2016 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the
Environment Act 1995
Local Air Quality Management

January 2017

Local Authority Officer	Neil Chaplin and Frances Taylor
Department	Environmental Protection
Address	Civic Centre 4, floor 3, Much Park Street, Coventry, CV1 2PY
Telephone	024 7683 1424
E-mail	Env.protection@Coventry.gov.uk
Report Reference number	ASR2016
Date	Jan 2017

Executive Summary: Air Quality in Our Area

1.1 Air Quality in Coventry

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

The main pollutants of concern in Coventry are nitrogen dioxide and particulate matter. These pollutants are predominantly associated with road traffic emissions particularly on busy roads and in areas where traffic queues regularly. The issues arise when people spend time near high levels of these pollutants whether through housing, working or recreation.

In Coventry, the main concern is centred on housing that is in close proximity to the major arterial routes with high levels of queuing traffic, principally around busy junctions and traffic lights. Current hotspots are parts of Holyhead Road, Walsgrave Road, Foleshill/Longford Road, Stoney Stanton Road and junctions along the A45, some of which serve the Warwick University campus.

Rather than focussing on individual roads and junctions, Coventry has declared the whole area as an AQMA. This decision was taken to ensure that the problem wasn't simply moved from one road or junction to another. More information is available at:

http://www.coventry.gov.uk/info/68/pollution/171/air_quality

Recent years' NO_2 diffusion tube monitoring results (2011-2015) show that levels of nitrogen dioxide are generally in decline and levels of PM_{10} do not exceed the national standards.

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Coventry City Council is working closely with neighbouring authorities and Government Agencies to address poor air quality. It is one of seven local authorities in the West Midlands working in partnership to improve air quality and reduce emissions from road transport as part of 'The Low Emissions Towns and Cities Programme (LETCP)'.

Actions to Improve Air Quality

There is a considerable amount of work being undertaken by Coventry City Council that has the potential to improve air quality whether directly or indirectly. Table 2.1 provides a summary of the main actions being undertaken.

At a strategic level, the grant-funded LETCP is a group of seven West Midlands Local Authorities including Coventry. They are working towards improving air quality and reducing road traffic emissions across the West Midlands. The aim is to do this by promoting the uptake of low emission fuels and technologies, establishing and sharing best practice policies and developing various tools and resources.

Coventry City Council is currently working in partnership with Public Health, along with colleagues from planning, transportation and other local authorities as part of the Coventry and Warwickshire Air Quality Alliance to develop a new Health Protection Strategy on the reduction of vehicle emissions, public education and encourage uptake of sustainable/active modes of transport.

In addition, the West Mids Combined Authority have produced the local transport plan 'Movement for Growth' a key theme of which is improving public transport and cycle networks to reduce the number of short journeys made by car in order to improve air quality.

A total of 44 transit sized vans within the City Council fleet have been retrofitted with hybrid electric systems. Along with the Lightfoot driver behavioural system this has reduced diesel use by around 20%.

Several major road traffic improvement schemes are taking place in Coventry to improve traffic flows and reduce road traffic emissions. The Whitley junction scheme at the A444/London Rd interchange to reduce queuing traffic into the Jaguar Land Rover and Whitley Business Park site is now complete and the major road

improvement scheme for the A45/A46 Tollbar End is close to completion. Both schemes are designed to reduce the volume of traffic using the associated roundabouts and congestion and therefore will likely have a net-beneficial impact on local air quality, according to the corresponding Environmental Statement.

In addition a number of public realm works have taken place around the city centre to create pedestrian and cycle friendly 'shared spaces', removal of traffic lights to reduce queuing and the introduction of 20mph zones. There have been junction improvements made on the A45 at Kenilworth Rd and Canley serving the Warwick University campus to reduce rush hour congestion, and the new railway station at the Ricoh Arena.

Local Priorities and Challenges

The key priorities for addressing air quality in Coventry remains the reduction in queuing traffic and congestion at junctions, and to produce a new air quality action plan to focus future improvements.

Other priorities include:

- Completion of the local plan which includes the commitment to improve air quality
- Continue to monitor NO_2 concentrations at existing locations using existing technology and to introduce new technologies that will give more accurate, real-time measurements.
- Continue to facilitate low emissions vehicles and non-car travel by requiring the incorporation of low emissions and sustainable travel infrastructure into new residential development through the planning regime.
- Continue to raise public awareness through campaigns for active travel such as Sky Ride events and 'rush hour challenge'.
- Continue green procurement for the promotion of low emission transport and vehicle fleet efficiency improvements.

How to Get Involved

A large proportion of road vehicles are private car users. There are lots of simple things the public can do to help improve air quality locally, such as:

- Using public transport and park and ride facilities
- Walking or cycling short journeys rather than using the car
- Share journeys with colleagues and friends
- Switch off car engines when stationary
- Choosing a low emission car for your next purchase – there are Government funds available
- Choosing an ultra-low NOx boiler with a dry NOx emission rate of 40mg/kWh or less for your next purchase

Further information can be found on the Council's website, and Defra's Local Air Quality Management (LAQM) website .

Table of Contents

List of Tables

List of Figures

1. Local Air Quality Management

This report provides an overview of air quality in Coventry during 2015. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Coventry City Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

The whole of Coventry was declared as an AQMA in 2009 but no AQAP has been produced since 2007 when three individual and small AQMA's were in effect. The city wide AQMA was declared in 2009 as a number of other pollution hotspots had been identified through the council's monitoring programme, and it was felt to declare further AQMA's would be difficult to manage with the additional risk that tackling hotspots in isolation could simply move the air quality problem from one place to another.

However, since 2009 the council has been through a series of restructures, and with the loss of specialist officers and reduced resources it has not been possible, to produce a revised AQAP that incorporates the 'new' hotspots. The 2007 AQAP is therefore out of date and has not been considered further as part of this report.

Nevertheless, and despite the lack of a formal AQAP there has been a huge amount of work in Coventry towards continuing to reduce traffic congestion, improving low emissions vehicles infrastructure and encouraging more sustainable methods of transport, all of which will have a beneficial impact on air quality. This report reflects this work bringing it together into a single document for the first time and will form the basis of Coventry City Council's new action plan.

The Low Emissions Towns and Cities Programme (LETCP) is a partnership comprising the seven West Midlands local authorities, (Birmingham City Council, Coventry City Council, Dudley MBC, Sandwell MBC, Solihull MBC, Walsall Council and Wolverhampton City Council) working together to improve air quality and reduce emissions from road transport.

The intention is to do this by promoting the uptake of low emission fuels and technologies, establishing and sharing best practice policies, and developing various tools and resources. The objectives of the programme are to investigate and produce various regional strategies designed to improve air quality, with a view to meeting national air quality objectives.

Funded through a Department of Environment, Food and Rural Affairs (Defra) Air Quality Grant, the aims of the LETCP are to:

- Improve air quality through the reductions in road transport emissions, and simultaneously reductions in carbon emissions;
- Establish best practice policies and measures for the West Midlands, creating transferable models for other towns and cities;
- Improve health; and
- Maximise opportunities for economic development through the transition to a green economy.

Since the launch of the LETCP in 2011, we have been working with stakeholders to develop produce Good Practice Guidance on Planning and Air Quality (completed May 2014) and Procurement Guidance (completed Sept 2014) for the West Midlands and West Midlands Low Emission Zone (LEZ) feasibility studies and scenario modelling have been produced (2015).

A Low Emission Vehicle Strategy for the West Midlands (2016-2021) has been agreed by the LETCP and replaced the Low Emission Strategy (LES). The LES formed part of the adopted West Midlands Strategic Transport Plan *"Movement for Growth"* (discussed further below), which will be implemented by West Midlands Combined Authority (WMCA, June 2016).

The strategy includes consideration of:

- The introduction of mandated and voluntary Clean Air Zones (CAZ)
- Local authority policy developments to support current and future low emission activity
- Low & Ultra-Low Emission Vehicles and Infrastructure

http://cms.walsall.gov.uk/low_emissions_towns_and_cities_programme

See below for links to the reports**.**

As mentioned above, the West Midland Combined Authority has also produced its new strategic transportation plan *'Movement for Growth'* for the next twenty years.

The three main objectives of the plan are:

- Improved national and regional links to boost the economy
- Improved links across the Metropolitan Area to provide better access to jobs, leisure and services
- Improved links within local communities to reduce the reliance on cars for short distance trips

To achieve these aims there is the intention to improve public transport and cycling networks across the WMCA region, with the associated benefits to air quality which is a key theme of the plan.

A summary of *'Movement for Growth'* is available at:
https://westmidlandscombinedauthority.org.uk/media/1179/2016-06-01-mfg-summary-document_wmca.pdf

The full *'Movement for Growth'* report can be viewed at:
https://westmidlandscombinedauthority.org.uk/media/1178/2016-06-01-mfg-full-document_wmca.pdf

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of the objectives.

A city wide AQMA for nitrogen dioxide was declared, effective from 1st November 2009. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at http://www.coventry.gov.uk/info/68/pollution/171/air_quality

2.2 Progress and Impact of Measures to address Air Quality in Coventry

Coventry City Council has taken forward a number of measures during the current reporting year of 2015/16 in pursuit of reducing congestion, improving pedestrian/cycle routes to key destinations and improving local air quality. Details of all measures completed, in progress or planned within Coventry are set out in Table 2.1.

Key completed measures are:

- Park and ride in the South of the city and at Canley and Tile Hill Train Stations. Improves access to public transport and provides alternatives to driving into the city centre.
- Ten new cycling route guides have been developed. The Whitley Bridge works have also improved the cycle route into town, as has the A4600 scheme to improve access around the University Hospital.
- Public realm works including Belgrade Plaza, New Union St, Little Park Street, Hales Street, Lidice Place, Hill Top, Gosford St/Coventry University and Fargo entrance improvement schemes have included widening footways and narrowing of roads, de-cluttering unnecessary street furniture including railings and removal of traffic lights, with 20 mph gateways to encourage low vehicle

speeds but freer moving traffic with the removal of signals and replacement of some junctions i.e. Belgrade Plaza with shared space principles making them more pedestrian and bicycle friendly. Also the creation of the new Friargate bridge deck over the ring road close to Coventry Railway Station includes a new landscaped pedestrian boulevard which creates a direct and more pleasant walking route for pedestrians travelling between the city centre and the railway station

- The Warwick University / South West Coventry Junction Improvement scheme on the A45 has improved access on one of the main routes into the university campus, as well as delivering a new bus interchange on the university campus to improve bus facilities and encourage patronage and improving walking and cycling routes.
- A new bus interchange delivered at the railway station to encourage public transport interchange, includes real time information. In addition, the road layout at Whittle Arch/Fairfax St has been improved for buses and coaches accessing the central Pool Meadow bus station and the Cathedral Quarter.
- The Whitley junction improvement scheme has been completed improving access into the Jaguar Land Rover Headquarters and Whitley Business Park, reducing queues and congestion on the A46/A444 and London Rd and improving cycle/pedestrian links to and from the site. Vehicles accessing the site from the South now have a new direct link into the site off the A46
- A review of the council's air quality monitoring strategy has taken place with the aim of focusing our resources on measures to improve air quality in the city rather than undertaking extensive monitoring. This work has led to the decommissioning of the remaining three automatic monitoring stations which were old, increasingly unreliable and resource intensive to keep running.

Coventry City Council expects the following measures to be completed over the course of the next reporting year:

- Completion of the Toll Bar End works. A major road improvement scheme for the A45/A46 Tollbar End roundabout in southern Coventry is expected to be

substantially completed by the end of 2016. This scheme aims to reduce the volume of traffic using the roundabout by providing a dual-carriageway underpass for traffic travelling between the A45/A46 & M69 corridor, and therefore will likely have a net-beneficial impact on local air quality, according to the corresponding Environmental Statement

- Works will start in the Broad Lane / Banner Lane area later this year to improve the highway layout as well as flooding alleviation, with the aim to reduce congestion and improve walking and cycling infrastructure.
- A bid for further funds for public realm schemes has been pushed forward, including the link between Greyfriars Lane/Pepper Lane (to further improve pedestrian links from the East/railway station area into the Cathedral quarter area of the city centre), a second phase of works on Fairfax Street, and a scheme on Greyfriars Green to produce a more direct walking route for those travelling between the city centre and the rail station, cycling infrastructure improvements which will all contribute to making further improvements to pedestrian and cycling routes.

- A Low Emission Vehicle Strategy for the West Midlands (2016-2021) has been agreed by the LETCP and replaced the Low Emission Strategy (LES). The LES formed part of the adopted West Midlands Strategic Transport Plan *"Movement for Growth"*, which will be implemented by West Midlands Combined Authority (WMCA, June 2016).

- Completion and relocation of approx. 2000 council staff to the new Friargate building in summer 2017, will help to reduce the number of council buildings from 27 to 9. Better use of technology, home working and agile working are being encouraged with the associated reductions in staff travelling into the city centre, parking and congestion. As part of the relocation, the council is also looking at a car share scheme for staff, pool cars and bikes, and subsidised public transport as part of a green travel plan that is under development. The new building will have 12 electric vehicle charging points for low emissions pool vehicles.

Coventry City Council's priorities for the coming year are:

- Completion of the local plan which includes commitment to air quality improvements
- Continued development of the Heatline District Energy System. The energy network uses waste heat from the municipal waste incinerator to heat eight major buildings within the city centre, one of which is Coventry Cathedral. The scheme eliminates the need for gas boilers at these premises and makes full use of the waste heat using a 650m^3 thermal store. Carbon savings are around 1300 tonnes per year with NO_X and particulate matter emissions from connected premises being reduced to zero
- Coventry Station Master Plan. Phase One of the plan is on site, a pedestrian tunnel is being constructed under Warwick Road to improve pedestrian accessibility to the railway station. The tunnel will eventually form part of a second entrance to the railway station, and is part of a £40M transformation for Coventry Railway Station to create capacity for current and future growth
- Continuation of monitoring programme at long term sites using diffusion tubes, supplemented by NO_2 modelling of the whole city by Walsall Council. We also aim to complete a trial of AirSensa and AQ Mesh monitors.
- Investigate feasibility of installing 2 x AQ Mesh units (funded by Public Health) into 2 schools in the city to educate children and parents about air quality and encourage behavioural changes such as walking and cycling.
- Participate in the Coventry and Warwickshire Air Quality Alliance, a new partnership of local authority public health, planning, transportation and environmental health professionals, and remain a board member of the West Midlands LETCP Group.
- Begin writing the new Air Quality Action Plan for Coventry

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Key Performance Indicator	Progress to Date	Comments
1	Park & Ride South	Alternatives to private vehicle use	Bus based park and ride	Coventry City Council (CCC)	Uptake	Complete	Allows drivers to park and finish their journey into the city centre by bus
2	Canley Station Park & Ride	Alternatives to private vehicle use	Rail-based Park & Ride	CCC	Uptake	Complete	Allows commuters to park at the stations and continue their journey on train
3	Tile Hill Station Park & Ride	Alternatives to private vehicle use	Rail-based Park & Ride	CCC	Uptake	Complete	Allows commuters to park at the stations and continue their journey on train
4	Car Share Coventry & Warwickshire	Alternatives to private vehicle use	Car & lift sharing schemes	CCC	Uptake –	On-going	Any business is able to sign up and car share. Once 'Guaranteed ride home' Policy is approved, the scheme could be promoted to City Council staff to encourage sign up
5	HoPE (Holistic Personal Public Eco-mobility)	Alternatives to private vehicle use	Other	West Mids Combined Authority (WMCA)	Uptake	On-going	Phone App which aims to satisfy the needs of citizens and tourists for a more easy to use and efficient public transport system. It is to be piloted and tested at three European cities. This will reduce the need to go through multiple timetables, network plans, price lists and conditions, and the like. HoPE is to ease the use of public transportation, encompassing all the phases involved in its typical usage: from access and schedule information to real-time operational information, from planning multi-modal trips to bookings and ticket purchases, redemption, and validation, maintaining interoperability across different transportation modes and pre-existing ICT systems.
6	Mercury emissions trading scheme	Environmental Permits	Tradable permit system through permit systems and economic instruments	CCC / Solihull	Uptake	On-going	A trading scheme for mercury emissions from cremations has been established between Coventry and Solihull councils. The scheme allows two crematoria in Solihull to fulfil their obligations under the Environmental Permitting Regulations to abate at least 50% of their emissions for mercury by trading emissions permits with Coventry City Council under an independent burden sharing scheme
7	Local Development Plan & Draft City Centre Action Plan	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	CCC	Uptake	On-going	Within these guidance documents there is a requirement for major developments to consider district energy systems for their heating and cooling needs. Information about the existing low carbon district energy network supplied by waste heat from the nearby waste incinerator is made available but developers are also advised that other similarly low carbon networks will also be acceptable

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Key Performance Indicator	Progress to Date	Comments
8	Heatline project	Promoting Low Emission Plant	Emission control equipment for small and medium sized stationary combustion sources / replacement of combustion sources	CCC	Uptake	On-going	The Heatline district energy network uses waste heat from the municipal waste incinerator to heat eight major buildings within the city centre, one of which is Coventry Cathedral. The scheme eliminates the need for gas boilers at these premises and makes full use of the waste heat using a 650m^3 thermal store. Carbon savings are around 1300 tonnes per year with NO_X and particulate matter emissions from connected premises being reduced to zero. There is an active programme to connect further large buildings to the scheme including the new Friargate business district and a new leisure centre. Funding from the Heat Networks Delivery Unit of DECC is being used to explore the feasibility of new connections in the Canley area of the city to link with an existing network operated by the University of Warwick
9	Planning guidance	Promoting Low Emission Plant	Emission control equipment for small and medium sized stationary combustion sources / replacement of combustion sources	CCC	Uptake	On-going	On planning applications for new developments applicants are advised (and planning conditions implemented) for the installation of low NOx (low emission) boilers and heating plant for residential, commercial and industrial schemes. Renewable energy technologies are encouraged whereas biomass plant for new commercial sites is less favourable
10	Agile working	Promoting Travel Alternatives	Encourage / Facilitate home-working	CCC	Uptake	On-going	Coventry City Council has been encouraging more 'Agile working', reducing the need to come to work if work can be managed at home
11	Cycling routes	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	CCC	Usage	Completed March 2016	10 new cycling route guides were developed. 5 of these routes were added to the 'new way-finding' app for city and travel to work area. The Whitley Bridge works have also improved the cycle route to into town. The A4600 scheme to improve access around the University Hospital has also improved cycle routes.
12	Pedestrian Thoroughfare	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	CCC	Usage	Completed	Creation of Friargate bridge with a new pedestrian boulevard which creates a more direct route for pedestrians into city centre from railway station. This reduces reliance on taxis to move users of rail into the City Centre.
13	Warwick University / South West Coventry Junction Improvement Scheme	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure / Promotion of walking & cycling	CCC	Reduction in congestion and car usage	Completed	This scheme has improved access on one of the main routes into the university campus, as well as delivering a new bus interchange on the university campus to improve bus facilities and encourage patronage and improving walking and cycling routes

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Key Performance Indicator	Progress to Date	Comments
14	Further public realm works	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure / promotion of walking & cycling	CCC	N/A	Bid entered	A bid for further funds for public realm schemes has been pushed forward, including the link between Greyfriars Lane/Pepper Lane, a second phase of works on Fairfax Street, a scheme on Greyfriars Green to produce a more direct walking route from Warwick Road to Warwick Row for those travelling to and from the rail station, cycling infrastructure improvements which will all contribute to making further improvements to pedestrian and cycling routes
15	The annual "Rush Hour Challenge"	Promoting Travel Alternatives / Public Information	Intensive active travel campaign & infrastructure / via radio etc.	CCC	Uptake	On-going	A fun event where participants see which mode of transport completes a commuting journey the quickest involving cycling, runners, walkers, kids scooters, pogo sticks. Progressed by Coventry on the Move to become a region wide annual event involving public health and partner Groundwork). Positive messages of active travel and health, reducing carbon emissions and congestion and improving air quality – publicity through local media including BBC Radio.
16	"Let's get moving"	Promoting Travel Alternatives	Personalised Travel Planning / Workplace Travel Planning	Public Health Cov & Warks	Uptake	On-going	Public Health (Coventry & Warwickshire) have commissioned Groundwork West Midlands to work with a minimum of 1,000 staff within 30 companies to improve levels of physical inactivity. The service will deliver "Let's Get Moving" pathway and a package of Personal Travel Planning to staff over this 1 year project.
17	Making Every Contact Count	Promoting Travel Alternatives	Personalised Travel Planning / Workplace Travel Planning	Public Health Cov & Warks	Uptake – 30 business supported in 2015 - 16	On-going	Public Health (Cov & Warks.) are redeveloping the Making Every Contact Count (MECC) training scheme to provide a greater focus on personal travel planning. MECC is core training for all practitioners delivering NHS Health checks as well as for the wider workforce.
18	Cycle Coventry	Promoting Travel Alternatives	Personalised Travel Planning	CCC	Uptake	On-going	7440 people accessed information at events and 31 community groups supported to make sustainable travel choices via Cycle Coventry in 2015
19	HoPE	Promoting Travel Alternatives / Public Information	Promote use of rail and inland waterways / Other	WMCA	Uptake	On-going	Aims to satisfy the needs of citizens and tourists for a more easy to use and efficient public transport system. It is to be piloted and tested at three European cities. This will reduce the need to go through multiple timetables, network plans, price lists and conditions, and the like. HoPE is to ease the use of public transportation, encompassing all the phases involved in its typical usage: from access and schedule information to real-time operational information, from planning multi-modal trips to bookings and ticket purchases, redemption, and validation, maintaining interoperability across different transportation modes and pre-existing ICT systems.
20	Love your bike	Promoting Travel Alternatives	Promote use of rail and inland waterways	CCC	Uptake	On-going	10 Love Your Bike sessions delivered at Coventry Stations in 2015, to be continued in 2016, and a Cycle hub due to open in 2016 at the station

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Key Performance Indicator	Progress to Date	Comments
21	Sky Ride	Promoting Travel Alternatives	Promotion of cycling	Public Health Cov & Warks	Uptake - 9940 participants in organised bike rides, 9,000 on Sky Ride. 1154 participants in adult cycle training via workplaces, schools, colleges and community venues	On-going	Public Health contribute funding to the Sky Ride and Sky Ride local schemes and work within schools, including supplementing the costs of the Bikeability scheme among schools serving areas of greater deprivation.
22	Public realm improvement schemes	Promoting Travel Alternatives / Traffic Management	Promotion of Walking / Reduction of speed limits, 20mph zones	CCC	Uptake	Completed	Belgrade Plaza, Whittle Arch & Fairfax Street, Lidice Place, Hill Top, Gosford St/Coventry University and Fargo entrance public realm improvement schemes have included widening footways and narrowing of roads, de-cluttering unnecessary street furniture including railings and removal of traffic lights, with 20 mph gateways to encourage low vehicle speeds but more freer moving traffic with the removal of signals and replacement of some junctions i.e. Belgrade with shared space principles
23	Wayfinding	Promoting Travel Alternatives / Public Information	Promotion of Walking / Via the internet	CCC	Uptake	Completed	A network of interactive pedestrian wayfinding totems around the city have been installed, which include points of interest and walking distances to encourage travel by foot around the city centre. These are now being used to promote sustainable events in 2016
24	Coventry Station Masterplan	Promoting Travel Alternatives	Promotion of Walking	CCC	Uptake	On-going	Phase One of the Coventry Station Masterplan is under way, a pedestrian tunnel is being constructed under Warwick Road to improve accessibility to the railway station. The tunnel will eventually form part of a second entrance to the railway station, and is part of a £40M transformation for Coventry Railway Station to create capacity for current and future growth
25	Supporting secondary schools	Promoting Travel Alternatives	School Travel Plans	CCC	Uptake	On-going	7 secondary schools and colleges supported to support sustainable travel, this is to continue in 2016/2017. They are also included as standard planning condition on new schools and colleges to reduce impact on air quality
26	Installation of 2 AQ Mesh units	Public Information	Via other Mechanisms	CCC	Feedback	Negotiating Stage	AQ Mesh unit to be installed on two schools in Coventry to promote education regarding air quality and green travel.
27	VMS Project	Public Information	Via other mechanisms	CCC	Uptake - 50 roadside adverts displayed for 4 weeks in 2015 to promote 'Sky Ride', this to continue in 2016	On-going	A network of Variable Message Signs (VMS) signs have been installed on the gantries of the ring road to improve navigation around the city for motorists, buses and coaches, with signposting to car parks and the ability to change the messages for events or emergencies to manage traffic more effectively.

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Key Performance Indicator	Progress to Date	Comments
28	Skyride	Public Information	Via radio & other mechanisms	CCC	Uptake	On-going	101,607 readers reached by newspaper campaign in lead up to Sky Ride in 2015. 108,290 listeners reached in lead up to Sky Ride
29	Appy Parking	Public Information	Other	CCC	Uptake	Trial stage	A trial Application, guiding people, giving information on car parking available in the city
30	IVMS	Public Information	Other	CCC	Uptake	Trial Stage	Intelligent Variable Messaging Systems (IVMS), previously called Dynamic Routing, the IVMS project focuses on three main corridors into Coventry delivering an App based in-vehicle and mobile phone solution building on the Hope project
31	UK Cite	Public Information	Other	CCC	Project success	Started in 2015 and will cease in 2018	The 'Connected Intelligent Transport Environment' Project is focussed at building a real world Connected Car to infrastructure demonstrator through bringing together multiple technologies for the purpose of testing both the technical and commercial viability of a road network "Connected Corridor" as a foundation for V2V, V2X and autonomous cars. It will establish a living lab test environment that will entice vehicle manufactures to use the UK as a hub for connect vehicle & autonomous vehicle research and development
32	UK AutoDrive	Public Information	Other	UK autodrive	Project success	Started in 2015 and funding will cease in 2018	Test reaction to autonomous and semi-autonomous vehicles. Principally focused on the vehicle and user experience. Approx. 18 use cases will be tested, using info transmitted from infrastructure - the autonomous vehicle will then determine what to do and how to proceed. Driverless pods to be trialled in Milton Keynes at first and later in Coventry
33	Modum	Public Information	Other	Modum	Project success	Completed	Low carbon multi-modal mobility and freight transport. It addresses the environmental footprint in the transport sector by aiming to develop a new approach for pro-active demand-responsive management of traffic to enable energy-efficient multi-modal transport choices accommodating dynamic variations, minimising the environmental impact and improving the quality of life in urban environments. It has the potential of utilising vehicles computational power and network capabilities for achieving their active participation in the demand-response management of urban traffic
34	CATCHI	Public Information	Other	Travel AI	Uptake	In developmental stage	Has two parts. One is developing the multimodal journey planner on phone. This will collect data on how people are travelling, and then provide real time information on how long a particular journey would really take people. The second part focuses on harvesting the data and making this available to policy-makers to help plan their policy and plan their networks,
35	20mph zones	Traffic Management	Reduction of speed limits, 20mph zones	CCC	N/A	Complete	Hockley Lane, Swan Lane and Wildcroft Road have reduced speed limits
36	Whitley Bridge Works	Transport Planning and Infrastructure	Cycle network	CCC	Reduction in congestion	Complete	A more direct access to Whitley Business Park, including Jaguar Land Rover off the A444 has been created, installing a new bridge and road infrastructure. This will reduce congestion and provide a more direct route from the A444, cutting journey times. The scheme has also improved cycle routes between the site and the city centre and neighbouring residential areas.

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Key Performance Indicator	Progress to Date	Comments
37	Broad Lane/Banner Lane	Transport Planning and Infrastructure	Cycle network	CCC	Reduction in congestion	Pending	Works will start on site later this year to improve the highway layout in this area as well as flooding alleviation, with the aim to reduce congestion and improve walking and cycling infrastructure. 44km of network completed by 2017, business case submitted to LEP in 2016.
38	Bike hire Scheme	Transport Planning and Infrastructure	Public cycle hire scheme	Warwick Uni	Uptake	On-going	50 bikes launched in 2015 at University of Warwick, this is to expand in 2016
39	Public realm works	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	CCC	Reduction in congestion	Complete	A new bus interchange delivered at the railway station to encourage public transport interchange, includes real time information. In addition, the road layout at Whittle Arch/Fairfax St has been improved for buses and coaches accessing Pool Meadow bus station and the Cathedral Quarter.
40	Tollbar Island works	Transport Planning and Infrastructure	Other	Highways England	Improvements in traffic flows and Air Quality monitoring results	Completion Autumn 2016	A major road improvement scheme for the A45/A46 Tollbar End roundabout in southern Coventry is expected to be completed by Autumn 2016. This scheme aims to reduce the volume of traffic using the roundabout by providing a dual-carriageway underpass, and therefore will likely have a net-beneficial impact on local air quality, according to the corresponding Environmental Statement.
41	Employee Training	Vehicle Fleet Efficiency	Driver training and ECO driving aids.	CCC	Uptake	On-going	All employees using City Council vehicles must complete defensive driver training including how to drive to reduce fuel use. Telematic units are currently fitted within all fleet vehicles to allow vehicles to be tracked and optimal routes to be identified – they are also used to encourage more efficient driving.
42	Improvement to existing fleet	Vehicle Fleet Efficiency	Vehicle Retrofitting programmes	CCC	Uptake	Complete	44 transit sized vans within the City Council fleet have been retrofitted with hybrid electric systems by Ashwoods. Along with the Lightfoot driver behavioural system this has reduced diesel use by around 20%.

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Given that only 50 – 55% of the total annual average of $PM_{2.5}$ in the UK comes from UK emissions, the success of any measure is going to be limited. Additionally, given that many episodes of high $PM_{2.5}$ occur on easterly winds, it is likely that the non-UK contribution to episodic concentrations of $PM_{2.5}$ is even higher than for annual averages. (AQEG, 2013)

Coventry City Council is having NO_2 and $PM_{2.5}$ modelling carried out as part of its partnership working in the combined LETCP. The results of this modelling will be used to determine whether there are any likely exceedences of standards and to indicate where it would be beneficial to carry out further monitoring.

Coventry City Council is currently trialling two different technologies that are capable of measuring $PM_{2.5}$:

AirSensa – a unit was placed on Sidney Stinger Academy at the end of Feb 2016 and at the Ball Hill area on Walsgrave Road. The AirSensa units are designed to take continuous readings of key air pollutants including NO_2 and $PM_{2.5}$ and atmospheric conditions. These readings are sent wirelessly to a cloud platform which adjusts the data to provide real-time measurements. The units are small enough to be placed on lampposts and are available to wire in to an electrical supply or are solar-powered.

AQMesh is also a wireless unit for continuous measurements of key pollutants including NO_2 and $PM_{2.5}$ along with atmospheric conditions. The units are battery operated and can be recharged using solar power. The units are designed to provide trend data.

Both the AirSensa and the AQMesh units have been placed alongside the Defra AURN and these results used to calibrate the units. They have then been placed at key locations around the city.

The results will be used to determine whether either of the units is suitable for monitoring air quality in Coventry and additional units will then be purchased. The units will then be placed in areas that would benefit from continuous monitoring but where space is limited or security is compromised. This will be guided by results of nitrogen dioxide tubes and the results of $PM_{2.5}$ modelling. The results produced by these units will then be used to help focus efforts to reduce $PM_{2.5}$.

Coventry City Council is a member of the newly created Arden Health Protection Committee. This committee was established as a joint venture by Public Health Coventry and Public Health Warwickshire. The Council is currently assisting in the development of a Health Protection Strategy, which will incorporate measures to improve air quality. The initial focus will be on areas of poorest air quality and success will be measured by reductions in ambient concentrations of NO_2 and $PM_{2.5}$ and in the use of private cars for short journeys and the increase in development and use of cycle ways.

Whilst discussions on the Health Protection Strategy are at an early stage, a number of actions to tackle air quality have been proposed:

- Active schools and workplaces initiative to encourage people to take up physical exercise
- A public awareness campaign to encourage people to walk, cycle or take public transport instead of using their cars
- Cycle infrastructure bids aimed at securing funding for new cycle ways and promoting cycling
- Supplementary Planning Document for developers to ensure appropriate consideration is given to air quality during the planning process
- Council vehicle fleet improvement initiatives
- Green Procurement

Development of the Action Plan is likely to be driven forwards by the Coventry and Warwickshire Air Quality Alliance, made up of Environmental Health, Public Health, Planning and Transport Officers from the Coventry and Warwickshire local authorities.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Coventry City Council no longer undertakes any automatic (continuous) monitoring. However, it is trialling two different technologies that are capable of continuously measuring $PM_{2.5}$. More information on the AirSensa technology is available at:

http://www.airsensa.org/

And the AQ Mesh technology at:

http://www.aqmesh.com/

National monitoring results from the AURN site in the Allesley area of the city operated by Defra are available at https://uk-air.defra.gov.uk/ A second AURN unit on Sky Blue Way was due on-line in autumn 2016.

3.1.2 Non-Automatic Monitoring Sites

Coventry City Council undertook non- automatic (passive) monitoring of NO_2 at 55 sites during 2015. Table A.1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for "annualisation" and bias. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.2 in Appendix A, compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

For diffusion tubes, the full dataset of raw monthly mean values is provided in Appendix B.

The results of diffusion tube monitoring across the city, shows generally decreasing results apart from a peak in nitrogen dioxide concentrations in 2012. Appendix F contains graphs which show the trend in nitrogen dioxide tube results for the past five years for five specific areas of the city.

In 2015, there were 18 tubes with exceedences of the annual mean (40 µg/m^3) from a total of 55 results. Of these, 1 tube exceeded 60 µg/m^3. This tube is located on a lamppost on a narrow pavement opposite the façade of a row of terrace housing. Whilst this result suggests that there may be exceedences of the hourly mean, there is no possibility of placing a continuous monitor in or near this location due to the lack of space. It is hoped that either the AQ mesh or AirSensa will prove suitable to provide this data along this stretch of road in the near future.

All exceedences occur in an AQMA as the whole of Coventry has been declared as one AQMA.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
CCO1*/ 1N	Holyhead Road, Beaumont Court	Roadside	432105	279578	NO_2	Y	4.1	3.1	N	2.8
HR1	Holyhead Road	Façade	432683	279240	NO_2	Y	0	5.8	N	2.7
HR1c	73 Holyhead Road	Roadside	432712	279227	NO_2	Y	4.2	1.8	N	2.5
HR2c	104 Holyhead Road	Façade	432525	279345	NO_2	Y	0	6.1	N	2.1

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
BH1a	Walsgrave Road, Library	Roadside	434987	279209	NO_2	Y	2.9	2.9	N	2.7
BH2a	Walsgrave Road, 161	Façade	435125	279286	NO_2	Y	0	3.9	N	2.8
BH4	Walsgrave Road, 243	Roadside	435331	279358.	NO_2	Y	2.2	1.3	N	2.5
BH15i	Walsgrave Road, Post Office	Roadside	435184	279298	NO_2	Y	3.5	1.0	N	3.1
BH13	196/198 Walsgrave Road	Façade	435507	279387	NO_2	Y	0	5.2	N	2.5

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
BH14	238 Walsgrave Road	Roadside	435655	279356	NO_2	Y	8	1.6	N	2.5
FS1	Fairfax Street, Pool Meadow	Roadside	433569	279234	NO_2	Y	3.9	1	N	3
CS2	Next to bus stop on Corporation St	Roadside	433322	279269	NO_2	Y	10.3	1.7	N	2.85
HS3	Hales Street opp. Transport Museum	Roadside	433439	279278	NO_2	Y	51.3	2.7	N	3

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
LON12	Between 76 & 78 London Road	Roadside	434073	278459	NO_2	Y	2	2	N	2.7
SE1	Spon End, 58a	Roadside	432084	279042	NO_2	Y	2.6	0.1	N	2.5
SE3	97 Spon End	Façade	432303	279028	NO_2	Y	0	2.3	N	2.5
QAV01	Queensland Avenue, Fairytale Flowers	Roadside	431595	278991	NO_2	Y	5.3	0.1	N	2.5
QAV12	Queensland Avenue, 2	Façade	431704	278680	NO_2	Y	0	4.3	N	2

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
QAV13	Hearsall Lane, 181	Façade	431763	278657	NO_2	Y	0	4.9	N	2.5
R4	Foleshill Road, Surestart	Façade	434233	281526	NO_2	Y	0	8.8	N	3.75
R5	Foleshill Road, 275	Façade	433716	280503	NO_2	Y	0	3.7	N	2.8
R6	Foleshill Road, between 181 & 183	Roadside	433609	280246	NO_2	Y	2.2	2.05	N	2.7
R8	Foleshill Road, 415	Façade	433992	281008	NO_2	Y	0	4.3	N	3.1

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
R9	Foleshill Road, 324	Roadside	434059	281105	NO_2	Y	1.8	3	N	2.65
LR1	23 Longford Road	Façade	434836	283030	NO_2	Y	0	5.6	N	2
LR2	24 Longford Road	Façade	434880	283077	NO_2	Y	0	4.2	N	2
LR3	Longford Road, 139	Façade	435016	283515	NO_2	Y	0	8.5	N	1.5
BRN2	Burnaby Road, 19	Façade	433605	281965	NO_2	Y	0	5.5	N	2.75
BRN5	41 Holbrooks Lane	Façade	433639	281995	NO_2	Y	0	6.7	N	2

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
BA1	Beake Ave/Radford Rd	Facade	432526	280806	NO_2	Y	0	7.5	N	3
BA1c	299 Beake Ave	Façade	432544	282004	NO_2	Y	0	10.5	N	2
SS1	Stoney Stanton Rd, 154	Façade	434062	280082	NO_2	Y	0	3.7	N	2.5
SS2	Stoney Stanton Rd, 155	Façade	433994	279969	NO_2	Y	0	4.5	N	2.5
SS3	21 Torcastle Cls (faces SS Rd)	Façade	434842	281272	NO_2	Y	0	4.5	N	2

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
SS5	Lampost L21CAC	Roadside	433852	279814	NO_2	Y	1.8	2	N	2
BELL1	16 Hall Green Road	Façade	435849	282211	NO_2	Y	0	1.7	N	2.8
BELL2	314 Bell Green Road	Façade	435826	282158	NO_2	Y	0	5.7	N	2.5
FGS1	34 Far Gosford Street	Façade	434330	278973	NO_2	Y	0	2.9	N	2.7
FGS2	Select & Save, Far Gosford Street	Façade	434450	279001	NO_2	Y	0	5.1	N	2.7

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
FGS3	74 Far Gosford Street	Façade	434530	279026	NO_2	Y	0	2.4	N	2.7
GR1	217 Gulson Road	Façade	434679	278920	NO_2	Y	0	4.5	N	2.5
Grange 2	Grange Road N of M6	Roadside	435765	284246	NO_2	Y	1.75	0.3	N	2.4
GS1	Outside Gosford Books	Façade	433899	278845	NO_2	Y	0	9.8	N	2.6
GF1	Greyfriars Taxi rank	Façade	433407	278882	NO_2	Y	0	0.47	N	2.8

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
TS3	Trinity Street nr Taxi rank	Roadside	433492	279239	NO_2	Y	0.9	2.4	N	2.3
QV1	Lampost outside student block	Roadside	433029	278798	NO_2	Y	2.12	1.95	N	2.2
TOR1	122 Torrington Ave	Façade	429802	277971	NO_2	Y	0	7.6	N	3.1
TOR2	Between 117 & 119 Torrington Ave	Roadside	429816	277954	NO_2	Y	4.8	2.15	N	2.6

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
SHP1	257 Sir Henry Parkes Road	Façade	430447	277080	NO_2	Y	0	9.9	N	2.4
SHP2	262 Sir Henry Parkes Road	Façade	430364	277059	NO_2	Y	0	12.5	N	2.3
SHP3	Outside 190 Sir Henry Parkes Rd	Roadside	430566	277231	NO_2	Y	4.1	4.6	N	2.4
BL1	Corner Broad Lane / Dunchurch Highway	Roadside	430043	278890	NO_2	Y	9.6	1.5	N	2.55

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
BL2	162 Broad Lane	Façade	430145	278869	NO_2	Y	0	15.5	N	2.1
LG1	100 Lynchgate Road	Façade	430437	276533	NO_2	Y	0	9.5	N	2.5
DH1	Outside 581 Dunchurch Highway	Roadside	430076	278789	NO_2	Y	12.6	3.2	N	2.45

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

Table A.2 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2015 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2011	2012	2013	2014	2015
CCO1*/ 1N	Roadside	Diffusion Tube		92	38.15	**41.7**	32.5	39.3	34.9
HR1	Façade	Diffusion Tube		100	**48.67**	**63.5**	**60.4**	**63.1**	**57.6**
HR1c	Roadside	Diffusion Tube		75	/	/	/	/	**81.7**
HR2c	Façade	Diffusion Tube		67	/	/	/	/	31.6
BH1	Roadside	Diffusion Tube		100	**48.34**	**52.8**	**41.2**	39.0	36.8
BH2a	Façade	Diffusion Tube		100	**48.67**	**77.4**	**53.8**	**48.9**	**47.1**
BH4	Roadside	Diffusion Tube		100	**45.21**	**56.1**	**46.2**	**47.0**	**43.2**
BH15i	Roadside	Diffusion Tube		100	**48.47**	/	**44.7**	**42.3**	39.3
BH13	Façade	Diffusion Tube		92	37.28	**42.9**	**41.2**	37.4	38.6
BH14	Roadside	Diffusion Tube		100	/	**43.9**	36.2	36.7	34.8
FS1	Roadside	Diffusion Tube		92	**68.26**	**60.0**	**49.6**	**44.2**	**41.2**
CS2	Roadside	Diffusion Tube		75	**46.34**	**49.1**	**45.9**	38.0	32.0
HS3	Roadside	Diffusion Tube		92	29.47	37.2	33.2	35.6	30.6
LON12	Roadside	Diffusion Tube		75	**44.01**	**45.8**	**44.0**	**43.9**	**42.7**
SE1	Roadside	Diffusion Tube		100	38.55	38.1	37.0	36.1	31.4
SE3	Façade	Diffusion Tube		100	38.73	**46.4**	**42.5**	**41.4**	38.7
QAV01	Roadside	Diffusion Tube		92	**43.37**	39.1	38.1	35.0	34.9
QAV12	Façade	Diffusion Tube		83	38.26	**41.6**	39.4	38.5	37.1
QAV13	Façade	Diffusion Tube		92	**41.92**	**46.0**	**43.1**	**43.3**	37.4
R4	Façade	Diffusion Tube		75	36.77	39.5	**40.1**	39.6	36.9
R5	Façade	Diffusion Tube		100	**42.15**	**53.4**	**48.8**	**44.9**	**46.6**
R6	Roadside	Diffusion Tube		100	**48.98**	**58.5**	**55.7**	**52.9**	**46.1**
R8	Façade	Diffusion Tube		92	38.30	**41.5**	**43.0**	38.9	38.1
R9	Roadside	Diffusion Tube		83	34.63	**46.6**	**45.8**	**41.2**	36.7

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2015 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
					2011	2012	2013	2014	2015
LR1	Façade	Diffusion Tube		100	**42.18**	**47.6**	**42.6**	**44.0**	**42.3**
LR2	Façade	Diffusion Tube		92	**44.85**	**47.2**	**47.4**	**43.4**	**43.5**
LR3	Façade	Diffusion Tube		92	**41.56**	**64.7**	**46.5**	**44.6**	**41.6**
BRN2	Façade	Diffusion Tube		100	38.84	**44.7**	38.9	39.1	37.5
BRN5	Façade	Diffusion Tube		58	/	**/**	/	/	**45.9**
BA1	Façade	Diffusion Tube		83	39.99	**59.8**	32.9	38.3	37.7
BA1c	Façade	Diffusion Tube		58	/	**/**	/	/	33.9
SS1	Façade	Diffusion Tube		75	37.55	**42.7**	37.3	36.8	35.0
SS2	Façade	Diffusion Tube		100	37.53	**43.2**	39.0	38.1	36.4
SS3	Façade	Diffusion Tube		100	38.68	**40.9**	39.0	39.1	37.3
SS5	Roadside	Diffusion Tube		100	**42.67**	**51.8**	**50.7**	**49.2**	**44.4**
BELL1	Façade	Diffusion Tube		100	39.98	**44.1**	**42.3**	**40.2**	38.9
BELL2	Façade	Diffusion Tube		92	39.18	**42.9**	39.5	38.9	36.4
FGS1	Façade	Diffusion Tube		75	**41.39**	**45.0**	**43.9**	**41.7**	**42.3**
FGS2	Façade	Diffusion Tube		92	37.97	**43.4**	39.7	38.9	37.9
FGS3	Façade	Diffusion Tube		75	38.18	**47.4**	**44.0**	**42.7**	37.5
GR1	Façade	Diffusion Tube		100	37.25	**40.8**	37.7	36.5	36.8
Grange2	Roadside	Diffusion Tube		83	/	37.6	38.2	**42.9**	33.0
GS1	Façade	Diffusion Tube		100	/	/	/	44.5	**43.1**
GF1	Façade	Diffusion Tube		100	/	/	/	37.8	**40.1**
TS3	Roadside	Diffusion Tube		83	/	/	/	**47.9**	**45.3**
QV1	Roadside	Diffusion Tube		83	/	/	/	39.8	39.8
TOR1	Façade	Diffusion Tube	100		/	/	/	/	31.0
TOR2	Roadside	Diffusion Tube	100		/	/	/	/	28.1
SHP1	Façade	Diffusion Tube	100	58	/	/	/	/	36.0
SHP2	Façade	Diffusion Tube		75	/	/	/	/	28.7

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2015 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2011	2012	2013	2014	2015
SHP3	Roadside	Diffusion Tube		75	/	/	/	/	31.3
BL1	Roadside	Diffusion Tube		67	/	/	/	/	**48.5**
BL2	Façade	Diffusion Tube	100		/	/	/	/	33.7
LG1	Façade	Diffusion Tube	67		/	/	/	/	20.0
DH1	Roadside	Diffusion Tube		58	/	/	/	/	37.5

Notes: Exceedences of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Technical Guidance LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Appendix B: Full Monthly Diffusion Tube Results for 2015

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2015

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
CC01/1*N	43.22	54.19	40.51	41.40	42.72	39.87	35.13	39.11	40.39	41.46	/	47.64	42.33	38.52
HR1	60.35	71.45	60.61	57.03	59.42	60.89	60.70	65.60	63.92	73.19	59.37	67.02	63.30	57.60
HR1C	/	/	/	42.05	24.64	30.40	29.05	33.51	41.76	51.03	35.51	24.70	34.74	31.61
HR2C	/	/	/	88.86	77.16	93.42	96.59	95.54	95.06	106.08	99.83	/	94.07	85.60
BH1	52.33	55.72	42.91	40.93	35.78	38.40	39.72	37.71	46.46	54.04	42.57	32.98	43.30	39.40
BH2a	51.99	61.36	60.37	53.38	43.42	49.20	48.29	48.46	57.98	60.11	51.15	35.46	51.76	47.10
BH4	47.58	63.55	60.45	60.41	41.38	49.43	51.93	49.12	58.69	64.61	55.47	46.90	54.13	49.26
BH13	48.65	53.26	54.17	41.21	/	30.41	36.34	37.66	35.57	42.80	47.82	38.36	42.39	38.57
BH14	50.88	54.43	51.18	47.49	47.51	41.83	44.64	42.12	45.55	50.54	45.99	38.99	46.76	42.55
BH15i	62.64	58.41	64.98	59.26	49.03	50.92	47.15	43.62	53.91	65.28	39.14	31.97	52.19	47.49
HS3	52.10	57.97	58.39	52.20	46.73	41.99	43.96	44.77	45.01		34.59	41.07	47.16	42.92
TS3	50.89	60.73	56.62	60.09	48.48	46.63	52.52	/	/	64.47	61.24	53.62	55.53	50.53
FS1	54.51	/	60.70	49.29	47.59	47.59	48.28	50.28	50.84	73.20	53.02	48.74	53.09	48.32
CS2	41.78	48.73	50.88	43.01	34.46	33.20	32.29	34.42	42.15	/	/	/	40.10	36.49

Site ID	NO_2 Mean Concentrations (µg/m^3)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
QV1	51.75	52.53	54.16	/	41.75	/	47.21	43.57	46.80	55.92	48.45	41.43	48.36	44.00
GF1	50.87	53.46	48.00	42.78	35.37	32.53	31.38	35.38	44.99	73.14	37.31	44.36	44.13	40.16
GS1	64.15	60.68	53.64	50.25	53.25	45.84	35.37	37.63	40.67	52.45	32.59	41.87	47.36	43.10
LON12	56.15	62.05	56.50	54.99	46.38	45.23	45.36	/	/	/	49.80	45.72	51.35	46.73
SE1	29.95	48.77	46.21	44.42	37.12	37.84	40.23	41.45	43.26	51.25	49.76	45.61	42.99	39.12
SE3	51.42	51.04	48.49	42.60	36.25	34.73	34.16	37.82	41.95	51.65	38.55	41.54	42.52	38.69
QAV01	58.15	52.85	56.26	51.48	47.39	/	48.01	46.66	52.97	72.07	50.33	54.69	53.71	48.88
QAV12	46.55	49.48		41.10	35.17	30.79	35.06	36.17	38.36	48.56	/	47.09	40.83	37.16
QAV13	49.42	50.96	49.76	46.52	0.3	41.29	46.84	40.22	43.43	/	40.63	43.02	41.13	37.42
R4	/	/	43.79	44.57	37.3	40.00	26.01		42.69	52.56	45.80	32.83	40.62	36.96
R5	47.59	57.08	52.76	51.46	42.92	49.74	46.56	50.70	54.02	65.50	51.57	44.24	51.18	46.57
R6	54.88	65.74	70.70	51.40	44.14	53.33	51.85	59.40	54.59	72.43	48.78	45.59	56.07	51.02
R8	40.02	46.40	48.04	45.16	37.3	39.72	/	37.25	43.04	54.46	38.91	30.34	41.88	38.12
R9	/	57.59	48.51	49.51	/	37.41	36.36	47.07	42.31	52.35	41.45	44.24	45.68	41.57
LR1	42.42	52.07	64.12	48.86	36.55	40.49	39.66	43.36	43.63	56.08	47.74	42.92	46.49	42.31
LR2	47.35	53.06	53.84	54.71	40.2	39.90	37.65	46.47	46.80	58.93	/	46.66	47.78	43.48
LR3	50.35	57.51	49.86	44.52	37.13	43.13	40.02	/	45.16	49.78	43.97	40.92	45.67	41.56

Site ID	NO_2 Mean Concentrations (µg/m^3)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
BRN2	36.69	46.87	45.67	41.33	34.68	34.18	37.13	39.63	41.53	49.72	44.15	42.61	41.18	37.48
BRN5	/	/	/	43.97	31.49	36.57	31.85	/	/	57.69	38.10	38.47	39.73	36.16
BA1	/	46.42	43.93	37.29	36.21		38.66	38.09	42.97	50.11	44.421	36.27	41.44	37.71
BA1C	/	/	/	31.54	26.2	26.91	21.58	/	/	38.87	26.49	25.03	28.09	25.56
SS1	/	/	/	43.86	36.09	31.68	32.18	38.40	37.53	53.20	37.69	35.63	38.47	35.01
SS2	40.54	43.93	41.83	44.53	32.06	30.86	32.15	34.95	38.64	48.02	47.74	44.29	39.96	36.37
SS3	43.25	39.65	46.14	44.69	35.41	36.76	34.96	41.30	39.09	52.31	42.08	36.26	40.99	37.30
SS5	60.08	57.68	58.80	52.69	41.37	47.53	47.17	46.14	52.50	71.59	48.12	44.63	52.36	47.65
BELL1	39.42	49.46	43.71	38.98	35.14	37.92	41.00	37.82	41.51	54.93	50.73	41.95	42.71	38.87
BELL2	40.34	47.92	36.72	39.55	32.34	37.65	35.42	40.79	39.94	/	44.08	45.72	40.04	36.44
FGS1	51.06	51.32	51.49	47.79	39.1	37.16	41.88	/	37.96	60.62	/	/	46.49	42.30
FGS2	41.27	51.89	46.44	41.67	36.87	36.49	38.25	37.45		53.10	44.95	29.86	41.66	37.91
FGS3	47.76	/	/	44.88	36.5	38.52	34.82	37.90	40.78	57.62	/	32.07	41.21	37.50
GR1	47.34	50.62	48.60	42.22	32.47	35.45	35.48	35.84	38.08	50.47	38.10	29.71	40.36	36.73
Grange2	51.39	56.75	46.51	38.7	35.47	37.58	38.26	/	/	45.91	51.66	45.30	44.75	40.73
TOR1	/	/	/	25.59	26.99	23.16	25.19	24.14	32.86	40.71	/	/	28.38	25.82
TOR2	/	/	/	31.30	20.44	18.19	18.34	21.86	26.70	35.15	/	/	24.57	22.36

Site ID	NO_2 Mean Concentrations (µg/m^3)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted (1)
SHP1	/	/	/	31.46	30.11	31.97	30.28	33.04	31.94	42.39	/	/	33.03	30.06
SHP2	/	/	/	30.92	29.11	28.78	26.39	31.85	34.81	43.98	27.41	30.68	31.55	28.71
SHP3	/	/	/	39.93	38.51	36.24	36.60	30.57	36.07	47.98	39.15	29.54	37.18	33.83
BL1	/	/	/	50.57	39.24	44.33	41.01	42.96	39.19	53.61	/	36.21	43.39	39.49
BL2	/	/	/	34.86	29.26	29.06	27.42	30.02	30.96	34.41	/	/	30.85	28.08
LG1	/	/	/	19.80	16.28	16.28	14.18	17.68	/	/	/	/	16.85	15.33
DH1	/	/	/	47.29	29.73	30.56	28.02	/	/	55.71	42.87	35.35	38.51	35.04

1 Bias adjustment figure 0.91

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

QA/QC Data

Diffusion Tube Bias Adjustment Factors

The bias adjustment for 2015 was taken from the National Diffusion Tube Bias Adjustment Factor spreadsheet, as Coventry no longer has any automatic monitoring data. There were 29 studies that contributed and therefore the adjustment factor of 0.91 is thought to be representative.

Figure 1: A screenshot of the National Diffusion Tube Bias Adjustment Factor spreadsheet, showing the laboratory, preparation method and factor used

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/16

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2016
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List
If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List
If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List
If a year is not shown, we have no data [2]

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor [3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote [4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953

Analysed By [1]	Method (To make your selection, choose [All] from the pop-up list)	Year [2] (To make your selection, choose [All])	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision [4]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2015	R	Ards and North Down Borough Council	12	38	26	48.6%	G	**0.67**
Gradko	20% TEA in water	2015	UC	Breckland Council	12	30	29	1.5%	G	**0.99**
Gradko	20% TEA in water	2015	R	Cheltenham Borough Council	12	35	35	2.7%	G	**0.97**
Gradko	20% TEA in water	2015	R	Lisburn & Castlereagh City Council	10	36	29	24.8%	G	**0.80**
Gradko	20% TEA in water	2015	R	Luton Borough Council	12	46	44	6.0%	G	**0.94**
Gradko	20% TEA in water	2015	R	Monmouthshire County Council	12	41	37	11.0%	G	**0.90**
Gradko	20% TEA in water	2015	B	Pembrokeshire Council	10	4	3	36.7%	G	**0.73**
Gradko	20% TEA in water	2015	R	City of Lincoln Council	12	39	33	17.9%	G	**0.85**
Gradko	20% TEA in water	2015	R	Borough Council of King's Lynn and West No	12	29	22	32.5%	G	**0.75**
Gradko	20% TEA in water	2015	R	Cheshire West and Chester	10	38	40	-5.2%	G	**1.06**
Gradko	20% TEA in water	2015	R	Dudley MBC	12	47	50	-5.9%	G	**1.06**
Gradko	20% TEA in water	2015	R	Dudley MBC	12	40	35	14.0%	G	**0.88**
Gradko	20% TEA in water	2015	R	Dudley MBC	12	34	31	10.0%	G	**0.91**
Gradko	20% TEA in water	2015	UB	Dudley MBC	11	23	19	20.9%	G	**0.83**
Gradko	20% TEA in water	2015	KS	Glasgow City Council	12	60	61	-0.9%	P	**1.01**
Gradko	20% TEA in water	2015	UB	Glasgow City Council	10	25	25	3.3%	P	**0.97**
Gradko	20% TEA in water	2015	R	Glasgow City Council	9	30	31	-2.8%	P	**1.03**
Gradko	20% TEA in water	2015	R	Glasgow City Council	12	43	38	14.0%	P	**0.88**
Gradko	20% TEA in water	2015	KS	Marylebone Road Intercomparison	12	102	81	26.2%	G	**0.79**
Gradko	20% TEA in water	2015	UB	Liverpool	12	20	22	-9.0%	G	**1.10**
Gradko	20% TEA in water	2015	R	Preston City Council	12	29	27	8.9%	G	**0.92**
Gradko	20% TEA in water	2015	R	Thurrock Borough Council	12	28	45	-37.1%	G	**1.59**
Gradko	20% TEA in water	2015	R	Gateshead Council	11	33	33	-0.8%	G	**1.01**
Gradko	20% TEA in water	2015	R	Gateshead Council	10	36	33	11.2%	G	**0.90**
Gradko	20% TEA in water	2015	R	Gateshead Council	12	28	25	9.2%	G	**0.92**
Gradko	20% TEA in water	2015	KS	New Forest DC	11	47	36	31.1%	P	**0.76**
Gradko	20% TEA in water	2015	R	New Forest DC	11	33	25	31.7%	G	**0.76**
Gradko	20% TEA in water	2015	R	Wokingham Borough Council	11	36	33	-69.0%	G	**0.93**
Gradko	20% TEA in water	2015	UC	Southampton City Council	12	28	29	-3.5%	G	**1.04**
Gradko	20% TEA in water	2015		**Overall Factor [3] (29 studies)**					**Use**	**0.91**

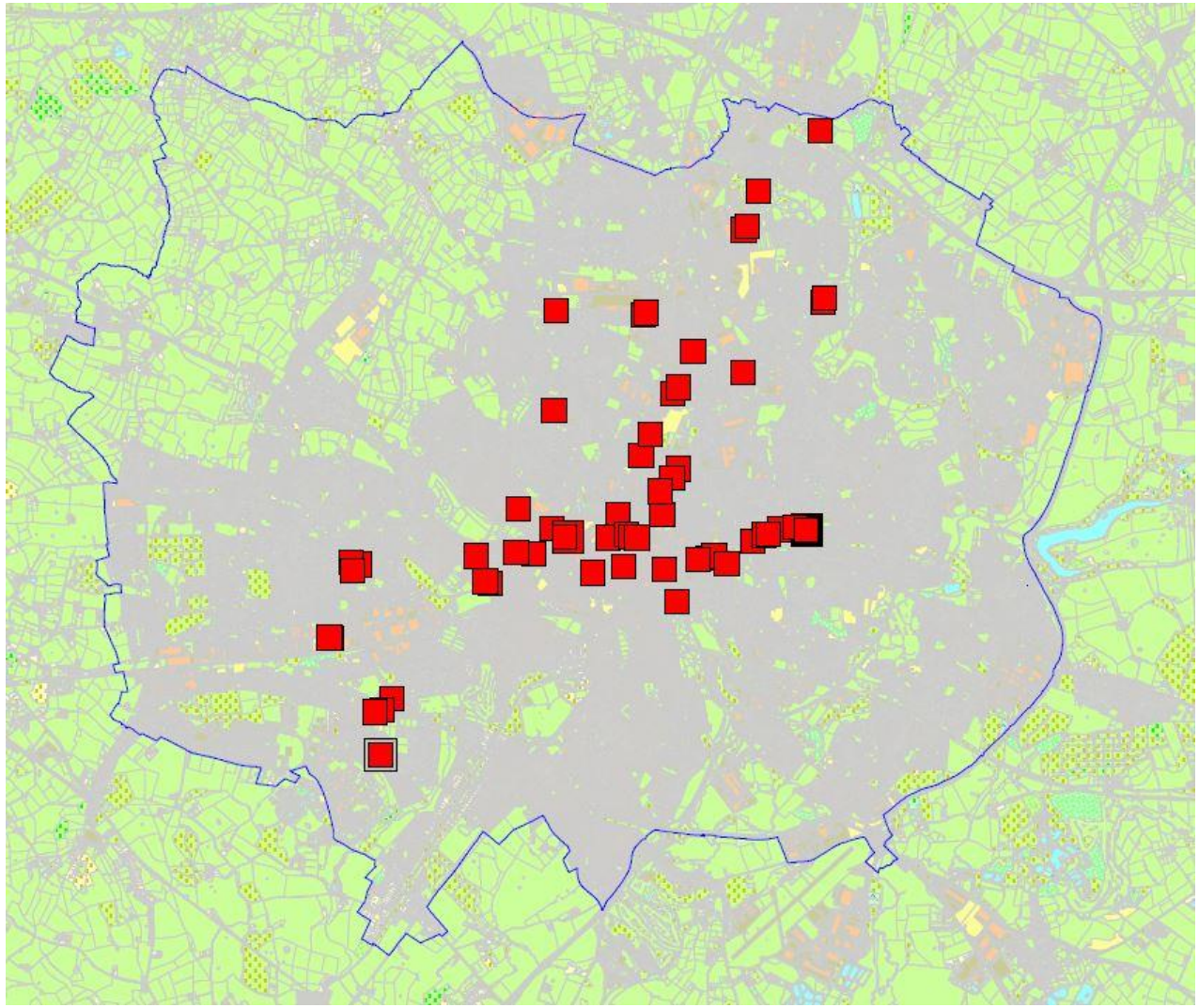
QA/QC of Diffusion Tube Monitoring

The test laboratory currently used by Coventry City Council is Gradko International Ltd. Gradko participates in the Workplace Analysis for proficiency (WASP) scheme managed by the Health and Safety Laboratory.

For the period April 2013 to February 2015 Gradko laboratory has had results which were determined to be 100% satisfactory and so has a good standard of performance with regard to WASP performance criteria.

For the period March 2014 to November 2015 Gradko laboratory has also had results which were determined to be 100% satisfactory and so has a good standard of performance with regard to WASP performance criteria.

Appendix D: Map of Monitoring Locations



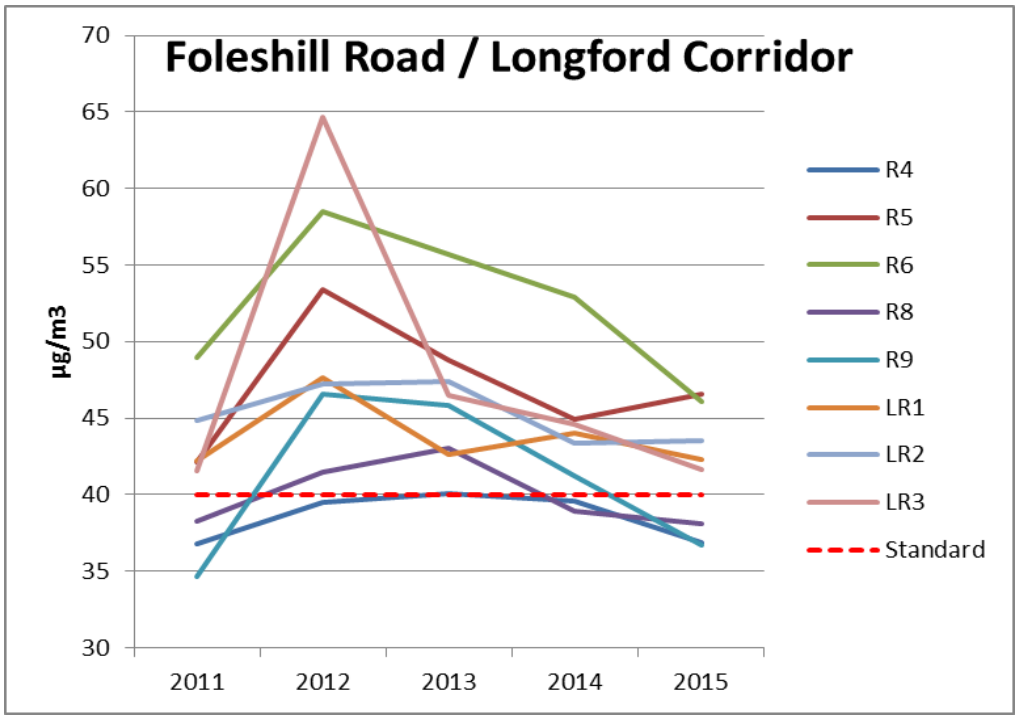
Appendix E: Summary of Air Quality Objectives in England

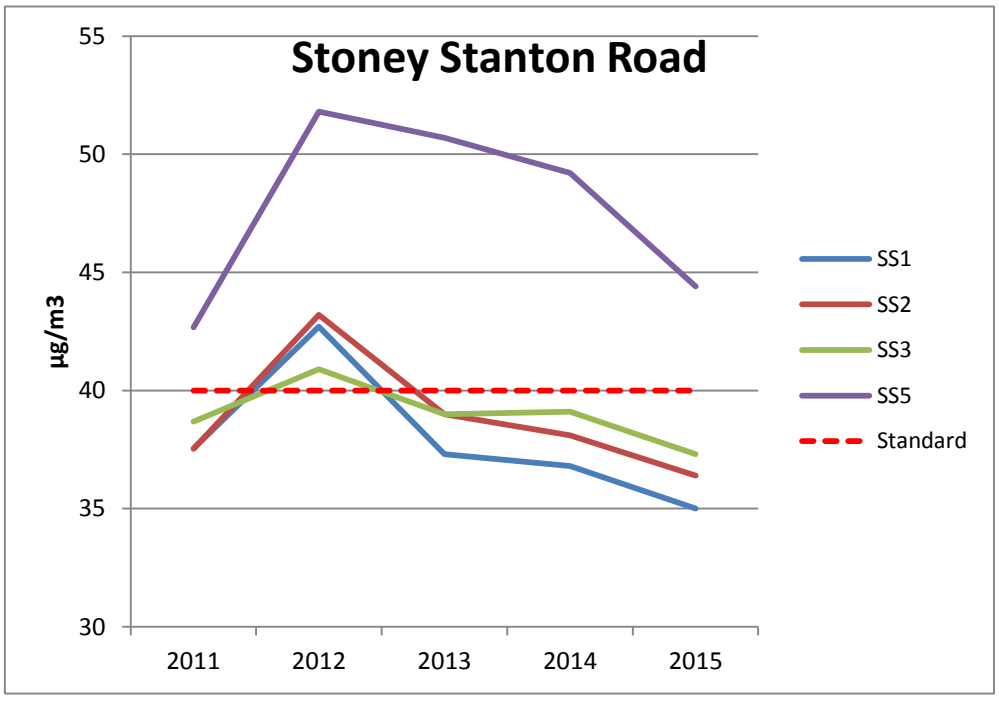
Table E.1 – Air Quality Objectives in England

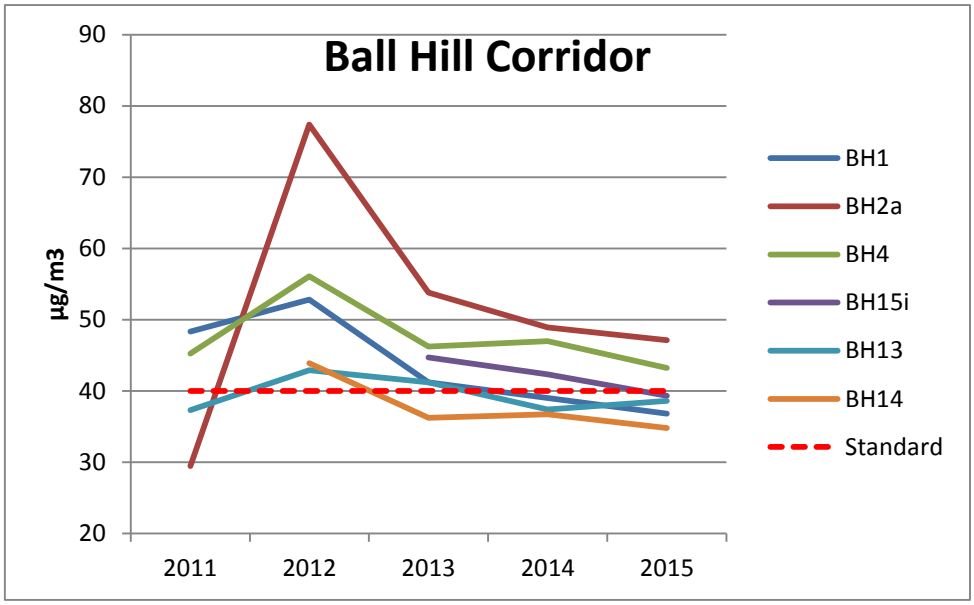
Pollutant	Air Quality Objective[4]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

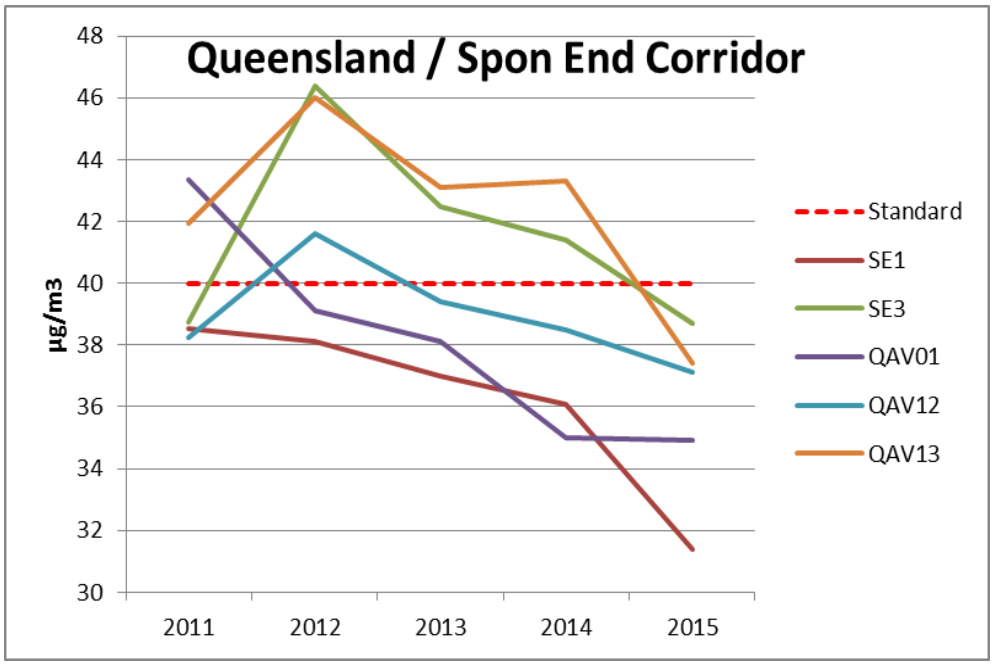
[4] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

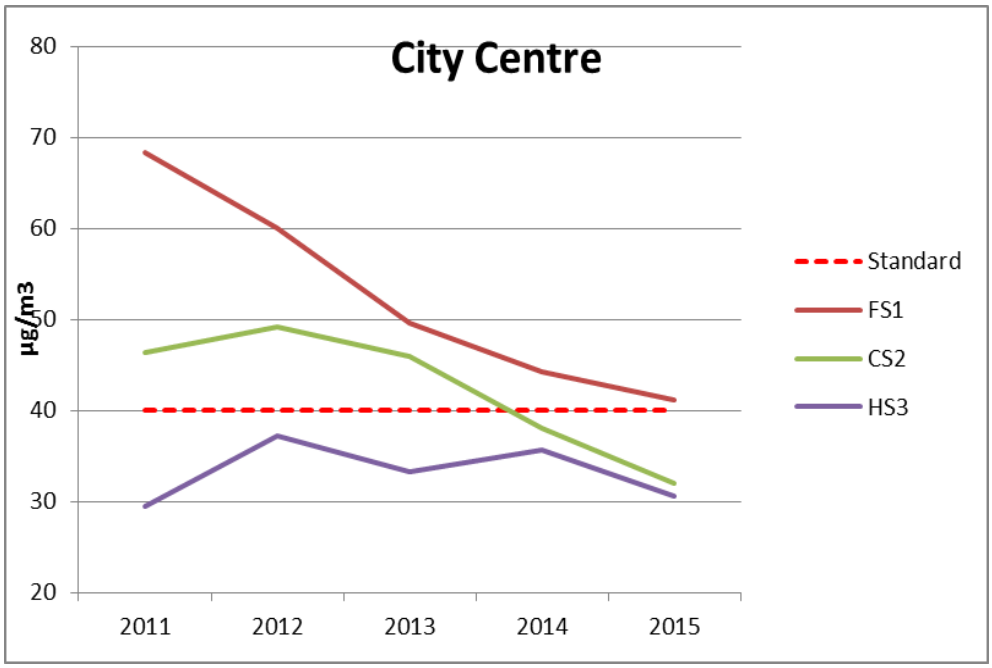
Appendix F: Trend data for past 5 years, for NO_2 diffusion tubes.






Ball Hill Corridor
µg/m3
90
80
70
60
50
40
30
20
2011
2012
2013
2014
2015
BH1
BH2a
BH4
BH15i
BH13
BH14
Standard


Queensland / Spon End Corridor
µg/m3
48
46
44
42
40
38
36
34
32
30
2011
2012
2013
2014
2015
Standard
SE1
SE3
QAV01
QAV12
QAV13


City Centre
80
70
60
50
40
30
20
µg/m3
2011
2012
2013
2014
2015
Standard
FS1
CS2
HS3

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQEG	Air Quality Expert Group
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
CAZ	Clean Air Zone
CCC	Coventry City Council
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
HoPE	Holistic Personal Public Eco-Mobility
LAQM	Local Air Quality Management
LES	Low Emission Strategy
LETCP	The Low Emissions Towns and Cities Programme
LEZ	Low Emission Zone
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less

$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
WMCA	West Midlands Combined Authority

References

AQEG (2013). *Mitigation of United Kingdom $PM_{2.5}$ Concentrations*. Report by the Air Quality Expert Group (AQEG) prepared for the Department for Environment, Food and Rural Affairs (Defra), Scottish Executive, Welsh Government and the department of the Environment in Northern Ireland. Available at: https://uk-air.defra.gov.uk/assets/documents/reports/cat11/1508060903_DEF-PB14161_Mitigation_of_UK_PM25.pdf]