

Caerphilly County Borough Council

Caerphilly Town Centre Air Quality Action Plan

**Report for Caerphilly County Borough
Council**

Ricardo-AEA/R/ED46519
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Executive summary

This Air Quality Action Plan (AQAP) has been prepared by Caerphilly County Borough Council (CCBC) under the Local Air Quality Management (LAQM) framework as it applies in Wales. The policies and plan discussed in this report have been formally adopted by CCBC and appraised by Welsh Government.

All comments from the statutory consultees have been considered within the plan. This plan has been adopted as official policy in CCBC and the measures described will be implemented as a result. Periodically, CCBC will need to review the plan to ensure that it remains appropriate for the air quality situation in Caerphilly. Therefore, it is possible that the plan may be varied in future in response to new information, challenges or opportunities.

This AQAP looks in detail at the local air quality issues that have led to the declaration of the built up area of Caerphilly town centre as traffic related Air Quality Management Area (AQMA) (See Appendix 2).

Part IV of the Environment Act 1995 required the Welsh Minister to publish a national Air Quality Strategy and established the system of local air quality management (LAQM). All local authorities are obliged to review air quality within their districts as part of the LAQM process. If it appears that any air quality 'Objective' prescribed in the regulations and in the National Air Quality Strategy (NAQS) is not likely to be achieved then the local authority must designate the affected area as Air Quality Management Area (AQMA). The Act then requires that an Air Quality Action Plan (AQAP) be produced for any area designated as an AQMA, setting out the actions that the County Borough Council intend to take to achieve the NAQS.

This local AQAP sets out a work programme to improve air quality in and around the Caerphilly AQMA, which was declared in 2008 for exceedances of the NAQS objectives for nitrogen dioxide (NO₂). The plan has been prepared by Ricardo-AEA on behalf of Caerphilly County Borough Council.

Modelling identifies that the likely dominant source of NO₂ in the town centre AQMA is road transport. Both queuing and moving heavy duty vehicles (HDV), light goods vehicles (LGV) and cars contribute approximately equally to the high NO₂ concentrations recorded in Caerphilly town centre. Evidence suggests that a more than a 20% reduction in traffic emissions of oxides of nitrogen (or NO_x, which is a precursor to NO₂) would be necessary to achieve the annual mean air quality objective for NO₂, based upon 2008 figures. It is likely that the reduction now required will be much less, though for conservatism the 2008 reduction requirement has been retained for this AQAP.

This AQAP considers a suite of options to improve air quality and recommends some of these for implementation following the activities and recommendations of a CCBC steering group, which are aimed at reducing levels of air pollution within the AQMA in Caerphilly town centre. It also sets actions being progressed by other organisations, for which the actions will be monitored and progress reported annually. That is, the plan is comprised of measures that will be taken forward by the Council itself, and some which have already been put in progress by partners. It is thought that emissions of NO_x in the AQMA would be reduced most effectively by traffic management measures given that the AQMA is spatially quite small, hence such measures form the bulk of this plan.

The plan aims to reduce transport emissions in the AQMA by around 20% though at this time it is not possible to say when this might be achieved. It is anticipated that a reduction of this scale will lead to the achievement of the annual mean NO₂ air quality objective (40 µg/m³) at sensitive receptors in Caerphilly town centre in future years. A significant number of measures contained in this plan require further feasibility studies to ascertain their usefulness for reducing emissions of NO_x- these studies are included in this plan as measures as they represent important initial steps to potentially resolving the air quality issue with road

infrastructure changes. This means that this version of the AQAP will almost certainly be subject to revision as the evidence base develops.

It is acknowledged that the AQAP is a continuously evolving document involving numerous groups and Authorities, and the County Borough Council will continue to review and assess air quality to monitor this situation, and to evaluate the success of the measures implemented using prescribed indicators. The plan will be updated periodically as the outputs of on-going feasibility work are available.

The actions and measures outlined in the AQAP will provide additional benefits for Caerphilly town centre, which are beyond the original scope of the Action Plan. The benefits may include:

- Reduction of other pollutants such as particulate matter, benzene etc.;
- Reduction in emission of greenhouse gasses;
- Reduced noise from traffic;
- Reduced congestion;
- Environmental improvements when schemes are undertaken;
- Assist with climate change policies; and
- Improvements to human health.

In compiling this AQAP, reference has been made to the 'Local Air Quality Management Policy Guidance for Wales', LAQM.PG (09), and the Review and Assessment reports produced by the County Borough Council as part of the Local Air Quality Management (LAQM) assessment process. The Action Plan will be subject to statutory and public consultation and amended accordingly prior to formal adoption. The intention is to consider consultation responses and to finalise and adopt the plan during 2013.

This AQAP will rely heavily on effective partnership working as the measures making up the plan are implemented. Relevant departments within CCBC will have to collaborate closely to take the measures forward, but will also need to work with regional partners such as South East Wales Travel Alliance (Sewta) on some of the bigger initiatives- many of which will require a significant amount of feasibility work before they can be progressed.

Indeed, a key focus of this plan is to first enhance the air quality evidence base so as to allow potential abatement schemes to be assessed based on robust science. We set out a thorough programme of air quality modelling that we will undertake as part of the feasibility assessments associated with measures. This approach will obviously need good lines of communication to be maintained between the Council and its' partners through the life of the plan while we strive to keep air quality high on the agenda.

For further information concerning this report, please contact: Maria Godfrey, District Environmental Health Officer on 01443 866544.

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1 Introduction

This document is the Air Quality Action Plan (AQAP) formulated to address the air quality problems identified in the Caerphilly Air Quality Management Area (AQMA) which has been declared by Caerphilly County Borough Council (hereafter referred to as the CCBC). It is the statutory duty of the County Borough Council to develop an AQAP which must be appraised and accepted by the Welsh Government as being fit for purpose before its final adoption and implementation.

This document has been put together using currently available best evidence and guidance, through discussion within a bespoke Steering Group and with the Council's contracted consultants, Ricardo-AEA, to draw up measures that will be introduced to make progress in improving air quality in and around the Caerphilly AQMA. This draft AQAP will be submitted to the following bodies for consultation:

- Caerphilly County Borough Council committees;
- Welsh Government, and;
- Other statutory consultees, where it will be made available for scrutiny by the public and other stakeholders.

Comments received during the consultation have been addressed and, where appropriate, amendments have been made to the AQAP. This final version of the AQAP has been submitted to WG for appraisal and accepted.

1.1 Background

The air quality issues faced in Caerphilly are not unusual- most urbanised areas of the UK have similar problems with exceedances of air quality objectives with emissions from road traffic being the main factor.

South East Wales is Wales' most densely populated and urbanised region. Home to more than 1.4 million residents, it exhibits great contrasts in terms of geography, culture, and prosperity. These contrasts are often characterised by the distinction between the South Wales Valleys, the coastal cities and the region's rural areas. The ease, or difficulty, with which people can travel to local services and facilities, to places of employment, education, health or leisure, or to see family and friends is fundamental to their quality of life.

In South East Wales 30% of households do not have access to a private car and accessibility is a particular problem for the less mobile and those with special travel needs such as young people, older people, people with disabilities, and those living in the rural parts of the region.

The increased dependency on the car has led to congestion which costs the local economy £600m a year. Road safety, with more than 5000 casualties per year, continues to be a serious issue (SEWTA, 2009). Regeneration of the Heads of the Valleys and other parts of the region is also likely to result in an increase in the need to travel. At the same time there are major global, national and local environment and health issues related to transport and road traffic in particular. The Welsh Government aims to reduce greenhouse gas emissions dramatically, and transport will need to play its part.

1.2 Caerphilly County Borough

The County Borough of Caerphilly was created in 1996 as part of the reorganisation of local government. It occupies approximately 28,000 hectares of the South Wales Valleys with a population of 178,806 (2011 Census). It stretches over 40 km between the urban centres of Cardiff and Newport in the South and the Brecon Beacons to the North taking in all parts of the valleys of the rivers Rhymney, Sirhowy and Ebbw. It contains some 50 distinct towns

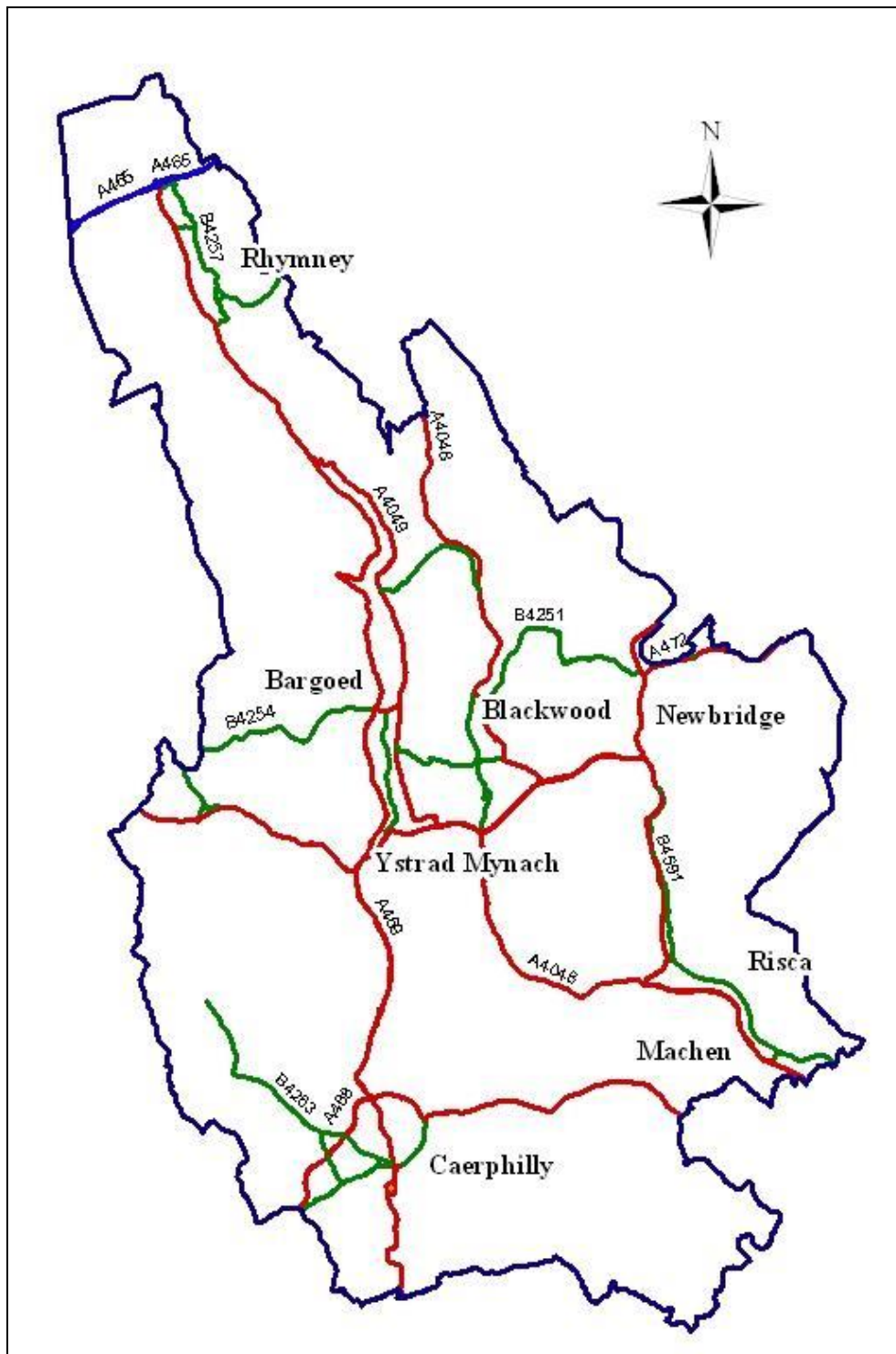
and villages, many (particularly in the north) are linear settlements located on the valley floors. The largest settlement is Caerphilly itself, situated in the south west corner of the county borough. Other significant settlements include Bargoed, Blackwood, Newbridge, Risca and Ystrad Mynach. A map of the County Borough, the main roads and towns, is shown in Figure 1-1.

Historically the County Borough of Caerphilly was a major source of heavy industry and coal mining. The main sources of air pollution today arise from heavy traffic flow in and around the town centres, particularly in the Caerphilly area, where there is frequent queuing and congestion. As such, an Air Quality Management Area has been declared in Caerphilly through the Local Air Quality Management process.

The one-way system around Caerphilly town centre allows traffic to travel south along Castle Street, up the incline of the residential Market and White Streets, and right along Barlett Street. Vehicles may turn right, downhill along Cardiff Road toward Caerphilly Castle and Castle Street, whilst the left turn along Mountain Road leads to a very steep incline up Caerphilly Mountain, south of the town.

The road layout in the town centre means that the residential roads of White Street and Barlett Street are highly trafficked. In addition, the AQMA area is characterised by quite narrow streets with buildings close to the kerb which limits dispersion of air pollution. It is highly likely that the orientation of the street is likely to contribute towards the high concentrations of NO₂ recorded at the roadside through reduced dispersion of the vehicle emissions.

Figure 1-1: Main roads and towns in Caerphilly County Borough Council (CCBC, 2013)



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2 Regulatory context and health

2.1 The legislative framework for air quality

To protect the health of the population, the UK Government has set out a National Air Quality Strategy which includes statutory objectives (standards) for some key pollutants. The air quality objectives applicable in Wales are set out in the Air Quality (Wales) Regulations 2000 (W.138), The Air Quality (Wales) (Amendment) Regulations 2002 (W.298), and are shown in Appendix 1. The objectives are expressed as a maximum ambient concentration not to be exceeded, either without exception or with a permitted number of exceedances within a specified timescale. The objectives have been set throughout the UK and European Union at levels that aim to protect the vulnerable in society from the harmful effects of breathing pollution.

In response, a number of measures have been introduced at an international level (including the UK) to reduce this impact. They include:

- Incremental reductions in emissions from vehicles and industry;
- Climate change programme policies; and
- Local Air Quality Management.

The UK government recognises the important role that local authorities have and continue to play in helping deliver the air quality objectives. “Action taken at the local level can be an effective way of tackling localised air quality problems leading to an overall improvement of air quality.”

2.1.1 Local Air Quality Management

The Environment Act 1995 gives local authorities duties and responsibilities that are designed to secure improvements in air quality, particularly at the local level. These include the review and assessment of key pollutants in their area in a series of rounds every three years. If it appears that any of the air quality objectives set by government are not likely to be achieved and members of the public are being exposed to the pollution, the local authority must by order designate any part of its area so affected, as an Air Quality Management Area (AQMA). They must then prepare and implement a remedial Air Quality Action Plan (AQAP) of measures to reduce air pollution levels in that AQMA.

Chapter 3 includes an outline of the main findings of previous rounds of the LAQM Review and Assessment process.

Note that the Council is not obliged to meet the objectives but must show that it is working towards them. The AQAP must include:

- Quantification of the source contributions to the predicted exceedances of the objectives; this will allow the action plan measures to be effectively targeted;
- Evidence that all available options have been considered on the grounds of cost-effectiveness and feasibility;
- How the local authority will use its powers and also work in conjunction with other organisations in pursuit of the air quality objectives;
- Clear timescales in which the authority and other organisations and agencies propose to implement the measures within its plan;
- Quantification of the expected impacts of the proposed measures, and where possible an indication as to whether the measures will be sufficient to meet the air quality objectives; and

- How the local authority intends to fund, monitor and evaluate the effectiveness of the plan

It should be noted that it will be difficult for CCBC to include all of this information at this stage as a significant aspect of the plan relates to further developing the evidence base – particularly for measures involving changes to road infrastructure. This means that the plan will be subject to some change with time as the measures are assessed for their effectiveness in reducing concentrations of NO₂ in the AQMA.

2.2 Health effects of poor air quality

In the UK, air pollution is currently estimated to reduce the life expectancy of every person by an average of 7-8 months with estimated equivalent health costs of up to £20 billion each year. Air pollution also has a detrimental effect on our ecosystems and vegetation. There are significant benefits to be gained from further improvements.

There are various sources of air pollution in the UK. These can include transport (mainly road transport), both the use and production of energy, commercial / industrial premises and natural sources. The Government has identified eight key pollutants for which health-based limit values / targets are defined in the National Air Quality Strategy (NAQS), as shown in (Appendix 1):

- Nitrogen dioxide (NO₂);
- PM₁₀ particulates;
- Benzene;
- 1,3 – butadiene;
- Lead;
- Sulphur dioxide (SO₂);
- Carbon monoxide (CO); and
- Ozone (O₃).

Whilst this Air Quality Action Plan is primarily aimed at reducing NO₂, the initiatives within it will have a positive effect on the reduction of other air pollutants, especially particulates. The health implications of the three main transport emissions types are as follows:

2.2.1 Nitrogen Oxides (NO_x)

Nitrogen dioxide (NO₂) and nitric oxide (NO) are both oxides of nitrogen, collectively known as nitrogen oxides (NO_x). All combustion processes produce NO_x, primarily in the form of NO, which is then converted to NO₂, mainly due to reaction with ozone present in the atmosphere. Road transport is responsible for approximately 50% of the emissions of NO_x in Britain, whilst NO₂ has been identified as having various adverse health effects particularly on the respiratory system and in both asthmatics and non-asthmatics. Short term exposure to this pollutant can increase the likelihood of reaction to allergens such as pollen and has been known to increase asthma in some people. Children exposed to this pollutant may have increased risk of respiratory infections.

2.2.2 Particulates (PM₁₀)

Particles can be produced directly from combustion and other processes, as well as from natural activities. They can also be generated by chemical reaction in the air. Particulate matter with an aerodynamic diameter of 10µm or less is commonly referred to as PM₁₀. Particles can cause inflammation of the respiratory system and a worsening of the condition of people with heart and lung diseases.

3 Air Quality in Caerphilly County Borough

3.1 Local Air Quality Management evidence

The risk of an exceedance of the 2005 UK objective for annual mean NO₂ in central Caerphilly was first indicated by diffusion tube monitoring at White Street in 2004 and 2005. The exceedance area was investigated during the Detailed Assessment, which was carried out in 2006. The Detailed Assessment predicted that the UK annual average objective of 40 µg.m⁻³ for NO₂ in 2005 was being exceeded at relevant receptors in White Street between Van Road and Bartlett Street. The report recommended that CCBC declare an AQMA in Caerphilly Town Centre from September 1st 2008.

The AQMA was hence declared on 1st September 2008, for the area encompassing a number of properties along Clifton Street, White Street and Bartlett Street in Caerphilly and later extended to encompass a wider area including Nantgarw Road, Cardiff Road, Ton-y-Felin Road and the Piccadilly Gyratory.. The area within the AQMA has continued to exceed the NO₂ annual mean objective since declaration. The AQMA boundary is shown in Figure 3-1.

3.1.1 2007-12 automatic monitoring data

Table 3-1 shows statistics calculated from the hourly NO₂ data collected at the White Street continuous monitor, since it was located at the end of 2007. The annual mean NO₂ objective of 40 µg.m⁻³ was exceeded by almost 8 µg/m³ in 2008 (a 20% exceedance) though the magnitude of the exceedance has reduced quite markedly since that time- in 2012 the recorded annual mean was 41.8 µg.m⁻³.

Table 3-1: Continuous monitoring of NO₂ on White Street, Caerphilly

Caerphilly White Street continuous analyser	2008	2009	2010	2011	2012
Annual mean (µg.m ⁻³)	47.9	41.2	46.4	40.9	41.8
Data capture (%)	97	98	97	98	96
Number of hourly exceedences (> 200 µg.m ⁻³)	19	18	29	4	18

The hourly NO₂ objective has typically been exceeded a number of times in each year measurements have been taken, though has been achieved in 2009, 2011, and 2012. The emissions that lead to hourly exceedances are the same as those that contribute to the annual mean, so the measures in this plan should reduce concentrations and exceedances of both.

The plot in Figure 3-2 shows the typical levels recorded at the White Street monitoring site by hour of the day, and day of the week. The plot clearly shows that the highest measurements are associated with the busiest times of the day, and that weekdays have higher concentrations of NO₂ than weekends. It can also be seen that concentrations are higher in the winter months than in summer. This is further evidence of road traffic being the main contributing source of NO_x and NO₂ in the Caerphilly AQMA and hence it is a natural focus for this plan.

Figure 3-1:Caerphilly town centre AQMA (boundary in purple)

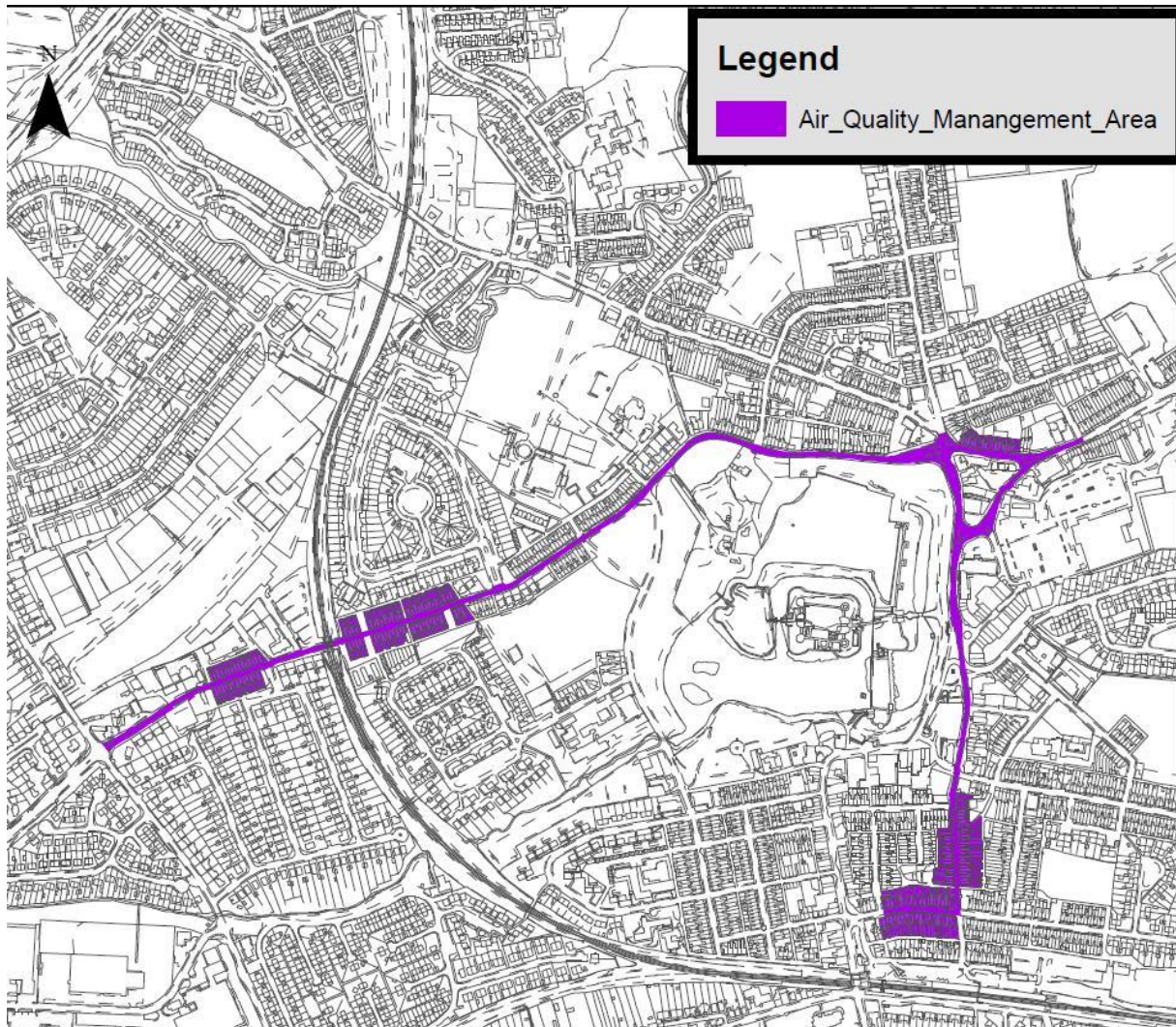
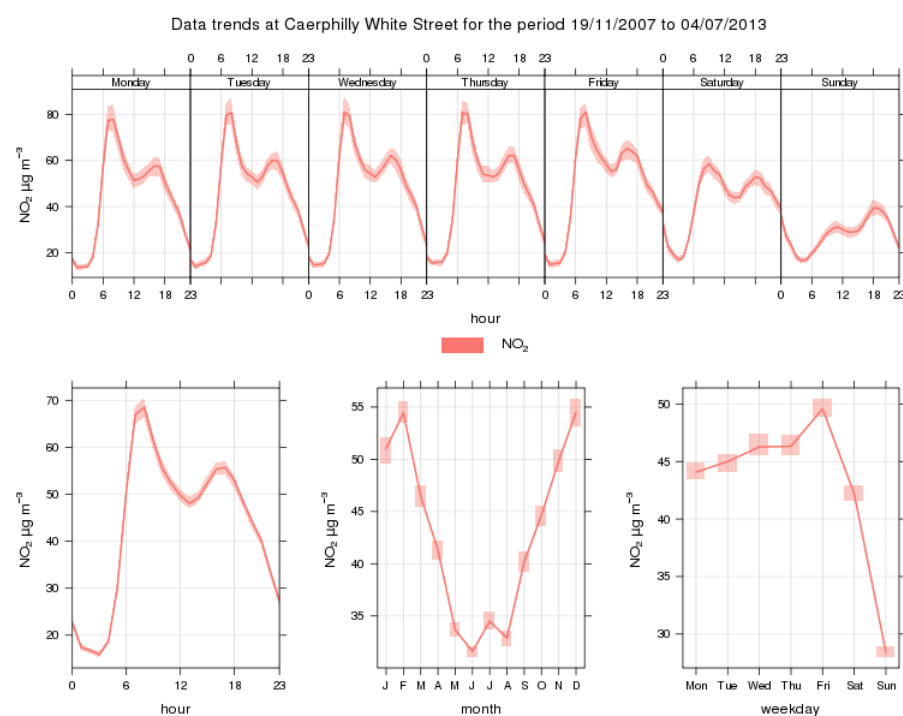


Figure 3-2 Concentrations of NO₂ at White Street at different times



3.1.2 2010-12 passive diffusion tube monitoring data

CCBC monitors NO₂ concentrations in the AQMA using passive diffusion tubes. A summary of annual mean results from 2010 to 2012 is shown in Table 3-2 below.

Table 3-2 2010 to 2012 diffusion tube results

Site	2010	2011	2012
CCBC19 White Street	55	58	50
CCBC33 White Street	52	54	49
CCBC34 White Street	33	29	30
CCBC35 White Street	32	31	36
CCBC38 Bartlett Street	42	44	43
CCBC39 Bartlett Street	36	34	34
CCBC40 Bartlett Street	41	31	28

The data above shows that overall, there is evidence of a general decrease in NO₂ over the past few years, and certainly since the Further Assessment was carried out. The exceedance area continues to be very localised with concentrations of NO₂ being heavily influenced by the street canyon topography at these locations.

3.1.3 Further Assessment of Air Quality

Before preparing an AQAP, the Council must undertake a Further Assessment of air quality in order to better understand the air quality problem at hand, and begin to think about ways to improve the situation.

The Further Assessment of air quality in the Caerphilly town centre AQMA was finalised in early 2010, using data recorded in 2008 to verify the model results. The exceedances of the NO₂ annual mean were identified as being dominated by emissions from local road traffic as there are no other significant sources within the locality and as such, road traffic is identified

as being the main source and should be the focus of any work done to remediate the problems in Caerphilly.

Monitoring and dispersion model results showed that exceedances of the annual mean NO₂ objective were observed in 2008 at several locations in Caerphilly with relevant exposure. More recent measurements suggest that this is still the case although the exceedances are probably not as significant given the quite marked reduction in NO₂ at the White Street monitoring station.

The modelling in the Further Assessment predicted improvements in NO₂ concentrations in the period 2008 to 2010 which have been somewhat borne out by recent measurements which have also shown a reduction in concentrations- NO₂ concentrations have further reduced in the period up to 2012. It is worth noting that the worst case receptor location in 2009 was experiencing concentrations of 54 µg.m⁻³ of NO₂, where recent monitoring from 2012 suggests this has reduced to around 50 µg.m⁻³.

As the fleet is gradually renewed, a reduction in emissions of NO_x is expected because of the gradual adoption of vehicle with better Euro Standards, which should continue to have a beneficial effect on NO₂ concentrations. However, there is inherent uncertainty in this assumption as local factors such as changing fleet mix or local growth due to planning decisions can offset any reduction caused by fleet modernisation.

As such, the worst case consideration would be to assume that if nothing were done to improve air quality in future years, concentrations of air pollutants will not improve at the hotspots in the town centre. All of this means that the aspiration to reduce NO_x emissions in the AQMA by 20% is still a reasonable objective for this plan, given the uncertainties described.

This conservative approach is central to this AQAP which recommends a careful approach to some of the measures that could have the greatest benefits, but which can only be realised through infrastructure improvements and which will require significant assessment of air quality benefits before being progressed.

3.1.4 Source apportionment

A source apportionment study is intended to provide evidence on which vehicle types are responsible for emissions of NO_x and hence concentrations of NO₂. This allows the action plan that follows to, where necessary, target certain fleet sectors that have the highest emissions.

The 2010 Further Assessment included a source apportionment study. The following sources of NO_x were considered at the monitoring locations currently operated by Caerphilly County Borough Council:

- Local background;
- Rural background;
- Moving vehicles;
- Queuing vehicles;
- Light duty vehicles (LDV- comprising cars, vans, motorcycles); and
- Heavy duty vehicles (HDV- comprising buses and HGVs).

The results of the study are shown in Table 3-3. The percentage contribution to total NO_x are broken down into three categories, 'Background', 'Road traffic' and 'Vehicle type', where 'Background' + either 'Road traffic' or 'Vehicle type' gives 100% NO_x.

The results indicate that the contributions from LDV and HDV are broadly similar across the AQMA. The impact of moving traffic is more significant than that from queuing vehicles, as shown in Figure 3-4. The exceptions are specific areas along Cardiff Road, Bedwas Road

and Bartlett Street. The results suggest that the White Street corridor is most affected by moving vehicles.

Table 3-3: Results of NO_x source apportionment study for Caerphilly town centre

Monitoring Location	% Contribution to total NO _x							
	Background			Road transport				
				Road traffic		Vehicle type		Total Road transport
	Local	Rural	Total	Moving	Queuing	LDV	HDV	
Automatic monitoring station, White Street	18.0	6.5	24.5	51.9	23.7	40.8	34.8	75.6
CCBC6 Ton Y Felin Road, Caerphilly	16.7	6.0	22.7	59.2	18.1	36.3	41.2	77.3
CCBC7 Cardiff Road	23.2	8.4	31.6	24.8	43.6	33.4	35.1	68.4
CCBC17 27 Bedwas Rd Caerphilly	26.0	9.4	35.4	25.4	39.2	30.1	34.8	64.6
CCBC18 22 Pontygwindy Road	30.4	11.0	41.4	53.8	4.8	28.7	29.8	58.6
CCBC19 11 White St	10.0	3.6	13.6	64.8	21.6	44.6	41.8	86.4
CCBC32 Colocation site	18.0	6.5	24.5	51.9	23.7	40.8	34.8	75.6
CCBC33 Lower left White St	13.6	4.9	18.5	60.7	20.7	42.2	39.3	81.4
CCBC34 Corner of Windsor and White St	18.8	6.8	25.6	51.1	23.3	40.2	34.3	74.4
CCBC35 Top right of White St	17.7	6.4	24.1	59.8	16.2	39.9	36.1	76.0
CCBC36 44/46 Bartlett St	19.5	7.0	26.5	69.6	3.9	38.5	34.9	73.5
CCBC38 Downpipe of 32 Bartlett St	21.4	7.7	29.1	42.5	28.4	37.6	33.2	70.9
CCBC39 18 Bartlett St	18.9	6.8	25.7	39.2	35.1	39.5	34.8	74.3
CCBC40 Corner of Broomfield and Bartlett St	18.0	6.5	24.5	39.0	36.6	40.0	35.5	75.6
CCBC45 38 Bedwas Rd	26.5	9.6	36.1	24.8	39.2	29.7	34.4	64.0
CCBC47 Wedding Shop	17.9	6.5	24.4	29.3	46.3	37.7	37.9	75.6

Note: Background + Road traffic = 100%; Background + Vehicle type = 100%.

The average source apportionment results are presented graphically in Figure 3-3 and Figure 3-4.

These results tell us that road traffic is strongly associated with the exceedances of the NO₂ objectives in Caerphilly. They also provide useful information as to which sections of the fleet are important sources of NO_x- in this instance the contributions from heavy and light vehicles are generally quite similar, and therefore both sectors should be targeted in this plan.

Figure 3-3: Average apportionment of NO_x for background and vehicle type sources in Caerphilly town centre

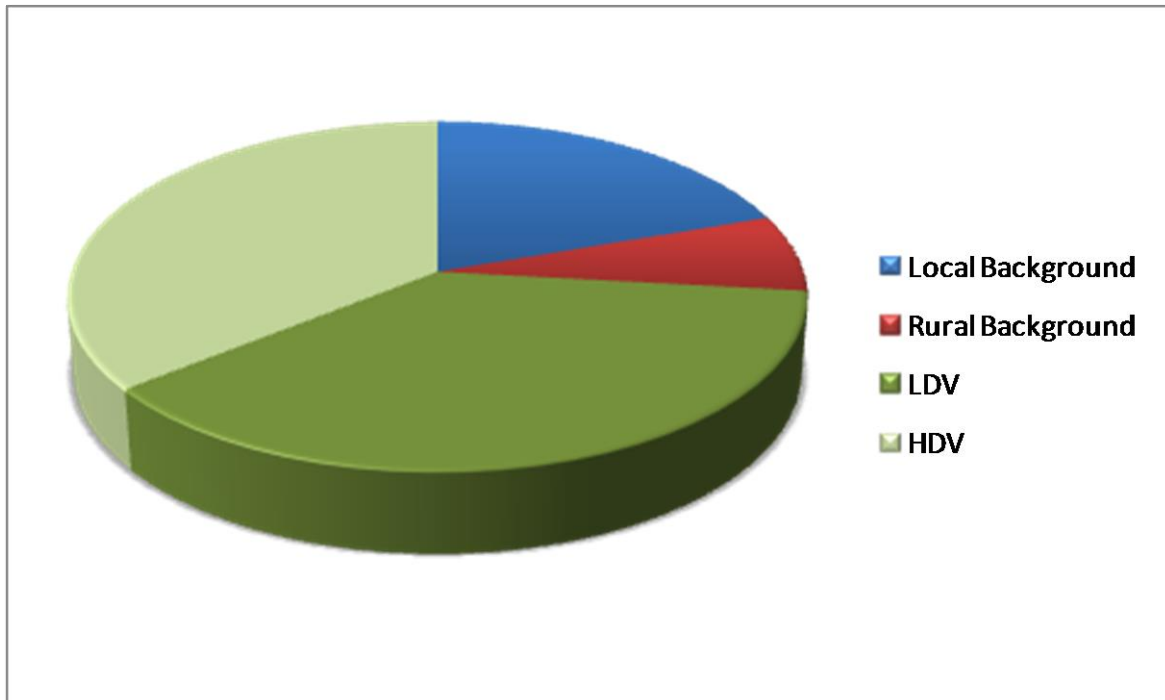
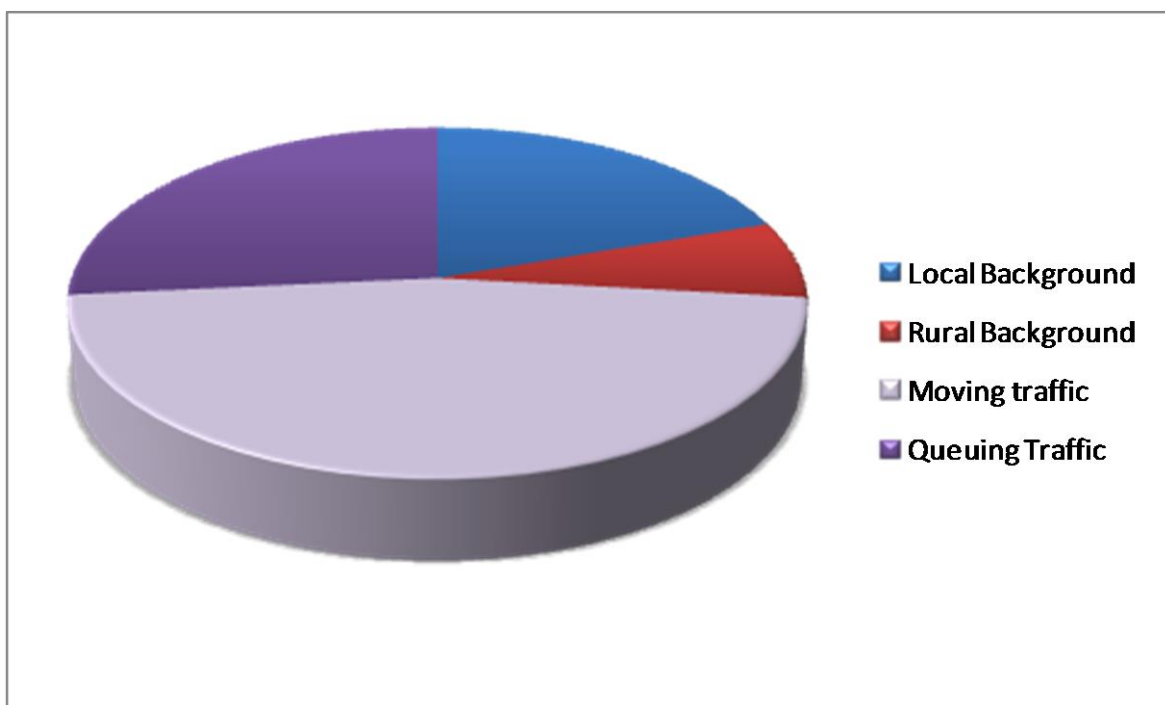


Figure 3-4: Average apportionment of NO_x for background and road traffic sources in Caerphilly town centre



It should be noted that topography plays a major role in the concentrations that arise from traffic emissions. In this instance the orientation of the street is undoubtedly causing poor dispersion of emissions and is resulting in concentrations in excess of the NO₂ annual mean objective.

In the AQMA the main topographical effect at play is the street canyons that are present in White Street and Bartlett Street (see Figure 3-5). Narrow streets with buildings on both sides limit dispersion of air pollutants- this can be as large a factor in high measured

concentrations as the emission themselves. There is little that can be done about the street canyons so the plan naturally must focus on the emissions aspect.

Figure 3-5 White Street- “street canyon”



Source: © 2013 Google

3.1.5 Air quality interventions modelled in the Further Assessment

A number of scenarios were modelled as part of the Further Assessment to identify the potential impact of proposed measures to improve road traffic flow and hence air quality in the town centre.

These were a mixture of interventions ranging from quite small changes to road traffic infrastructure in the town centre, through to large road programmes. It should be noted that this work was undertaken some time ago and hence the modelling will be revisited accordingly as part of this plan. That said, the benefits of the schemes should be broadly similar had the modelling been undertaken more recently as the measures were concerned with traffic flow redistribution i.e. the effect is a net change in vehicle numbers.

The potential effects of *four* short-term measures were modelled, with traffic data for each intervention supplied by Capita Symonds:

- Traffic signals at the Van Road / White Street junction with a left-turn prohibition from Van Road into White Street. The Zebra crossing on White Street replaced with a pedestrian phase in the signal staging;
- Southbound closure of Mountain Road over rail bridge;
- Reinstatement of vehicle detection at Bartlett Street traffic signals; and
- Right turn prohibition from Pontygwindy Road into Nantgarw Road.

As the effects of these four measures cannot be separated, they were referred to as the ‘basket’ of short-term measures.

Two long term measures were also considered:

- Dualling of Northern Bypass from Bedwas Bridge through Pwllypant Roundabout to Penrhos Roundabout; and
- Caerphilly South Eastern Bypass.

The four modelling scenarios were:

- Scenario 1: South- East bypass;
- Scenario 2: Basket of short term measures;
- Scenario 3: Basket of short term measures and dualling of Northern Bypass; and
- Scenario 4: Basket of short term measures and both long-term measures.

Annual mean concentrations of NO₂ modelled at the worst-case sensitive receptors on White Street, are presented in Table 3-4 for each of the modelled scenarios. The impact of each of the options in terms of the percentage change in annual mean NO₂ is given relative to the base scenario ('do-nothing'). All mitigation measures that have been modelled in the assessment are predicted to result in improved air quality through a decrease in the annual mean NO₂ concentration. However, the measures are not sufficient to reduce the concentration to achieve the annual mean objective of 40 µg.m⁻³ at all locations in the White Street AQMA.

All Short Term Measures- traffic effects in AQMA

As stated, the measures in question are primarily concerned with flow redistribution. The short term measures in combination cause traffic flow decreases of 2500 vehicles per day at Bartlett St, and increases of 4300 vehicles per day at Nantgarw Rd. This should be considered in light of the recent high concentrations observed and modelled at Nantgarw Road.

Nearly all of the Bartlett St decrease is due to the Mountain Rd southbound closure. The Nantgarw Rd increase is caused by both the Pontygwindy Road to Nantgarw Road right turn prohibition and the Mountain Road closure. Around half of the Nantgarw Road increase is caused by the Pontygwindy Road to Nantgarw Road right turn prohibition and the other half by the Mountain Road closure. Progressions of this basket of measures will have to be carefully considered in the context of the recent air quality evidence in the Nantgarw Road area of Caerphilly.

Short Term Measures and Dualling of Northern Bypass- traffic effects in AQMA

The Northern Bypass dualling causes a transfer of trips from the Nantgarw Rd Corridor and Bedwas Road corridor onto the Northern Bypass. The reduction on the Nantgarw Road AQMA is 3600 vehicles per day. The resulting flow, however, is still 700 vehicles per day greater than the baseline. The impact on the Caerphilly Town Centre AQMA is thought to be minimal.

Short Term Measures, Dualling of Northern Bypass and SE Bypass- traffic effects in AQMA

The South Eastern Bypass provides a new through route to the south and catches trips that were diverted by the Mountain Road Closure along with other more local trips. The net effect is a further reduction of 2600 vehicles per day on Nantgarw Road. This reduces the flow to 1900 vehicles per day below existing levels.

The greatest impact is seen for Scenario 4, when all long- and short-term measures are predicted to result in a 17% decrease in the NO₂ annual mean. On their own, the four short-term measures included in the 'basket' are predicted to result in a 13% decrease in the NO₂ annual mean concentration (Scenario 2; -7.1 µg/m³), whilst the south-east bypass is predicted to improve the annual mean NO₂ by 8%.

Table 3-4: Annual mean NO₂ concentration and impact of Scenarios 1-4 at eastern side of White Street.

Scenario	Baseline Annual mean NO ₂ (µg/m ³)	Difference relative to Base	
		µg/m ³	%
Base - No measures	54.4 *	n/a	n/a
Scenario 1	49.8	-4.6	-8%
Scenario 2	47.3	-7.1	-13%
Scenario 3	45.6	-8.8	-16%
Scenario 4	45.1	-9.3	-17%

Note: * base concentration is derived from 2008 monitoring data at the worst case receptor on White Street.

More recent measurements taken in White Street show a reduction in concentrations of NO₂ and so the results presented above should be interpreted in this light- the most recent worst case concentration of NO₂ is 50 µg.m⁻³ and covers a very small area in White Street. The reductions in NO₂ required to achieve the objectives now are likely to be less given the reduction to 2012- though the level of improvements associated with the measures above is expected to be broadly similar, albeit applied to a lower baseline concentration. Using the 2008 data however provides a conservative underpinning to this plan however.

Clearly the measures modelled in the Further Assessment have shown the potential to reduce concentrations of NO₂ in the Caerphilly Town Centre AQMA through road infrastructure developments. However what the modelling also shows is that the impact of the measures can be complex to estimate given that in reality a combination of the modelled measures could be progressed, all with subtle variations in effect- not only in the AQMA itself, but in the wider Caerphilly area. For this, and for other reasons already outlined, it would be prudent for this plan to further develop the evidence around these potential interventions before they are progressed. This will require a significant amount of additional modelling work, but will result in a much more robust basis for determining the air quality benefits of infrastructure works in Caerphilly.

3.1.1 Required reduction in ambient NO_x concentrations

The required reduction in ambient NO_x concentrations to attain the objectives allows the Local Authority to judge the scale of the effort required to comply with the NO₂ annual mean objective. For NO₂, the required reduction in road contribution to ambient concentrations should be expressed in terms of NO_x as a non-linear relationship exists between NO_x and NO₂ concentrations.

Considering data recorded in 2008, the ambient concentration of NO_x required to achieve the annual mean objective for NO₂ at the locations of worst case relevant exposure were derived using the Defra NO_x/NO₂ model (CCBC, 2010). The largest predicted reduction of NO_x from road transport that would be required to comply with the annual mean NO₂ objective of 40 µg.m⁻³, is 49.5%. This corresponds to a 26.5% reduction in NO₂.

It should be noted that these figures were calculated some time ago, and hence the level of reduction required is now likely to be much less (given the large reduction in measured concentrations at the automatic analyser and some of the diffusion tube sites). Using 2012 worst case data, a reduction in NO₂ of 20% is required. The aim of this plan is to reduce NO_x emissions in the AQMA by around 20% which is a more realistic benchmark- no intervention that could be reasonably implemented by the Council would deliver a NO_x reduction of nearly 50%.

4 Focus of AQAP and Existing Actions

The findings of the source apportionment exercise should be used to inform this draft Air Quality Action Plan. In general, measures aimed at reducing the amount of moving traffic will have a beneficial effect at all locations. Since queuing traffic is also an important source, measures to improve this should also be considered. It is likely that much of the queuing in Caerphilly relates to the roads being used beyond their capacity. It is hence anticipated that measures to reduce the amount of moving traffic through the town will improve congestion and queuing traffic, and potentially have a beneficial impact on ambient concentrations of NO₂.

It is thought that emissions of NO_x in the AQMA would be reduced most effectively by traffic management measures given that the AQMA is spatially quite small, hence such measures form the bulk of this plan. These will require more evidence as to their effectiveness before implementation.

A relatively large proportion of the vehicle fleet that uses White Street, travelling through the AQMA in Caerphilly, is made up of HDVs, including buses. White Street is a major bus route, used to access the bus station which is located on Station Terrace, running parallel to Bartlett Street. Since emissions of pollutants are proportionately greater per HDV than per car, a significant impact is likely to be made by targeting emissions from buses moving along White Street and/or Bartlett Street.

Although exceedances of NAQS objectives in areas outside the White Street / Bartlett Street AQMA are beyond the scope of this report, all proposed measures should be assessed with the junction of Pontygwindy Road and Ton y Felin Road in mind, and also the Nantgarw Road corridor which also has quite high concentrations of NO₂ from road traffic. Where appropriate, discussion of the impact of the measure upon air quality at this junction has been made.

Investigation into the possibility of a Bus Quality Partnership should consider the feasibility of permitting access through the AQMA in Caerphilly town centre to only those buses with newer, cleaner emissions technology. This may be supported by Sewta:

- Bus Policy 3 of the Sewta RTP states that 'Sewta supports regional quality standards for all bus services and the associated infrastructure';
- Bus Action 2 states that 'Sewta will work with operators to improve the reliability, frequency and timetabling between services, and the quality of vehicles, including proposals to reduce vehicle emissions'.

4.1 Summary of actions underway to improve air quality

All AQAPs involve a number of measures that will be taken forward by the Council, and some that will be progressed by partner organisations. It is also important to capture work that is already being undertaken by the Council and others so that their air quality benefits may inform action planning. This section explores actions already being taken by CCBC and their partners in this regard.

In particular, the actions with a potential benefit to air quality that will be undertaken by CCBC's regional transport partners Sewta should be considered as supplementary to this

plan as measures already being progressed regionally could benefit air quality locally in Caerphilly. CCBC is a major partner in this organisation, providing both funding and operational support so it is sensible to include actions in the Sewta delivery plan in this AQAP as appropriate.

This sections explains the current activities being undertaken by Sewta and highlights some measures that are being progressed which could improve air quality in Caerphilly. More information on these and other measures affecting the wider South Wales area can be found in Sewta's RTP documents and annual delivery plans.

4.1.1 South East Wales Transport Alliance, Sewta

Sewta is an alliance of 10 local authorities in South East Wales (including CCBC), which prepares and co-ordinates regional transport policies, plans and programmes on behalf of its constituent councils. It prioritises the regional capital transport programme and formulates funding applications in pursuit of the programme. While local authorities implement individual capital schemes, and manage and maintain the assets created, Sewta manages the overall programme, and monitors progress of implementation and expenditure.

Sewta provides guidance to member councils on scheme development and monitoring. It also provides advice to member authorities on transportation issues and responds to related consultations.

Sewta has adopted a number of objectives with regard to the environment, including;

- To reduce significantly the emission of greenhouse gases from transport;
- To reduce the impact of the transport system on the local street scene and the natural, built and historic environment; and
- To promote sustainable travel and to make the public more aware of the consequences of their travel choices on climate, the environment and health.

Sewta submitted its first Regional Transport Plan (RTP) to the Welsh Assembly Government (Welsh Government) in December 2009. The RTP was prepared in accordance with Welsh Government guidance and is the product of extensive consultation, listening to the views and ideas of stakeholders, partners and the public. The RTP contains a prioritised five year capital programme of regional and local transport interventions, which includes a breakdown by category, an implementation timetable, scheme costs, state of readiness indication, reserve schemes and project management proposals.

The RTP is a statutory plan which sets out an integrated and sustainable transport strategy for South East Wales. The plan includes

- a strategic framework, setting out the issues, analysis, vision, aims, and policies
- an implementation programme identifying actions, proposals and a five year programme
- a monitoring and review mechanism

As the RTP has a focus on environmental improvement, some of the measures included therein could have a benefit on air quality in Caerphilly.

Whilst the objectives provide a basis for transport interventions in the region, it must be recognised that Sewta's resources are likely to be limited. Eight priorities have been developed to steer Sewta's activities and investment over the next five years (in priority order):

1. To improve access for all to services, facilities and employment, particularly by walking, cycling and public transport;
2. To increase the proportions of trips undertaken by walking, cycling and public transport;
3. To minimise demand on the transport system;

4. To develop an efficient, safe and reliable transport system, with improved transport links between the 14 key settlements in South East Wales, and between South East Wales and to the rest of Wales, the UK and Europe;
5. To provide a transport system that encourages healthy and active lifestyles;
6. To reduce significantly the emission of greenhouse gases and the impact of the transport system on local communities;
7. To ensure developments are accessible by sustainable transport and to make sustainable transport and travel planning an integral component of regeneration schemes; and
8. To make better use of the existing transport system.

Sewta's RTP outlines three key policy areas with a series of actions that will be taken under each. Many of these are concerned with sustainable travel options, and trying to influence the planning process so as to minimise road traffic generation. Clearly some of these measures contained in Sewta's plan could have air quality benefits in the South Wales area, some of which could be realised in Caerphilly. The Figures below outline these in more detail.

Figure 4-1 Sewta Planning Policies and Actions (Sewta RTP)

Table 1 - Planning Policies and Actions
<p>Planning Policy 1: Sewta supports improved public transport links between the 14 WSP key settlements, and equivalent neighbouring settlements in Mid and South West Wales and adjoining regions in England, and between the WSP key settlements, other core market towns (e.g. Monmouth) and their hinterlands.</p>
<p>Planning Policy 2: Sewta supports improved sustainable transport links to the 'Strategic Opportunity Areas' identified in the WSP.</p>
<p>Planning Policy 3: Sewta will seek to ensure that Local Development Plans, supplementary planning guidance and development control processes establish a pattern of land use that reduces the need to travel and maximises the potential for sustainable transport infrastructure and services (including car-free housing developments), secure contributions towards improvements to the transport network and ensure that all significant development proposals are accompanied by effective travel plans.</p>
<p>Planning Policy 4: Sewta opposes land use proposals which will adversely affect transport networks, or which will conflict with the objectives, policies and proposals of the RTP.</p>
<p>Planning Policy 5: Sewta supports the transport elements of regeneration and development programmes where they are to the benefit of RTP objectives, make provision for pedestrians, cyclists and public transport and do not adversely affect the operations of the highway network.</p>
<p>Planning Action 1: Sewta will develop improved public transport links between the 14 WSP key settlements, and equivalent neighbouring settlements in Mid and South West Wales and adjoining regions in England, and between the WSP key settlements, other core market towns (e.g. Monmouth) and their hinterlands.</p>
<p>Planning Action 2: Sewta will seek to ensure that Local Development Plans contain appropriate planning obligations policies.</p>
<p>Planning Action 3: Sewta will seek to ensure that the location of public services is guided by the use of accessibility analysis to ensure services are provided in locations that reduce the need to travel by car.</p>

Figure 4-2 Sewta Walking and Cycling Policies and Actions (Sewta RTP)

Table 2 - Walking & Cycling Policies and Actions
Walking & Cycling Policy 1: Sewta supports improved infrastructure for walking and cycling.
Walking & Cycling Policy 2: Sewta supports consistent regional design standards for walking and cycling infrastructure to improve provision for pedestrians and cyclists in new or regenerated developments.
Walking & Cycling Action 1 Sewta will develop plans for improved walking and cycling infrastructure, including urban cycle networks, secure cycle parking provision, better cycle facilities at bus and rail stations and the reallocation of road space for walking and cycling.
Walking & Cycling Action 2 Sewta will develop common regional design standards for walking and cycling infrastructure to improve provision for pedestrians and cyclists in new or regenerated developments.
Walking & Cycling Action 3: Sewta will develop plans for the provision of cycle carrying facilities on trains and buses.

Figure 4-3 Sewta Smarter Choices Policies and Actions (Sewta RTP)

Table 3 - Smarter Choices Policy and Actions
Smarter Choices Policy 1: Sewta supports the promotion, development and marketing of sustainable travel choices (Smarter Choices agenda) including travel planning, home-working, teleconferencing, car sharing, car clubs and personal travel plans.
Smarter Choices Action 1: Sewta will implement an ongoing, high quality campaign promoting the importance of sustainable travel choices and the impact on health and well-being.
Smarter Choices Action 2: Sewta will continue to promote and develop a regional car sharing system.
Smarter Choices Action 3: Sewta will assist, coordinate and monitor travel plan development and implementation.
Smarter Choices Action 4: Sewta member authorities will each develop, implement and monitor organisational travel plans for staff and visitors.
Smarter Choices Action 5: Sewta will promote regional travel planning best practice advice and guidance.

Figure 4-4 Sewta Rail Policies and Actions (Sewta RTP)

Table 4 - Rail Policies and Actions
Rail Policy 1: Sewta supports improvements and further extensions to the regional rail system.
Rail Policy 2: Sewta supports capacity improvements to facilitate increased movement of freight by rail.
Rail Action 1: Sewta will develop plans to improve the regional rail system, including plans for train/platform lengthening, line speed increases, frequency improvements, rolling stock improvements, station upgrades, capacity enhancements and to make services more accessible.
Rail Action 2: Sewta will develop plans to extend the rail system through line and station re-openings.

Figure 4-5 Sewta Bus Policies and Actions (Sewta RTP)

Table 5 - Bus Policies and Actions
Bus Policy 1: Sewta supports further improvements to the regional bus network
Bus Policy 2: Sewta supports the introduction of a more efficient and effective bus regulatory system.
Bus Policy 3: Sewta supports regional quality standards for all bus services and the associated infrastructure.
Bus Action 1: Sewta will develop measures that aim to reduce bus journey times and their variability, including the reallocation of road space, bus lanes, junction priority measures and civil parking enforcement.
Bus Action 2: Sewta will work with operators to improve the reliability, frequency and timetabling between services, and the quality of vehicles, including proposals to reduce vehicle emissions.
Bus Action 3: Sewta will develop measures to improve accessibility to services, vehicles and infrastructure, and to enhance the safety and security of users.
Bus Action 4: Sewta will develop regional standards to ensure concessionary passes are issued in a fair, timely and efficient manner, including a consistent approach to eligibility assessment and the retention of a common approach to operator reimbursement.

Figure 4-6 Sewta Flexible Transport Policies and Actions (Sewta RTP)

Table 6 - Flexible Transport Policy and Action
Flexible Transport Policy 1: Sewta supports flexible transport services, including Demand Responsive Transport and Voluntary and Community Transport that compliment and enhance the mainstream transport system.
Flexible Transport Action 1: Sewta will develop a flexible transport initiatives that compliment and add to the mainstream transport system through an enhancement programme.

Figure 4-7 Sewta Flexible Transport Policies and Actions (Sewta RTP)

Table 7 - Integration Policies and Actions
Integration Policy 1: Sewta supports further improvements and expansion of public transport interchanges and Park & Ride facilities.
Integration Policy 2: Sewta supports a single integrated ticketing system for the regional public transport network.
Integration Policy 3: Sewta supports consistent high quality standards for public transport information provision across the region.
Integration Action 1: Sewta will develop plans for public transport interchanges at the 14 key settlements and other appropriate locations. including the reallocation of road space, bus lanes, junction priority measures and civil parking enforcement.
Integration Action 2: Sewta will develop consistent high quality criteria for interchange facilities to enable consistency across the region e.g. for signage, information and waiting facilities.
Integration Action 3: Sewta will develop plans for Park & Ride and Park & Share facilities across the region.
Integration Action 4: Sewta will develop plans for integrated ticketing across the region, including consideration for smart-card based schemes, for cash-less ticketing and for off-vehicle purchase.
Integration Action 5 Sewta will develop a public transport information programme.

We now provide a summary of measures included in Sewta's recent delivery plans that could benefit air quality in Caerphilly. Some measures are complete but it is important to show work that has been carried out, and that which is still ongoing.

Walking and cycling measures- Caerphilly Basin Radial Routes

The Sewta RTP places an important emphasis on walking and cycling. Once such project delivered through the RTP is the a new cycling route which provides a continuous link from the community of Senghenydd in the Aber Valley to Caerphilly Town Centre where it links with the National Cycle Network Route 4. The cycle route received £350k funding through the RTP in 2010/11 and was completed in 2011/12. The RTP commits Sewta to monitor the outputs and outcomes of all interventions- in relation to walking and cycling schemes the primary outputs will be the number of new routes developed and the increase in route length for extensions to existing routes. Setwta will also monitor use/patronage on the route. This measure could benefit air quality by reducing the traffic flow into Caerphilly town centre.

In addition, the Core-route enhancement programme will seek to enhance existing routes across the region by undertaking a range of small-scale improvements e.g. surface improvements, better route access, cycle parking, improved signage and safety and security measures.

Travel planning measures- Sewta Travel Plan Grant Programme

Sewta operates a grant scheme to support and promote sustainable transport initiatives and the development of workplace travel plans. The Welsh Government also funds Sewta to employ two Regional Travel Plan Coordinators (RTCPs) to help in delivering the smarter choices agenda across the region. The Sewta RTCPs continue to work to deliver a travel planning work programme across all ten member authorities (CCBC included) in line with the smarter choices policies and actions contained in the RTP. The RTCPs also manage the Travel Plan Grant Programme.

Regional car share scheme

Sewta is already operating an open access regional car share scheme. The scheme aims to increase and improve communication between parties interested in more sustainable travel, such as lift sharing or car sharing. The scheme website is free to use (<http://wales.carbonheroes.com/>), and whilst it is not intended to be a service, it is a method by which individuals may initiate contact with each other and arrange lift sharing. The user registers themselves and their journey through www.liftshare.com, and may subsequently search for people making a similar journey. The site can also be used to find a BUDi with whom to share a bike, taxi or walking journey. The site aims to encourage more sustainable forms of travelling, with the following benefits for participants:

Save money;

- Reduce pollution from car emissions;
- Provide company on the journey;
- Reduce local congestion;
- Save time;
- Motivation to do some exercise;
- Safety;
- Opportunity to make new friends and meet neighbours;
- Reduce the use of limited fossil fuels.

CCBC- School Travel Plans

There are currently 52 school travel plans in place since the scheme started in Caerphilly County Borough Council in 2003. A breakdown of participating schools is provided in Table 4-1 below.

Table 4-1 Schools with travel plans in CCBC area

Participating schools				
Rhymney Comprehensive School	Tyn-y-Wern Primary School	Graid-y-Rhacca Primary School	Pontllanfraith Primary School	St Martins Comprehensive School
Hengoed Primary School	Machen Primary School	Hendre Junior School	Ysgol-y-Lawnt	White Rose Primary School
Ysgol Gynradd Gymraeg Caerffili	Pengam Primary School	Twyn Primary School	Bedwas High School	Cwmaber Junior School
Glyn Gaer Primary School	Ysgol Cymraeg Trelyn	Cwmcarn Primary School	St James's Primary	Libanus Primary School
St Gwladys Primary School	Hendredenny Park Primary School	St Cenydd Community School	Greenhill Primary	Ty Isaf Infants School
Cwrt Rawlin Primary School	St Helens RC Primary School	Blackwood Comprehensive school	Ysgol Gymraeg Bro Allta	Ysgol Cwm Gwyddon
Bryn Primary School	Plas-y-Felin Primary School	Deri Primary School	Ystrad Mynach Primary School	Cwmifor Primary School
Risca Primary School	Markham Primary School	Rhydri Primary School	Nant-y-Parc Primary School	Pantside Primary School
Newbridge Comprehensive School	Blackwood Primary School	Cwmaber Infants School	Ynysddu Primary School	Bedwas Junior School (draft only)
Aberbargoed Primary School	Bryn Awel Primary	Ysgol Penalltau	Bedwas Infants	Abercarn Primary
Ysgol Bro Sannan	Fleur-de-Lis Primary			

All primary schools are invited to take part in Walk to School Week in May and Walk to School month in October. Each school is given resources to help make the week a success. Competitions are run throughout the week with the Walking Buses. There are now 16 Walking Buses in operation at local schools.

As this group of measures is already underway, CCBC will report on how the operation of these plans in annual AQAP progress reports submitted to Welsh Government.

5 Air Quality Action Plan options and their assessment

5.1 Introduction

This section outlines the AQAP options that have been explored by CCBC, details which will be taken forward and why, and outlines some of the key decision making processes.

We hope the plan demonstrates that CCBC are already trying to improve air quality in Caerphilly through existing initiatives, while committing to additional work to allow us to progress towards achieving the objectives.

To recap- the AQAP should include:

- Quantification of the source contributions to the predicted exceedences of the objectives, allowing the Action Plan measures to be effectively targeted;
- Evidence that all available options have been considered on the grounds of cost-effectiveness and feasibility;
- How the local authority will use its powers and also work in conjunction with other organisations in pursuit of the air quality objectives;
- Clear timescales in which the County Borough Council and other organisations and agencies propose to implement the measures within the plan;
- Quantification of the expected impacts of the proposed measures and where possible an indication as to whether the measures will be sufficient to meet the air quality objectives; and
- How the local authority intends to fund, monitor and evaluate the effectiveness of the plan.

5.2 Air Quality Action Plan Steering Group

In the development of the AQAP, a Steering Group has been set up. The Group has guided and consulted on the development of the AQAP, which has subsequently been influenced by local knowledge. Caerphilly County Borough Council has also commissioned a technical consultant (Ricardo-AEA) to provide additional guidance and to help in the development of the AQAP.

The Steering Group has the following objectives:

- To facilitate a further detailed assessment of the air pollution problems and source apportionment of emissions between the different possible sources;
- To identify, develop, consider, assess and analyse all options and measures presented for inclusion in the Caerphilly Town Centre Air Quality Management Area Action Plan;
- To initiate a public consultation programme to ensure effective public participation;
- To produce the final Action Plan for Caerphilly Town Centre Air Quality Management Area;
- To report on a regular basis to the Regeneration and Environment Scrutiny Committee.

5.2.1 Inception Meeting of the Caerphilly AQAP Steering Group

The first Steering Group 'inception meeting' was held on 11th September 2008, with attendees including officers from various sections within the Council, representatives from the Local Health Board and the Environment Agency, councillors and ward members from St. Martin's, St. James' and Morgan Jones wards, representatives from local residents and business associations.

5.3 Initial assessment of options

A wide range of options to reduce emissions from road transport was put forward for consideration by the Steering Group at the second meeting, held on 19th March 2009. It should be noted that the County Borough Council does not necessarily have the power to implement all options directly. However the Council may potentially have a role in attempting to influence those bodies or individuals that could implement them. Therefore, it is appropriate to initially consider all options.

Measures put forward for consideration can be considered to come under certain 'types' of measure, including:

- Strategic actions;
- Movement of receptors and/or sources away from the AQMA;
- Optimisation of emissions source movement through the AQMA;
- Reduction of emissions from sources by technical means; and
- Reduction of emissions from sources through reduction in demand for travel, or achieving better travel choices.

The Steering Group and Technical Officers provided an initial assessment of the feasibility and applicability of the types of options in October 2009. A decision was reached for each option; either to eliminate it from further consideration, or to consider the option in greater detail. The decisions were made with reference to:

1. Conclusions drawn from the Detailed and Further Assessments of air quality in the Caerphilly AQMA (see Chapter 3);
2. Comments received from the Steering Group; and
3. Additional comments from Caerphilly County Borough Council's consultant, based upon experience of previous assessments.

The full list of potential options put forward for further consideration, specifically targeting road transport issues in Caerphilly AQMA, is presented in Appendix 4 under the following headings:

- Traffic management and highways;
- Soft measures;
- Third party initiatives; and
- Non-feasible options (eliminated following their initial assessment).

The measures listed as 'non-feasible' have been excluded from further consideration at this time, as they were either not considered feasible, or were not believed to have an appropriately targeted impact on the predominant sources of emissions identified in the further assessment.

Caerphilly County Borough Council intends to develop all of the remaining measures for inclusion within the Air Quality Action Plan. These measures include several new measures that will require further development and assessment prior to implementation. Also included are numerous measures that are in the process of being implemented by the County

Borough Council but which may require some modification or supplementation in order to make a more significant contribution to improving local air quality in the Caerphilly town centre AQMA and also meet future reporting requirements.

5.4 Impact assessment of options

Welsh Government requires Local Authorities to consider measures they have identified within their action plans according to their cost and the improvements to air quality that each measure might bring. A detailed cost benefit analysis is not required as it would be both impracticable and technically difficult to quantify the air quality impacts associated with every proposed measure in the AQAP. We have assessed the cost and benefits using a simple matrix approach based on the best judgement of the steering group

We have attempted to predict the potential air quality benefits of the options using the professional judgement of the steering group and experiences gained by other Local Authorities. CCBC believe that the plan, if fully implemented (including the more ambitious measures that still require significant efforts to develop the evidence base) will allow CCBC to achieve the objectives although we cannot say at this moment when this will occur. We note that predictions across the UK that air pollution arising from traffic would reduce over time have not been realised in some circumstances (despite more stringent Euro standards), so we are reluctant to make such a prediction here. Suffice to say, business as usual is not an option for CCBC as there would then be no prospect of achieving the objectives at all locations in Caerphilly.

It is proposed that CCBC keep the impact of the plan under periodic review, with use of modelling as appropriate to assess the impact of the measures as they develop. Many of the measures in the plan are at very early stages of development, and will need a significant amount of feasibility work, though the potential benefits (but potentially high costs) from them warrant this careful approach. It is our intention to assess the air quality impact of these initiatives as part of overall feasibility work and report the outputs of studies as they arise in future progress reports. Clearly, if some of the more ambitious initiatives cannot be taken forward the emphasis will shift to the rest of the plan, and the AQAP may need revision. Therefore, if the best available evidence suggests that the plan is not going to deliver the necessary air quality benefits, we are committed to revise it as required.

5.4.1 Available strategies and feasibility of options

Making links with the Regional Transport Plan (RTP)

Four Regional Transport Consortia have been established in Wales following the additional powers conferred on the Welsh Government under the Transport Wales Act 2006 and the Railways Act 2005. The Transport Wales Act requires Welsh Government to produce a Wales Transport Strategy, and gives it new powers to promote regional transport planning and to take direct control of local and regional rail services in Wales. Welsh Government has approved a Regulatory Order to remove the requirement for the twenty-two local authorities in Wales to produce Local Transport Plans and instead, has introduced the requirement for Regional Transport Plans (RTP) to be prepared by the four Transport Consortia.

The relevant RTP to Caerphilly was prepared by the South East Wales Transport Alliance (Sewta) a consortium of ten local authorities; Blaenau Gwent, Bridgend, Caerphilly, Cardiff, Merthyr Tydfil, Monmouthshire, Newport, Rhondda-Cynon-Taf, Torfaen and the Vale of Glamorgan. Sewta submitted its Final Regional Transport Plan to Welsh Government on 30th September 2009 (Sewta, 2009).

Sewta's RTP states that,

'dependence on the car is one of the main causes of poor health in the area, with clear social and economic consequences. The problem is closely linked to a

reduction in walking, with men walking 40% less than 15 years ago, and women 25% less'.

The key issues for the Sewta RTP include:

- Access to key facilities and services e.g. healthcare and educational facilities;
- Social exclusion and severance;
- Congestion and access to employment;
- Impact of regeneration and economic development on the transport network;
- Integration of land use and transport planning; and
- Impact of transport on the environment.

The wider goals of the Sewta RTP are:

1. To develop the economy, through improving connectivity for business and freight, making transport more effective and efficient, providing access to employment, education, shopping and leisure, and by improving transport integration;
2. To promote social inclusion and equality, by providing a transport system that is safe, accessible, and affordable to all sections of the community; and
3. To protect the environment, by minimising transport emissions and consumption of resources and energy, by promoting walking, cycling, quality public transport, modal shift and minimising demand on the transport system.

To ensure that these goals are achieved, the RTP gives Key Performance Indicators (KPI) which will be used to measure the success of the plan, two of which relate specifically to air quality- RTP KPIs are shown in Table 5-1.

Table 5-1 RTP Key Performance Indicators

Obj Ref	Objective	Sub Ref	Indicator(s)	Data Source(s)	Trend Outcome
9	To reduce significantly the emission of greenhouse gases from transport	9a	Number of buses meeting relevant Euro vehicle emissions standard	Bus ops	Increase
		9b	Air Quality at AQMA	Air Quality Management Site data	Increase
		9c	VOSA Bus and HGV roadside surveys results	VOSA (to be confirmed)	Reduce
10	To reduce the impact of the transport system on the local street scene and the natural, built and historic environment	10a	Number of buses meeting relevant Euro vehicle emissions standard - refer 9a	Bus ops	Increase
		10b	No of Air Quality Management Areas (AQMA)	Air Quality Management Site data	Increase
		10c	Number of pedestrianisation schemes implemented	UA	Increase

Measures included in the RTP aim to promote walking or cycling as the preferred means of travel for shorter journeys, such as improving the existing Sewta Walking & Cycling programme. Existing routes close to Caerphilly include:

- C17 Caerphilly Basin / Town Centre – Radial Routes;

- C20 & C23 Rhymney Valley Linear Route & HotV's to Bedwas/Caerphilly;
- MT2 Extension to the Taff Trail to provide a western link across the Heads of the Valleys into RCT along with an eastern link into Caerphilly CB.

Improvements in rail transport to encourage the use of public transport over car travel are included in the Sewta Rail Strategy Prioritised Investment Programme. Measures affecting rail transport around Caerphilly include the prioritisation of improved frequency of services from Queen Street North to Cogan Junction in order to provide a reliable 'turn up and go' service within Cardiff's core journey to work area through:

- Additional platforms at Cardiff Central and Queen Street;
- Remodelling of Cogan Junction;
- Turnback facilities at Caerphilly and Pontypridd; and
- Track and signal enhancements.

The regional rail programme will be implemented predominantly by Welsh Government, and directly funded from Welsh Government's rail budget. Sewta has prioritised schemes that would hope to see funded by Welsh Government in the short to medium term, including capacity improvements to enable an additional service every hour between Cardiff and Caerphilly.

The main recommendation of the bus investment programme study is to focus on improvements to strategic network routes, including Blackwood / Bargoed – Ystrad Mynach – Caerphilly – Heath – Cardiff corridor.

Under Section 106 of the Town and Country Planning Act 1990, local authorities can seek to enter into planning obligations with developers in respect of the use or development of land or buildings. Section 106 agreements are increasingly used with regards to value transport in the County Borough.

5.5 Development of proposed measures

The shortlist of measures generated by the Steering and Technical Officers Groups has been further developed and divided into three types of measures:

1. Actions to take forward in the draft Air Quality Action Plan;
2. Actions for which further assessment of feasibility is required; and
3. Actions which are already underway, and whose progress should be recorded.

Each of the measures short-listed for further consideration in the draft plan are discussed in more detail below, including the relevant authorities responsible for implementation, and the powers available to implement the given measures. The shortlist of options to put forward for further assessment has been arranged under the following headings:

- Traffic management and highways;
 - o Short-term measures;
 - o Long-term measures;
 - o Public transport;
 - o Alternative transport;
- Education and improved awareness;
- Third party initiatives.
- Planning;

5.5.1 Traffic management and highways

A number of 'short-' and 'long-term' road infrastructure measures have been proposed to help improve air quality in Caerphilly town centre. The impacts of four short-term measures were modelled together in the 2009 Further Assessment as a 'basket' of short-term measures. As such the quantitative impact on air quality cannot be separated for each of the measures, and the proposed short-term measures are described below as a single option.

These options will require further modelling work to better ascertain their potential air quality benefits. This will mean that this plan will be subject to change according to the outcomes of those studies.

Short-term options

Table 5-2: Basket of short term road infrastructure / management measures

Definition		Key Intervention
<p>a) Assess (through modelling) the air quality benefits of replacing the zebra crossing at White Street with a signalised crossing and prohibit the left turn from Van Road onto White Street</p> <p>b) Assess (through modelling) the air quality benefits of closing Mountain Road over the rail bridge to Southbound traffic</p> <p>c) Refurbishment of the vehicle detection at Bartlett Street traffic signals</p> <p>d) Assess (through modelling) the effect of a right turn prohibition from Pontygwindy Road into Nantgarw Road</p>		<p>Reduce road traffic congestion in Caerphilly town centre through reduction in traffic flow, queue lengths and journey times.</p> <p>Modelling work to support the measures will be undertaken from 2014-15 subject to availability of funding</p>
Responsible authority and other partners		Powers to be used
Caerphilly County Borough Council – Engineering		Changes to road infrastructure
Details		
<p>a) The replacement of the zebra crossing on White Street with a signalised crossing will control the number and timing of pedestrian crossings on the steep incline. This will help to reduce congestion and emissions in the AQMA which arise from the frequent need for vehicles to make hill-starts due to the acceleration required on the slope. The Option is likely to have a relatively large impact upon air quality in Caerphilly Town Centre AQMA by reducing vehicular emissions related to the hill-starts required, which are particularly significant for HGVs and buses.</p> <p>Whilst it is anticipated that traffic waiting times during school gate times will be reduced, the banned left turn from Van Road to White Street is also predicted to increase traffic flow on the residential streets of Southern Street and North View Terrace.</p> <p>The impact of the Option will be assessed using traffic and dispersion modelling, the results of which will inform further development of the option. Progress with the modelling work will be provided in the annual Action Plan Progress Report.</p> <p>If the option is taken forward it will be possible to measure the effect by considering queue lengths on White Street and continuation of monitoring of NO₂ in the AQMA</p>		
b) Progress with the modelling work will be provided in the annual Action Plan Progress Report.		
<p>c) The traffic signal controller at the junction of Bartlett Street with Station Terrace and Cardiff Road is currently operating on a fixed phase. It is expected that the refurbishment of the vehicle detection system would allow for improved traffic management through the junction and reduce traffic waiting times at the junction on Station Terrace and Bartlett Street.</p> <p>The Option is likely to have a relatively large impact upon air quality in Caerphilly Town Centre AQMA by giving priority to buses emerging from the bus station on Station Terrace. The impact of the Option will be reported through consideration of the peak hour queue length on Bartlett Street and continuation of monitoring of NO₂ around the junction.</p>		
<p>d) Traffic signal improvements will be tested for their air quality benefits, with the banned right turn from Pontygwindy Road to Nantgarw Road at the Piccadilly Gyratory. Traffic will be forced to circle the gyratory, hence reducing queue lengths on Pontygwindy Road and improving the efficiency of the junction as well as flows along Nantgarw Road.</p> <p>Improvements to the Piccadilly Gyratory are included in the schemes outlined in the 2008 update of the UDP Supplementary Planning Guidance, 'Caerphilly Basin Strategic Highway Network Obligation' (CCBC, 2008). If planning permission for a housing development is granted, the guidance a levy is requested from the developer which is assigned to a specific scheme (see Caerphilly Northern Bypass).</p>		
Impact on Air Quality		
Cost score (if built):3	Benefit score: 2	Overall score: 6

Predicted decrease in NO₂ concentrations > 10% (to be confirmed by updated modelling in 2014-15). This measure is recommended for implementation as, if implemented after the modelling, it will directly affect traffic flow within the AQMA, and has a relatively high cost/benefit score (low cost for a potentially large improvement in air quality in the AQMA).

Care will be taken to understand the potential negative impacts on air quality elsewhere in Caerphilly of implements any of these measures. It has previously been identified that concentrations of NO₂ are in excess of the Air Quality Strategy annual mean objective of 40µg/m³ at the junction of Pontygwindy Road and Ton y Felin Road, at the Piccadilly Gyratory as well as on Nantgarw Road

Ban right turn from Castle Street to Market Street

It is proposed that road traffic is banned from turning right from Castle Street (northbound) to Market Street (southbound) at the cenotaph.

The intended aim of the Option would be to prevent traffic from circling the town through the one-way system from Castle Street (southbound) to Market Street (northbound). This would force road traffic to continue to the Piccadilly Gyratory.

The impact of this option upon air quality has not been modelled, hence the potential impact can only be assessed qualitatively.

By preventing traffic on Castle Street from turning right to Market Street, vehicles wishing to change direction in this way would be required to find another route. This may result in a small decrease in traffic through the AQMA on White Street and Bartlett Street, however an increase in the volume of traffic circling the Piccadilly Gyratory may also occur. In addition, the measure is likely to increase journey times and hence emissions from vehicles in the region. Any beneficial impact upon air quality in the town centre AQMA is unlikely to be significant. Hence it is recommended that the option is not pursued without further investigation into the feasibility of the option and the wider impacts in the town e.g. increase in traffic flow on other roads.

Deliberately increase journey times through the town centre

Whilst increasing the time that it takes for vehicles to traverse the town centre may eventually discourage driving through the town centre, in the short term increased journey times will result in increased emissions in the town centre. It is likely that the measure would also exacerbate the existing air quality problems due to queuing traffic.

Make some residential streets one-way

The impact of this option on air quality in the AQMA would depend directly on which streets were defined in the proposal. The measure may also result in increased vehicle emissions if trip lengths were to increase.

Make Dol-y-felin one-way

The impact of this measure is unlikely to generate a beneficial impact in terms of air quality in the town centre AQMA. The measure may also increase vehicle emissions if trip lengths were to increase.

Long-term options

Table 5-3: Caerphilly Northern bypass

Definition		Key Intervention
Assess (through modelling) the air quality benefits of dualling of the A468 Caerphilly northern bypass		Alleviate congestion on the existing bypass, encouraging use of the road to travel around the town rather than traverse it.
Assess (through modelling) the air quality benefits Bedwas Bridge – Pwllypant – Penrhos roundabout		Modelling work to support the measures will be undertaken from 2014-15 subject to availability of funding
Responsible authority and other partners		Powers to be used
Caerphilly County Borough Council – Engineering		Changes to road infrastructure
Details		
<p>The proposed widening of the Caerphilly Northern bypass is a Strategic Initiative which is included in the current LDP and the RTP. Through the LDP, land is being safe-guarded for the improvements to the highway, which is already operating at or beyond capacity.</p> <p>If planning permission is granted for a housing development in the Caerphilly basin, a levy is requested under LDP 3 Supplementary Planning Guidance, 'Caerphilly Basin Strategic Highway Network Obligation' (CCBC, 2010) and Section 106 in order to fund highway improvements which will be affected by the development. If a specific scheme for which finances have been sought through the application is not at least commenced within 7 years of the contribution (and a completion date known), the funds are returned to the developer. This obligation has been in force since March 2005.</p> <p>The impact of the Option will be assessed using traffic and dispersion modelling, the results of which will inform further development of the option. Progress with the modelling work will be provided in the annual Action Plan Progress Report.</p>		
Impact on Air Quality		
Cost score (if built): 1	Benefit score: 2	Overall score: 2
<p>The impact of the dualling of the Northern Bypass was not modelled in isolation, but modelled in conjunction with the basket of short-term measures (Scenario 3, 2009 Further Assessment). The predicted impact was found to be a reduction in NO₂ concentrations of > 15% (to be confirmed by modelling undertaken 2014-15)</p> <p>"The Northern Bypass dualling causes a transfer of trips from the Nantgarw Rd Corridor and Bedwas Road corridor onto the Northern Bypass. The reduction on the Nantgarw Road AQMA is 3600 AADT. The resulting flow, however, is still 700 AADT greater than existing. The impact on the Bartlett St AQMA is minimal" (Capita Symonds, 2009).</p> <p>Whilst the dualling scheme is not expected to have a significant impact upon road traffic in the town centre AQMA, modelling suggests that traffic will be displaced to the bypass from Nantgarw Road, where there is concern that air quality may deteriorate if road traffic flow were to increase. The measure may hence be of benefit to air quality in Caerphilly if implemented with any of the 'soft' options which increase road traffic flow on Nantgarw Road e.g. southbound closure of Mountain Road. The widening of the highway is likely to be subject to an air quality assessment during the planning phase.</p>		

Table 5-4: Caerphilly South-Eastern bypass

Definition		Key Intervention
Assess (through modelling) the air quality benefits of construction of a bypass to the south-east of Caerphilly		Prevent 'through' traffic in Caerphilly town centre except for buses, taxis and deliveries Modelling work to support the measures will be undertaken from 2014-15 subject to availability of funding
Responsible authority and other partners		Powers to be used
Caerphilly County Borough Council – Engineering		Changes to road infrastructure
<p>Land is safeguarded to the south east of Caerphilly to facilitate construction of the Caerphilly South East Bypass (TR9 in the Adopted Local Development Plan).</p> <p>The construction of such a bypass would reduce 'through' traffic in the town centre, and alleviate demand upon the northern bypass. The impact of the proposal upon air quality in Caerphilly town centre was modelled as part of the Further Assessment report.</p> <p>This Option should be considered to be a long-term measure, and it remains under consideration. Progress on the feasibility of this Option will be reported in the annual Action Plan Progress Report.</p>		
Impact on Air Quality		
Cost score (if built): 1	Benefit score: 3	Overall score: 3
<p>It is likely that a significant amount of traffic would be removed from Caerphilly town centre AQMA if this option were implemented, resulting in an improvement in air quality. The impact of the south-eastern bypass on air quality within the AQMA was modelled together with the impact of the basket of short-term measures and the dualling of the northern bypass (Scenario 4, 2009 Further Assessment). The predicted cumulative impact of all of these measures was found to be a reduction in NO₂ concentrations of >17%.</p> <p>"The South Eastern Bypass provides a new through route to the south and catches trips that were diverted by the Mountain Road Closure along with other more local trips. The net effect is a further reduction of 2600 AADT on Nantgarw Road. This reduces the flow to 1900 AADT below existing levels" (Capita Symonds, 2009).</p> <p>>17% reduction in NO₂ concentrations in Caerphilly town centre: Scenario 1, 2009 Further Assessment (to be confirmed by modelling undertaken 2014-15)</p>		

Other Options requiring further assessment of feasibility

It has been proposed that road traffic is banned from turning right from Castle Street (northbound) to Market Street (southbound) at the cenotaph. This proposal requires additional assessment in terms of feasibility and impact upon air quality before implementation.

The intended aim of the Option would be to prevent traffic from circling the town through the one-way system from Castle Street (southbound) to Market Street (northbound), forcing road traffic to continue to the Piccadilly Gyratory. However this option may also increase journey times, hence increasing pollution if traffic were to circle the gyratory and subsequently travel south along Market Street through the one-way system.

5.6 Smart Measures and Third Party Partnerships

A number of measures are proposed under the headings of 'smart measures' and 'third party partnerships'. The options have been further divided under the following headings:

1. Travel Planning;
2. Parking;

3. Buses;
4. Rail;
5. Cycling;
6. Walking;
7. Increase awareness; and
8. CCBC vehicle fleet.

A summary is given for each proposed measure in this section, including:

- Current situation;
- Aim;
- Further development;
- Responsible department/authority;
- Impact upon air quality; and
- Additional recommendations.

5.6.1 Travel Planning

Table 5-5: Green Travel Plans

Definition	Key Intervention	
Encourage green travel plans for businesses, schools and CCBC	Reduce the need to travel by car	
Responsible authority and other partners	Powers to be used	
CCBC Planning / Sustainable Development and Living Environment	Specification for new developments and business	
<p>The provision of green travel plans by businesses promotes the use of buses and trains by employees by providing information. The Council proposes to encourage such plans in order to promote modal shift from cars to other means of transport. Information should be made available for travel within and between local authorities.</p> <p>An associated Council Tax discount may be considered in conjunction with the take-up of a travel plan as an incentive.</p> <p>There are currently 52 school travel plans in place since the scheme started in Caerphilly County Borough Council in 2003. These include the operation of several ‘walking-buses’. Schools within the Caerphilly Basin area that have travel plan include:</p> <ul style="list-style-type: none">• St James’ Primary;• Bedwas High School;• St Cenydd Community School• Twyn Primary School;• Hendre Junior School• Plas-y-felin Primary School;• St Helen's Roman Catholic Primary School,• Hendreddeny Park Primary School;• Ysgol Gynradd Gymraeg Caerffili. <p>The council was recently awarded the Welsh Government-backed All Wales Travel Plan Award at Gold level – the scheme was introduced to recognise best practice and excellence in travel planning. The scheme is available to all organisations where ongoing commitment to travel planning is clearly evidenced.</p> <p>To achieve the Gold Level award, Caerphilly County Borough Council has achieved a variety of sustainable travel initiatives including undertaking a staff travel survey, introducing a staff car share scheme, providing showers, lockers, cycle shelters and pool bikes for staff to use during work and leisure time.</p> <p>The council has also worked to raise awareness and understanding of sustainable travel to staff, introduced a cycle to work scheme and developed sustainable travel plans for the main council buildings.</p>		
Impact on Air Quality		
Cost score: 3	Benefit score: 2	Overall score: 6
<p>The potential impact of green travel plans cannot be assessed quantitatively; however the uptake of travel plans could be monitored and recorded in conjunction with monitoring of ambient air quality.</p> <p>This options is already underway and CCBC will report on travel planning activity in annual AQAP Progress Reports.</p>		

Table 5-6: Use the planning system to secure air quality improvements

Definition		Key Intervention
Use the planning system to secure air quality improvements		Reduce vehicular emissions in the town centre
Responsible authority and other partners		Powers to be used
CCBC Planning / Sustainable Development and Living Environment		s.106 agreements under the Town and Country Planning Act 1990 / Community Infrastructure Levy (CIL)
<p>There should be no adverse impact upon air quality due to any new developments which may affect traffic flow in Caerphilly town centre. it is hence proposed that a measure should be included in the AQAP to ensure that there is little/no impact from such a development, by for example specifying vehicle standards for new developments. This may be unfeasible, but Supplementary Planning Guidance could be used for the following:</p> <ul style="list-style-type: none"> • Stipulate that an air quality assessment be undertaken if the development is likely to have any impact on roads in or near an AQMA • Limit the number of parking spaces per development • Stipulate the issue of a green travel plan, including details of access to public transport • Request financial assistance through the Section 106 agreement e.g. for monitoring equipment 		
Impact on Air Quality		
Cost score: 3	Benefit score: 2	Overall score: 6
<p>The direct impact of the proposals cannot be quantitatively assessed. However there is potential for the measure to directly impact upon the town centre AQMA.</p> <p>CCBC will report on how this measure is working in subsequent AQAP progress reports.</p>		
Recommendations		
Using s.106 agreements and the Community Infrastructure Levy is a useful way of securing improvements		

Table 5-7: Publicise alternative transport options

Definition		Key Intervention
Publicise alternative modes of transport available in Caerphilly		Encourage modal shift from car travel / reduce congestion
Responsible authority and other partners		Powers to be used
CCBC Sustainable Development and Living Environment / Leisure		Voluntary
<p>Access to car parks and public transport is already publicised with the advertisement of large events e.g. events such as the 'Big Cheese'. Such events increase traffic flow in and around Caerphilly, therefore alternative transport / parking is promoted with event publicity.</p> <p>http://www.caerphilly.gov.uk/bigcheese/english/visitorinformation.htm</p> <p>http://www.caerphilly.gov.uk/sustainable/pdf/making_events_more_sustainable.pdf</p> <p>CCBC already has a sustainable travel website which includes advice/details for car sharing http://www.sewtacarshare.com</p> <p>Passenger transport information is available at:</p> <p>http://www.caerphilly.gov.uk/site.aspx?s=ApPDxt0DTUsmNlp7oQxktecZiHF1058LVT4aRKhpXrYsMO1jeboSg==</p> <p>Traveline Cymru provides a journey planner facility:</p> <p>http://cymru.trapezegroup.co.uk/journeyplanner/enterJourneyPlan.do;jsessionid=7E823EC4EAD3B5DA3D004CA43FAFCC41.wa1</p> <p>By encouraging a modal shift from car travel, additional benefits might include a reduction in regional CO₂ emissions from road traffic.</p>		
Impact on Air Quality		
Cost score: 3	Benefit score: 1	Overall score: 3
<p>The direct impact of the measure cannot be quantitatively assessed.</p> <p>The measure is unlikely to significantly improve air quality in the AQMA, however congestion and emissions from idling vehicles during public events will be reduced across the region.</p> <p>Appropriate 'indicators' might be the estimated number of trips avoided based upon the assessment of registrations on the car share website, or increased patronage of buses or trains on the days of large events.</p>		
Recommendations		
The measure is already underway- CCBC will report annually on implementation in AQAP Progress Reports.		

Table 5-8: Hiring of electric vehicles

Definition		Key Intervention
Investigate the potential for hiring electric vehicles		Reduce emissions from road traffic
Responsible authority and other partners		Powers to be used
CCBC Sustainable Development and Living Environment		Feasibility study
Further assessment is proposed to identify whether the provision of electric vehicles to hire is a feasible option.		
Impact on Air Quality		
Cost score: 3	Benefit score: 0	Overall score: 0
<p>The feasibility study will have no impact upon air quality.</p> <p>If the measure were found to be feasible, the hiring of electric vehicles in the region would reduce NO_x and particulate emissions from road vehicles. The potential impact could not be assessed quantitatively; however the number of vehicles hired could be recorded in conjunction with monitoring of ambient air quality. Additional benefits would include a reduction in regional CO₂ emissions from road traffic.</p>		
Recommendations		
The investigation regarding the feasibility would not be financially demanding, and is hence recommended- such feasibility work will include assessment of air quality effects		

5.6.2 Parking

Table 5-9: Enforcement of vehicle standards and parking

Definition		Key Intervention
Work with police / DVLA / community safety to enforce vehicle standards/ parking		Eliminate potential causes of congestion
Responsible authority and other partners		Powers to be used
CCBC Fleet Management		Law enforcement
<p>Eliminate offences (e.g. parking, idling) in the town centre that cause traffic congestion and hence increased emissions.</p> <p>Work with local police, DVLA to enforce the law.</p>		
Impact on Air Quality		
Cost score: 2	Benefit score: 1	Overall score: 2
<p>The direct impact of the proposals cannot be quantitatively assessed.</p> <p>However there is potential for the measure to directly impact upon the town centre AQMA</p>		
Recommendations		
The measure is already underway.		

5.6.3 Buses

Table 5-10: Reduce emissions from buses

Definition		Key Intervention
Reduce emissions from buses		Reduce emissions from buses
Responsible authority and other partners		Powers to be used
CCBC Passenger Transport / Bus Operators		Voluntary or through tenders/contracts and partnerships
<p>HGVs, including buses, emit greater amounts of pollutant per vehicle than cars. Therefore if emissions from buses could be improved, a significant impact upon air quality could be made.</p> <p>Pollutant emissions from buses could be reduced through the introduction of a voluntary Bus Quality Partnership. This would require negotiations between the local authority and the local bus companies. CCBC will investigate options to introduce a requirement for low emission vehicles that transit the AQMA. This will be explored by modelling the emissions from the bus fleet at present and how these might change with implementation of a low emissions scheme. CCBC will aim to undertake this investigation in 2014-15, after which the AQAP may require revision.</p> <p>The potential for the deployment of electric or hybrid buses could be investigated.</p> <p>To maximise the impact of low emitting vehicles in the borough, the least polluting vehicles should be deployed on those routes that run through the AQMA.</p>		
Impact on Air Quality		
Cost score: 2	Benefit score: 3	Overall score: 6
<p>The impact of buses using the route through the AQMA needs to be quantified in terms of air quality. Further modelling will be necessary to understand the impact of the buses.</p> <p>Further assessment of the feasibility of this option is required for inclusion in the Action Plan. HGVs, including buses, emit greater amounts of pollutant per vehicle than cars. Therefore if emissions from buses were improved with a particular focus on those that travel through the AQMA, a significant impact upon air quality in the AQMA could be made.</p>		
Recommendations		
<p>Results from CCBC investigations into the potential effects of reducing bus emissions will be presented in subsequent AQAP Progress Reports.</p>		

Table 5-11: Eliminate bus idling in the station

Definition		Key Intervention
Eliminate bus idling in the station		Reduce vehicular emissions due to idling
Responsible authority and other partners		Powers to be used
CCBC Public Transport / Bus Operators		Voluntary
<p>A code of practice regarding the idling of buses is already in place. The measure aims to ensure that the code is strictly enforced.</p> <p>This will be reviewed and strengthened through discussion with the bus companies, with the aim of achieving consistent compliance.</p>		
Impact on Air Quality		
Cost score: 3	Benefit score: 2	Overall score: 6
<p>The direct impact of the proposals cannot be quantitatively assessed.</p> <p>However there is potential for the measure to directly impact upon the town centre AQMA</p>		
Recommendations		
<p>The measure is being developed with bus operators. CCBC will report annually on implementation in AQAP Progress Reports</p>		

5.6.4 Cycling

Table 5-12: Cycling facilities

Definition		Key Intervention
Increase and publicise the availability of cycling facilities		Reduce emissions from road traffic / Encourage modal shift away from road vehicles
Responsible authority and other partners		Powers to be used
CCBC/Sewta		Voluntary
<p>Publicise the availability of existing cycling facilities and routes in the borough and Caerphilly town centre. This would include cycle lanes, parking and hiring.</p> <p><u>Cycle lanes & parking</u></p> <p>It is proposed to investigate the potential for increasing bike lane and bike parking provision in the town centre though this requires further feasibility assessment.</p> <p>The location and route of the lanes would require special consideration so as to avoid exacerbating congestion and queuing of road traffic, as well as hiring points e.g. train station.</p> <p>The measure would also encourage healthier lifestyle. If the number of journeys e.g. by car were subsequently reduced, regional emissions of CO₂ would also be reduced.</p> <p>Some measures are being progressed through the RTP via Sewta's delivery mechanisms.</p> <p><u>Hiring</u></p> <p>This measure is currently being trialled in Cardiff. The location of hiring points would need to be considered in order to maximise their use e.g. train station. Additional benefits would include a reduction in regional CO₂ emissions from road traffic and congestion.</p>		
Impact on Air Quality		
Cost score: 2	Benefit score: 1	Overall score: 2
<p>The direct impact of the proposals cannot be quantitatively assessed.</p> <p>The measure is unlikely to significantly improve air quality, however wider benefits would include the encouragement of a healthier lifestyle by increasing the number of town centre cycling routes.</p> <p>Sewta are actively engaged in developing cycling in Caerphilly- CCBC will report annually on schemes that are pertinent to the town in AQAP Progress Reports.</p>		
Recommendations		
The measure is already underway- CCBC will report annually on implementation in AQAP Progress Reports		

Table 5-13: Cycling Proficiency

Definition		Key Intervention
Reintroduce cycling proficiency into schools		Encourage use of alternative modes of transport; reduce road traffic emissions
Responsible authority and other partners		Powers to be used
CCBC Sustainable Development and Living Environment		Voluntary
It is proposed to reintroduce cycling proficiency lessons and tests into local schools. The measure would help to encourage healthier lifestyles by increasing awareness of road safety and other road traffic issues whilst also encouraging alternatives to road vehicles from an early age. The measure would increase awareness of potential health impacts of poor air quality, and also improve road safety in the region as well as potentially reducing the use of road traffic vehicles.		
Impact on Air Quality		
Cost score: 2	Benefit score: 1	Overall score: 2
The direct impact of the reintroduction of cycling proficiency cannot be quantitatively measured, however surrogate indicators, such as the number of pupils cycling to school – used to estimate the number of avoided vehicle trips – could be used to measure the success of the option. The implementation of the option would hopefully also improve road safety in the region.		
Recommendations		
Set out programme for implementation of the measure.		
Though the relative improvement in air quality may not be significantly large, increased awareness of the issue should be considered as an investment for the future.		

5.6.5 Walking

Table 5-14: Promote school walking-buses

Definition		Key Intervention
Promote school 'walking-buses'		Reduce the need to travel by car
Responsible authority and other partners		Powers to be used
CCBC Sustainable Development and Living Environment		Voluntary
There are several 'walking-buses' already in operation in Caerphilly through the 34 school travel plans.		
Additional benefits would include a reduction in regional CO ₂ emissions from road transport, and as well as road safety.		
Impact on Air Quality		
Cost score: 3	Benefit score: 1	Overall score: 3
The potential impact of the walking-buses cannot be assessed quantitatively; however the number of children participating in the scheme could be recorded in conjunction with monitoring of ambient air quality.		
Appropriate 'indicators' might be the estimated number of trips avoided, with the uptake assessed through before and after surveys or questionnaires		
Recommendations		
Set out a programme for the promotion of the walking-buses.		
Though the relative improvement in air quality may not be significantly large, increased awareness of the issue should be considered as an investment for the future.		
The measure is already underway- CCBC will report annually on implementation in AQAP Progress Reports		

Table 5-15: Town centre walking routes

Definition		Key Intervention
Improve walking routes into town centre		Encourage alternatives to road vehicles
Responsible authority and other partners		Powers to be used
CCBC Planning / Engineering		Voluntary
<p>The introduction of trails to schools and/or the town centre to keep pedestrians amused en route is proposed. This requires further feasibility assessment. The plans would also include the support of other initiatives to encourage walking into the town centre for access to the rail and bus interchanges located in the town centre.</p> <p>Improved footpaths or trails would encourage walking and healthier lifestyle. If the number of journeys e.g. by car were subsequently reduced, regional emissions of CO₂ would also be reduced.</p> <p>Sewta are actively engaged in improving walking facilities across the Carphilly area so CCBC will align their efforts in this regard.</p>		
Impact on Air Quality		
Cost score: 2	Benefit score: 1	Overall score: 2
<p>The direct impact of the proposed walking routes cannot be quantitatively assessed.</p> <p>The measure is unlikely to significantly improve air quality, however wider benefits would include the encouragement of a healthier lifestyle by increasing the number of walking routes.</p>		
Recommendations		
<p>It is likely that this option requires further assessment of its feasibility. The measure is unlikely to significantly improve air quality, however there are wider benefits e.g. encouraging a healthier lifestyle.</p> <p>CCBC will report annually on development of walking facilities in Caerphilly.</p>		

5.6.6 Increase awareness

Table 5-16: Health awareness

Definition		Key Intervention
Work with the Health Improvement team to add information on air pollution to existing health awareness packs / education		Increase awareness of potential health impacts of poor air quality
Responsible authority and other partners		Powers to be used
CCBC Health Alliance / Pollution		Teaching
<p>The Health Improvement team currently makes ad-hoc visits to schools to present information on health-related issues. This does not currently include the effects of poor air quality. The visits could potentially be made more regular.</p> <p>It is proposed that awareness of air quality issues should be linked to these visits. Awareness exercises might include air quality games on the internet for children so as to encourage healthier lifestyles e.g.</p> <p>http://www.chiltern.gov.uk/claire/site/scripts/documents.php?categoryID=13</p> <p>http://www.doncaster.gov.uk/airq/what_can_you_do/what_can_you_do.asp</p> <p>http://www.ace.mmu.ac.uk/kids/</p> <p>http://www.airqualityni.co.uk/kidscorner/</p> <p>The introduction of Billy Belisha, the Living Streets campaign mascot, into local school communities would help to encourage healthier lifestyles by increasing awareness of road safety and other road traffic issues coupled with decision making not to use road transport. The measure would hopefully also improve road safety in the region.</p>		
Impact on Air Quality		
Cost score: 3	Benefit score: 1	Overall score: 3
<p>The direct impact of increased awareness cannot be quantitatively measured, however surrogate indicators, such as the uptake of school travel plans or participation with the walking bus – used to estimate the number of avoided vehicle trips – could be used to measure the success of the option.</p> <p>A wider benefit might be a reduction in the number of hospital admissions due to poor air quality if people were to stay indoors or take precautions (e.g. carry medication) during periods of poor air quality, as well as improving road safety.</p>		
Recommendations		
<p>Refine detail regarding the curriculum / learning material to be presented.</p> <p>Though the relative improvement in air quality may not be significantly large, increased awareness of the issue should be considered as an investment for the future.</p> <p>CCBC will report on implementation of this measure in subsequent progress reports.</p>		

5.6.7 CCBC vehicle fleet

Table 5-17: Improve CCBC vehicle fleet

Definition		Key Intervention
Improve CCBC vehicle fleet – set by example		Set by example
Responsible authority and other partners		Powers to be used
CCBC Fleet Management		Voluntary
This measure is already underway through the natural fleet renewal process at the Council. This measure is primarily concerned with capturing the characteristics of the fleet so that the emissions benefits may be estimated.		
Impact on Air Quality		
Cost score: 1	Benefit score: 1	Overall score: 1
The direct impact of the proposals cannot be quantitatively assessed.		
Recommendations		
CCBC will report on fleet replacement in their annual AQAP progress report and will review opportunities to upgrade the CCBC accessible minibuss fleet.		

Table 5-18: Limit street cleaning to off-peak hours

Definition		Key Intervention
Limit street cleaning to off-peak hours		Reduce vehicular emissions due to congestion
Responsible authority and other partners		Powers to be used
CCBC Fleet Management / Environmental Services		
This measure aims to eliminate congestion in the town centre which may be caused by council vehicles involved in street-cleaning activities. The measure would ensure that cleaning of the streets in Caerphilly town centre was undertaken outside of morning and evening 'rush-hours'.		
This should focus in particular on the White Street corridor as the street canyon layout compounds the effects of emissions from congestion.		
Impact on Air Quality		
Cost score: 3	Benefit score: 2	Overall score: 6
The direct impact of the proposals cannot be quantitatively assessed.		
However there is potential for the measure to directly impact upon the town centre AQMA		
Recommendations		
CCBC will report on whether this measure is in force each year in their annual AQAP progress reports.		

5.7 Non-feasible options

A number of options were put forward at the Steering Group meetings that have since been considered to be 'non-feasible', and were hence eliminated following their initial assessment.

The measures listed as 'non-feasible' in Table 5-19 have been excluded from further consideration at this time, as they were either not considered feasible, or were not believed to have an appropriately targeted impact on the predominant sources of emissions identified in the further assessment.

Table 5-19: Summary on non-feasible options

Action	Comments
Make Dol-y-felin One Way	No beneficial impact in terms of AQ in AQMA - may increase vehicle emissions as increases trip length
Deliberately increase journey times through the town centre.	Whilst this may discourage people driving through the town centre, in the short term increased journey times will result in increased emissions in the town centre
Make some residential streets one way	Unlikely to improve AQ
Environmental planting throughout town centre	Increase 'green' aspect of town centre to improve social health; consider type of vegetation planted as emissions from vegetation can contribute towards air pollution. Unlikely to have a significant impact upon AQ, though may be beneficial in terms of 'quality of life'
Increase the provision of benches/rest stops for pedestrians	Unlikely to have a significant impact upon AQ, though may be beneficial in terms of 'quality of life'
Improve public transport especially for disabled persons	Should not be limited to disabled persons"
Traffic lights/roundabout on Bartlett Street/Cardiff Road	Roundabout would not work. Traffic lights required to allow buses out of bus station.
Identify types of vehicles e.g. video surveys/vehicle recognition	Traffic data collection has identified the type and class of vehicle travelling through the town centre.
Divert traffic from problem areas	Need to be careful not to exacerbate air quality problems elsewhere. The implications of any traffic management proposals need to be carefully assessed.
Free parking at Twyn Car Park for 2 hours max.	Could encourage traffic to circulate to wait for a space. Could introduce more cars into the town centre.
Free parking at Crescent Car park	Could increase number of cars circulating and waiting for free spaces.
Pedestrianise town centre	Traffic would need to go elsewhere – could exacerbate the situation elsewhere in Caerphilly.
	Need to consider taking buses out of town centre – what would happen to passengers/shoppers?
	May have a detrimental effect on town centre.
	Twyn Road will be closed for Christmas Market in 2009 we need to assess the effect of this.
Limit delivery access times (off peak)	Very difficult to enforce.
Insulate houses to reduce heating and exhaust gases	Very costly and the major contributor to air quality is traffic. This proposal would have very little effect.
Introduce speed limits to keep traffic flowing	Problems with enforcement.
	Does not reduce the number of vehicles using the town centre route.

Action	Comments
Government to intervene by setting standards for vehicle emissions	MOT testing looks at the level of Carbon Monoxide emitted from the engine not levels of NOx.
Air extraction from problem areas for example compulsory purchase homes affected and demolish.	No pragmatic options available.
Change one way system to two way	Could exacerbate air quality problem.
	Massive cost involvement and traffic management issues to resolve with a high likelihood of any benefits being lost due to disbenefits in terms of air quality.
Congestion charging	Scheme very expensive to set up initially.
	Unrealistic in this town centre as the problem is not congestion based. The social marginal cost principle could not be justified and would just succeed in a detrimental effect on the business sector.
Remove bus stop near Tesco in the town centre	No residential receptors in this area and would have no effect on air quality overall.
Remove parking from White Street/Bartlett Street	Very few parking options in this area for residents and does not present a problem.
No parking in loading bays in town centre	Disabled bays are essential there are problems with enforcement for parking in loading bays.
Waste vehicles collect during off peak times	Would require justification.
All buses to use eastern bypass and have a TAG system in park and ride to allow then through	This would cause problems for certain drop off points.
No through traffic at all	Not desirable – Improved Air Quality at a cost - The trade off would be potential reduction in trade and how would people access the services/ traders at the top of the Town?
Park and ride- total access from eastern bypass	Could work in principle but issues with passenger drop off points.
Residents parking only in Twyn Car Park	This would have very little effect and reduce the access for shoppers to the town centre.
Spray to reduce pollution	
Install large fans at the bottom of White Street	
Remove some of the traffic control measures in Caerphilly for example less signals/speed bumps	Not specific would not cause a reduction in flow or better operation of the road network. Would impact on the Piccadilly Junction cause longer journey times and potentially have a detrimental effect on the air quality along Pontygwindy Road.
NO _x eating paint on houses	
Widening footpaths/reducing carriageway width on White Street	No – would have no effect on air quality.
Relocate schools e.g. welsh school	No - Freedom of choice issues.
Make St Martins road one way	Detrimental impact on other roads in the area. Unsure if this would have benefits for the air quality in the town centre
Encourage alternative opening times in Commercial Street	
Install cable cars	
Limit the number of deliveries and consolidate deliveries of town centre	
Encourage home deliveries from businesses	No - Double edged sword – could effect other businesses. Home deliveries could increase air quality issues or assist.

Action	Comments
Introduce park and ride to the train station/into the town centre.	Could have a detrimental impact on local trade. There is already an alternative access to the Town Centre route to the park and ride facility. Requires identification of a suitable Park and Ride site and land. May introduce more buses in to the area.
Introduce driving education in schools	Not appropriate at this age. Colleges already targeted.
Consider industry as a pollutant	Industries that are highly potential polluters are regulated under PPC. These will all be assessed within annual air quality reports to Welsh Government.
Traffic management – change structure/street environment/Hans mode man/shared space	Home Zone concept the impact is difficult to predict. However traffic may just travel more slowly creating more pollution or redirect and reduce.

6 Reviewing the Action Plan

6.1 Overall summary of the focus for actions

The Further Assessment of air quality in Caerphilly highlighted high pollutant concentrations within the town centre. Now and in the foreseeable future the annual mean concentration of NO₂ is highly likely to be above the objectives for this pollutant at some residential properties within the AQMA particularly those within the street canyon in White Street and at the junction with Bartlett Street.

Local traffic in the town is responsible for three-quarters of the NO₂ concentrations experienced in the worst exposed areas. In particular, heavy-duty vehicle traffic (including freight, buses and coaches) is a major contributor to local NO₂ levels. It is thought that local measures that focus on reducing the impacts of heavy duty traffic and congestion would be particularly effective in moving towards achievement of the NO₂ air quality objectives in Caerphilly.

The measures required to deliver tangible air quality improvements in Caerphilly are likely to involve road infrastructure changes as much of the problem lies with the street canyon topography in the AQMA. This compounds the problem somewhat as emissions cannot disperse effectively and high NO₂ concentrations result from these emissions, which would not cause exceedances of the objective at a more open location. Since road infrastructure works are expensive can be disruptive to other parts of the town, these will require careful progression and significant air quality assessment work which we have outlined in this plan.

A summary of the measures discussed previously that CCBC intends to progress are presented in Table 6-1.

6.2 Monitoring progress

It is important to develop meaningful indicators of progress with the measures in the plan and we have attempted to identify quantitative surrogate indicators where possible. As is the case with all AQAPs, the plan consists of a wide variety of measures some of which it is impossible to set quantitative indicators for. To show progress with such measures we will still report annually but in more qualitative terms (e.g. outcomes of feasibility work). Although may develop surrogate indicators for each of the measures in the AQAP, there is still a need to report against “headline” indicators. CCBC carry out extensive monitoring in and around the AQMA so it is natural that our headline indicator is concentrations of NO₂ in the White Street AQMA.

There are issues with comparing year on year monitoring data as meteorology often influences measured concentrations. That said it is meaningful to discuss trends in concentration, as these are more reliable. The high concentrations of NO₂ are the reason we have had to formulate this AQAP, so it is vital that progress is ultimately measured in against this indicator.

6.3 Next steps

This document is intended to be organic in nature and will in effect be subject to on-going consultation as it evolves. Guidance on consultation relating to air quality places emphasis on the consensus building by engaging as wide a section of the community as possible. This includes residents, local community groups and businesses.

If technical or policy guidance from the Welsh Government changes in future then it may be necessary to revise the AQAP.

6.3.1 Keeping the action plan under review

Local authorities have a duty to keep their action plans up to date. Section 84(4) of the 1995 Environment Act states that an authority may from time to time revise an action plan. Whenever an action plan is revised, local authorities must consult the Welsh Ministers and other statutory consultees (see Schedule 11(1)(c) of the 1995 Act).

CCBC are committed to regular review of the AQAP and will make changes to it as and when evidence supports this. In order to ensure that local authorities implement the measures within an action plan by the timescales indicated within that plan, the Welsh Government expects authorities to submit annual progress reports. These progress reports list the measures within the action plan and include the timescales by when they are/were due to be implemented and give an update on progress in terms of implementation. The progress report should be submitted by the end of April each year. It is recommended that the report is combined with the Review and Assessment Progress Report in years when these are submitted.

Table 6-1 Caerphilly County Borough Council- Summary of measures in the draft Air Quality Action Plan

Intervention	AQ					Responsible authority
Category	Measure	Impact	Timing	Costs	Progress indicator	
Short term road infrastructure	Assess (through modelling) the air quality benefits of replacing the zebra crossing at White Street with a signalised crossing and prohibit the left turn from Van Road onto White Street	To be determined during study though currently this is estimated to have a rated AQ benefit of 2 (medium) for the group.	2014-15	3 for group of measures (if progressed)	Publication of study- results will be discussed in subsequent AQAP progress reports	CCBC
	Assess (through modelling) the air quality benefits of closing Mountain Road over the rail bridge to Southbound traffic		2014-15		Publication of study- results will be discussed in subsequent AQAP progress reports	CCBC
	Refurbishment of the vehicle detection at Bartlett Street traffic signals	Individual AQ scores will be developed from the modelling work	2014-15		Publication of study- results will be discussed in subsequent AQAP progress reports	CCBC
	Assess (through modelling) the effect of a right turn prohibition from Pontygwindy Road into Nantgarw Road		2014-15		Publication of study- results will be discussed in subsequent AQAP progress reports	CCBC
Long term road infrastructure	Assess (through modelling) the air quality benefits of dualling of the A468 Caerphilly northern bypass	To be determined during study though currently this is estimated to have a rated AQ benefit of 2 (medium)	2014-15	1 (if progressed)	Publication of study- results will be discussed in subsequent AQAP progress reports	CCBC
	Assess (through modelling) the air quality benefits Bedwas Bridge – Pwllpant – Penrhos roundabout					
	Assess (through modelling) the air quality benefits of construction of a bypass to the south-east of Caerphilly	To be determined during study though currently this is estimated to have a rated AQ benefit of 3 (high)	2014-15	1 (if progressed)	Publication of study- results will be discussed in subsequent AQAP progress reports	CCBC
Smarter choices	Encourage green travel plans for businesses, schools and CCBC	2	Ongoing	3	This options is already underway and CCBC will report on travel planning activity in annual AQAP Progress Reports. Sewta undertake activities in this area so CCBC will liase with them and report accordingly on measures implemented form the RTP	CCBC

Intervention Category	Measure	AQ Impact	Timing	Costs	Progress indicator	Responsible authority
Development control	Use the planning system to secure air quality improvements	2	Ongoing	3	This options is already underway and CCBC will report on important developments and how air quality has been considered in AQAP Progress Reports.	CCBC
Publicity	Publicise alternative modes of transport available in Caerphilly	1	Ongoing	3	The measure is already underway- CCBC will report annually on implementation in AQAP Progress Reports.	CCBC
Technology	Investigate hiring of electric vehicles in Caerphilly	0 (feasibility work itself will have no impact- currently no quantitative basis to estimate benefits with implementation)	2015-16	3	Publication of study- results will be discussed in subsequent AQAP progress reports	CCBC
Bus emissions	CCBC will investigate options to introduce a requirement for low emission vehicles that transit the AQMA. This will be explored by modelling the emissions from the bus fleet at present and how these might change with implementation of a low emissions scheme.	3	2015-16	2	Publication of study- results will be discussed in subsequent AQAP progress reports	CCBC
	Eliminate bus idling in the station	3	Ongoing	2	A policy regarding the idling of buses is already in place. The measure aims to ensure that the policy is strictly enforced. Enforcement data will be provided in subsequent progress reports	CCBC
Cycling	Increase and publicise the availability of existing cycling facilities and routes in the borough and Caerphilly town centre. This would include cycle lanes, parking and hiring.	1	Ongoing	2	Sewta are actively engaged in developing cycling in Caerphilly- CCBC will report annually on schemes that are pertinent to the town in AQAP Progress Reports.	CCBC/Sewta

Intervention Category	Measure	AQ Impact	Timing	Costs	Progress indicator	Responsible authority
	Reintroduce cycling proficiency into schools. . The measure would help to encourage healthier lifestyles by increasing awareness of road safety and other road traffic issues whilst also encouraging alternatives to road vehicles from an early age	1	Ongoing	2	Data from scheme operation will be provided in subsequent AQAP progress reports	CCBC
Walking	Promote school 'walking-buses'	1	Ongoing	3	There are several 'walking-buses' already in operation in Caerphilly through the 52 school travel plans. CCBC will report on activity associated with walking buses in annual progress reports	CCBC
	Improve walking routes into town centre.	1	Ongoing	2	Sewta are actively engaged in improving walking facilities across the Caerphilly area so CCBC will align their efforts in this regard and report on this measure on our annual progress reports	CCBC
Awareness	Work with the Health Improvement team to add information on air pollution to existing health awareness packs / education	1	Ongoing	3	CCBC will report on awareness raising programmes undertaken in each year in annual progress reports.	CCBC
Improve CCBC emissions	Improve CCBC vehicle fleet – set by example	1	Ongoing	1	This measure is already underway through the natural fleet renewal process at the Council. This measure is primarily concerned with capturing the characteristics of the fleet so that the emissions benefits may be estimated.	CCBC
	Limit street cleaning to off-peak hours-focus on White Street/Bartlett Street	2	Ongoing	3	CCBC will report on whether this measure is in force each year in their annual AQAP progress reports.	CCBC
Key to costs			Key to AQ benefits			

Intervention			AQ			Responsible authority
Category	Measure	Impact	Timing	Costs	Progress indicator	
Cost			AQ Impact			
3=	Low	< £10,000	0=	Negative	< 0µg/m3	
2=	Medium	£10,000 - £100,000	1=	Low	0 - 1µg/m3	
1=	High	>£100,000	2=	Medium	1- 3µg/m3	
			3=	High	> 3µg/m3	

Appendices

Appendix 1: UK National Air Quality Strategy Objectives

Appendix 2: Caerphilly Air Quality Management Area

Appendix 3: Air Quality Action Plan Assessment Methods

Appendix 4: Full list of the options to improve air quality within Caerphilly Town Centre for consideration arising from the 2nd Steering Group meeting, 19th March 2009

Appendix 1

UK National Air Quality Strategy Objectives

Objectives included in the Air Quality Regulations 2000 and (Amendment) Regulations 2002 for the purpose of Local Air Quality Management

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene All authorities	16.25 µg/m ³	running annual mean	31.12.2003
Authorities in England and Wales only	5.00 µg/m ³	annual mean	31.12.2010
Authorities in open areas and coastal areas should be cleaner as air changes more frequently and Northern Ireland only	3.25 µg/m ³	running annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m ³	running annual mean	31.12.2003
Carbon monoxide Authorities in England, Wales and Northern Ireland only	10.0 mg/m ³	maximum daily running 8-hour mean	31.12.2003
Authorities in Scotland only	10.0 mg/m ³	running 8-hour mean	31.12.2003
Lead	0.5 µg/m ³	annual mean	31.12.2004
	0.25 µg/m ³	annual mean	31.12.2008
Nitrogen dioxide^b	200 µg/m ³ not to be exceeded more than 18 times a year	1 hour mean	31.12.2005
	40 µg/m ³	annual mean	31.12.2005
Particles (PM₁₀) (gravimetric)^c All authorities	50 µg/m ³ not to be exceeded more than 35 times a year	24 hour mean	31.12.2004
	40 µg/m ³	annual mean	31.12.2004
Authorities in Scotland only ^d	50 µg/m ³ not to be exceeded more than 7 times a year	24 hour mean	31.12.2010
	18 µg/m ³	annual mean	31.12.2010
Sulphur dioxide	350 µg/m ³ not to be exceeded more than 24 times a year	1 hour mean	31.12.2004
	125 µg/m ³ not to be exceeded more than 3 times a year	24 hour mean	31.12.2004
	266 µg/m ³ not to be exceeded more than 35 times a year	15 minute mean	31.12.2005

b. The objectives for nitrogen dioxide are provisional.

c. Measured using the European gravimetric transfer standard sampler or equivalent.

d. These 2010 Air Quality Objectives for PM₁₀ apply in Scotland only, as set out in the Air Quality (Scotland) Amendment Regulations 2002.

Additional national particles objectives for England, Wales and Greater London (see table below) are not currently included in Regulations for the purpose of LAQM. The Government

and the Welsh Assembly Government however intends that the new particles objectives will be included in Regulations as soon as practicable after the review of the EU's first air quality daughter directive. Whilst authorities have no obligation to review and assess against them, they may find it helpful to do so, in order to assist with longer-term planning, and the assessment of development proposals in their local areas.

Proposed new particles objectives for England, Wales and Greater London (not included in Regulations)

Region	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
London	50 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 10 times a year	24 hour mean	31.12.2010
	23 $\mu\text{g}/\text{m}^3$	annual mean	31.12.2010
	20 $\mu\text{g}/\text{m}^3$	annual mean	31.12.2015
Rest of England and Wales	50 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 7 times a year	24 hour mean	31.12.2010
	20 $\mu\text{g}/\text{m}^3$	annual mean	31.12.2010

Efforts to achieve these objectives should be focussed on locations where members of the public are likely to be exposed over the averaging period of the objective. The table below summarises the locations where these objectives should and should not apply.

Typical locations where the objectives should and should not apply

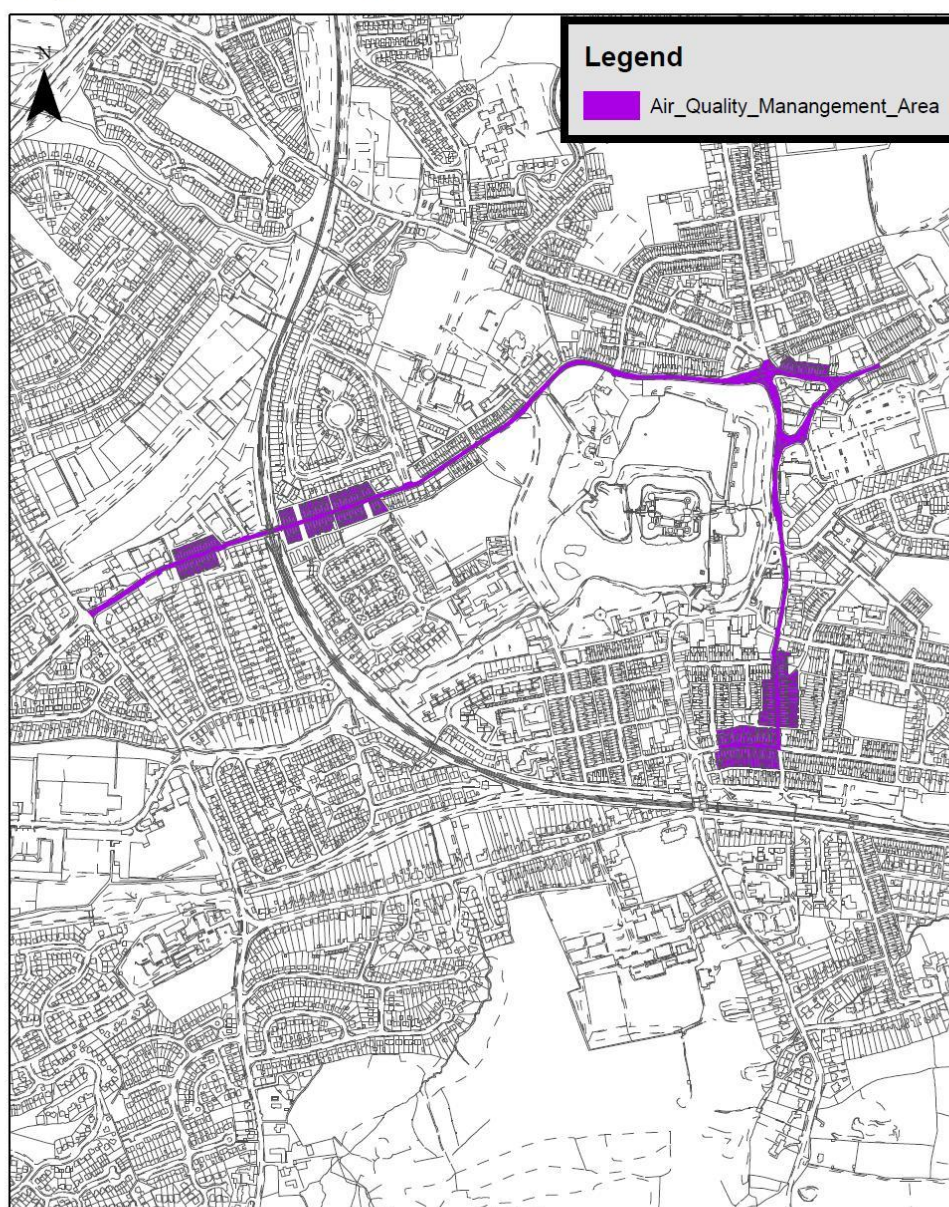
Averaging Period	Pollutants	Objectives <i>should</i> apply at ...	Objectives <i>should not</i> generally apply at ...
Annual mean	1,3 Butadiene Benzene Lead Nitrogen dioxide PM ₁₀	All background locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, libraries etc.	Building facades of offices or other places of work where members of the public do not have regular access. Gardens of residential properties. Kerbside sites (as opposed to locations at the building facade), or any other location where public exposure is expected to be short term.
24 hour mean and 8-hour mean	Carbon monoxide PM ₁₀ Sulphur dioxide	All locations where the annual mean objective would apply. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building facade), or any other location where public exposure is expected to be short term.
1 hour mean	Nitrogen dioxide Sulphur dioxide	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks and railway stations etc. which are not fully enclosed. Any outdoor locations to which the public might reasonably be expected to have access.	Kerbside sites where the public would not be expected to have regular access.
15 minute mean	Sulphur dioxide	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	

Appendix 2

Caerphilly Air Quality Management Area

Caerphilly Town Centre Air Quality Management Area

1:9,753



OS Products: © 100025372, 2012. MasterMap™, 1:10000, 1:25000, 1:50000, 1:250000,
Image Layers: © 2006 produced by COWI A/S for
the Welsh Assembly Government's Department for Environment, Planning and Countryside.
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Appendix 3

Air Quality Action Plan Assessment Methods

The Air Quality Action Plan Steering Group identified a wide range of options during the initial assessment. These have been assessed in more detail against a range of criteria in order to determine which ones to include within the Action Plan. The following paragraphs outline how the assessment has been made.

What is the option?

The Steering Group listed the potential options and, the council officers made comments on the potential effects, pros and cons associated with the option. The information given here along with the source apportionment information in Chapter 3 is the basis of the assessment.

What is being proposed?

The options are defined in specific terms where possible. For the detailed assessment each option has been defined in sufficient detail to understand the change, from the current situation, that is being proposed.

Typically the proposal is either to change the traffic in the AQMA or traffic more generally across Caerphilly. The effects on traffic in these locations are defined as 'fewer vehicles' or 'fewer vehicles queuing' or 'lower emitting vehicles'. In other cases the focus is considered to be 'strategic' i.e. developing those options may not have direct impacts on the problem but improve the Councils' capacity to make the correct decision on managing air quality in the AQMA and across Caerphilly.

Potential air quality impact

The Air Quality Action Plan must focus on prioritising options that improve air quality most effectively. This assessment is complex in that the detailed assessment of any given option could normally be subject to a study of its own requiring significant resources.

For some road transport options, predicted changes in road traffic flow have allowed for the quantitative assessment of the potential air quality impacts of the option. For the remaining options, a semi-quantitative assessment relying on a level of judgement has been adopted. The method used is described below:

1.1.1.1 What proportion of emissions would be affected by the option?

The option descriptions, comments, focus of the option and source apportionment have been used to estimate what proportion of the contribution to the air quality issue in Caerphilly town centre each option may potentially address.

1.1.1.2 Realistically how much of the traffic would change due to the option?

Beyond the potential influence there must be consideration of the realistic impact of the proposed option. Road closure would obviously remove all traffic emissions and hence realistically remove 100% of all local road transport emissions. However, this may be acceptable in very few cases. Non-regulatory interventions are likely to have limited impact since the users will still be left to decide whether to take the measure or not.

The level of realistic change in road traffic has been estimated as follows:

- Neutral – no change;

- Very small – around 1-2% change;
- Small – 2-5% change;
- Moderate – 5-10% change;
- Large – more than 10% change.

1.1.1.3 Therefore what level of reduction in emissions might result from the option?

The proportion of emissions potentially affected by the option and the view on how far they could be changed by the option (steps 1 and 2 above) are combined to express an overall assessment of the volume of local transport emissions in Caerphilly town centre that may realistically be reduced by the option.

1.1.1.4 How significant might the air quality improvement be as a result?

The source apportionment and review and assessment information presented in this report indicates that a 36% reduction in NO₂ concentrations in the Caerphilly town centre AQMA is required based upon 2008 modelling, to achieve the air quality standard.

For the purpose of the air quality assessment the result of the realistic intervention has been assessed as having a potentially:

- Neutral local air quality benefit if the realistic intervention is 0% or worse
- Low local air quality benefit if the realistic intervention is 1%
- Medium local air quality benefit if the realistic intervention is 2-5%
- Large local air quality benefit if the realistic intervention is >5%

The result of the assessment is to define the potential air quality benefit of an option (in terms of making progress towards the air quality standard in the AQMA) as ranging from neutral to relatively large.

Cost-effectiveness assessment

Implementation costs

The potential implementation costs of each option are assessed as follows:

- Neutral (costs already allocated or spent);
- Low costs (up to £10k annually e.g. for small surveys or campaigns or other options using current resources);
- Medium costs (up to £100k annually e.g. for small traffic management schemes); and
- High costs (above £100k annually e.g. for new infrastructure).

The assessed costs attempt to include the costs to vehicle operators as well as to the Councils. Costs already allocated or spent by the Councils are not included in this assessment and would therefore be described as 'neutral'.

Table 6-2 summarises the score, level and magnitude used in the cost/benefit assessment.

Table 6-2: Level and magnitude of cost and air quality impact indicators

Indicator	Score	Level	Magnitude
Cost	3	Low	< £10,000
	2	Medium	£10,000 - £100,000
	1	High	>£100,000
AQ Impact	0	Negative	< 0µg/m ³
	1	Low	0 - 1µg/m ³
	2	Medium	1- 3µg/m ³
	3	High	> 3µg/m ³

The effectiveness of each measure in improving air quality is compared to the implementation costs in the matrix provided below. In this matrix the assessed implementation costs and potential air quality impacts have been given a weighted score. The product of the weighted scores for each option is calculated. The results can be interpreted as follows:

- If the product is high (8 or more) then the measure is more cost-effective (significant impacts for the cost involved) and perhaps favourably cost-effective;
- If the product is medium (between 3-7) then the measure is in the medium range of cost-effectiveness; and
- If the product is low (2 or less) then the measure is less cost-effective (small impacts for the cost involved) and perhaps unacceptably poor in cost-effectiveness terms.

The final cost-effectiveness value is sensitive to changes in the assumptions of how effective a measure might be in reducing emissions and how costly it is.

Note that a score of 4 for one option and a score of 8 for another does not necessarily mean that the former option is exactly two times more cost-effective. This method estimates the *relative* cost-effectiveness of options rather than their *absolute* values. The method is useful during discussions of the relative priority of different options.

Table 6-3: Generated scores for level and magnitude of cost and air quality impact indicators

AQ benefit Cost	Rating	Neutral	Low	Medium	High
Rating		0	1	2	3
Neutral	4	0	4	8	12
Low	3	0	3	6	9
Medium	2	0	2	4	6
High	1	0	1	2	3

Potential co-environmental benefits

In this assessment other environmental benefits are highlighted.

Other pollutants: The likely effect on local PM₁₀ concentration is assessed as being an overall reduction or a local reduction perhaps with emissions being relocated elsewhere;

Greenhouse gases: The likely effect on greenhouse gas emissions is assessed as being an overall reduction or a local reduction perhaps with emissions being relocated elsewhere in the Borough.

Without detailed information on the true impacts of the options these assessments rely on judgement.

Potential risk factors

In this assessment risk factors are highlighted. These may be looked at more closely within a Strategic Environmental Assessment of any option implemented. At this stage it is simply highlighted whether it is likely that the option:

- may relocate emissions and hence lead to worsening air quality elsewhere;
- may require a change in land use;
- may place limits on pace of development or their costs.

Without detailed information on the true impacts of the options these assessments rely on judgement.

Potential social impacts

Potential social impacts are highlighted. These may need to be examined more closely when developing the options further. At this stage it is simply highlighted whether it is likely that the option would potentially:

- Provide health benefits in terms of lower exposure to pollutants or increased mobility;
- Increase road safety; and
- Improve accessibility.

Without detailed information on the true impacts of the options these assessments rely on judgement.

Potential economic impacts

Potential economic impacts are highlighted. These may need to be examined more closely when developing the options further. At this stage it is simply highlighted whether it is likely that the option would potentially:

- Improve sustainable development or accessibility in Caerphilly;
- Reduce or increase overall travel time;
- Impact on deliveries to Caerphilly;
- Impact on operator costs and potentially pass these through to passengers or clients; and
- Require significant re-adjustment to the scheme.

Without detailed information on the true impacts of the options these assessments rely on judgement and therefore any issues have been raised within the 'comments' column in the assessment results in Appendix 5.

Who is the appropriate authority for implementing an option?

A single authority would be responsible for leading on developing and implementing Action Plan measures or in attempting to influence other agencies to take such action. Each option has been identified as being within the responsibility of the relevant department of Caerphilly County Borough Council.

Appendix 4

Full list of the options to improve air quality within Caerphilly Town Centre for consideration arising from the 2nd Steering Group meeting, 19th March 2009

Table A4.1 Traffic Management & Engineering

Table A4.2 Soft Measures

Table A4.3 Third Party Partnership

Table A4.4 Non feasible options

Table A4.1 Traffic Management & Engineering

Action	Feasible	Comments	Responsibility	% Reduction NO ₂	Timescales
South Eastern Bypass: create a by-pass to stop through traffic except for bus/taxi/deliveries etc	Yes	Strategic Initiative being considered as part of the LDP. Would alleviate demand on the northern by-pass and encourage people to use the by-pass routes. Air quality impact modelled as part of the assessment report.	CCBC Engineering	- Needs modelling.	Long Term
Dualing Northern Bypass from Bedwas Bridge to Pwllpant to Penrhos R/A	Yes	Strategic Initiative included in the current UDP/LDP/RTP	CCBC Engineering	- Needs modelling	Long Term
Make Dol-y-felin One Way	Yes	Would not have a huge impact on air quality. There would be implications for residents.	CCBC Engineering	- Needs modelling	Short Term subject to consultation.
Signalise zebra crossing on White Street - Could only be considered in conjunction with a left turn ban from Van Road. Has implications for the Bus network.	Yes	Would reduce traffic waiting times during school gate times	CCBC Engineering	- Needs modelling	Short Term subject to funding/consultation.
Closure of Mountain Road to Southbound Traffic over bridge.	Yes	Would reduce the traffic using town centre and Mountain Road as a route to Cardiff. May create increased circulation of town centre until drivers become aware of prohibition.	CCBC Engineering	- Needs modelling	Short Term subject to funding/consultation.
Bartlett Street bus station carriageway and traffic signal controller reinstatement currently operating on a fixed phase.	Yes	Would allow better traffic management through the junction and reduce traffic waiting times at the junction on the bus station and Bartlett Street arms.	CCBC-Engineering	Needs modelling	Short Term subject to funding.
Stop right turn at cenotaph lights	Yes	POSSIBILITY – could run with a series of other turning bans.	CCBC-Engineering	Needs modelling	Short to medium Term subject to consultation/funding.

Stop left turn up White Street off Van Road (linked to option to signalise zebra crossing).	Yes	POSSIBILITY – could run with a series of other turning bans.	CCBC-Engineering	Needs modelling	Short to medium Term subject to consultation/funding.
Deliberately increase journey times through the town centre.	Yes	Could cause significant delays on feeder routes into the centre.	CCBC-Engineering	Needs modelling	Short Term
Make some residential streets one way	Yes		CCBC-Engineering	Needs modelling	Medium Term subject to consultation/funding.

Table A4.2 Soft Measures

Action	Feasible	Comments	Responsibility	% Reduction NO ₂	Timescales
Environmental planting throughout town centre	Yes	No air quality quantification.	CCBC - Planning	No air quality quantification.	Short to medium term subject to funding
Promote school walking buses	Yes	Already in place. Marginal benefit in improved air quality not quantifiable.	CCBC - Engineering	No air quality quantification.	Ongoing
Promote car share/hire scheme and electric vehicles	Yes	Requires interchange from car parks to access town centre high cost project requiring service and on-going costs/management. Needs to be combined with a restricted access for cars to the AQMA areas.	Requires Partnership working with tourism and or private sector.	Difficult to model and quantify in terms of air quality benefits.	Ongoing/ medium to long term
Educate	Yes	Ongoing – could not quantify in air quality terms.	Public choice involved unlikely to make a big impact without traffic restraint measures.	Difficult to model and quantify in terms of air quality benefits.	Ongoing
Make bike hire available and introduce more bike lanes and bike parking points	Yes	POSSIBILITY – Cardiff trialling this. Although bike lanes would cause more traffic queues and could be a disbenefit	Requires significant funding and could be a tourism initiative	Difficult to model and quantify in terms of air quality benefits.	Medium to long term
Work with the Health Improvement team to encourage healthier lifestyles	Yes	Ongoing – can not quantify in terms of air quality.	CCBC-Health Alliance	Difficult to model and quantify in terms of air quality benefits.	Ongoing
Introduce Billy Belisha in schools	Yes	Would need to be in conjunction with other projects. Would have a low impact if done in isolation.	CCBC - Engineering	Can not quantify in air quality terms	Ongoing
Introduce trails to schools/town centre to keep pedestrians amused on route	Yes	Supports other initiatives to encourage cycling and walking into the town centre and to access the rail and bus interchanges located in the town centre.	CCBC Engineering/Planning	No air quality quantification.	Medium term subject to funding
Use educational signing through the town centre	Yes	Might cause Air Quality problems elsewhere.		Difficult to model and quantify in terms of air quality benefits.	

Action	Feasible	Comments	Responsibility	% Reduction NO ₂	Timescales
Increase the provision of benches/rest stops for pedestrians	Yes	Not likely to provide large air quality benefits.		Difficult to model and quantify in terms of air quality benefits.	
Promotion of vehicles to go around the town rather than through the town	Yes	Possibility - would need to encourage the use of bypass routes. Bypass routes would need to be improved first.	CCBC - Engineering		
Encourage the use of public transport/walking/cycling /raise awareness of air quality	Yes	Potentially this suggestion is about shared space – home zone concept. What the impact of this would be is unknown it could be that traffic would just travel slower and create more pollution or redirect and reduce in numbers.	CCBC - Engineering	Difficult to model and quantify in terms of air quality benefits.	Ongoing
Encourage green transport plans for businesses – link with other LAs/Welsh Government/public sector		Actively done on new planning applications – for existing businesses, Nicola Davies regional travel plan coordinator available for advice.	CCBC Engineering & Planning	Local Area impact of Travel Plans is difficult to measure.	Ongoing
		Possible links to discounts in Council Tax – option would need to be explored.			
Link with tourism events car sharing and park and ride to minimise parking demand in the town centre.	Yes	Ongoing anyway. Not an every day thing, won't have a day-to-day impact on AQ.	CCBC - Leisure/Engineering	Very small impact on Air Quality.	
Reintroduce cycling proficiency in schools	Already in place		CCBC - Engineering	Can not quantify in air quality terms	Ongoing

Table A4.3 Third Party Partnership

Action	Feasible	Comments	Responsibility	% Reduction NO ₂	Timescales
Specific Euro emissions standard for school bus contracts.	Yes	EURO 3 stipulated, EURO 4 aspirational. Monitored by bus company providing specific details of fleet - Rolling Programme	Bus Operators		Medium/Long Term
Improve standards of LA vehicle fleet	Yes	Ongoing process anyway.	CCBC - Fleet Management	Unknown improvements on air quality.	Being undertaken
Work with police/DVLA/ community safety to enforce vehicle standards/ parking etc	Yes	Aspirational	Police/ CCBC- Community Enforcement	Can not quantify in air quality terms	Ongoing anyway, but does not impact on air quality.
Improve public transport especially for disabled persons	Already in place		Public Choice	Can not quantify in air quality terms	DDA requirements in place already.
Stop buses idling in the station	Yes	Not enforceable to be taken forward in partnership with Bus Operators	Bus Operators/ Drivers	Would reduce background levels of No2	Short term
Limit street cleaning activities to off peak times	Yes	A study is required to gauge the level of impact this activity has on traffic in the town centre.	CCBC Environment.	Would not be easily modelled.	
Specify vehicle standards for new developments in Caerphilly town centre	Yes	Needs to be specified and taken forward as part of development control and development planning.	CCBC - Planning	Only beneficial for new development	Longer term benefits.
Encourage new developments of ped pods	Yes	Needs to be specified and taken forward as part of development control and development planning.	CCBC - Planning/ Developers	Only beneficial for new development	Longer term benefits.
Work with the Police/DVLA/ Community Safety to enforce vehicle standards/parking etc.	Yes	On-going	CCBC/Police/ Community Safety		
Install parking meters in and around town centre	Yes	Possibility – together with above. There are servicing/ maintenance issues to consider.	CCBC/Police	Limited impact might encourage more trips.	
Work with bus companies to improve vehicle standards	Yes	Possibility - Requires a quality bus partnership initiative.	CCBC-Public Transport/Bus Operators.		Longer term benefits.

Use electric/hybrid busses	Yes	Possibly an option - need justification - Cost implications buses cost 1.5 times the usual cost of a vehicle.	CCBC-Public Transport/Bus Operators.		
Consider bringing some buses through the park and ride	Possibility	Not easily achieved needs a feasibility study. Could potentially isolate the Town centre and affect certain drop off/pick up points.	CCBC-Public Transport/Bus Operators.		

Table A4.4 Non feasible options

Action	Feasible	Comments
Traffic lights/roundabout on Bartlett Street/Cardiff Road	No	Roundabout would not work. Traffic lights required to let buses out of bus station.
Identify types of vehicles e.g. video surveys/vehicle recognition	No	Traffic data collection has identified the type and class of vehicle travelling through the town centre.
Divert traffic from problem areas	No	Need to be careful not to exacerbate air quality problems elsewhere. The implications of any traffic management proposals needs to be carefully assessed.
Free parking at Twyn Car Park for 2 hours max.	No	Could encourage traffic to circulate to wait for a space. Could introduce more cars into the town centre.
Free parking at Crescent Car park	No	Could increase number of cars circulating and waiting for free spaces.
Pedestrianise town centre	No	Traffic would need to go elsewhere – could exacerbate the situation elsewhere in Caerphilly.
		Need to consider taking buses out of town centre – what would happen to passengers/shoppers?
		May have a detrimental effect on town centre.
		Twyn Road will be closed for Christmas Market in 2009 we need to assess the effect of this.
Limit delivery access times (off peak)	No	Very difficult to enforce.
Insulate houses to reduce heating and exhaust gases	No	Very costly and the major contributor to air quality is traffic. This proposal would have very little effect.
Introduce speed limits to keep traffic flowing	No	Problems with enforcement.
		Does not reduce the number of vehicles using the town centre route.
Government to intervene by setting standards for vehicle emissions	No	MOT testing looks at the level of Carbon Monoxide emitted from the engine not levels of NOx.
Air extraction from problem areas for example compulsory purchase homes affected and demolish.	No	No pragmatic options available.
Change one way system to two way	No	Could exacerbate air quality problem.
		Massive cost involvement and traffic management issues to resolve with a high likelihood of any benefits being lost due to dis-benefits in terms of air quality.
Congestion charging	No	Scheme very expensive to set up initially.

Action	Feasible	Comments
		Unrealistic in this town centre as the problem is not congestion based. The social marginal cost principle could not be justified and would just succeed in a detrimental effect on the business sector.
Remove bus stop near Tesco in the town centre	No	No residential receptors in this area and would have no effect on air quality overall.
Remove parking from White Street/Bartlett Street	No	Very few parking options in this area for residents and does not present a problem.
No parking in loading bays in town centre	No	Disabled bays are essential there are problems with enforcement for parking in loading bays.
Waste vehicles collect during off peak times	No	Would require justification.
All buses to use eastern bypass and have a TAG system in park and ride to allow then through	No	This would cause problems for certain drop off points.
No through traffic at all	No - Unrealistic	Not desirable – Improved Air Quality at a cost - The trade off would be potential reduction in trade and how would people access the services/ traders at the top of the Town?
Park and ride- total access from eastern by-pass	No	Could work in principle but issues with passenger drop off points.
Residents parking only in Twyn Car Park	No	This would have very little effect and reduce the access for shoppers to the town centre.
Spray to reduce pollution	No - Unrealistic	
Install large fans at the bottom of White Street	No - Unrealistic	
Remove some of the traffic control measures in Caerphilly for example less signals/speed bumps	No - Unrealistic	Not specific would not cause a reduction in flow or better operation of the road network. Would impact on the Piccadilly Junction cause longer journey times and potentially have a detrimental effect on the air quality along Pontygwindy Road.
Nox eating paint on houses	No – very little effect.	
Widening footpaths/reducing carriageway width on White Street	No	No – would have no effect on air quality.
Relocate schools e.g welsh school	No unrealistic	No - Freedom of choice issues.
Make St Martins road one way	No	Detrimental impact on other roads in the area. Unsure if this would have benefits for the air quality in the town centre
Encourage alternative opening times in Commercial Street	No – Unrealistic	
Install cable cars	No – Unrealistic	
Limit the number of deliveries and consolidate deliveries of town centre	No – needs justification.	
Encourage home deliveries from businesses	No - Unrealistic	No - Double edged sword – could effect other businesses. Home deliveries could increase air quality issues or assist.

Action	Feasible	Comments
Introduce park and ride to the train station/into the town centre.	No	Could have a detrimental impact on local trade. There is already an alternative access to the Town Centre route to the park and ride facility. Requires identification of a suitable Park and Ride site and land. May introduce more buses in to the area.
Introduce driving education in schools	No	Not appropriate at this age. Colleges already targeted.
Consider industry as a pollutant	No	Industries that are highly potential polluters are regulated under PPC. These will all be assessed within annual air quality reports to Welsh Government.
Traffic management – change structure/street environment/Hans mode man/shared space	No – shared space	Home Zone concept the impact is difficult to predict. However traffic may just travel more slowly creating more pollution or redirect and reduce.



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