

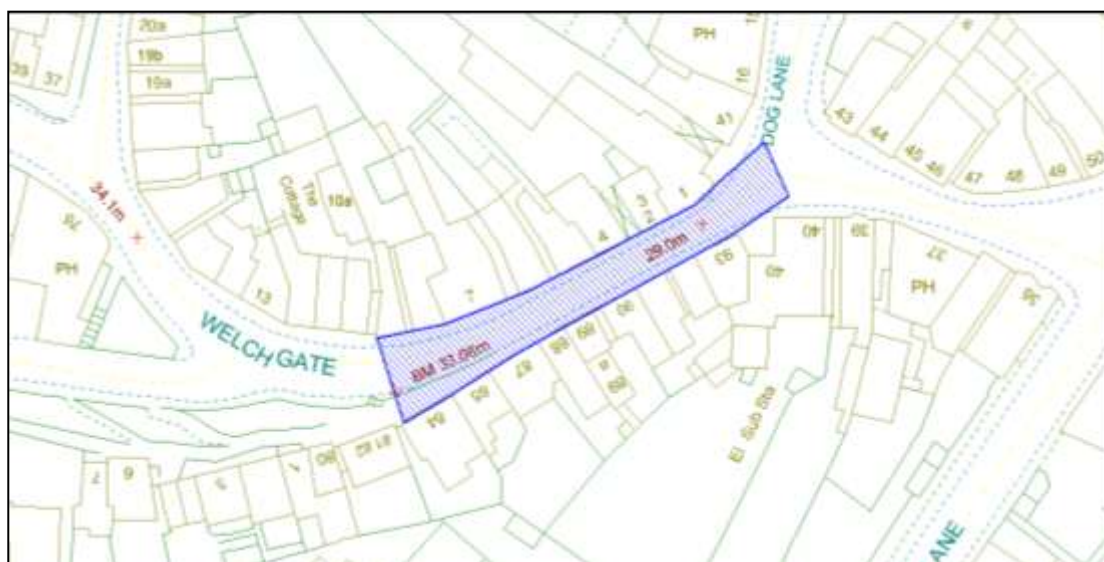
3.9 Welch Gate, Bewdley AQMA – Wyre Forest District Council (WFDC)

Date of Detailed Assessment: Jan 2003 (Stage 3 air quality review and assessment recommended AQMA)

Date of Declaration: 6 January 2003

Date of Further Assessment: March 2004 (Stage 4 air quality review and assessment declared AQMA valid)

Figure 3-28 Plan of AQMA



The B4190 runs along Load Street from an easterly direction and then turns left up Welch Gate continuing on out of Bewdley in a westerly direction. The road numbering follows the previous layout of the junction where it was a through road from Bewdley town centre and out along Welch Gate.

The current area of the Welch Gate AQMA encompasses a short section of the B4190 Welch Gate from the junction with Dog Lane and Load Street to a point level with property number 84 Welch Gate and runs in a ENE to WSW direction. The AQMA is predominately residential.

At the eastern end of the AQMA there is a now a junction on the B4190 where Dog Lane the B4194 extends to the north and Load Street B4190 to the east. Dog Lane B4194 continues for approximately 75m to a forked junction where the B4194 now named as Dowles Road continues north and Dog Lane forks to the north east. Dog Lane properties at the closest point to the junction of the AQMA consist mainly of ground floor retail units with residential units at first floor level. Load Street the B4190 continues in an easterly direction through the town centre and out across the bridge, river crossing, towards Kidderminster. Load Street properties at their closest point to the junction of the AQMA Load Street consist mainly of ground floor retail units and residential units at first floor level.

At the western end of the AQMA the B4194 continues in a west north westerly direction and is predominately a residential area. Sandy Bank junctions with the B4190 approximately 20m to the west of the AQMA, Sandy Bank is a steep residential area that becomes Wyre Hill further to the west where the local primary school is located. Approximately 50m to the north west of the AQMA Richmond Road junctions with the B4190, Richmond Road is a residential area.

3.9.1 Prevailing Conditions

AM and PM peak traffic time site observations of the Welch Gate AQMA were undertaken in 2012/2013 to characterise existing conditions and identify issues in order to inform the focus of potential measures within the action plan. Photos from the site walkover are included at the end of this section.

The area of the AQMA in Welch gate itself is mainly residential with properties that typically reach 3 storeys in height that coupled with the narrowness of the street create a canyon effect locally. The boundaries of the AQMA follow the facades of the buildings in Welch Gate.

There are no taxi ranks, bus stops or loading bays to hinder traffic flow in the AQMA but the traffic light pedestrian crossing in the centre of the town on Load Street appears to create traffic queues that back up to Dog Lane and hinder the flow of traffic out of the junction of Welch Gate. There is a traffic light pedestrian crossing located at Dog Lane by the Horn and Trumpet public house that can be beneficial when there are high pedestrian numbers wishing to cross Dog Lane as traffic can flow out of Welch Gate but they can also stop all traffic in any direction as commuters regularly block the Welch Gate junction entirely.

Double yellow lines exist the full length of the AQMA and for a considerable distance either side. There are no restrictions on loading or unloading and there are no restrictions on lane turning or directions. There are no weight restrictions in the AQMA however there are weight restrictions on the Bewdley bridge river crossing. The speed limit for the area is 30 mph.

Queues develop regularly at all times due to abuse of the double yellow lines, painters, decorators, workman and residents loading and unloading regularly park on the double yellow lines and create queues as traffic cannot easily get round parked vehicles.

The length of the AQMA can be traversed comfortably in less than a minute's walk by an average person. Therefore the area does not meet the description of a location requiring assessment against any short term (i.e. 1 hour for NO₂) air quality standards, as outlined in LAQM.TG(09).

Site observations during the a.m. and p.m. peak traffic hours noted the majority of traffic consisted of cars/commuters with some LDVs and buses. The direction of the traffic flow was almost a 70/30% split of commuter/cars observed travelling east and west respectively at a.m. peak time. A quarter of vehicles were noted to have more than one occupant travelling west corresponding with the school run, and those travelling east the majority had just one occupant. Buses were quite regular at a.m. peak times heading to the school and residential areas located to the west of the AQMA and back in to Kidderminster.

Queuing traffic was observed at the junction of Welch Gate and Dog Lane/Load Street heading east on the B4190. These queues were observed to be the from the high volume of slow moving vehicles due to the narrowness of the street that wish to turn right at the junction and continue on the B4190 towards Kidderminster. The queues appeared to be worse due to the high number of vehicles also travelling down Dowles Road and Dog Lane B4194 to continue along the B4190 to Kidderminster using the river crossing. The B4190 east by the Swan public house has a narrowing of the road that hinders traffic flow especially when large goods vehicles or buses wish to pass, they have to wait for a clear road creating queues.

The amount of pedestrians using the pavements during school times was observed to be very high school children travel from the estates in the west of Bewdley by foot to the high school along the Stourport Road and there are no official crossing points in Welch Gate so

there is a tendency for pedestrians to cross anywhere between the queuing traffic. Queuing traffic was also observed on Load Street at the junction of Welch Gate heading west these queues were mainly observed to be as the result of the narrowness of Welch Gate and busses or large vehicles blocking the access of vehicles wishing to travel west.

Photo 1 – Looking towards east down the length of the AQMA to the Junction with Load Street/Dog Lane



Photo 2 – Looking towards west from the western end of the AQMA to where Richmond Road junctions with Welch Gate



Photo 3 – Looking towards west from the western end of the AQMA to where Sandy Bank junctions with Welch Gate

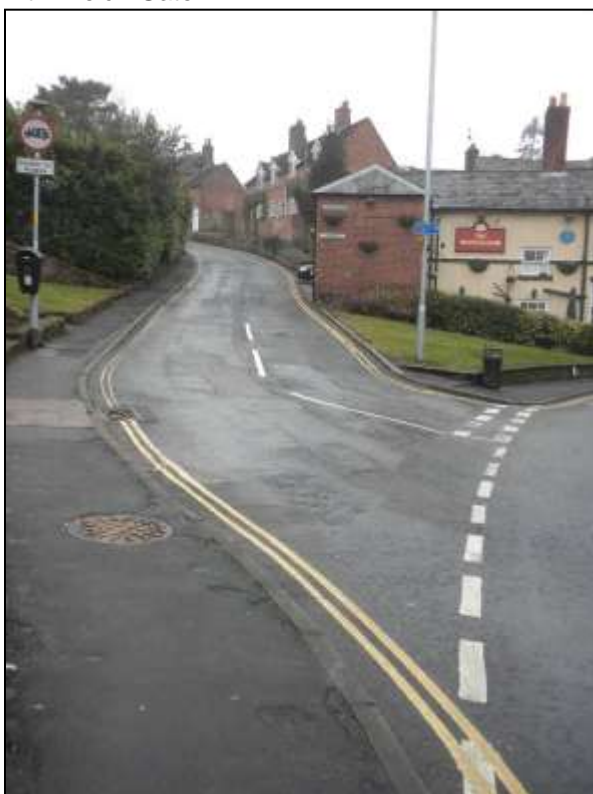


Photo 4 – The pedestrian crossing outside the Horn & Trumpet public house on Dog Lane, Looking north from junction of the AQMA with Dog Lane / Load Street.



Photo 5 – Looking towards the west down the length of the AQMA, note the bus waiting for a clear road to travel down the AQMA.



Photo 6 – Looking east down Load street from the junction of the AQMA with Load Street / Dog Lane, note the narrow road approximately where the van is opposite the Swan public house.



Photo 7 – The AQMA at junction of Load Street/Dog Lane, looking west, note the bus waiting to enter the AQMA as the street is narrow and the bus cannot swing round.



3.9.2 Summary of any Further Assessment report

There has been no specific report entitled further assessment of the Welch Gate AQMA as the declaration of the AQMA was some 10 years ago and guidelines for LAQM have changed over time.

The Welch Gate AQMA was declared and validated following the stage 1, 2, 3 and 4 air quality review and assessments and the USA between stage 3 and 4. Each authority was required to undertake a first stage review and assessment for each of the pollutants for which there is a prescribed objective. This consisted of an initial screening of industrial, transport and other sources of pollutants that have a significant impact within an authority's borders. Information on any existing or proposed significant sources of these pollutants within its area was collated. Consideration was then given to whether a person might reasonably be expected to be exposed over the averaging period for the specified objective in a relevant location. Significant pollutant sources outside the authority's area, which could lead to an exceedence of a prescribed objective within its area, were also included.

The second stage of the review and assessment process required a more detailed quantitative assessment to be undertaken, based on modeling or monitoring, depending on the pollutant being assessed. The third stage of the review and assessment process required a more detailed assessment, based on more sophisticated modeling and monitoring. The third stage, utilizing continuous and passive monitoring data, identified that Welch Gate was likely to exceed the appropriate objective and an AQMA was recommended. The likely geographical extent of the area considered at risk of exceedence of the relevant AQ objectives where members of the public are likely to be exposed over the relevant averaging period was defined.

The USA report confirmed the findings of the Stage 3 report, concluding that a detailed assessment of NO₂ was required for the AQMA. This conclusion was reached upon consideration of NO₂ diffusion tube monitoring data, in conjunction with a DMRB assessment. The following stage 4 review and assessment by Faber Maunsell was to

provide a detailed study of modeling of nitrogen dioxide for the AQMA. The results of the modeling were compared against nitrogen dioxide diffusion tube data. The results validated the declaration of the AQMA, it was suggested that the AQMA may need extending to encompass the Dog Lane, Load Street junction area however later monitoring has ruled this out.

3.9.3 Source Apportionment Data

The additional modelling undertaken within the Stage 4 assessment utilised basic source apportionment data based on 2003 traffic data. The percentage contribution from HGV against total traffic volume identified in the report is shown below in Table 3-32.

Table 3-32 Percentage of HGV contribution in 2003 to Welch Gate AQMA

Street	HGV %	AM Peak Hour Traffic Flow	
		2003	2005
High St	3	319	326
Load St S	3.6	326	333
Load St N	3.3	917	938
Load St	3.45	1243	1271
Welch Gate	3.5	559	571
Winbrook	3.5	335	343
Dowles Road	3.5	383	392
Sandy Bank	3.5	66	68
Park Lane	1.1	173	177

3.9.4 Air Quality Improvement Required.

The requirements for improvement identified in the Stage 4 assessment are detailed in Table 3-33 below.

Table 3-33 Air Quality Improvements required in 2004 in Welch Gate AQMA

	Receptor	Easting	Northing	Modelled NO ₂ , 2005	% Contribution		Required NO ₂ decrease from Traffic sources (%)
					Traffic	Background	
Bewdley	1	378452	275294	37.2	48	52	-
	2	378481	275300	40.5	53	47	2.5
	3	378506	275320	40.2	52	48	1
	4	378510	275309	39.5	51	49	-
	5	378527	275311	39.9	52	48	-

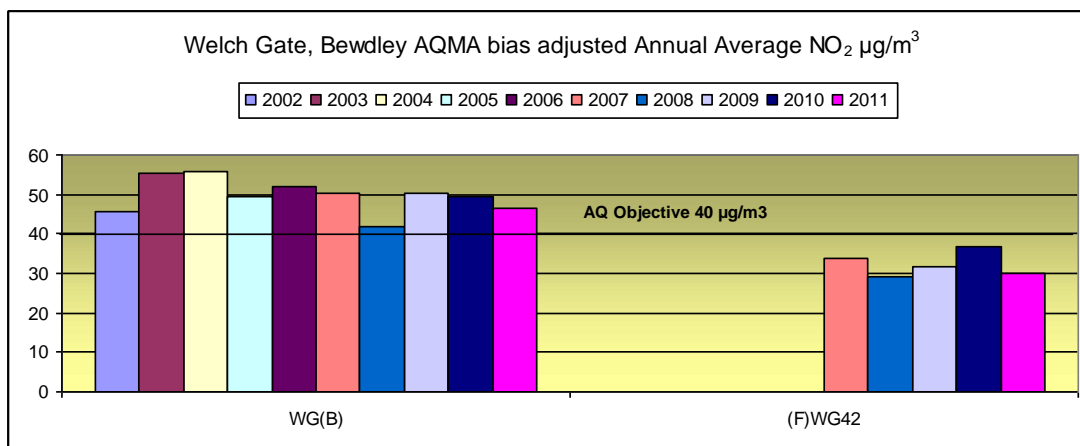
Table 3-33 lists the modelled 5 sensitive receptor locations, the modelled NO₂ concentrations for 2005, and the percentage contribution to these concentrations from traffic. Also shown is the required percentage decrease of traffic related NO₂, based on the modelling results, to reduce the NO₂ concentration to below the 2005 annual mean air quality standard of 40µg/m³. It should be noted that to reduce the concentrations below 36 µg/m³, to take into account model error, a further decrease in NO₂ (in addition to that detailed in Table 3-33) is required.

3.9.5 Long term local trends in NO₂

As part of the AQAP process data has been collated from previous WFDC yearly progress reports and screening assessments to produce a meaningful picture of long term trends in monitoring results of nitrogen dioxide in Welch Gate, Bewdley.

The graph below depicts these long term trends from bias adjusted annual average results of NO₂ at relevant exposure receptor locations.

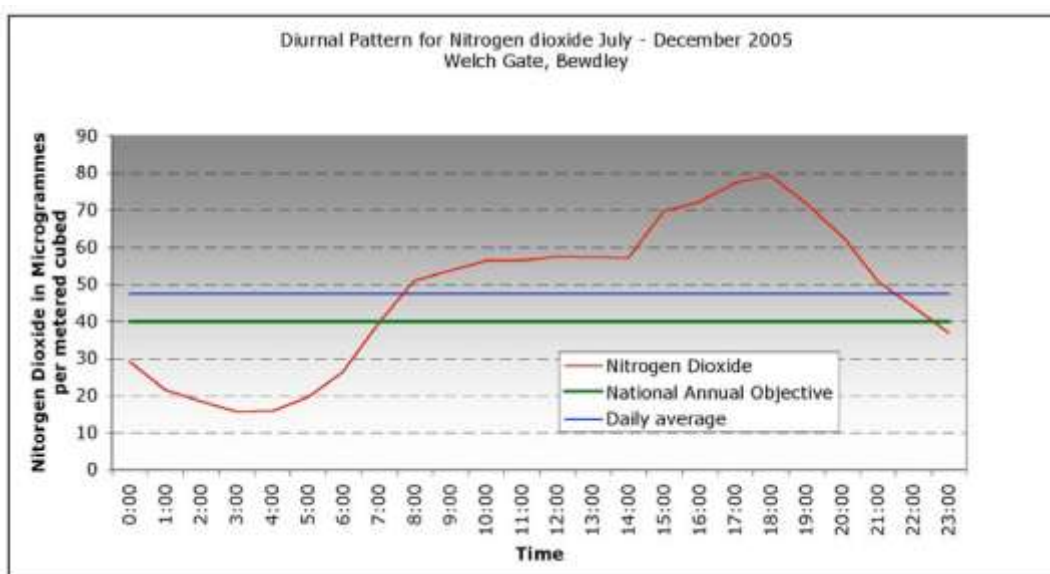
Figure 3-29 Bias adjusted Annual Average NO₂ monitoring results 2002 - 2011 Welch Gate AQMA



Since the stage 4 review and assessment the Welch Gate diffusion tube monitoring has continued to show exceedences of the AQ objectives and the existence of the AQMA is valid.

In addition to diffusion tube locations real time analyses was undertaken from July 2005 to May 2006 using Airpointer equipment.

Figure 3-30 Diurnal patterns of NO₂ in 2005-06 in Welch Gate AQMA



The Airpointer was installed in the Cellar of a residential property, and the sampling tube was installed through the property onto the external façade on Welch Gate. Nitrogen Dioxide diffusion tubes were also tri-located on the property façade to establish a local correction factor for nitrogen dioxide diffusion tubes. The Graph above sums six months results of the diurnal patterns to an average daily value. The trace confirms that air quality deteriorates quickly from approximately 6am and continuously builds through the day, cumulating to a peak around rush hour 5-7pm. NO₂ levels then tail off and only dip below the objective levels around 10pm. The graph confirms that the degradation in air quality is solely attributed to road vehicles traversing Welch Gate.

3.9.6 Summary of progress of actions identified or implemented to date

An Air Quality Action Plan was produced by WFDC in October 2004. A number of options were identified within the plan to improve air quality within the AQMA. An update on these options was regularly produced for annual Progress Reports for Defra. A brief description of the actions and progress to date is summarised below in Table 3-34

Table 3-34 Summary of targeted actions for Welch Gate AQMA from previous AQAP

Action ID	Description	Outcome to Date
Option WF1	Review of make-up & condition of WFDC transport fleet with a view to improving fleet quality, maintenance & emission levels	Improvements achieved - Part of WFDC climate change strategy
Option WF2	Increase in WFDC fleet use of alternative fuels (e.g. LPG & combined fuel vehicles)	Part of WFDC climate change strategy
Option WF3	Review of the WFDC employee / contract car user & leasing policy to give incentives for greener vehicle ownership / use	Part of WFDC climate change strategy
Option WF4	Workplace charging schemes where employees are charged to use car park provision	Part of WFDC climate change strategy
Option WF5	Promote WFDC use of public transport during working day	Part of WFDC climate change strategy
Option WF6	Car sharing and work travel planning for staff to encourage take-up of public transport / reduced car journeys	Part of WFDC climate change strategy - Green Travel Plan to be implemented.
Option WF7	Restriction and better timing of WFDC delivery and service schedules	Not known.
Option WF8	Alterations to parking provision & pricing throughout district to ease traffic around AQMAs and to deter local car use	Part of WFDC climate change strategy – on going through planning policy implementation
Option B1	Review of signage for traffic into Bewdley to encourage use of the bypass. Electronic signage may be able to indicate traffic congestion / local air quality problems. Possible use of 'Town Centre only signs'	Trialled recently - failure of signs to reduce traffic in AQMA – Part of Wyre Forest Transport Package in LTP3.
Option B2	Use of traffic lights to prevent traffic up & down Welch Gate at the same time. Traffic lights on Cleobury Rd, corner of Load St / Welch Gate & corner of Dowles Rd / Welch Gate. May only need to operate in 'busy period'. Possible 'one way' up Sandy Bank, The Hollow, Bark Hill or traffic lights. Could include pavement widening scheme. (For scheme see Appendix B)	Trialled recently - failure to improve air quality in AQMA - Part of Wyre Forest Transport Package in LTP3.
Option B3	One way traffic permitted uphill (westward) along Welch Gate as far as Sandy Bank Junction, two way thereafter. Suggested corresponding one way up Sandy Bank and Richmond Rd. (See diagram of scheme in Fig	Support for this option was withdrawn by the originators in preference for Option B18

Action ID	Description	Outcome to Date
	E, appendixD)	
Option B4	Change the priority of the junction at the bottom of Welch Gate so that traffic from Dog Lane must give way.	This was the previous set up of road priority. Part of Wyre Forest Transport Package in LTP3.
Option B5	A one way system for West Bewdley: Traffic to go up Park Lane to Wyre Hill and down Sandy Bank / Winbrook and Welch Gate. Includes proposals for connection from Wyre Hill (near Merricks Lane) to the by-pass.	Part of Wyre Forest Transport Package in LTP3
Option B6	Traffic lights on the bridge to control flow of traffic through Bewdley	Part of Wyre Forest Transport Package in LTP3.
Option B7	Traffic calming measures, particularly in and around AQMA (speed zones/bumps etc.)	Subject of debate in area, currently not implemented.
Option B8	Bridge Closure	Not viable, only 2 river crossings in Bewdley.
Option B9	Bridge Closure with possible timed control of movements over the bridge	Not viable, only 2 river crossings in Bewdley.
Option B10	Close Load St entrance to car park, pedestrianise current short-stay Load St car park areas and move car park entrance to Dog Lane	Part of Wyre Forest Transport Package in LTP3 and current planning considerations as part of the new re located medical centre.
Option B11	Car park on North East side of river (with free or cheap charging scheme to motivate use)	Part of Wyre Forest Transport Package in LTP3.
Option B12	Park and ride scheme for Bewdley to take traffic away from AQMA	Part of Wyre Forest Transport Package in LTP3.
Option B13	Tonnage limit on Bridge / along Welch Gate. Also suggestions for possible restrictions on High Street and Park Lane	Weight restriction in place on bridge, no other limits imposed in area.
Option B14	Signage on Safari Park Island, or other appropriate position, giving directions to Bewdley Business Park	Part of Wyre Forest Transport Package in LTP3.
Option B15	Pedestrianisation of Bewdley Town Centre	Not currently viable due to the need to access the bridge as a river crossing.
Option B16	Continue the Bypass on to Habberley Road	Little benefit to AQMA – ruled out.
Option B17	Ventilation System under footpath / on houses	No funding and technology not proven – ruled out.
Option B18	Reviewed and amended Option B3	Part of Wyre Forest Transport Package in LTP3.
Option B19	Introduction of Bewdley walking initiative (particularly for journeys to school and home delivery scheme)	Implemented in areas of Bewdley but not in AQMA area, footpaths narrow and no plans to change width of footpaths.
Option B20	Bewdley Park and Ride options to be assessed	Implemented in part of Bewdley but failed due to low take up – no benefit to AQMA.

3.9.7 Actions identified from Local Transport Programme 3 (LTP3)

A number of actions have been identified within the County Councils transport strategy as having a potential impact on Welch Gate AQMA. The LTP3 scheme code, brief description

and current status as provided by WCC in February and updated in June 2013 are shown in Table 3-35.

Table 3-35 LTP3 actions impacting Welch Gate AQMA

LTP3 Scheme	Description of Improvements	Current Status
BE1 - Bewdley (Welch Gate) AQMA Remediation	Direct - Involve changing traffic flows through Bewdley Town Centre using a variety of measures, to manage traffic flows through Town Centre to manage traffic flow and mitigate AQMA at Welch Gate	Trials have been held but unfortunately none were successful. The majority of the traffic flow in the AQMA is locally generated so attention will be refocused on campaigns to encourage modal shift to sustainable modes to access town centre services and facilities for local residents
BE3- Bewdley – Traffic & Parking Study	Indirect - Study would identify where to focus investment to improve the operation of the local transport network.	Would form part of Wyre Forest Transport Package. Programmed for later in Local Transport Plan.
BE4- Bewdley – Minor Transport Improvements Scheme	Indirect - Minor complimentary transport improvements to enhance safety, accessibility, information & travel choice integrated with other schemes	This scheme was delivered during late 2012/early 2013.
BE5- Bewdley – Walk/Cycle Bridge Scheme	Indirect - Development of a walk/cycle bridge over River Severn south of Bewdley bridge	Would form part of Wyre Forest Transport Package. Programmed for later in Local Transport Plan.

3.9.8 Summary of key issues identified from review for consideration within actions

Issue WG1 – It has been more than 8 year since real time analyses has been undertaken at the AQMA or any detailed modelling.

Issue WG2 – The main issue identified is the sheer volume of traffic in the area proceeding to one of the 2 river crossing bridges in the Bewdley area.

Issue WG3 - The narrowness of Welch Gate and the tall buildings creates a canyon effect on air quality.

Issue WG4 – The longer length variety of buses are regularly used in the area and block the road as they cannot negotiate the narrow bends of Welch Gate unless the road is clear.

Issue WG5 – The traffic light pedestrian crossing at the Horn & Trumpet public house in Dog Lane creates queues that block the junction of Welch Gate. The yellow grid no entry/waiting box painted on the road to ease the flow of traffic out of the junction is not observed.

Issue WG6 – Traffic light pedestrian crossings at the Horn & Trumpet in Dog Lane and in Load Street in the centre of town can create queues and hinder flow of traffic at the junction of Welch Gate.

Issue WG7 – Heavy lorries and vehicles still traverse Welch Gate even though there is a weight limit on the bridge as some are short cutting through town and some may need to proceed along Dowles Road in a northerly direction.

Issue WG8 – Two way traffic on all roads in the vicinity of the AQMA and the AQMA itself creates queues due the narrowness of the roads.

Issue WG9 – Welch Gate is a gateway to the local primary school on Wyre Hill and for the access to cross the river to the east side of the river to the other primary school for the area and the only high school in the area.