Bath & North East Somerset Council

CONSULTATION DRAFT

Farrington Gurney and Temple Cloud Air Quality Action Plan

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

2020 – 2025

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Executive Summary

This consultation draft Air Quality Action Plan (AQAP) has been produced as part of our statutory duties required by the Local Air Quality Management framework. It outlines the action we will take to reduce the concentrations of nitrogen dioxide (NO_2) in the villages of Farrington Gurney and Temple Cloud in Bath and North East Somerset between 2020 and 2025.

This is the first action plan for Farrington Gurney and Temple Cloud following the declaration of Air Quality Management Areas in August 2018.

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

Bath and North East Somerset Council is committed to reducing the exposure of people in Bath and North East Somerset to poor air quality in order to improve health.

We have developed actions that can be considered within 5 broad topics:

- Traffic Management
- Public information
- Policy guidance and development control
- Promoting travel alternatives
- Transport planning and infrastructure

Our priorities are to reduce emissions produced by traffic, principally by smoothing the flow of traffic and reducing the 'stop/starting' of vehicles through the villages. Secondly to increase awareness in order to help residents reduce their exposure through making more informed choices.

In this AQAP we outline how we plan to effectively tackle air quality issues within our control. However, we recognise that there are a large number of air quality policy areas that are outside of our influence (such as vehicle emissions standards agreed in Europe), but for which useful evidence may exist and so we will continue to work

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

with regional and central government on policies and issues beyond Bath and North East Somerset Council's direct influence.

Responsibilities and Commitment

This AQAP was prepared by the Environmental Monitoring team of Bath and North East Somerset Council with the support and agreement of the following officers and departments:

- Environmental Protection
- Transport – including Transport Planning
- Public Health Team
- Highways – including Traffic Management
- Sustainability
- Planning Policy
- Parks & Green Spaces
- Sustainable Transport – including the School Travel Plan Officer

This AQAP consultation document has been approved by:

- Bruce Laurence, Director of Public Health
- Councillor David Wood, Cabinet Member for Climate Emergency and Neighbourhood Services and Ward Councillor for Mendip
- Councillor Ryan Wills, Ward Councillor for High Littleton

This AQAP will be subject to an annual review, appraisal of progress and reporting to the relevant Council Cabinet Members. Progress each year will be reported in the Annual Status Reports (ASRs) produced by Bath and North East Somerset Council, as part of our statutory Local Air Quality Management duties.

If you have any comments on this draft AQAP complete the online questionnaire at:

www.bathnes.gov.uk/a37-air

or send your comments to the Environmental Monitoring Team at:

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BA1 1JG

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1 Introduction

This report outlines the proposed actions that Bath and North East Somerset Council will deliver between 2020 and 2025 in order to reduce concentrations and exposure to nitrogen dioxide in Farrington Gurney and Temple Cloud; thereby positively impacting on the health and quality of life of residents and visitors to Farrington Gurney, Temple Cloud and the wider Bath and North East Somerset area.

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

This Plan will be formally updated every five years. The progress of measures set out within this Plan will be reported on annually within Bath and North East Somerset Council's air quality Annual Status Report (ASR).

2 Summary of Current Air Quality in Farrington Gurney and Temple Cloud

2.1 Farrington Gurney Air Quality Management Area

The monitoring of NO_2 during 2017 indicated that an AQMA was required along the A37 through Farrington Gurney. The area shown in Figure 2.1 was declared in August 2018 following a public consultation exercise which was carried out between 19th February and 23rd March 2018.

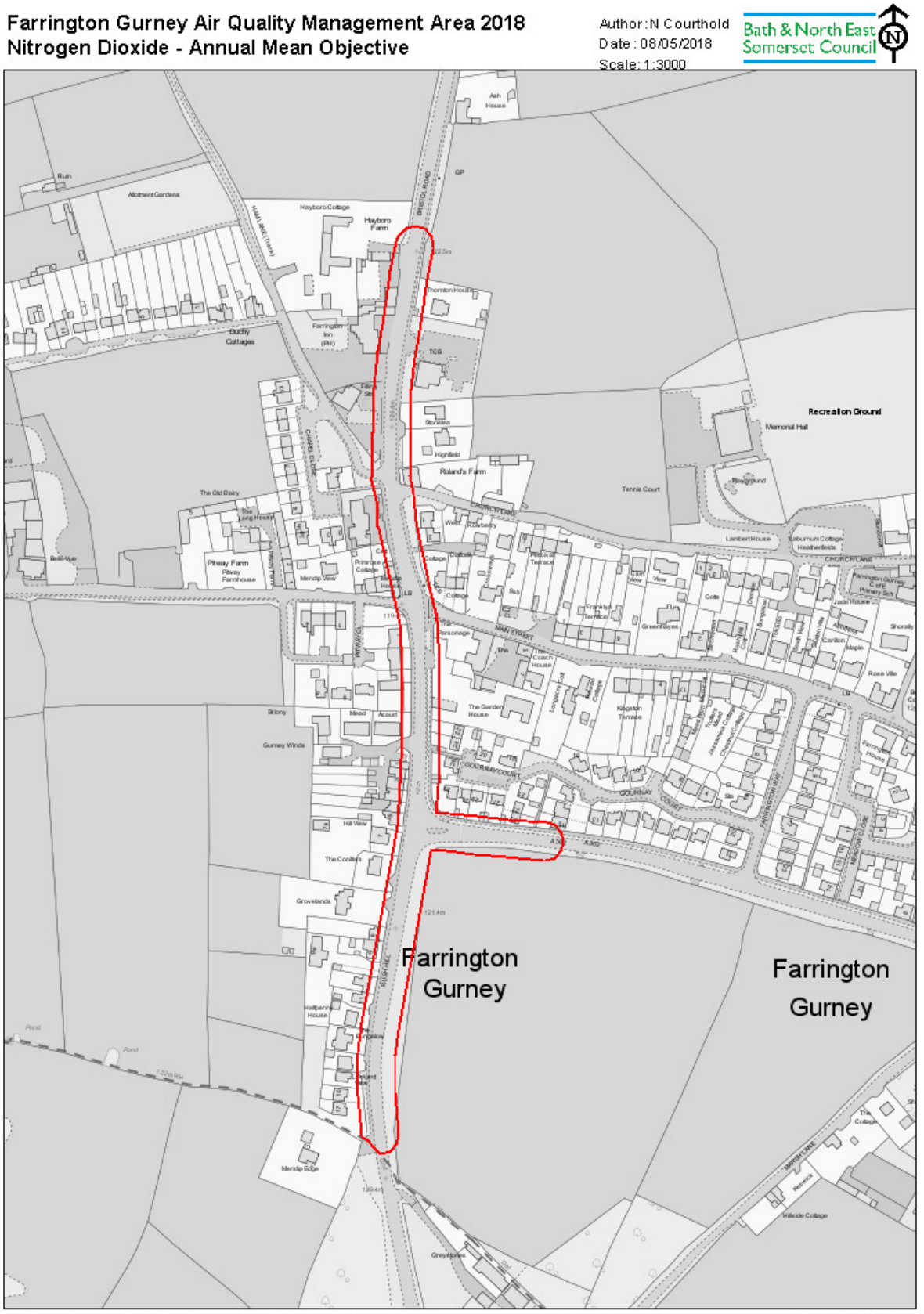
Exceedances of the annual average NO_2 objective were recorded in 2017, therefore the area was declared for breaching the annual average objective. Bath and North East Somerset Council's Annual Status Reports can be viewed on the website: http://www.bathnes.gov.uk/services/environment/pollution/air-quality/reports.

The population with the AQMA was estimated using 2011 Census data. The result of this was 44 as displayed Table 2.1.

Table 2.1: Estimated population within the Farrington Gurney AQMA

Number of residential properties whose façade is within the AQMA	18
Average number of people per dwelling	2.46
Estimated total population within the AQMA	**44**

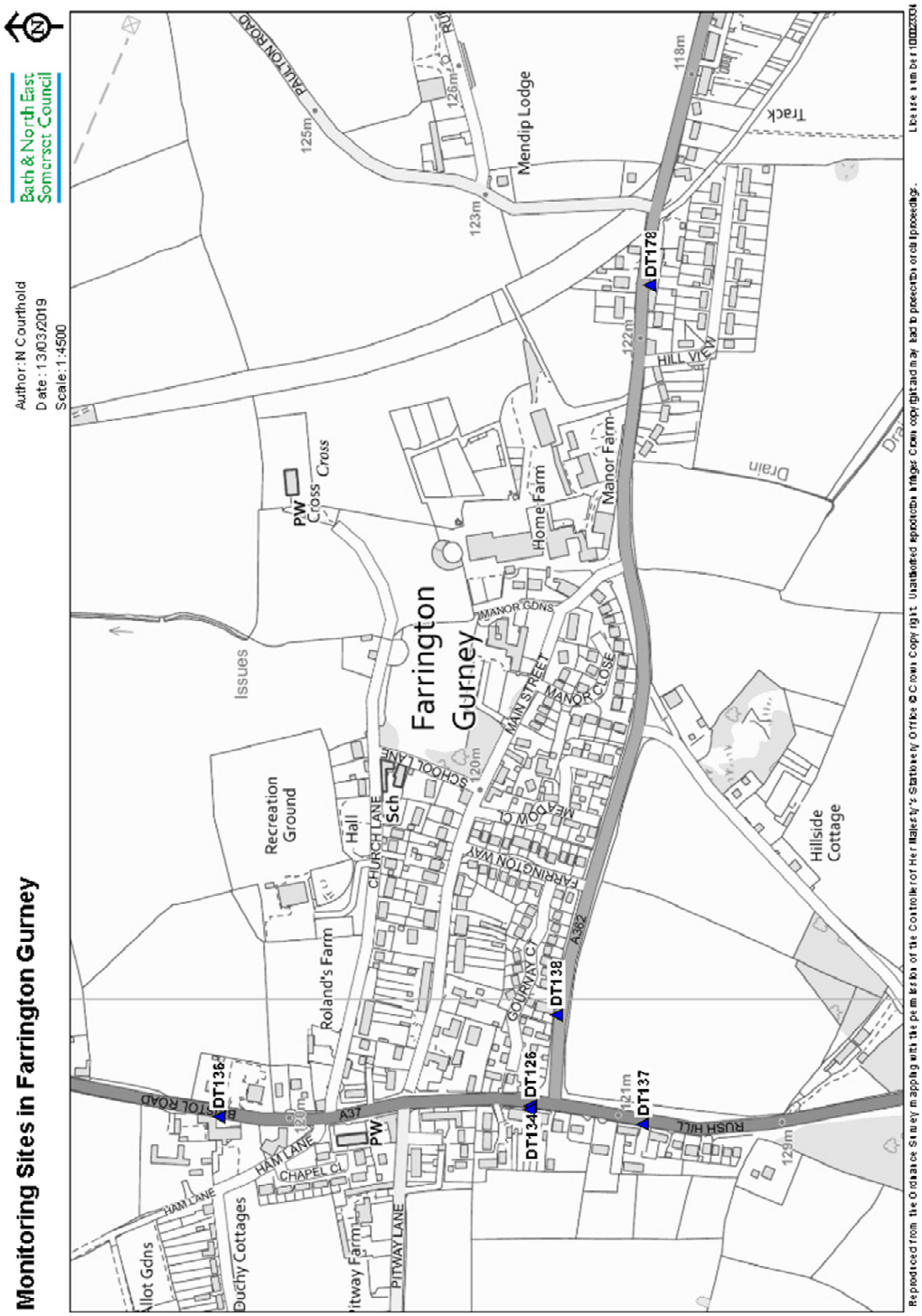
Figure 2.1: The declared Air Quality Management Area in Farrington Gurney



Monitoring

The monitoring in Farrington Gurney has been carried out using diffusion tubes; the locations of these are mapped in Figure 2.2.

Figure 2.2: Locations of the diffusion tube sites in Farrington Gurney



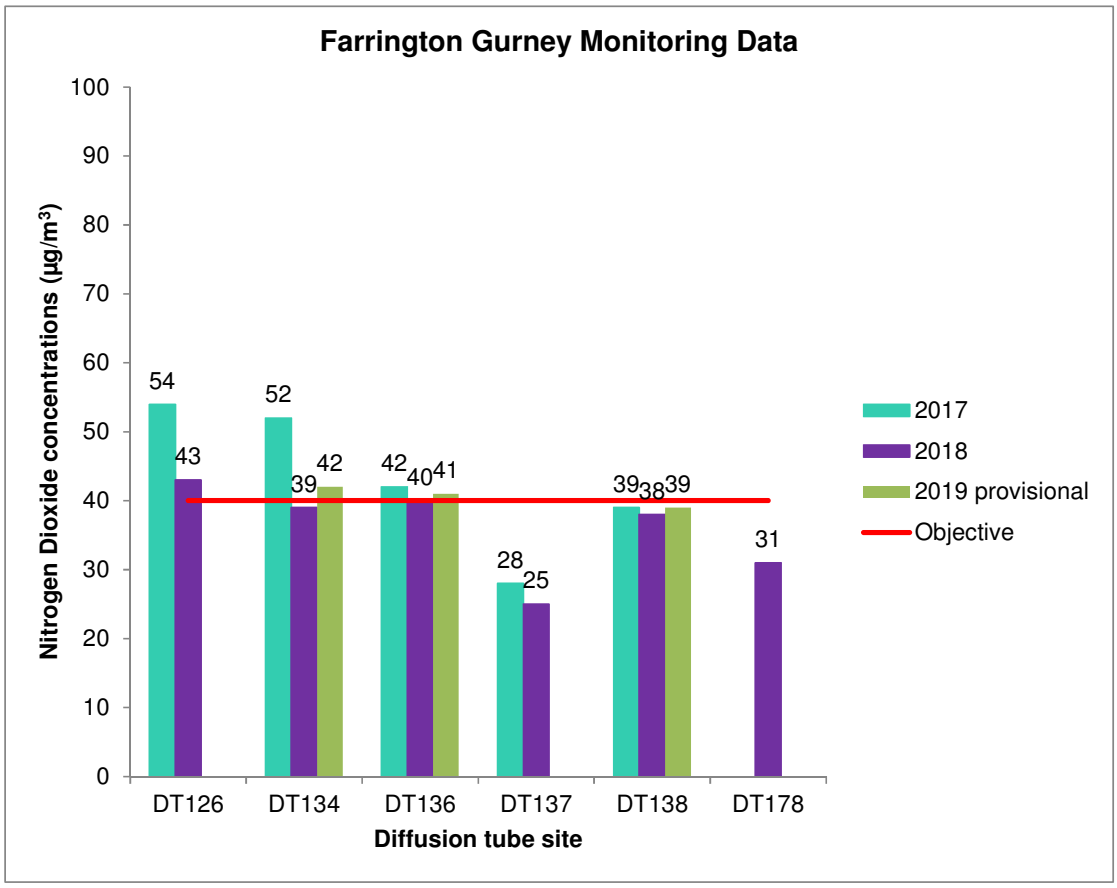
The 2017, 2018 and provisional 2019 data is tabulated below in Table 2.2. All values are annual average NO_2 concentrations (annually and bias corrected) in µg/m^3. The 2019 data provisional is and has not been bias corrected. It is shown here for information and due to its provisional status is not included in the air quality modelling for this report.

Table 2.2: The Farrington Gurney monitoring data

Location	2017	2017 at façade	2018	2018 at façade	2019 Provisional	2019 Provisional at facade
DT126	**54**	40	**43**	32	-	-
DT134	**52**	**52**	39	39	**42**	**42**
DT136	**42**	**42**	40	40	**41**	**41**
DT137	28	22	25	19	-	-
DT138	39	32	38	31	39	32
DT178	-	-	31	30	-	-

Figure 2.3 is a graphical representation of the data recorded at the diffusion tubes. The 40 µg/m^3 annual average objective was exceeded at three diffusion tube locations in 2017: DT126, DT134 and DT136, one location in 2018: DT126 and two locations provisionally in 2019: DT134 and DT136. In 2019, DT126 was removed as DT134 is located at the property façade at the same location and is more representative of exposure. DT137 and DT178 were removed as the concentrations recorded were well below the annual average objective.

Figure 2.3: Graphical representation of the Farrington Gurney data



2.2 Temple Cloud Air Quality Management Area

The monitoring of NO_2 during 2016 and 2017 indicated that an AQMA was required along the A37 through Temple Cloud. The area shown in Figure 2.4 was declared in August 2018 following a public consultation exercise which was carried out between 14th February and 23rd March 2018.

Exceedances of the annual average NO_2 objective were recorded and concentrations above 60 µg/m^3 were recorded. This indicated that the 1-hour average objective could also be exceeded and therefore the area was declared for both the annual and 1-hour average objectives.

Bath and North East Somerset Council's Annual Status Reports can be viewed on the website: http://www.bathnes.gov.uk/services/environment/pollution/air-quality/reports.

The population with the AQMA was estimated using 2011 Census data. The result of this was 158 as displayed Table 2.3. The local doctor's surgery 'Cameley Surgery' falls within the Temple Cloud AQMA. It is located towards the south of the AQMA and is of interest in terms of its visitors – their health and their mode of travel.

Table 2.3: Estimated population within the Temple Cloud AQMA

Number of residential properties whose façade or garden are within the AQMA	63
Average number of people per dwelling	2.51
Estimated total population within the AQMA	**158**

Figure 2.4: The declared Air Quality Management Area in Temple Cloud

Monitoring

The monitoring in Temple Cloud has been carried out using diffusion tubes; the locations of these are mapped in Figure 2.5.

Figure 2.5: Locations of the diffusion tube sites in Temple Cloud

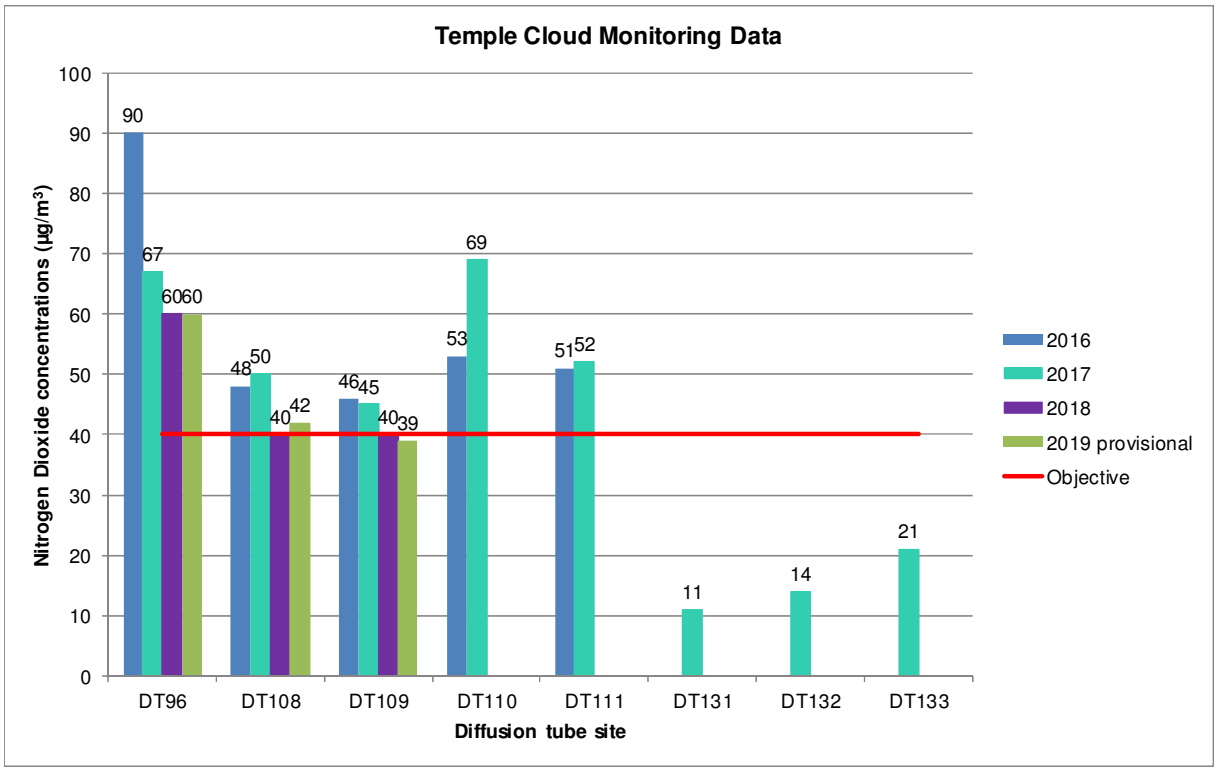
The 2016, 2017, 2018 and 2019 provisional data is tabulated below in Table 2.4. All values are annual average NO_2 concentrations (annually and bias corrected) in µg/m^3. The 2019 data is provisional and has not been bias corrected. It is shown here for information and due to its provisional status is not included in the air quality modelling for this report.

Table 2.4: The Temple Cloud monitoring data

Location	2016	2016 at façade	2017	2017 at façade	2018	2018 at façade	2019 Provisional	2019 Provisional at façade
DT96	**90**	**90**	**67**	**67**	**60**	**60**	**60**	**60**
DT108	**48**	35	**50**	34	40	27	**42**	29
DT109	**46**	**41**	**45**	39	40	34	39	33
DT110	**53**	40	**69**	**49**	-	-	-	-
DT111	**51**	**51**	**52**	**52**	-	-	-	-
DT131	-	-	11	9	-	-	-	-
DT132	-	-	14	12	-	-	-	-
DT133	-	-	21	16	-	-	-	-

Figure 2.6 is a graphical representation of the data recorded at the diffusion tubes. The 40 µg/m^3 annual average objective was exceeded at five diffusion tube locations in 2016 and 2017. One diffusion tube (DT96) exceeded in 2018 and two diffusion tubes (DT96 and DT108) have exceeded, based on the 2019 provisional data. In 2018 DT110 and DT111 were removed as they were as they were within the centre of the AQMA however, these are being reinstated in order to more accurately monitor the improvements in air quality and to understand whether the modelling is accurate. DT96 was retained as it was the original site and recorded the highest concentrations at the façade and DT 108 and DT109 were retained as they are located at each end of the AQMA. DT131-DT133 were removed as the concentrations recorded were well below the annual average objective.

Figure 2.6: Graphical representation of the Temple Cloud data



3 Bath and North East Somerset Council's Air Quality Priorities

3.1 Public Health Context

The health effects of air pollution are widely recognised and thoroughly researched. Long-term exposure to air pollution is linked to increases in premature death, associated with lung, heart and circulatory conditions. Short term exposure can contribute to adverse health effects including exacerbation of asthma, effects on lung function and increases in hospital admissions.

The recent COMEAP (Committee on the Medical Effects of Air Pollutants) report published in August 2018 estimated a mortality burden of 28,000 to 36,000 deaths attributable to the air pollution mixture (the combined impacts of NO_2 and $PM_{2.5}$) in the UK. This equates to an associated loss of 328,000 to 416,000 life years.

The resulting cost of health and social care due to air pollution places an economic burden on the National Health Service (NHS). The 2018 Public Health England (PHE) report 'Estimation of costs to the NHS and social care due to the health impacts of air pollution' quoted costs of £1.60 billion between 2017 and 2025 for the combined impacts $PM_{2.5}$ and NO_2 where there is robust evidence for an association between the disease and air pollution. This rises to £5.56 billion if all diseases, where there is currently less robust evidence for an association, were included in the calculation.

The Farrington Gurney and Temple Cloud AQMAs are both declared for the pollutant nitrogen dioxide. Specific health impacts for nitrogen dioxide include high concentrations leading to inflammation of the airways and long term exposure can increase symptoms of bronchitis in asthmatic children and reduced lung development and function.

3.2 Planning and Policy Context

There are several Policies and Strategies of national, regional, and local scale that have implications for air quality, and provide guidance and direction to achieve improvement in air quality. These are explored in more detail below.

3.2.1 National

National Planning Policy Framework

The Government's planning policies are set out in the National Planning Policy Framework (NPPF) which was most recently revised in February 2019.

Air quality is specifically mentioned within Section 9: Promoting sustainable travel and Section 15: Conserving and enhancing the natural environment. The following quote from Section 15 sets out the consideration that should be given to Air Quality Management Areas and air quality in planning policies and decisions:

> *"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."*

In line with the NPPF, measures that seek to improve air quality or mitigate the potential impacts of development should be identified and implemented.

Proposed Major Road Network

In 2017 the Government's Department for Transport set out the proposal to create a 'Major Road Network' (MRN) in line with the Transport Investment Strategy. The

intention being that the MRN would form an intermediate level between the national Strategic Road Network (SRN) and the rest of the local road network.

Five central objectives of the MRN were set out, these are as follows:

- Reduce congestion
- Support economic growth and rebalancing
- Support housing delivery
- Support all road users
- Support the Strategic Road Network

The A37 has been indicated on the proposed MRN. As a result, and assuming the A37 is included within the final MRN, a new funding stream could be available for major schemes and improvements that aim to raise the performance standards of the network, but the potential for this is limited as air quality is not listed as an objective and proposals related to bypasses, missing links, major structural works, major junctions and use of smart technology over £20m, take precedence.

3.2.2 Regional

West of England Joint Transport Study and Joint Local Transport Plan

The West of England Joint Transport Study (JTS) is a technical report which covers the long-term transport vision, up to 2036 and beyond, for the West of England region and aims to identify long term transport deficiencies and necessary improvements to mitigate the proposed growth in housing and jobs in the Joint Spatial Plan. The study recognises poor air quality, caused by traffic, as an important challenge and one that causes ill health and premature deaths. It also recognises that a growing economy could place additional pressure on the road network.

Following on from this, a new draft Joint Local Transport Plan has been developed and is due for adoption in March 2020.

Poor air quality has significant impacts on human health, which risks holding back economic growth due to the impacts of poor health on productivity. The Local Policy L5 will ‘Support the identification and implementation of measures that will improve air quality’.

This AQAP aims to address the issue of poor air quality in Farrington Gurney and Temple Cloud, and some of the measures within the plan relate specifically to traffic management, policy guidance and promoting travel alternatives. The AQAP is therefore in line with the objectives set out in the JTS.

Go Ultra Low West and Ultra Low Emission Taxi Infrastructure Scheme

Go Ultra Low West is a £7 million joint project between the West of England authorities. The project aims to accelerate and encourage the uptake of electric vehicles across the region.

The main objectives of the project include: to double the number of public electric vehicle charge points on the Source West network and install four new charging hubs across the region. Electric vehicles are zero emission in terms of nitrogen dioxide, and their uptake - where replacing existing conventional internal combustion engine vehicles - results in an improvement in local air quality.

Feasibility work has been undertaken for a number of sites including for rapid chargers (30 minute recharge) in Bath, Keynsham and Radstock and fast chargers (2 to 4 hour recharge) in Midsomer Norton, Farrington Farm Shop and numerous locations in Bath. The final number and locations of sites is yet to be confirmed but the installations will be complete by April 2021. This work could result in an increase of up to 44 charging bays across the authority area.

3.2.3 Local

The Sustainable Community Strategy

Bath and North East Somerset Council's Sustainable Community Strategy contains the ambition statement:

> *"To lead Bath and North East Somerset to an environmentally sustainable, low carbon and climate resilient future"*

The declaration of Air Quality Management Areas and the development of Air Quality Action Plans contribute towards this ambition by addressing the issue of poor air quality.

Draft Corporate Strategy 2020-2024

Bath and North East Somerset Council's Draft Corporate Strategy 2020-2024 identifies two core policies: *'tackling the climate and nature emergency and giving people a bigger say.'* Measures that aim to reduce air pollution, such as those within this Air Quality Action Plan, would positively exhibit progress within this area and at least not compromise the ability of actions undertaken in line with these policies to fulfil the desired outcomes.

Core Strategy

Air quality is detailed within Bath and North East Somerset Council's Core Strategy; paragraph 6.101 states:

> *"The reduction of the adverse effects of transport on climate change and air quality, particularly in Air Quality Management Areas (AQMA) in Bath and Keynsham and in future AQMAs, will be managed in accordance with the NPPF."*

This recognises the importance of Air Quality Management Areas in formally representing air quality issues within the planning framework; and directly links transport and air quality which is in line with the West of England Joint Transport Study.

Climate Emergency (Carbon Neutrality by 2030)

In March 2019, Bath and North East Somerset Council resolved to declare a climate emergency; to ‘provide leadership to enable carbon neutral B&NES by 2030’; to ‘enable citizen engagement’; and to oppose expansion of Bristol Airport’.

The West of England Combined Authority also declared a climate emergency and carbon neutrality by 2030.

The first outline action plan was completed in September 2019. The first phase of research has enabled a clear definition of three immediate priorities for action for the Bath and North East Somerset area and the scale and speed of ambition needed to achieve the 2030 target. In summary these are:

- Energy efficiency improvement of the majority of existing buildings (domestic and non-domestic) and zero carbon new build;
- A major shift to mass transport, walking and cycling to reduce transport emissions;
- A rapid and large-scale increase in local renewable energy generation.

An update report for the next stage of work will be brought to the meeting of the Climate Emergency and Sustainability Policy Development and Scrutiny Panel on 16 March 2020. The update report will identify the timescale for reviewing all the Council's existing strategies and plans to re-align them to the Climate Emergency.

Local Plan 2016-2036

Bath and North East Somerset Council has been preparing a new local plan for the district to cover the period from 2016 to 2036. Bath & North East Somerset Council will be working with our three neighbouring West of England councils and WECA to positively address the strategic planning needs the region, and will be jointly commissioning a refresh of the strategic evidence base to inform future plan-making, following the withdrawal of theWest of England Joint Spatial Plan.

The plan will make direct references to the Farrington Gurney and Temple Cloud Air Quality Management Areas to ensure they are given consideration when assessing development plans.

Placemaking Plan

Bath and North East Somerset Council's current Placemaking Plan contains Policy PCS3 Air Quality:

1. *Development will only be permitted where the proposal:*
   a) *does not give rise to polluting emissions which have an unacceptable adverse impact on air quality, health, the natural (in particular designated wildlife sites) or built environment or local amenity of existing or proposed uses from air polluting activities, or*
   b) *is not located where it would be at unacceptable risk from, or be adversely affected by existing sources of odour, dust and /or other forms of air pollution*
2. *New development located within an Air Quality Management Area should be consistent with the local air quality action plan. Where an air quality assessment is necessary to support an application, it should be proportionate to the nature and scale of development proposed and the level of concern about air quality*

This policy recognises the interactions between air quality and the planning system.

The Somer Valley Enterprise Zone

Land at Old Mills north of the A362 and to the east of Farrington Gurney has been allocated to employment for many years and was given 'Enterprise Zone' status in 2017. New transport infrastructure will be required to help facilitate the development of the site and this will be determined through the Local Development Order process.

Potential junction improvements at the A37/A362 junction identified thus far to support the SVEZ development, are within the Farrington Gurney AQMA. These improvements will create additional capacity by widening the A362 junction entry arm to the A37 and reviewing the traffic signal phasing to better optimise flows.

Temple Cloud with Cameley Action Plan

The Cameley Parish Council Action Plan is an evolutionary document that is reviewed annually. One of the main actions is listed as *'Hold B&NES Council to account for the Air Quality Action Plan and measures to reduce the impact of pollution on residents.'* It goes on to say that 'the Parish Council is committed to ensuring that all residents are kept informed of developments as the public consultation is undertaken and will positively engage with the team at B&NES Council to ensure that these results are acted on in order to reduce harm to our residents.'

Another action within the plan is listed as 'Reduce the impact of speeding'. This is stated as being 'raised as the number one concern by residents at the Annual Parish Meeting.'

3.3 Bath's Clean Air Plan

In July 2017, Bath and North East Somerset Council (B&NES) was directed by the Joint Air Quality Unit (JAQU) to produce a Clean Air Plan (CAP) to achieve statutory NO_2 limit values within the shortest possible time.

The Council's Cabinet approved the full business case for a Class C Charging Clean Air Zone (CAZ) with Traffic Management at Queen Square alongside supporting measures in January 2020. A Class C CAZ will impose charges on higher emission buses, coaches, taxis, private hire vehicles, HGVs, vans and light goods vehicles (LGVs) that do not meet the minimum emission standards set out in the Government's Clean Air Zone Framework.

The minimum standards are as follows:

- Euro VI/6 diesel vehicles (registered from approximately 2015)
- Euro IV/4 petrol vehicles (registered from approximately 2006)

Taxis, private hire vehicles, vans and LGVs not meeting the required standards will be charged £9 per day for moving in the zone. HGVs over 3.5 tonnes, buses and coaches that don't meet the standards will be charged £100 per day.

Bristol City Council received the same letter of direction and is also developing a Clean Air Plan. The A37 road which runs through Farrington Gurney and Temple Cloud originates in Bristol and ends in Dorchester. The Bristol Clean Air Plan may have an impact on the vehicles that travel along the A37, to and from Bristol, and therefore has the potential to impact on air quality in the AQMAs.

The Government's 'Air quality plan for nitrogen dioxide (NO_2) in UK (2017)' has placed legal obligations on many Local Authorities to develop local action plans to achieve statutory NO_2 limit values. The development of plans nationally may have wide reaching air quality implications.

The Bath Clean Air Zone is scheduled to become operational on 4th November 2020.

3.4 Source Apportionment

The main source of air pollution in Bath and North East Somerset, and in Farrington Gurney and Temple Cloud, is from road traffic.

3.4.1 Vehicular Split

The AQAP measures presented in this report are intended to be targeted towards the predominant sources of emissions within Farrington Gurney and Temple Cloud.

A two week Automatic Number Plate Recognition (ANPR) survey was undertaken by Bath and North East Somerset Council between the dates of 31/10/17 and 13/11/17. As part of the survey an ANPR camera was installed on the A37 in Temple Cloud. The survey provided traffic count data and was cross referenced with Carweb data to obtain information on vehicle type, fuel type and Euro standard. In 2019, as part of the A37 Options and Feasibility Study (Appendix C) a further 24 hour ANPR survey was carried out on the A37 Farrington Gurney to determine the vehicle split and traffic count on this section of the A37. In addition, a further Automatic Traffic Count (ATC) was also carried out in Temple Cloud to update the vehicle count information.

The figures and data presented in this section utilise the data from these traffic surveys to calculate the source apportionment for both Farrington Gurney and Temple Cloud as this was deemed the most accurate data available.

The graph in Figure 3.2 and Figure 3.3 displays the vehicular split obtained from the ANPR surveys. Petrol cars (37% in Temple Cloud and 36% in Farrington Gurney) and diesel cars (36% in Temple Cloud and 34% in Farrington Gurney) are the largest proportions of the vehicle fleet. Heavy Goods Vehicles (Artic and Rigid combined) make up around 6-8% of the fleet. Small percentages (less than 1%) of motorcycles, specialist vehicles, electric cars and petrol LGVs were also recorded but are omitted from this summary graph.

Figure 3.2: Graphical representation of the weekday average vehicular split (%) obtained from the 2017 ANPR survey in Temple Cloud

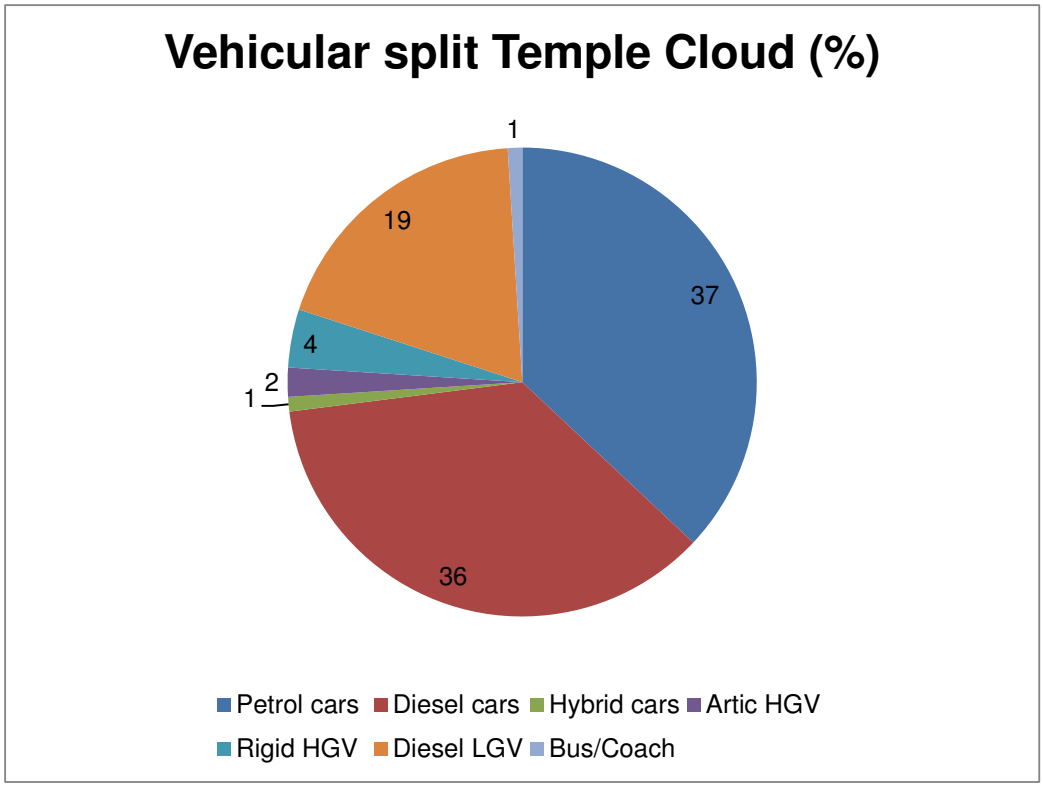
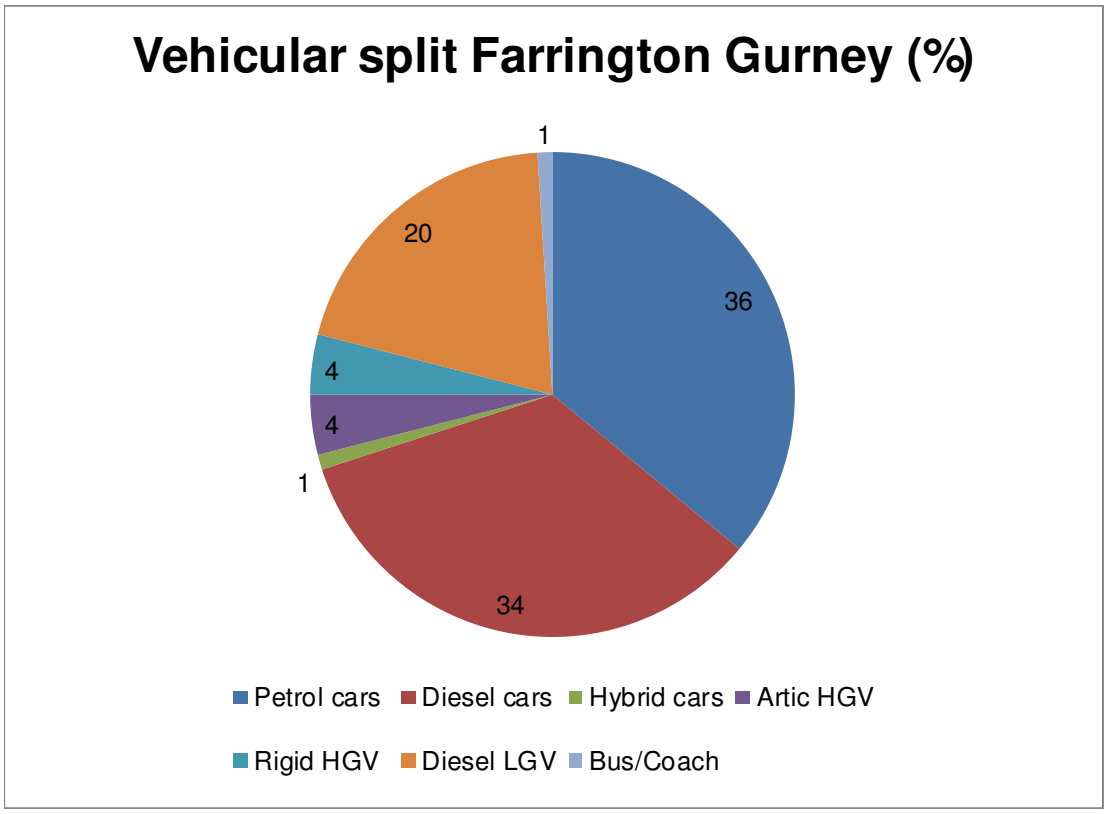


Figure 3.3: Graphical representation of the weekday vehicular split (%) obtained from the 2019 ANPR survey in Farrington Gurney



Within both the AQMAs there are factors which affect vehicle flow. In Farrington Gurney, the A37/A362 junction is traffic signalled and therefore has the ability to interrupt flow. In Temple Cloud, there are sections of the A37 which are too narrow for larger vehicles to pass one another and as a result they stop and give way; therefore also interrupting flow.

The Emissions Factor Toolkit (EFT) (version 9.0) assumes an average speed in its calculations. Due to the interruptions of vehicle flow present in both of the areas; one average speed is not likely to always be representative when considering emissions and this should be noted. An additional factor present in Temple Cloud is the road gradient which would increase the power demanded from vehicle engines travelling uphill and this is especially apparent for Heavy Duty Vehicles (HDVs - HGVs, buses and coaches) (this was considered by using the gradient calculations in the Emission Factor Toolkit).

3.2.4 Farrington Gurney- source apportionment

The source apportionment exercise undertaken identified the percentage source contributions at 20 kph within the Farrington Gurney AQMA (based on journey time data)[3], shown in Table 3.1. The 2018 data at the highest diffusion tube reading and the 2018 background NO_2/NO_x maps were used as the most recent ratified monitoring data and 2019 ANPR survey in Farrington Gurney for fleet mix.

[3] A37 Options and Feasibility Study (Appendix C)

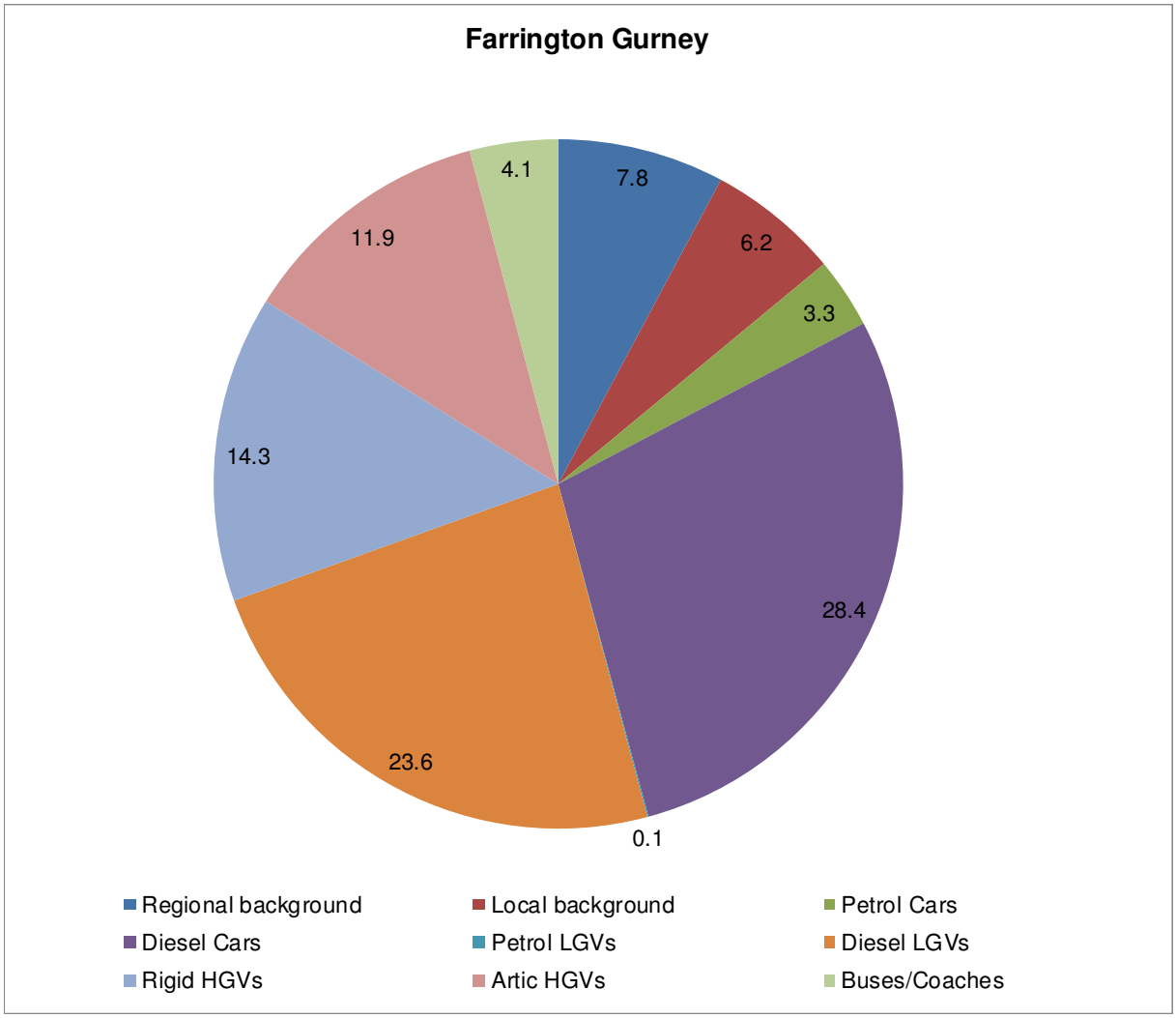
Table 3.1: Farrington Gurney source apportionment (at 20 kph)

Category	NO_2 concentration (µg/m^3)	% contribution
Highest Diffusion Tube reading	43	100
Regional background	6.0	7.8
Local background	2.6	6.2
Petrol Cars	1.42	3.3
Diesel Cars	12.2	28.4
Petrol LGVs	0.02	0.1
Diesel LGVs	10.1	23.6
Rigid HGVs	6.2	14.3
Artic HGVs	5.1	11.9
Buses/Coaches	1.8	4.1

The source apportionment for Farrington Gurney when calculated at 20 kph shows diesel cars as the largest source contributor to road NO_2 concentrations; contributing 28.4%. Diesel Light Good Vehicles (LGVs); 23.6% and Heavy Goods Vehicles (HGVs); 26.2% also present a significant contribution. A graphical representation of the source apportionment at 20 kph is displayed in Figure 3.4.

The source apportionment exercise therefore suggests that measures which focus on encouraging alternative modes of travel and reduce vehicle usage or measures that promote alternative fuels would be effective at reducing road NO_2 concentrations.

Figure 3.4: Graphical representation of the source apportionment (%) in Farrington Gurney at 20 kph



As discussed there are features present in Farrington Gurney that affect vehicle movements and therefore vehicle speed meaning the 20 kph average speed used within the source apportionment exercise may not be wholly representative.

3.4.3 Temple Cloud- source apportionment

The source apportionment exercise undertaken identified the percentage source contributions at 35 kph within the Temple Cloud AQMA (based on journey time data)[4], shown in Table 3.2. The 2018 data at the highest diffusion tube reading and the 2018 background NO_2/NO_x maps were used as the most recent ratified monitoring data and 2017 ANPR survey in Temple Cloud for fleet mix. The gradient option of the EFT was used to take into account the extra emissions from HGV's moving uphill.

Table 3.2: Temple Cloud source apportionment (at 35kph)

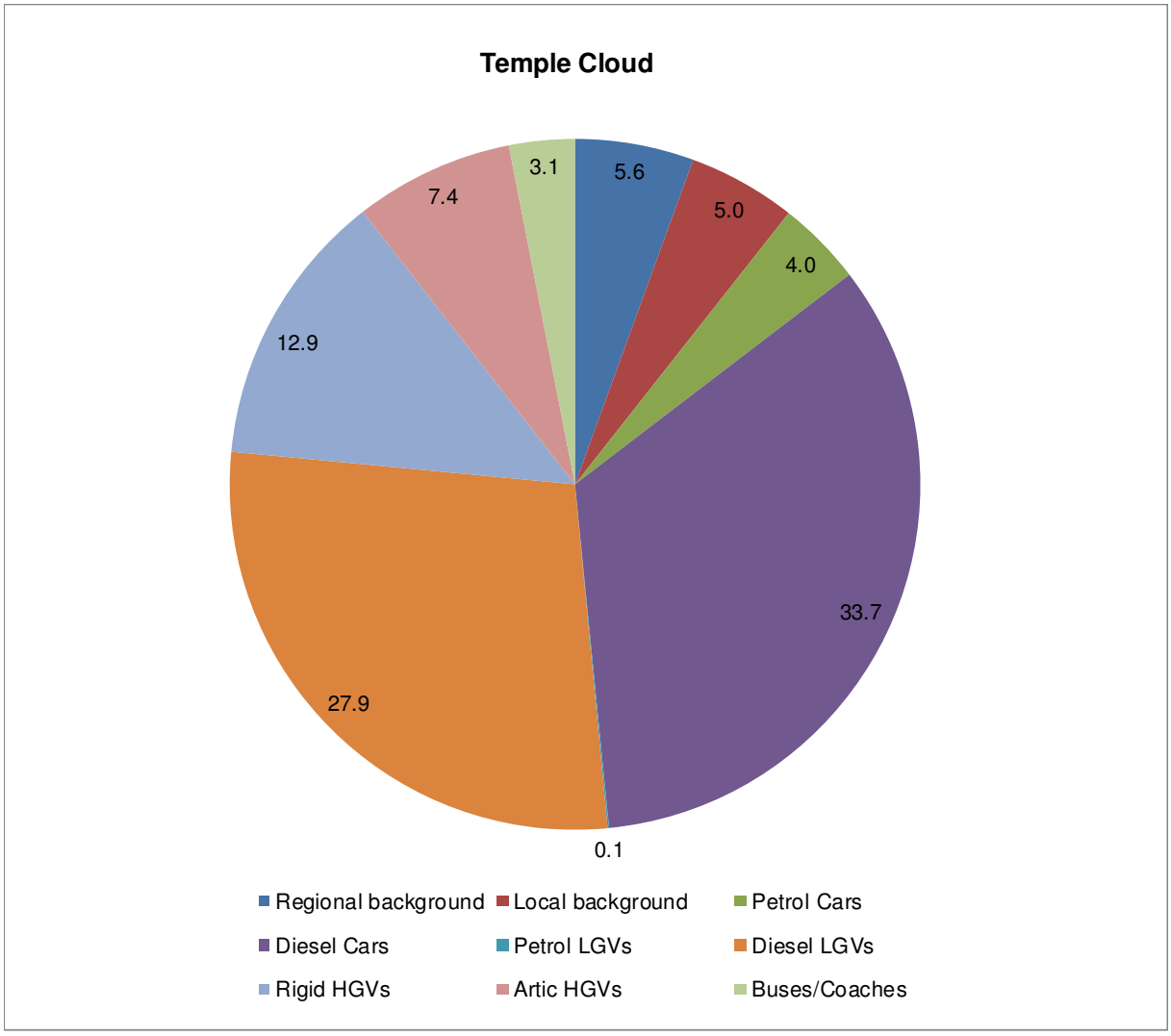
Category	NO_2 concentration (µg/m^3)	% contribution
Highest Diffusion Tube reading	59.5	100
Regional background	6.3	5.6
Local background	3.0	5.0
Petrol Cars	2.4	4.0
Diesel Cars	20.1	33.7
Petrol LGVs	0	0.1
Diesel LGVs	16.6	27.9
Rigid HGVs	7.7	12.9
Artic HGVs	4.4	7.4
Buses/Coaches	1.8	3.1

The source apportionment for Temple Cloud when calculated at 35 kph shows diesel cars as the largest source contributor to road NO_2 concentrations; contributing 33.7%. Diesel Light Good Vehicles (LGVs); 27.9% and Heavy Goods Vehicles (HGVs); 19.6% also present a significant contribution. A graphical representation of the source apportionment at 35 kph is displayed in Figure 3.5.

The source apportionment exercise therefore suggests that measures which focus on encouraging alternative modes of travel and reduce vehicle usage or measures that promote alternative fuels would be effective at reducing road NO_2 concentrations.

[4] A37 Options and Feasibility Study

Figure 3.5: Graphical representation of the source apportionment (%) in Temple Cloud at 35 kph



In Temple Cloud the HDVs (Heavy Diesel vehicles which include HGV's, buses and coaches) are sometimes required to stop/start as they are unable to pass in the narrow sections. This can lead to periods of lower speeds which are not seen in the average journey time data used to calculate the emissions. This is likely to increase the proportion of HDV emissions at these times. As the majority of vehicle types experience an increase in emissions at lower speeds when following a vehicle which is required to stop/start, measures that focus on traffic management or infrastructure to alleviate the issues with road width and gradient in Temple Cloud, and measures that maximise smooth vehicle movements in Farrington Gurney will have an beneficial impact on vehicle emissions.

3.5 Required Reduction in Emissions

3.5.1 Farrington Gurney

The required reduction in emissions to meet the annual average objective was calculated at the highest diffusion tube monitoring location at façade using the 2017 monitoring data, the 2017 NO_2 background maps and the NO_x to NO_2 calculator (version 7.1). The results are displayed in Table 3.3 below.

Table 3.3: The required reductions in emissions in Farrington Gurney

Location	Annual mean (µg/m^3)	Reduction in NO_2 required (µg/m^3)	Reduction in road NO_x required (µg/m^3)	Reduction in road NO_x required (%)
DT134	52	12.0	31.6	30.7

Results based on 2017 data showed that a 30.7% reduction in road NO_x is required to meet the annual average objective in Farrington Gurney.

The 2018 data was not included in the exercise as façade concentrations met the objective in this year. The provisional 2019 data indicates it is possible that 2018 was a ‘good year’ in terms of nitrogen dioxide concentrations, and this will continue to be monitored to establish the trend.

In addition, the predicted year the objective will be met (with no interventions) was calculated using the formula and projection factors provided by Defra. As above, the highest diffusion tube monitoring location at façade from 2017 data was used and the results are displayed in Table 3.4.

Table 3.4: The predicted year the objective will be met in Farrington Gurney

Year	Location	Annual mean ($\mu g/m^3$)	Predicted year the objective will be met
2017	DT134	52	2023
2018	DT134 (2018)	39	Objective met
2019 (provisional)	DT134	42	2021
2021 modelled concentrations (with no interventions)	Farrington Gurney worst case modelled location (FG7)	38.8	Objective met

Results based on 2017 data and the roadside projection factors predicted that the annual average objective would not be met in Farrington Gurney until 2023 with no intervention. The 2018 data shows that façade concentrations met the objective in this year. The provisional 2019 data indicates it is possible that 2018 was a 'good year' in terms of nitrogen dioxide concentrations, and this will continue to be monitored to establish the trend. The air quality modelling carried out as part of the A37 Options and Feasibility Study (Appendix C) showed that the highest modelled location was further along the road to DT134. This modelling showed that the objective would be met locally by 2021 in Farrington Gurney without any intervention.

However, in light of the fact that these are modelled values and there is insufficient information to confirm a downward trend (especially in light of the possible increase in the 2019 monitoring data), actions have been included for Farrington Gurney also. The implementation period however, will prioritise the low cost actions during the early years of the 5 year action plan, and will programme the significant highways infrastructure actions for later years once further monitoring has confirmed if this is necessary.

The other matter to carefully consider is the Somer Valley Enterprise Zone and its effects on the AQMA, however this will be mitigated against through the placing of officers on respective project teams.

3.5.2 Temple Cloud

The required reduction in emissions to meet the annual average objective was calculated at the highest diffusion tube monitoring location at façade using the 2017, 2018 and 2019 provisional data, the relevant NO_2 background maps and the NO_x to NO_2 calculator (version 7.1). The results are displayed in Table 3.5 below.

Table 3.5: The required reduction in emissions in Temple Cloud

Data	Location	Annual mean (µg/m^3)	Reduction in NO_2 required (µg/m^3)	Reduction in road NO_x required (µg/m^3)	Reduction in road NO_x required (%)
2017	DT96	67	27.0	75.4	51.6
2018	DT96	60	20.0	54.3	43.3
2019 (provisional)	DT96	60	20.0	54.3	43.3

Results based on 2017 data showed that a 51.6% reduction in road NO_x was required to meet the annual average objective in Temple Cloud, this reduced to 43.3% in the calculations which used 2018 data.

In addition, the predicted year the objective will be met (with no interventions) was calculated using the formula and projection factors provided by Defra. As above, the highest monitored concentrations at façade from 2017, 2018 and 2019 provisional data was used and the results are displayed in Table 3.6. The air quality modelling carried out as part of the A37 Options and Feasibility Study (Appendix C) showed that the worst case location was further along the road to DT096. The predicted year the objective would be met was also calculated at this highest modelled location for the modelled scenarios of 2021 (with no interventions) and 2021 (with interventions).

Table 3.6: The predicted year the objective will be met in Temple Cloud

Data	Location	Annual mean ($\mu g/m^3$)	Predicted year the objective will be met
2017	DT96	67	2029
2018	DT96	60	2027
2019 (provisional)	DT96	60	2027
2021 (with no interventions)	Worst case modelled location in Temple Cloud (TC4)	60.5	>2030
2021 (with vehicle width restriction)	Worst case modelled location in Temple Cloud (TC4)	42.7	2023
2021 (with tree-cutting)	Worst case modelled location in Temple Cloud (TC4)	58.1	2029

Results based on 2017 monitoring data predicted that the annual average objective would not be met in Temple Cloud until 2029 with no intervention. This prediction improved slightly to 2027 when the 2018 data was used. The air quality modelling carried out as part of the A37 Options and Feasibility Study (Appendix C) showed that the worst case location (TC4) was further down the road from the monitoring site. Based on the modelled 2018 data and the roadside projection factors the objective would not be met at this location (TC4) before 2030.

The potential action to introduce a vehicle width restriction would not lead to immediate compliance with the objective levels for NO_2. At the worst case receptor (TC4) the year of compliance is predicted to be 2023 with this scheme, and that would be within the life period of the draft AQAP (5 years).

The action to reduce emissions contained within the action plan for Temple Cloud by tree cutting would not lead to an immediate compliance with the objective levels for NO_2 . At the worst case receptor (TC4) the year of compliance is predicted to be 2029 with the tree-cutting intervention. At all but 2 receptors (TC4 and TC13) the model predicts the objective to be met by 2022 with the tree-cutting intervention.

To confirm the model results at Temple Cloud it is planned to carry out further monitoring using additional diffusion tubes.

3.6 Key Priorities

- **Priority 1 – Reduce emissions**
- **To implement a measure or measures that reduce the emissions from vehicular traffic within the AQMAs**

In Temple Cloud – this would aim to reduce the occurrence of vehicles (especially larger vehicles) starting and stopping on the inclined, narrow sections of the A37 which exist through the Temple Cloud AQMA.

In Farrington Gurney – this would focus on smoothing the flow of traffic through the A37/A362 junction. The improvements proposed in line with the Somer Valley Enterprise Zone (SVEZ) development will also be a factor locally, and this will need to be considered on an ongoing basis. There is a representative from the Environmental Monitoring Team on the SVEZ project and vice versa.

Interventions that are successful under this priority would contribute to achieving the required reductions in NO_x emissions.

- **Priority 2 – To educate and inform about air pollution, encourage active travel and promote methods to reduce exposure to air pollution.**

Air pollution can be a challenging subject, especially when it cannot be seen or smelt. The profile of air quality has risen over recent years, however more can be done to aid understanding and inform members of the public. Small actions can be taken to reduce personal contribution and exposure to air pollution; and active travel interventions have additional health benefits.

This priority would focus on local residents, schools, and businesses in Farrington Gurney, Temple Cloud and nearby areas.

Over time, the priorities set out within this AQAP may develop and focus on other initiatives. The AQAP acts as a live document and therefore can be added to or updated at any point.

The 2019 Public Health England report titled ‘Review of interventions to improve outdoor air quality and public health’ details the air pollution intervention hierarchy. The hierarchy categorises measures or interventions as Prevention, Mitigation or Avoidance. Prevention interventions are the first priority which prevent or reduce emissions, mitigation interventions are the second priority which aim to reduce the environmental concentrations once emissions have occurred, and avoidance interventions are the third priority which reduce personal or population exposure to environmental pollutants. Prevention interventions should therefore be prioritised; however avoidance interventions can also be effective in certain circumstances.

4 Development and Implementation of Temple Cloud and Farrington Gurney AQAP

4.1 Consultation and Stakeholder Engagement

In developing/updating this consultation draft AQAP, we are working with other local authorities, agencies, businesses and the local community to improve local air quality. Schedule 11 of the Environment Act 1995 requires local authorities to consult the bodies listed in Table 4.1. In addition, we have either already undertaken, or have planned the following stakeholder engagement as a part of the consultation process:

- Presentations at the Parish Council Meeting
- Information on the website (https://www.bathnes.gov.uk/services/environment/pollution/air-quality)
- Articles in local publications
- Questionnaires distributed directly to households within the AQMA as a part of this consultation. The response to our consultation stakeholder engagement is given in Appendix A. **NOTE**: this is not populated until the consultation has been undertaken.

Table 4.1: Consultation Undertaken

Yes/No	Consultee
	the Secretary of State
	the Environment Agency
	the highways authority
	all neighbouring local authorities
	other public authorities as appropriate, such as Public Health officials
	bodies representing local business interests and other organisations as appropriate

4.2 Steering Group

Bath and North East Somerset Council have an internal Air Quality Action Group. This includes colleagues from the following departments:

- Environmental Protection
- Transport – including Transport Planning and the Somer Valley Enterprise Zone Project Lead
- Public Health
- Highways – including Traffic Management
- Sustainability
- Planning Policy
- Parks & Green Spaces
- Sustainable Transport – including the School Travel Plan Officer

The Group meets bi-annually to discuss the current B&NES Air Quality Action Plans and the progress of measures. Updates on this are then provided within the Council's Annual Status Report. The meetings also give an opportunity for new issues, plans and the feasibility of proposed measures to be discussed; as is the case with Farrington Gurney and Temple Cloud.

Contact has been maintained, and will continue to be made with the respective Parish Councils for Farrington Gurney and Temple Cloud throughout the project.

4.3 A37 Options and Feasibility Study

An Options and Feasibility Study was carried out to assess all available measures that could achieve the required air quality improvement in the AQMAs of Farrington Gurney and Temple Cloud. The study was completed in January 2020.

An assessment of several potential options in Temple Cloud and Farrington Gurney was completed. They include:

Temple Cloud

The main issue that leads to the concentrations of NO_2 in Temple Cloud is the start stopping of vehicles, particularly larger vehicles. The north bound vehicles then accelerate from a stopped position, causing increased emissions. Despite the fact that the large vehicle is the only vehicle that cannot 'fit', all vehicles behind are also forced to stop and accelerate also.

Option 1: Reduction or removal of the footway on the western side of the A37 through the 'narrowing' to increase carriageway width;

Option 2: Replacement of the footway on the western side of the A37 with other suitable north- south pedestrian routes for the village away from the A37, which would facilitate the removal of the existing footway on the A37;

Option 3: More comprehensive widening including purchase of land to allow for road widening to take place whilst retaining the existing footway;

Option 4: Introducing a system of 'shuttle working' using traffic signals to allow larger vehicles to pass through unimpeded without 'passage conflict;

Option 5: The use of Vehicle Activated Signs (VAS) further out on the approach to the village to warn approaching HGV drivers that another HGV is currently in the narrowing;

Option 6: The introduction of priority workings;

Option 7: The implementation of a Clean Air Zone for this section of the A37;

Option 8: Implement a width restriction for larger vehicles.

Option 9: Undertake significant 'cutting back' of the high hedge/vegetation/trees on the eastern side of the narrow section to allow more effective use of the existing carriageway by HGVs; or

Option 10: Construction of a bypass to Temple Cloud.

Farrington Gurney

The main issue that gives raise to the concentrations of NO_2 in Farrington Gurney is the junction (with the A362) that breaks the flow of travel on the A37.

Option 1: Review the existing Method of Control at the A37/A362 traffic signals to increase junction capacity, including changes to the existing signal sequencing and/or the removal of the pedestrian stage;

Option 2: Implement proposed junction improvements at the A362/A37 junction linked with the Somer Valley Enterprise Zone (SVEZ) development - Extended two-lane entry on the A362 approach;

Option 3: Construction of an additional lane on the A37 southbound approach to the A37/A362 signals utilising the existing verge and possibly the existing footway or are of 'hatching' if required;

Option 4: Combination of Option 2 and Option 3 works to the A37/A362 junction;

Option 5: The construction of a small 'compact' type of 'Normal' Roundabout with single lane entries to replace the existing traffic signals;

Option 6: The construction of a larger 60m 'Normal' Roundabout allowing 'flared' 2-lane entries roundabout to replace the existing traffic signals; and

Option 7: The implementation of a Clean Air Zone for this section of the A37.

4.3.1 Options taken forward to Traffic and Air Quality Modelling

As a result of the shortlisting process the following schemes were taken forward for more detailed traffic and air quality modelling:

Temple Cloud

Option 4: Introducing a system of 'shuttle working' using traffic signals, using the shorter controlled section length of 117m.

This option had a very significant negative effect as it makes travel times and queues considerably longer in all weekday hours modelled (7:00 am to 7:00 pm). As such, this option was not considered further in subsequent air quality modelling and is not featured in the AQAP as an action.

Option 8: Introducing a vehicle width restriction.

This option has, not unexpectedly, a significant positive effect on the improvement of air quality in Temple Cloud as it removes most of the vehicles (HGVs) that cause the present two-way passage conflicts in the narrow section. However, this scenario has been modelled with little consideration as to where affected HGVs would re-route and what effect they may have on those other roads. This is included as an option in the plan, but further work is needed to establish whether it is possible to implement this without unacceptable impacts on surrounding villages, businesses and operators of HGVs. Further work is also needed on how the width restriction would be enforced.

Option 9: Cutting back of the high hedge/vegetation/trees on the east side of the narrow section to allow more effective use of the existing carriageway by HGVs.

This option is shown to have a minor positive effect on travel times and delay as it reduces the number of HGV conflicts occurring. However, these conflicts cannot be entirely removed by simple vegetation removal/cutting-back, and the transport model results suggest that these could still occur with some frequency. As such this option, whilst an improvement, could remain highly susceptible to queuing 'spikes' when those conflicts do materialise.

Farrington Gurney

▪ **Option 3:** Additional lane on the A37 southbound approach to the junction; and,

▪ **Option 5:** Compact roundabout to replace existing junction.

Both options are predicted to result in improvements to journey times on all approaches during all periods of the day. The provision of an additional southbound lane on the A37 approach to the traffic signals (Option 3) provides additional capacity through the junction and thus greatly improves the journey time on that approach. The change also 'frees- up' green time to be used by other phases, so there are also journey time improvements on the other two approaches. While the A37 northbound sees only a marginal improvement, there is a significant improvement to the A362 westbound approach.

4.3.2 Air Quality Modelling output

Temple Cloud

The implementation of Option 8 (vehicle width restrictions) is predicted to lead to substantial reductions in NO_2 concentrations along the A37. If this option was delivered, then the year of compliance would be 2023.

Significant beneficial impacts are experienced throughout Temple Cloud with this option, largely due to reductions in the number of HDVs along the A37 though the whole of Temple Cloud. The vehicle width restrictions within Temple Cloud could provide further beneficial impacts within Farrington Gurney, with the diversion of HDVs away from the A37, however the scope of these impacts has not been considered within this study. This initial assessment does not however consider the impact of the displaced vehicles from the A37 onto roads outside of Temple Cloud, which would be expected to lead to adverse impacts on air quality elsewhere. A further study would be required to quantify the impacts of diverted traffic on existing properties and receptors outside of Temple Cloud.

The implementation of Option 9 (cutting back vegetation) is expected to lead to a reduction in NO_2 concentrations along the A37. Predicted concentrations are expected to remain above the objective at four receptors, with ultimate compliance

being reached in 2029. Critically, the concentration at TC4 without intervention is predicted to remain above 60 µg/m^3, resulting in a continued risk of an exceedance of the short-term objective. However, the cutting back to vegetation is predicted to lead to a reduction in concentrations of 2.8 µg/m3 at the highest modelled location (TC4). The scheme overall is predicted to result in moderate to substantial beneficial impacts for the highest relevant receptors, with negligible impacts at all other receptors within Temple Cloud.

Note: During the preparation of this Draft AQAP, observations by Highways Safety Officers led to a decision that this cutting back is urgently needed from a highway safety point of view. It has been included as an emission reducing action in this draft plan, although in fact, this will be delivered with funding from Bath and North East Council to secure a resolution to the safety aspects that will also yield air quality benefits.

	Option 8 (width restrictions)	**Option 9 (cutting back vegetation)**			
Year	**TC4 NO2 conc (µg/m3)**	**TC4 NO2 conc (µg/m3)**	**TC13 NO2 conc (µg/m3)**	**TC15 NO2 conc (µg/m3)**	**TC16 NO2 conc (µg/m3)**
2021	**42.7**	**58.1**	**50.0**	**41.7**	**40.5**
2022	**40.5**	**55.1**	**47.4**	39.5	38.4
2023	38.5	**52.4**	**45.1**	37.6	36.5
2024	36.6	**49.8**	**42.9**	35.7	34.7
2025	34.9	**47.4**	**40.8**	34.1	33.1
2026	33.3	**45.3**	39.0	32.5	31.6
2027	31.9	**43.4**	37.3	31.1	30.2
2028	30.6	**41.6**	35.8	29.8	29.0
2029	29.4	40.0	34.5	28.7	27.9
2030	28.5	38.7	33.3	27.8	27.0

It can be seen that introducing vehicle width restrictions bring forward the year of compliance in the whole of the AQMA to 2023, whereas cutting back the trees will not meet the objective standard in the entire AQMA until 2029 (although the nature of the

modelling does not allow for this type of tree canopy to be easily modelled so this may be under-representing the benefits). That said, if this was to be implemented in 2021, then the objective standard is modelled to be met in every receptor location in Temple Cloud apart from 2 in 2022. The last 2 are modelled to be compliant in 2026 and 2029. Further monitoring is being deployed to confirm this modelling outcome.

Although multiple interventions were not modelled, it is possible that introducing a vehicle width restriction as well as cutting back the hedges/vegetation could lead to compliance even earlier than the 2023.

Farrington Gurney

Farrington Gurney is anticipated to have concentrations of nitrogen dioxide below the objective at all receptors in 2021 **with or without** the implementation of the proposed options.

However, the implementation of the additional lane southbound (Option 3) is predicted to lead to a large reduction in concentrations at receptors close to the junction between the A37 and A362 where the road layout modification will occur, with reductions in concentrations predicted of up to 8.4µg/m^3. Moderate and slight beneficial impacts are predicted at the receptors located next to the junction.

The implementation of the compact roundabout to replace existing junction (Option 5) is expected to lead to a substantial reduction in NO_2 concentrations along the A37 adjacent to the A37/ A362 junction, with reductions up to 14.2 µg/m^3 predicted at the worst-case receptors next to the junction. Close to the junction impacts are predicted to range from moderate to substantial beneficial, due to increased traffic speeds and alterations to the road realignment which increase the distance of receptors to the carriageway. There are, however, increases in concentrations at three receptors to the south of the proposed roundabout along the A37. This causes one slight adverse impact as a result of the new junction type (and therefore slower traffic) moving south

towards these receptors. However, at this receptor, concentrations are not predicted to exceed 27.3 µg/m^3, and so concentrations will remain well below the objective.

4.3.3 Recommendation of the feasibility study

Temple Cloud

As a short term measure it is recommended that works are done to increase the effective width of the existing carriageway through the narrow section for HGV's (Option 9) by significantly cutting back the high vegetation to the line of the wall (so removing all encroachment across/into the highway).

Farrington Gurney

Both the short-listed highway options for Farrington Gurney are relatively expensive to implement. Mindful that the current exceedances are only just above the 40µg/m^3 objective, and compliance expected to be achieved naturally by 2021 with changes to the fleet composition, it would be prudent to monitor the on-going situation in the short-term.

5 AQAP Measures

5.1 Farrington Gurney

Table 5.1 overleaf shows the Farrington Gurney AQAP measures. It contains:

- a list of the actions that form part of the plan
- the responsible individual and departments/organisations who will deliver this action
- estimated cost of implementing each action (overall cost and cost to the local authority)
- expected benefit in terms of pollutant emission and/or concentration reduction
- the timescale for implementation
- how progress will be monitored

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

Table 5.1: Farrington Gurney Air Quality Action Plan Measures

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
FG 1	Advice and information for residents	Public Information	Via the Internet, via other mechanisms	B&NES Public Protection	2020	Early	Number of hits on website, number of people engaged with	No reduction in concentrations, exposure reduction.			
FG 2	School travel plan (Modeshift STARS)	Promoting Travel Alternatives	School Travel Plans	B&NES Sustainable Travel	2020	Early	Hand's up data	No reduction in concentrations, exposure reduction.			
FG 3	Clean Air Schools Toolkit	Public Information	Other (Education)	B&NES Public Health	2020	Early	Use of Toolkit by schools	No reduction in concentrations, exposure reduction, but would also deliver emission reduction through anti idling scheme etc.			
FG 4	Influence planning decisions for any development within 200 metres of an AQMA boundary	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	B&NES Planning, Public Protection	2020	Ongoing	Number of decisions consulted on	No reduction in concentrations, exposure reduction.			
FG 5	Targeted information campaign for the most vulnerable groups	Public Information	Via other mechanisms	B&NES Public Health (subject to funding)	2020	Ongoing	Uptake of information by organisations and individuals	No reduction in concentrations, exposure reduction.			

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
FG 6	If necessary: Construction of an additional lane on the A37 southbound approach to the A37/A362 signals utilising the existing verge and possibly the existing footway or hatchway if required.	Traffic Management	Strategic highway improvements	B&NES	Review if necessary upon annual completion of Annual Status Report						Currently it seems that this is not necessary.

FG1: Advice and information for residents

This measure would be targeted towards the residents of Farrington Gurney. An online B&NES Council webpage will be developed and dedicated to providing information and advice on a number of different topics, including the following:

- Low emission transport – provide information and promote benefits.
- Exposure reduction – provide information including suggestions of alternative routes.
- Planting – advice on vegetation and planting; including information about different species and planting methods.
- Active travel – to promote the benefits from a health and air pollution perspective.
- Health impacts – provide information and raise awareness about the health impacts of air pollution.
- General information and facts – to raise public awareness about air pollution and increase understanding.
- National Clean Air Day – on 18th June 2020; promote the day and the useful resources produced by Global Action Plan.

Electronic leaflets will be produced and tailored to contain key information and facts. The local Farrington Gurney journal and the Farrington Gurney Parish Council website and other social media could be utilised to disseminate information as part of this measure.

Monitoring and evaluation

Feedback will be gathered from local Councillors. A judgement of the uptake of advice can be made. Also, through responses to a designated questionnaire that can be distributed through the Parish Council.

Lead authority or department: B&NES Public Protection Team

Cost: Low

FG 2: School travel plan (Modeshift STARS)

School Travel Plans encourage active travel and cleaner modes of transport for journeys to and from school. These documents are developed online with Modeshift STARS, the national accreditation scheme “to recognise schools that have demonstrated excellence in supporting cycling, walking and other forms of sustainable travel”.

The local primary school in Farrington Gurney, Farrington Gurney C of E Primary School, would be the initial location for this action. Previous ‘hands up’ data from the School, in the 2016/17 school year, indicated that 37% of pupils walked to school, 4.5% cycle, 7.9% park and stride, 9% scoot or skate and 37% came by car. Farrington Gurney C of E Primary School had previously achieved a bronze accreditation on Modeshift STARS in March 2017, however this has since expired.

B&NES Council has a dedicated School Travel Plan Officer who supports B&NES schools to develop online School Travel Plans via Modeshift STARS. Measures to encourage active travel and cleaner modes of travel will seek to build on the good work already undertaken at Farrington Gurney C of E Primary School.

Monitoring and evaluation

A biannual (once in winter, once in summer) ‘hands up’ survey to track changes when compared with the 2016/17 data. Progress through the Modeshift STARS accreditation scheme can be tracked online through the Modeshift STARS Portal.

Lead authority or department: B&NES Sustainable Travel Team

Cost: Low – the support provided by B&NES for this measure comes under an existing role.

FG 3: Clean Air Schools toolkit

The B&NES Clean Air Schools Toolkit was launched on Clean Air Day 2019. The toolkit offers a number of resources for primary schools and other community settings including: lesson plans, posters, Modeshift Stars, stickers, pledge cards, a musical rap/song, Bikeability, and advice on setting up a walking bus and anti-idling campaigns.

A number of schools are already actively using the toolkit. The toolkit will continue to be promoted across B&NES and specifically by the Council's Sustainable Travel Officer when visiting organisations in Farrington Gurney.

Monitoring and evaluation

Incorporated into the Clean Air Schools Toolkit are methods of evaluation and feedback from teachers, pupils and parents/carers via questionnaires:

- Feedback from teachers will focus on the toolkit itself – its functionality, its strengths and areas for improvement.
- Feedback from pupils aims to evaluate whether there is any change in the children's knowledge and understanding of air pollution before and after the lessons and activities. This will help to evaluate the effectiveness of the toolkit.
- Feedback from parents/carers is more general; asking for their thoughts about air quality and the activities the schools are undertaking.

The feedback received would be utilised to make any necessary improvements to the toolkit, and the uptake of the toolkit will be tracked i.e. the number of schools using the toolkit, and the evaluation and feedback process will be ongoing. An annual review and second version of the toolkit is due during the summer of 2020.

Lead authority or department: B&NES Public Health Team

Cost: Low – B&NES Officer time and costs to print resources, however extra cost may be encountered.

FG 4: Input into planning decisions for any development within 200 metres of an AQMA boundary

Air Quality is a material consideration for all planning applications. This action proposes that an Environmental Monitoring Officer is positively consulted on every application within 200m of the boundary of the AQMA. Therefore, the Environmental Monitoring Officer is responsible for determining and imposing air quality assessment requirements on the developer and placing mitigation conditions on the planning consent. Planning decisions should ensure that any new development in the AQMA is consistent with the air quality action plan[5]

Monitoring and evaluation

Officers will report on the number of developments for which consent has been given with conditions attached arising from recommendations from the Environmental Monitoring Team. Advice will be given in accordance with the "Land-Use Planning & Development Control: Planning For Air Quality; Guidance from Environmental Protection UK and the Institute of Air Quality Management for the consideration of air quality within the land-use planning and development control processes. January 2017".

Lead authority or department:

Bath and North East Somerset Council Development Control Team

Cost:

There is no additional cost to the authority in activating this action as the officers are already salaried. The capacity of the Environmental Monitoring Team will have to be monitored should there be a continuing influx of applications to be considered.

[5] National Planning Policy Framework, July 2018.

FG 5: Targeted information campaign for the most vulnerable groups

Air pollution affects those most vulnerable in society; the young, the elderly and those with existing respiratory and cardiovascular conditions. Nitrogen Dioxide is a respiratory irritant that exacerbates conditions, such as asthma.

This measure would be based on the provision of health advice and information relating to air pollution to the most “at risk” groups in society. This would aim to raise awareness and positively influence behaviours to mitigate the negative impacts of air pollution.

This could focus on several methods:

- Working with local GP surgeries, acute trusts, community health organisations and local health and social care workers.
- Targeted information for specific organisations i.e. care homes and early years settings.
- Promotion of the various platforms which provide live air quality data i.e. Defra’s UK-Air website

Monitoring and evaluation

This measure would be monitored by recording the engagement i.e. the number of organisations contacted, the number of initiatives developed, the number of health and social care workers trained and the number of hits on certain webpages.

Lead authority or department: B&NES Public Health Team (subject to funding).

Cost: Low – however this will be dependent on the extent of the campaign and the methods used.

FG 6: Construction of an additional lane on the A37 southbound approach to the A37/A362 signals utilising the existing verge and possibly the existing footway or hatchway if required.

Further design work is required in order to establish whether this is a feasible option. There is limited width of highway land available and the initial design for this option results in the loss of the verge on the east side of the road, which will mean passing vehicles are travelling much closer to pedestrians using the footway than they do now. This will create a less comfortable environment for pedestrians and may deter some people from walking here. It will also mean traffic is passing closer to houses which back onto this section of the A37.

Monitoring and evaluation

Through the Annual Status Report updates.

Lead authority or department: B&NES Highways & Traffic

Cost: Estimated without land, £900k

5.2 Temple Cloud

Table 5.2 shows the Temple Cloud AQAP measures. It contains:

- a list of the actions that form part of the plan
- the responsible individual and departments/organisations who will deliver this action
- estimated cost of implementing each action (overall cost and cost to the local authority)
- expected benefit in terms of pollutant emission and/or concentration reduction
- the timescale for implementation
- how progress will be monitored

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

Table 5.2: Temple Cloud Air Quality Action Plan Measures

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
TC1	Implementation of vehicle width restriction through Temple Cloud	Traffic Management	Other	B&NES Highways,	2020	Further assessment required before this can be established.	Reduction in nitrogen dioxide concentrations	18 µg/m^3 at worst case receptor			Further assessment work is needed before establishing whether this can proceed
TC2	Undertake significant 'cutting back' of the high hedge/vegetation on the eastern side of the narrow section to allow more effective use of the existing carriageway by HGVs.	Traffic Management	Other	B&NES Public Protection	2020	2020	Reduction in nitrogen dioxide concentrations	3 µg/m^3 at worst case receptor		2020	This has been bought forward in light of safety concerns
TC 3	New public footpath link from Molly Close	Promoting Travel Alternatives	Promotion of walking	B&NES Highways, Public Rights of Way	2021	TBC	Public footpath link built	This action would focus on exposure reduction			
TC 4	Advice and information for residents	Public Information	Via the Internet, Via other mechanisms	B&NES Public Protection	2020	Ongoing	Number individuals engaged with; number of website hits	This action would focus on exposure reduction		2021	
TC 5	School travel plan (Modeshift STARS)	Promoting Travel Alternatives	School Travel Plans	B&NES Sustainable Travel	2020	Ongoing	Hands Up data	This action would focus on exposure reduction		2020	

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
TC 6	Clean Air Schools Toolkit	Public Information	Other (Education)	B&NES Public Health	2020	Ongoing	Use of Toolkit by schools	This action would focus on exposure reduction, but would also contribute to emission reduction (anti idling etc.)		2020	
TC 7	Influence planning decisions for any development within 200 metres of an AQMA boundary	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	B&NES Planning, Public Protection	2020	Ongoing	Number of decisions consulted on	This action would focus on preventing a deterioration in the quality of the air locally.		2020	
TC 8	Targeted information campaign for the most vulnerable groups	Public Information	Via other mechanisms	B&NES Public Health (subject to funding)	2020	Ongoing	Uptake of information by organisations and individuals	This action would focus on exposure reduction		2021	
TC9	Instillation of 'pollution cleaning technology'	Technology	Other	Unknown	2021	Assessment required in the first instance	Reduction in concentration of nitrogen dioxide	Further research required.		n/a	Further work needs to be undertaken to establish what technology exists and whether it would be suitable to this setting.

TC 1: Implement a vehicle width restriction

This would mean introducing a Traffic Regulation Order prohibiting all vehicles exceeding the indicated width from being driven along the road in Temple Cloud. The order may be imposed to prevent entry to roads physically incapable of accommodating larger vehicles or to protect the environment by preventing unnecessary intrusion by large vehicles. The latter case would apply in the case of Temple Cloud as the narrowed section is not physically capable of accommodating the largest articulated HGVs.

A physical feature might need to be installed to enforce it. However, provision might be needed to permit buses, emergency vehicles and local access (deliveries) to use the A37 through Temple Cloud, in effect permitting 'required' HGV access. Where buses are to be excluded from an environmental width limit it may be preferable to impose a lorry ban with signs. Consideration will have to be given to enforcement if this is the case.

This would require an alternative route for HGV's to 'bypass' Temple Cloud, noting the A37 is a key route between the A303/A39 and Bristol.

This would in effect be a regulatory ban on most HGVs routing through Temple Cloud. As such, consideration would need to be given to suitable alternative routes and advance signing to what would be a 'point restriction' on the A37 for HGV traffic. Advance signing needed as a minimum at the A37/A39 junction and the A37/A368 Chelwood Roundabout could encourage undesirable HGV re-routing through Hallatrow or High Littleton, Farmborough and Chelwood as a local 'bypass'.

Should this option be one that is seen as being attractive through the consultation, further work is required to establish whether this option can be implemented (realising significant air quality improvements) without causing unacceptable consequences to other residents, businesses and operators of HGVs.

Monitoring and Evaluation

Should this option be chosen for further study and subsequently implemented, the network of diffusion tubes will provide an assessment of whether the scheme is as successful as it was modelled to be.

Lead authority or department: B&NES Highways Team

Cost: Medium

TC 2: Undertake significant 'cutting back' of the high hedges/vegetation at the narrow section of road.

This involves significantly cutting back the hedges to the eastern side of the narrow section to allow more effective use of the existing carriageway by HGV's and to reduce the 'canyon effect'.

Subject to further investigation by arboricultural specialists, this would appear to be the most appropriate measure to undertake that could lead to improvements in the flow of traffic and thereby improve air quality. In exploring this further it would be necessary to identify how this cut back section of vegetation would be maintained on a routine basis in future in order to maintain the available carriageway width.

During the preparation of this Draft AQAP, observations by Highways Safety Officers have led to a decision that this cutting back is urgently needed from a safety point of view. It has been included as an emission reducing action here, although in fact, this will be delivered with funding from Bath and North East Council to secure a resolution to the safety aspects that will also yield air quality benefits.

Monitoring and Evaluation

The effect of this will be assessed through officer observations (reduction in the incidence of lorries having to stop in a set time period), and through the observed concentrations ofNO_2 .

Lead authority or department: B&NES Public Protection

Cost: £40k

TC 3: New public footpath link from Molly Close

The pavement along the A37 is narrow and only present on the western side of the highway. This and the high volumes of traffic do not positively promote the A37 as a walking route. There is a public footpath which runs parallel to the A37 and near to Molly Close; which provides a more pleasant, safer route. Within the draft Chew Valley Transport Strategy the idea of promoting this route (marked in red on the map below) and constructing a new link to Molly Close (marked in blue on the map) is discussed. The route could be successful as an alternative by encouraging active travel and reducing individual exposure to air pollution; both of which could have positive health implications.

Monitoring and evaluation

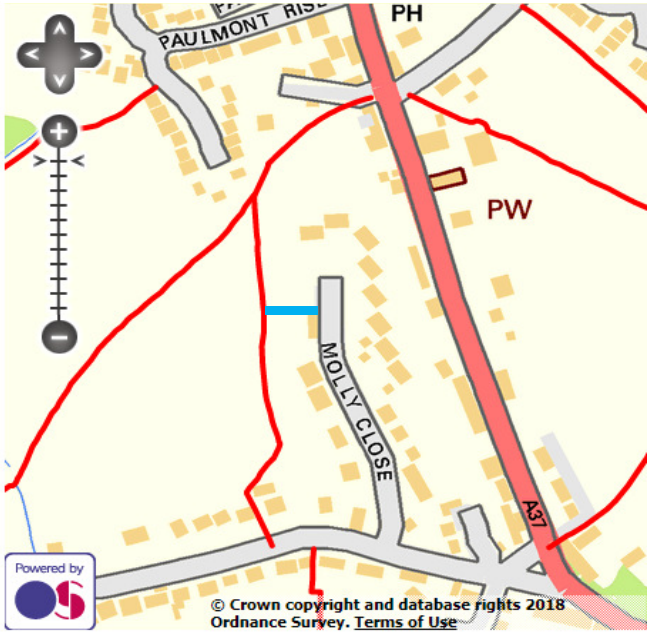
This measure formalises a footpath link that is already used informally.

The success of this would be gauged through footfall counts, and feedback obtained through the Parish Council.

Lead authority or department: B&NES Public Rights of Way and Transport

Cost: Medium to high – due to construction costs

Figure 5.1: The proposed new public footpath link (in Blue) between Molly Close and the existing public footpath



TC 4: Advice and information for residents

This measure would be targeted towards the residents of Temple Cloud. An online B&NES Council webpage will be developed and dedicated to providing information and advice on a number of different topics, including the following:

- Low emission transport – provide information and promote benefits.
- Exposure reduction – provide information including suggestions of alternative routes.
- Planting – advice on vegetation and planting; including information about different species and planting methods.
- Active travel – to promote the benefits from a health and air pollution perspective.
- Health impacts – provide information and raise awareness about the health impacts of air pollution.
- General information and facts – to raise public awareness about air pollution and increase understanding.
- Clean Air Day – on Thursday 18 June 2020. Promote the day and the useful resources produced by Global Action Plan.

Electronic leaflets will be produced and tailored to contain key information and facts. The local Cameley and Temple Cloud newsletter and the Temple Cloud with Cameley Parish Council website and other social media could be utilised to disseminate information as part of this measure.

Monitoring and evaluation

Feedback will be gathered from local Councillors. A judgement of the uptake of advice can be made. Also, through responses to a designated questionnaire that can be distributed through the Parish Council.

Lead authority or department: B&NES Public Protection

Cost: Low

TC 5: School travel plan (Modeshift STARS)

School Travel Plans encourage active travel and cleaner modes of transport for journeys to and from school. These documents are developed online with Modeshift STARS, the national accreditation scheme “to recognise schools that have demonstrated excellence in supporting cycling, walking and other forms of sustainable travel”.

The local primary school in Temple Cloud, Cameley CEVC Primary School, would be the initial location for this measure. Previous ‘hands up’ data from the School, in the 2016/17 school year, indicated that 40% of pupils walk to school and 52% travel by car. In January 2018 Cameley CEVC Primary School achieved a bronze Modeshift STARS accreditation.

B&NES Council has a dedicated School Travel Plan Officer who supports B&NES schools to develop online School Travel Plans via Modeshift STARS. Measures to encourage active and cleaner modes of travel will seek to build on the good work already undertaken at Cameley CEVC Primary School.

Monitoring and evaluation

A biannual (once in winter, once in summer) ‘hands up’ survey to track changes when compared with previous data. Progress through the Modeshift STARS accreditation scheme can be tracked online through the Modeshift STARS Portal.

Lead authority or department: B&NES Sustainable Travel

Cost: Low – the support provided by B&NES for this measure comes under an existing role.

TC 6: Clean Air Schools Toolkit

The B&NES Clean Air Schools Toolkit was launched on Clean Air Day 2019. The toolkit offers a number of resources for primary schools and other community settings including: lesson plans, posters, Modeshift Stars, stickers, pledge cards, a musical rap/song, Bikeability, and advice on setting up a walking bus and anti-idling campaigns.

A number of schools are already actively using the toolkit. The toolkit will continue to be promoted across B&NES and specifically by the Council's Sustainable Travel Officer when visiting organisations in Temple Cloud.

Monitoring and evaluation

Incorporated into the Clean Air Schools Toolkit are methods of evaluation and feedback from teachers, pupils and parents/carers via questionnaires:

- Feedback from teachers will focus on the toolkit itself – its functionality, its strengths and areas for improvement.
- Feedback from pupils aims to evaluate whether there is any change in the children's knowledge and understanding of air pollution before and after the lessons and activities. This will help to evaluate the effectiveness of the toolkit.
- Feedback from parents/carers is more general; asking for their thoughts about air quality and the activities the schools are undertaking.

The feedback received will be utilised to make any necessary improvements to the toolkit, and the uptake of the toolkit will be tracked i.e. the number of schools using the toolkit, and the evaluation and feedback process will be ongoing. An annual review and second version of the toolkit is due during the summer of 2020.

Lead authority or department: B&NES Public Health

Cost: Low – B&NES Officer time and costs to print resources, however extra cost may be encountered.

TC 7: Input into planning decisions for any development within 200 metres of an AQMA boundary

Air Quality is a material consideration for all planning applications. This action proposes that an Environmental Monitoring Officer is positively consulted on every application within 200m of the boundary of the AQMA. Therefore, the Environmental Monitoring Officer is responsible for determining and imposing air quality assessment requirements on the developer and placing mitigation conditions on the planning consent. Planning decisions should ensure that any new development in the AQMA is consistent with the air quality action plan[6]

Monitoring and evaluation

Officers will report on the number of developments for which consent has been given with conditions attached arising from recommendations from the Environmental Monitoring Team. Advice will be given in accordance with the "Land-Use Planning & Development Control: Planning For Air Quality; Guidance from Environmental Protection UK and the Institute of Air Quality Management for the consideration of air quality within the land-use planning and development control processes. January 2017".

Lead authority or department: Bath and North East Somerset Council Development Control Team

Cost: There is no additional cost to the authority in activating this action as the officers are already salaried. The capacity of the Environmental Monitoring Team will have to be monitored should there be a continuing influx of applications to be considered.

[6] National Planning Policy Framework, July 2018.

TC 8: Targeted information campaign for the most vulnerable groups

Air pollution affects those most vulnerable in society; the young, the elderly and those with existing respiratory and cardiovascular conditions. Nitrogen Dioxide is a respiratory irritant that exacerbates conditions, such as asthma.

This measure would be based on the provision of health advice and information relating to air pollution to the most “at risk” groups in society. This would aim to raise awareness and positively influence behaviours to mitigate the negative impacts of air pollution.

This could focus on several methods:

- Working with local GP surgeries e.g. Cameley Surgery in Temple Cloud, acute trusts, community health and local health and social care workers.
- Targeted information for specific organisations i.e. care homes and early years settings.
- Promotion of the various platforms which provide live air quality data i.e. Defra’s UK-Air website

Monitoring and evaluation

This measure would be monitored by recording the engagement i.e. the number of organisations contacted, the number of initiatives developed, the number of health and social care workers trained and the number of hits on certain webpages.

Lead authority or department: B&NES Public Health Team (subject to funding).

Cost: Low – however this will be dependent on the extent of the campaign and the methods used.

TC 9: Introduce technology to 'clean' polluted air

Members of the community have already contributed a suggestion that involves installing technology/feature that 'cleans' polluted air. Examples include https://www.digitaltrends.com/cool-tech/biomitech-artificial-tree/, where they state that "the company has developed an artificial tree that it claims is capable of sucking up the equivalent amount of air pollution as 368 living trees. That's not only a saving on growing time, but also on the space needed to accommodate them".

Another example is Green City Solutions https://greencitysolutions.de/en/, and they state that their product "The ability of certain moss cultures to filter pollutants such as particulate matter and nitrogen oxides from the air makes them ideal natural air purifiers". This company have also provided products in London https://www.timeout.com/london/news/artificial-trees-are-popping-up-in-london-to-suck-up-the-citys-pollution-011020 "Introducing City Trees: moss-covered installations designed to soak up the worst of the offending nitrogen dioxide (NO2), while releasing fresh oxygen. Created by Green City Solutions, each of these miniature forests offers the equivalent benefit of 275 trees in terms of pollution reduction".
Further work would be required to establish the appropriateness and efficiency of such technology in Temple Cloud.

Monitoring and Evaluation

Diffusion tube monitoring could be located in and around the location of the installation to establish what effect it/they are having on concentrations.

Lead authority or department: B&NES Public Protection

Cost: Unknown, further research required.

6 Appendix A: Response to Consultation

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

NOTE: THIS WILL BE COMPLETED POST CONSULTATION

Consultee	Category	Response

7 Appendix B: Reasons for Not Pursuing Action Plan Measures

Table B.1: Action Plan Measures Not Pursued and the Reasons for that Decision

NOTE: THIS WILL BE UPDATED POST CONSULTATION

Description of the measure	Reason for inclusion/exclusion in the draft AQAP (impacts, AQ, cost etc.)
TEMPLE CLOUD	
Reduction or removal of the footway on the western side of the A37 through the 'narrowing' to increase carriageway width.	This would allow the carriageway running width to be increased by circa 0.7 to 1.1 metres. However, this would have an unacceptable highway safety impact on pedestrians and residents, who would be forced to walk within a heavily trafficked carriageway. It would also severely restrict the visibility achievable at vehicle accesses on the west side of the carriageway.
Linked to Option 1, replacement of the footway on the western side of the A37 with other suitable north-south pedestrian routes for the village away from the A37, which would facilitate the removal of the existing footway on the A37	Residents of most properties fronting this section have no means of access to other pedestrian routes without first using this section of footway. As such, they would be exposed to a high risk of collision with traffic by being forced to walk within a 'live' carriageway. Alternative 'continuous' north-south pedestrian via Molly Close (West) and Gillets Hill Lane-Brandown Close (East) do not exist. Creating a dedicated Public Rights of Way (PROW) would involve establishment of rights through several private gardens
More comprehensive widening including purchase of land to allow for road widening to take place whilst retaining the existing footway.	Widening either side with a loss off third party land is considered unacceptable and likely to face significant local opposition. Widening affecting the western side is particularly problematic due to short front gardens and/or buildings flanking the back edge of existing footway. Widening on the eastern side would pose a complex construction issue on how to build a new retaining wall whilst ensuring access to the residential units. The land rises from the A37 this side, so alterations to driveways would be required to maintain a suitable gradient and 'tie-in' to a widened carriageway on the east side

Introducing a system of 'shuttle working' using traffic signals to allow larger vehicles to pass through unimpeded without 'passage conflict.	This option was initially taken forward for testing with the traffic model, but was rejected at the testing stage. It was modelled to have a very significant negative effect as it makes travel times and queues considerably longer in all weekday hours modelled (7:00 am to 7:00 pm).
The use of Vehicle Activated Signs (VAS) further out on the approach to the village to warn approaching HGV drivers that another HGV is currently in the narrowing	HGV drivers approaching the narrowing from either direction already have a clear line of sight along the restricted section, so the opportunity to gauge 'passage' conditions and whether to enter/yield on reaching the Cameley Road junction (NB) or near the driveway access to 'Lark Rise' (SB). Installing signs to forewarn HGV drivers was therefore considered to have little impact as this would not remove the passage conflict for HGVs.
The introduction of priority workings	If 'one way' working was to be implemented it would need to be actively managed given the length of the controlled section. Existing problems with a long 'narrowing' under priority control can be readily observed on the A362 at the 'Sunnyside' pinch-point (just east of Farrington Gurney). This includes disproportionate queuing on the non-priority approach and road safety issues associated with these drivers attempting to 'race the gap' or force a right-of-way.
The implementation of a Clean Air Zone for this section of the A37	Whilst a CAZ 'Type C' charging HGVs would specifically target the vehicle types creating passage issues through the 'narrowing' and associated queuing/delay, a significant amount of this fleet (as surveyed, Nov-17) is Euro Class 6 compliant and so would be unaffected by the CAZ. As such, a significant amount of passage conflict associated with HGVs would remain. The introduction of a local CAZ on what is a strategic HGV route is likely to create undesirable diversionary issues affecting local roads which are less suitable. Whilst non-compliant HGV drivers will have the option of paying the charge, many will choose not to, and seek out local diversionary routes. The A39 between Whitecross Gate and Marksbury, and the A368 between Marksbury and Chelwood crossroads are examples, creating potential for additional HGV traffic through Hallatrow, High Littleton, Farmborough, Marksbury and Chelwood. Notwithstanding the benefits that might accrue in Temple Cloud, this measure is likely to attract significant concern and objections from residents in these surrounding settlements.

Construction of a bypass to Temple Cloud	Whilst probably the most effective measure for significantly reducing emissions within Temple Cloud, the lead-time in delivering a bypass would be too long. Furthermore, the long-standing 'safeguarded' line for a bypass to Temple Cloud-Clutton was removed in the adopted B&NES Placemaking Plan (PMP). This was due to concerns about the realistic prospect of delivery with the Plan period, coupled with planning blight issues linked to the long-standing safe-guarding of the alignment to the west of Temple Cloud.
FARRINGTON GURNEY	
Review the existing Method of Control at the A37/A362 traffic signals to increase junction capacity, including changes to the existing signal sequencing and/or the removal of the pedestrian stage.	This proposal would require the loss of the only controlled crossing point over the A37 in Farrington Gurney, to the detriment of pedestrian safety. As the appearance of the crossing phase occurs in the same stage as that controlling the right turn to the A362 (Stage 1), the only phase that would benefit from its removal would be the northbound 'ahead' phase on the A37. As such the queuing/delay on the southbound A37 approach where air quality exceedances occur would not be improved by the potential allocation of additional green light time.
Implement proposed junction improvements at the A362/A37 junction linked with the Somer Valley Enterprise Zone (SVEZ) development - Extended two-lane entry on the A362 approach.	Traffic modelling indicates that, as an isolated measure, the effect in reducing queuing and delay on the A37 southbound approach would be negligible;
The construction of a roundabout to replace the existing traffic signals. Smallest type of 'Normal' Roundabout (Compact)	Initial traffic modelling showed that this 'compact' roundabout layout (single lane approaches) could accommodate existing flows in the weekday 'peak' hours. Modelling suggested that the single lane entries could achieve an improvement in traffic flow and a reduction in nitrogen dioxide concentrations, however, given that the additional lane on the A37 southbound could also achieve a reduction at half the cost, this is an unnecessary expense. (est cost £1.98M)

The construction of a roundabout to replace the existing traffic signals. Larger ICD 'Normal' Roundabout allowing 'flared' 2-lane entries	This option also provided an improvement in traffic flow and a reduction in nitrogen dioxide concentrations, however, given that the additional lane on the A37 southbound could also achieve a reduction at a third of the cost, this is an unnecessary expense (est £3milion excl land cost).
The implementation of a Clean Air Zone for this section of the A37	As noted with Temple Cloud, whilst a CAZ 'Type C' charging HGVs would specifically target a key contributor to emissions, a significant amount of this fleet (as surveyed, June 2019) is Euro Class 6 compliant and so would be unaffected by the CAZ. There are similar key concerns with lorry re-routing. The absence of suitable alternative HGV routes to the A37 for north-south movements between the Yeovil area (A303(T)) and Bristol is a strategic network issue. As such, a 'point' restriction at Farrington Gurney could have regional impacts, to the point that many operators may simply pay the charge when faced with the additional operating costs of significant diversion.

8 Appendix C: A37 Options and Feasibility Study report

A37 Options and Feasibility Study report

9 Glossary of Terms

Abbreviation	Description
ANPR	Automatic Number Plate Recognition
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
B&NES	Bath and North East Somerset
CAP	Clean Air Plan
CAZ	Clean Air Zone
CIL	Community Infrastructure Levy – a planning charge
COMEAP	Committee on the Medical Effects of Air Pollutants
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DPD	Development Plan Document
ESP	Environmental Sustainability Partnership
EU	European Union
g/km	Grams per kilometre – units of emissions
GULW	Go Ultra Low West
HDVs	Heavy Duty Vehicles (HGVs, buses and coaches)
HGVs	Heavy Goods Vehicles (over 7.5 tonnes)
JAQU	Joint Air Quality Unit
JTS	Joint Transport Study

LAQM	Local Air Quality Management
Mph	Miles per hour
MRN	Major Road Network
NHS	National Health Service
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NPPF	National Planning Policy Framework
OBC	Outline Business Case
PHE	Public Health England
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
SOC	Strategic Outline Case
SRN	Strategic Road Network
VAS	Vehicle Activated Sign
WECA	West of England Combined Authority

10 References

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Public Health England (2018) Estimation of costs to the NHS and social care due to the health impacts of air pollution

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West of England Combined Authority Joint Local Transport Plan

Draft Bath and North East Somerset Corporate Strategy 2020 – 2024

Bath and North East Somerset Council's Sustainable Community Strategy 2009 – 2026

Bath and North East Somerset Core Strategy (2014)

Bath and North East Somerset Council Placemaking Plan (2017)