

SCRUTINY COMMISSION – 6TH APRIL 2021

<i>REPORT TO:</i>	Scrutiny Commission
<i>SUBJECT:</i>	2019 Air Quality Annual Status Report
<i>LEAD OFFICER:</i>	Alan Twells
<i>CABINET LEAD MEMBER:</i>	Cllr. Shona Rattray Executive Member for Business Support
<i>ORIGIN OF ITEM:</i>	<p>Following a question on the status of the Council's 2019 Air Quality Annual Status Report (ASR), raised by Councillor Draycott in December 2019, the Environmental Protection Team agreed to provide an update on air quality across the borough and to clarify any questions Members had on the Council's current air quality monitoring programme.</p> <p>This report was initially requested pre-Covid but was deferred to the meeting on 6 April 2021.</p>
<i>BRIEF FOR THE COMMITTEE</i>	To consider the update of the annual ASR and receive a summary of the monitoring of air quality across the Borough.

1. EXECUTIVE SUMMARY

- 1.1 The Government's requirements for Local Air Quality Management (LAQM) are set out in Part IV of the Environment Act (1995). This legislation places an obligation on all local authorities to regularly review and assess air quality in their areas and take action to improve air quality when objectives for specific pollutants, set out in regulation, cannot be met.
- 1.2 Under the LAQM process the Council are legally required to submit an Annual Status Report (ASR) to DEFRA by 30 June each year. This report (in the form of a mandatory template) must report on three main pollutants: Nitrogen Dioxide (NO₂), Particulate Matter (PM₁₀) and Sulphur Dioxide (SO₂); provide a summary of the local strategies employed to improve air quality and detail any progress that has been made.
- 1.3 There is also a requirement for a further four pollutants to be considered, these are Benzene, Lead, 1,3-Butadiene and Carbon Monoxide, however historic monitoring and desktop studies have ruled out the likelihood of these being significant in Charnwood.

- 1.4 The Council's ASR 2019 was submitted to DEFRA on 28th June 2019. Due to the annual averaging requirements this summarised the air quality data from monitoring undertaken in 2018.
 - 1.5 Once ratified by DEFRA the report is published on the Council's website and this was accepted and completed in December 2019.
 - 1.6 The Council's latest ASR was submitted to DEFRA in August 2020 (following an authorised extension to the submission timetable due to the Covid pandemic) and summarised the air quality data undertaken in 2019. This has now also been ratified by DEFRA and published on the Council's website. The full summary of the findings and monitoring undertaken are detailed in Appendix 1 to this report.

2. PURPOSE

- 2.1 The purpose of this report is to update Scrutiny Commission of the Council's air quality Annual Status Report 2019 (ASR), outlining the monitoring methodology, a summary of the monitoring data and an explanation of the results used to prepare the annual report for submission to DEFRA.
 - 2.2 The Commission is asked to note that since the initial request the Council's ASR for 2020 has been prepared and published and this report therefore updates members on the latest findings.

Appendices: Appendix 1- Summary of Air Quality Annual Status Report 2019

Background Papers: Annual Status Report
https://www.charnwood.gov.uk/files/documents/2020_annual_status_report_asr/Charnwood%20ASR%202020.pdf

Public Health Joint Strategic Needs Assessment
[http://politics.leics.gov.uk/ieListDocuments.aspx?CId=135
&MId=5998&Ver=4](http://politics.leics.gov.uk/ieListDocuments.aspx?CId=135&MId=5998&Ver=4)

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1.0 Background

- 1.1 Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions.
- 1.2 The Local Air Quality Management (LAQM) process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.
- 1.3 Current guidance from DEFRA, requires Annual Status Reports (ASRs) to be submitted every year. The ASR should include information about action to improve air quality, monitoring data and any new sources of emissions. If a risk of an air quality objective is identified at a relevant location, the local authority is required to declare an AQMA; either through a fast-track process or following gathering of additional evidence. Likewise, if an AQMA could be revoked, this would also be reported in the ASR.
- 1.4 At the core of LAQM delivery are three pollutant objectives; these are:
 - Nitrogen Dioxide (NO₂),
 - Particulate Matter (PM₁₀) and
 - Sulphur Dioxide (SO₂).
- 1.5 These pollutants are principally the products of combustion from motor vehicle traffic, space heating and power generation. All current Air Quality Management Areas (AQMAs) across the UK are declared for one or more of these pollutants, with NO₂ accounting for the majority.
- 1.6 The air quality objectives are based on concentrations of pollutants, over a given time period, which are considered to be acceptable in terms of what is scientifically known about the effects of each pollutant on health and on the environment. The Air Quality Objectives for England are summarised in Table 1 below:

Table 1 – Air Quality Objectives in England

Pollutant	Air Quality Objective	
	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

The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

- 1.7 The Air Quality Objectives apply at locations where members of the public might be regularly exposed to pollutants, such as building façades of residential properties, schools, hospitals, care homes etc. The Council's monitoring points are therefore situated at receptor locations considered to represent 'worse case'. The focus for road traffic sources are, therefore, locations close to busy roads, narrow congested streets with residential properties close to the kerb, busy junctions, built up areas where the road is canyon-like with the buildings either side restricting dispersion and dilution of the emission and roads with a high proportion of buses or HGVs. Our focus for industrial sources are installations with significant contained or fugitive emissions likely to lead to elevated short-term concentrations.
- 1.8 During 2018 four automatic (continuous) real-time monitoring sites were used to monitor NO₂, SO₂ and PM₁₀. In addition, non- automatic (passive) diffusion tube monitoring was undertaken at a further 48 sites for NO₂. Diffusion tubes are a reasonably low-cost monitoring device which take samples over approximately a 1 month period. They are therefore useful for assessing compliance against the annual mean objective but can't monitor against the short-time means. To improve the accuracy of the tubes, the results must be bias corrected, based on data for the same period from local or nationally located referenced analysers and the results annualised if the data capture is less than 75% (due to missing or spoilt tubes).
- 1.9 Since the inception of LAQM a number of AQMAs have been declared and revoked in Charnwood and there are currently 4 declared in the district (as described in Table 2). These are all locations where residential properties are near to roads, or local industrial sources.

Table 2- Charnwood AQMAs

Number	Name	Objective	Year Declared	Description
AQMA 1	Loughborough	NO ₂ annual mean	2001 (amended in 2004)	Around town centre from road traffic emissions
AQMA 2	Syston	NO ₂ annual mean	2001 (amended in 2004)	Along Melton Road and Sandford Road, from road traffic emissions
AQMA 3	Mountsorrel	PM ₁₀ 24-hour mean	2011	Around Granite Way for fine particulate matter from the Mountsorrel quarry
AQMA 4	Great Central Railway	SO ₂ 15-minute mean	2001	Around Wolsey Way from steam locomotive emissions

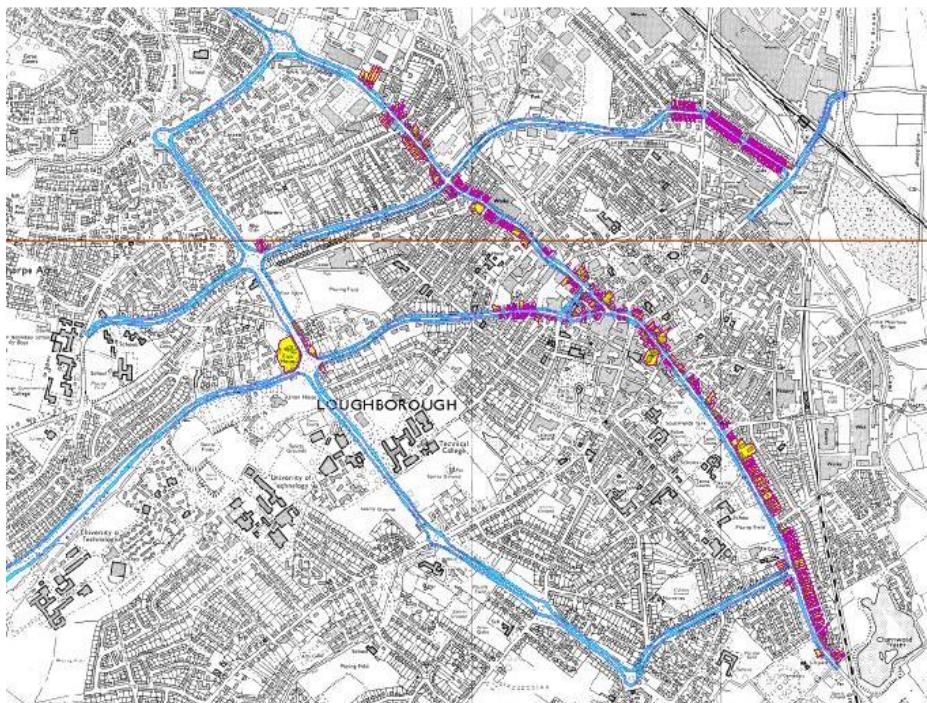
2.0 Existing Air Quality

- 2.1 Charnwood Brough Council carries out monitoring of nitrogen dioxide (NO₂) concentrations using a network of diffusion tubes and at four continuous real-time monitoring sites for NO₂, Sulphur dioxide (SO₂) and particulate matter (PM₁₀).
- 2.2 Maps showing the location of the monitoring points are included in the ASR but the general areas of monitoring are summarised in Figure 1 below.

Figure 1- location of monitoring sites.



3.0 Loughborough (AQMA 1)



- 3.1 Monitoring of NO₂ in Loughborough is conducted using a network of non-automatic diffusion tubes and an automatic analyser located on Baxter Gate.
- 3.2 As shown in Figure 2 below, concentrations at High Street and Baxter Gate exceeded the Air Quality Objective before 2013, but have been consistently below the objective since 2014. This coincides with the opening of the Inner Relief Road in November 2014.
- 3.3 There has been a similar reduction in concentrations over time at all Loughborough sites with no exceedances of the relevant objectives recorded in 2018 or more recently in 2019.
- 3.4 As these diffusion tube sites represent worst case locations and most are closer to the road than relevant receptors, we are confident that no residents are being negatively impacted.

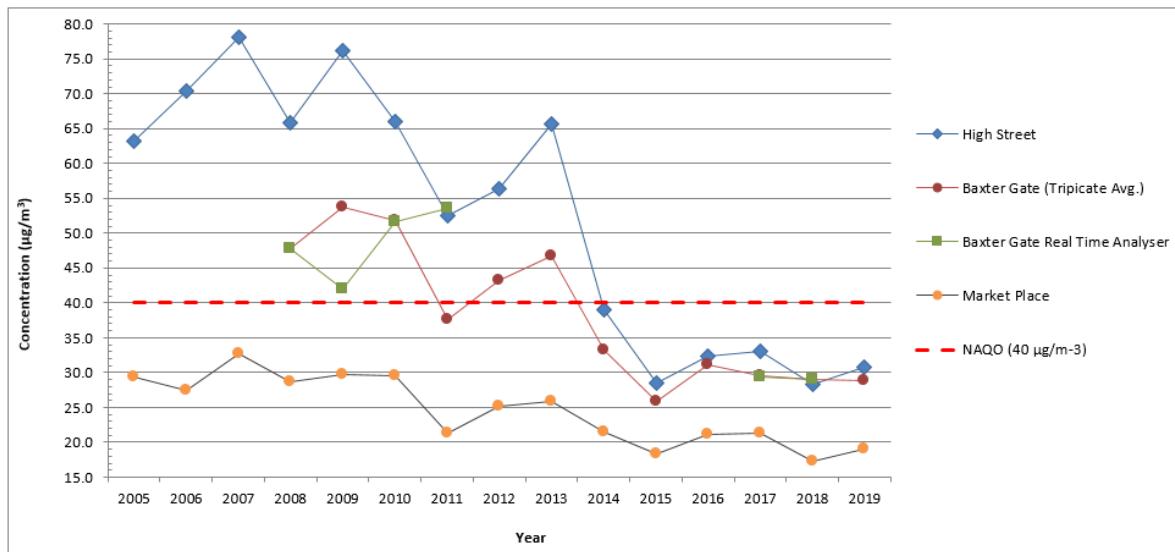


Figure 2- Annual Mean NO₂ concentrations in Loughborough AQMA

4.0 AQMA 2- Syston



- 4.1 Monitoring of NO₂ in Syston is conducted using non-automatic diffusion tubes and an automatic analyser located on Melton Road.
- 4.2 As shown in Figure 3 below, concentrations at Melton Road and High Street remain consistently beneath the Air Quality Objectives and supports the Council's view that revocation of this AQMA should be actioned as a priority.

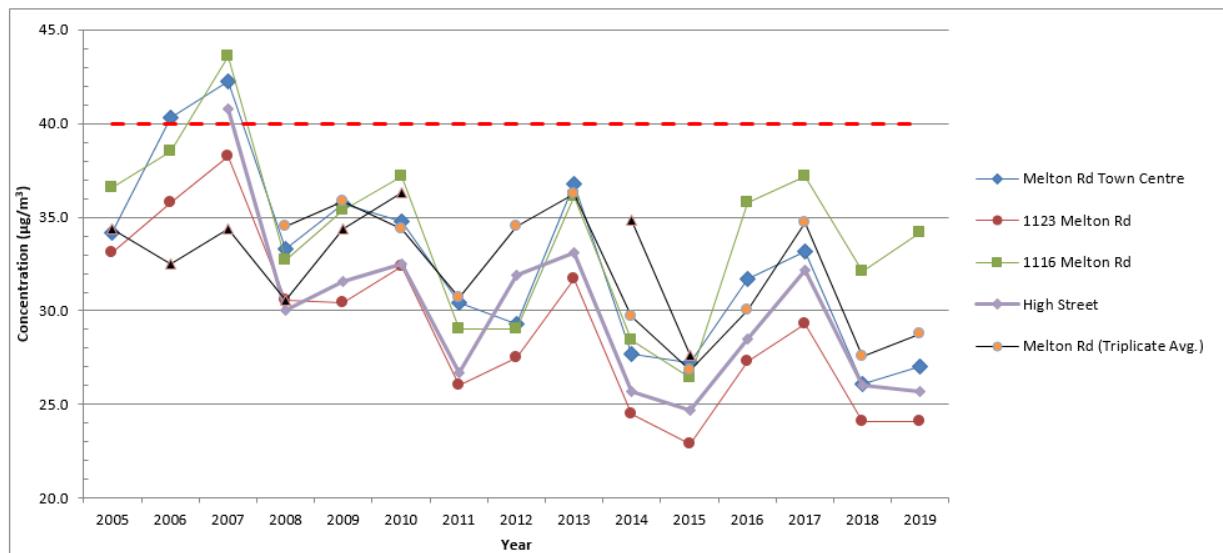
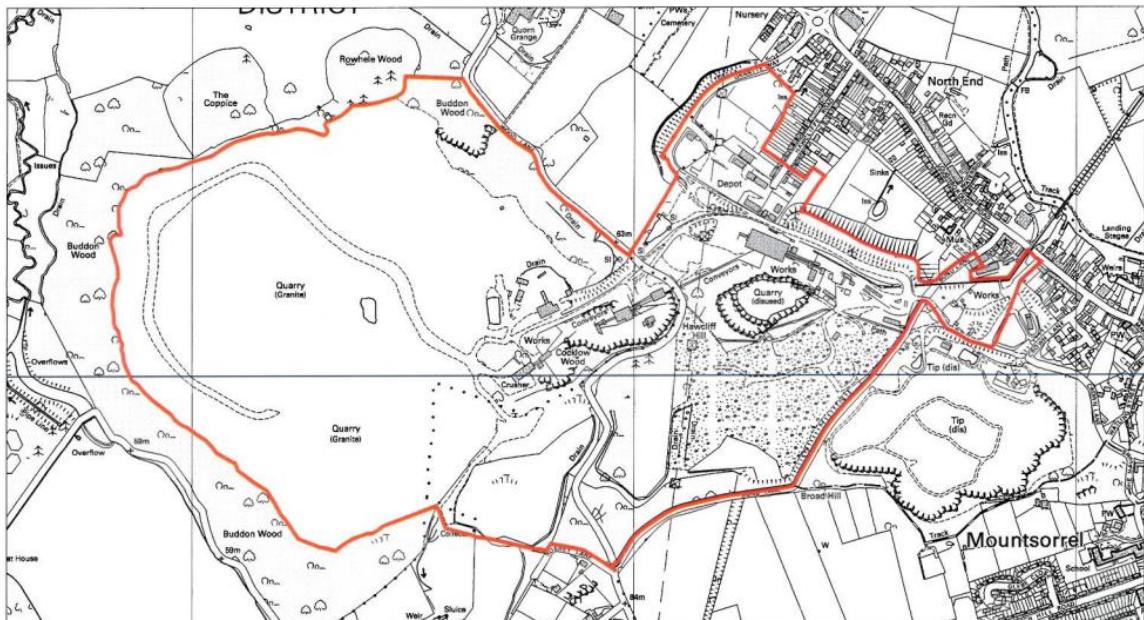


Figure 3- Annual Mean NO₂ concentrations in Syston AQMA

5.0 AQMA 3-Mounstorrel



- 5.1 Automatic monitoring for fine particulate matter (PM₁₀) is undertaken at Hawcliffe Road Mountsorrel using a Partisol analyser.
- 5.2 PM₁₀ around Mountsorrel Quarry has markedly lowered since the introduction of the quarry's Dust Management and Monitoring Plan (DMMP), with concentrations averaging around 25% lower than those observed prior to the declaration of the Air Quality Management Area (AQMA) in 2011. The DMMP continues to be regularly reviewed with the quarry management team to identify and refine operational activities so as to reduce fugitive dust impact on the local community.

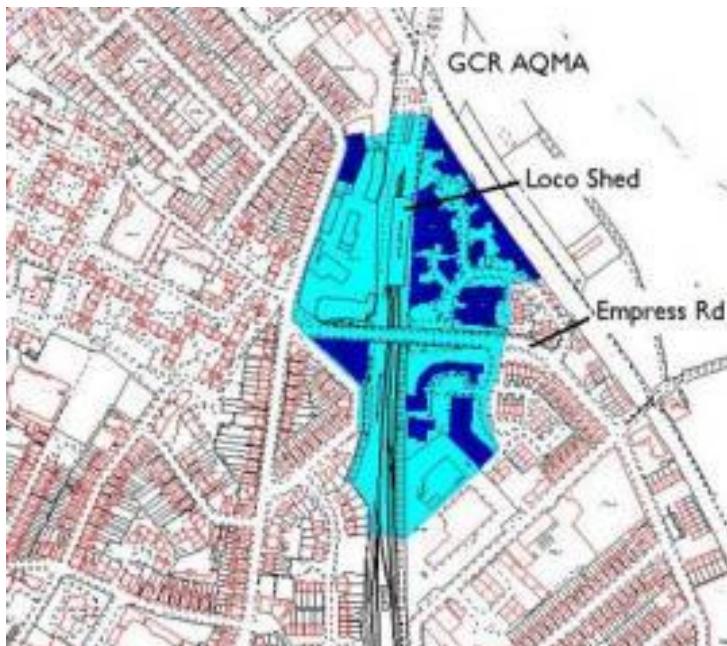
- 5.3 In 2018 the site recorded an annual mean of 24.7 $\mu\text{g}/\text{m}^3$, below the Air Quality objective of 40 $\mu\text{g}/\text{m}^3$, and no exceedance of the 24-hour mean objective. This continued in 2019 when the site recorded an annual mean of 22.6 $\mu\text{g}/\text{m}^3$, again significantly below the objective.

Figure 4- PM concentrations in Mountsorrel

Site ID	Air Quality Objective	2015	2016	2017	2018	2019
CM1	PM ₁₀ Annual Mean Concentration (40 $\mu\text{g}/\text{m}^3$)	27.09	24.65	24.84	24.66	22.6
CM1	PM ₁₀ 24-hour Mean Concentration (50 $\mu\text{g}/\text{m}^3$)	49.0	46.8	46.9	46.2	43.1

Exceedances of the PM₁₀ annual mean objective of 40 $\mu\text{g}/\text{m}^3$ are shown in **bold**

6.0 AQMA 4- Great Central Railway



- 6.1 Sulphur Dioxide (SO₂) is recorded using an automatic analyser close to Great Central Railway (GCR) engine sheds. The monitor is co-located alongside 3x sulphur dioxide tubes that are changed on a monthly basis. 3 further 'background' diffusion tubes have also been located throughout the Borough to allow a comparison of concentrations against the site of interest.
- 6.2 Results for 2018 indicated no exceedances of the 15-minute, 1-hour or 24-hour objectives for this particular pollutant, however we will continue to monitor levels to build a longer-term picture of concentrations at this site.

Figure 5- SO₂ concentrations in Great Central Railway AQMA

Site ID	Year	15-minute Objective (266 µg/m ³)	1-hour Objective (350 µg/m ³)	24-hour Objective (125 µg/m ³)
CM2	Number of Exceedances 2018 (percentile in bracket)	0 (61.6)	0 (41.4)	0 (24.9)
CM2	Number of Exceedances 2019 (percentile in bracket)	0 (66.09)	0 (46.94)	0 (22.05)

7.0 Summary of ASR 2019

- 7.1 All monitoring results during 2018 showed compliance with the air quality objectives, both inside and outside of the existing AQMAs. Overall trends for NO₂ remained downward and the work committed to at Mountsorrel Quarry continued to achieve PM₁₀ concentrations averaging around 25% lower than those observed when compared to results during 2009/10, prior to the declaration of the Air Quality Management Area (AQMA).
- 7.2 A second set of monitoring data was reported from our SO₂ monitor located close to the Great Central Railway engine sheds. Whilst results again suggested that concentrations were within the required objective levels of this particular pollutant, it was our stated intention to continue to monitor levels as we were aware that there has been some disruption to the monitoring over the past 2 years with both equipment and 'server-side' enhancements taking the monitor off-line for extended periods.
- 7.3 During both 2018 and 2019 we have reviewed the location of our monitoring sites following a number of queries from Members. Whilst we had no reason to believe there were any areas of concern we have, where appropriate and practicable, re-sited a small number of existing diffusion tubes to specific areas which were not previously covered by our network, this included areas in Anstey and Fredrick/William Street Loughborough.

8.0 Future Developments and Collaborative Working

- 8.1 The legislative framework underpinning air quality assessment in the UK has remained relatively consistent throughout the last decade. However, recent developments have meant that this may change due to the ever-increasing scrutiny on climate change, in the wake of the declared climate emergency in the UK. In the future, as nitrogen dioxide concentrations decrease, greater emphasis is likely to be placed on Particulate Matter (PM) which is less locally controllable, but is a more important metric in relation to health effects.
- 8.2 Particulate matter is different from the gaseous pollutants in that it is not a clearly defined chemical compound. It can be expressed in a number of ways, by size, composition, origin or other metrics. PM₁₀ and PM_{2.5} are the most commonly used units. We will therefore be reviewing our monitoring requirements as new legislation dictates, e.g. the new Environment Bill. This also aligns with the Public Health agenda following production of the Joint Strategic Needs Assessment (JSNA) and associated action plan which went to Leicestershire County Council Cabinet on 20 October 2020. Within the JSNA there is an air

quality chapter and the Environmental Protection team will work closely with the County Council to ensure that the action plan is implemented. One of the aims of the JSNA Action Plan is to assess background concentrations of PM_{2.5}, and implement measures to both reduce exposure to PM and reduce overall concentrations of PM_{2.5}.

- 8.3 Since the 2019 ASR we have sought to increase our ability to monitor PM levels within the borough by purchasing a relatively low cost mobile monitoring unit (a Zephyr). We will seek to deploy this unit at a suitable location to assess background levels or assess trends at locations where future Air Quality Objectives may be at risk due to new or local industrialised sources. Further work is required on this before a monitoring strategy and locations are agreed on.
- 8.4 Another area for collaborative work is ensuring that any updates to the Local Plan have fully considered air quality. External consultants have been undertaking an Air Quality Study as part of the Charnwood Local Plan and we will review any suggestions on Key Priority Areas to ensure air quality considerations and interventions are targeted most effectively.
- 8.5 Providing information to the public is an area which may also need to be prioritised, both as part of the Action Planning process, and more generally through work with Public Health. Ensuring clear messages for the public is difficult for a technical area such as air quality. The messaging should also link in with climate change aspirations. For example, communication around measures such as active travel will assist in modal shift away from private vehicles. Following the Coronavirus lockdown, utilising messages at national level to reiterate local advice may provide a useful opportunity to retain and enhance levels of cycling and walking.