

LICENSING & PUBLIC PROTECTION COMMITTEE: 13 November 2002

Report of the Chief Regulatory Services Officer

AIR QUALITY ACTION PLANS

1. Background

At its meeting of 10th July 2002 this Committee approved the issuing for consultation of draft Air Quality Action Plans for three of the four Air Quality Management Areas. The Air Quality Action Plans describe the measures that are proposed in order to move towards the Air Quality Objective for nitrogen dioxide within the Cardiff West, Newport Road, and The Philog Air Quality Management Areas. This report summarises the outcome of the consultation process and seeks the Committee's approval of the final proposed Action Plans.

2. Consultation Responses

- 2.1 Consultees included appropriate public authorities such as the Environment Agency Wales, the Welsh Assembly Government, and neighbouring Local Authorities. All Members representing wards containing all or part of an Air Quality Management Area were also consulted. The consultation exercise involving the draft Action Plans was also reported upon in the September issue of the Capital Times. In addition the draft Action Plans were made available on the Cardiff County Council website.
- 2.2 Of the responses received none made comments resulting in substantive changes to the draft Action Plans. A summary of consultation responses and subsequent amendments to the Action Plans is attached at Appendix B. Some minor alterations have been made in the light of the comments received and the proposed final version of the Action Plans is attached to this report at Appendix A.

3. Air Quality Action Plan Proposals

- 3.1 The Action Plans consider options for improving air quality within the Air Quality Management Areas. Many of the longer term improvement actions such as travel plans, park and ride, and other measures to promote modes of travel other than the private car are already addressed by the Council within its Local Transport Plan. Short-term actions specific to the Air Quality Management Areas are limited by the fact that the roads of concern are principal routes into the city; clearly it would be undesirable to displace traffic from these routes and onto surrounding residential streets.
- 3.2 In general terms the Actions Plans proposals are confined to local traffic management measures. The Action Plans also propose that additional air pollution monitoring equipment is installed within each of the Areas. The

proposed equipment would measure air pollution and feed this data as an additional parameter into the Council's existing SCOOT traffic management system.

4. Achievability

The recommendations reflect compliance with statutory duties placed upon the County Council. Implementation of the Action Plans will require additional resources in terms of air pollution monitoring equipment.

5. Financial Implications

The Air Quality Action Plans propose that air pollution monitoring equipment be installed in each of the air quality management areas. Whilst the Council must discharge its duties in respect of Air Quality Management as set out below it clearly has some discretion in identifying actions to meet those duties. No specific grant has been made to the Council to meet the additional resource identified. The estimated cost of the equipment is £16,000 and, if the Action Plans are approved by this Committee, it is proposed that a bid for this additional resource is made in the current budget setting process.

6. Legal Implications

- 6.1 If, following a review of air quality, it appears to a local authority that air quality standards and objectives are not being, or are not likely to be met in an area, Section 83 of the Environment Act 1995 places a statutory duty upon that local authority to pass an order, designating that area as an Air Quality Management Area. The Authority therefore have no option but to pass such an order, once they are aware that air quality objectives can not be met for any specific area.
- 6.2 Once an order designating an area as an Air Quality Management Area has been passed, Section 84 of the Environment Act 1995 requires the local authority to conduct a further assessment of the air quality and future air quality for the relevant period in the designated area, and the respects (if any) in which it appears that the standards and objectives are not being met, or are not likely to be met within the relevant period. Furthermore, Section 84 requires a local authority, within 12 months of the passing of an order, to prepare a report containing the results of this assessment, and to prepare an action plan which the local authority proposes to implement, in order to achieve the air quality standards and objectives for the designated area. A local authority in carrying out its functions in relation to any air quality review, any assessment of air quality or whether air quality standards or objectives are being achieved, or the preparation of an action plan or any revision of an action plan, must consult certain persons in accordance with the requirements of the Act. Consultation must be meaningful and proper consideration must be given to any observations received as a result of such consultation.
- 6.3 Members should be aware of the fact that, by virtue of Section 85 of the Environment Act 1995, the National Assembly for Wales is empowered to

serve directions upon a local authority which fails to discharge any of the obligations imposed by Section 83 and 84, requiring that local authority to take relevant action.

- 6.4 All decisions taken by or on behalf the Council must (a) be within the legal powers of the Council; (b) comply with any procedural requirement imposed by law; (c) be within the powers of the body or person exercising powers of behalf of the Council; (d) be undertaken in accordance with the procedural requirements imposed by the Council e.g. standing orders and financial regulations; (e) be fully and properly informed; (f) be properly motivated; (g) be taken having regard to the Council's fiduciary duty to its taxpayers; and (h) be reasonable and proper in all the circumstances.

7. Recommendations

It is recommended that Committee approves the Air Quality Action Plans for the Cardiff West, Newport Road, and The Philog Air Quality Management Areas at Appendix A to this report.

M. W. Evans
Chief Regulatory Services Officer

21 October 2002

Background Papers:

Environment Act 1995,

Air Quality (Wales) Regulations 2000,

Cardiff West, The Philog, Newport Road Air Quality Management Orders

Report to Licensing & Public Protection Committee – 10th July 2002

APPENDIX A

ACTION PLANS

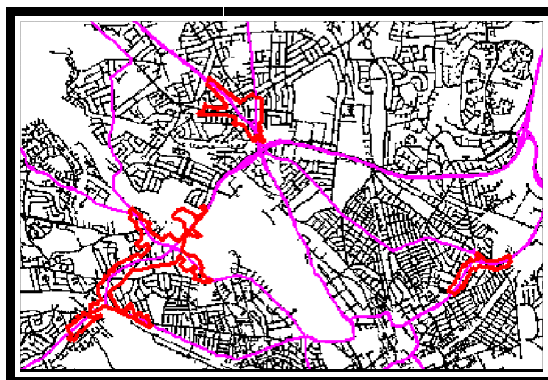
THE CARDIFF WEST, NEWPORT ROAD AND THE PHILOG AIR QUALITY MANAGEMENT AREAS

THE COUNTY COUNCIL OF THE CITY AND COUNTY OF CARDIFF

SECTION 84(2)b, THE ENVIRONMENT ACT 1995

LOCAL AIR QUALITY MANAGEMENT

THE CARDIFF WEST, NEWPORT ROAD AND THE PHILOG
AIR QUALITY MANAGEMENT AREAS



AIR QUALITY ACTION PLANS NOVEMBER 2002



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THE COUNTY COUNCIL OF THE CITY AND COUNTY OF CARDIFF

SECTION 84(2)b, THE ENVIRONMENT ACT 1995

LOCAL AIR QUALITY MANAGEMENT

ACTION PLANS

THE CARDIFF WEST, NEWPORT ROAD AND THE PHILOG AIR QUALITY MANAGEMENT AREAS

Executive Summary

In accordance with Part 4 of The Environment Act 1995 ("the Act") and following an extensive Review and Assessment of Air Quality, The County Council of the City and County of Cardiff declared three Air Quality Management Areas (AQMAs) which came into force on 1st December 2000.

The Air Quality (Wales) Regulations 2000 set Standards and Objectives for eight key pollutants. The Review and Assessment process concluded that there was a risk that the annual average Objective for nitrogen dioxide ($40\mu\text{g}\text{m}^{-3}$ to be achieved by the end of 2005) would not be achieved without local measures being taken to address the problem.

As a result of declaring the AQMAs, the Act places an obligation on the Council to work towards achieving the Objective and to do this by developing an Air Quality Action Plan (AQAP) to address the problem.

This document presents the AQAPs for the three AQMAs declared in December 2000. The plans have been developed so as to complement the traffic and emission reduction measures contained in the Cardiff Local Transport Plan 2000 – 2016 (LTP).

The measures in the LTP tend, in the main, to be focussed on the longer-term and, although likely to be effective, are unlikely, in themselves to allow the annual average air quality Objective for nitrogen dioxide to be achieved. Consequently, the AQAP planning process has concentrated on options for the shorter-term.

The principal source of emissions which caused the AQMAs to be declared is road traffic and the high levels of nitrogen dioxide identified in the Review and Assessment of Air Quality were found close to road junctions on principal radial routes into and out from the city centre or across it.

The AQAP planning process considered a range of options to address the poor air quality. In each of the AQMAs the roads were not considered suitable for options such as pedestrianisation to be practical or viable. The range of available options proved to be limited to traffic management measures such as using an air quality monitoring system as input to the Council's SCOOT traffic management system and queue relocation.

Air quality will continue to be monitored in the areas in order to assess progress towards achieving the annual average nitrogen dioxide Objective. A further Review and Assessment is due at the end of 2003 and it is suggested that this will allow an interim assessment of the AQAPs before the date specified in the Objective. This will also allow further characterisation of pollution levels within the AQMA and, if necessary, the AQAPs can be reconsidered at that time.

In addition to these plans, the Council will be developing a Local Air Quality Strategy which is planned to be published in the Autumn of 2002.

Additional copies of this document are available from the above address and, together with copies of earlier Review and Assessment of Air Quality documents, may be downloaded in Adobe Acrobat format from:

<http://www.cardiff.gov.uk/airquality/>

CYNGOR SIR DINAS A SIR CAERDYDD

ADRAN 84(2)b, DEDDF YR AMGYLCHEDD 1995

CYNLLUNIAU GWEITHREDU

RHEOLI ANSAWDD AER LLEOL

ARDALOEDD RHEOLI ANSAWDD AER GORLLEWIN CAERDYDD, NEWPORT ROAD A'R PHILOG

Crynodeb Gweithredol

Yn unol â Rhan 4 o Ddeddf yr Amgylchedd 1995 ("y Ddeddf") ac yn dilyn Adolygiad ac Asesiad Helaeth o Ansawdd Aer, mae Cyngor Sir Dinas a Sir Caerdydd wedi datgan tair Ardal Rheoli Ansawdd Aer (AQMA) a ddaeth i rym ar 1 Rhagfyr 2000.

Mae Rheoliadau Ansawdd Aer (Cymru) 2000 yn pennu Safonau ac Amcanion ar gyfer wyth o lygryddion allweddol. Canlyniad y broses Adolygu ac Asesu oedd bod perygl na fuasai modd cyrraedd yr Amcan cyfartalog ar gyfer nitrogen diocsid ($40\mu\text{g m}^{-3}$ erbyn diwedd 2005) heb gymryd camau lleol i fynd i'r afael â'r problem.

O ganlyniad i ddatgan yr AQMA, mae'r Ddeddf yn gosod rhwymedigaeth ar y Cyngor i weithredu i sicrhau'r Amcan ac i wneud hynny drwy ddatblygu Cynllun Gweithredu Ansawdd Aer (AQAP) i fynd i'r afael â'r problem.

Mae'r ddogfen hon yn cyflwyno'r Cynlluniau Gweithredu ar gyfer y tair AQMA a ddynodwyd yn Rhagfyr 2000. Mae'r cynlluniau wedi cael eu datblygu i gydategu'r mesurau lleihau traffig ac allyriannau a nodir yng Nghynllun Trafnidiaeth Lleol Caerdydd 2000 - 2016 (LTP).

Mae'r mesurau yn y Cynllun yn tueddu, i raddau helaeth, i ganolbwyntio ar y tymor hwy ac er eu bod yn debygol o fod yn effeithiol, maent yn annhebygol o alluogi i ni gyrraedd yr Amcan ansawdd aer cyfartalog blynyddol ar gyfer nitrogen diocsid ar eu pennau eu hunain. Am hynny, mae'r broses cynllunio AQAP wedi canolbwyntio ar ddewisiadau ar gyfer y tymor byrrach.

Prif ffynhonnell yr allyriannau a berodd i'r AQMAs gael eu datgan yw traffig ffyrdd a chafwyd bod y lefelau uchel o nitrogen diocsid a nodwyd yn yr Adolygiad a'r Asesiad o Ansawdd Aer yn agos at gyffyrdd ar y prif lwybrau yn ôl ac ymlaen i ganol y ddinas ac ar draws canol y ddinas.

Ystyriodd y broses cynllunio AQAP amrywiaeth o ddewisiadau i fynd i'r afael ag ansawdd aer gwael. Ym mhob un o'r AQMAs nid ystyriwyd bod y ffyrdd yn addas ar gyfer dewisiadau megis pedestreiddio fel dewisiadau ymarferol neu ddichonadwy. Roedd yr amrywiaeth o ddewisiadau yn gyfyngedig i ddewisiadau rheoli traffig megis defnyddio system monitro ansawdd aer fel mewnbwn i system rheoli traffig SCOOT y Cyngor ac adleoli rhesi o draffig.

Byddwn yn parhau i fonitro ansawdd yr aer yn yr ardaloedd hyn er mwyn asesu cynnydd tuag at yr Amcan cyfartalog blynyddol ar gyfer nitrogen diocsid. Cynhelir Asesiad ac adolygiad pellach tua diwedd 2003 ac argymhellir y bydd hyn yn caniatáu ar gyfer asesiad interim pellach o'r AQAP cyn y dyddiad a nodwyd yn yr Amcan. Bydd hyn yn galluogi cymeriadaeth bellach o'r lefelau llygredd yn yr AQMA ac, os oes angen, gellir ailystyried yr AQAP bryd hynny.

Yn ogystal â'r cynlluniau hyn, bydd y Cyngor yn datblygu Strategaeth Ansawdd Aer Lleol a'r bwriad yw ei chyhoeddi yn Hydref 2002.

Gellir cael copïau ychwanegol o'r ddogfen hon o'r cyfeiriad uchod, ac ynghyd â chopïau o ddogfennau Adolygu ac Asesu Ansawdd Aer cynharach, gellir eu llwytho i lawr mewn fformat Adobe Acrobat o:

<http://www.cardiff.gov.uk/airquality/>

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1.0 Introduction

Cardiff County Council has, in common with all other local authorities in England and Wales, been actively engaged in meeting the statutory requirements of Part IV of the Environment Act 1995 (the Act) in respect of air quality.

The Act introduced the concept of Local Air Quality Management (LAQM) and local authorities are under a statutory obligation to review and assess air quality in their area according to the Standards and Objectives contained in the relevant Regulations. Where it appears that the Objectives will not be met, and exposure over the averaging period is likely (called relevant locations) then the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) for improving the air quality in those areas.

Guidance issued by Central Government recommended that local authorities review and assess their air quality in up to three stages. All local authorities are required to undertake a 1st Stage Review and Assessment and the results of this indicate whether or not a 2nd and/or 3rd Stage Review and Assessment are necessary. In Cardiff, a 3rd Stage Review and Assessment of Air Quality was published in July 2000; it concluded that the NO₂ annual mean Objective of 40ugm⁻³ (to be achieved by 31st December 2005) was likely to be breached in a numbers of discrete areas and that AQMAs were necessary.

The Review and Assessment proposed the declaration of three AQMAs. A fourth area of Cardiff centred on St Mary Street was also found to have high levels of nitrogen dioxide. Due to significant changes in the local road network, it was not possible to be certain that past air quality monitoring would reflect the future scenario and traffic flow data for the new road layout was not available. It was therefore proposed monitor air pollution levels for a further year and review the local situation more fully in the light of the additional information.

Three AQMAs came into force on 1st December 2000:

1. The Newport Road AQMA
2. The Cardiff West AQMA
3. The Philog AQMA

This document reports the development of AQAPs in respect of these.

The fourth (St Mary Street) AQMA came into force on 1st September 2002. This document does not address this particular AQMA and development of Action Plans for the St Mary Street AQMA will be started in the near future.

2.0 Strategic and Legislative Air Quality Framework

2.1 The Environment Act 1995

Part IV of The Environment Act 1995 ("the Act") provides the legislative backbone to the characterisation and strategic improvement in UK air quality.

Section 80 of the Act requires central government to prepare a statement ("strategy") containing policies with respect to the assessment or management of air quality. This is the legislation which has led to the publication of the National Air Quality Strategy.

Section 82 of the Act requires local authorities to periodically review air quality in their areas having regard to Standards and Objectives prevailing at that time and to identify any parts of their areas which are unlikely to meet the Standards and Objectives.

Section 83 of the Act requires local authorities to designate an AQMA in those areas where the Standards and Objectives are unlikely to be met.

Section 84 of the Act requires local authorities that designate an AQMA to continue to review air quality within the areas, make an assessment of the likely future air quality within the AQMA(s) and to prepare a report of this review/assessment within twelve months of the AQMAs coming into force. This section also requires those local authorities that have declared an AQMA to prepare an action plan (AQAP) to address the issues.

2.2 National Air Quality Strategy

The National Air Quality Strategy (NAQS) was first published in 1997. It was updated in 2000 following consultation during the previous year

The NAQS sets the "air quality scene" for the UK, giving information such as the known adverse health effects of the key pollutants, current national trends in air quality/pollution and it highlights initiatives and developments currently being taken at the national level to cut emissions of the key pollutants and their precursors. The NAQS also discusses its relationship with other initiatives and strategies, such as sustainability.

It is projected that these "national measures" will be sufficient on their own to secure air quality objectives in many areas of the UK. However, the Strategy acknowledges that local "hotspots" will exist where national measures will not, of themselves, be sufficient to secure the achievement of certain Objectives. It is for this reason that the "Local Air Quality Management" (LAQM) regime came into being; its purpose is to enable more detailed study of local hotspots and to enable local authorities to develop local strategies and plans to address them.

At the time of writing, central government is completing a consultation on proposed changes to the NAQS and the air quality objectives. Of principal interest is a proposal to set a lower long-term Objective for particulate matter – small particles less than 10microns in diameter (known as PM_{10}) – and a proposal to set a higher (but perhaps more achievable) Objective for London when compared to the rest of England. For Scotland it is proposed to set a more stringent Objective than for England.

2.3 Air Quality (Wales) Regulations 2000

These Regulations give legal status to the air quality Standards and Objectives in Wales. Standards and Objectives are set for eight key pollutants, seven of which are designated as suitable for local control.

A summary of the 2000 Regulations' Standards and Objectives is given in Table 3, Appendix 1.

2.4 Local Air Quality Management

Part IV of the Environment Act 1995 ("the Act") requires each local authority periodically to review air quality in its area having regard to any relevant Regulations applying at the time.

The pollutants prescribed in The Air Quality (Wales) Regulations 2000 are *benzene, 1,3-butadiene, carbon monoxide, lead, nitrogen dioxide, ozone, particulates (PM_{10}), and sulphur dioxide*. The Review and Assessment process has to be undertaken for

each of these pollutants, with the exception of ozone. Local authorities have been advised that ozone is to be considered a transboundary pollutant for which local control measures will be inappropriate; ozone is a secondary pollutant which, due to its complex, slow, chemical formation reactions, tends to form away from the sources of its primary precursors.

Of the Pollutants for which Objectives have been set in the Regulations each have known adverse health effects at very high levels as follows:

Nitrogen dioxide, Sulphur dioxide and Ozone

These gases irritate the airways of the lungs, increasing the symptoms of those suffering from lung diseases.

Particles

Fine particles can be carried deep into the lungs where they can cause inflammation and a worsening of the condition of people with heart and lung diseases.

Carbon monoxide

This gas prevents the normal transport of oxygen by the blood. This can lead to a significant reduction in the supply of oxygen to the heart, particularly in people suffering from heart disease.

Lead

This has toxic biochemical effects which may cause problems in the synthesis of haemoglobin and have effects upon the kidneys, gastrointestinal tract, etc. However, the greatest concern is with regard to the intellectual development of children.

Benzene, 1,3 butadiene

Both are genotoxic carcinogens and known to induce cancers such as leukaemia.

The primary objectives of the review and assessment process are:

- a] to identify those areas at the local level where national policies and actions appear unlikely, of themselves, to secure the Objectives; and
- b] to ensure that air quality considerations are integrated into Cardiff County Council's decision making processes such as land use planning, traffic management and economic development.

A series of General and Technical Guidance Notes are published and, from time to time reviewed, by Central Government. These form the basis of the methodology for Local Air Quality Management (LAQM).

3.0 Other Policies and Strategies

3.1 Local Transport Plan 2000 - 2016

3.1.1 Air Quality

Section 2.2 Cardiff's Local Transport Plan for 2000 – 2016 says that:

"Monitoring of air quality standards indicates that Cardiff experiences some air quality problems.. Consequently, air quality objectives will not be met in some parts of Cardiff and that the elevated levels of pollution are due to road traffic."

Section 4.6.2 of the Local Transport Plan - "Action on Air Quality" – acknowledges the local air quality management issues and states that:

"Local highway authorities have a number of existing powers with which to help address air quality, to encourage different trip making behaviour and control traffic movements....."

The Local Transport Plan includes a range of measures common to all parts of Cardiff which will have an impact upon traffic movements, growth and emissions. These are detailed in the following section.

3.1.2 Transport Initiatives Impacting upon Air Quality

Widening Travel Choices

Section 4 of Cardiff's Local Transport Plan 2000 – 2016 details the overall transport strategy for Cardiff.

Section 4.1 details measures designed to widen travel choice and so reduce dependence and use of the private passenger car to travel to, from and around the City. The following details some of those measures which will help promote the use of alternative modes of transport to the private car and so aid the improvement of local air quality.

3.1.2.1 Buses

The Local Transport Plan details planned improvements for bus services in the City; these will be the most widespread of the improvements in public transport.

There will be significant short term improvements as a result of the creation of an Express/Core Bus Network. This will focus on the City Centre and involve priority measures, e.g. reallocation of road-space to buses, High Occupancy Vehicle (HOV) lanes or Selected Vehicle Lanes (SVL) and traffic signal priorities. The roads used will include the key radial corridors of Cowbridge Road, Newport Road, North Road, Manor Way, Caerphilly Road and Penarth Road, i.e. the principal routes through the City, some of which are inside the AQMAs.

The Core Network will be supplemented by a Feeder Core Network along adjacent roads and improvements in bus infrastructure/services, traffic priority measures and interchange facilities, improved information via a Global Positioning System (GPS)-based bus shelter information system, ticketing and service co-ordination.

3.1.2.2 Rail

The Local Transport Plan details planned changes in the local rail network. In the shorter term, most of the improvements will rely on enhancing heavy rail services on the Valley and City Lines thereby reducing the load on the road network.

In the longer term (i.e. towards the end of the plan period), it is possible that the City Line from Coryton to Radyr could be converted to Diesel

Light Rail. The longer term could also include the creation of a "City Circle" rail loop by the joining of Coryton and Radyr Stations.

Additionally, agreed "service aspirations" include increasing the frequency of services on the local rail network, i.e. between Cardiff, its suburbs, the South Wales Valleys and neighbouring towns and Cities.

3.1.2.3 Cycling

Cardiff places great importance on developing the role of cycling within an integrated transport system. The Strategy for cycling is designed to build on recent achievements and includes measures to reorder priorities, promoting cycling through better integration of engineering measures with those of education, encouragement and enforcement. The strategy includes objectives and budgets with systems to monitor progress and will enable Cardiff to effectively contribute towards the National Cycling Strategy's vision.

There are now almost 48km of cycle routes in Cardiff. These have improved cyclist's safety and encouraged greater use of cycling. Further routes have been identified, including radial routes into the City Centre and Waterfront. It is expected that 100km of cycle routes will be in place by the end of 2002, with a further 100 km beyond this date.

A study has been undertaken to complete identification of the strategic cycle network for Cardiff. It is intended that the full network be included in the forthcoming Unitary Development Plan, in line with Government planning policy guidance.

A detailed study is underway to design cycle measures for the A469 (Caerphilly Road / Thornhill Road) corridor. This work will be undertaken in conjunction with similar work to design one of the Express / Core Bus Network corridors.

3.1.2.4 Walking and Pedestrianisation

Cardiff is seeking to encourage more people to make trips on foot, particularly for those journeys over shorter distances including links to public transport. Additionally, the Council will seek to capitalise on the significant potential to enhance the role of walking with other sustainable transport modes.

3.1.2.5 Powered Two-Wheelers

Mopeds and motorcycles can provide a viable alternative mode of transport to the private car for many trips, particularly where public transport is limited and either walking or cycling is unrealistic. Such vehicles use less road-space than a passenger car and their increased use could reduce congestion and vehicle queuing. Additionally, the smaller powered two-wheeled vehicles tend to be more fuel efficient and so have lower overall emissions, particularly the more modern vehicles which might be fitted with catalytic converters.

The strategy for powered two-wheelers will consist of three strands:

1. An investigation into the provision of secure parking facilities both on and off-street where a clear demand can be demonstrated and the inclusion of requirements for two-wheeled parking in development control parking standards.
2. Evaluate opportunities for increasing the priority for powered two-wheelers in traffic management.
3. Continuing education and engineering to improve road safety for powered two-wheelers.

3.1.2.6 ULTRA (Urban Light Transport)

This new system consists of small automated electric vehicles circulating on a segregated track network. It is promoted as an automatically controlled personal taxi system running on its own guideway. The network would consist of frequent stops at which people would request a vehicle and select a destination using a smart-card. The vehicle would then take the quickest non-stop route to the destination.

An 18 month study is currently underway, investigating the feasibility of ULTra and its application to Cardiff. It is assessing the practicalities of such a system in an area of Cardiff, in particular, the link between Cardiff Central Station and the Waterfront area and the National Assembly for Wales. A key issue for consideration is the role of ULTra and the various forms of public transport. The aim is to achieve compatibility with the public transport proposals in the Local Transport Plan.

Traffic Management and Demand Restraint

Section 4.2 of the Local Transport Plan deals with traffic management and demand restraint.

Travel Demand Management is a major element of the Cardiff Movement Strategy. In order to encourage people to use more sustainable modes and to reduce reliance on the car, a range of policies, secondary objectives and proposals have been developed to maximise efficient use of the network.

3.1.2.7 Intelligent Transport Systems

Transport Telematics is the term used to describe the ability to combine Information Technology and Telecommunications in systems which enable on-line information to be passed to travellers, vehicles and road infrastructure. Such systems are called 'Intelligent Transport Systems' and these are used to make better use of the road network with an emphasis on the pro-active strategic management of traffic at the network level. This will allow the management of the road network to benefit all users and in particular:

- Improve safety.
- Reduce Pollution.
- Manage demand and congestion.
- Encourage modal shift to more sustainable forms.
- Provide information to travellers so that they may make informed decisions about when and how they travel.

Cardiff has an extensive Intelligent Transport Systems infrastructure that is controlled from a state of the art Control Centre located at County Hall. The Urban Traffic Control system centrally co-ordinates traffic signals using a fully adaptive real time traffic control strategy called SCOOT (Split, Cycle and Offset Optimisation Technique). This system is integrated with sophisticated signing systems, closed circuit television, environmental control and monitoring systems.

Recently a new bus priority and Real-Time Information system has been installed on the Northern Sector of Cardiff (between the River Taff and the Rhymney Railway Line) which aims to adjust road space in favour of sustainable transport strategies. The system provides priority for nearly 200 buses at 46 signalised junctions enabling quicker and more consistent journey times. Real-time information about the predicted arrival times of buses is provided at over 120 bus shelters in both textual and audible formats. The system uses the latest satellite technology and is the largest and most advanced GPS based system in the UK. It is planned that the system should be further extended to include additional routes and be enhanced by the provision of new and well integrated incident management and comprehensive dynamic signing systems. The further deployment of advanced Intelligent Transport Systems is currently being considered as part of the A470 corridor sustainable movement strategy study.

3.1.2.8 Capacity Reallocation

The proposals for Cardiff will inevitably involve significant changes to access restrictions on the main radial routes into the City Centre, which will significantly reduce traffic at peak times to benefit public transport, pedestrians and cyclists through priority, parking, and enforcement measures.

The positive and proactive approach to promoting developments has recently involved a more integrated approach to assessing the transportation impacts of significant developments.

Developers are being encouraged to identify measures, both on site and in the vicinity of the site, which will contribute to greater use of public transport and encourage more cycling and walking, as evidenced in the Waterfront area. It is not acceptable for developers to assume high levels of modal change without demonstrating how it can be achieved and even assisting in the process.

3.1.2.9 Other measures to address congestion and pollution.

The Council is seeking to develop and promote the wider benefits of Green Travel Plans and sustainable working practices.

The County has and continues to promote School Travel Plans.

Clear Zones are areas restricted to the operation of low or non-polluting transport. The Council is also considering using existing powers to introduce Clear Zones in the City to help reduce traffic and pollution levels.

Consideration is also being given to introduce the Clear Zone(s) in phases:

Phase 1: the restriction of access to essential vehicles at specific times of the day only and the introduction of digital enforcement technology.

Phase 2: the establishment of emission and quality standards to be applied to all vehicles permitted to enter the zone, and

Phase 3: a review of the technological advancements in vehicle propulsion and possible introduction of zero emission vehicles.

The opportunities for new revenue generation via road user and/or workplace parking charges are currently being considered.

The Council intends to prepare a parking strategy which will seek to balance demands for parking in a way which maintains the economic viability and attractiveness of the City and district and local centres, yet reduces congestion and promotes sustainable travel patterns.

Integrated Transport

3.1.2.10 Interchange

The provision of an attractive alternative to car travel the development of a comprehensive, efficient public transport network is vital. This requires easy transfer between services and with different modes.

The Local Transport Plan includes joint working with train operators and Railtrack to upgrade Queen Street Station and other existing stations within Cardiff, a review of the bus network with special attention to the City Centre, investigating the potential for transport links in district and local centres, hospitals, universities and major employment sites to encourage easy transfer between radial and orbital bus services, developing new rail and bus interchange facilities including those which form part of the SWIFT initiative, determination of the efficient location of interchange facilities including provision of bus priority measures, pedestrian/passenger facilities and development of interchange facilities at several locations (e.g. Cardiff Central Station, Cardiff Queen Street

Station and Greyfriars Road) and the continuation of the SWIFT integrated ticketing initiative.

Development of more flexible ticketing such as Smartcard technology is currently being considered by the Council and SWIFT.

The Council is currently investigating consultant's proposals for improved bus access to and within the City Centre, including a new bus interchange immediately south of the Cardiff Central Station. This requires provision of a new bus-only bridge across the River Taff and the Council is in the process of initiating discussions with relevant parties.

3.1.2.11 Park and Ride

Park and Ride is a developing feature of Cardiff's movement network. Seasonal and event park and ride operations at Ocean Way and Leckwith have improved the accessibility of the City Centre. These park and ride operations contribute to reducing traffic on congested radial routes. Although initially introduced as a shoppers service, park and ride has been developed for events and has been extended to attract weekday commuters.

The emerging park and ride strategy is largely bus-based, and suggests an outer ring of locations close to the A4232/M4. Leckwith is the principal outer ring site serving the west which has already been used to provide event and seasonal park and ride and is shortly to commence weekday operations all year round. In addition, sites at Coryton (M4, Junction 32) and Cardiff Gate/Pontprennau have also been suggested. The latter has potential to be linked to new housing developments as well as intercepting strategic car movements from the east.

In addition to bus-based park and ride, four rail-based sites are currently available at Radyr, Llandaff North, Llanishen and Lisvane/Thornhill providing spaces, but are in need of improvement.

Potential rail-based park and ride is also being investigated as part of future rail service links to new housing locations in the north western sector of the City (east of junction 33) together with new stations at St. Fagans and Rumney.

Peripheral Park-and-Ride provides an interchange between rural and urban travel for those living in areas outside the main Cardiff urban area that are not well-served by public transport.

3.1.2.12 Public Transport Information

It is recognised that the provision of accurate, relevant and timely information can enhance travel awareness and support a modal change to public transport. The establishment of Public Transport Information Cymru (PTI Cymru) to provide a call centre for all-Wales bus information is a major advance.

3.1.2.13 Travel Awareness and Changing Travel Behaviour

It is recognised that there will need to be a major change in attitude towards car use if the targets of modal change are to be achieved.

The Council's Strategy for Travel Awareness is proposed on two inter-related elements:

1. an enabling role to advise and guide other organisations and individuals to adapt their travel behaviour; and
2. the need to ensure that the strong links between transport and other issues such as health, education and energy are recognised and incorporated into transport policies and programmes.

Travel Plans

Travel Plans are largely voluntary in nature, being aimed at organisations making changes from within to increase use of alternative means of travel to the car. The Council has an important role to play, by encouraging their preparation which is complementary to the LTP.

Urban and Rural Aspects

Travel awareness and behavioural change needs to take into account the differing circumstances of urban and rural communities. For example, the need to reduce travel is inter-linked with rural communities trying to retain, maintain and encourage local shops and facilities, development of home delivery and e-commerce.

3.1.2.14 Air Travel Strategy

The Council, in conjunction with other relevant organisations, is seeking to improve links to the Airport. Significantly better public transport links are needed from the Central Station to the Airport as part of an integrated public transport network.

3.1.2.15 Signage

Cardiff's signage is currently under consideration so as to improve provision for visitors, events, particularly major events at venues such as the Millennium Stadium, information for pedestrians and cyclists, public transport information, coach drivers, car parking, particularly information on the availability of spaces at sufficient distance from the car park to allow alternatives to be displayed and drivers to make early choices, including use of park-and-ride sites as an alternative and for road freight.

3.1.2.16 Movement Hierarchy

The Council is investigating the principles of a hierarchy following feedback from public consultation referring to the York example.

3.2 Local Sustainability Strategy for Cardiff

Cardiff's Local Sustainability Strategy was published in November 2000 after extensive consultation as part of the Local Agenda 21 programme.

The Strategy acknowledges the link between sustainability and poor air quality. One of the Strategy's key "performance indicators" is "the number of low air pollution days"; this uses DEFRA's "Air Quality Banding System" and is modelled on DEFRA's guidance for the development of such indicators.

The Council's permanently located real-time continuously recording monitoring station at Briardene Road Safety Centre is used together with data from DEFRA's AURN monitoring station in Frederick Street for the compilation of this indicator.

3.3 Urban Development Plan

The Cardiff UDP (1996-2016) "Outline Proposals" under went consultation in June/July 2001 and the report on the representations made to it were reported to the Council's Cabinet at the end of November 2001.

The Outline Proposals set out a series of Propositions, and Proposition 36 refers to air quality. It states that "The UDP will resist development which, by its location, would have an unacceptable effect on the amenity of residential areas because of air or noise pollution".

A "deposit version" of the UDP is being prepared and it is hoped to go out to consultation on the deposit UDP in January 2003.

4.0 Understanding the Causes of Poor Air Quality in Cardiff

The Review and Assessment process has provided a focus for air quality monitoring within Cardiff and the monitoring network has expanded and evolved to reflect both the needs and the findings of this work.

Unsurprisingly, the Review and Assessment process seems to have highlighted a number of features common to each of the three AQMAs and within Cardiff generally. The findings have influenced the development of the Action Plans and they are discussed below.

4.1 Traffic and Topography

High traffic flows do not appear of themselves to be enough to cause high levels of air pollution. Local topography and congestion/queuing are hugely significant in determining whether emissions from road vehicles are translated into elevated pollutant concentrations.

The following monitoring data serve as examples:

Table 1 Briardene Road Safety Centre
North Road, Gabalfa
Annual Average Daily Traffic flow = ~45,000 vehicles

Year	1998	1999	2000	2001
Briardene	39.2	29.6	25.2	22.3

Annual average nitrogen dioxide in microgrammes per cubic metre

Table 2 City Centre
 St Mary Street and High Street, Cathays
 Annual Average Daily Traffic flow = ~9,500 vehicles

Year	1998	1999	2000	2001
St Mary Street	76	61	59	59
High Street	-	-	71	69

Annual average nitrogen dioxide in microgrammes per cubic metre

Briardene Road Safety Centre is about 2.5 miles north of the other two sites and is a "roadside" continuously recording monitoring station. The St Mary Street and High Street are "kerbside" diffusion tube sites.

There are significant differences in local topography. Briardene is relatively "open" in aspect and, with the exception of about 1 hour during the morning peak, there is little or no vehicle queuing apparent in the vicinity. For the most part, traffic is free flowing at around 30mph.

Conversely, St Mary Street and High Street have 4 and 5 storey buildings along the whole length of the road link and, with several junctions, pedestrian crossings and a bus lane on the north-bound side, traffic queuing is observed for most of the day and traffic speeds can be as low as walking pace.

It is therefore not unsurprising to note that the monitoring locations which prompted the declaration of the AQMAs are kerbside sites situated at road junctions which have buildings relatively close to them.

4.2 Background NO₂ Levels

Air pollution monitoring in Cardiff has, in the period since the declaration of the AQMAs expanded. For example, there are now 57 diffusion-tube monitoring sites compared to 42 at the end of 1999. The monitoring has also evolved and it is now the case that most of the diffusion tubes are at "kerbside" locations or on the facades of buildings within the AQMAs.

However, monitoring is still carried out at a number of "background" locations. Information from such where there is a history of monitoring can be helpful in characterising the local area and the extent of local pollution "hotspots".

Data from some background sites is given below:

Site	1995	1996	1997	1998	1999	2000	2001
Cardiff Centre AURN	41	40	39	39	33	30	34
Crofts Street				32	32	25	25
Green Street					27	26	25

Annual average nitrogen dioxide in microgrammes per cubic metre

The Cardiff Centre AURN and Crofts Street sites are both situated some considerable distance from the nearest heavily-trafficked road (195m and ~370m respectively). Green Street is just 50m distant from the busy Cowbridge Road East and was originally placed in order to assess the exposure of residents in the area to nitrogen dioxide. It was not expected that this site would show nitrogen dioxide levels close to background.

These results, together with recent data from diffusion tube sites on the facades of buildings close to “kerbside” diffusion-tube sites would seem to confirm findings nationally that elevated pollution concentrations are only found very close to the kerb (<10m) and the concentrations diminish rapidly with increasing distance from a road source.

5.0 The Action Plan Working Group

It became very obvious during the Review and Assessment process that Cardiff was not experiencing a city-wide nitrogen dioxide problem when considered in the light of current objectives.

Low background nitrogen dioxide levels together with just a few localised “hotspots” close to junctions on busy roads indicated that the prime source of the air quality problem was road traffic. The review and assessment process concluded that there were no significant industrial sources of nitrogen dioxide in the city which could be a significant contributor to the localised problems.

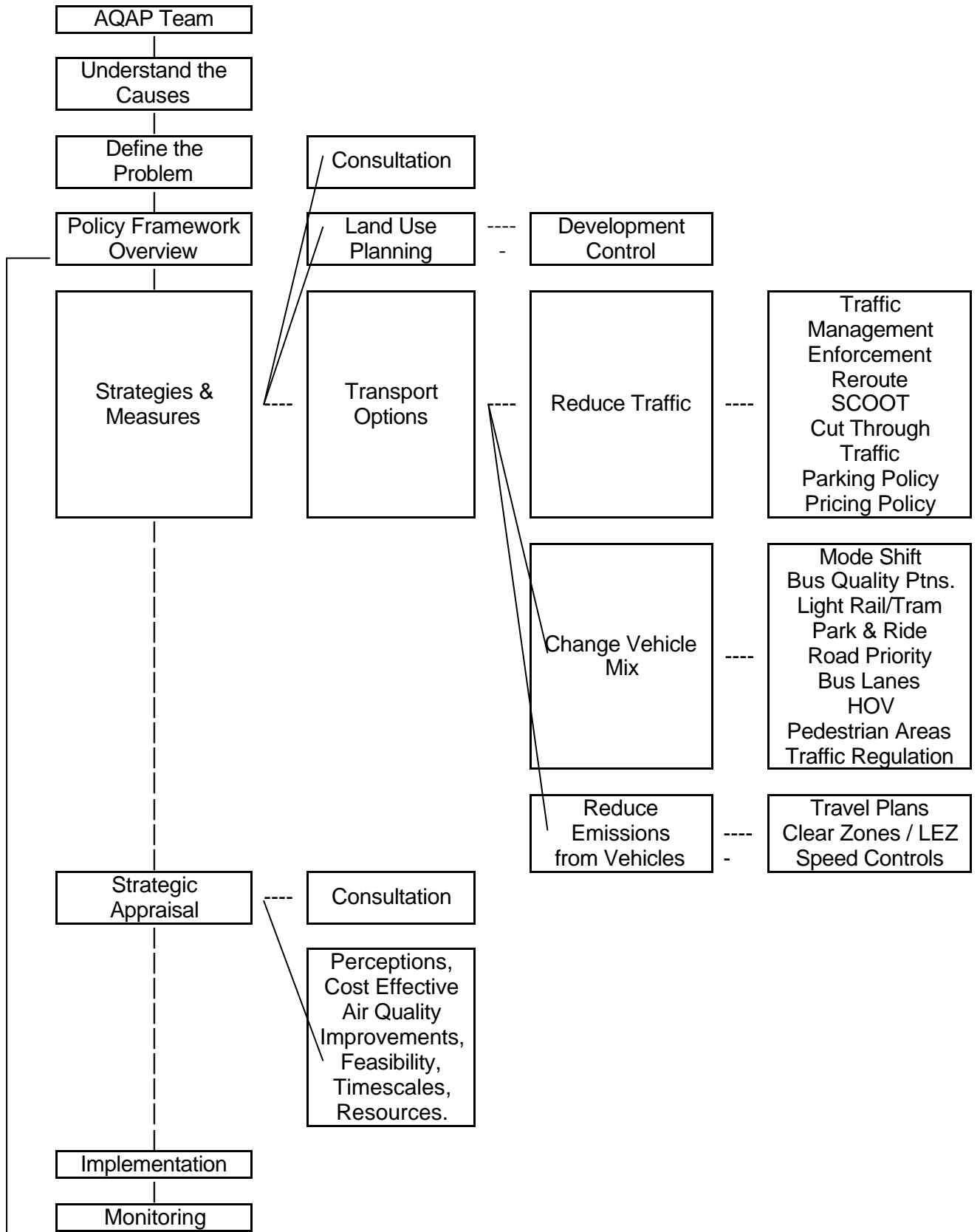
Initially, a working group of officers from Pollution Control and Traffic and Transportation Services met to consider the issues within each of the AQMAs. This working group would develop the Action Plans initially, calling upon expertise from other service areas should a need be identified.

The framework given on Page 16, is that by which an AQAP for each of the declared AQMAs in Cardiff was developed.

Each of the AQMAs was considered individually within the action planning process as a whole.

In order to provide a focus for the action planning process a framework was agreed. Table 3 shows this framework, which was distilled and adapted from guidance and tailored to local needs.

Framework for AQAP Development



6.0 The Action Plans

The three AQMAs are alike in many ways, and in particular:

1. They are centred on the busy radial and distributor routes into and across the City,
2. None of the AQMAs are “end destinations” in their own right and much of the traffic using the roads is just “passing through”,
3. Each of the roads pass through long-established residential areas with little or no industrial or commercial property close to the roads
4. Roads immediately adjacent to the principal routes tend, in the main, to be lightly trafficked due to the residential nature of the areas

The nature of the areas seems to dictate that the available options will be very limited. Radical options such as Compulsory Purchase of residences within the AQMAs were clear non-starters and didn't even merit the briefest of discussions save for the fact that it was swiftly ruled out. Of great concern was to avoid the possibility of implementing options which would introduce the possibility of traffic leaving the principal road links in the areas in the hope of finding a quicker route through adjacent residential areas - so called “rat running”.

Add to this the comprehensive range of traffic and transportation initiatives contained in the Local Transport Plan which are either already in place or under development and it is no great surprise to find that the additional options available to improve air quality are somewhat limited.

The majority of the measures in the Local Transport Plan will impact upon air pollution levels in the medium to long term. The aim of the action planning process has been to try and identify additional short term measures which will help the air quality Objectives in the Regulations to be achieved.

6.1 Cardiff West AQMA

6.1.1 The Geography of the AQMA

The Cardiff West AQMA is centred upon Western Avenue (A48), including the north-western end of Cowbridge Road West (known locally as Ely Bridge) to its junction with Western Avenue and Cowbridge Road East, the eastern end of Cowbridge Road East to the same junction and Western Avenue itself as far north-east as the River Taff. The AQMA also includes Cardiff Road (A4119) as it runs through Llandaff and across Western Avenue through to the junction with Penhill Road, Pencisely Road and Llandaff Road.

Western Avenue is a dual-carriageway road which forms part of the principal cross-city route; it becomes Eastern Avenue at the main Gabalfa Interchange and becomes the A48(M) at the St Mellons interchange to the east of the city.

Generally, the AQMA encompasses residential properties close to the roads. The exception to this is a few ground-floor retail premises with residential above on Cowbridge Road East and in Llandaff High Street. There are no industrial premises in the area.

6.1.2 The Local Air Quality Perspective

The AQMA was declared as a result of monitoring by nitrogen oxide diffusion tubes at three principal traffic intersections in the area. The monitoring data was then used to inform and calibrate a modelling exercise to predict the extent of the air quality problem in 2005.

The Stage 4 Review and Assessment of Air quality was published in November 2001 and this detailed monitoring in the AQMAs since the 3rd Stage Review and Assessment. Monitoring has continued since the Stage 4 report and results are given in Table 4, Appendix 1. These should be considered in light of preliminary data from an exercise designed to compare data from nitrogen oxide diffusion tubes with an automatic analyser calibrated to national standards.

The data in Table 4 show that NO₂ levels at Mitre Place, Llandaff and Ely Bridge (tubes 33 and 47) remain high and at Western Avenue the values have dropped year on year. These are the monitoring locations which prompted the AQMA declaration.

Of the other locations, only the diffusion tube at Cardiff Road (tube 83) is recording high NO₂ levels. This site, together with the others in Table 4, have been commissioned since the AQMA was declared.

It is interesting to compare the kerbside monitoring sites' data with preliminary data obtained from nearby sites on building facades. Comparing Mitre Place, Llandaff (tube 33) Cardiff Road, Llandaff (tube 99), Western Avenue (tube 48) with Western avenue (P) (tube 98) and Cardiff Road (tube 83) with 188 Cardiff Road (tube 100) shows that measured levels on building facades are significantly lower than at nearby kerbside sites even when these sites are close together and the building façade only a few metres back from the kerb. Monitoring will continue at all of these sites and the data will be used to inform the Phase 2 Review and Assessment due at the end of 2003.

The preliminary data in Table 7 show that Cardiff's diffusion tubes appear to be over-reading when compared to a calibrated automatic analyser by up to 50%. Again, this monitoring will continue so as to inform the Phase 2 Review and Assessment.

Although the monitoring data briefly discussed is preliminary and the data from the automatic analyser are as yet unratified, it would appear that the extent of the NO₂ problem might not be as great as predicted in the Stage 3 Review and Assessment of Air Quality used to inform the AQMA declaration.

6.1.3 Changes in Local Land Use

The south-west end of this area could be affected by the redevelopment of a brown field site once used by Arjo Wiggins paper mill. Plans are under development which could include mixed commercial and residential uses but this is as yet uncertain.

There is very little potential for new road-build in or near to the AQMA, with the possible exception of an additional link between the Peripheral Distributor Road and the Western Avenue/Cowbridge Road West/Cowbridge Road East junction. However, although this road link appears in the LTP, it is very much

at the “desirability study” stage rather than “feasibility” study stage. Certainly, there is doubt as to whether the road is needed/wanted and there are no firm plans for its building. For the time being, we have to assume that the road will not be built.

Similarly, it is the nature of the area that there is little free land available for the development of uses which would significantly affect/improve air quality.

There has been a great-deal of local retail development in the Culverhouse Cross area of Cardiff at the south-western end of Cowbridge Road West. There is little doubt that that this has attracted additional road trips through the Ely Bridge area. These developments have, in general, been granted following Appeal to the Welsh Office/National Assembly for Wales following refusal of consent by the Council.

It is possible that major developments south of the AQMA, such as the proposed Sports Village, an Ikea store and a new Cardiff City football stadium could have some influence on air quality within the AQMA.

6.1.4 Options for Measures Additional to the Local Transport Plan

The Framework given in Table 3 above divides the Transport options into three distinct sections; traffic reduction, changing vehicle mix and the reduction of emissions. These are considered below. In general, the measures discussed are additional to those long-term measures given in more detail in the Local Transport Plan and are those for which potential was identified by the working group. Table 3 includes items for which no viable option was identified, a typical example of which would be “Pedestrian areas” which was not viable due to the nature of the local geography

Identified Options:

1. Reducing Traffic

Traffic management

All of the major traffic junctions are controlled by the SCOOT system. There is no scope for extending its use within the AQMA.

Rerouting

This is a part of the “inner box” route through the city and there are no suitable parallel routes except the M4 some miles north, but it does not give the same level of access to the city areas, nor is it appropriate for intra-city trips.

It is possible that should an “Ely Spur” road be constructed, traffic will be reduced along the length of Cowbridge Road West, which will, in turn, reduce congestion and pollution at Ely Bridge. Although this road link is included in the Local Transport Plan, it is only at the “feasibility study” stage and it is by no means certain that it will be needed or built.

Telematics

It is possible to add indicative air quality monitoring equipment to the SCOOT system to provide an additional parameter by which traffic may be managed. This system is available and under trial in a number of UK towns and cities, including Leicester and Stoke. The system provides an additional data input for SCOOT to automatically manage the local traffic flows and can be used to

trigger measures such as traffic gaiting during periods of elevated pollution levels.

At Ely Bridge there is the possibility to use such a system relocate traffic queues to the more open areas beyond Grand Avenue. There is little scope to use this in other areas of the AQMA.

This is considered a viable short-term measure to be used until the long-term Local Transport Plan measures take effect.

Cut through traffic

The roads in this AQMA are all major radial routes through the city and each is enclosed by well established residential areas. It is not desirable to use measures which will force traffic from the main routes onto local residential roads as this will adversely affect road safety.

As an example of this, in an attempt to both reduce the frequency of accidents and to improve the flow of vehicles through Llandaff, right turns into and out from Ely Road to Cardiff road have been banned and traffic management measures used to force the traffic onto Western Avenue.

Parking policy

In the long-term demand could be reduced by parking controls in the central area of Cardiff.

Road Pricing policy

NAW have indicated that road pricing is unlikely to be approved in Wales.

2. Changing Vehicle Mix

Mode shift

In the long term mode shift will assist traffic reduction. This is a long term option addressed in the Local Transport Plan.

Park & Ride

The use of park and ride at Culverhouse Cross or Leckwith could reduce traffic demand at Ely Bridge. This is very much a long-term option for which there are as yet no firm plans.

3. Reducing Emissions

Travel plans

There are a number of schools around the Llandaff City area for which travel plans could be developed to reduce the dependence on the private car for school trips. Again, this is an option for the long term addressed in the Local Transport Plan

Speed controls

Western Avenue is subject to a 40mph limit and other roads are subject to 30 mph limits. There is no scope for modified speed limits to reduce emissions without adversely affecting traffic management systems.

6.1.4 Timescales for Implementation

The only viable short-term improvement measure identified is the addition of air pollution monitoring equipment to the Council's existing SCOOT traffic management system in the Ely Bridge area. The monitoring equipment used is

based upon the "Learian Streetbox" and measures NO₂ locally with the data being used as an input parameter to the computer-controlled traffic management system.

Although the system is still undergoing trials in a number of towns/cities we are advised that the trials are almost complete and have been successful.

The system is therefore based upon existing monitoring technology and could be implemented relatively quickly – perhaps by the end of 2002.

6.1.5 Costs

The cost of a "Learian Streetbox" is approximately £3,000. To this it will be necessary to add such items as the local interface to the SCOOT system and modifications to the SCOOT software and installation of both.

As this system is still under trial, these additional costs have not yet been firmed-up, but they are not expected to be prohibitive.

Funding is currently being sought, but it looks like this will have to be found from existing budgets as there are no grant or "Supplementary Credit Approval" schemes available in Wales for this.

6.1.6 Impact Assessments

It has not been possible to quantify the impact of the SCOOT/Learian Streetbox system for the following reasons:

1. The system is very new and trials in other towns/cities have yet to be completed. Consequently, there are no traffic flow impact/assessment data available upon which to consider this in air quality terms. Indeed, it may well be that Cardiff's use of the system forms part of the assessment trials for the system.
2. The data from the air pollution monitoring equipment will be just one of a number of input parameters to SCOOT and the actual traffic management decisions made will be dependent upon the assessment of all of the inputs. The actual order of input priority will have to be decided based upon the local situation and needs.

However, it is reasonable to assume that the overall impact upon NO₂ pollution levels will be positive and probably significant.

6.2 Newport Road AQMA

6.2.1 The Geography of the AQMA

The Newport Road AQMA is based upon Newport Road (A4161), running from eastwards from its junction with Elm Street/Clifton Street through to Harlequin Court. This road link is the principal route into the city centre from the residential areas in the east of the city, such as Rumney, Llanrumney and St Mellons. Substantial amounts of traffic travel into and out from the city centre along Newport Road as a result of the Southern Way link to Eastern Avenue.

Within the AQMA, Newport Road is a single carriageway road at the western extreme, becoming dual-carriageway road from the junction with Albany Road.

It is this change from dual to single carriageway road as traffic moves towards the city centre that causes significant amounts of vehicle queuing and which might be the cause of the high pollution levels which prompted the AQMA declaration.

There is a bus lane running east to west which has recently been extended into the single carriageway part of the road link and the existing other lanes narrowed to accommodate the bus lane. It may be that the original bus lane and road layout compounded the vehicle queuing problem in the past and that right-turning traffic is an issue in this regard with the new layout.

Generally, the AQMA encompasses residential properties close to the roads. There are no industrial premises within the AQMA. However, there is substantial commercial activity beyond the eastern extreme of the AQMA from the junction with Dominions way.

6.2.2 The Local Air Quality Perspective

The AQMA was declared as a result of monitoring by nitrogen oxide diffusion tube at the Newport Road/Albany Road junction adjacent to Roath Court. The monitoring data was then used to inform and calibrate a modelling exercise to predict the extent of the air quality problem in 2005.

The Stage 4 Review and Assessment of Air quality was published in November 2001 and this detailed monitoring in the AQMAs since the 3rd Stage Review and Assessment. Monitoring has continued since the Stage 4 report and results are given in Table 4, Appendix 1. These should be considered in light of preliminary data from an exercise designed to compare data from nitrogen oxide diffusion tubes with an automatic analyser calibrated to national standards.

The data in Table 5 show that NO₂ levels at Newport Road (tube 8) may have dropped in recent years but still give cause for concern. The Dominions Way diffusion tube (tube 69) which was new in 2000 also records high NO₂ levels. Unsurprisingly given the local experience, this site is on the kerbside adjacent to a light-controlled junction. Newport Road (tube 8) was the monitoring location which prompted the AQMA declaration.

None of the other locations are recording high NO₂ levels; all of which have been commissioned since the AQMA was declared.

It is interesting to compare the Newport Road kerbside monitoring site's data with preliminary data obtained from a nearby site on a building facade. Comparing Newport Road (tube 8) with Newport Road (P) (tube 100) shows that the measured level on the building facade may be lower than at the nearby kerbside site despite being only a short distance from the kerb. Monitoring will continue at all of these sites and the data will be used to inform the Phase 2 Review and Assessment due at the end of 2003.

The preliminary data in Table 7 show that Cardiff's diffusion tubes appear to be over-reading when compared to a calibrated automatic analyser by up to 50%. Again, this monitoring will continue so as to inform the Phase 2 Review and Assessment.

Although the monitoring data briefly discussed is preliminary and the data from the automatic analyser are as yet unratified, it would appear that the extent of the NO₂ problem might not be as great as predicted in the Stage 3 Review and Assessment of Air Quality used to inform the AQMA declaration.

6.2.3 Changes in Local Land Use

There have been no changes in local land use with significance to air quality and none are planned. It is the nature of the area that there is little free land available for the development of uses which would significantly affect/improve air quality.

There is very little potential for new road-build in or near to the AQMA. However, a feasibility study has shown that were the Peripheral Distributor Road to be completed with a link from Queen's Gate in the docks to southern Way then this would remove up to 37% of the traffic from Newport Road. However, at a cost of up to £150m, it is unlikely that this road link could be available by the end of 2005.

Potentially significant amounts of new housing are being contemplated in the north-east of Cardiff in order to meet local demand and needs as part of the Urban Development Plan process.

6.2.4 Options for Measures Additional to the Local Transport Plan

The Framework given in Table 3 above divides the Transport options into three distinct sections; traffic reduction, changing vehicle mix and the reduction of emissions. These are considered below. In general, the measures discussed additional to those long term measures given in more detail in the Local Transport Plan are those for which potential was identified by the working group. Table 3 includes items for which no viable option was identified, a typical example of which would be "Pedestrian areas" which was not viable due to the nature of the local geography

Identified Options:

1. Reducing Traffic

Traffic management

All of the major traffic junctions are controlled by the SCOOT system. There is no scope for extending its use within the AQMA.

Improved weaving entering the narrow section of Newport Road and reducing delays due to right turning movements will help reduce vehicle queuing and thereby assisting traffic flow, reducing queuing and overall emissions.

This is a possibility in the short-term particularly given the recent extension of the west-bound bus lane towards the city centre and the consequent narrowing of the other lanes to accommodate the bus lane.

A traffic camera has been installed in the area and the possibility of restricting right turns into and out of side roads is being evaluated.

Rerouting

This is a preferred route for traffic due to the residential nature of the surrounding roads; measures which cause vehicles to use the residential roads in preference to Newport Road will be undesirable.

The only desirable alternative route would be the proposed Eastern Bay Link Road to complete the Peripheral Distributor Road. This is unlikely to be available in the short-term although the Council is actively seeking £300 - 400m of partnership agreements with the private sector to enable the implementation of Local Transport Plan measures including this new road link.

Telematics

Queue relocation or fragmentation is a possible short-term option for dealing with the city-bound queues at the Newport Road/Albany Road junction. This would involve the merging of the two west-bound lanes of traffic further east than at present (in the area of the commercial premises beyond Dominions Way) and would mean that there was a single lane of traffic moving west towards the city centre as it passes through the AQMA thus eliminating the queuing at the Newport Road/Albany Road junction.

It is possible to add indicative air quality monitoring equipment to the SCOOT system to provide an additional parameter by which traffic may be managed. This system is available and under trial in a number of UK towns and cities, including Leicester and Stoke. The system provides an additional data input for SCOOT to automatically manage the local traffic flows and can be used to trigger measures such as traffic gating during periods of elevated pollution levels.

In this case there is the possibility of using such a system to trigger the queue relocation mentioned above and/or to control the flow of traffic into the AQMA.

The queue relocation is considered a viable short-term measure which could be used into the longer-term Local Transport Plan measures begin to take effect. The effectiveness of this will be enhanced when the SCOOT system is augmented with the indicative air quality monitoring equipment.

Parking policy

In the long-term demand could be reduced by parking controls in the central area of Cardiff.

Road Pricing policy

NAW have indicated that road pricing is unlikely to be approved in Wales.

2. Changing Vehicle Mix

Mode shift

In the long term mode shift will assist traffic reduction. This is a long term option addressed in the Local Transport Plan.

Park & Ride

The use of park and ride at locations in north-east Cardiff could reduce traffic demand through Newport Road. This is very much a long-term option for which there are as yet no firm plans.

Road space priority

Should the Eastern Bay Link Road be built then a substantial amount of road-space could be reclaimed and reallocated for public transport/green transport initiatives.

However, and as stated elsewhere, this road link is unlikely to be available in the short-term for helping with these Action Plans.

Bus lanes

The bus lane within the AQMA has recently been extended and others in the area are being considered as part of Express/Core Bus Network Study. This could involve extending the AQMA's bus lane eastwards.

3. Reducing Emissions

Travel plans

This is an option for the long term addressed in the Local Transport Plan

Speed controls

Newport Road is already subject to a 30mph limit, as are other roads in the area. There is no scope for modified speed limits to reduce emissions.

6.2.5 Timescales for Implementation

The only viable short-term improvement measure identified is the management of traffic queuing in the area by relocating the west-bound queues at the Newport Road/Albany Road junction to outside of the AQMA and therefore away from relevant locations with respect to LAQM.

The addition of air pollution monitoring equipment to the council's existing SCOOT traffic management system in the Newport Road area will enhance this option and maybe provide some flexibility with regard to when and where the queues are relocated. The monitoring equipment used is based upon the "Learian Streetbox" and measures NO₂ locally with the data being used as an input parameter to the computer-controlled traffic management system.

Given the currently high NO₂ levels in the area of Dominions Way, it may be that two of the "Learian Streetboxes" will be necessary inside the AQMA to allow "staged gating" and provide some degree of day-to-day flexibility for the traffic management system in the area.

Although the system is still undergoing trials in a number of towns/cities we are advised that the trials are almost complete and have been successful.

The system is therefore based upon existing monitoring technology and can be implemented relatively quickly – perhaps by the end of 2002.

However, it should be borne in mind that the bus lanes and bus priority systems in the area are in a state of change and implementation of any queue relocation will have to be carefully managed.

6.2.6 Costs

The cost of a "Learian Streetbox" is approximately £3,000. To this it will be necessary to add such items as the local interface to the SCOOT system and modifications to the SCOOT software and installation of both.

As this system is still under trial, these additional costs have not yet been firmed-up, but they are not expected to be prohibitive.

Funding is currently being sought, but it looks like this will have to be found from existing budgets as there are no grant or "Supplementary Credit Approval" schemes available in Wales for this.

6.2.7 Impact Assessments

It has not been possible to quantify the impact of the SCOOT/Learian Streetbox system for the following reasons:

1. The system is very new and trials in other towns/cities have yet to be completed. Consequently, there are no traffic flow impact/assessment data available upon which to consider this in air quality terms. Indeed, it may well be that Cardiff's use of the system forms part of the assessment trials for the system.
2. The data from the air pollution monitoring equipment will be just one of a number of input parameters to SCOOT and the actual traffic management decisions made will be dependent upon the assessment of all of the inputs. The actual order of input priority will have to be decided based upon the local situation and needs.
3. Traffic flows and speeds in the area have recently altered as a result of the changes to the bus lane and bus priority scheme and so it may be that pollution levels in the area will have altered too, making assessment unreliable.

However, it should be recognised that the queuing west-bound traffic at the Newport Road/Albany Road junction is the major contributor to congestion and emissions in the immediate area. It is therefore reasonable to expect that overall impact of the traffic management measures upon NO₂ pollution levels will be significant and will deliver the small improvement needed (if, indeed, an improvement is necessary) to meet the Objective at the façade of nearby relevant locations.

6.3 The Philog AQMA

6.3.1 The Geography of the AQMA

The Philog AQMA is based upon Manor Way/Northern Avenue (A470), running from southwards from its junction with Caegwyn Road through to the Gabalfa Interchange. The area also includes The Philog from its junction with Manor Way and the "triangle" of premises bounded by Manor Way, Birchgrove Road and Caerphilly Road.

Northern Avenue/Manor Way is the principal route into the city centre from the M4 (Junction 32), the residential areas in the north of the city, such as Whitchurch and Rhiwbina, and traffic from towns north of Cardiff such as Pontypridd, Caerphilly and Aberdare and the South Wales Valleys in general.

Additionally, traffic uses Northern Avenue/Manor Way to access Eastern and Western Avenues via the Gabalfa Interchange to allow access to the University Hospital of Wales, the Excelsior Road retail area and the M4 Eastbound via the A48(M) at the St Mellons interchange (Junction 29a).

Within the AQMA, Northern Avenue and Manor Way are dual-carriageway roads along their whole length. The other roads are all single carriageway.

During the morning peak, there is a significant amount of vehicle queuing along The Philog and Birchgrove Road west of Manor Way. Whilst much of the traffic emanates from the residential area of Whitchurch it is thought that a significant proportion of vehicles cut down through Whitchurch village from the M4 junction 32 in the mistaken belief that it is quicker to do this than travel down Northern Avenue/Manor Way.

It is believed that the 2001 census, when published will show a significantly increased proportion of people travelling from outside of Cardiff to work in the city centre when compared to the earlier 1991 census. This is providing the driver from many of the measures included for this area in the Local Transport Plan.

Generally, the AQMA encompasses residential properties close to the roads. There are no industrial premises within the AQMA

6.3.2 The Local Air Quality Perspective

The AQMA was declared as a result of monitoring by nitrogen oxide diffusion tube at the Manor Way/The Philog junction (tube 53). The monitoring data was then used to inform and calibrate a modelling exercise to predict the extent of the air quality problem in 2005.

The Stage 4 Review and Assessment of Air quality was published in November 2001 and this detailed monitoring in the AQMAs since the 3rd Stage Review and Assessment. Monitoring has continued since the Stage 4 report and results are given in Table 5, Appendix 1. These should be considered in light of preliminary data from an exercise designed to compare data from nitrogen oxide diffusion tubes with an automatic analyser calibrated to national standards.

The data in Table 6 show that NO₂ levels as measured at The Philog (tube 53) remain high. None of the other locations are recording high NO₂ levels; all of which have been commissioned since the AQMA was declared. Even the kerbside-located Cross Inn tube (tube 66) records NO₂ values which are relatively low despite its location in the centre of a heavily-trafficked junction.

It is interesting to compare the The Philog kerbside monitoring site's data with data obtained from a nearby site on a building façade – 104 Birchgrove Road (tube 82). These two sites are relatively close together, tube 82 being on the façade of the building about 9m from the kerb.

The preliminary data in Table 7 show that Cardiff's diffusion tubes appear to be over-reading when compared to a calibrated automatic analyser by up to 50%. Again, this monitoring will continue so as to inform the Phase 2 Review and Assessment.

Although the monitoring data briefly discussed is preliminary and the data from the automatic analyser are as yet unratified, it would appear that the extent of the NO₂ problem might not be as great as predicted in the Stage 3 Review and Assessment of Air Quality used to inform the AQMA declaration.

6.3.3 Changes in Local Land Use

There have been no changes in local land use with significance to air quality and none are planned. It is the nature of the area that there is little free land available for the development of uses which would significantly affect/improve air quality.

There is very little potential for new road-build in or near to the AQMA.

6.3.4 Options for Measures Additional to the Local Transport Plan

The Framework given in Table 3 above divides the Transport options into three distinct sections; traffic reduction, changing vehicle mix and the reduction of emissions. These are considered below. In general, the measures discussed additional to those the long term measures given in more detail in the Local Transport Plan. The options discussed are those for which potential was identified by the working group. Table 3 includes items for which no viable option was identified, a typical example of which would be "Pedestrian areas" which was not viable due to the nature of the local geography

Identified Options:

1. Reducing Traffic

Traffic management

All of the major traffic junctions are controlled by the SCOOT system. There is no scope for extending its use within the AQMA.

However, and in an attempt to both control the speed and amount of traffic entering The Philog from its western end at Whitchurch Common, a new light-controlled junction has been installed at the junction of Merthyr Road and College Road. It is hoped that this will discourage traffic travelling through Whitchurch from the M4 and encourage local traffic onto Northern Avenue/Manor Way rather than use The Philog.

Whilst this road scheme was primarily introduced for reasons of road safety, the possible benefits in respect of air quality by reducing the queue length at the junction of The Philog and Manor Way were recognised, albeit informally, at the planning stage.

Rerouting

Northern Avenue/Manor Way is the preferred route for traffic travelling south towards Gabalfa and the city centre due to the residential nature of the surrounding roads; measures which cause vehicles to use the residential roads in preference will be undesirable.

Telematics

There is an opportunity to break the queues into smaller parts and to hold some traffic back between Pantmawr Road and Caegwyn Road in order to control queuing at the Manor Way/Birchgrove Road junction.

It is possible to add indicative air quality monitoring equipment to the SCOOT system to provide an additional parameter by which traffic may be managed. This system is available and under trial in a number of UK towns and cities, including Leicester and Stoke. The system provides an additional data input for SCOOT to automatically manage the local traffic flows and can be used to trigger measures such as traffic gating during periods of elevated pollution levels.

In this case there is the possibility of using such a system to trigger the queue relocation mentioned above and/or to control the flow of traffic into the AQMA.

The queue relocation is considered a viable short-term measure which could be used until the longer-term Local Transport Plan measures begin to take effect. The effectiveness of this will be enhanced when the SCOOT system is augmented with the indicative air quality monitoring equipment.

Parking Policy

In the long-term demand could be reduced by parking controls in the central area of Cardiff.

Road Pricing policy

NAW have indicated that road pricing is unlikely to be approved in Wales.

2. Changing Vehicle Mix

Mode shift

In the long term mode shift will assist traffic reduction. This is a long term option addressed in the Local Transport Plan.

Additionally, the SWIFT consortium are working to increase the use of public transport for trips from valleys north of Cardiff and from the Vale of Glamorgan. However, this is very much at the planning/feasibility stage and this option is for the long-term via the Local Transport Plan route.

Park & Ride

The use of park and ride at locations in north Cardiff could reduce traffic demand through Newport Road. This is very much a long-term option for which there are as yet no firm plans.

Road space priority

The Northern Avenue/Manor Way is a dual carriageway two lane road, meaning that it is theoretically possible to put in high occupancy vehicle lanes or bus lanes or no car lanes. These measures could reduce the volume of traffic queuing at the affected junction. There would be a trade off with the car lane being more congested, but research has shown trips can be suppressed if costs (congestion) are raised.

It is considered that there must be a high volume of buses to make a bus lane work efficiently. Although Manor Way is a major radial route, it is not certain that the number of routes which use it would be sufficient to make this a viable option.

High occupancy vehicle lanes been used in Leeds and Bristol to apparent good effect. It is possible that the volume of vehicles could be reduced whilst theoretically maintaining the person carrying capacity of this road.

Given the current studies being carried out as part of the Express/Core Bus Network Study under the Local Transport Plan, these options are more for the long-term than the short-term.

Traffic regulation

Northern Avenue and Manor Way benefit from a Traffic Regulation declaring a "Clearway" along this stretch of road and so do not suffer from parking obstructions or turning delays. Any reduction of the speed limit from the current 40 to 30 mph could increase the volume of traffic in a given length of road thereby causing additional traffic management and telematics problems and so possibly exacerbating the existing air quality problem.

3. Reducing Emissions

Travel plans

This is an option for the long term addressed in the Local Transport Plan

Speed controls

With the exception of Northern Avenue/Manor Way, all or the roads in the area are subject to a 30 mph speed limit and there is no scope for reducing speeds further. Reducing speeds on Northern Avenue from the present 40mph limit to 30 mph could increase the volume of traffic in a given length of road thereby causing additional traffic management problems and possibly exacerbating the existing air quality problem.

6.3.5 Timescales for Implementation

Given that the new light-controlled junction at Merthyr Road/College Road is now installed, the only viable short-term improvement measure identified is the management of traffic queuing in the area by relocating/shortening the south-bound queues at the Manor Way/Birchgrove Road junction to outside of the AQMA where relevant locations are further away from the road and pollution levels are lower.

The addition of air pollution monitoring equipment to the council's existing SCOOT traffic management system in The Philog area will enhance this option and maybe provide some flexibility with regard to when and where the queues are relocated. The monitoring equipment used is based upon the "Learian Streetbox" and measures NO₂ locally with the data being used as an input parameter to the computer-controlled traffic management system.

Although the system is still undergoing trials in a number of towns/cities we are advised that the trials are almost complete and have been successful.

The system is therefore based upon existing monitoring technology and could be implemented relatively quickly – perhaps by the end of 2002.

6.3.6 Costs

The cost of a "Learian Streetbox" is approximately £3,000. To this it will be necessary to add such items as the local interface to the SCOOT system and modifications to the SCOOT software and installation of both.

As this system is still under trial, these additional costs have not yet been finalised, but they are not expected to be prohibitive.

Funding is currently being sought, but it looks like this will have to be found from existing budgets as there are no grant or "Supplementary Credit Approval" schemes available in Wales for this.

6.2.7 Impact Assessments

It has not been possible to quantify the impact of the SCOOT/Learian Streetbox system for the following reasons:

1. The system is very new and trials in other towns/cities have yet to be completed. Consequently, there are no traffic flow impact/assessment data available upon which to consider this in air quality terms. Indeed, it may well be that Cardiff's use of the system may form part of the assessment trials for the system.
2. The data from the air pollution monitoring equipment will be just one of a number of input parameters to SCOOT and the actual traffic management decisions made will be dependent upon the assessment of all of the inputs. The actual order of input priority will have to be decided based upon the local situation and needs.

However, it should be recognised that the queuing traffic at the Manor Way/Birchgrove Road junction is the major contributor to congestion and emissions in the area. It is therefore reasonable to expect that overall impact of the traffic management measures upon NO₂ pollution levels will be significant and will deliver the small improvement needed (if, indeed an improvement is necessary) to meet the Objective at the façade of nearby relevant locations.

6.4 Monitoring

In this case, monitoring the progress of the planned actions will be relatively straightforward.

The aim of the Action Plans is to enable Cardiff to work towards the Objectives in the Air Quality (Wales) Regulations 2000 and achieve them wherever possible.

Cardiff County Council's approach to the Local Air Quality Management process has been based upon the measurement of air pollution rather than the modelling of it whenever possible and the monitoring strategy has become tightly focussed upon those areas of the city where problems have been identified. This is exemplified by the number of new monitoring sites within the AQMAs that have commenced measuring since they were declared. From sites that have tended to be located at the kerbside in the search for local pollution "hot-spots" it is now the case that new sites tend to be located at the façade of buildings classed as "relevant locations" in accordance with guidance from Central Government and the devolved administrations.

This monitoring will continue the recent initiative of co-locating three nitrogen oxide diffusion tubes with DEFRA's Cardiff Centre AURN automatic monitoring station. All of the analysers at this site are calibrated using reference gases traceable to national standards and the data is independently verified and ratified to the highest standards using nationally approved protocols. This will allow all of the diffusion tube monitoring by the Council to be calibrated and afford greater confidence in the results obtained. The results so far available from this study are given in Table 7, Appendix 1.

The Objectives for NO₂ are to be achieved by the end of 2005. However, Central Government and the devolved administrations have asked local authorities to complete

a further Review and Assessment of Air Quality (the so-called Phase 2 Review and Assessment) in their areas by the end of 2003. This will allow an interim assessment of progress towards the Objectives to be made at that time.

7.0 Discussion

Cardiff's three AQMAs are centred on main distributor roads and through-routes which generally pass through well established residential areas. These are the very roads that the traffic should be using for safety reasons.

In the long-term it is expected that a combination of national measures to cut emissions to air and measures in the Cardiff Local Transport Plan will cut emissions such that the air quality Objectives will be achieved. The aim of the action planning process has therefore been to look for short-term measures that could be used in addition to those already identified for the long-term.

It is the nature of the principal roads around which the AQMAs have been declared that the traffic that uses them is moving from one destination to another. Consequently, options for dealing with the air quality problem such as pedestrianisation or road closures are not viable for any of the roads. Other options such as bus lanes and priority and mode shift are currently being investigated, evaluated and considered under the Local Transport Plan. It was not the purpose of the action planning process to duplicate this work.

Options for additional measures have proved to be limited to traffic management, being such things as queue relocation and air pollution monitoring to provide active input and control over traffic to provide the short-term solution until the longer-term measures take effect.

8.0 Conclusions

Cardiff has a very comprehensive Local Transport Plan, developed with the local environment very much to the fore. It is often the case that measures taken to improve facilities for alternative modes of transport and traffic demand restraint also have a positive impact on local transport emissions. These measures will, in themselves, deliver local emission improvements over and above measures taken at the national level, such legislation requiring improvements in vehicle emissions and control over emissions from large combustion plant.

This is reflected in the fact that emissions of nitrogen oxides are falling year-on-year.

One consequence is the small number available options to improve air quality at the local level where the principal source of emissions is road traffic. Within Cardiff's AQMAs the choice of available options has been limited to traffic management measures additional to those already in the Local Transport Plan.

Local Air Quality Management in Cardiff has evolved with the Review and Assessment process and as each stage in the process more evidence comes to light which allows a better understanding of the local situation.

Monitoring evidence is beginning to suggest that predictions of future poor air quality may have been pessimistic and there are several possible reasons for this.

Overall, it now appears that only small improvements are necessary in order to achieve the Objectives. The traffic management measures outlined in the Action Plans for the AQMAs should be enough to ensure that the Objectives are met.

Monitoring will continue in order to assess the effectiveness of the Action Plan measures combined with the wider-reaching measures in the Local Transport Plan.

The Phase 2 Review and Assessment of Air Quality due at the end of April 2004 will allow for a further detailed assessment of local air quality to be made before the end of 2005. If it appears that the measures taken to improve air quality are not sufficiently effective then the Action Plans can be re-evaluated at that time.

Appendix 1

Tables of Information and Monitoring Data

Table 3 Standards and Objectives in Air Quality (Wales) Regulations 2000

<i>Pollutant</i>	<i>Standard</i>	<i>Objective</i>
Benzene	16.2ugm ⁻³ , measured as running annual mean	16.2ugm ⁻³ by 31/12/2003.
1,3 - Butadiene	2.25ugm ⁻³ , measured as running annual mean	2.25ugm ⁻³ by 31/12/2003
Carbon monoxide	11.6mgm ⁻³ , measured as running 8-hour mean	11.6mgm ⁻³ by 31/12/2003
Lead	0.5ugm ⁻³ , measured as annual mean 0.25ugm ⁻³ , measured as annual mean	0.5ugm ⁻³ by 31/12/2004. 0.25ugm ⁻³ by 31/12/2008
Nitrogen dioxide	200ugm ⁻³ , measured as 1 hour mean 40ugm ⁻³ , annual mean	200ugm ⁻³ by 31/12/2005 (maximum of 18 exceedences) - PROVISIONAL OBJECTIVE 40ugm ⁻³ by 31/12/2005 - PROVISIONAL OBJECTIVE Annual national Objective for the protection of vegetation and ecosystems of 30 ug m ⁻³ for 31/12/2000. NOT TO BE INCLUDED IN REGULATIONS/LAQM
Ozone	100ugm ⁻³ , measured as running 8-hour mean	100ugm ⁻³ by 31/12/2005 - PROVISIONAL AND NOT TO BE PART OF REGULATIONS/LAQM
Particles (PM₁₀)	50ugm ⁻³ , measured as 24-hour mean 40ugm ⁻³ , measured as annual mean	50ugm ⁻³ by 31/12/2004, maximum of 35 exceedences per year 40ugm ⁻³ by 31/12/2004
Sulphur dioxide	350ugm ⁻³ , measured as 1 hour mean 125ugm ⁻³ , measured as 24 hour mean 267ugm ⁻³ , measured as 15- minute mean 20ugm ⁻³ , measured as annual mean 20ugm ⁻³ , measured as winter average (1 Oct to 31 Mar)	350ugm ⁻³ by 31/12/2004, not to be exceeded more than 24 times per year. 125ugm ⁻³ , by 31/12/2004, not to be exceeded more than 3 times per year 267ugm ⁻³ by 31/12/2005, not to be exceeded more than 35 times per year National annual Objectives for the protection of ecosystems of 20ugm ⁻³ for 31/12/2000. NOT TO BE INCLUDED IN REGULATIONS/LAQM National winter Objectives for the protection of ecosystems of 20ugm ⁻³ for 31/12/2000. NOT TO BE INCLUDED IN REGULATIONS/LAQM

Table 4 Cardiff West AQMA – Monitoring Data
(data for NO₂, all values in µgm⁻³)

Site Name	Tube No.	Grid Reference	Site Classification	data start date	data end date*	1999	2000	2001	2002
Mitre Place, Llandaff	33	315248,178165	Kerbside	before 1998	Aug 2002	46	52	51	51
Ely Bridge	47	314487,176760	Kerbside	May 1999	Aug 2002	59	48	59	51
Western Avenue	48	314832,177340	Kerbside	May 1999	Aug 2002	59	46	41	38
Lansdowne Road	55	315582,176594	Kerbside	May 1999	Aug 2002	42	40	38	35
Grand Avenue/CRW	62	314168,176522	Kerbside	May 2000	Aug 2002		38	43	34
The Crescent	63	315751,177725	Kerbside	May 2000	Aug 2002		42	42	38
St Fagans Road	77	314606,177338	Kerbside	May 2000	Aug 2002		27	30	27
Ely Road	78	314792,177127	Kerbside	May 2000	Dec 2001		27	27	-
Cardiff Road	83	316252,177298	Kerbside	May 2001	Aug 2002			53	56
Western Avenue (P)	98		Building Facade	Oct 2001	Aug 2002			36	27
Cardiff Road, Llandaff	99		Building Facade	Oct 2001	Aug 2002			39	31
188 Cardiff Road	100		Building Facade	Jan 2002	Aug 2002				34

Table 5 Newport Road AQMA – Monitoring Data
(data for NO₂, all values in µgm⁻³)

Site Name	Tube No.	Grid Reference	Site Classification	data start date	data end date*	1999	2000	2001	2002
Newport Road	8	319920,177586	Kerbside	before 1998	Aug 2002	53	42	47	37
Dominion's Way	69	320448,177684	Kerbside	May 2000	Aug 2002		57	53	49
Oakfield Street	70	319687,177317	Kerbside	May 2000	Aug 2002		36	37	37
Marlborough Road	71	319804,177782	Kerbside	May 2000	Aug 2002		27	30	22
Newport Road (P)	97		Building Façade	Dec 2001	Aug 2002			39	35

Data end date = latest data included in this report. It does not mean that monitoring at this location has ceased.*

Table 6 Philog AQMA – Monitoring Data
(data for NO₂, all values in µgm⁻³)

Site Name	Tube No.	Grid Reference	Site Classification	data start date	data end date*	1999	2000	2001	2002
The Philog	53	316545,179691	Kerbside	May 1999	Aug 2002	61	53	56	47
Pantbach Rd	65	316698,179838	Kerbside	May 2000	Aug 2002		27	28	23
Cross Inn	66	316800,179480	Kerbside	May 2000	Aug 2002		40	41	40
Whitchurch Common	67	316129,179671	Kerbside	May 2000	Aug 2002		29	33	20
104 Birchgrove Road	82	316518,179683	Building Façade	Nov 2000	Aug 2002		34	25	22
Manor Way Junction	96		Building Façade	Dec 2001	Aug 2002			49	31
Birchgrove PS	-	316724,179761	Intermediate	July 2000	June 2001	12 month average=		25	

Data end date = latest data included in this report. It does not mean that monitoring at this location has ceased.*

Table 7 Comparison of Cardiff Diffusion Tube Data with Automatic Analyser
(data for NO₂, all values in µgm⁻³)

Site Name	Tube No.	Feb 2002	Mar 2002	Apr 2002	May 2002	June 2002	July 2002	Aug 2002	Average
AURN	-	29	16	26	19	13	15	16	19
AURN DT1	101	35	42	31	24	22	23	37	31
AURN DT2	102	36	39	29	32	23	21	22	29
AURN DT3	103	35	41	33	26	24	19	16	28

APPENDIX B

Responses From Consultation Exercise

Consultee	Date and Comments	Amendments
<p>Environment Agency (Dr John Houlgrave)</p>	<p>3rd September 2002</p> <p>1 We agree with your assessment and conclusions that industrial sources are not a major contributor to air quality problems in Cardiff and that the major source is road transport. It is therefore appropriate that the AQAP should be linked with the Local Transport Plan (LTP) and that the LTP should be a major means for achieving the Air Quality Strategy Objectives.</p> <p>2. In your conclusions you state that "Monitoring evidence is beginning to suggest that predictions of future poor air quality may have been pessimistic" and that "it now appears that only small improvements are necessary in order to achieve the Objectives". Can you confirm that these statements are based on your preliminary results comparing AURN with diffusion tubes and comparing kerbside with building facade? The Environment Agency make extensive use of diffusion tubes and your conclusions are of great interest and relevance to our work. Could you give details of the methodology and results that have led to your conclusions? Where are your tubes located in relation to the AURN inlet? (I'm planning on going through a similar exercise towards the end of this year).</p>	<p>1. No response needed.</p> <p>2. The statements are indeed based upon preliminary results of a comparison of diffusion-tube data and data from the chemiluminescent analyzer at the Cardiff AURN site.</p> <p>There are three diffusion tubes co-located on the monitoring site's inlet duct. Data from the tubes show good agreement with each other, although they consistently over-read when compared to the AURN site. This is not unexpected; the comparison was not implemented to find out if there was an over-read; it was to find out the magnitude of it.</p> <p>Data from February to August 2002 (inclusive) indicate that the diffusion tubs may be over-reading by as much as 50%.</p>

	<p>3. The Environment Agency welcomes the proposals to develop a comprehensive, efficient public transport network.</p> <p>4. A number of people in our Cardiff office are Cardiff residents and use the current Cardiff cycle network. They voice the issues/problems identified in your LTP regarding cycling in the city. They welcome the improvements proposed for the cycle network and feel that these will make existing cyclists happier, but they do not think that they will encourage a significant increase in the number of people using cycles in the city.</p>	<p>3. No response needed.</p> <p>4. No response needed.</p>
<p>Councillor Rose Pearson (County Councillor for Whitchurch and Tongwynlais)</p>	<p>11th September 2002</p> <p>Whilst welcoming the measures proposed, I am very disappointed with the limited scope of the response. These measures fail to address the problem of the amount of traffic coming in to and out of Cardiff along the A470, and serve to re-distribute pollution rather than to tackle it at its source.</p> <p>One key measure identified is the installation of new traffic lights at College Road. These were introduced mainly as a safety measure, and not as part of the AQMA strategy, although they have the additional and welcome effect of deterring traffic passing through the village via the Common and the Philog, and of diverting other traffic to Manor Way. Rerouting to</p>	<p>The Actions Plans have been developed in order to identify measures in the very short-term (that is, before the end of 2005) to rectify predicted breaches of Air Quality Objectives contained in the Regulations. The Action Plans do not specifically address the amount of traffic on the A470/Manor Way; road-traffic reduction is a matter being considered under the Cardiff Local Transport Plan 2000 – 2016 (LTP).The Action Plans set-out the viable short-term measures which would enable the Objectives to be met over and above any medium and long-term road-traffic reduction and modal-shift measures contained in the LTP.</p> <p>The principal aim of the new traffic signals at the junction of College Road and Merthyr Road is to increase road safety. However, the potential for acting as a deterrent to traffic using Whitchurch village as a through-route was recognised at the time that the traffic signals were planned. The consequent potential for air quality benefits by reducing the queue length at the junction of The Philog and Manor Way at peak hours were also</p>

	<p>discourage motorists from using residential streets is clearly desirable for many reasons. However, traffic on Manor Way also passes the end of the Philog, and so the traffic lights will not lessen the overall amount of air pollution within the AQMA.</p> <p>The SCOOT system does go some way to address the immediate problem of lessening pollution in the AQMA, and will help to provide a better environment (though probably still not much better) for residents and pedestrians in the area identified. However, if the same amount of traffic comes along Manor Way, and much of it is delayed and spaced at peak times, pollution will increase in the area adjacent to the AQMA.</p> <p>The purpose of the targets is not to address the problems of vehicle pollution by redistributing the pollution, but to encourage solutions based upon the statement in 'Ambitions for Cardiff' (p18) which states that</p> <p style="padding-left: 40px;">'In 2002-3 we will.....'develop and implement policies that accelerate the shift from private cars to public transport by providing bus priority measures on the Northern corridors.....' etc.</p> <p>I am consequently disappointed that this document does not regard bus priority lanes as a 'viable option.' I appreciate the points made, but would respond that great effort should be put in to working with bus providers and providing Park and Ride facilities. This of course has to be paid for, and I was alarmed to learn from the document that the NAW have indicated that</p>	<p>recognised. The wording of this paragraph of the draft Action Plans has been altered to convey this.</p> <p>The proposed additions to the SCOOT system will not cause a reduction in emissions but will merely redistribute the pollution at times of high pollution around this junction. This will not cause other parts of the AQMA to exceed the Objectives. It will, however help to ensure that the Objectives are met at the Manor Way/Philog "hotspot" in the short-term and enable the Council to demonstrate that it has achieved its legal obligations.</p> <p>The Objectives in the Air Quality (Wales) Regulations 2000 have been set having regard to known adverse health and have not therefore been set so as to enable local transport policy. The statement referred to on page 18 of "Ambitions for Cardiff 2002 – 2003" refers directly to the LTP. As implied, air pollution and transport planning are not mutually exclusive and the draft Action Plans were prepared jointly by officers from both Regulatory Services and Traffic and Transportation.</p> <p>The draft Action Plans do not dismiss the idea of a bus lane on Manor Way. The section entitled "Road Space Priority" on page 29 says that a bus lane could be a viable option were there to be sufficient buses using the lane and refers to studies in other Cities where such an option has been used successfully. However, studies carried out as part of the on-going Express/Core Bus Network Study suggest that this may only be</p>
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	<p>road pricing is unlikely to be approved in Wales. I shall be writing to Sue Essex, AM and Minister with responsibility for Transport, for clarification on this matter.</p> <p>In my view, a more far-reaching scheme that actually addresses levels of traffic should be prepared and argued for. It should aim to include bus priority lanes; park and ride, and a frequent and cheap or free bus shuttle into town. To enable this, Cardiff should join other progressive authorities such as London, Edinburgh and Durham, and consider introducing road pricing. We should seek to persuade the NAW of the urgent need for radical measures to effect a modal shift towards public transport.</p>	<p>viable were there to be sufficient buses using it and that is an option more for the long-term rather than the short-term focus of the draft Action Plans.</p> <p>Section 3.1.2 on page 6 of the draft Action Plans considers the LTP in relation to air quality. The matters raised with regard to bus priority schemes, park and ride schemes and public transport partnerships are discussed in this section of the Plans. The background work to these schemes has been on-going for quite some time under the auspices of the LTP and this is the appropriate mechanism for them to be continued. Although some of these measures, such as the new GPS bus-shelter information system, are now operational, most are for the medium to longer-term and their effects are very unlikely to have the short-term effects necessary to enable the Air Quality Objectives to be met.</p>
<p>Councillor Heather Douglas County Councillor for Plasnewydd</p>	<p>27th September 2002 Telephone call to say that the Draft Air Quality Action Plans were informative and that she agreed with them.</p>	<p>No response needed.</p>