New Forest
DISTRICT COUNCIL

Lyndhurst Air Quality Action Plan

An update 2019

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

DECEMBER 2019

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Executive summary

This document is an updated report to the 2008 Air Quality Action Plan (AQAP) for Lyndhurst.

The 2008 report was produced following the review and assessment of air quality in the New Forest which determined the exceedance of the annual mean objective for nitrogen dioxide in the High Street, Lyndhurst. An air quality management area (AQMA) was duly declared in 2005. The Action Plan confirmed the likely source of greatest nitrogen dioxide emissions was from transport.

The main aim of the AQAP was to present options which, if implemented, should reduce the nitrogen dioxide concentrations in pursuit of the nitrogen dioxide annual mean objective. Options involving the reduction in vehicle emissions were particularly focussed upon in the 2008 report (http://www.newforest.gov.uk/airquality) and have subsequently been implemented over the intervening years.

District wide plans currently known as Annual Status Reports (ASR) have been produced by New Forest District Council since (NFDC) 2008 providing information on air quality within the District and included the progress made on the Lyndhurst AQAP. Monitoring results have shown significant reductions in NO_2 over the past 9 years, due in part to the implementation of the options. The Lyndhurst AQMA has met the air quality objective for the annual mean concentration of NO_2 since 2015 and continues to do so. The most recent ASR (2019) has been appraised by DEFRA who commented that it was well structured, detailed and provided information specified in guidance. They encouraged the revision of the 2008 plan to ensure the monitored reduction in NO_2 is maintained. That comment has been addressed through the production of this report.

The aim of the 2019 Action Plan Report is to update the 2008 Action Plan for Lyndhurst; to assess the extent of the implementation of the options presented, to review these options and pursue those which remain viable, and to consider further options and schemes which may lead to further improvements in air quality in the village.

The 2019 report advises that the majority of options that could practically be undertaken, have been pursued and that since 2015, the annual mean objective for nitrogen dioxide has been met.

Compliance with the NO_2 air quality objective is a significant achievement but it is important that work to maintain and improve upon this objective continues to ensure that the Local Authority is confident that the objective can continue to be met over the long term.

The report goes on to suggest that further measures to improve air quality are likely to involve the 'softer' options such as community engagement in order to bring about change. Such changes would be most effective when brought about through collaboration with other agencies such as Hampshire County Council (HCC) Lyndhurst Parish Council, as well as local schools and businesses' and this report suggests options to accomplish this.

This report will be reviewed and updated by January 2022.

Introduction

1.0 • The Local area

Lyndhurst is a village at the heart of the New Forest National Park. Historically, Lyndhurst has always been at the centre of the New Forest with the Local Authority, Forestry Commission and Verderers all having main offices in the village. The village is home to approximately 3,000 residents along with associated schools and businesses. In addition, Lyndhurst also attracts numerous tourists throughout the year but in particular during the summer months.

Lyndhurst is located on main routes to other destinations, for example to the coast and southern forest towns of Brockenhurst and Lymington via the A337, as well as being on the A35 between Christchurch and Southampton. These two 'A' roads meet at Lyndhurst and combine on a small one way system through the centre of the village. A map of the village is shown in Figure 1 (below).

The combination of a busy village, tourist destination and location on main 'A' roads can result in congestion on the routes approaching the village and on the one way system itself. This has left Lyndhurst with somewhat of a reputation locally as a 'bottle neck' for traffic which is not desirable for a village at the centre of a National Park.

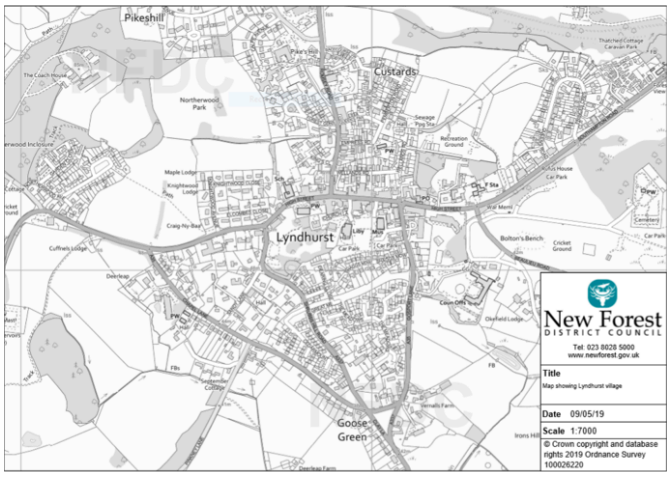
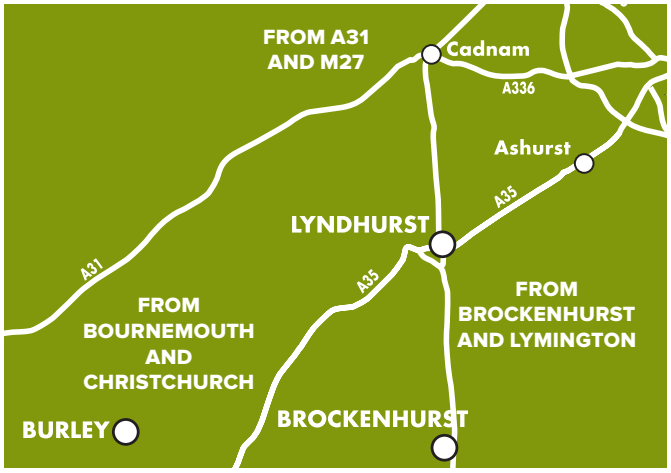


Figure 1
Map showing Lyndhurst village.



Alternative map showing where traffic to Lyndhurst comes from.

1.1 • Local air quality management

This report outlines the actions that NFDC will deliver in order to reduce concentrations of NO_2 and exposure to air pollution; thereby positively impacting on the health and quality of life of residents and visitors to Lyndhurst.

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 which require the Local Authority to continuously review and assess air quality in their district.

The review and assessment of local air quality is undertaken by following Government guidance and utilising modelling and monitoring techniques to determine if objectives set for three pollutants are likely to be met. Previously, seven pollutants were required to be considered, however four pollutants, namely benzene, 1,3-butadiene, carbon monoxide and lead, no longer need to be reported annually as the levels of these have been well below the objective levels for several years throughout England. The air quality objectives for the three remaining pollutants are shown in table 1.

Table 1
Table showing the UK Air Quality objectives.

Pollutant	Air Quality objective
Nitrogen Dioxide - NO_2 (mainly from traffic)	200 µg/m^3 when expressed as an hourly mean not to be exceeded more than 18 times a year to be achieved by 31 December 2005.
	40 µg/m^3 when expressed as an annual mean to be achieved by 31 December 2005.
PM_{10} (mainly from traffic) In 2008 a 6 month survey of PM_{10} was undertaken in the Totton and Lyndhurst AQMA's. There was no requirement for further action.	50 µg/m^3 or less when expressed as a 24hr mean not to be exceeded more than 35 times a year to be achieved by 31 December 2004.
	40 µg/m^3 or less when expressed as an annual mean to be achieved by 31 December 2004.
Sulphur Dioxide (mainly from industrial sources - no exceedances in the New Forest)	125 µg/m^3 or less, when expressed as a 24hr mean, not to be exceeded more than three times per year, to be achieved by 31 December 2004.
	350 µg/m^3 or less when expressed as an hourly mean, not to be exceeded more than 24 times a year, to be achieved by 31 December 2004.
	266 µg/m^3 or less when expressed as a 15 minute mean not to be exceeded more than 35 times a year, to be achieved by 31 December 2005.

If through the review and assessment process it is found that a pollutant is unlikely to meet its objective, the Local Authority has a duty to declare an Air Quality Management Area (AQMA). Following such a declaration an Air Quality Action Plan (AQAP) must be prepared, the main aim of which is to state how the Local Authority intends to improve air quality in pursuit of the objective within the AQMA.

1.2 • The review and assessment process

The review and assessment process requires Local Authorities to assess the air quality in their district and present their conclusions in reports which follow guidance set out by Government. Currently Local Authorities have been obliged to produce an ASR which replaced the previous Updating and Screening Assessment (USA) process.

The purpose of these reports is to assess local concentrations of NO_2, particulates and sulphur dioxide and determine whether these pollutants are exceeding or likely to exceed the objective levels set in legislation.

The following steps were taken when the air quality in Lyndhurst was reviewed and assessed:

Step 1: Updating and screening assessment

In 2003, a screening assessment was undertaken that concluded that there was a likelihood of an exceedance of the annual mean objective for NO_2 in Lyndhurst High Street. The exceedance was attributed to;

(i) the narrow and congested streets with residential properties close to the kerb;

and;

(ii) busy streets where people may spend one hour or more close to traffic

as shown in the photograph below;

Figure 2
Photo showing the narrow and congested High Street in Lyndhurst.

Step 2: Detailed assessment

As a result of the screening assessment, the Authority had a duty under the Environment Act 1995 to undertake a detailed assessment to provide an accurate assessment of the likelihood of the air quality objective being exceeded at locations with relevant exposure. In Lyndhurst, NO_2 concentrations were being monitored using diffusion tubes, and this monitoring regime was increased with more diffusion tubes being erected and the installation of a nitrogen oxides real time analyser in December 2004.

The results from the diffusion tube monitoring sites provided the basis for the production of the detailed assessment 2004 which concluded that there was a likelihood of an exceedance of the annual mean objective for NO_2 in the High Street, Lyndhurst. However it was unlikely that the hourly mean objective for nitrogen dioxide would be exceeded. Therefore the Authority had a duty under the Environment Act 1995 to declare an AQMA in respect of the annual mean objective for nitrogen dioxide.

An AQMA was duly declared in June 2005 after consultation with the local community, Hampshire County Council (HCC) transport planners and Council Members. Its location is shown in figure 3 (right).

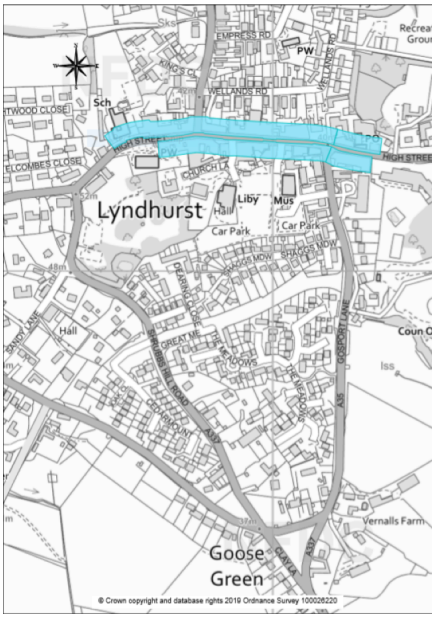


Figure 3
Location of Lyndhurst AQMA.

Step 3: Further assessment

A further assessment was produced in 2006, 12 months after the declaration of the AQMA, and was based on the monitoring data obtained in 2005. The purpose of the 2006 report was to validate the AQMA, determine the reduction in oxides of nitrogen required to meet the NO_2 annual mean objective and apportion the source(s) of pollution in Lyndhurst.

It was concluded that the declaration of the AQMA was justified and there was no requirement to revoke or amend the declared area.

Step 4: Production of an Air Quality Action Plan (AQAP)

Having declared an AQMA, the Local Authority was then responsible for the production of an Action Plan, the aim of which was to outline the Authority's plans to attempt to reduce the pollution concentration in pursuit of the air quality objective. The Action Plan utilised the data obtained in previous research to suggest schemes to reduce oxides of nitrogen and aimed to work with other regulatory authorities (for example the County Council) with regards to transport related issues.

The Lyndhurst AQAP was adopted by the Council in 2008.

1.3 • Aims of the 2008 AQAP

The AQAP is a working document involving the Local Authority, other regulatory bodies and the local community. The overall aim is to attempt to reduce nitrogen dioxide concentrations within the AQMA in pursuit of the annual mean objective for this pollutant.

The aims of the AQAP:

- to quantify the source contributions to the predicted exceedance of the annual mean objective for nitrogen dioxide in order to target the action
- to consider all available options in terms of effectiveness, cost and feasibility
- to quantify the expected impacts of each option and if possible indicate if the options will be sufficient to meet the relevant air quality objective
- to demonstrate the Local Authority has worked with other interested parties and used its legislative powers where necessary in pursuit of meeting the Air Quality objectives
- to determine realistic time scales in which to implement any options
- to state how the Local Authority intends to monitor and assess the effectiveness of the action plan

1.4 • Sources of Nitrogen Oxides (NOx) – Source Apportionment

An essential aspect of the Action Plan was to quantify the source contributions to the predicted exceedance of the annual mean objective for nitrogen dioxide so that options and resources could be appropriately targeted to give the most rapid reduction in nitrogen oxides in order to meet the air quality objective.

Data obtained from modelling and monitoring was used to establish the source apportionment and concluded that 79% of nitrogen oxides were from road transport as detailed in the table below. (See Lyndhurst: AQAP 2008 for further details).

Table 2
Table showing source apportionment of concentrations of NOx and NO_2 taken from NFDC Lyndhurst: AQAP 2008

Source category	NO_2 concentration contribution		NOx concentration contribution	
	µg/m³	%	µg/m³	%
Light duty vehicles	19.8	41	53.9	46
Heavy duty vehicles	14.2	29	38.8	33
Total traffic	34.0	70	92.8	79
Background	14.4	30	24.8	21
Total	**48.4**	**100**	**117.5**	**100**

The traffic data at the time showed that the heavy duty vehicles in the street canyon account for only 4.1% of the total traffic, but equated to 33% of the total traffic nitrogen oxides concentration.

As a result of this work it was concluded that road transport was the major contributor towards nitrogen oxides (and therefore nitrogen dioxide) concentrations. In the location of the exceedances of the nitrogen dioxide annual mean objective, heavy duty vehicles accounted for 33% of the total oxides of nitrogen concentration.

It was concluded that the area to target to achieve the greatest reduction in nitrogen oxides concentrations should be weighted towards road transport and in particular heavy duty vehicles. This was taken into account when developing options to bring about the necessary reduction in nitrogen oxides.

Using this data as a baseline, the 2008 report went on to suggest numerous options and schemes, which if implemented should lead to an improvement in air quality.

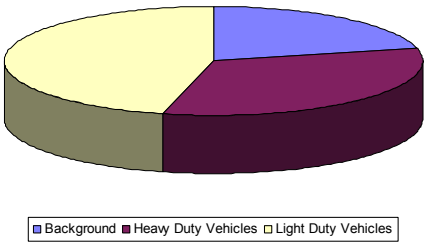


Figure 4
Graph showing source apportionment of Oxides of Nitrogen in High Street, Lyndhurst.

1.5 • Key priorities of the 2019 updated Lyndhurst AQAP

Since the declaration of the AQMA in 2005, the Council has produced regular reports, recently known as ASR, which detail the strategies that have been employed by the Council to improve air quality and the effectiveness of the Councils action in pursuit of the air quality objectives.

It was a priority of the 2018 ASR to update the Lyndhurst AQAP to further improve local air quality. This report aims to fulfil that priority by:

- reviewing the options to improve air quality stated in the 2008 report;
- removing options that have been discounted;
- providing an update on options that have been progressed;
- considering which options still have potential for development and the means of implementing them;
- considering new schemes to further improve air quality and the means of implementing them; and
- considering other factors which may influence air quality in Lyndhurst such as traffic flow.

Current air quality status and the health impacts of nitrogen oxides

The 2008 AQAP described 19 options for further consideration in pursuit of the nitrogen dioxide air quality annual mean objective. Since that time NFDC has progressed many of these options as well as continuing to work with other agencies to monitor and improve the air quality in its district.

Monitoring results from diffusion tubes and the air quality analyser have shown that the Lyndhurst AQMA has met the air quality objective for the annual mean concentration of NO_2 since 2015 and continues to do so.

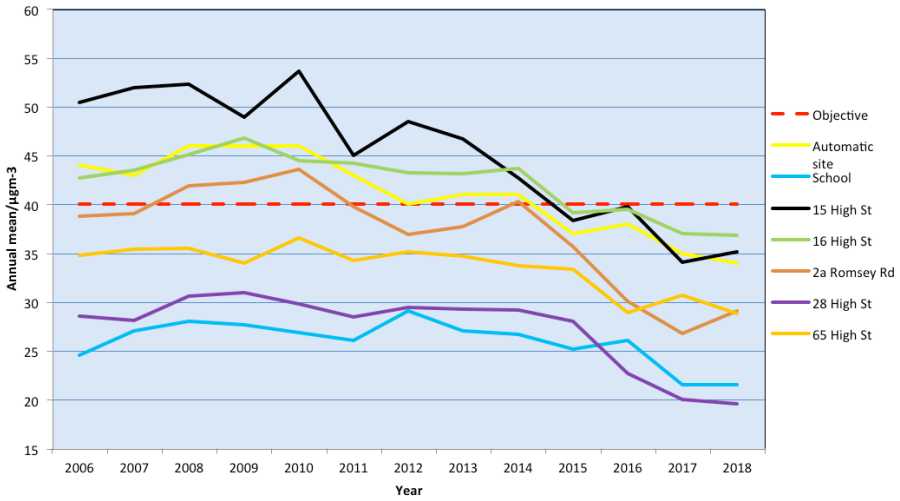


Figure 5
Trends in Annual Mean NO_2 concentrations

Compliance with the air quality objective of 40µg/m³ is a significant achievement but it is important that work to maintain and improve upon this objective continues to ensure that the Local Authority is confident that the objective can continue to be met over the long term.

Improvements in air quality beyond the objective value should be strived for to bring about confidence in the monitoring data, additional improvements for human health and the environment.

2.1 • Reasons for improvements in air quality within the Lyndhurst AQMA

Lyndhurst has monitored significant decreases in NO_2 concentrations of between 4-11µgm^{-3} over the last eight years within part of the High Street (the annual mean objective for NO_2 is 40µgm^{-3}), with no exceedances of the nitrogen dioxide annual mean objective being monitored in Lyndhurst over the past four years. However, whilst the decreases are noted and welcomed, the cause of the decrease is not clear. Improvements have been made to the flow of traffic within Lyndhurst, but these came into effect in 2010 when the decrease in the monitored concentrations started. Continued decreases are difficult to explain, other than a generalisation that newer, cleaner vehicles on the road may also be having a positive local impact.

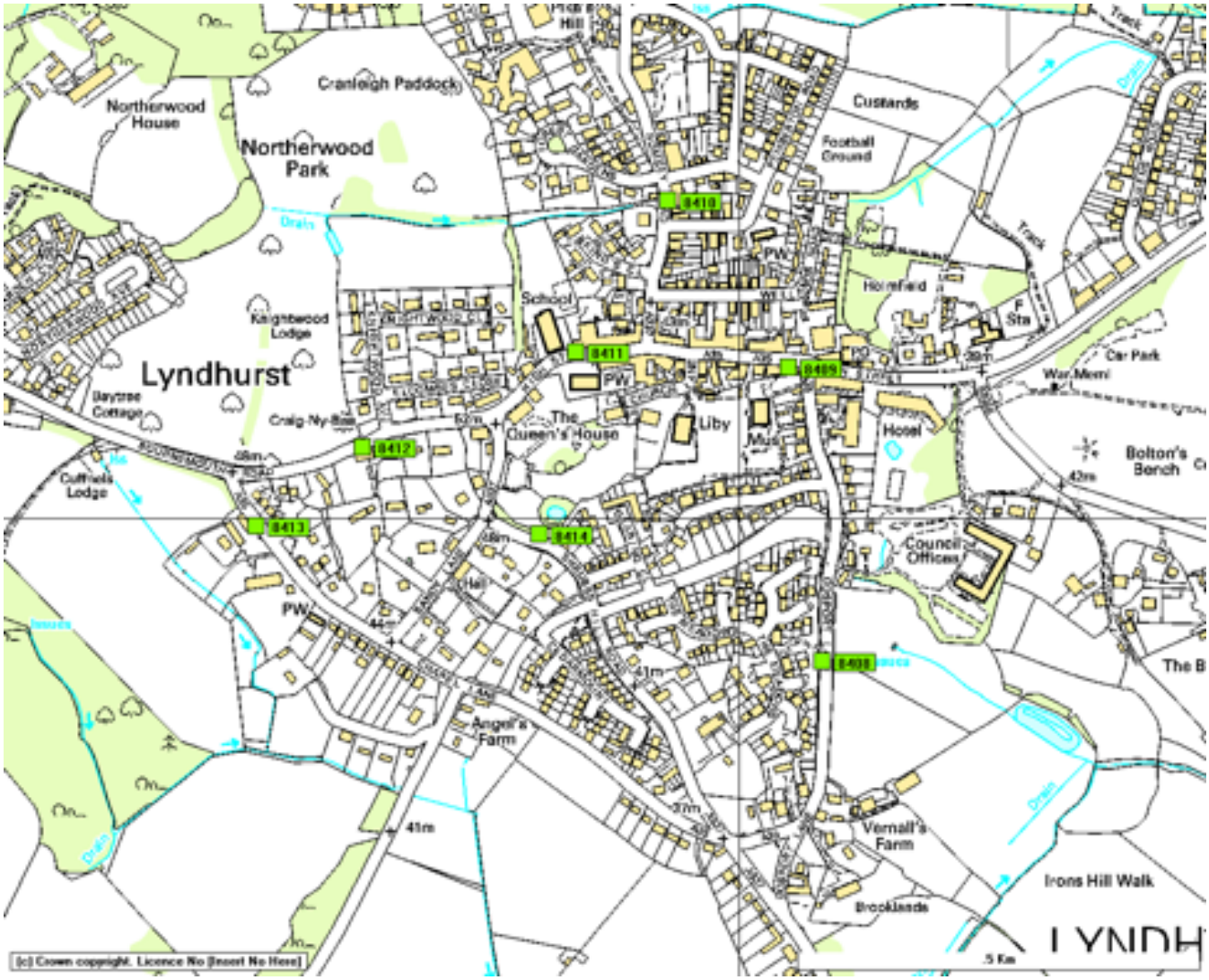
This theory was supported in 2016 when a report by the Royal College of Physicians established that in general *'in the UK, the abatement of air pollution from petrol vehicles has been very effective – a new petrol car emits less than one-twentieth of the levels of nitrogen oxides emitted by cars made in 1992, before catalytic converters were required. There have also been huge cuts in CO and hydrocarbons (VOCs) in petrol exhausts. In contrast to petrol engines, the technology applied to clean up diesel vehicles has not yielded significant improvements in emissions of nitrogen oxides, and the proportion of NO_2 in diesel exhaust has actually increased.'*

Chapter 3 reviews the schemes undertaken by the Local Authority and its partners to improve local air quality in Lyndhurst. The impact of each individual option has proved difficult to assess but nevertheless the overall impact of the actions along with improvements in engine technology have ensured the objective is currently being met. One factor which should be taken into account when judging the effectiveness of the schemes to improve air quality is the traffic flow through Lyndhurst. It would be beneficial to understand whether the improvements are linked to a reduction in the number of vehicles passing though Lyndhurst or the result of the improvements brought about by technology and air quality improvement schemes.

2.2 • Current traffic data

To enable current traffic movements to be compared to both past and future movements, HCC undertook traffic surveys in February 2019 on behalf of NFDC. The survey points are shown on the map below.

Figure 6
Location of traffic monitoring points.



In practice, it has proved challenging to accurately compare data obtained from this survey with previous figures since a complete set of survey results from past years is no longer available. Ad-hoc results from surveys taken in different years from the same survey points and the 2019 counts are shown in the tables below. Although they can provide an indication of variation in traffic flow over time, it should be noted that a comparison of surveys taken at different times of the year is not ideal and may not provide a reliable means of comparing traffic flow. It is preferable to compare figures taken at the same time of year. The traffic data obtained in 2019 can however be used to benchmark future traffic surveys and it is anticipated that further surveys will be undertaken in February 2020 to allow more accurate comparisons to be made.

Shrubbs Hill Road (monitoring location 8414)

	Vehicle count	HGV (groups 6.5-11.5m &>11.5m)
April 2008	8270	537
February 2019	7910	548

High Street (East of Romsey Road) (monitoring location 8409)

	Vehicle Count	HGV (groups 6.5-11.5m &>11.5m)
February 2011	11806	729
February 2019	13007	610

High Street (West of Romsey Road) (monitoring location 8411)

	Vehicle Count	HGV (groups 6.5-11.5m &>11.5m)
November 2014	12663	No data
February 2019	12133	1890

Romsey Road (Southbound) (monitoring location 8410)

	Vehicle Count	HGV (groups 6.5-11.5m &>11.5m)
November 2010	5805	230
February 2019	5748	326

Romsey Road (Northbound) (monitoring location 8410)

	Vehicle Count	HGV (groups 6.5-11.5m &>11.5m)
November 2010	6791	463
February 2019	6469	512

A comparison of the tables shows increased traffic on some routes, and decreases on others but the results are broadly similar.

The similar volume of traffic passing though the AQMA suggests that other factors have led to the decrease in monitored NO_2 levels over the last five years.

2.3 • Emery Down

Emery Down is a small hamlet to the west of Lyndhurst. Local road networks in the area enable cars to effectively by-pass Lyndhurst from the A337 (Romsey Road) to the A35 (west of Lyndhurst). However, it should be noted that these roads can be difficult to navigate when many vehicles are using the route, due to parts of the route being single carriageway with passing places.

Residents of Emery Down have commented on the drop in NO_2 concentrations through Lyndhurst AQMA suggesting that the fall in pollution equates to an increase in the number of vehicles now using this by-pass route through Emery Down as a detour to avoid congestion in Lyndhurst. The residents group points to satellite navigation systems 'My Journey Planner' and Google, as the main reasons behind the rise in traffic through their village, as these journey planning aids often direct traffic away from Lyndhurst and through Emery Down particularly during periods of congestion.

This issue would benefit from further research to establish the current levels of nitrogen dioxide in proximity to residential properties in the village. If nitrogen dioxide levels are found not to meet the objective level, further work will be necessary in accordance with Government guidance as well as establishing:

a) Whether vehicle numbers passing through Emery Down have increased and if this is at the expense of traffic passing though Lyndhurst,

b) The purpose of journeys diverting through Emery Down i.e. local commuting traffic, commercial traffic or journeys for social or recreational purposes,

c) Means of redirecting traffic away from unsuitable roads if necessary.

The use of traffic counts, diffusion tube monitoring and surveys could all be employed to secure answers. This issue will form part of the further action detailed in Chapter four.

2.4 • Health impacts of Nitrogen Dioxide

On a national level, the main sources of nitrogen dioxide are from road transport, commercial and industrial processes, and domestic sources; basically any processes which burn fossil fuels.

The burning of fossil fuels produce a group of pollutants collectively known as oxides of nitrogen (NOx) which includes nitric oxide (NO) and nitrogen dioxide (NO_2). The oxides of nitrogen undergo complex chemical reactions with other atmospheric pollutants, including ozone (O_3) to form further nitrogen dioxide. The formation of NO_2, and therefore its concentration in the ambient atmosphere, is dependent on the availability of these other pollutants, including ozone, in the atmosphere.

Air pollution is a national public health priority and of all environmental factors, it has the largest impact on health in the UK. NO_2 can be attributed to over 40,000 deaths nationally and has health effects across the life course; from the underdevelopment of the unborn baby through to dementia in the later years of life. The strongest evidence of health impact is the worsening symptoms of respiratory and cardiovascular diseases.

Currently, NO_2 and particulates are the pollutants causing the largest health impacts in the UK. These pollutants are mostly associated with road transport.

2.5 • Air quality and its impact on resident's health in Lyndhurst

Public Health England compiles statistics relating to the health of the UK in terms of geographic location and socio-economic groups. Their data was used to judge the health of the residents of Lyndhurst living in an area with a current AQMA; against that of England as a whole, in order to gauge if the poorer air quality monitored in the past may have had a detrimental effect on health.

The public health outcome framework indicator for air pollution is mortality attributable to particulate matter. For the New Forest, this equates to approximately 100 deaths per year caused by long term exposure to particulate air pollution.

Published local data from the doctors surgery in Lyndhurst details the prevalence of the common respiratory diseases, asthma and chronic obstructive pulmonary disease (COPD) in Lyndhurst. These diseases are linked to exposure to particulate pollution.

Table 4 details the reported prevalence of asthma and COPD in Lyndhurst. The figures presented indicate that the prevalence of asthma and COPD in Lyndhurst is lower than in England as a whole.

	The Lyndhurst Surgery	Registered & Recorded in Lyndhurst
Reported asthma prevalence GP	5.67%	5.67%
Reported asthma prevalence England	5.93%	5.93%
Registered asthma patients GP	301	301
Reported COPD prevalence GP	1.71%	1.71%
Reported COPD prevalence England	1.90%	1.90%
Registered COPD patients GP	91	91
Registered patients list size	5,306	5,306

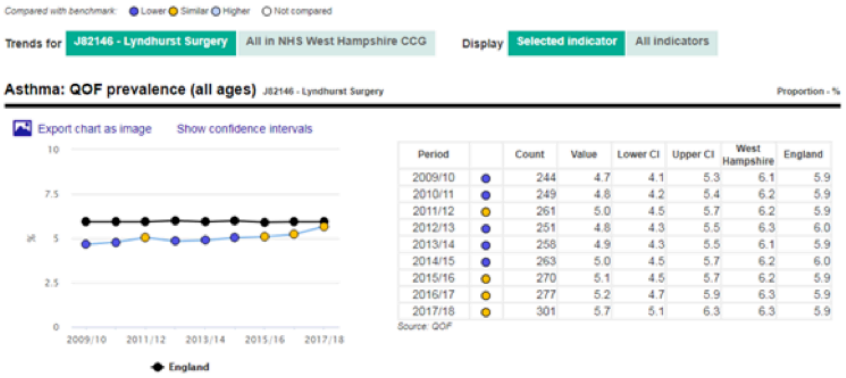
Table 4
Reported data from GP surgeries in Lyndhurst detailing asthma and COPD prevalence, for all ages. Comparison with the national reported figures (2016/17)

Source
https://digital.nhs.uk/data-and-information/publications/statistical/quality-and-outcomes-framework-achievement-prevalence-and-exceptions-data/2017-18

https://files.digital.nhs.uk/publication/c/r/qof-1617-rep.pdf

(*note: the columns show the same figures as there is only one surgery in Lyndhurst)

The graphs below show trends in asthma and COPD prevalence in Lyndhurst from 2009 to 2018.



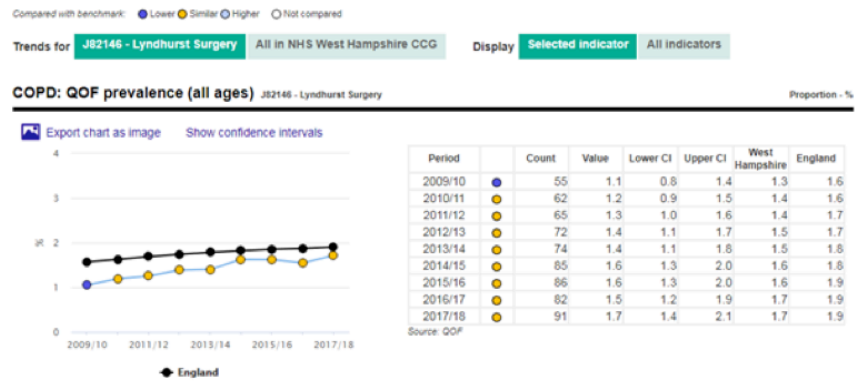
Period		Count	Value	Lower CI	Upper CI	West Hampshire	England
2009/10		244	4.7	4.1	5.3	6.1	5.9
2010/11		249	4.8	4.2	5.4	6.2	5.9
2011/12		261	5.0	4.5	5.7	6.2	5.9
2012/13		251	4.8	4.3	5.5	6.3	6.0
2013/14		258	4.9	4.3	5.5	6.1	5.9
2014/15		263	5.0	4.5	5.7	6.2	6.0
2015/16		270	5.1	4.5	5.7	6.2	5.9
2016/17		277	5.2	4.7	5.9	6.3	5.9
2017/18		301	5.7	5.1	6.3	6.3	5.9

Source: QOF

Figure 7
Graph showing the prevalence of patients registered and recorded as having asthma at the Lyndhurst Surgery from 2009 to 2018.

Source
Public Health England, National General Practices Profiles.

The prevalence of patients registered and recorded as having asthma at the Lyndhurst Surgery is lower than the England average. The Lyndhurst Surgery prevalence has been steadily increasing since 2012/13 and while it was significantly lower than the England average, since 2015/16 it has been similar to the England average.



Period		Count	Value	Lower CI	Upper CI	West Hampshire	England
2009/10		55	1.1	0.8	1.4	1.3	1.6
2010/11		62	1.2	0.9	1.5	1.4	1.6
2011/12		65	1.3	1.0	1.6	1.4	1.7
2012/13		72	1.4	1.1	1.7	1.5	1.7
2013/14		74	1.4	1.1	1.8	1.5	1.8
2014/15		85	1.6	1.3	2.0	1.6	1.8
2015/16		86	1.6	1.3	2.0	1.6	1.9
2016/17		82	1.5	1.2	1.9	1.7	1.9
2017/18		91	1.7	1.4	2.1	1.7	1.9

Source: QOF

Figure 8
Graph showing the prevalence of patients registered and recorded as having COPD at the Lyndhurst Surgery from 2019 to 2018.

Source
Public Health England, National General Practices Profiles.

The prevalence of patients registered and recorded as having COPD at the Lyndhurst Surgery is lower than the England average. The Lyndhurst Surgery value has been steadily increasing since 2009/10. Since 2010/11 it has been similar to the England average.

In addition to recording the prevalence of respiratory conditions which may be attributed to air pollution, the local health data provided by Public Health England also reports the mortality rates for various diseases, including respiratory disease. This data advises of the number of deaths where respiratory disease is the underlying cause of death.

Causes of deaths - all ages, numbers, 2011-2015

Indicator	Lyndhurst (Ward (2016))	New Forest (Lower Tier Local Authority)	Hampshire (Upper Tier Local Authority)	England
All causes	189	10,422	60,172	2,357,381
All cancer	52	2,916	17,087	666,658
All circulatory disease	44	2,962	16,204	646,138
Coronary heart disease	18	1,279	6,766	289,738
Stroke	15	846	4,387	165,375
Respiratory diseases	20	1,277	7,781	325,764

Source: Public Health England, produced from ONS data Copyright © 2017

Figure 9
Causes of death. All ages, numbers 2011 - 2015 (Lyndhurst).

The latest reported figures (2011-2015) for Lyndhurst advises that within the assessment period, 20 Lyndhurst residents died with respiratory disease being the underlying cause of death for all ages. This is a higher number of deaths compared to those from stroke (15) and coronary heart disease (18) in Lyndhurst for the same reporting period.

Causes of deaths - all ages, Standardised Mortality Ratios (SMR), 2011-2015

Indicator	Lyndhurst (Ward (2016))	New Forest (Lower Tier Local Authority)	Hampshire (Upper Tier Local Authority)	England
All causes	82.3	83	89.4	100
All cancer	83.6	87.1	90.7	100
All circulatory disease	67.7	83.7	87.2	100
Coronary heart disease	62.7	82.5	81.5	100
Stroke	88.9	90.8	91.7	100
Respiratory diseases	59.6	70.1	82.7	100

Source: Public Health England, produced from ONS data Copyright © 2017

Figure 10
Causes of death. Aall ages Standardised Mortality Ratios 2011 - 2015 (Lyndhurst).

To enable statistical comparisons to be made, a standardised mortality rate (SMR) is utilised. This allows disease rates in a cohort (i.e. Lyndhurst) to be compared to a general population within the geographical area from which the cohort was selected. It is used to remove bias in the cohort such as significant differences in age, ratio of male to female etc. when compared to the general population. A figure of 100 is the expected number of deaths when respiratory disease is the underlying cause of death for all ages. Lyndhurst, for the period 2011-2015, has a SMR of 59.6 for respiratory diseases which equates to ~40% below what is expected and is therefore summarised as being significantly better than England. In addition, the SMR for the New Forest is 70 for respiratory disease; Lyndhurst therefore also has a lower reported mortality rate for respiratory disease compared to the New Forest as a whole, and when compared to Hampshire. (~83)

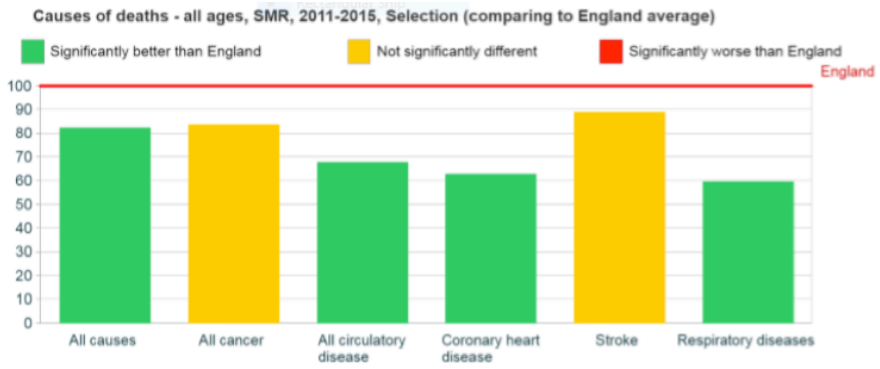


Figure 11
Causes of deaths. All ages, SMR 2011 - 2015 for Lyndhurst compared to England Average

Source
Public Health England, produced from ONS data Copyright © 2017.

It can be concluded from the figures presented, that the GP surgery in Lyndhurst reports a lower prevalence of respiratory disease (asthma and COPD) when compared to the national average. The standardised mortality rates for respiratory disease for all ages in Lyndhurst is also significantly better than England all of which is welcome news, nevertheless where there are opportunities to improve residents health through the reduction of NOx, they should be taken.

2.6 • Other sources of pollution

Recent research from the Royal College of Physicians and of Paediatrics and Child Health has shown that outdoor air pollution is contributing to 40,000 early deaths a year in the UK. It has been linked to cancer, asthma, stroke and heart disease, diabetes, obesity, and changes linked to dementia. Whilst this report focusses primarily on NO_2 levels within the AQMA, it is worth considering other forms of pollution which the population may be exposed to on a frequent basis. The Royal College of Physicians report also commented upon the often overlooked forms of indoor air pollution which we may be exposed to within our homes. The report stated that tobacco still poses the biggest indoor threat, but badly maintained gas appliances, radioactive radon gas, wood burning stoves, some cleaning products as well as solvents that seep from plastics, paints and furnishings can also generate air pollutants within the domestic environment. The report calls for manufacturers and Local Authorities to address these issues and it is noted that the Government's recently released Clean Air Strategy 2019 attempts to address these points.

The Royal College of Physicians along with the Clean Air Strategy give advice to the public on reducing their exposure to pollution both indoors and outdoors for example by:

- walking, cycling or taking the bus or train instead of driving, when possible,
- keeping gas appliances and solid fuel burners in good repair
- making homes more energy efficient

Further discussion on these issues falls outside the scope of the report but the implementation of tighter air quality standards, particularly for particulate matter may form the basis of future reports produced by NFDC.

Review of the 2008 Air Quality Action Plan options

The 2008 AQAP listed 19 options for consideration in reducing nitrogen dioxide concentrations in the Lyndhurst AQMA. Section 7 of the 2008 plan required that these options be considered, with feasibility studies where necessary to determine which of the options were suitable for progression. It is appropriate now to review the progress made on these options, to note successful outcomes and to consider both any further action to pursue these existing options, and what further options and interventions may now be applicable to reducing nitrogen dioxide in the Lyndhurst AQMA.

3.1 • Option 1
Bypass

Discounted

Given the constraints of cost and the impact on areas of nature conservation, the HCC Lyndhurst Bypass Scrutiny Review in March 2008 resolved that it could not support the prioritisation of either a Lyndhurst focused bypass or a New Forest wide bypass at the present time. This situation is unlikely to change and thus this option is now discounted.

3.2 • Option 2
Works to improve junction of A337 and High Street

Implemented and ongoing

In order to reduce congestion and air pollution in the High Street in Lyndhurst, particularly within the street canyon, work undertaken by HCC led to the extended use of the left turn filter light at the High Street / Romsey Road traffic signals and the installation of Long Vehicle Detection (LVD). This was to facilitate the more regular operation of the left filter light (at the High Street and Romsey Road traffic signals) whilst ensuring that it was possible for large vehicles, which require a greater turning radius, to navigate the junction without conflict.

The County Council also improved the efficiency of the junction by installing MOVA (Microprocessor Optimised Vehicle Actuated) to the traffic signals, to provide a more dynamic method of controlling the timings. The system has the ability to monitor traffic flows and utilise the most appropriate mode i.e. minimising mode when traffic is free flowing, switching to a capacity maximising procedure when congestion starts to occur. The changes have allowed the left turn filter arrow to operate more frequently and traffic to move more quickly through the AQMA.

The above measures have had a positive impact upon traffic movements and have helped in reducing queuing traffic and improved air quality. The situation, although not perfect, is making the most of the road space and through the use of traffic signals is managing traffic (which it is noted is high during the summer months and other holiday periods).

3.3 • Option 3
Additional road traffic management schemes

Discounted

These schemes proposed to install additional traffic signals at the junction of the A35 and Shrubbs Hill Road. Each scheme proposed a different road layout on the approach to the top of the High Street but both aimed to minimise traffic being held at the current traffic signals by holding traffic further back away from the street canyon.

Both schemes were reviewed in 2012 but were not considered feasible to progress, mainly as a result of the increased congestion likely to result in areas away from the street canyon and the negative impact any such road changes would have on local residents.

3.4 • Option 4
Enforcement of heavy goods vehicle restrictions

Implemented and ongoing

The Further Assessment for Lyndhurst concluded that whilst Heavy Goods Vehicles only accounted for between 4 - 9% of the road transport figures on the A35 east and west bound and the A337 north and south bound, this traffic group accounts for between 33% - 48% of the total NOx contribution in the vicinity of Lyndhurst. Therefore reducing heavy goods vehicle numbers on the roads through Lyndhurst should reduce nitrogen dioxide concentrations.

Since 1997, HCC has imposed a restriction for vehicles over 7.5 tonnes from travelling down the High Street unless they are making a delivery. The restriction starts approximately 4 miles north of Lyndhurst on the A337 at Cadnam and runs along the A337 and through the High Street. However, the restriction does not include the top of the High Street, from the A35 to the junction with the A337, therefore the ban does not include the part of the AQMA with the highest nitrogen dioxide concentrations.

A number of restricted vehicles do still use the High Street from both the A35 and A337 without making a delivery. Continued enforcement of the restriction to make the route less attractive to heavy goods vehicle drivers would help reduce nitrogen dioxide concentrations.

There has been little opportunity for NFDC to work with the Police to uphold the HGV restriction but NFDC will continue to progress this where possible. New possibilities for working with the business community to help reduce the number of HGV's requiring entry to the AQMA will be pursued.

3.5 • Option 5
Installation of variable messaging system

Implemented and ongoing

Lyndhurst is particularly congested during peak holiday periods. Directing traffic away from the south bound A337 and onto the westbound A35 via Ashurst was considered as an option to ease congestion and trials were undertaken in 2006. Traffic counts showed an improvement but there was some opposition from Ashurst residents who experienced increase traffic flows.

There remains scope for further work with HCC to extend the use of the messaging system over peak times.

3.6 • Option 6
Enforcing parking restrictions in High Street

Implemented and ongoing

It has been noted that vehicles stopping in the High Street in Lyndhurst often increase traffic congestion along the High Street and Romsey Road, particularly if this occurs during the hours of peak traffic flow.

This increase in congestion can impact on traffic waiting to pass through the traffic lights of the junction of the High Street and Romsey Road, which reduces the volume of traffic able to pass through the traffic lights and increases the number of vehicles waiting to pass through the AQMA. Therefore the NO_2 concentrations could increase due to an increase in slow moving traffic through the village centre.

Responsibility for parking enforcement now rests with NFDC and the Enforcement Operations Team. During the period 01/04/17 and 31/03/18 officers undertook 454 observations in Lyndhurst over 82 hours of patrol. During this time 293 tickets were issued. Specifically, 60 visits were undertaken in the AQMA culminating in the issuing of 3 notices.

Continued enforcement of the parking and loading restrictions (see Figure 12, below) in the High Street and the presence of officers in the area to act as deterrents to drivers who may otherwise stop in these zones, is an option that can be pursued in the future.

Figure 12
Loading restriction, Lyndhurst High Street.

Source
NFDC mapping.

3.7 • Option 7
Review signage around Lyndhurst

Implemented

The main car park for Lyndhurst is located in the centre of the village. There are two entrances into the car park, one off the High Street and the other off Gosport Lane, the exit from the site is back onto the High Street.

Should visitors miss their intended entrance, drivers must take a loop through the one way system back to the High Street (or Gosport Road). Improved signage to reduce the likelihood of 'missing' the turning and thereby the need to recirculate through the one way system was carried out.

Further improvements regarding the signs advising of the restrictions on heavy goods vehicles entering Lyndhurst were also undertaken.

Further signage is not currently proposed however it is noted that the increased use of satellite navigation systems is likely to have made navigation to the car parks easier.

3.8 • Option 8
Review and support NFDC's travel plan

Implemented and ongoing

NFDC is the main employer in Lyndhurst. Many staff and visitors will travel to Appletree Court through the AQMA and/or travel through it during their normal working day.

With the New Forest being mainly rural with limited public transport throughout the district, the use of a car for employees of the Authority is often a necessity. In addition, there is a requirement for some staff to provide a car for work purposes.

The Green Transport Plan or 'Go Green' was adopted by the Authority in November 2002 and ended in 2016. It had three main aims, namely to help employees to use alternatives to driving to work alone, to reduce carbon emissions and to introduce new vehicle technology and less polluting fuels for the Authority's own fleet and lease cars.

In association with the Green Transport Plan and the Go Green working group numerous schemes were proposed to encourage the Authority's employees to utilise alternative forms of transport to travel to work and reduce business miles. Since 2008, many of these schemes have been put in place namely:

- Providing secure cycle parking at the Authority's offices.
  Completed
- Providing shower and changing facilities at the Authority's offices.
  Completed
- Running a monthly prize draw for those employees utilising an alternative means of transport (including car sharing) to travel into work.
  Completed but no longer in practice
- Providing 2 pool cars for business use.
  Completed but no longer in practice

- Providing reserved parking spaces for employees who car share.
  Completed
- Paying all essential car users the same business mileage rate regardless of the vehicles' engine size, therefore providing an incentive to run a smaller more fuel efficient vehicle.
  Completed
- Video conferencing facilities which assist in meetings at the Authority particularly when the Authority is run from 2 main office sites (Lyndhurst and Lymington).
  Completed but the Lymington Office is no longer utilized by NFDC
- Home working. *Encouraged under the Green Transport plan and is now being promoted extensively throughout the council as a means of working more effectively and economically (see smarter working).*
- Possibility of moving both Lyndhurst and Lymington offices one site.
  Completed

In addition to these schemes in 2016 NFDC commissioned Sustran to produce a Travel Action Plan for the Authority. The primary aims of the Travel Action Plan were to:

- Reduce the costs of business travel for the company;
- Increase efficiency and apply more environmentally friendly practices;
- Build on existing credentials and accreditation
- Improve Corporate Social Responsibility and build upon the employee centred and customer focused approach of the company; and
- Improve site accessibility and widen travel choices to/from work.

In terms of improving air quality, it was anticipated that a reduction in work related travel through the Lyndhurst street canyon, would lead to reductions in the monitored level of NO_2.

As part of the Travel Action Plan in 2016, NFDC completed a work place site audit which detailed the ways in which the Council supported sustainable transport ideas. This included encouraging the use of cycling through the provision of bike sheds, shower facilities and lockers as well as the promotion of cycling as a means of transport through events such as the Go Green prize draw and the Bike Dr maintenance workshop. The audit also reviewed safe walking routes around the office grounds and facilities such as parking and car sharing. The audit demonstrated that many of the factors required to encourage alternative means of transport were in place (see above).

The Travel Action Plan has not been pursued since 2016 but a Fuel Efficient Vehicles And Infrastructure Task And Finish Group was convened in October 2018. See Option 14.

Smarter working

Implemented and ongoing

NFDC has made a significant commitment to smarter working to encourage more efficient and economic means of delivering services. As part of this new means of working, the majority of mobile officers now use hybrid laptops allowing them to work away from the Lyndhurst office, for example at home or at the Ringwood and Lymington hubs. There is also increased opportunity to schedule visits and appointments in such a way so as to avoid the need to make multiple or unnecessary journeys to the office when work can be completed offsite.

The anticipated arrival and roll-out of Office 365 to NFDC staff may bring further changes to working practices and in some cases may remove the need for travel if meetings can be held via skype.

These changes in the way staff work may lead to a reduction in business mileage as well as a reduction in the number of staff vehicles passing through the Lyndhurst AQMA, which in turn will contribute to a reduction in NO_2 concentrations.

3.9 • Option 9
Review and support St. Michael and All Angels Infant School travel plan

Implemented and ongoing

The school is located at the top of the High Street in one of the areas experiencing potentially higher levels of NO_2 due to the frequently queuing traffic at the traffic lights exacerbated by the influence of the canyon effect in this part of the High Street. NFDC and HCC have worked with the school to develop their school travel plan with the duel aims of reducing car travel to school and more, specifically to develop a 'clean walk to school route' which would direct children and parents away from the street canyon and its associated higher exposure levels.

As part of this initiative, diffusion tubes were placed in Church Lane and within the churchyard over the period October 2017 to December 2018. The results shown in the graph below show lower levels of NO_2 concentrations in these areas compared with the High Street and thus this route was chosen as the preferred, cleaner, walk to school route.

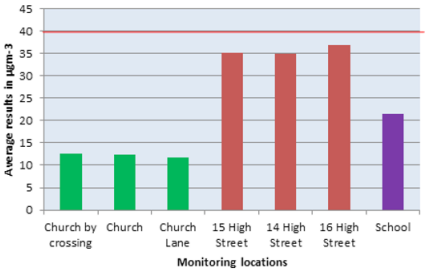


Figure 13
Graph showing NO_2 concentrations measured along the route of the Clean Walking Route, within the AQMA and at the Infant School on the high street.

The clean walking route directs pedestrians away from the High Street and onto Church Lane leading to the footpath through the church yard and onward either via, the steps or the slope to the exit onto the pavement opposite the school. To publicise the new route and encourage parents and pupils to use it on a regular basis, the school devised a treasure hunt along the route for pupils to follow. Feedback from parents indicated that this was now a preferred route for many of them.

Whilst the route in itself, has not led to a reduction in NO_2 concentrations, it has had the effect of reducing the public's exposure to the elevated levels in this part of the High Street. Additionally, it may also have encouraged parents who previously drove their children to school through the AQMA to avoid walking along the canyon, to walk to school using the cleaner route.

In addition to the clean walking route, NFDC and HCC also joined forces with both St Michaels and All Angels Infant School and Hounsdown School in Totton to develop an anti idling campaign encouraging drivers to switch of their engines whilst waiting at the traffic lights.

Pupils at Hounsdown School were invited to design an anti idling banner to be placed at and around Lyndhurst School highlighting the pollution issue and how individuals can make a positive difference to a reduction in NO_2 concentrations. The winning design in figure 14 was duly produced both as banners and as posters and was unveiled in February 2018 when NFDC, HCC, pupils, teachers and governors from both schools and the local press met to push the campaign forward. Posters were also placed in the majority of shops and businesses along the street canyon where they could be seen by drivers queuing at the traffic lights. The effectiveness of the anti idling campaign was measured by undertaking simple traffic surveys before and after the placement of the banners and posters.

Figure 14
winning poster, anti idling campaign

The surveys which counted the numbers of vehicles switching off their engines pre and post banner did not show a significant decrease in engines left idling whilst stationary. Whilst this was initially disappointing, it is hoped that the presence of the banners along with a greater public understanding of air quality issues, will encourage drivers to switch off engines and/or engage the automatic engine cut off when queuing at the Lyndhurst lights.

3.10 • Option 10
Areas for development

Ongoing liaison with planning authority

The AQMA in Lyndhurst is relatively small and narrow extending back 25m from both kerbs on the High Street. The area itself is developed with high street shops and accommodation above the shops. The buildings within the AQMA are unlikely to be redeveloped substantially and so an increase in traffic as a result of redevelopment in this area is unlikely.

When the action plan was produced in 2008 there was an area of land just outside the AQMA that had been partly redeveloped. This site could potentially have been developed as a shopping area which may have contributed to an increase in traffic through the AQMA. In fact, the area has now been redeveloped as housing and no increase in NO_2 concentration has been noted as a result.

There remains however potential for redevelopment towards the east of the town on the site of the former Lyndhurst Park Hotel.

This area falls within the planning jurisdiction of the New Forest National Park Authority and due to the National Park status, it is highly unlikely that any substantial development will occur which would have a long term detrimental impact on air quality in Lyndhurst. However, to ensure there is consideration with regards to local development and air quality, the District and National Park planning officers are aware of the AQMA in Lyndhurst and would consult with Environmental Health Officers on any future developments.

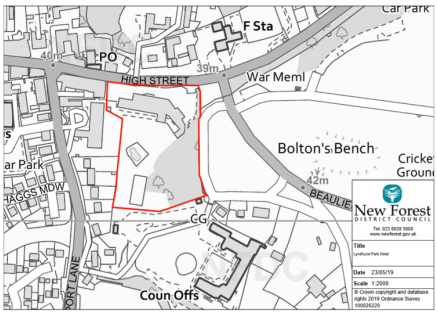


Figure 15
Area of potential redevelopment, Lyndhurst Park Hotel

3.11 • Option 11
Review of bus routes and services

Implemented and ongoing

Lyndhurst, whilst being in the centre of the New Forest, has a limited bus service when compared to more urban areas.

In 2008 there were no priority bus routes on services into Lyndhurst, therefore buses were often held up in congestion around the town. As a result the service was unreliable and unattractive for use as an alternative means of transport for the public.

A priority bus lane has now been introduced on Shrubbs Hill Lane allowing buses (and taxis) to by-pass queuing traffic in the right hand lane and merge into the top of the High Street at the top of Shrubbs Hill Lane. Whilst this may not have led to a drastic reduction in NO_2 concentration, faster journey times may have encouraged bus use.

In 2008, HCC, in partnership with Solent Blue Line bus company, NFDC and New Forest National Park, operated 2 open top tourist buses from May to September. These tourist buses run a route visiting the major towns and villages within the New Forest. Passengers pay a set fare and can hop on and off the service at any stop, with a bus visiting each stop every hour. The buses also have facilities to take bicycles.

The aim of the tourist buses is to encourage visitors to the area to enjoy the New Forest without the worry of getting lost or using their car. A Day Out Guide is available to encourage visitors using the tour to get off the bus to visit towns and walk and cycle in the Forest. This service proved popular and New Forest Bus Tours now operate 3 routes covering all main towns and villages around the New Forest.

Whilst it is acknowledged that some passengers may have to drive into the centre of Lyndhurst (and therefore through the AQMA) to catch the tourist bus, the bus can be picked up at any pre set stop. With tourists using the bus service, the overall number of tourist journeys using cars throughout the New Forest is reduced which has a positive impact on overall air quality. As a further benefit it is intended to replace the current fleet (currently Euro 3) with Euro 6 engines in 2021.

In 2018 our neighbouring Authority, Southampton City Council secured £2.6milion from the Governments Clean Bus Technology Fund to reduce harmful emissions from buses. This will be used to retro fit 145 buses that operate in the city. 15 of Southampton's 35 bus routes extend beyond the City into areas including Lyndhurst which will therefore benefit from the cleaner vehicles.

3.12 • Option 12
Review of cycle routes

Implemented

The New Forest contains many recreational cycle routes which run across the forest and link forest towns. Such routes are popular with visitors to the area, however it is unlikely that recreational cycling will have an impact on air quality in Lyndhurst as most recreational cycling routes run across the forest rather than into Lyndhurst.

However a new cycle route between Ashurst and Lyndhurst has now been constructed. This completes a route from Totton / Southampton through Ashurst to Lyndhurst, encouraging cyclists to leave their vehicles at home and cycle into Lyndhurst. With a number of NFDC employees living in the Totton / Southampton / Ashurst area, employees may be encouraged to cycle into the Authority's Lyndhurst office.

It is acknowledged that the new cycle route will reduce vehicles entering Lyndhurst on the west bound A35, and is thus unlikely to reduce vehicles entering the AQMA with the highest exceedances of the nitrogen dioxide annual mean. However any route that encourages a reduction in vehicle use is a positive outcome with regards to improvements in air quality.

3.13 • Option 13
Review car parking in Lyndhurst

Discounted

The 2008 report suggested that a parking survey be carried out to identify the main users of the car park, i.e. locals or visitors to assess the acceptability of the current location of the car park. This has not been undertaken and has been discounted since there is no other feasible area within the village which could be used for car parking.

Parking charges and how they influence a drivers willingness to use alternative means of transport could have an effect on car use in Lyndhurst but this is a complex matter and not considered solely as a means to improve air quality.

3.14 • Option 14
Review of NFDC's fleet management

Currently being pursued through the task and finish group

The Authority has to provide numerous services throughout the district, for example refuse collections, and operates a fleet currently made up of 141 vans; 23 cage vehicles and street sweepers; and 37 refuse collection vehicles. Some of the Authority's fleet vehicles run through the AQMA in Lyndhurst. Therefore it is important that these vehicles are operated correctly and maintained regularly to ensure emissions are kept to a minimum.

The Council has recently set up fuel efficient vehicles and infrastructure task and finish group which held its inaugural meeting in October 2018. Its purpose is to evaluate and make recommendations to the Portfolio Holder on:

- Options for achieving optimal arrangements to establish a cost-effective, energy efficient, fleet of Council vehicles; and

- Options for providing infrastructure and charging points for electric vehicles in council-owned public car parks; leisure centre and office centre car parks.

Clearly, the NFDC vehicle fleet will operate throughout the District including Lyndhurst. Working towards an energy efficient clean fleet is unlikely to make a significant contribution to air quality in Lyndhurst, however all measures to improve air quality in the district would be commended.

The task and finish group has advised the majority of the Council owned vehicles comply with the current emission standards Euro VI, those that do not comply are older vehicles due for renewal. The group has also decided to employ the Energy Savings Trust who offer an ultra low emission vehicle review to identify where plug in or alternatively fuelled vehicles may be appropriate as well as assessing operational and financial constraints and requirements for renewing the Councils fleet.

In addition the fuel efficient vehicles and infrastructure group has commissioned a feasibility study in respect of the installation of electric charging points in Council owned public car parks. At this stage, the provision of charging points for electric vehicles in Lyndhurst is unlikely to have a significant impact on air quality but encouraging the use of such vehicles in general is welcomed.

3.15 • Option 15
Vehicle emission testing

Discounted

An Authority with an AQMA can apply to the Secretary of State for Transport for the power to undertake emission testing and issue fixed penalties under the Road Traffic Regulations 2002. Emission testing in Lyndhurst may raise the profile of air quality and encourage motorists to have their vehicles properly maintained. Historically, VOSA have undertaken vehicle emission testing issuing fines and warnings to drivers whose vehicles are found to be polluting.

This service is no longer operated and as result has not been progressed.

3.16 • Option 16
Investigate the use of NOx absorbing paving surface

Discounted at the present time

A recent development pioneered by the Japanese is the production of paving slabs which absorb oxides of nitrogen (NOx). The paving slabs contain titanium oxide (TiO2) which uses sunlight (UV) to absorb the NOx onto its surface. The NOx is then degraded and washed off the paving slab by rainwater.

The pavements within the AQMA are narrow and it would need to be determined if the surface area of the paving slabs is sufficient for the effective absorption of NOx. The paving slabs also have an associated cost and a limited life. It may be beneficial to see if this technology becomes more commonplace and to judge its effectiveness before pursuing this option.

3.17 • Option 17
Increase public awareness of air quality issues

Implemented and ongoing

Whilst the Environmental Protection department within NFDC has continued to fulfil its duty to review and assess air quality within its district, the Authority needs to ensure the public, council employees and council members are kept informed with regards to these issues.

Currently air quality information and continuous analyser results are available through the Authority's website; **newforest.gov.uk** and the necessary council committees and parish council are informed on progress with regards to air quality issues.

Further work, expanding the theme of air quality has been undertaken through the clean route to school route and the anti idling campaign detailed in option 9. In addition NFDC is working pro-actively with other Hampshire Authorities to engage with the public on air quality with the aim to pool resources, target specific air quality projects and bid for joint funding for larger air quality schemes.

3.18 • Option 18
Review air quality monitoring within the New Forest

Implemented and ongoing

Since the production of the 2008 AQAP, NFDC has continued to monitor air quality throughout the district. The results of the last 5 years monitoring at Lyndhurst have shown a decrease in the concentration of nitrogen oxides to below the UK air quality objective of 40µg/m^3. This is welcome news but further work is required to establish the causes of this decrease and ensure the downward trend continues.

3.19 • Option 19
Do nothing

Discounted

Improvements in vehicle engines are predicted to cause a reduction in NO_2 over time and one option put forward in the 2008 plan was to do nothing and allow NO_2 concentration to reduce naturally. This was not however a viable option because the Local Authority has a duty under the Environment Act 1995 to produce and deliver an Action Plan to improve air quality once an AQMA has been declared.

A table summarising these options is shown in Figure 16 in appendix 1. This table is presented in a format required by Defra and includes supplementary data requested by them in the Local Authorities Annual Status Report.

Further air quality action plan options

The decrease in monitored nitrogen dioxide concentrations have been significant and should the current trend in monitored nitrogen dioxide concentrations continue the evidence is supporting revocation in the near future. However, considering the exact reason for the fall in NO_2 concentration is difficult to pinpoint, NFDC must be confident that current nitrogen dioxide concentrations in Lyndhurst can be maintained over the long term. Therefore further work with our partners and the community will continue with the aim of maintaining or improving concentrations, both for the health benefits associated with this and in order to obtain the required confidence in the long term concentrations for Lyndhurst before the Council considers revoking the current AQMA.

4.1 • Further Options to improve air quality

The analysis of the 19 options given in section 3 shows that many have now been dismissed or forwarded as far as reasonably practical. The remaining options worth pursuing may be considered the 'softer' measures and involve engagement with the wider community to bring about further improvements in air quality. In addition to the options presented in the 2008 report, additional initiatives have also been carried out across the District as part of the Councils commitment to improving air quality throughout the area. Many of these initiatives involve joint working with neighbouring authorities such as Southampton as well as local businesses, schools and the wider community.

Table 5 (below) provides further information on these incentives.

Table 5
Current options to improve air quality in Lyndhurst

Option	Action	Organisation involved	Assessment criteria	Time scale
Enforcement of parking and loading restrictions in High Street	Carry out checks/ provide guidance/ enforcement action	NFDC Enforcement team to undertake targeted observations in AQMA	Reduced obstruction in the High Street allowing improved traffic flow. To be measured by observation and number of parking charge notices issued	Spring/Summer 2019
Enforcement of HGV restriction through AQMA	Checks of vehicles passing through High Street	Police, NFDC enforcement team	Reduction in number of HGV's through AQMA measured via observation and traffic counts	Spring/ Summer 2019

Further promotion of clean walk to school route at St Michaels and All Angels School	Distribution of HCC leaflet with map of clean route. Promote route during 'Walk to School week'.	NFDC to liaise with school to encourage use of the clean walk to school route.	Increase number of children using the clean walk to school route. To be measured by observation.	May 2019
Further promotion of anti idling campaign	Replacement of banners and posters in High Street area.	Liaison between NFDC and Parish Council to reposition banners and promote scheme.	Reduction in idling at the traffic lights measured via survey.	2019/20
Reducing trade vehicle movements within the AQMA	Advice and guidance to business on restricting deliveries where possible.	NFDC, Parish Council, Local Businesses to produce information leaflet on means of minimising vehicle movements within the AQMA.	Impact likely to be slight but could be measured via observational surveys.	2019/20
Improving motorway signage	Directing drivers to junction 2 M27 in peak periods.	To request HCC arrange traffic monitoring and activation of signage on M27 during periods of congestion in the High Street.	Reduced congestion and pollution at busy times measured by diffusion tubes and number of occasion in which signage was used.	2019/20
Obtaining traffic counts of vehicle movement through the AQMA including vehicle type	Increased data on vehicle numbers and type traveling in the AQMA allowing resources to be directed appropriately.	NFDC and HCC to arrange traffic counts at all points into Lyndhurst.		2019 and future years
Promotion of car sharing	Encourage the use of car sharing at NFDC.	NFDC to produce procedure to facilitate communication between staff to enable lift sharing.	Measured by survey of cars in car park.	2019/20

In addition to the Lyndhurst based initiatives, there are also District wide measures that would contribute to improvements in air quality in Lyndhurst.

Table 6
District wide measures to improve air quality

Option	Action	Organisation involved	Assessment criteria	Time scale
Assessment of vehicle movements and air quality in Emery Down	Use of diffusion tubes and traffic surveys	NFDC, HCC	Analysis of monitoring data	2019/20
Collaboration with Public Health England	To promote AQ issues and engage with the Public. To encourage the use of alternative means of transport and promote the benefits of walking/ cycling.	Regional meetings with other LA's and Public Health England. Production of leaflets/website information encouraging alternative modes of transport.	Increased take up of alternatives means of transport	2019/20
Assess council fleet emissions	To increase numbers of low emission vehicles within the Council fleet	NFDC has set up a task and finish group to forward this. Procurement of an electric vehicle for carpark wardens has been suggested as a first step. (Operations Service leading this).	To increase numbers of low emission vehicles within the Council fleet	Ongoing
Electric vehicle charge points	Installation of electric charge points on council owned land.	Council working with HCC scheme to review Council owned land and car parks with a view to install electric vehicle charge points by 2020.	Charging points installed at Appletree Court & Ringwood and other sites being reviewed.	Ongoing
Sustainable travel	Working in partnership to engage in sustainable transport plans, clean air walking route and local air quality monitoring schemes	NFDC, New Forest National Park, HCC, Local Schools.	Encourage number of children walking to school or using clean walk to school route. Promote car sharing in house and with other offices.	Lyndhurst Infant school clean walk to school route in place 2017 and promoted again May 2019. Development of NFDC transport plan 2019 onward

Sustainable travel	To implement cycling infrastructure as an extension of the western approach cycling scheme in Southampton to the A35, Totton.	HCC, SCC and New Forest National Partk Authority.	This scheme is to encourage increased cycling between New Forest and Southampton, encourage active travel and reduce car trips on the A35.	Ongoing
Council Strategy	Clean Air / Air Quality Strategy	NFDC	A long term strategy outlining the Council's aims, objectives and actions to improve air quality across the district	To be developed
Anti idling campaigns	Encourage engines to be switched off at all rail crossings in District: Brockenhurst, Totton, Lymington	NFDC	Reduction in idling at the crossings measured via survey	
Council Strategy	Health and Wellbeing Strategy		A long term strategy outlining the Council's aims, objectives and actions to improve health and wellbeing across the district which link in to the Joint Strategy Assessment	To be developed
Clean Air Network	To support Southampton City Council in the Clean Air Network scheme for residents and businesses within New Forest	NFDC/Southampton City Council		Ongoing
Engagement	Working in partnership to promote schemes to improve local and regional air quality, for example linking air quality and health and well-being schemes (increasing activity) by providing and promoting local walking and cycling routes	Council departments, New Forest National Park Authority, Local Authorities and external bodies such as Environment Agency, industry		Ongoing

Tables 5 and 6 are summarised in Appendix 2

4.2 • Implementing further air quality options

To continue to develop the schemes listed above and to identify other potential means of improving air quality it is intended that a community working group will be convened comprising of the following stakeholders:

- NFDC Portfolio holder for the Environment;
- NFDC (Environmental Protection, Enforcement, Transportation);
- NFNPA (sustainable transport)
- HCC;
- Lyndhurst Parish Council;
- local schools;
- local businesses

who could work together to get the most out of the existing options and possibly to develop new options to reduce NO_2 concentrations further in Lyndhurst.

Some of these options particularly lend themselves to a community approach and examples of how they may be progressed with the working group include:

1) Working with the enforcement team to enforce the parking and loading restrictions in the High Street, possibly concentrating patrols over dedicated weeks. For example the Clean Air day in June.

2) Further promotion of the clean walk to school route to coincide with the HCC 'Walk to School' week in May.

3) Further promotion of the anti idling campaign with help from the Parish Council in identifying locations for banners and posters.

4) Developing and promoting a car sharing scheme for NFDC employees at Appletree Court

5) Working with businesses to reduce vehicle movements within the AQMA for example by:

- Ensuring deliveries are made out of peak times to avoid congestion
- Ensuring deliveries are grouped as far as possible to minimise the number of deliveries to the business
- Ensuring delivery vehicles park appropriately

6) Working with HCC to continue the use of motorway signage directing drivers to use Junction 2 rather than 1 when leaving the M27 during busy times

7) Working with HCC to obtain traffic counts both of Lyndhurst and Emery Down.

8) Developing an assessment of traffic flow and its impact through Emery Down

It is NFDC's intention that the community working group will start meeting at the beginning of 2020.

4.3 • Additional soft options

In addition to these options there are a number of other generalised soft options to promote local engagement which could be promoted throughout the village. The most appropriate means of communicating this advice to the wider public is a matter which would benefit from discussion at the community group meeting with all interested parties. Table 7 (below) provides further information.

Table 7
Options to promote local engagement to improve air quality

Category	Action
Vehicle	Encourage drivers to find out about local public transport and car share schemes to replace driving to work, school, business trips or weekends away. Encourage the use of local bus services. For example during the summer, bus companies in the New Forest operate hop on / off services throughout the district and to local beaches, often with offers to some local attractions. Encourage the use of cycle routes in the area and across the New Forest. Encourage the use of My Journey Planner website to identify transport options, routes (including fastest and quietest) and public transport details. Encourage drivers to change the vehicles air circulation from pulling in external air to re-circulating internal air to stop drawing the surrounding air pollution into the vehicle. Encourage eco-driving such as anticipating traffic flow, maintaining a steady speed at a low revs per minute (RPM) and shifting up through the gears early. This will not only reduce pollution from vehicles, but save on fuel consumption. Encourage regular vehicle maintenance including checking tyre pressures monthly.
Get Active	Encourage residents to leave the car at home and walk to local shops or school, even if it is just once or twice a week. Encourage the use of walking and cycling routes to get active and leave the car at home.
Plan ahead	Promote planning ahead and the consideration of the small steps that could be taken to reduce pollution, for example planning journeys without the use of a car and car sharing Encourage the use of clean walking routes - It may be possible to take footpaths and streets away from busy high street or areas of local traffic congestion therefore avoiding areas of higher air pollution. When buying or leasing a new vehicle (private or business), encourage the consideration of vehicle emissions and fuel type in addition to the other typical considerations such as miles per gallon, insurance group and safety. Increase awareness of air pollution forecasts for the local area, particularly for those who suffer from respiratory issues.

The options highlighted in this chapter have been suggested as practical means of maintaining and improving upon the monitored NO_2 concentrations in Lyndhurst. Their effective implementation will require collaborative working with partners such as HCC, Lyndhurst Parish Council, local schools and businesses and the wider community.

Conclusion

This report aims to review the objectives of the 2008 AQAP which sought to reduce concentrations of nitrogen dioxide, predominantly from traffic, within the Lyndhurst AQMA in pursuit of the nitrogen dioxide annual mean objective. Monitoring over the intervening period has shown a steady decline in NO_2 concentrations over the last seven years with the objective having been met since 2015. This trend indicates the decline is not weather related but rather is a response to on-going actions including both technological improvements to engines and the impact of measures taken by this and other agencies to improve local air quality.

The report has shown that some of the options have now been rejected, others have been implemented and some remain as viable schemes to pursue in the future in tandem with additional plans which have been developed over the intervening years.

The majority of the remaining options may be considered a 'softer' approach to improving air quality and rely on a change in behaviour rather than in physical alterations to roads and traffic flows. Such schemes are likely to be most effective when all members of the community and its stakeholders are involved in their implementation. To accomplish this it is intended that a working group be convened to assess the current options, identify any additional options and how best to implement and promote them.

Additionally, developments undertaken by our neighbouring Authorities may also bring about improvements within Lyndhurst such as the Clean Air Zone work undertaken by Southampton City Council. This may see a rise in cleaner vehicles entering and leaving the City many of which may have made part of their journey through Lyndhurst.

This report also highlights the challenges faced with monitoring air quality and associated traffic flow over a period of years and the necessity of obtaining traffic data from the same locations and during similar time periods in order to make meaningful comparisons between data sets. The traffic data obtained in 2019 will provide a baseline for future monitoring. This may be of particular benefit in an assessment of traffic flows through Emery Down where it has been suggested that traffic flow and congestion through the village has increased. Continued monitoring is required to ensure that improvements in Lyndhurst have not come at the expense of exceedances of the air quality objectives in Emery Down.

It is anticipated that this report will be reviewed in two years along with a detailed review of air quality monitoring data. If, as expected monitoring data reflects a continuing trend of improvement in air quality, the Local Authority will consider revoking the AQMA in Lyndhurst. This view has been supported by DEFRA in their commentary on the submission of the NFDC ASR 2019.

Appendix 1 - Progress on Measures to Improve Air Quality (2008 Action Plan)

Figure 16

Measure no.	1	2	3	4	5	6
Measure	Bypass	Improvements to A337 and High St. junction	Additional road traffic management scheme	Enforcement of heavy goods vehicle restriction	Installation of variable messaging system	Enforcing current parking restrictions
EU category	Transport Planning and Infrastructure	Traffic Management	Traffic Management	Traffic Management	Traffic Management	Traffic Management
EU classification	Other	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	Other	Other	UTC, Congestion management, traffic reduction	Other
Organisations involved and Funding Source	HCC (lead + funded) + NFDC Environmental Health (EH)	HCC (lead + funded) + NFDC (EH)	HCC (lead + funded) + NFDC (EH)	Police - own budget	HCC - unknown funding	NFDC (parking) - own budget
Planning phase	N/A	Completed (2008)	Completed (2008)	Continuous	Completed (2009)	Continuous
Implementation phase	N/A	Completed (2010)	AQ & traffic modelling (2009). 2025 for CCTV recognition	Continuous	Completed (2010)	Continuous
Key performance indicator	N/A	Traffic surveys to assess traffic movements and monitoring NO2	Traffic surveys to assess traffic movements and monitoring NO2	Traffic surveys to assess no's. of illegal HGV's and monitoring NO2	Traffic surveys to assess traffic flows and monitoring NO2	Enforcement figures and monitoring NO2
Reduction in Pollutant / Emission from Measure	Unknown	7 µgm-3	1-5 µgm-3	1–2 µgm-3	1–2 µgm-3	< 1µgm-3
Progress to date	Scrutiny review at County Council in 2008	No physical junction alterations Installation of long vehicle detection technology in High Street on approach to junction with Romsey Road. 'MOVA' system installed to work in conjunction with long vehicle detection.	Air quality and traffic modelling work completed. Additional traffic gating systems discounted due to impacts on vehicle flows. New Forest Transport Statement advises of schemes to install CCTV and number plate recognition around Lyndhurst to assist in overall traffic management.	County Council traffic survey	System installed	None
Estimated / Actual Completion Date	Option discounted (cost and environmental impacts)	Option to alter junction layout discounted (cost) Option to install long vehicle detection completed Option to install 'MOVA' completed	Traffic gating option discounted (impact on traffic flows) >10years for traffic management scheme.	Continuous	Completed	Continuous
Comments / Barriers to implementation	Option not feasible after scrutiny review	Monitoring at the automatic site has noted a decrease of 7µgm-3 since 2010. Real time analyser monitored compliance with AQO's in 2016. Observations have determined reduced congestion in terms of queue lengths and frequency of occurrence	Traffic management scheme will depend on funding from developers contributions. The scheme is not proposed as a 'vehicle charging' scheme.	HCC traffic survey showed a low percentage of illegal HGV's (~7% of all HGV's) travelling down High St.	System is only used when traffic is congested on A337 and the traffic signs are available for use.	Requirement to regularly meet with traffic wardens to discuss issues / progress

Measure no.	7	8	9	10	11	12
Measure	Review signage around Lyndhurst	Review and support New Forest District Council's travel plan	Development of school travel plan	Areas of planned developments	Review bus routes (incl. green transport)	Review cycle routes
EU category	Traffic management	Promoting Travel Alternatives	Promoting Travel Alternatives	Alternatives to private vehicle use	Transport Planning and Infrastructure	Transport Planning and Infrastructure
EU classification	Other	Workplace Travel Planning	School travel plans	Other	Bus route improvements	Cycle network
Organisations involved and Funding Source	HCC - own budget	NFDC - own budget	HCC - unknown funding	NFDC (EH and Planning) + New Forest National Park planning authority - own budgets	HCC + NFDC (transport) - own budgets	HCC + NFDC - own budgets
Planning phase	Completed (2011)	Continuous	Continuous	Continuous	Continuous	Completed (2008)
Implementation phase	Completed (2012)	Continuous	Continuous	Continuous	Continuous	Completed (2010)
Key performance indicator	Visitor surveys	Travel surveys of Council staff and monitoring NO2	Travel surveys of school travel and monitoring NO2	None	Travel surveys to assess use of public transport and monitoring NO2	Travel surveys to assess use of cycle routes and monitoring NO2
Reduction in Pollutant / Emission from Measure	< 1µgm-3	< 1µgm-3	< 1µgm-3	< 1 µgm-3	< 1 µgm-3	< 1 µgm-3
Progress to date	7.5t restriction signage reviewed	Incentives to car share, use alternative transport/fuel efficient vehicles	School travel plan approved 2006. Improved pathway to school via church avoiding High Street completed	Planning assessed for air quality impacts, including provision of air quality GIS maps to planning	Bus priority lane installed in Shrubbs Hill Road.	Installation of additional cycle parking in Lyndhurst. Additional cycle schemes identified in New Forest Transport Statement including cycle routes to rear of primary school. Completion of Ashurst to Lyndhurst cycle route
Estimated / Actual Completion Date	2016	Continuous	Continuous	Continuous	Bus priority lane (Shrubbs Hill Road) completed	Cycle parking completed. >10yrs for additional schemes
Comments / Barriers to implementation	Further work required	'eCO2 champions' group set up to manage climate change and sustainability responsibilities for the Council but not maintained – Revived in 2018 with Fuel efficient Vehicles and Infrastructure task & Finish Group	New links with HCC school travel team. Engagement made with 3 local schools to discuss AQ / sustainable travel options		Option unlikely to reduce NO2 emissions greatly, but encourages use of public and green transport into and through Lyndhurst	Additional schemes currently at pre-feasibility stage

Measure no.	13	14	15	16	17	18
Measure	Review car parking	New Forest District Council vehicle fleet management	Vehicle emission testing	Investigate use of absorbing paving surface	Increase public awareness of air quality	Review air quality monitoring
EU category	Transport Planning and Infrastructure	Vehicle Fleet Efficiency	Vehicle Fleet Efficiency	Transport Planning and Infrastructure	Public Information	Public Information
EU classification	Other	Driver training and ECO driving aids	Testing Vehicle Emission	Other	Via the Internet	Other
Organisations involved and Funding Source	NFDC (EH) - own budget	NFDC - own budget to date	NFDC	NFDC	NFDC (EH) - own budget	NFDC (EH) - own budget
Planning phase	2016	Completed (2008)	2012	N/A	Continuous	Continuous
Implementation phase	2016	Continuous	2013	N/A	Continuous	Continuous
Key performance indicator	Travel surveys and monitoring NO2	N/A	N/A	N/A	N/A	N/A
Reduction in Pollutant / Emission from Measure	< 1 µgm-3	< 1 µgm-3	< 1 µgm-3		< 1 µgm-3	N/A
Progress to date	Car parking reviewed by County Council	Assessment of council fleet. Staff using Council vehicles trained in eco-driving. Tracker equipment installed into vehicles. Review methods of working of council workers. Assessment of remaining Council fleet.	None	Option discounted due to lack of positive outcomes from trials with other LA's	Update website Instigation of the anti idling campaign	Additional monitoring completed
Estimated / Actual Completion Date	2018 to review car park usage	Continuous	Discounted	Discounted - technology not available	Continuous	Continuous Review every January
Comments / Barriers to implementation	County Council review determined no agreeable alterations to current car parking arrangement. Car park usage should be reviewed for air quality purposes.	Procurement of fleet vehicles being investigated				

Appendix 2 - Current measures to improve air quality

	1	2	3	4	5	6
Measure	Enforcement of loading restrictions	Enforcement of HGV restriction in High Street	Clean walk to school route	Anti idling campaign	Reduce trade vehicle movements	Improve motor way signage
EU category	Traffic management	Traffic management	Promoting travel	Traffic management	Public information	Traffic management
EU classification	Other	Other	School travel plans, promotion of walking	Anti idling enforcement	Via leaflets	Utc, congestions management, traffic reduction
Organisations involved and Funding Source	NFDC enforcement	Police, NFDC, Env Health	NFDC Env. Health, local school.	NFDC Env Health	NFDC Env. Health with community groups and Parish Council	HCC
Planning phase	Continuous	Continuous	Implemented in 2017, promoted again in 2019	February 2018	July 2019	System installed 2009
Implementation phase	Continuous	Continuous	May 2019	February 2018	Autumn 2019	Used sporadically
Key performance indicator	Traffic survey	Traffic surveys NO2 monitoring	Travel surveys	Traffic surveys NO2 monitoring	Traffic Surveys and questionnaires to businesses	NO2 monitoring
Reduction in Pollutant / Emission from Measure		<1-2 µg/m3				<1-2 µg/m3
Progress to date	Surveys undertaken June 2019	Survey undertake June 2019	Increased no. of children walking to school during walk to school week	Poster, banner campaign in High street. To be reviewed again	To convene working party	System installed
Estimated / Actual Completion Date	Continuous	Continuous	May 2019	2020	2020	
Comments / Barriers to implementation	Survey showed no illegal parking during survey period	Only Police may take enforcement action. Resource intensive	Location of school means most children already walk	Many vehicles now have start/stop engines.	Businesses may be reluctant to changes delivery times or suppliers	System only used when there is congestion on A337 and signs are available

	7	8	9	10	11
Measure	Sustainable travel	Installation of electric charge points	Review council fleet	Increase awareness of issues	Smarter working
EU category	Vehicle fleet efficiency	Vehicle fleet efficiency/promoting low emission transport	Promotion of low emission transport	Policy guidance and development control	Promoting travel alternatives
EU classification	Promoting low emission public transport	Procuring alternative refuelling infrastructure	Company vehicle procurement	Other policy	Facilitate home working
Organisations involved and Funding Source	HCC, NFDC, National Park, Southampton City Council	NFDC	NFDC	NFDC, HCC Public Health England	NFDC
Planning phase	Continuous	Some points installed. Feasibility studies carried out 2019	One phase completed in 2008. Electric vehicle task and finish group set up 2018	Continuous	Continuous
Implementation phase		Ongoing	Possible purchase of electric vehicles 2019	Continuous	Much investment in 2018/19
Key performance indicator	NO_2 monitoring	NO_2 monitoring		Questionnaires from community groups	Work mileage costs
Reduction in Pollutant / Emission from Measure		Some points already installed	<1 µg/m3		
Progress to date			Task and Finish Group set up	Publication of AQAP	
Estimated / Actual Completion Date				Continuous	Continuous
Comments / Barriers to implementation	Requires long term investment from multiple agencies	Charge points in car parks take up parking spaces	Mileage range of electric vehicles		Not suitable for all employees

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
AQS	Air Quality Strategy
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
EU	European Union
HCC	Hampshire County Council
LAQM	Local Air Quality Management
NFDC	New Forest District Council
NFNPA	New Forest National Park Authority
NO_2	Nitrogen Dioxide
NOx	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less

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