Luton

Luton Borough Council Air Quality Action Plan

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management December 2017

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Executive Summary

This Air Quality Action Plan (AQAP) has been produced as part of our statutory duty required by the Local Air Quality Management framework. It outlines the action we will take to improve air quality in Luton between 2017 and 2022.

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

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

Luton Borough Council is committed to reducing the exposure of people in Luton to poor air quality in order to improve health.

The Council has a duty to regularly review and assess the air quality within the Borough. Where air quality objectives look unlikely to be met, the Council must declare an Air Quality Management Area (AQMA) and develop an action plan outlining measures to improve air quality in the AQMA.

This Air Quality Action Plan (AQAP) has been produced as a result of the declaration of an AQMA along the A505 (Dunstable Road) in part of Bury Park and the Town Centre (also referred to as the Luton AQMA3), which was declared on 29 April 2016 (Figure 1).

It sets out the key themes, highlighting measures that the Council needs to take to improve air quality in Luton, and contribute to reducing emissions. The AQAP addresses an integrated approach to improving air quality by setting reduction targets for air pollution and carbon emissions from road transport.

The AQAP recognises that the Council should not act in isolation in order to deliver a comprehensive package of measures, and should at any opportunity involve and engage a wide set of stakeholders in its delivery.

[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

Air pollution is a shared problem. It is as a result of activities that we all contribute to, and therefore solutions to resolve air pollution and improve air quality need to be shared.

Following a review Luton Borough Council has identified transport emissions as the pollution source requiring most attention, and is highlighting a range of measures to be implemented across the Council with support from stakeholders.

In order to be effective, these measures will require cooperation from all sectors, including transport policy and management, public health and planning; especially with regard to greener practices for new developments. Public transport operators, residents, students and workers of Luton, can also support the AQAP through their daily transport choices and provision.

Luton Borough Council has already undertaken measures to improve local air quality including:

- Introducing the Luton Dunstable Busway
- Creating a new travel hub in the town centre
- Providing electric vehicle charging posts to support and encourage the use of electric vehicles
- Creating a town centre car club using electric vehicles
- Providing free, personalised travel planning advice, and green travel information on the Travel Luton Website
- Coordinating school travel plans to encourage more active and sustainable journeys to local schools
- Reallocating lanes on Dunstable Road between Telford Way and Cardiff Road
- Ongoing monitoring of air quality at key locations.

We will continue to support and improve on the measures shown above. We have developed actions that can be considered under seven broad categories:

1. Alternatives to private vehicle use
2. Policy Guidance and Development Control
3. Promoting Low Emission Transport
4. Promoting Travel Alternatives

5. Public Information
6. Traffic Management
7. Transport Planning and Infrastructure

Our priority is to tackle emissions caused by local traffic and public transport, by implementing measures to encourage the use of more sustainable travel modes that will reduce congestion and emissions, with a plan to upgrade fleet where possible to greener vehicles, ensuring appropriate infrastructure and Council policy is provided to support these measures.

Private hire operators have started to consider upgrading to cleaner vehicles, including electric, and the Council will be supporting this through the provision of more EV charging points throughout the town. Public transport operators are already working towards a more environmentally friendly fleet, and Arriva has just introduced hybrid Euro6 buses on the local 12 and 27 routes. We will continue to work with local operators on improving their fleet, and will be looking at opportunities for further bus investment or retrofitting after the budget announcement later this year.

In this AQAP we outline how we plan to effectively tackle air quality issues that are within our control and in the first instance relevant to the AQMA 3. There are a large number of air quality policy areas that are outside of our influence (such as vehicle emissions standards agreed in Europe, traffic travelling through Luton from other destinations). Where we have useful evidence to influence, we will continue to work with neighbouring local councils and central government.

Responsibilities and Commitment

This AQAP was jointly prepared by the Food, Safety and Environment Team and Strategy and Sustainability services of Luton Borough Council with the support and agreement of the following officers and service areas:

- Liz Bailey, Food, Safety and Environment Team
- Keith Dove, Strategic Policy Adviser
- Christine Davy, Traffic Safety and Regulation
- Shopna Amin, Public Health
- Tony Ireland, Public Protection Authorisation

- Joanne Nelson, Environmental Protection
- Jake Kelly, Strategic Planning
- Jane Conway, Parks
- David Foord, Luton Clinical Commissioning Group
- Robbie Barnes, Parks Operations

The Luton Health and Wellbeing and Transport Boards have both had the opportunity to comment on the AQAP throughout its development.

This AQAP has been approved by:

Name	Signed	Date
Laura Church, Corporate Director for Place and Infrastructure		
Gerry Taylor, Director Public Health		
Cllr Sian Timoney, Portfolio Holder for Regeneration		
Cllr Paul Castleman, Portfolio Holder for Local Plans		
Cllr Aslam Khan, Portfolio Holder for Public Health		

This AQAP will be subject to an annual review, appraisal of progress and reporting to the relevant Council Committee. Progress each year will be reported in the Annual Status Reports (ASRs) produced by Luton Borough Council, as part of our statutory Local Air Quality Management duties. Previous ASRs are available on the Council's Website[4].

If you have any comments on this AQAP please send them to Liz Bailey at:

Town Hall, Luton, LU1 2BQ

01582 546511

Liz.Bailey@Luton.gov.uk

[4] http://www.luton.gov.uk/Environment/Environmental%20health/Air_pollution_2/Air%20Quality/pages/Pollution%20control%20-%20air_2.aspx

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1. Introduction

The Environment Act (1995) introduced Local Air Quality Management (LAQM), a process which all local authorities must follow in order to ensure air quality is adequately addressed in their areas.

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 exceedances are considered likely, the local authority must then 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.

Whilst the LAQM process considers a range of pollutants, only particulate matter (PM_{10}) and nitrogen dioxide are the main pollutants monitored.that are considered an issue (or potential issue) to Luton at the present time and are monitored by the Council. $PM_{2.5}$ has recently begun to be monitored but we do not currently have enough data to know whether this is in exceedance of objective concentrations. We have a continuous air quality monitoring station on the east end of Dunstable Road which monitors particulate matter and nitrogen dioxide in real time. In addition to this we have 42 nitrogen dioxide diffusion tubes locations around the borough which enable the annual mean levels to be calculated.

A relevant exceedance for nitrogen dioxide was identified on Dunstable Road. Monitoring showed that concentrations at the façade of residential properties were 54µg/m3, 14µg/m3 above the objective concentration of 40µg/m3. As a result, an air quality consultant was commissioned to undertake a detailed assessment of the area concerned. This report ("2015 Detailed Assessment") has been published on the Councils Website[5].

The detailed assessment revealed that a significant length of the A505, a section of the A6, a section of Dallow Road, a section of Castle Street and a number of other properties on the adjoining side streets are considered to have elevated concentrations of nitrogen dioxide (see Figure 1), and as such, people will be exposed to poor air quality. As a result of this, the area was declared an Air Quality Management Area (AQMA) in 2016.

[5] http://www.luton.gov.uk/Environment/Environmental%20health/Air_pollution_2/Air%20Quality/pages/Pollution%20control%20-%20air_2.aspx

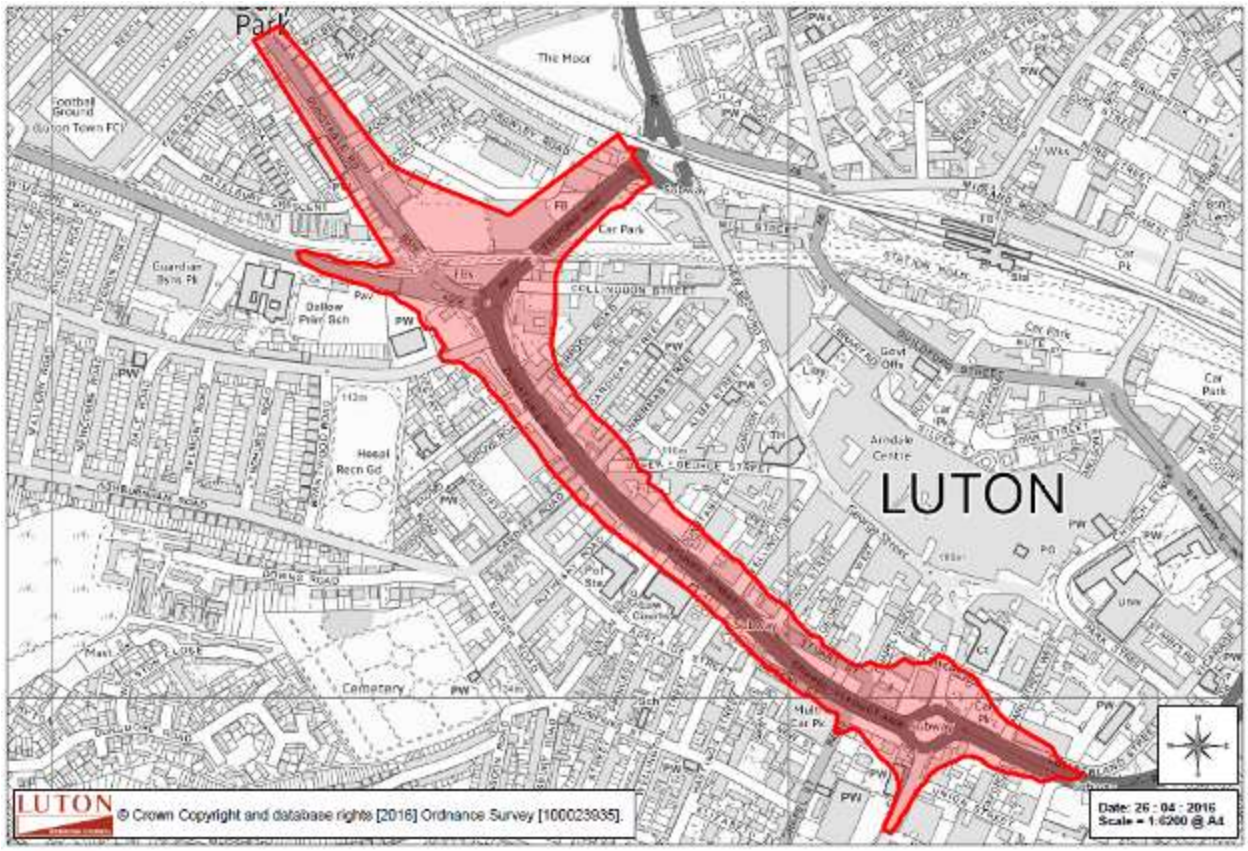
Once an AQMA is declared the Council must produce an Air Quality Action Plan (AQAP) detailing the steps it intends to take to reduce the nitrogen dioxide concentrations. The AQMA declaration and Action Plan will enable the Council to better target resources towards actions that should bring about a reduction in pollutant concentrations.

This report outlines the actions that Luton Borough Council will deliver between 2017-2022 in order to reduce concentrations of air pollutants and exposure to air pollution in the AQMA3 along the A505 (Dunstable Road), Bury Park and the Town Centre (Figure 1); thereby positively impacting on the health and quality of life of residents in this area, and visitors to Luton.

It has been developed in recognition of the legal requirement on the local authority to work towards Air Quality Strategy (AQS) objectives under Part IV of the Environment Act 1995 and relevant regulations made under that part and to meet the requirements of the Local Air Quality Management (LAQM) statutory process.

This Plan will be reviewed every five years and progress on measures set out within this Plan will be reported annually within Luton's air quality ASR.

Figure 1 – AQMA3 declaration area



2. Summary of Current Air Quality in Luton

Luton Borough Council is a unitary authority in Bedfordshire with an estimated population of 214,700 (2015) in an area that covers 4336 hectares. The borough is densely populated and traversed by the M1 motorway running north/south on its western side, and London Luton Airport at the south east of the borough.

A recent report by Public Health England estimated that in Luton, 86 deaths were attributable to particulate air pollution per annum with 1,004 associated life-years lost. Luton has a higher percentage of adult deaths (5.8%) related to long term exposure to air pollution than England (5.1%).

The main source of air pollution in Luton is road traffic, particularly on the M1 motorway and congested Town Centre streets. Other sources include London Luton Airport and local industry, which is distributed in pockets around the borough. There are currently 42 industrial processes permitted by Luton Borough Council, and also one industrial installation that is permitted by the Environment Agency.

Luton's air quality is continuously monitored for nitrogen dioxide and particulates (PM_{10}) at a roadside analyser in the Town Centre, and there are an additional 42 sites across the Borough also measuring nitrogen dioxide (Figure 2). Recent focus on particulate matter has changed to the smaller $PM_{2.5}$ fraction, which Luton Borough Council has started to measure at the new automatic monitoring station in the Town Centre (Dunstable Road East). As this monitoring station was installed towards the end of 2014, the most recent ASR only includes its first year's data. It is therefore not possible to draw conclusions at present with regards to whether this pollutant is improving or deteriorating.

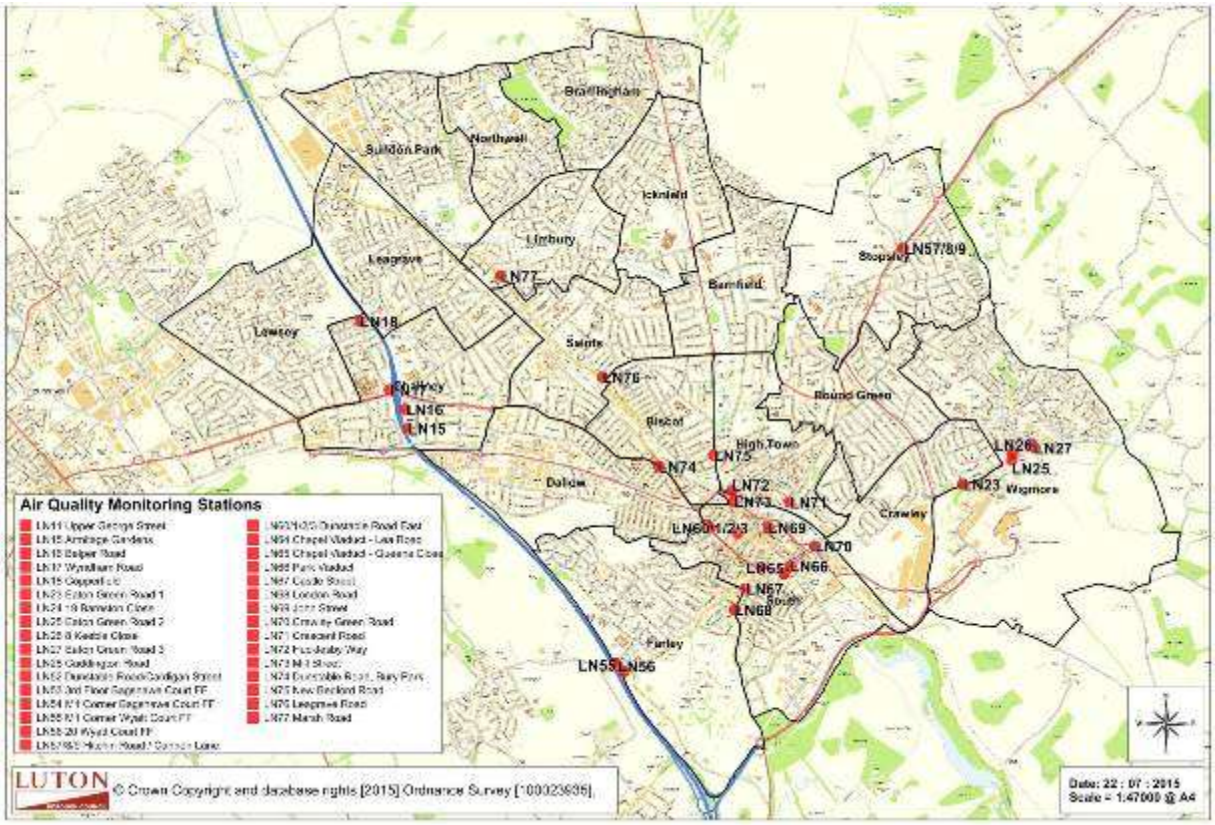
Nitrogen dioxide diffusion tubes that have been located in the same place for more than one year have all reported reduced measured levels compared to those reported in 2014, and all except one of these are below 2013 annual mean concentrations, but greater than those recorded in 2012.

Concentrations of nitrogen dioxide above the objective have been identified in 2 main locations to date: along the length of the M1 Motorway and along the A505 (Dunstable Road) in part of Bury Park and the Town Centre.

Both of these areas have now been declared as Air Quality Management Areas. Further information about AQMA1 and 2 is available online[6].

As a result of the most recent Air Quality Management Area Declaration (AQMA3 along the A505), Luton Borough Council has created this Action Plan to address the concentrations found. Please refer to the latest ASR from Luton Borough Council for full details and monitoring data, which can be found on the Council's website[7].

Figure 2 – Air Quality Monitoring Stations in Luton



[6] **http://www.luton.gov.uk/Environment/Environmental%20health/Air_pollution_2/Air%20Quality/pages/Pollution%20control%20-%20air_2.aspx**

[7] http://www.luton.gov.uk/Environment/Lists/LutonDocuments/PDF/Environmental%20and%20Consumer%20Services/Pollution/2016%20Air%20Quality%20Annual%20Status%20Report%20(ASR).pdf

3. Luton's Air Quality Priorities

3.1.1 Local Priorities and Challenges

Following the measurement of elevated concentrations of nitrogen dioxide in 2014, a detailed assessment of the town centre area was undertaken in 2015. This assessment modelled the area of the town centre which was likely to exceed the annual objective concentration for nitrogen dioxide and has subsequently been declared in AQMA3 in 2016. An action plan to address this management area has been the focus of attention.

As part of the action plan, a review of AQMA1 and 2 will also be undertaken to ensure that they are still relevant, and where required to revoke the action areas where levels of air quality have improved to below statutory exceedences; or revise actions necessary to improve air quality in these areas.

The Council's priorities are to tackle emissions caused by local traffic and public transport. Measures to encourage the use of more sustainable travel modes, to reduce congestion and emissions and upgrade fleet where possible to greener vehicles, whilst ensuring appropriate infrastructure is provided to support such measures, including the production of Council policy to support these measures.

3.1.2 Challenges

Population growth, a shortage of residential properties and a lack of building land has resulted in an intensification of development. Increased traffic that is associated with such developments, as well as other major developments planned for the town such as the growth of London Luton Airport and the relocation of the town's Football Club, have the potential to increase traffic volumes and consequently have a negative effect on public health.

External factors which are out of the Council's control present challenges, such as through traffic using the M1 and A505 to reach out of borough destinations. Whilst we have a limited impact on vehicles travelling from and to destinations outside of Luton, we will continue to work with neighbouring Local Authorities and partners to mitigate the impacts of local traffic as far as possible.

As reflected in our Local Transport Plan, we believe the key environmental challenges are:

- Improving local access by walking and cycling, especially to green space and parks and other places where people linger and socialise;
- Increasing the number of children walking and cycling;
- Continuing to increase the number of adults who walk and cycle, especially to work;
- Increasing the number of people who walk and cycle for leisure/ recreation;
- Mitigating the impact of noise generated by new development and associated traffic;
- Continuing to improve air quality and ensure that no new Air Quality Management Areas are declared, especially as a result of new development.

3.1.3 Community involvement

The potential for the residents and businesses of Luton to have a positive impact on air quality is considerable. Poor air quality has been shown to be as a result of busy and congested roads.

By choosing sustainable methods of travel, there will be less pollution in the local atmosphere. Recommended travel methods are:

- Walking
- Cycling
- Public Transport
- Use of Electric Vehicles

Where these are not feasible, the use of a newer vehicle that meets a higher emission specification will produce less pollution than an older engine.

The following websites provide information to assist with journey planning in Luton, and will be promoted as part of the communications plan for the AQAP:

- Travel Luton : http://www.travelluton.co.uk/home
    - has sections on : Walking, Cycling, Bus, Train, Car, Busway. Airport

General and supporting information regarding the transport networks can be found at Luton Borough Councils website.[8]

3.2 Public Health Context

Poor air quality is the largest environmental risk to public health in the UK. It is known to have more severe effects on vulnerable groups, for example the elderly, children and people already suffering from pre-existing health conditions such as respiratory and cardiovascular conditions.[9] Studies have suggested that the most deprived areas of Britain bear a disproportionate share of poor air quality.[10]

No organisation can single-handedly improve the health and wellbeing of Luton's residents. Our Joint Strategic Needs Assessment (JSNA) makes it clear that Luton faces a number of interconnected health and wellbeing challenges and it provides 24 strategic recommendations for action.

The JSNA identified the key drivers for change and made strategic recommendations in four key areas:

1. **Healthy place** – create an environment that promotes health and wellbeing and helps reduce inequalities
2. **Healthy start** – support all children to realise their full potential through the coordination of early years' support
3. **Adult wellbeing**- improve physical and mental wellbeing by supporting adults to have a greater ability to manage their own lives, to create stronger social relationships and to have access to improved care when they need it
4. **Ageing well** – support older people to age well and maintain their independence, building their resilience, and giving them information and opportunities to make positive choices about their lives.

(Source: Luton's Health and Wellbeing strategy 2016-19)

Areas 1 and 3 in the Council's Health and Wellbeing strategy directly relate to actions to combat air quality issues, such as promoting active travel over private car use for short journeys, improving access to jobs and education via sustainable transport

[8] http://www.luton.gov.uk/Transport_and_streets/Pages/default.aspx
[9] World Health Organization, 'Review of evidence on health aspects of air pollution – REVIHAAP Project', 2013 www.euro.who.int/__data/assets/pdf_file/0004/193108/REVIHAAP-Final
[10] Mitchell, G., and others (2015) Who benefits from environmental policy? An environmental justice analysis of air quality change in Britain, 2001–2011. Environmental Research Letters. DOI: http://dx.doi.org/10.1088/1748-9326/10/10/105009

modes, and making Luton a more pleasant place to be through greening and clean air projects. It is integral that departments work together to achieve a positive overall outcome in all areas.

Air pollution impacts on public health, the natural environment, and the economy.

3.2.1 Impact on public health and the environment

Air pollution also results in damage to the health of local residents and the natural environment. NO_2 contributes to acidification and eutrophication of soil and watercourses, which impacts on animal and plant life and biodiversity. It also contributes to local ozone production which damages agricultural crops, forests and plants.[4]

3.2.2 Impact on the economy

Air pollution has social costs[5] and threatens economic growth. It also impacts upon people of working age which can have economic effects, for instance if they have to take days off work. It is estimated that in 2012, poor air quality had a total cost of up to £2.7 billion through its impact on productivity. [6]

3.2.3 $PM_{2.5}$ and Public Health

Air pollution affects mortality from cardiovascular and respiratory conditions, including lung cancer. In its report on 'The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom', published in 2010, the Committee on the Medical Effects of Air Pollutants[11] (COMEAP) estimated the mortality burden of existing levels of air pollution on the population of the UK as being equivalent to 29,000 deaths and an associated loss to the population of 340,000 life-years[12]. Local authorities, working together with the public, can implement measures to reduce exposure to air pollution as well as reducing polluting emissions through – for instance – active travel plans.

4 National Statistics (2016) Emissions of air pollutants in the UK, 1970 to 2015 www.gov.uk/government/statistics/emissions-of-air-pollutants
5 Defra (2015) 'Valuing impacts on air quality: Updates in valuing changes in emissions of Oxides of Nitrogen (NOX) and concentrations of Nitrogen Dioxide (NO2)' www.gov.uk/guidance/air-quality-economic-analysis
6 Defra (2015) Report: Valuing the impacts of air quality on productivity https://uk-air.defra.gov.uk/library/reports?report_id=832
Source: https://consult.defra.gov.uk/airquality/air-quality-plan-for-tackling-nitrogen-dioxide/supporting_documents/Draft%20Revised%20AQ%20Plan.pdf[11]
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/304641/COMEAP_mortality_effects_of_long_term_exposure.pdf
[12] The loss of life attributable to population exposure to a particular factor (i.e. the years of lost life expectancy associated with attributable deaths)

3.2.4 Public Health Outcomes Framework (PHOF)

The Public Health Outcomes Framework (PHOF) - Healthy Lives, Healthy People[13] is a Department of Health data tool for England, intended to focus public health action on increasing healthy life expectancy and reducing differences in life expectancy between communities. The tool uses indicators to assess improvements. Recognising the significant impact that poor air quality can have on health, the PHOF includes an indicator relating to fine particulate matter ($PM_{2.5}$).

Public health professionals and air quality specialists within local authorities should be aware of the PHOF indictor for air pollution in their area. Updates can be found at: http://www.phoutcomes.info/public-health-outcomes-framework#gid/1000043

At its heart, the indicator for air pollution is about raising awareness of the effect of air pollution on public health. It is intended to encourage promotion of the need for local, regional and national actions to reduce air pollution and to help form a partnership between all delivery partners in pursuit of this goal. The Framework concentrates on two high-level outcomes to be achieved across the public health system, and focuses not only on how long people live, but on how well they live at all stages of life.

3.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions / Concentrations

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.

Luton Borough Council is taking the following measures to address $PM_{2.5}$:

- Working in partnership with our Public Health Department has resulted from the following drivers:
    - Incorporation of the Public Health role within Unitary Authorities such as Luton Borough Council
    - Increased evidence and awareness of harm from exposure to $PM_{2.5}$
    - A Public Health Outcomes Framework indicator “Fraction of all-cause mortality attributable to anthropogenic particulate air pollution (measured as fine particulate matter, $PM_{2.5}$)”

[13] https://www.gov.uk/government/publications/healthy-lives-healthy-people-improving-outcomes-and-supporting-transparency

- Luton's Public Health Department has funded the new real time air quality monitoring station that is located on Dunstable Road, to the west of the town centre. This station includes a FIDAS particulate analyser which monitors a range of particulate fractions including $PM_{2.5.}$ This analyser will enable the Council to monitor any changes in particulate concentrations and assist in determining the effectiveness of measures taken to improve air quality.
- Luton Borough Council has not identified any measures that will specifically tackle $PM_{2.5}$ concentrations however all measures aimed at reducing the numbers of road vehicles and those that increase the uptake of sustainable transport methods will have a positive impact on the reduction on $PM_{2.5s}$ that are produced locally.

3.3.1 Roles and Responsibilities under the Public Health Outcomes Framework (PHOF)

Working in partnership will increase support for measures to improve air quality, with co-benefits for all. We intend to work closely with local Directors of Public Health and the Luton Health and Wellbeing Board. Examples of joined-up working include:

Directors of Public Health

- To ensure the Joint Strategic Needs Assessment has up to date information on air quality impacts on the population; and
- To work closely with local authority health and air quality officers – e.g. have regular update meetings on key, emerging issues and sign off on ASRs and Action Plans.

Local Authorities (Including Transport and Planning Departments)

- To ensure that Directors of Public Health are fully briefed on the scale of the problem in your local authority area – e.g. what is being done; what is needed;
- To encourage employment of a public health consultant or policy officer that has air quality responsibilities outlined in their job profile; and
- To ensure Transport and Planning departments are fully briefed on their public health duties and the risks associated with transport and planning policy (the air quality team could produce a briefing pack for these teams).

3.3.2 $PM_{2.5}$ Indicator

The PHOF includes an indicator, based on the effect of particulate matter ($PM_{2.5}$) on mortality (Table 1).

Table 1 – PHOF Indicator

PHOF Indicator 3.1 Health Protection	
Fraction of all-cause adult mortality attributable to anthropogenic particulate air pollution (measured as fine particulate matter, $PM_{2.5}$)[14].	The estimates of mortality burden are based on modelled annual average concentrations of fine particulate matter ($PM_{2.5}$) in each local authority area originating from human activities. Local data on the adult population and adult mortality rates is also used. Central estimates of the fraction of mortality attributable to long-term exposure to current levels of human-made particulate air pollution range from approx. 2.5% to 5% in some local authorities in rural areas, to over 8% in some London boroughs[15].

This indicator enables Directors of Public Health to prioritise action on air quality with the potential to consider necessary actions to address $PM_{2.5}$ issues.

Air Quality Indicators should not be seen in isolation from other public health framework indicators. For instance, as well as reducing emissions, encouragement of active travel will have wider public health benefits, such as increased physical activity (indicator 2.13) and reducing excess weight at various ages (indicators 2.6 & 2.12). These co-benefits should form part of the overall strategy approach as they will maximise the benefits and viability of any proposed measures.

3.4 Planning and Policy Context

~~<Describe here any supporting planning and policy documents that will contribute toward improvements in air quality in your Local Authority area.>~~

Population growth, a shortage of residential properties and a lack of land available to develop in Luton has resulted in an intensification of development. Increased traffic that is associated with such developments, as well as other major developments planned for the town such as the growth of London Luton Airport and the relocation

[14] http://www.phoutcomes.info/public-health-outcomes-framework#gid/1000043/pat/6/ati/102/page/6/nn//par/E12000007/are/E09000002/iid/30101/age/230/sex/4
[15] Source: "Estimating Local Mortality Burdens associated with Particulate Air Pollution" – Public Health England 2014 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/332854/PHE_CRCE_010.pdf

of the town's Football Club, has the potential to increase traffic volumes and therefore have a negative effect on public health. In order to minimise the impact of such development, it is important to ensure that appropriate mitigation measures are requested at the planning stage and that each scheme proceeds in accordance with those agreed measures. A review of local policies will ensure that such measures are applied consistently and appropriately, and will support the management and protection of Luton's air quality.

The greatest challenge will be to obtain sufficient priority for air quality issues when they are considered alongside the competing priorities that planning professionals are obliged to balance; against a backdrop of encouraging development by removing regulation and the perceived barriers to development.

Luton is seeing an increased number of planning applications, including a number of substantial developments which have potential to impact upon air quality. Policies to control development and the associated travel implications are contained within the Luton Local Plan 2011-2031 and the third Local Transport Plan (LTP3).

Planning applications are referred to Environmental Health to determine if there is likely to be an impact on air pollution concentrations, or if the development is likely to result in people being exposed to poor air quality. Further assessment may be required by developers in order to determine appropriate mitigation for the development considering its location and the impact of the development on the local environment. For smaller developments, mitigation may be agreed without providing further assessment of the air quality impacts.

A review of potential mitigation measures appropriate for new developments is under way. This review should bring about an accelerated implementation of greener transport strategies, which it is hoped will bring about a reduction in pollution concentrations in the borough despite the number of development projects that are taking place and planned for the future.

We are working with our colleagues in neighbouring authorities to provide a consistent approach and raise the awareness of air quality in Hertfordshire and Bedfordshire.

Where Air Quality Management Areas have been declared, appropriate actions are identified working in conjunction with partners both within the Council (Public Health,

Highways, Sustainability, Licensing, Development Control) and externally (Environment Agency, Highways England, local transport providers). Regular contact with these partners will ensure that steps identified are progressed with the aim of reducing concentrations of air pollutants.

3.4.1 National Policy background

The Government's White Paper published in January 2011 is based on two overarching themes; encouraging economic growth and sustainable travel. This was the culmination of the response to the Eddington Report and the Stern Review on the impact of Climate Change. The new white paper sets the context of transport improvements in the form of five goals, which are:

1. Supporting economic growth.
2. Tackling climate change.
3. Promoting equality of opportunity.
4. Contributing to better safety, security and health.
5. Improving quality of life.

In July 2017, the Government published a White Paper "Transport Investment Strategy-moving Britain ahead" (Cmnd 9472), which recognises the importance of continuing to invest in transport infrastructure and complements "Building Our Industrial Strategy" published in 2016 and the White Paper "Industrial Strategy" (Cmnd 9528) published in November 2017. The key objectives of the investment strategy are to:

- Create a more reliable, less congested and better connected transport network that works for the users who rely on it;
- Build a stronger, more balanced economy by enhancing productivity and responding to local growth priorities,
- Enhance our global competiveness by making Britain a more attractive place to trade and invest, and
- Support the creation of new housing

This will mean investing in our transport network's core capability; its condition, capacity and connectivity, but also improving the user experience and adapting the

network to safeguard our environment and health and prove adaptable in the face of uncertainty and change. It also recognizes the importance of seizing the opportunities provided by investment in innovation, research and technology in developing ultra-low emission, connected and autonomous vehicle technologies.

The New Approach to Appraisal (NATA) is the Government's recommended approach for improving the consistency and transparency with which decisions on all transport investment projects are made. This was first applied for trunk road schemes in 1998, and has since been revised to be suitable for the appraisal of all transport projects. It requires that the key economic, environmental, and social impacts of projects are presented in a clear, consistent, and balanced way.

3.4.2 Luton's Strategic Policies

Luton Prospectus

Following the significant changes to local government funding since the economic crash in 2008/9, the Prospectus was developed to refocus the Authority and provide a steer to the redevelopment / updating of strategies. It identifies that:

- Luton has a quality built and natural environment that gives businesses confidence.
- There is an economic case to be made for taking a holistic and preventative approach to delivering public health.
- Businesses and sustainable employment have the secondary benefits of making happier and healthier residents arising from being employed; a better built and natural environment; a 'positive multiplier' effect, keeping spending within the local area; less call on expensive public services associated with helping people who are unemployed.
- The financial pressures faced by the council will be challenging for areas of service delivery concerned with environmental improvement, protection and the enhancement of green space. It suggests that all opportunities should be made to draw down external funding opportunities and grants to deliver this area of work.

The Council's first Prospectus for Luton outlined the three main priorities for 2013-2016: to ensure that people are safe, supported and healthy, with access to great

education and training, and to make our town fit for economic growth; and work is continuing to achieve this. Table 2 below shows how the Council's strategic priorities support the three themes of the Prospectus. These are underpinned by a priority which recognises the ongoing importance of providing services as efficiently and economically as possible.

Table 2 – Luton Borough Council's Strategic Priorities

Prospectus Theme	Strategic Priorities
Business and growth	Create a vibrant environment where businesses thrive & prosper.
	Protect and enhance the quality of the natural & built environment.
Education and lifelong learning	Improve life and learning opportunities & skills for all.
Safe, supported and healthy	Empower, support & protect the vulnerable.
	Improve health & promote health equality.
	Reduce crime, antisocial behaviour & the fear it causes.
	Strengthen community cohesion.

Luton Local Plan

The Luton Local Plan (LLP) establishes Luton's long-term spatial vision for the Town and through the provision of objectives and policies demonstrates how this vision will be achieved. The LLP sets out the challenges and opportunities associated with the growth of the town, and includes chapters on each of the council's main delivery areas, which analyse the baseline situation and sets out policies along with supporting evidence to shape delivery.

The Vision identifies a commitment to protect and enhance the town's natural features and provide multi-functional open space and leisure opportunities and to the provision of a better-connected town, which is less dependent on the car to promote healthy communities with good access to jobs and services.

Of the eleven 'Strategic Objectives' within the LLP, four have direct relationships to transport as follows:

- **Strategic Objective 1**: To retain and enhance Luton's important sub-regional role as a place for economic growth and opportunity, including the safeguarding of London Luton Airport's existing operations and to support the airport's sustainable growth over the plan period based on its strategic importance;
- **Strategic Objective 2**: To utilise Luton's economic, social and environmental resources efficiently and sustainably within the limited physical land capacity of the Borough whilst ensuring the permanence of the Green Belt;
- Part of **Strategic Objective 4** is also relevant in terms of improving health and wellbeing through improved access by train, bus, walking and cycling to a mix of uses including shopping, services and jobs, and
- **Strategic Objective 8**: Improve accessibility, connectivity, sustainability and ease of movement to, from and within the borough

Furthermore Strategic Objective 10, to "Improve the quality, accessibility and recreational value of green space and natural areas, whilst protecting and enhancing biodiversity", is also relevant as it relates to use of Open Space.

Luton Local Plan Infrastructure Delivery Plan 2015 - 2031

The primary function of the Infrastructure Delivery Plan (IDP) is to support the delivery of the planned growth set out in the LLP. It identifies the critical and other infrastructure necessary to support the delivery of the objectives, spatial development strategy and other policies set out in the LLP. The IDP also provides an overarching framework for service providers' plans and programmes, bringing them into one place.

3.4.3 Significant impacts of the local plan

The Local Plan contains a variety of policies and strategies that impact on air quality. The significant impacts of the Luton Local Plan 2011-2031 have been identified and considered throughout its preparation.

To summarise:

- Air quality is identified as a local sustainability issue covered by the following sustainability objectives, against which the plan was assessed (pages 13 and 14):
    - SO2: Use environmental resources efficiently and sustainably including appropriate mitigation;
    - SO5: Improve the built and natural environment through high quality and sustainable design taking into account the landscape setting and character of the town;
    - SO8: Improve accessibility, connectivity, sustainability and ease of movement to, from and within the town;
    - SO10: Improve, protect and enhance biodiversity of natural areas, including the quality, accessibility and recreational value of green space; and
    - SO11: Increase sustainable energy and water efficiency to help adapt to climate change, and secure improvements in ar and water quality.
- Pages 78 to 89 provide some qualitative analysis of significant environmental effects
- Pages 90 to 93 provide a summary table of significant transport effects, including the role encouraging greater use of sustainable transport can play
- Pages 106 to 107 provide a summary of recommended mitigation, much of which relates to actions in your plan.

Pages 108 to 110 provide monitoring recommendations, which Luton Borough Council have tried to incorporate into the local plan's monitoring framework.

The Luton Local Plan's sustainability appraisal can be viewed in full online[16].

3.4.2 Local Authority Pollution Prevention and Control (LAPPC)

Under the Environmental Permitting Regulations 2010, Luton Borough Council is required to permit certain industrial processes that are likely to introduce pollutants to the air. Whether or not a business requires a permit depends upon what processes it

[16] http://www.luton.gov.uk/Environment/Lists/LutonDocuments/PDF/Local%20Plan/Luton%20Local%20Plan/SUB%20004A.pdf

undertakes, and whether it exceeds a threshold for that that process. The processes requiring a permit are detailed in Schedule 1, Part 2 to the Regulations.

The Authority is required to inspect its area for processes requiring such a permit. Once identified and permitted, inspections are undertaken to monitor and encourage compliance with the permit conditions. This inspection includes a risk assessment which determines the annual fee payable for the permit, and also the frequency of future inspections. Fees are set by Defra, and are designed to cover the cost of undertaking this function to the local authority.

Luton has a range of such processes within its area:

- Roadstone Coating Plant
- Crematoria
- Concrete Batching Plant
- Aircraft Coating
- Powder Coating
- Vapour Recovery at Petrol Stations
- Dry Cleaning
- Waste Oil Burners
- Re-spraying of Road Vehicles

3.4.3 Vision and Objectives

Based on the wider policy vision for the Luton area, the vision for the long term transport strategy is summarised below.

Transport Vision for 2031

To make Luton a safer and healthier place in which to live, work, learn and have fun, we will provide an integrated, safe, accessible and more sustainable transport system which supports the economic regeneration and prosperity of the conurbation and the planned growth of the area whilst reducing unnecessary car use and CO_2 emissions, enhances the environment and generally improves the health and quality of life of the community.

Improving air quality is firmly embedded within the aims and objectives of Luton's LTP, specifically:

- ***Generate continued employment and prosperity*** by improving access to employment and skills/training opportunities for local residents, and by improving existing and providing new transport infrastructure and other measures that support local businesses, climate change objectives and the diversification of the local economy;
- ***Create and preserve an attractive environment and pleasant living conditions*** by promoting a quality built environment together with improving the condition of green space in the conurbation and conserving/enhancing the surrounding Chilterns AONB to encourage greater access by walking and cycling;
- ***Give people the opportunity to choose more sustainable travel habits*** by implementing transport schemes and travel planning initiatives to maximise the role of public transport, walking and cycling, thus reducing vehicular emissions and increasing physical activity;
- ***Lay the foundations for future expansion*** by ensuring accessibility (by more sustainable transport modes) between the new residential developments, existing and proposed employment areas, the town centres, and existing and new community facilities to serve the growth area.

The AQAP will form one of the key elements of the emerging fourthLTP (LTP4), and sections of it will be further developed following consultation responses to this document which help to further shape the priorities for air quality.

3.4.4 Supporting the Environment

Transport is a key determinant of health and is therefore an important consideration for improving health and wellbeing. Air pollution exacerbates respiratory problems, and can have a negative effect on the quality of life of local people. In 2009 Asthma UK reported that 42% of asthma sufferers said that fumes from traffic stopped them walking and shopping in congested areas. In addition, European evidence has shown that high concentrates of particulate matter *decrease* life expectancy of every European by, on average, almost one year. This could potentially have a bigger impact in more deprived areas of Luton where there are low levels of life expectancy.

Emerging evidence show the costs of illness as a result of physical inactivity to the NHS amounts to over £1 billion per year. They also contribute to economic benefits to the wider society, particularly in the workplace where evidence has shown that intensive changes in travel behaviour, through active travel to work, lead to significant health improvements and reduce absenteeism.

Supporting communities to change unhealthy (or health limiting) behaviour is a key aim of the LTP and is reflected in the many active travel and behaviour change actions in this AQAP. Evidence from NICE public health guidance note 8 shows how physical activity and the built environment are intertwined and, by applying the recommendations from this guidance, local transport plans can contribute to the reduction in rising obesity levels in children and adults.

Most studies have shown that there is a direct cost to the NHS due to physical inactivity. Nationally, a 20% increase in cycling would save the NHS £50 million per year in treatment of diseases related to inactivity. However, the indirect costs, including expenditure not directly attributed to the NHS, such as informal care, inferior physical and mental function, can be estimated at billions per annum.

Evidence from the Social Exclusion Unit (2003) has also shown that improving local networks, accessibility and walking and cycling trips could contribute to tackling issues of poverty. This is because the poorest fifth of households who own cars are likely to spend up to 25% of their income on the cost of motoring. Furthermore, the importance of high levels of accessibility to key services and products such as fresh fruit and vegetables has wider implications for delivering improvements in general health conditions such as coronary vascular disease, obesity and diabetes. This is considered in Policy 16 of the LTP on access to services.

The key challenges are:

- Improving local access by walking and cycling, especially to green space and parks and other places where people linger and socialise;
- Increasing the number of children walking and cycling;
- Continuing to increase the number of adults who walk and cycle, especially to work;
- Increasing the number of people who walk and cycle for leisure/ recreation;

- Mitigating the impact of noise generated by new development and associated traffic;
- Continuing to improve air quality and ensure that no new Air Quality Management Areas are declared, especially as a result of new development.

Air pollutants above regulated threshold limits are considered dangerous to human health. When air pollution levels exceed these limits, local authorities are required to declare Air Quality Management Areas (AQMAs) and produce action plans to reduce air pollution back to safe levels (such as this AQAP).

The main focus of the environmental impacts of transport is to reduce Greenhouse Gas emissions. Carbon dioxide (CO_2) is the most abundant greenhouse gas and has therefore become the main focus of climate change mitigation activity. The majority of CO_2 emissions from transport in Luton arise from vehicles travelling on minor roads rather than on A roads. Although Luton has relatively low per capita transport CO_2 emissions there remains scope for further reductions from the transport sector.

There are currently three AQMAs within Luton, two of which relate to traffic using the M1. AQMA3 is around part of the Town centre ring road. The Council is required by the National Air Quality Strategy, where an AQMA has been declared, to produce an Air Quality Action Plan containing initiatives which will reduce relevant air pollutants to levels no higher than the corresponding objective levels in the Government's Air Quality Strategy. Although Local Air Quality Management remains a function of the Borough council, when an AQMA is declared on the basis of traffic sources of air pollution from a Motorway or Trunk road, Highways England is responsible for delivering transport improvements and actions to reduce transport air pollution emissions along those roads

We have decided to integrate the emerging LTP4 and the Air Quality Action Plan, to show how the synergy of many transport related initiatives will contribute to the overall improvement of air quality in the Borough.

Policy 1: Improving Air Quality

Where AQMAs are declared as a result of traffic sources from a trunk road, we will work closely with Highways England to develop and implement an appropriate Air Quality Action Plan for reducing air pollution emissions within those AQMAs.

In order to ensure that no new Air Quality Management Areas are declared in Luton, we will require an Air Quality Assessment for all development proposals that:

- result in increased congestion, or a change in traffic volumes and/or speeds;
- significantly alter the traffic composition in an area, such as bus stations, lorry parks and new road layouts;
- include new car, coach or lorry parks;
- adversely affect sensitive areas or areas nearing air quality threshold limits; would be close to known sources of air pollution and which would include Relevant Receptors, e.g. housing, schools, hospitals.

Most of this will be implemented through our development management process as and when planning applications are received. In order to better understand air pollution levels across the Borough and facilitate the application of the above policy, we will be reviewing our existing air quality monitoring data and agree an appropriate extended monitoring regime to establish baseline air pollution levels. We will also use this monitoring data to inform the development of future transport schemes and initiatives and to monitor their performance in air quality terms.

3.5 Source Apportionment

The AQAP measures presented in this report are intended to be targeted towards the predominant sources of emissions within Luton Borough Council's area.

A source apportionment exercise was carried out by Bureau Veritas UK on behalf of Luton Borough Council in 2016. This identified that within the AQMA, the percentage source contributions were as follows:

Table 3 – Source Apportionment results for NO_x

NO_x Source Apportionment Results	All Vehicles	Car	LGV	HGV	Bus	Moto	Background
Average across locations representative of exposure							
NO_x Concentration ($\mu g/m^3$)	33.4	15.4	0.9	2.2	14.9	0.0	39.9
Percentage of Total NO_x	40.3%	19.2%	1.4%	2.7%	16.9%	0.1%	59.7%
Percentage Road Contribution to NO_x	100%	45.9%	2.8%	6.6%	44.5%	0.1%	-
Average across locations representative of exposure with NO_2 Concentration greater than 40$\mu g/m^3$							
NO_x Concentration ($\mu g/m^3$)	65.9	28.1	0.9	4.0	32.7	0.1	39.9
Percentage of Total NO_x	61.7%	26.4%	0.9%	3.7%	30.7%	0.1%	38.3%
Percentage Road Contribution to NO_x	100%	42.7%	1.4%	6.0%	49.7%	0.1%	-
At location representative of exposure with maximum road NO_x Concentration							
NO_x Concentration ($\mu g/m^3$)	81.6	34.8	0.8	4.1	41.8	0.1	39.9
Percentage of Total NO_x	67.2%	28.7%	0.6%	3.4%	34.4%	0.1%	32.8%
Percentage Road Contribution to NO_x	100%	42.7%	0.9%	5.1%	51.2%	0.1%	-

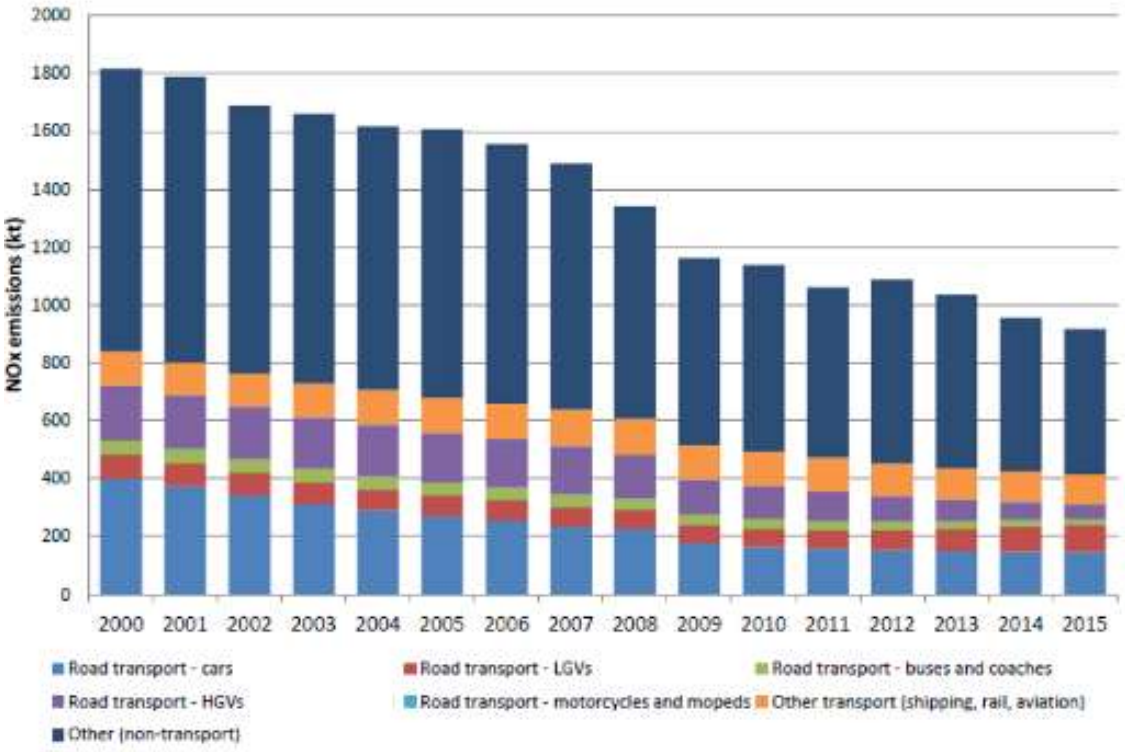
Table 4 – Source Apportionment results for NO_2

NO_2 Source Apportionment Results	All Vehicles	Car	LGV	HGV	Bus	Moto	Background
Average across locations representative of exposure							
NO_2 Concentration ($\mu g/m^3$)	14.4	6.7	0.4	1.0	6.3	0.0	24.8
Percentage of Total NO_2	33.4%	15.9%	1.1%	2.3%	14.1%	0.0%	66.6%
Percentage Road Contribution to NO_2	100.0%	46.3%	2.9%	6.7%	44.0%	0.1%	-
Average across locations representative of exposure with NO_2 Concentration greater than 40$\mu g/m^3$							
NO_2 Concentration ($\mu g/m^3$)	27.0	11.5	0.4	1.6	13.4	0.0	24.8
Percentage of Total NO_2	51.8%	22.1%	0.7%	3.1%	25.8%	0.1%	48.2%
Percentage Road Contribution to NO_2	100.0%	42.7%	1.4%	6.0%	49.7%	0.1%	-
At location representative of exposure with maximum NO_2 concentration							
NO_2 Concentration ($\mu g/m^3$)	32.4	13.8	0.3	1.6	16.6	0.0	24.8
Percentage of Total NO_2	56.6%	24.2%	0.5%	2.9%	29.0%	0.1%	43.4%
Percentage Road Contribution to NO_2	100.0%	42.7%	0.9%	5.1%	51.2%	0.1%	-

Although non-transport sources of NOx are considerable contributors (Figure 3) road transport is responsible for some 80% of NOx concentrations at roadside, with diesel vehicles the largest source in these local areas of greatest concern (Figures 4 and 5). This is due to both the significant growth in vehicle numbers, particularly diesel vehicles, and improvements in real world testing showing that laboratory test-based emission standards have not delivered expected reductions under real world driving conditions[17].

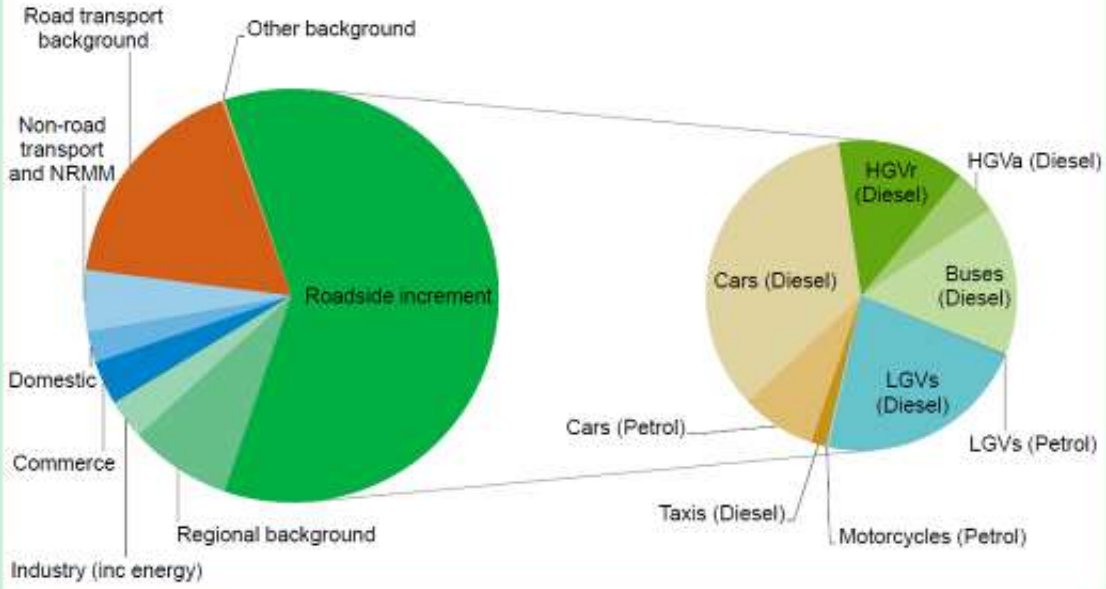
Source apportionment for NO_x is used as a proxy for the source apportionment of NO_2. This is because it is not possible to calculate a precise source apportionment for annual average NO_2 concentrations because ambient NO_2 concentrations include contributions from both directly emitted primary NO_2 and secondary NO_2 formed in the atmosphere by the oxidation of NO.

Figure 3 – Annual UK emissions of NOx since 2000



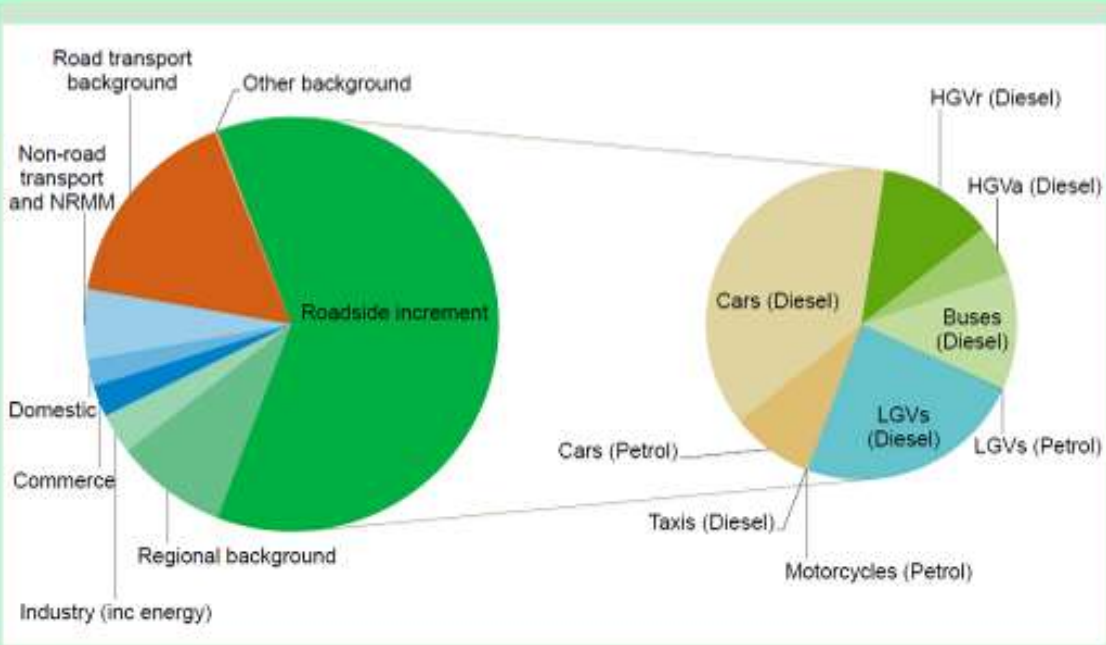
[17] DfT (2016) Vehicle Emissions Testing Programme report www.gov.uk/government/publications/vehicle-emissions-testing-programme-conclusions

Figure 4 – Breakdown of UK national average NO_x roadside concentrations into sources, 2015



Note: The 'Roadside increment' in the large pie chart is the estimate of the proportion of NO_x roadside concentrations contributed by local traffic, which is shown in greater detail in the smaller pie chart. NRMM = Non-Road Mobile Machinery; LGV = Light Goods Vehicles; HGVr = Rigid Heavy Goods Vehicles; HGVa = Articulated Heavy Goods Vehicles.

Figure 5 – Breakdown of UK (excluding London) average NO_x roadside concentration into sources, 2015



Note: The 'Roadside increment' in the large pie chart is the estimate of the proportion of NO_x roadside concentrations contributed by local traffic, which is shown in greater detail in the smaller pie chart. NRMM = Non-Road Mobile Machinery; LGV = Light Goods Vehicles; HGVr = Rigid Heavy Goods Vehicles; HGVa = Articulated Heavy Goods Vehicles.

3.6 Required Reduction in Emissions

In Luton, the air quality objectives are exceeded for annual mean concentrations of nitrogen dioxide (NO_2) along key transport routes and busy junctions, such as sections of Dunstable Road and areas within the vicinity of the M1 motorway.

A relevant exceedance for nitrogen dioxide was most recently identified on Dunstable Road. Monitoring showed that concentrations at the façade of residential properties were 54µg/m3, 14µg/m3 above the objective concentration of 40µg/m3. Subsequently this area was declared an Air Quality Management Area, the third AQMA in Luton following two others identified along the M1 motorway (Figure 6), and this action plan was drawn up.

The actions contained within this AQAP will help achieve objectives for the hourly mean and ultimately result in the required reduction of 14µg/m3 if successful.

Figure 6 – Map of all Luton AQMAs

3.7 Key Priorities

The aim of this strategy is to:

- Facilitate the achievement of air quality objectives for nitrogen dioxide and particulate matter in the AQMA3.
- Protect public health in the AQMA3 where air quality objectives are not being met.
- Continue to reduce the Council's own impact on air quality.
- Improve the Council's efficiency at addressing air quality issues.

The actions outlined in this AQAP aim to improve air quality by:

- Enhancing the street environment through greening projects and improving the condition of green space in the conurbation
- Giving people the opportunity to choose more sustainable travel habits through providing and improving infrastructure, training and information
- Promoting healthy, safe and sustainable travel
- Working with schools and businesses to maximise their levels of sustainable travel
- Increasing awareness of air quality and the services available within the local community.

It is also a priority of the AQAP to improve the general health and wellbeing of Luton's residents through its actions, which aim to create a cleaner, greener environment, and encouraging more active travel, which has been proven to reduce the risk of obesity and many chronic diseases and improve mental health and wellbeing[18].

[18] https://www.sustrans.org.uk/policy-evidence/related-academic-research/health-and-active-travel

4. Development and Implementation of Luton Borough Council AQAP

4.1 Consultation and Stakeholder Engagement

In developing and updating this AQAP, we have worked with neighbouring local authorities, agencies, businesses and the local community to improve local air quality. Schedule 11 of the Environment Act 1995 requires local authorities to consult the bodies listed in Table . In addition, we have undertaken the following stakeholder engagement:

- Consultation via Luton's online consultation portal http://consult.luton.gov.uk/portal/
- Articles in local newspapers
- Messages using Luton Borough Council's social media platforms
- Emails to Luton Borough Council subscribers
- Letters with links to the online consultation distributed directly to households within the AQMA3

The response to our consultation stakeholder engagement is given in Appendix A.

Table 5 – Consultation Undertaken

Yes/No	Consultee
No	the Secretary of State
Yes	the Environment Agency
Yes	Highways England
Yes	all neighbouring local authorities
Yes	other public authorities as appropriate, such as Public Health officials
Yes	bodies representing local business interests and other organisations as appropriate
Yes	local residents and the wider Luton community

4.2 Steering Group

The Defra guidance on AQAPs recommends that a Steering Group is set up comprising of staff from departments across the Council who will be implementing all or parts of the measures detailed in section 5 of this plan. The core steering group for the Luton AQAP is made up of representatives from:

- Food, Safety and Environment
- Transportation Strategy and Regulations
- Traffic Safety and Regulation
- Public Health
- Public Protection Authorisation
- Environmental Protection
- Strategic Planning
- Parks
- Luton Clinical Commissioning Group

The steering group will be meeting on a monthly basis while the AQAP is in its early stages of development and implementation, after which time meetings may be scheduled less frequently, as appropriate.

Each steering group member will be responsible for feeding back consultations, actions and information to their wider teams, as well as to key stakeholders that fall within their departmental area (such as Highways England, local public transport and private hire operators, neighbouring local authorities, Luton BID etc). The steering group has met on a monthly basis while the AQAP is in its early stages of development and implementation, after which time the frequency of meetings will be reviewed.

5. AQAP Measures

The table below shows the AQAP measures for Luton Council's AQMA3. It contains:

- a list of 21 actions to improve air quality in AQMA3
- the responsible departments/organisations who will deliver this action
- the timescales for implementation
- how progress will be monitored and what's happened to date
- estimated cost of implementing each action, costs are shown where an exact budget has already been identified, or marked as follows:
    - £ = promotion, marketing and other activities that could largely be covered by day to day staff costs, with the addition of government revenue funding or planning contributions when available
    - ££ = will require revenue or capital funding, but cost not anticipated to be more than £20k per annum

NB: Please see future ASRs for regular annual updates on implementation of these measures

The actions have been grouped into seven categories following EU guidance. These categories are:

1. Alternatives to private vehicle use
2. Air Quality Planning and Policy guidance
3. Promoting Travel Alternatives
4. Promoting Low Emission Transport
5. Public Information
6. Traffic Management
7. Transport Planning and Infrastructure

Table 6 – Air Quality Action Plan Measures

No	Measure	Department / Team	Timescales	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Cost	Comments
Alternatives to private vehicle use								
1	Implement a Luton Park and Ride by securing delivery at identified locations.	Transport	Ongoing	Monitor use of park and ride once up and running	A Park and Ride would result in fewer cars driving into Luton Town Centre.	Locations for park and ride sites have been identified. Next step is to secure delivery at these locations.	£7.0m	The emerging Luton Local Plan 2011-2031 provides policy support for park and ride schemes at M1 junction 10A and Butterfield Park. Seek funding contributions towards P&R.
2	Promote / encourage more take-up of the electric vehicle Town Centre car club with residents and businesses in the town centre	Transport	Ongoing	Number of car club users	Use of the Car Club's two electric cars rather than less sustainable transport methods will result in a reduction in emissions.	49 users within Luton Council and 30 personal users	£5600/car (£11200/yr in total)	Extension to this scheme following planning conditions for certain developments which provide additional funding for Town Centre Car Club.
Policy Guidance and Development Control								
3	Monitor air pollutants and prepare and publish an annual review and assessment of air quality. Audit air quality monitoring equipment and investigate additional locations in the AQMA3 for equipment to maximise monitoring potential	Environmental Health	Ongoing	Lower levels of air pollutants	Successful AQAP should lead to lower emissions and so improved monitoring results	All monitoring results can be viewed in the annual reports	£1200/yr	Monitoring reports are available online: http://www.luton.gov.uk/Environment/Environmental%20health/Air_pollution_2/Air%20Quality/Pages/Pollution%20control%20-%20air_2.aspx

4	Implement smoke-free areas in the AQMA3, including playgrounds, St Georges Square, The Mall entrances. Expand these areas throughout the rest of Luton.	Public Health	Ongoing	Number of people smoking in / near smoke-free areas	Smoke-free areas result in improved air quality.	On TfL action plan.	£8,000/yr	Protecting public from effects of second hand smoke especially children and young people through non-enforcement implementation of smoke free public areas. Relying on support of public social norms as voluntary enforcement as seen in examples in Bristol, Barnsley and Hertfordshire. New developmental areas should consider planned signage in terms of adding 'smoke free' requirements.
5	Run the LBC Tree inventory for the town centre area through I-Tree Eco and provide a summary report in order to assess the value of trees in improving public realm in the town centre and Bury Park Including green spaces in new developments) in relation to storing and sequestering of carbon and improving air quality.	Parks	2017 – 2018	Number of Trees Planted Vs number of trees felled	The right kinds of plants can help absorb and store CO2, improving air quality.	Ongoing	£1250	Introduce CO2 absorbing / storing trees, work with Luton BID on town centre green spaces. £1,250 for I-Tree Eco report. Further Ward based reports circa £900 per ward
6	Commission the preparation of a landscaping proposal for the town centre to maximise the benefits from tree and shrub planting. Tie in with the importance of trees and shrubs on sustainable drainage for developments.	Parks / Sustainable Drainage	2017 – 2019	Number of Trees Planted Vs number of trees felled	The right kinds of plants can help absorb and store CO2, improving air quality.	Ongoing	£25k	To be costed. Promote the use of green roofs as mitigation for air quality impacts.
7	Secure funding to undertake a feasibility study to identify appropriate and sustainable* locations within the town centre and the Dunstable Road AQMA3 and develop a tree planting scheme to improve air quality.	Parks / Transport	2017 – 2019	Number of Trees Planted Vs number of trees felled	The right kinds of plants can help absorb and store CO2, improving air quality.	Ongoing	££	*The management of street trees in traffic sensitive roads often requires significant maintenance budgets to pay for the Traffic Management arrangements required by the Highway Authority. These can be far in excess of the costs of the tree maintenance. Promote the use of green roofs as mitigation for air quality impacts.

Promoting Low Emission Transport								
8	Investigate implementing a Clean Air/Low Emissions Zone in the town centre	Transport / Environmental Health	2017-19	Increased take up of clean energy vehicles / bikes by local businesses	Cleaner / greener transport options for staff and deliveries will reduce emissions in the town centre	Ongoing	££	Research required into feasibility and funding options.
9	Encourage greater uptake of clean energies. Provide charging points at town centre taxi ranks, car parks and on-street for electric vehicles, with free/ reduced parking during charging period. Encourage new developments to incorporate electric car charging points. (Prioritise AQMA3)	Transport	Ongoing	Number of EV charge points	Increased use of electric vehicles will result in a decrease in emissions	14 charge point so far; looking at an extra 10	£	Going forward, large developments will be required to include EV points for residents use as part of the scheme. This will be required via planning condition, and included in the new Local Plan.
10	Hold electric vehicle (EV) pop-up events in Luton town centre to showcase the variety of EVs that are available to help inform people. In coordination with Luton BID and local EV dealers.	Environmental Health / Transport	Ongoing	More EVs bought as a result of pop-up events providing Improved information / awareness of EVs with residents and businesses.	More uptake of EVs in Luton will help improve air quality as people start driving low / no emissions vehicles	Investigate the feasibility of holding an event in the Town Centre	£1000 / event	Cost based on Hackney's ZEN pop-up events: https://zeroemissionsnetwork.com/news/zen-pop-ups-are-back Cost includes: - Bike mechanics - Coffee all day - Pizza at lunchtime - Community Links (gazebo, tables, chairs etc.) - Parking suspensions
Promoting Travel Alternatives								
11	Joint bid with Central Bedfordshire and Bedford Borough Councils for Access Fund to promote sustainable travel to and from 6 stations.	Transport / Central Bedfordshire / Bedford BC	2017 - 2020	Increase in use of sustainable travel into Luton town centre	Increased use of sustainable travel will reduce car use and emissions.	Bid submitted and approved	£1.19m in Luton	Total £2.7 million revenue funding over 3 years between the three Councils.

12	Improve connections to Luton-Dunstable cycle route. Promote and re-brand it as a cycle superhighway to increase awareness and modal shift	Transport / Road Safety	2017 - 2018	Number of people using cycle routes to access the town centre	Increase in cycling creates modal shift away from the car, resulting in reduced emissions.		£10k	Develop, design and implement proposals for cycle routes identified in Sustrans report.
13	Review 20mph zones in and around the AQMA3 to encourage traffic calming and lower speeds.	Transport / Road Safety	Ongoing	Vehicles adhering to 20mph within the zones	Vehicles travelling under 30mph generally emit less particulates and so improve air quality	20mph zones in place.	£	
14	Develop Workplace Travel Plans for Town Centre employers, including Luton Council, to reduce staff travel by car. Use Modeshift STARS to manage this.	Transport / Road Safety	Ongoing	Modal shift by staff to more sustainable modes.	Increased uptake of lift sharing or sustainable transport methods will result in reduced emissions	Different elements in place, needs to be assembled as an official plan.	£2000/yr	Potential measures to encourage sustainable travel include promotion of cycling and walking, discounted bus and rail travel, and car-sharing.
Public Information / Traffic Management								
15	Implement VMS linked to car parks in town centre, with direction signing varying dependent on least congested route to car parks. Investigating the use of UTMC for integrating systems.	Transport / Network Technology	2017-18	Improved traffic flow and information dissemination	Smoother traffic flow helps improve air quality	Initial investigations into UTMC system and possible data sets to integrate into it	£330k	£76k Government Grant awarded in February to commence implementation in 2017-18
16	Review of operation of all traffic signals around Luton town centre and upgrade to UTMC	Transport / Network Technology	2017-18	Improved traffic flow	Less idling would result in reduced emissions		£120k	Undertake study and implement recommendations
17	Raise awareness of vehicle idling through no-idling campaigns and driver education. Prioritise the town centre and AQMA3.	Transport / Parking Enforcement / Licensing	2017-2018	Fewer drivers idling as a result of receiving	Less idling would result in reduced emissions	Ongoing	£	Idling is an offence under the Road Traffic Regulations 1984. Also, turning off your engine and restarting it after a minute or longer causes less

	Emphasis on licensed vehicles (850 licensed vehicles around Luton) and buses.			information				pollution and uses less fuel than keeping the engine idling.
18	Construct multi-storey car park on Crawley Road surface car park to re-provide for parking spaces lost in the town centre	Transport	Ongoing	Improved parking information and organisation	Less engine idling and running time while drivers search for parking	Ongoing	£6.5m	Tie in to parking VMS and UTMC systems.
19	Emissions reduction – investigate the expansion of the pedestrianised area around the town centre, either permanently or at peak times.	Transport / Environmental Health	Ongoing	Expansion of pedestrianised area results in more people walking into Luton town centre	Wider pedestrianisation leads to less vehicles in the town centre area and improved air quality	Ongoing	£	Undertake study
20	Reallocation of lanes, where possible in order to reduce start-stop traffic and congestion.	Transport	Lane re-allocation on Dunstable Rd between Telford Way & Cardiff Rd in Summer 2017	No significant reduction in peak journey time/speeds	By reducing start stop traffic, less acceleration and braking would occur, resulting in fewer emissions	Ongoing	Up to £500k	More information http://www.luton.gov.uk/news/Pages/Dunstable-Road-highway-improvements.aspx
Transport Planning and Infrastructure								
21	Improvement of Chapel viaduct / Castle Street roundabout	Transport	2018-19	Improved traffic flow	Less idling would result in reduced emissions	Various options currently being considered	Up to £1.5m	Various options being considered.

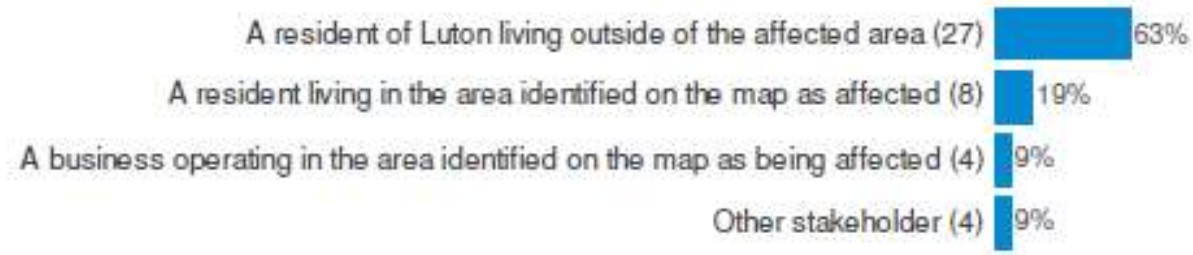
Appendix A: Response to Consultation

A.1 Summary report of Responses to Consultation and Stakeholder Engagement on the AQAP

This report was generated on 07/11/17 to show all responses to the consultation. Overall 44 respondents completed this questionnaire.

The report has been filtered to show relevant consultation responses for 'All Respondents'. For those questions where comments were invited, only those specific to the Dunstable Road AQMA3 have been included in the Action Plan. Comments regarding air quality in areas outside the AQMA 3 and in general will be addressed in developing a wider Air Quality strategy for the whole town.

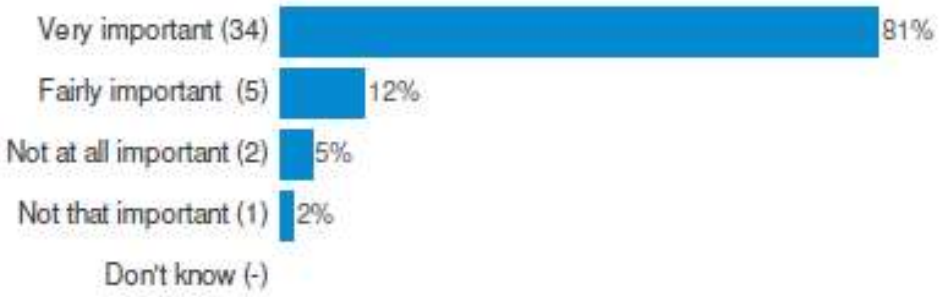
Are you? please tick one answer only



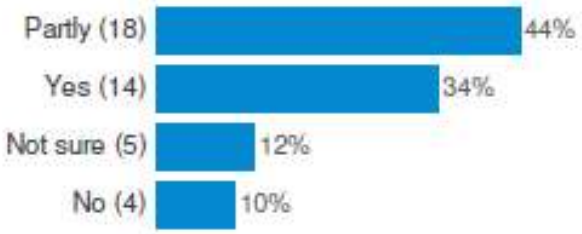
(Other, please specify)

Resident of central beds
Can't find the map
I live in Leagrave but frequently visit the town centre in the vicinity of Stuart Street.
The Health and Wellbeing Board

How important do you feel it is to tackle air pollution in Luton? please tick one answer only



Do you think that the Air Quality Action Plan has identified the areas of work needed to improve air quality in Luton town centre? Please tick one answer only



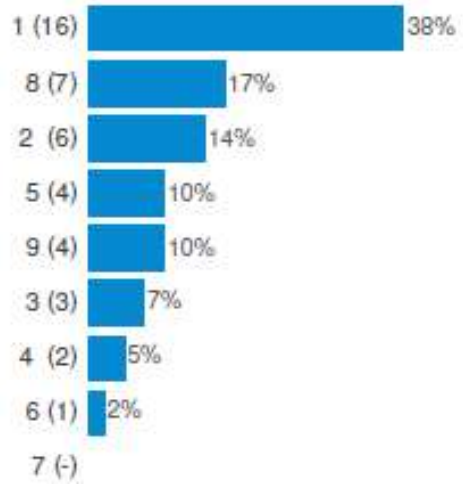
If no or partly, what other areas do you think this Action Plan should address?

- Not clear that a park and ride scheme will have the expected impact. What is the evidence? Need to do more to encourage people to leave cars at home. Planning policy also key. Population within 400m of the affected area will grow significantly with current developments.
- A major tree planting exercise in the central area. It's disappointing that the council has removed trees along Dunstable Road and nearby George Street. Also vandalism has killed a significant number of trees in St Georges Square.
- I don't think it goes far enough.
- It should be extended to take in the whole of Dunstable Road up to Beech Hill School, there is no real change in the traffic density to at least Ash Road, and it is the children and elderly who will benefit most if any real changes take place.
- Emissions from public transport remain a concern: I note that start/stop engine technology has been introduced on some buses, but it is not always implemented by individual drivers.
- Bus routes as they keep their engines running even when waiting several minutes between pick ups/drop off, especially at terminals.
- Air Quality Action Plan is a waste of time. There is no air quality in Luton whatsoever. Compare the metrics to those in other cities and you will see that Luton doesn't have anything like the pollution levels of many other cities. This is yet another exercise by Luton Council to create legislation for the sake of justifying staff members' jobs. Bureaucracy for the sake of bureaucracy.
- Stuart St air problems caused by idling and high acceleration. Reintroduce planting on central barriers and add planters alongside to stop pollutants

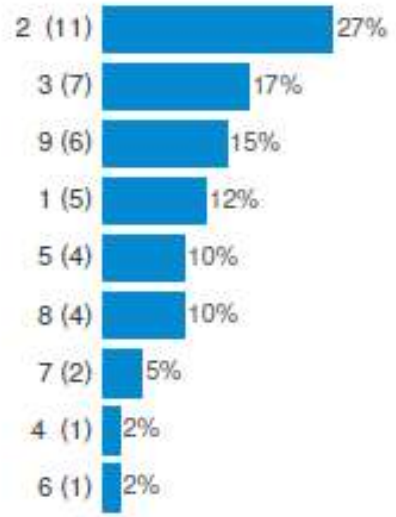
getting spread around easily. Average speed cameras. Tidal flow on Inkerman lights to stop queues back to Bannatyne's at 5pm.

- Buses in Luton are very expensive - this is why most people drive. Arriva needs to have affordable tickets.
- Pedestrian crossings holding up traffic during rush hours, poorly planned junctions that again hold up traffic, static traffic produces poor air quality. Introduce pedestrian foot bridges over the worst pedestrian crossings, more right turn filter lights at key road junctions, more no right turns at key junctions.
- General Feedback: The AQAP presents a range of different elements that aim to improve the air quality in the AQMA. The Health and Wellbeing Board would like to see the plan have more of a health focus which will in turn support economic growth and wellbeing and for the plan to be more specific in terms of those health outcomes intended to be achieved. In general, proposals would benefit from more specific outcomes timescales and milestones; for example, actions 1, Park and Ride and 2 number of car club users. In order to understand what is achievable these actions need to be quantified and targets for delivery agreed, SMART targets will aid progress on intent.

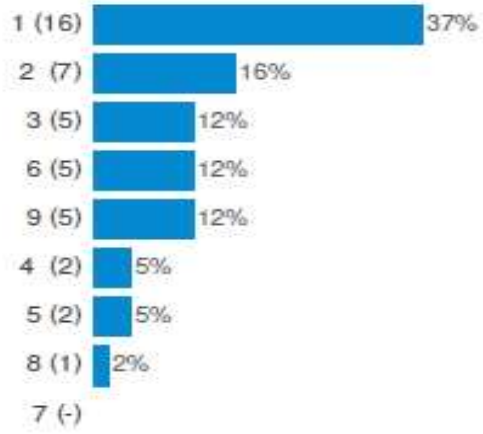
Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Air quality monitoring)



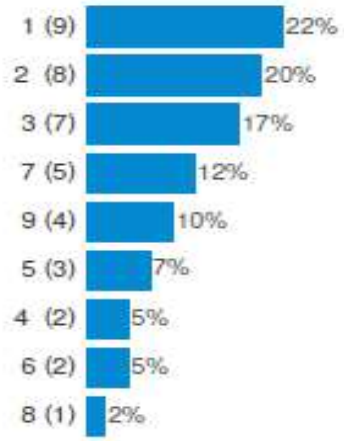
Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Increasing awareness with businesses and the public through information and air quality alerts)



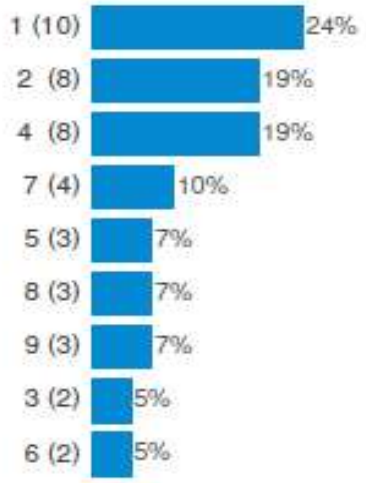
Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Reducing emissions from delivery and freight)



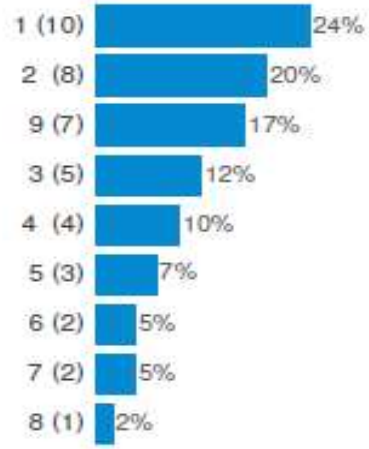
Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Reducing emissions from public and private hire transport)



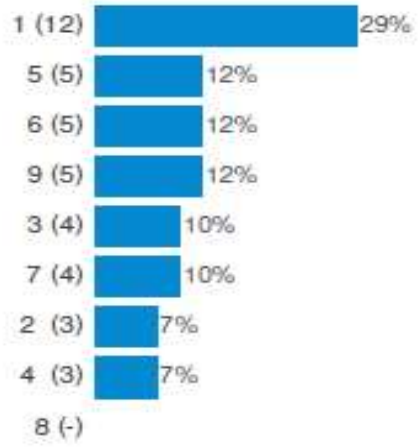
Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Reducing emissions from private vehicles)



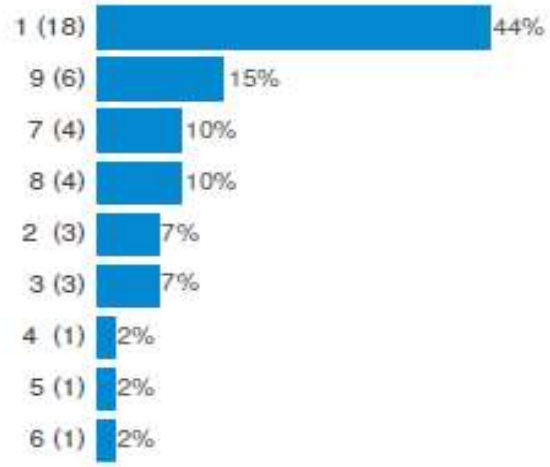
Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Reducing emissions from the Council's own fleet)



Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Encouraging more walking and cycling)



Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Planting more trees and creating more green space)



Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Encouraging the take-up of electric vehicles for private and commercial use)

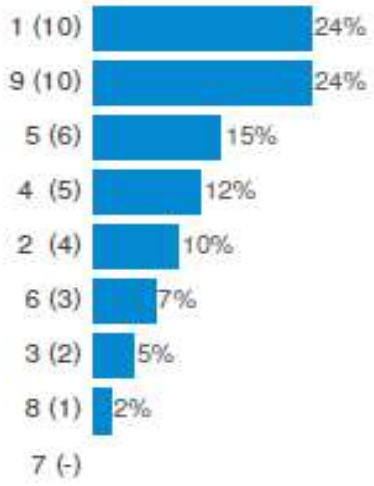


Table A.1. Priorities ranked overall:

Measure	Priority (hi/low)
Reducing emissions from delivery & freight	1
Air Quality monitoring	2
Reducing emissions from private vehicles	3
Reducing emissions from the Council's own fleet	4
Reducing emissions from public & private hire transport	5
Planting more trees & creating more green space	6
Encouraging more walking & cycling	7
Increasing awareness with businesses & the public through Info & air quality alerts	8
Encouraging the take-up of electric vehicles for private & commercial use	9

Are there any specific actions from the Action Plan that you feel should be prioritised? Please write the action number and explain your views

- Implement clean air zone.
- Maximise traffic flow, since the air quality issues result from queueing traffic. Reopening closed Town Centre alternative routes would help.
- Planting trees, as this will also make a very ugly part of town look more attractive Encourage parking away from town centre with very low cost park and ride. Make central parts of Luton permit parking only on residential roads and limit the number of permits. No permits for new build properties to reduce car ownership, then ensure proper enforcement of the rules.

- 19 - A traffic free town centre would reduce emissions and provide a safe place for walking and cycling. It would have add on benefits such as less crime as more people would be around.
- Car parking bays have been provided along Dunstable Road but no provision has been made for public transport buses to pull in out of the line of traffic at a stop. This consequently causes other vehicles to back up and idle behind the bus while it waits at the stop.
- General, the impact of air pollution in relation to nearby schools and routes taken by children to get there and return, crossing polluted roads etc.
- For this part of Luton the latest Government suggestions for improving air quality is to move traffic on more quickly in the areas of high pollution, and of course what has the council done to help this, exactly the opposite, They have put in more barriers to moving the traffic on quickly through the whole of Dunstable Road, with at peak times, long traffic delays, not just on Dunstable Road, but on the side roads as well, that feed into the main road. Look again at what has been done and take some of the changes out so that traffic can move more smoothly through the area and hence more quickly.
- Vehicle emissions: the park and ride scheme would help, but only if the vehicles used were to emit minimal pollution.
- I have noticed that a lot of unpleasant fumes come from the buses in Luton.
- Green space....absorbs pollution and encourages non vehicle use.

Are there any specific actions from the Action Plan that you feel should be prioritised? Please write the action number and explain your views

- See earlier comments relating to bus operators.
- Encouraging the public to use buses.
- Improve junctions and pedestrian crossings.
    - Provide park and ride south and east of the town to minimise traffic in the town centre. Freeing up circulation of traffic reduces pollution. 4. Ban smoking outside the Arndale Centre and throughout the pedestrianised town centre. Safety and pollution reduction. 14. Develop workplace travel plans. Reduce traffic and exhaust pollution.

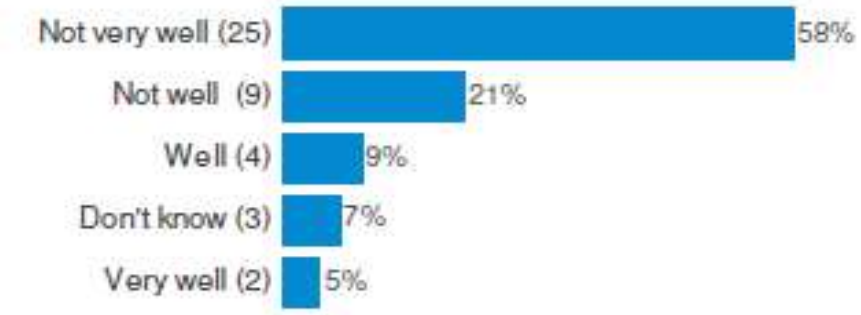
- Air quality monitoring and vehicles emissions in general.
- The one-way systems in the Town create a great deal of stationary traffic at peak times, I think the council should look at removing some of these restrictions which will allow traffic to disperse more quickly.
- There is a lack of clarity relating to what could be considered contradictory actions. For example, action 1 park and ride to reduce those driving into the area and action 18 adding additional parking in the town centre. This needs additional detail to determine which policy has primacy as part of the town centre plan; are we aiming to reduce vehicles, or promote additional town centre parking? The plan is focused on specific interventions or investments in feasibility studies where it would be more helpful to provide the opportunities for changes in policy. For example action 17 proposes awareness rising on idling (already an offence under Road Traffic Regulations 1984), with no indication of what is already in place and what is required to strengthening enforcement, either through neighbourhood enforcement, traffic officers or taxi licensing. Penalties such as spot fines for an idling vehicle in designated zones to coincide with actions [4 and 9] and outside of schools could be a lever to deliver this action with greater success.

Are there any additional actions you would like to see included in the final Action Plan? Please explain

- Ensure that all taxis/private hire vehicles are electric or hybrid.
- Restrict on street parking in central areas to discourage car ownership. Ensure all new developments limit car ownership. Pedestrianise more of town centre to limit car access. Ban old and polluting taxis and mini cabs from Luton roads.
- Taxis should be regularly check for pollution levels, have noticed very smoky taxis of late.
- The buses in Luton have bad black unpleasant fumes from them.
- Preventing developments from taking place within areas of poor air quality.
- Speed reductions in Stuart St. Many cars undertake at huge speeds to get past vehicles from the lights.

- Improve the traffic light sequence at Crawley Green Road/ Church Street roundabout.
- There should also be greater use of old fashioned Zebra Crossings in place of traffic light crossings which delay traffic unnecessarily.
- Seek alternative routes for heavy vehicles along the A505 Stuart Street where possible.
- Yes, emissions coming from farms and factories nearby and within Luton.
- There should be consideration of horizon scanning, looking at what other areas have achieved and translating this to local policy. Development of a specific policy on types of vehicles through licensing; for example by 2020 only allowing CAT 6 diesel engines for taxis operating in the borough or restrictions in heavy diesel vehicles at different times of the day, cat 6 only bus zones in the area linked to action 9 (Investigate implementing a clean air/low emissions zone), are the types of forward thinking plans that recognise that we have to adapt and flex with new technology and respond to what we know about the impact of current policy. This could be tied into the development of review a Luton's local transport plan and or town centre plan that could include policy proposals for an ultralow emission zone as proposed in London.
- Limit on age vehicles to 15 years old.

Information about air quality. Please tick (How well do you think the Council communicates information about air quality?)



(Please explain)

- First I've heard about it for a couple of years. Links on the website do not work - they need to be updated.

- Haven't seen anything apart from surveys. But compared with 1950's smog, air quality these days not an issue anyway.
- Very little communication. Council has been cutting down trees in centre of Luton - hardly helps!
- Never seen anything about air quality.
- I don't think I have received much communication about this.
- This is the first I've been aware of the Council being so proactive in monitoring air quality; up until now I have only heard it so forcefully promoted from protest groups.
- We have never seen the results of air pollution monitoring in the area, so how can we, the residents know when it does get better, or worse, not just for one hour of one day, but continual monitoring 24/7 over a whole month, then we can see just how bad it is and at what times of the day, then changes can be seen to be working or not.
- This survey is a start, but has limited coverage. More visible actions, such as air quality monitoring stations, would make the issue more apparent.
- I don't recall seeing council info about air quality.
- I think I only know about this survey because I signed up for Luton council info.
- Until this email never heard anything.
- Never hear anything about it.
- No information is provided.
- If I had not been browsing the open consultations I would never have known about the air quality monitoring. The Council needs to give this more focus on its bulletins boards, notices and website.
- There is not much information published about this or its importance.
- Until I undertook a different survey I was not aware that this was even being considered.

How do you think the Council could improve communication and engagement about air quality and related issues? Please explain

- Local press.
- Try publishing it Not on it's useless website.
- Show current measures on the website. Tweet when air quality is expected to be poor.
- Better monthly e-bulletins.
- More info on its Facebook pages.
- Publish results on web page.
- Kerbside monitors which flash up warnings to high emission vehicles as speed cameras do.
- Regular newsletter or app with regular refresh of air quality figures.
- You shouldn't be asking Luton residents this question instead you should be asking it of yourselves and your own Officers both of whom should have in depth knowledge of what's required.
- Make the Motorist understand he/she had a duty in driving to reduce pollution levels in the way they drive.
- See my previous response. Put the details into the local papers, if anyone reads them! Use the Council website, if you can keep it updated. You have stopped area meetings, so put the details onto the local councillors Facebook pages for the affected areas, then at least those that DO CARE about the town can see them and comment.
- Publish in local papers, websites and on signs in the area.
- Air monitoring stations, located around the town centre, with explanatory notices, would provide a visible message.
- Just do it! E.g. via the Herald & Post (is there still a council magazine?), bus stops and billboards, Facebook etc.
- Use the media, social media showing progress and results of continuous monitoring.
- Facebook.
- Get out and about in the town.
- Alerts via schools.

- Display signs on council transport and buses.
- I see nothing happening, so do something!
- Produce information to all households.
- Use 'e-Luton' and the LBC website front page and have a different focus on part of the front page each fortnight.
- Include them in e news.
- On our website and through the media.
- I think it’s hard for the council to do this when the public are so concerned with the cutbacks that are occurring in their everyday lives.
- Communicating more about air quality in the e-newsletter.
- Through making sure employers understand their responsibility for travel to work plans via, for example, loans to purchase bicycles on which Standard Life Aberdeen can advise you if you contact them. Through making people aware of public transport options. Through promoting bus passes which keep routes open since, if bus passes are victim to age-related hate crime, routes will have to close.
- Use of intranet and email communications with households within Luton.
- Information about air quality should be accessible through councils and public internet sites, such as Luton Borough Council website, library website, public spaces - information available on library computers etc. There also should be information on how to access data electronically.
- Other actions that could be considered as part of proposals There are a number of actions that have not been put forward as part of the AQAP and the HWBB seeks clarity on the process of consideration for the following; consider the impact on school transport polices and the impact of traffic in the area, reducing polluting emissions through freight consolidation, delivery management policies in the town centre and including low or zero emission last mile deliveries, building air conditioning and energy efficiency policies in planning applications and building conversations - currently only those classed large developments are required to show mitigating air quality impact, provide eco driving training to local businesses and delivery companies as part of

business travel plans, all new homes, offices and businesses have a facility to secure cycles to support active travel plans across the town.

- Do regular checks and put information in local newspapers.
- Communication.

Do you have any other suggestions on how air quality could be improved in this area? Please explain

- Get all council employees to cycle to work.
- Get the most polluting vehicles off Luton roads.
- Ban old and polluting mini cabs and taxis from Luton as a whole. Plant large number of trees – e.g. London Planes that are very good at removing pollution. Put tree preservation orders on all private trees in and close to the area. Ban any new drive ways from being created in homes in area to encourage gardens and limit car ownership. Severely restrict on street parking in the area to discourage private cars.
- Warn drivers of bad quality vehicles that they are liable to either fines or confiscation of vehicle if persistently exceeding a safe limit.
- Luton is growing at an ever increasing rate and more growth means more traffic. A subsidy for electric vehicles and/or a restriction of polluting vehicles could be the answer. It would have to be strong and determined Council to implement that, but you never know.
- Obviously, ban traffic but cannot be done; so how about more smiley faces when speeds are correct. Limit vehicle numbers per house.
- Education - a program in schools specifically about Luton's air quality issues. Maybe linked to more general education about environmental issues.
- Council to stop using diesel cars and vans. Council to stop providing parking places for councillors and Council staff. Only provide expenses for public transport usage develop and adopt an integrated transport plan for the town.
- As said before with the buses and checking of vehicles exhaust systems and catalytic converters and working correctly.

- Less high speeds. Less idling. More plants to reduce pollutants rolling around easily.
- Create a verge on the pavement near the road side and add railings. Plant sturdy, pollution resistant hedges or climbing plants up against the railings. It will be safer for pedestrians, hopefully help cut down on pollution and be more aesthetically pleasing to look at. The pavements in this area are more than wide enough to accommodate this feature.
- When problems on the M1 clog up the town why are there not electric sign to inform drivers that there are problems before they get to the M1 only to turn round then back through the town to find an alternative route.
- Plant more trees. The budget for this has been removed and needs reinstating.
- Reduction of traffic for low length journeys. For example people where I live would rather spend 15 minutes getting the car out and driving to the local shop and back instead of the 10 minutes it would take them to walk there and back thus reducing both pollution and obesity. In some parts of the town, better value shops on local estates would prevent the need to drive into the town centre. For example, ALDI opened a branch in Sundon Park to serve the north of the town and people can go there from Marsh Farm. More rigorous enforcement of MOT requirements for exhaust emissions on public transport operators. Encourage more exercise to discourage people from taking their car to the shops.
- Air traffic limitations, old diesel cars charges and funds available for drivers to support them to replace these cars, promoting and supporting renewable energy, EDUCATING Luton residents on how to improve their pollution produced at home, there should be massive changes to infrastructure – lanes for bikes!!! And better public transport.
- Feedback on specific actions Action 1; reducing the number of polluting vehicles entering the town is likely to have the greatest impact for improving air quality and benefit population health and wellbeing. Therefore all actions designed to alleviate vehicle numbers and congestion such as: Park and ride scheme [1], supporting sustainable travel plans [8, 12, 14], encouraging take-up of cleaner energies [1, 2, 10, 19]; preventing cars from idling [17], electronic systems and road designs supporting a reduction in congestion and

to ease flow of traffic through the town [15, 16, 20, 21]; should be considered priority actions, with specific ambition, expected health outcomes and timeframes stated. It is important that monitoring equipment is maintained, up to date and fit for purpose, and this should be seen as a means for measurement rather than an action in itself [action 3] Actions 4 and 9, smoke free zones and low emission zones, make powerful social statements that will support positive population lifestyle behaviours that support Luton in its LIF aspirations and the health of the public; however there are no timeframes for implementation or scale of ambition. Having these would be beneficial to quantify possible impact. Actions 5, 6 and 7 set out proposals for feasibility of action. In order to understand what is achievable these actions need to be quantified and targets for delivery agreed. The proposed construction of a multi-story car park on Crawley Road area [action 18] is sited near the AQMA. The proposal seeks to re-provide car parking spaces which are being lost to other developments in the town, however the proposal as is, would increase the number of parking spaces by over 120 (476 lost, with 600 plus proposed). This is likely to increase the amount of traffic in the area conflict with action [1] and undermines potential benefits from actions [2, 5, 6, 7]. The HWBB suggest an impact assessment to give clarity of the priority area in terms of reducing town centre traffic or increasing number of available parking spaces. It should be carried out before any further progress on this proposal is made and clarity stated on which action takes primacy i.e. reducing traffic or increase parking spaces.

- Like London any cars under euro 4 engines to be banned.

Would you be interested in becoming a Cleaner Air Champion? (See Frequently Asked Questions for further information) Please tick

A.2 Summary report of Responses to Consultation and Stakeholder Engagement on the AQAP – AQMA3 Area Only

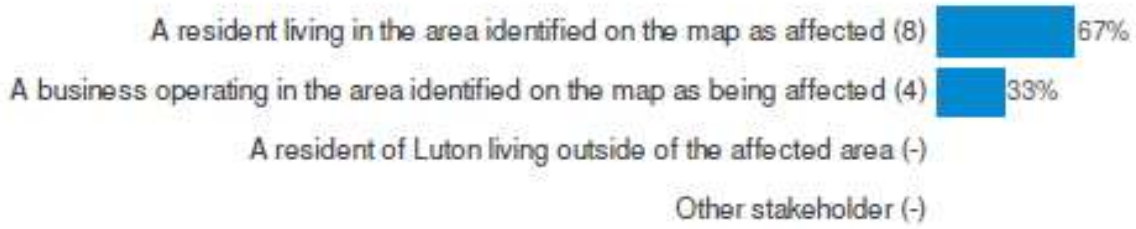
This report was generated on 23/11/17. Overall 44 respondents completed this questionnaire.

The report has been filtered to show the relevant responses for 'Are you? please tick one answer only = A resident living in the area identified on the map as affected' and

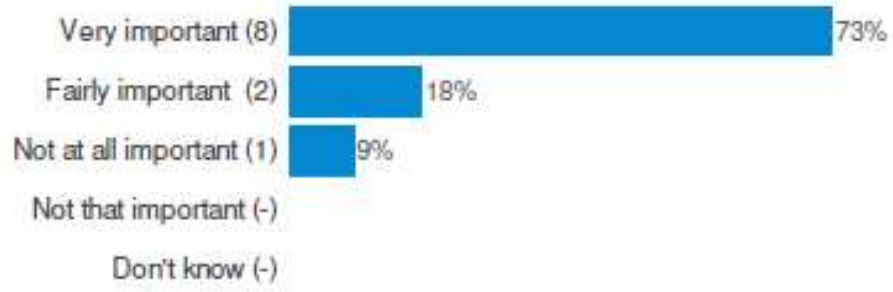
'Are you? (please tick one answer only) = A business operating in the area identified on the map as being affected'.

The following charts are restricted to the top 12 codes. Lists are restricted to the most recent 100 rows.

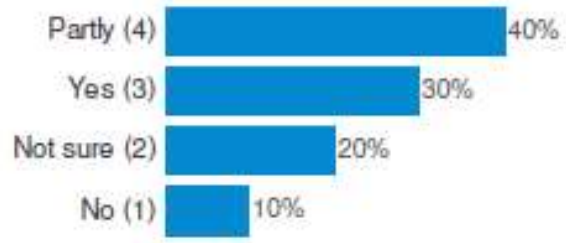
Are you? please tick one answer only



How important do you feel it is to tackle air pollution in Luton? please tick one answer only



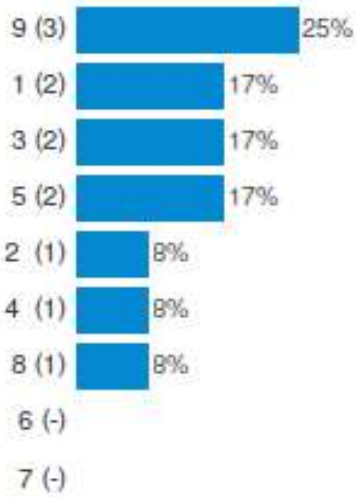
Do you think that the Air Quality Action Plan has identified the areas of work needed to improve air quality in Luton town centre? Please tick one answer only



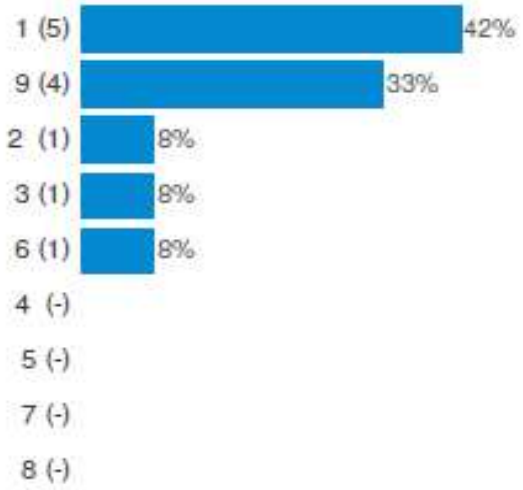
-

Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Air quality monitoring)

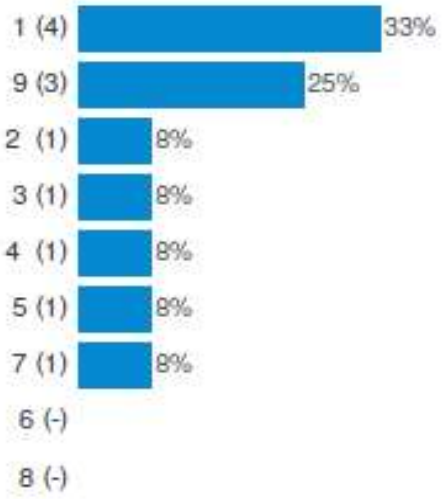
Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Increasing awareness with businesses and the public through information and air quality alerts)



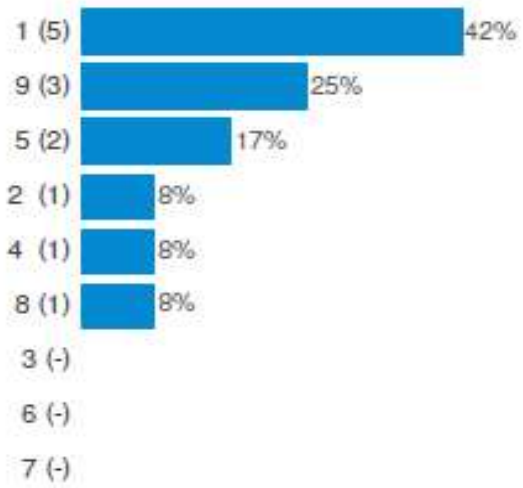
Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Reducing emissions from delivery and freight)



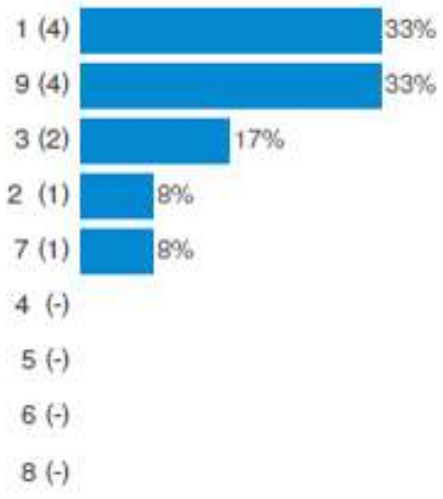
Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Reducing emissions from public and private hire transport)



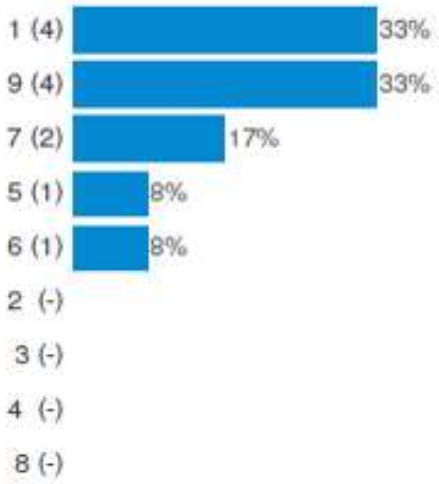
Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Reducing emissions from private vehicles)



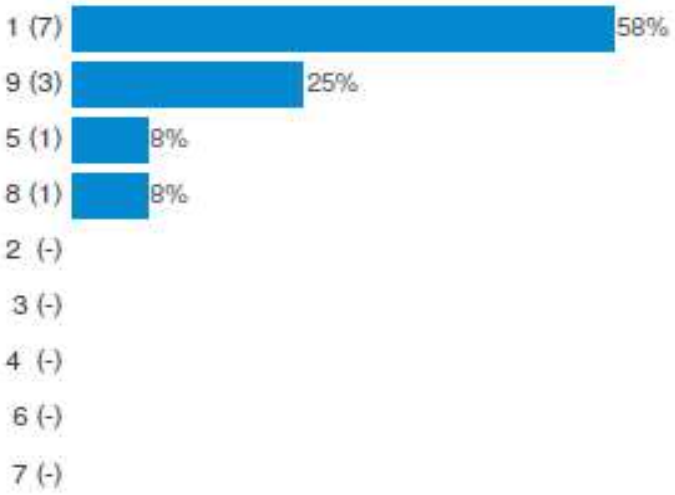
Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Reducing emissions from the Council's own fleet)



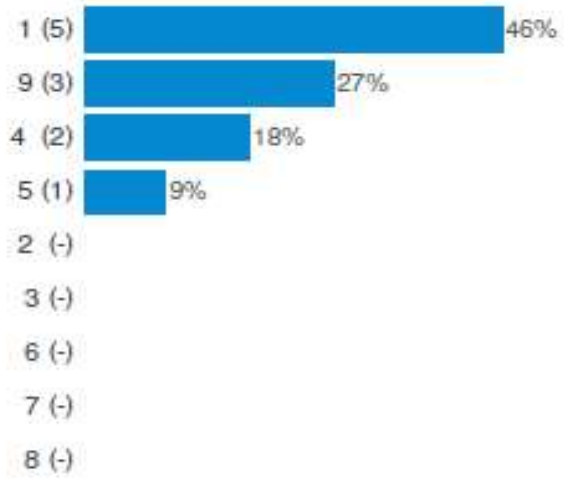
Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Encouraging more walking and cycling)



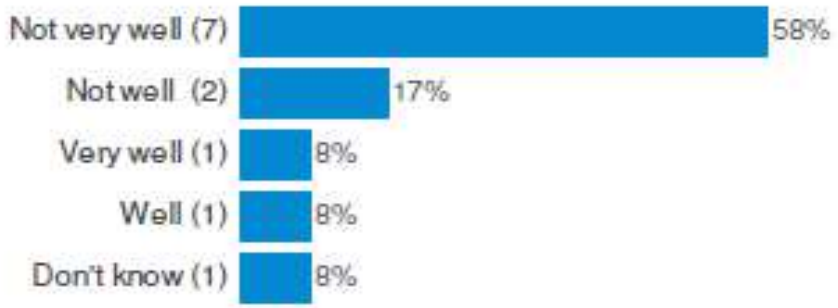
Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Planting more trees and creating more green space)



Which areas do you think should be prioritised in this Action Plan? Please choose in order with 1 being the most important, to 9 being least important (Encouraging the take-up of electric vehicles for private and commercial use)



Information about air quality. Please tick (How well do you think the Council communicates information about air quality?)



Would you be interested in becoming a Cleaner Air Champion? (See Frequently Asked Questions for further information) Please tick

A.3 Analysis of Air quality survey 2017

By LBC consultation team - Key points

NB Percentages need to be put in context of response rate of 44

- Majority of respondents is 65 +in age, with high scores for retired and in full employment.
- Vast majority of respondents is White British and is not disabled. Few more males have responded.
- Vast majority of 26 (63%) responds as 'A resident of Luton living outside of the affected area', with 8 respondents (19%) living in the affected area. Rate of Businesses operating in the area that responded is 4(9%). This means that sending out letters in the affected area has resulted in 12 submissions (28% of the total response). The consultation team is not aware of any requests for postal surveys.
- 81% ticks very important for 'How important do you feel it is to tackle air pollution in Luton? Together with 'fairly important' gives 93%
- Regarding: Do you think that the Air Quality Action Plan has identified the areas of work needed to improve air quality in Luton town centre? Yes = 14 (34%), Partly = 18 (45%)

- Regarding: Which areas do you think should be prioritised in this Action Plan? Areas with most support are: '**Planting more trees & creating more green space'**, '**Air quality monitoring**', and '**Reducing emissions from delivery and freight'**.
- Note that **'Increasing awareness with businesses & the public through info & air quality alerts'** scores high as second priority.
- There is a higher score for '**Reducing emissions from delivery & freight'**, compared to lower scores for reducing emissions from public and private hire transport, from private vehicles, and from the Council's own fleet.
- Encouraging the take-up of electric vehicles for private & commercial use has a mixed score in terms of priority with as many highs (10) as lows (10).
- In hindsight respondents have filled out this grid question in a horizontal way when asked to rate 1-9, rather than vertical 1-9. Though this does not affect the outcome, and on the whole the grid has been filed out well (See grid score below).
- Regarding: '**Information about air quality -How well do you think the Council communicates information about air quality?**' - Not (very) well totals 78% and (very) well totals 15%
- Regarding: 'Would you be interested in becoming a Cleaner Air Champion?' 4 people (10%) have given their details. 36 respondents (90%) are not interested.
- Individual verbal responses as additional comments and in response to separate questions have been submitted and are listed in the summary report. There appears to be a variety of views – these have not been included in this analysis.

Table A.2 – Priority grid

Which areas do you think should be prioritised in this Action Plan?

(to score 1-9) NB: in bold response 10 or more – based on 44 responses received

Priority: Areas:	1 high	2	3	4	5	6	7	8	9 low
Air Quality monitoring	**16**	6	3	2	4	1	0	7	4
Increasing awareness with businesses & the public through Info & air quality alerts	5	**11**	7	1	4	1	2	4	6
Reducing emissions from delivery & freight	**16**	6	5	2	2	5	0	1	4
Reducing emissions from public & private hire transport	9	8	7	2	3	2	5	1	4
Reducing emissions from private vehicles	**10**	8	2	8	3	2	4	3	3
Reducing emissions from the Council's own fleet	**10**	8	5	4	3	2	2	1	7
Encouraging more walking & cycling	**12**	3	4	3	5	5	4	0	5
Planting more trees & creating more green space	**18**	3	3	1	1	1	4	4	6
Encouraging the take-up of electric vehicles for private & commercial use	**10**	4	2	5	6	3	0	1	**10**

A.4 The Health and Wellbeing Board's response

General Feedback

The AQAP presents a range of different elements that aim to improve the air quality in the AQMA. The Health and Wellbeing Board would like to see the plan have more of a health focus which will in turn support economic growth and wellbeing and for the plan to be more specific in terms of those health outcomes intended to be achieved.

In general, proposals would benefit from more specific outcomes timescales and milestones… For example, actions 1, Park and Ride and 2 number of car club users. In order to understand what is achievable these actions need to be quantified and targets for delivery agreed, SMART[19] targets will aid progress on intent.

There is a lack of clarity relating to what could be considered contradictory actions. For example, Action 1 'Park and ride to reduce those driving into the area' and action 18 'adding additional parking in the town centre'. This needs additional detail to determine which policy has primacy as part of the town centre plan; are we aiming to reduce vehicles, or promote additional town centre parking?

The plan is focused on specific 'interventions' or investments in 'feasibility studies' where it would be more helpful to provide the opportunities for changes in policy. For example action 17 proposes 'awareness raising on idling' (already "an offence under Road Traffic Regulations 1984"), with no indication of what is already in place and what is required to strengthening enforcement, either through neighbourhood enforcement, traffic officers or taxi licensing. Penalties such as spot fines for an idling vehicle in designated zones to coincide with actions [4 and 9] and outside of schools could be a lever to deliver this action with greater success.

There should be consideration of horizon scanning, looking at what other areas have achieved and translating this to local policy. Development of a specific policy on types of vehicles through licensing; for example by 2020 only allowing CAT 6 diesel engines for taxis operating in the borough or restrictions in heavy diesel vehicles at different times of the day, cat 6 only bus zones in the area linked to action 9 (Investigate implementing a clean air/low emissions zone), are the types of forward thinking plans that recognise that we have to adapt and flex with new technology and respond to what we know about the impact of current policy. This could be tied into the development of review a Luton's local transport plan and or town centre plan that

[19] Specific, Measurable, Achievable and Time framed.

could include policy proposals for an ultra-low emission zone as proposed in London[20].

Feedback on specific actions

Action 1; reducing the number of polluting vehicles entering the town is likely to have the greatest impact for improving air quality and benefit population health and wellbeing. Therefore all actions designed to alleviate vehicle numbers and congestion such as: Park and ride scheme [1], supporting sustainable travel plans [8, 12, 14], encouraging take-up of cleaner energies [1, 2, 10, 19]; preventing cars from idling [17], electronic systems and road designs supporting a reduction in congestion and to ease flow of traffic through the town [15, 16, 20, 21]; should be considered priority actions, with specific ambition, expected health outcomes and timeframes stated.

It is important that monitoring equipment is maintained, up to date and fit for purpose, and this should be seen as a means for measurement rather than an action in itself [action 3]

Actions 4 and 9, smokefree zones and low emission zones, make powerful social statements that will support positive population lifestyle behaviours that support Luton in its LIF aspirations and the health of the public; however there are no timeframes for implementation or scale of ambition. Having these would be beneficial to quantify possible impact.

Actions 5, 6 and 7 set out proposals for feasibility of action. In order to understand what is achievable these actions need to be quantified and targets for delivery agreed.

The proposed construction of a multi-story car park on Crawley Road area [action 18] is sited near the AQMA. The proposal seeks to 're-provide' car parking spaces which are being lost to other developments in the town, however the proposal as is, would increase the number of parking spaces by over 120 (476 lost, with 600 plus proposed). This is likely to increase the amount of traffic in the area conflict with action [1] and undermines potential benefits from actions [2, 5, 6, 7]. The HWBB suggest an impact assessment to give clarity of the priority area in terms of reducing town centre traffic or increasing number of available parking spaces. It should be

[20] https://tfl.gov.uk/modes/driving/ultra-low-emission-zone

carried out before any further progress on this proposal is made and clarity stated on which action takes primacy i.e. reducing traffic or increase parking spaces.

Other actions that could be considered as part of proposals

There are a number of actions that have not been put forward as part of the AQAP and the HWBB seeks clarity on the process of consideration for the following;

- consider the impact on school transport polices and the impact of traffic in the area
- reducing polluting emissions through freight consolidation, delivery management policies in the town centre and including low or zero emission last mile deliveries
- building air conditioning and energy efficiency policies in planning applications and building conversations - currently only those classed ‘large’ developments are required to show mitigating air quality impact
- provide eco driving training to local businesses and delivery companies as part of business travel plans
- all new homes, offices and businesses have a facility to secure cycles to support active travel plans across the town.

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

Figure B.1- Bias Adjustment factor : LBC NO2 Diffusion Tubes

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 spreadsheet 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[4]

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 undo your selection, choose (All) from the pop-up list)	Year[2] (To undo 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[5]	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 Norfolk	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

[1] For Casella Stanger/Bureau Veritas (NOT Bureau Veritas Labs) use Gradko 50% TEA in Acetone.
For Casella Seal/GMSS/Casella CRE/Bureau Veritas Labs/Eurofins/ use Environmental Scientific Groups.
From 2011 for Environmental Scientific Groups use ESG Glasgow.
From 2011 for Harwell Scientific Services use ESG Didcot.
For Staffordshire CC SS/Staffordshire County Analyst use Staffordshire Scientific Services.
For Bodycote Health Sciences and Clyde Analytical Laboratories use Exova.
For Rotherham MBC use South Yorkshire Labs.
For Dundee CC use Tayside SS.
For Leicester Scientific Services use Staffordshire Scientific Services.
For South Yorkshire Air Quality Samplers use South Yorkshire Labs. As of January 2010 sampler body changed. As of April 2010 sampler cap changed.
Lancashire County Analysts withdrew from the Field Intercomparison at the end of 2010. No submissions were supplied in 2011.
Walsall MBC closed in March 2011.
Bristol Scientific Services closed at the end of 2011.
Somerset County Council did not start the Marylebone road intercomparison until June 2012. Exova stopped providing diffusion tubes at the end of 2013. Kent Scientific Services stopped providing diffusion tubes at the end of 2013.

[2] In this situation it would be reasonable to use data from the nearest year.

[3] Overall factors have been calculated using orthogonal regression to allow for uncertainty in both the automatic monitor and diffusion tube. The uncertainty of the diffusion tube has been assumed to be double that of the automatic monitor.

[4] If you have your own co-location study, please send your data to us, so that it can be included here. If this is not possible, but you wish to combine these factors with your own, select and copy the relevant data from this spreadsheet and paste them into a new one (otherwise your calculations will include hidden data). Then add your own data and calculate the bias. To obtain a new correction factor that includes your data, average the bias (B) values, expressed as a factor, i.e. -16% is -0.16. Next add 1 to this value, e.g. -0.16 + 1.00 = 0.84 in this example, then take the inverse to give the bias adjustment factor 1/0.84 = 1.19. (This will not be exactly the same as the correction factor calculated using orthogonal regression as used in this spreadsheet, but will be reasonably close).

To add data download a questionnaire

[5] Where an annual data set falls into two years it has been ascribed to the year in which most of the data has fallen.

[6] Tube precision is determined as follows: G = Good precision - coefficient of variation (CV) of diffusion tube replicates is considered G when the CV of eight or more periods is less than 20%, and the average CV of all monitoring periods is less than 10%; P = Poor precision - CV of four or more periods >20% and/or average CV >10%; S = Single tube, therefore not applicable; na = not available.

Figure B.2 - Bias Adjustment factor : LLA NO2 Diffusion Tubes

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 spreadsheet 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

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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 undo your selection, choose (All) from the pop-up list)	Year[2] (To undo 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[5]	Bias Adjustment Factor (A) (Cm/Dm)
ESG Glasgow	50% TEA in acetone	2015	KS	Marylebone Road Intercomparison	12	104	81	28.3%	G	0.78
ESG Glasgow	50% TEA in acetone	2015		Overall Factor[3] (1 study)				Use		0.78

[1] For Casella Stanger/Bureau Veritas (NOT Bureau Veritas Labs) use Gradko 50% TEA in Acetone.
For Casella Seal/GMSS/Casella CRE/Bureau Veritas Labs/Eurofins/ use Environmental Scientific Groups.
From 2011 for Environmental Scientific Groups use ESG Glasgow.
From 2011 for Harwell Scientific Services use ESG Didcot.
For Staffordshire CC SS/Staffordshire County Analyst use Staffordshire Scientific Services.
For Bodycote Health Sciences and Clyde Analytical Laboratories use Exova.
For Rotherham MBC use South Yorkshire Labs.
For Dundee CC use Tayside SS.
For Leicester Scientific Services use Staffordshire Scientific Services.
For South Yorkshire Air Quality Samplers use South Yorkshire Labs. As of January 2010 sampler body changed. As of April 2010 sampler cap changed.
Lancashire County Analysts withdrew from the Field Intercomparison at the end of 2010. No submissions were supplied in 2011.
Walsall MBC closed in March 2011.
Bristol Scientific Services closed at the end of 2011.
Somerset County Council did not start the Marylebone road intercomparison until June 2012. Exova stopped providing diffusion tubes at the end of 2013. Kent Scientific Services stopped providing diffusion tubes at the end of 2013.

[2] In this situation it would be reasonable to use data from the nearest year.

[3] Overall factors have been calculated using orthogonal regression to allow for uncertainty in both the automatic monitor and diffusion tube. The uncertainty of the diffusion tube has been assumed to be double that of the automatic monitor.

[4] If you have your own co-location study, please send your data to us, so that it can be included here. If this is not possible, but you wish to combine these factors with your own, select and copy the relevant data from this spreadsheet and paste them into a new one (otherwise your calculations will include hidden data). Then add your own data and calculate the bias. To obtain a new correction factor that includes your data, average the bias (B) values, expressed as a factor, i.e. -16% is -0.16. Next add 1 to this value, e.g. -0.16 + 1.00 = 0.84 in this example, then take the inverse to give the bias adjustment factor 1/0.84 = 1.19. (This will not be exactly the same as the correction factor calculated using orthogonal regression as used in this spreadsheet, but will be reasonably close).

To add data download a questionnaire

[5] Where an annual data set falls into two years it has been ascribed to the year in which most of the data has fallen.

[6] Tube precision is determined as follows: G = Good precision - coefficient of variation (CV) of diffusion tube replicates is considered G when the CV of eight or more periods is less than 20%, and the average CV of all monitoring periods is less than 10%; P = Poor precision - CV of four or more periods >20% and/or average CV >10%; S = Single tube, therefore not applicable; na = not available.

Figure B.3 - Distance from Road Calculator : Caddington Road

This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monito
The next sheet shows your results on a graph.

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Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	1.7	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	15	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m³)?	(Note 2)	16.29	µg/m³
Step 4	What is your measured annual mean NO_2 concentration (in µg/m³)?	(Note 2)	42.55	µg/m³
Result	The predicted annual mean NO_2 concentration (in µg/m³) at your receptor	(Note 3)	29.6	µg/m³

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

Issue 4: 25/01/11. Created by Dr Ben Marner; Approved by Prof Duncan Laxen. Contact: benmarner@aqconsultants.co.uk

B.1. Diffusion Tube Monitoring QA/QC

Tubes deployed by Luton Borough Council are obtained from Gradko International Ltd. using a preparation of 20% TEA in deionised water. The performance of Gradko is monitored under the WASP NO2 Proficiency Testing Scheme. In 2015 Gradko achieved 100% in all 4 rounds of monitoring.

Tubes deployed by London Luton Airport are obtained from the Environmental Services Group Ltd (ESG) using a preparation of 50% TEA in acetone. The laboratory takes part in the WASP scheme, under which is achieved 87.5% in the first round, followed by 100% for the other 3 rounds of monitoring in 2015.

B.2. Automatic Monitoring QA/QC

Luton Borough Council officers undertook fortnightly calibrations of the nitrogen dioxide analyser at Dunstable Road East (LN60). The FIDAS particulate analyser does not require calibrating. Air monitors Limited were contracted to undertake 6 monthly service and maintenance of both analysers at this monitoring station.

Enviro Technology (ET) undertook the 6 monthly calibration and maintenance of the BAM located at London Luton Airport (LA08).

Results from Automatic Monitoring sites at both LN60 and LA08 were validated and ratified by Air Quality Data Management (AQDM) who have provided this information regarding the procedures used.

Air quality measurements from automatic instruments are ratified to the standards described in the Local Air Quality Management – Technical Guidance LAQM TG(09) http://www.defra.gov.uk/publications/2011/03/25/pb13081-laqm-technical-guidance-tg09.

B.3. Validation

This process operates on data during the data collection stage. All data are continually screened algorithmically and manually for anomalies. There are several techniques designed to discover spurious and unusual measurements within a very large dataset. These anomalies may be due to equipment failure, human error, power failures, interference or other disturbances Automatic screening can only safely identify spurious results that need further manual investigation.

Raw data from the gaseous instruments (e.g. NOx, O3, SO2 and CO) are scaled into concentrations using the latest values derived from the manual and automatic calibrations. These instruments are not absolute and suffer drifts. Both the zero baseline (background) and the sensitivity change with time. Regular calibrations with certified gas standards are used to measure the zero and sensitivity. However, these are only valid for the moment of the calibration since the instrument will continue to drift. Raw measurements from particulate instruments (e.g. PM10 and PM2.5) generally do not require scaling into concentrations. The original raw data are always preserved intact while the processed data are dynamically scaled and edited.

B.4. Ratification

This is the process that finalises the data to produce the measurements suitable for reporting. All available information is critically assessed so that the best data scaling is applied and all anomalies are appropriately edited. Generally this operates at three, six or twelve month intervals. However, unexpected faults can be identified during the instrument routine services or independent audits which are often at 6-monthly intervals. In practice, therefore, the data can only be fully ratified in 12-month or annual periods. The data processing performed during the three and six monthly cycles helps build a reliable dataset that is finalised at the end of the year.

There is a diverse range of additional information that can be essential to the correct understanding and editing of data anomalies. These may include:

- The correct scaling of data
- Ignoring calibrations that were poor e.g. a spent zero scrubber
- Closely tracking rapid drifts or eliminating the data
- Comparing the measurements with other pollutants and nearby sites
- Corrections due to span cylinder drift
- Corrections due to flow drifts for the particulate instruments
- Corrections for ozone instrument sensitivity drifts
- Eliminating measurements for NO2 conversion inefficiencies
- Eliminating periods where calibration gas is in the ambient dataset
- Identifying periods were instruments are warming-up after a power cut

- Identification of anomalies due to mains power spikes
- Correcting problems with the date and time stamp
- Observations made during the sites visits and services

The identification of data anomalies, the proper understanding of the effects and the application of appropriate corrections requires expertise gained over many years of operational experience. Instruments and infrastructure can fail in numerous ways that significantly and visually affect the quality of the measurements. There are rarely simple faults that can be discovered by computer algorithms or can be understood without previous experience.

Further information about air quality data management, expert data ratification and examples of bad practices are given on the Air Quality Data Management (AQDM) website http://www.aqdm.co.uk

Appendix C: Maps of Monitoring Locations

Figure C.1 - Map of LBC NO_2 Monitoring Locations by M1

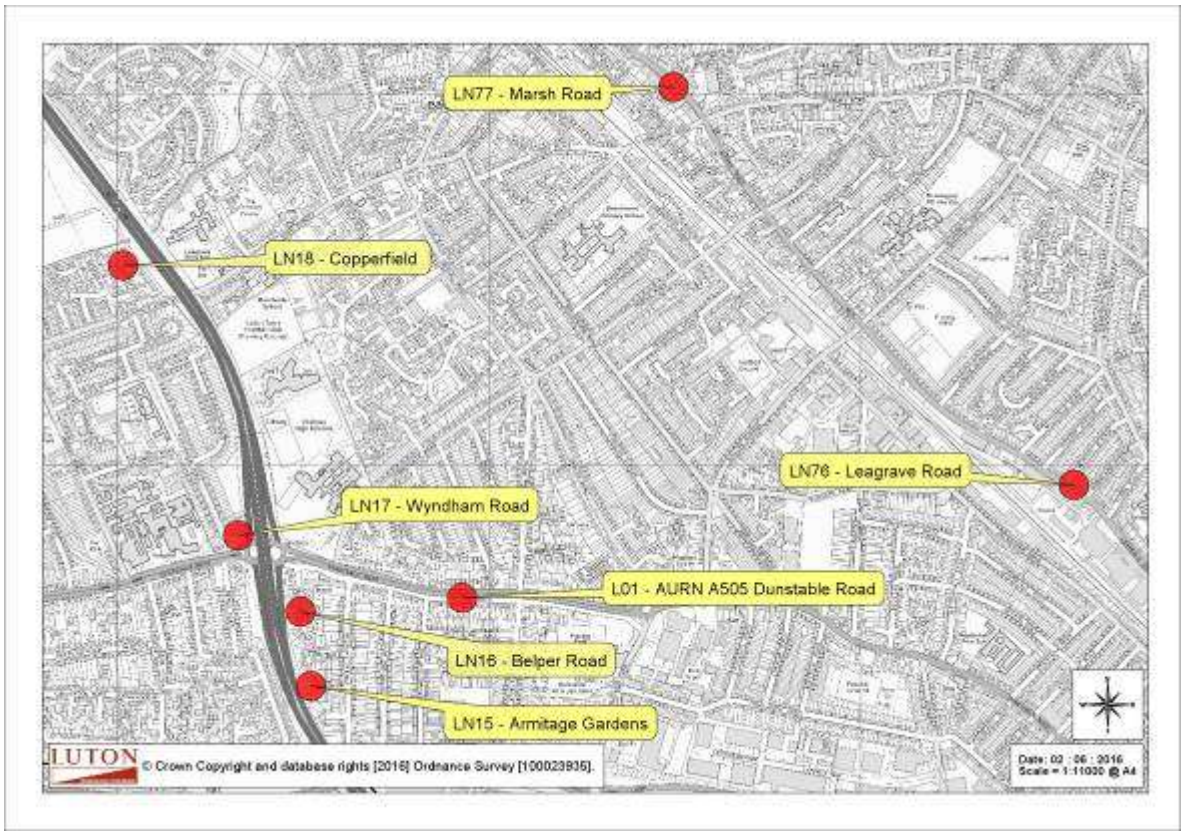


Figure C.2 - Map of LBC NO_2 Monitoring Locations in South Luton by M1

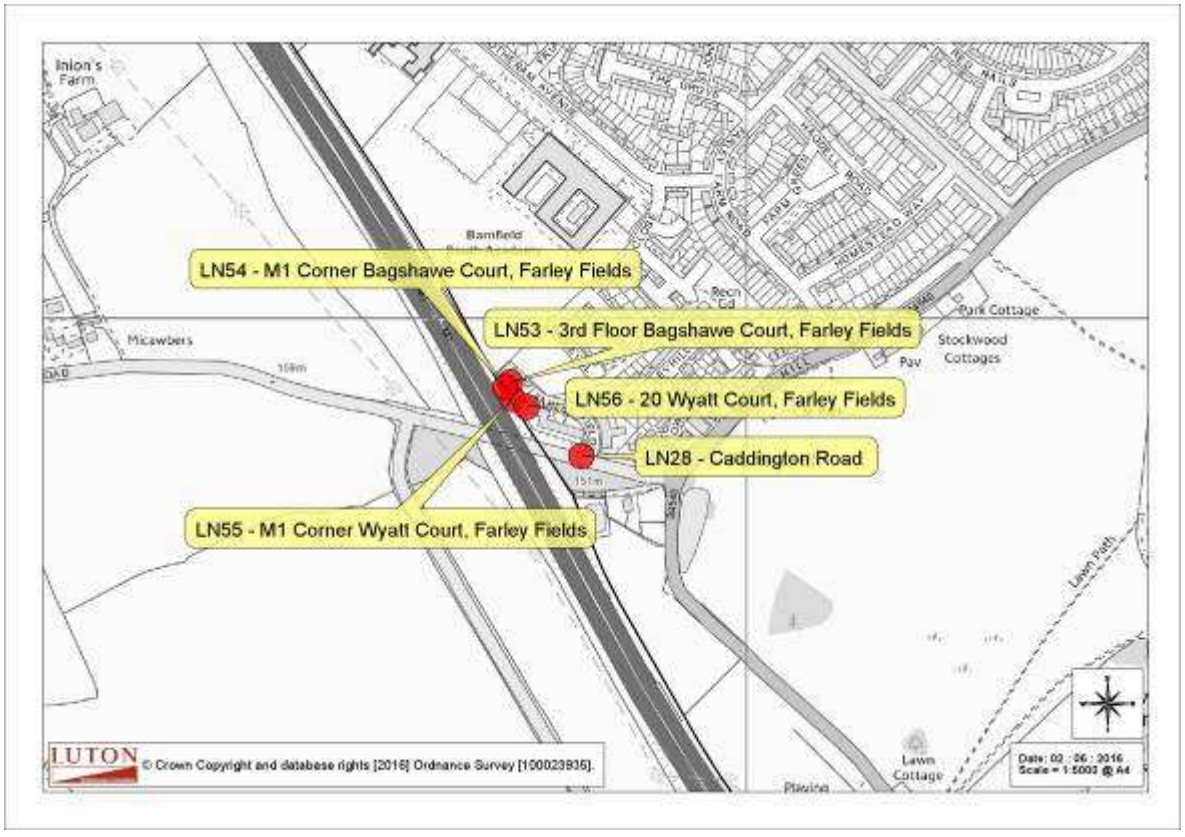


Figure C.3 - Map of LBC NO_2 Monitoring Locations in the Town Centre

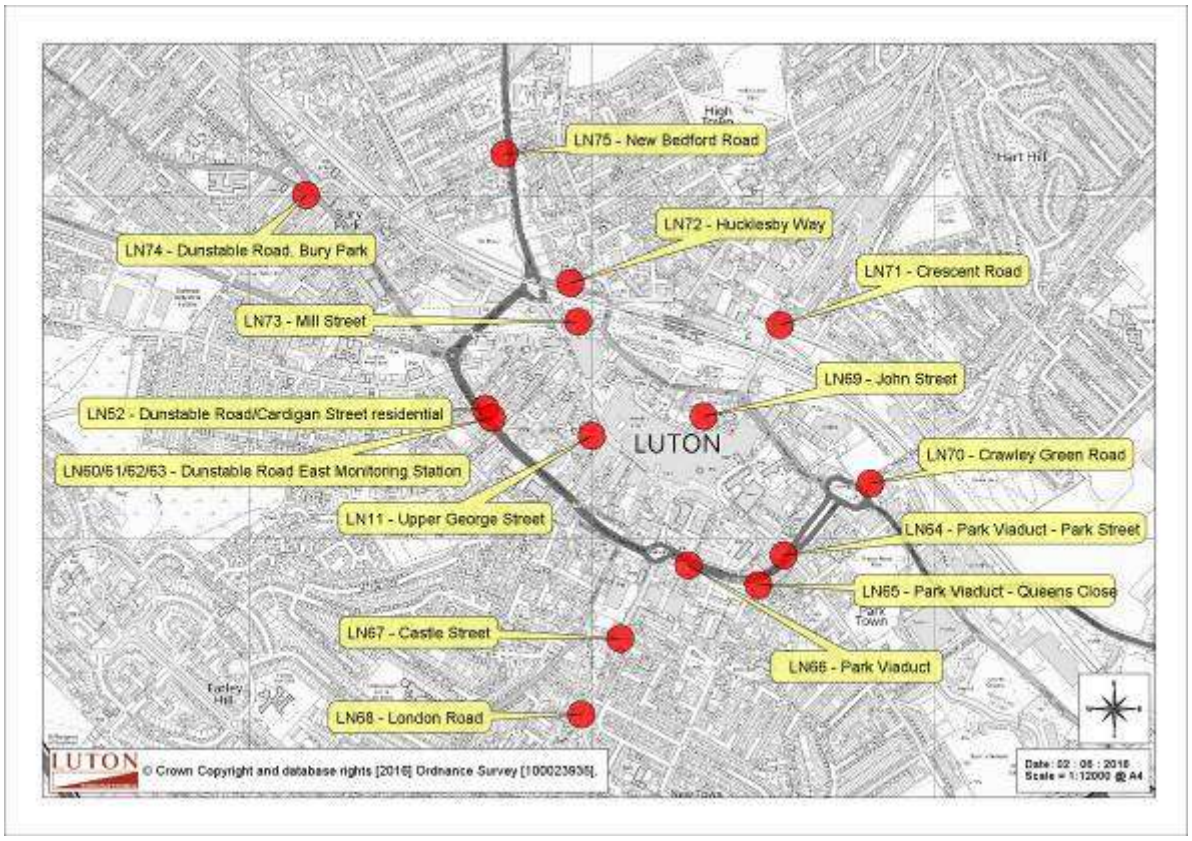


Figure C.4 - Map of LBC NO_2 Monitoring Locations in East Luton

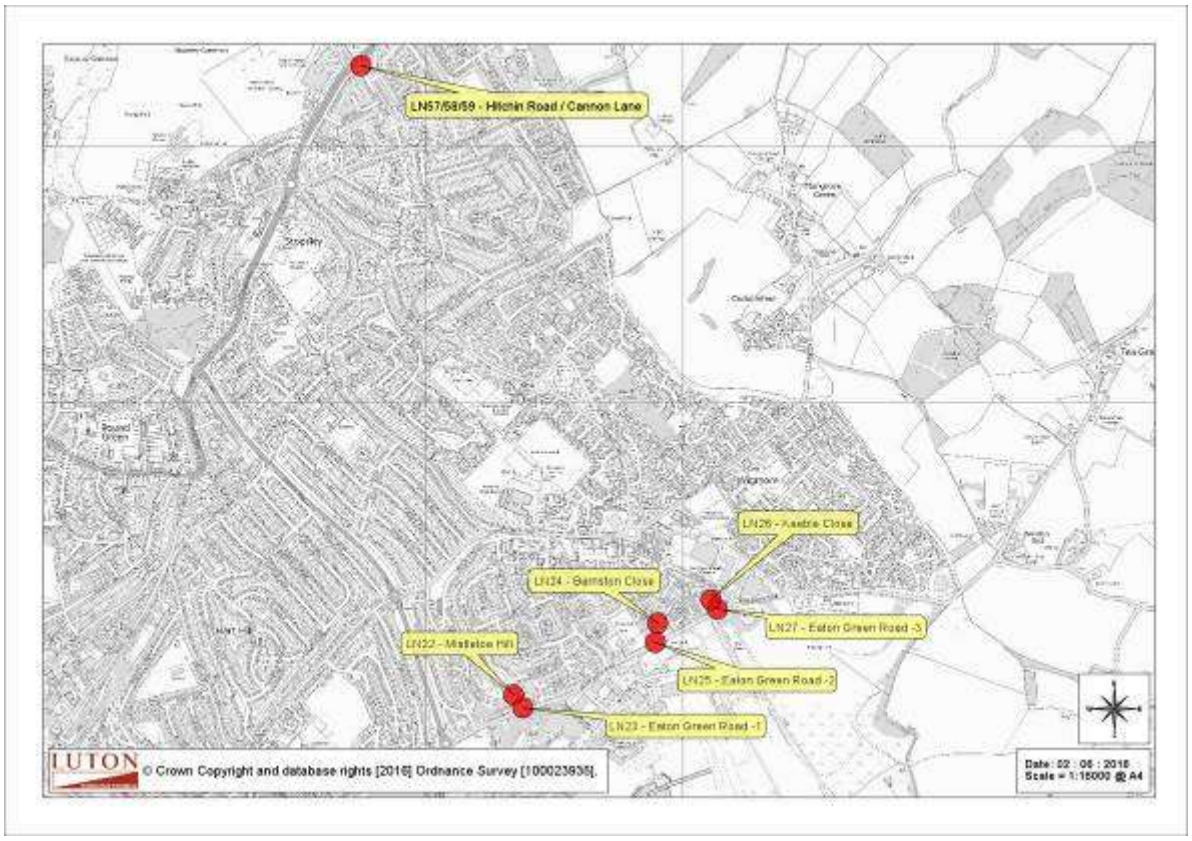


Figure C.5 - Map of LLA NO_2 Monitoring Locations around the Airport

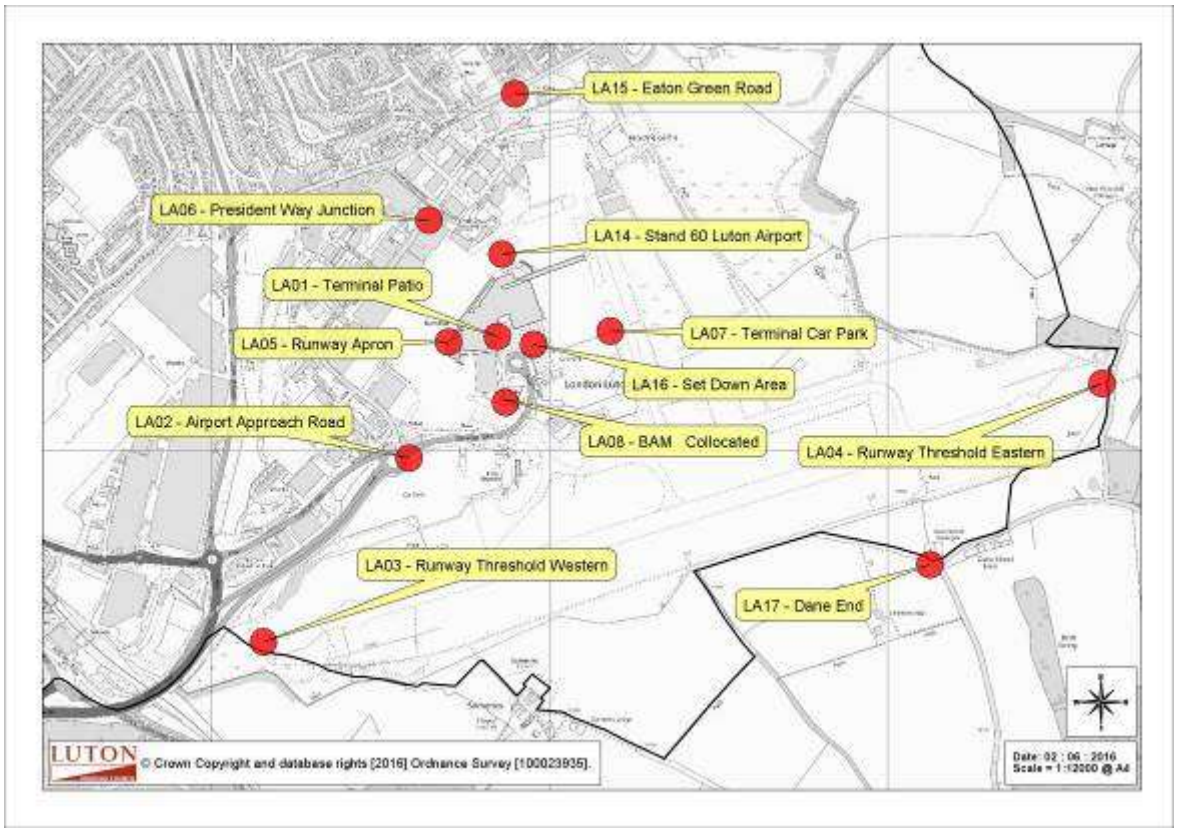
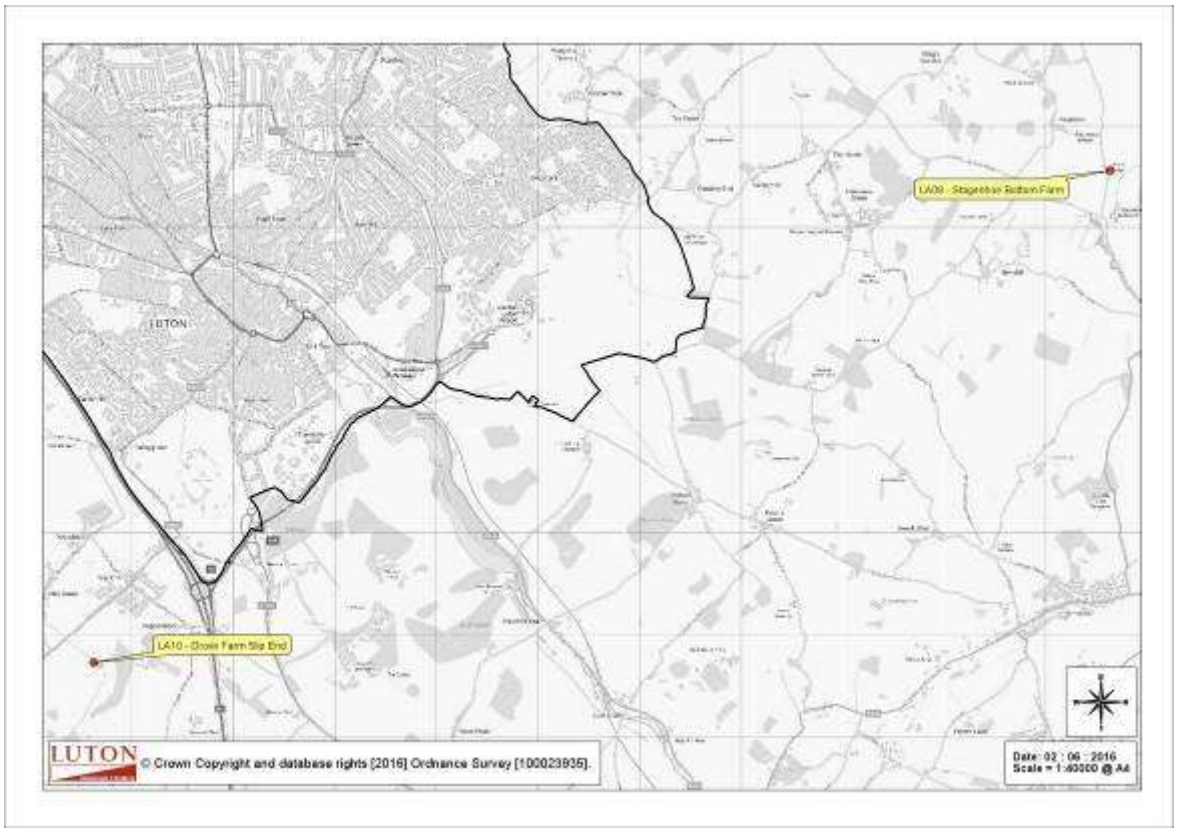


Figure C.6 - Map of LLA NO_2 Monitoring Locations under the flight path



Appendix D: Summary of Air Quality Objectives in England

Table D.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[21]	
	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

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

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'
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
BAM	Beta Attenuation Monitor
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
FIDAS	Ambient Air Monitoring Analyser
LAQM	Local Air Quality Management
LTP	Local Transport Plan
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_4	Airborne particulate matter with an aerodynamic diameter of 4µm or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
PM_1	Airborne particulate matter with an aerodynamic diameter of 1µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
WASP	Workplace Analysis Scheme for Proficiency

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2 Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

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5 http://www.luton.gov.uk/Environment/Environmental%20health/Air_pollution_2/Air%20Quality/pages/Pollution%20control%20-%20air_2.aspx

6 http://www.luton.gov.uk/Environment/Environmental%20health/Air_pollution_2/Air%20Quality/pages/Pollution%20control%20-%20air_2.aspx

7 http://www.luton.gov.uk/Environment/Lists/LutonDocuments/PDF/Environmental%20and%20Consumer%20Services/Pollution/2016%20Air%20Quality%20Annual%20Status%20Report%20(ASR).pdf

8 http://www.luton.gov.uk/Transport_and_streets/Pages/default.aspx

9 World Health Organization, 'Review of evidence on health aspects of air pollution – REVIHAAP Project', 2013 www.euro.who.int/__data/assets/pdf_file/0004/193108/REVIHAAP-Final

10 Mitchell, G., and others (2015) Who benefits from environmental policy? An environmental justice analysis of air quality change in Britain, 2001–2011. Environmental Research Letters. DOI: http://dx.doi.org/10.1088/1748-9326/10/10/105009

11 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/304641/COMEAP_mortality_effects_of_long_term_exposure.pdf

12 The loss of life attributable to population exposure to a particular factor (i.e. the years of lost life expectancy associated with attributable deaths)

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14 http://www.phoutcomes.info/public-health-outcomes-framework#gid/1000043/pat/6/ati/102/page/6/nn//par/E12000007/are/E09000002/iid/30101/age/230/sex/4

15 Source: “Estimating Local Mortality Burdens associated with Particulate Air Pollution” – Public Health England 2014 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/332854/PHE_CRCE_010.pdf

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