by DEFRA), the traffic data for queues was modelled at **10kph** for the queues on the arms of Broken Cross roundabout. A very different figure. Why has this changed?

There is a lack of consistency in the adjustment factors that have been applied to the modelled results to ensure a strong connection to monitored results.

- In the last published CEC AQ Annual Status Report (approved by DEFRA), the modelling carried out to confirm the need for an AQMA at Broken Cross was shown to be under-predicting the NO2 figures by 46%, The figures were then adjusted to provide a more realistic value, using an adjustment factor of 2.949.
- In the BWB report on Air Quality produced in 2017, an adjustment factor of 4.10 was used.
- In the BWB 2018 report an adjustment factor of 1.1302 has been used. This implies that the modelling is believed to be almost 100% accurate. We would question this.

Section 3.8 (and others) discuss the approach to the **roundabout**, but we understand that the modelling has been done based on a replacement traffic signal layout, not a roundabout. However even this is unclear – as different design layouts are referenced in the various documents. Can we be sure that the correct (final) layout was used for the purposes of AQ modelling?

Section 6.3 The diagram references 2016 as the base year, but the text references 2017. Which data has been used?

1.4 Air Pollution for cyclists and pedestrians

CEC have 'distance corrected' the monitored Air Quality data to reflect the estimated NO2 levels on building facades. The same approach can be applied to determine the NO2 exposure levels for pedestrians, cyclists and car-drivers around Broken Cross. These results show that people walking, cycling or indeed driving through Broken Cross on a regular basis will be exposed to levels of NO2 that exceed the legal limit and are much higher than those that have been reported.

The travel plans associated with the developments are encouraging more walking and cycling.

2 Comments on Transport Assessment

Safety concerns were raised by CE Highways team – will these result in any change to design, and if so, will there be implications for traffic flow?

The Highways team only commented on safety aspects of the proposed design. Has the team verified the conclusions on traffic flow? If not, why not?

The pedestrian flow survey was conducted on Monday 21st May 2018, when several year groups were absent from school due to exams. Clearly this data does not represent typical flows.

The transport assessment refers to different measured flows – see table 4.1. Section 4.12 states that the flows measured by DTPC for Henbury Parish Council '*are notably higher than other surveyed flows*' and in 4.14 that '*the DTPC September flows are likely to be less representative than the CBO November 2016 flows, of evening peak hour conditions'*. It is interesting to compare the flow numbers with those submitted by Croft in the original transport assessment for 17/4277M. These counts were made in June 2017, see the table below. It is clear that the Croft results are actually the largest in the Eastbound/Westbound directions and therefore the CBO statements can therefore be considered incorrect/misleading. It is interesting to note that section 1.8 of the document states that "*This note sets out the findings of these considerations and has been prepared* ***jointly between CBO and Croft and represents the opinion of both Consultants****.".* We therefore have to ask why the Croft data has been completely ignored? Is this simply because it had higher east/west flow counts?

	AM				PM			
	Mar-16	Nov-16	DTPC Sep-17	Croft Jun-17	Mar-16	Nov-16	DTPC Sep-17	Croft Jun-17
Eastbound	617	616	622	**697**	753	703	813	**841**
Westbound	759	810	789	**885**	606	615	736	**753**

The results of section 4.17 can therefore be questioned, where, in Table 4.3, flows have been reduced as an average of DTPC and CBO figures. Had the Croft data been included then greater flow counts would have resulted if E/W flows are the main concern. A similar observation can be made to section 4.30 and the queue comparison with the reduced flows.

Regarding queue lengths, the assessment uses DTPC queues. There is no reference to queue measurements by CBO or Croft. In the HPC response to the previous applications, including the DTPC document, it is explained how the queue lengths were constrained by the positioning of the video cameras surveying the queues. As a result, further measurements were made by RDS Ltd (as used by Croft) with more extensive camera coverage and these results presented by HPC in a submission to 17/4277M. However they have not been referred to in this new assessment.

How realistic are the assumptions relating to school places? It has been assumed that all children living North of Chelford Road find places in primary schools north of Chelford Road, and those to the South find places to the South. Many schools are already oversubscribed

(including the nearest primary at the north of Chelford Road, i.e. Whirley) and Fallibroome Secondary is unable to expand.

The pedestrian usage of the junction is modelled at access every 2 cycles in the morning and every 3 in the afternoon on the east/west arms. With cycle times specified as up to 180s this equates to potential pedestrian waiting times of 6 minutes in the morning and 9 minutes in the afternoon. This considered unrealistically high, and a safety issue for schoolchildren, who are unlikely to wait for such long times. The modelling also shows the junction to be reaching capacity at these intervals, hence it is questioned whether this actually is a realistic solution?

The traffic flow model uses TRICS data to predict increases in traffic as a result of developments. A number of sites in England and Wales in a timeframe from 2011 to 2017 have been selected. What were the criteria used to select these specific sites, and how representative are they of the specific issues affecting Broken Cross?

The traffic flow forecasts (and therefore the Air Quality modelling), have failed to take account of increased traffic relating to the new location for Kings School, or the developments lower down the A537 e.g. Bollin Meadow. Furthermore, the overall expansion of Macclesfield in the local plan is for 4350 properties, despite the original requirement being under 2500. The extra traffic generated by developments outside of the immediate Broken Cross area will still be significant at this major junction, and hence all modelled flows, queues and delays will be optimistic.