RHONDDA CYNON TAF

RECORD OF DELEGATED OFFICER DECISION

Key Decision ✓

SUBJECT:

Publication of the 2018 Air Quality Action Plan Addendum and Adoption of the Church Village, Llanharan, Tonyrefail & Treforest Air Quality Action Plans.

PURPOSE OF REPORT:

In accordance with the Council's Scheme of Delegation, this report has been prepared to accompany the intended officer decision of the Director, Public Health, Protection and Community Services, as described below:

The purpose of this report is to seek approval to publish the "2018 AQAP Addendum" for public consultation and, dependent upon the outcome of said public consultation, adopt four individual Air Quality Action Plans.

DELEGATED DECISION:

To publish the "2018 AQAP Addendum" for public consultation and delegate authority to the Director of Public Health, Protection and Community Services to consider the outcome of the public consultation and ensure that Rhondda Cynon Taf County Borough Council discharge its statutory duty by adopting the following individual statutory 'written plans':

a) The 'Church Village Air Quality Action Plan 2018';
b) The 'Llanharan Air Quality Action Plan 2018;
c) The 'Tonyrefail Air Quality Action Plan 2018'; and
d) The 'Treforest Air Quality Action Plan 2018'.

Chief Officer Signature	Print Name	Date
P J Lee	PAUL LEE	11.5.18

The decision is taken in accordance with Section 15 of the Local Government Act, 2000 (Executive Functions) and in the terms set out in Section 5 of Part 3 of the Council's Constitution

RHONDDA CYNON TAF

CONSULTATION

	10/05/2018
CONSULTEE CABINET MEMBER SIGNATURE	**DATE**
CONSULTEE OFFICER SIGNATURE	**DATE**

CALL IN PROCEDURE RULES.

IS THE DECISION DEEMED URGENT AND NOT SUBJECT TO CALL-IN BY THE OVERVIEW AND SCRUTINY COMMITTEE:

NO

Reason for urgency:.....

If deemed urgent - signature of Mayor or Deputy Mayor or Head of Paid Service confirming agreement that the proposed decision is reasonable in all the circumstances for it being treated as a matter of urgency, in accordance with the overview and scrutiny procedure rule 17.2:

.....	.....
(Mayor)	***(Dated)***

NB - If this is a reconsidered decision then the decision Cannot be Called In and the decision will take effect from the date the decision is signed.

RHONDDA CYNON TAF

FOR CABINET OFFICE USE ONLY

PUBLICATION & IMPLEMENTATION DATES

PUBLICATION
Publication on the Councils Website:- 14th May 2018

DATE

IMPLEMENTATION OF THE DECISION
Note: This decision will not come into force and may not be implemented until the expiry of 5 clear working days after its publication to enable it to be the subject to the Call-In Procedure in Rule 17.1 of the Overview and Scrutiny Procedure Rules.

Subject to Call In the implementation date will be 22nd May 2018

DATE

Secretary to the Cabinet Signature	Print Name: CHRISTIAN SHANAGAN	Date: 14/5/18.

RHONDDA CYNON TAF

RHONDDA CYNON TAF COUNTY BOROUGH COUNCIL

KEY DELEGATED DECISION

REPORT TO ACCOMPANY A DECISION OF THE DIRECTOR OF PUBLIC HEALTH, PROTECTION AND COMMUNITY SERVICES

8TH MAY 2018

PUBLICATION OF THE 2018 AIR QUALITY ACTION PLAN ADDENDUM AND ADOPTION OF THE CHURCH VILLAGE, LLANHARAN, TONYREFAIL & TREFOREST AIR QUALITY ACTION PLANS

Authors: **Louise Davies, Head of Public Protection**
Neil Pilliner, Pollution and Public Health Manager

1. PURPOSE OF THE REPORT

1.1 The purpose of this report is to seek approval to publish the "2018 Air Quality Action Plan Addendum" [the 2018 AQAP Addendum] for public consultation.

1.2 Dependent upon the outcome of said public consultation, to adopt the individual Church Village, Llanharan, Tonyrefail and Treforest Air Quality Action Plans

1.3 In accordance with the Council's Scheme of Delegation, this report has been prepared to accompany the intended Officer decision of the Director of Public Health, Protection and Community Services, as described below.

2. RECOMMENDATIONS

It is recommended to:

2.1 Publish the "2018 AQAP Addendum" for public consultation; and

2.2 Delegate authority to the Director of Public Health, Protection & Community Services, to consider the outcome of the public consultation and ensure that Rhondda Cynon Taf County Borough Council discharge its statutory duty by adopting the following individual statutory 'written plans': -

a) The 'Church Village Air Quality Action Plan 2018';
b) The 'Llanharan Air Quality Action Plan 2018;
c) The 'Tonyrefail Air Quality Action Plan 2018'; and
d) The 'Treforest Air Quality Action Plan 2018'

3. REASONS FOR RECOMMENDATIONS

3.1 Although compliance to the Air Quality Objectives [AQOs] within an Air Quality Management Area [AQMA] may inevitably rely, in part, upon national policy implementation, evidence suggests that without a programme of proactive proportionate local intervention, it may not be possible to achieve timely compliance to the annual mean AQO for Nitrogen Dioxide at the Church Village, Llanharan, Tonyrefail and Treforest AQMAs. Therefore, each of the four AQMAs will require bespoke Air Quality Action Plans [AQAPs] containing effective, reasonable and proportionate actions to facilitate progress towards achieving compliance.

3.2 So as to enable full consideration of the actions to be included with the necessary AQAPs, the 2018 AQAP Addendum includes detailed analysis and evaluation of potential actions and possible outcomes. This has been achieved by the use of a systematic method capable of illustrating multi-agenda benefits as well as associated uncertainties. Enabling the identification of a number of actions, ranging from potential changes to local road traffic management, behavioural measures which enable the public to make informed transport decisions, the advocacy of speed restrictions to parts of the A470 and support of major infrastructural improvements, for instance the South East Wales Metro.

3.3 If implemented, the proposed AQAPs are expected to make significant progress in achieving timely compliance within the Church Village, Llanharan, Tonyrefail and Treforest AQMAs. This could help to tackle potentially negative health impacts from poor air quality. In addition, the actions within the proposed AQAPs have been identified, in part, due to their potential to deliver multi-agenda benefits and the maximisation of overall positive outcomes.

4. BACKGROUND

4.1 The recently published '2017 Annual Progress Report' provided the latest examination of all relevant local air quality information. It confirmed the need for the Local Authority to put in place appropriate AQAPs to work towards achieving compliance to the health based Air Quality Objective for long term exposure to Nitrogen Dioxide at the Church Village, Llanharan, Tonyrefail and Treforest AQMAs.

4.2 Nitrogen Dioxide is a toxic gas which in concentrations above the relevant Air Quality Objective may reduce the quality and length of life of chronically exposed individuals. Evidence suggests that the lowest social economic groups are most likely to experience poor air quality and are likely to be the most adversely affected by it.

4.3 The 2017 Annual Progress Report provided up to date consideration of all four of the above AQMAs, including the reasons why levels of Nitrogen Dioxide were elevated. It also provided the evidence base to enable the consideration of possible actions which could be implemented to enable the aspiration of achieving compliance. As such, this 2018 Air Quality Action Plan Addendum is a continuation of the 2017 Annual Progress Report and should be considered in conjunction with it.

4.4 In considering the four AQMAs, several common reasons for the observed elevated levels of Nitrogen Dioxide have been determined. These include the importance of local topography & urban environment and the volume, speed and composition of road traffic as well as the management of this traffic along roads within or nearby to each AQMA. However, each location also experiences specific influences upon the local prevalence of Nitrogen Dioxide that may not be replicated further afield, for instance the close proximity and elevation of the A470 at Treforest.

4.5 It is acknowledged that when working towards achieving compliance to an AQO within an AQMA, it may be necessary to draw upon a range of both national and local actions. An AQAP identifies and facilitates bespoke locally targeted measures which the Local Authority should draw upon to work towards achieving compliance within the associated AQMA.

4.6 An Air Quality Action Plan may contain a wide range of actions and may include multiple actions with the aim to achieve compliance. When considering actions which may be appropriate for inclusion with an Air Quality Action Plan, statutory guidance and the Well-being of Future Generations (Wales) Act 2015 now requires a multi-agenda outcome approach. This not only looks to support a compliance-effectiveness process but also requires a wider cost-benefit analysis which seeks to identify and promote possible wider benefits of any programme of intervention. In particular, wider benefit considerations should take account of the wider air pollution Burden-Reduction approach as well as the Climate Change, Noise Action Planning and Public Services Board Priority agendas.

4.7 Once adopted, the Local Authority will annually report upon any progress in implementing an AQAP and will, from time to time, review its effectiveness and any need to modify it.

5. EQUALITY AND DIVERSITY IMPLICATIONS

5.1 A screening EqIA has examined the impact of each of the proposed AQAPs, their associated actions and their likely outcomes upon protected groups. Although the initial EqIA summary assessment indicated a potential impact with regards to the protected characteristic "disability", it has been identified that sufficient protective measures are innately associated with the relevant actions, so that any detrimental effect can be avoided and any positive effects maximised; as such a full EqIA is not required at this time.

5.2 An EqIA screening form has been produced and can be provided upon request

6. CONSULTATION

6.1 To discharge its statutory responsibilities, the Local Authority will consult upon the 2018 AQAP Addendum both with directly affected local ward members, the public and other statutory consultees including the Welsh Government who will peer review its findings.

7. FINANCIAL IMPLICATION(S)

7.1 The proposed AQAPs within the 2018 AQAP Addendum contain a number of actions which could incur a financial burden if it is determined to implement them. The Local Authority will seek, where possible, to identify dedicated external funding opportunities and synergism with other programmed interventions.

7.2 Nevertheless, it may not be possible to obtain sufficient external resources to implement the proposed AQAPs. In the event of the partial resourcing of AQAP actions, the 2018 AQAP Addendum provides for the prioritisation of the AQAPs, based upon need and the possible differing vulnerability of the public within each AQMA.

8. LEGAL IMPLICATIONS *OR* LEGISLATION CONSIDERED

8.1 Rhondda Cynon Taff County Borough Council is under a legal obligation, in accordance with Section 84(2) of the Environment Act 1995 [the Act], to prepare "a written plan for the exercise by the authority, in pursuit of the achievement of air quality standards and objectives in the [...AQMA...], of any powers exercisable by the authority". In accordance with previous practice Rhondda Cynon Taf County Borough Council will produce an Air Quality Action Plan separately for each of the four AQMAs which are yet subject to an Air Quality Action Plan.

8.2 An Air Quality Action Plan must include the actions that comprise it and the proposed dates the action shall be implemented on. As an Air Quality Action Plan is dependent upon real-world change, they are considered 'living plans' that, from time to time, may be reviewed in accordance with statutory guidance and common practice.

8.3 To maintain consistency with statutory guidance[1] and the principles and working practices necessary to facilitate the goals of the Well-being of Future Generations (Wales) Act 2015, an Air Quality Action Plan must be composed of actions that have been considered in regards to their compliance-effectiveness and their wider there cost-benefit, in particular to the delivery of several specified agendas.

8.4 The Local Authority has determined that, subject to public consultation, bespoke Air Quality Action Plans are adopted as described within the 2018 AQAP Addendum in respect of the Church Village AQMA, the Llanharan AQMA, Tonyrefail AQMA and Treforest AQMA.

8.5 The Local Authority is not under a legal obligation to achieve compliance to an Air Quality Objective or to immediately fully implement an Air Quality Action Plan per se. However, it is required to annually demonstrate its pursuit of achievement of compliance to an Air Quality Objective.

8.6 Under Section 85 of the Act the National Assembly of Wales may compel the Local Authority to act in a certain way in regard to local air quality. Recent statutory

[1] Welsh Government, Local Air Quality Policy Guidance for Wales LAQM.PG(17)(W), 2017

guidance has clarified that such a direction will be issued to instruct the Local Authority to undertake its local air quality management duties, including declaring, amending or revoking an Air Quality Management Area, should Welsh Government feel it necessary to do so. In addition, the Localism Act 2011 may provide a mechanism for the Welsh Minister to recover any costs as a result of infraction proceedings brought against the United Kingdom as a result of an 'EU Limit Value' air quality standard not being achieved due to the inaction of Rhondda Cynon Taf County Borough Council.

8.7 Current advice from Welsh Government is that until such time as the United Kingdom withdraws from the EU, all air quality management duties transposed from EU legislation shall be adhered to. It is also noted that local air quality management duties are an obligation derived from United Kingdom primary legislation in its own right.

9. LINKS TO THE CORPORATE AND NATIONAL PRIORITIES AND THE WELL-BEING OF FUTURE GENERATIONS ACT.

9.1 Both mortality and morbidity factors associated with poor air quality have increased in precedence, as understanding of the health impact of air quality has improved. This includes a greater appreciation of the accumulative impacts poor air quality can have on deprived communities which may already be affected by higher rates or poor health.

9.2 In regard to "People – Promoting independence and positive lives for everyone" within the Well-being Objectives Plan. Although not an identified action per se, the proposed AQAPs may directly bring about improved health outcomes for local communities. This could be directly achieved by improving the quality of air these communities may regularly experience as well as addressing the perceptions of poor air quality and is affect on local amenity.

9.3 In regard to "Economy – Building a strong Economy" within the Well-being Objectives Plan. Many of the actions within the proposed AQAPs may incidentally support the efforts to achieve this objective. For instance, measures to increase and support public transport and resultant community connectivity can have a driving effect for local and regional economic development.

9.4 Local Air Quality Management statutory guidance now incorporates the principles and ways of walking associated within the Well-being of Future Generations Act. By fully abiding with this guidance and utilising a method that acknowledges and promotes sustainable multi-agenda delivery, the 2018 AQAP Addendum furthers the local authority delivery of WFG.

10. CONCLUSION

10.1 The Local Authority has produced the "2018 AQAP Addendum" and will publish its findings for public dissemination and comment.

10.2 The Local Authority has identified that it is necessary, subject to the outcome of public consultation to adopt bespoke individual Air Quality Action Plans for the Church Village, Llanharan, Tonyrefail and Treforest AQMAs. The Air Quality Action Plans as detailed within the 2018 AQAP Addendum will be composed of actions that are considered compliance-effective as well as where possible, delivering multi-agenda beneficial outcomes.

10.3 To comply with statutory obligations and promote understanding of the situation, a comprehensive consultation will be undertaken. The responses received, including that from the Welsh Government will be considered prior to any final decision being made and if necessary this matter will be re-examined.

Other Information:-

Relevant Scrutiny Committee

Health and Wellbeing Scrutiny

RHONDDA CYNON TAF

LOCAL GOVERNMENT ACT 1972

AS AMENDED BY

THE LOCAL GOVERNMENT (ACCESS TO INFORMATION) ACT 1985

RHONDDA CYNON TAF COUNTY BOROUGH COUNCIL

8TH MAY 2018

REPORT TO ACCOMPANY A DECISION OF THE DIRECTOR OF PUBLIC HEALTH, PROTECTION AND COMMUNITY SERVICES

PUBLICATION OF THE 2018 AIR QUALITY ACTION PLAN ADDENDUM AND ADOPTION OF CHURCH VILLAGE, LLANHARAN, TONYREFAIL & TREFOREST AQAPS

Contact Officer:

Louise Davies
Head of Public Protection
Tel No 01443 425385

CYNGOR BWRDEISTREF SIROL RHONDDA CYNON TAF

RHONDDA CYNON TAFF COUNTY BOROUGH COUNCIL

RHAN IV, DEDDF YR AMGYLCHEDD 1995
RHEOLI ANSAWDD AER LLEOL

PART IV, ENVIRONMENT ACT 1995
LOCAL AIR QUALITY MANAGEMENT

Adendwm Cynlluniau Gweithredu Ansawdd Aer 2018

2018 Air Quality Action Plans Addendum

Ionawr 2018

January 2018

STRONG HERITAGE | STRONG FUTURE

RHONDDA CYNON TAF

TREFTADAETH GADARN | DYFODOL SICR

Mae'r Adendwm Cynlluniau Gweithredu Ansawdd Aer 2018 wedi ei baratoi a'i gyhoeddi gan Gyngor Bwrdeistref Sirol Rhondda Cynon Taf yn unol â'i ddyletswyddau o dan Adran IV o Ddeddf yr Amgylchedd 1995. Oni nodir fel arall, barn a sylwadau Cyngor Bwrdeistref Sirol Rhondda Cynon Taf yn unig sy'n cael eu mynegi yn yr Adendwm Cynlluniau Gweithredu Ansawdd Aer 2018.

Mae'r Adendwm Cynlluniau Gweithredu Ansawdd Aer 2018 yn destun Asesiad o'r Effaith ar Gydraddoldeb yn unol â Chynllun Cydraddoldeb Strategol Cyngor Bwrdeistref Sirol Rhondda Cynon Taf 2014–2017 a Deddf Cydraddoldeb 2010.

Yn unol â Chynllun y Gymraeg Rhondda Cynon Taf, ystyrir yr adendwm yn un technegol a fyddai o ddiddordeb i gynulleidfa fach o bobl yn unig, ac felly mae wedi'i gyhoeddi yn y Saesneg. Fodd bynnag, bydd modd gofyn am fersiwn Gymraeg ohono.

The 2018 Air Quality Action Plans Addendum has been produced and issued by Rhondda Cynon Taff County Borough Council in fulfilment of its duties under Part IV of the Environment Act 1995. Unless otherwise stated all opinions and views contained within the 2018 Air Quality Action Plans Addendum are that of Rhondda Cynon Taff County Borough Council only.

The 2018 Air Quality Action Plans Addendum is subject to an Equality Impact Assessment in accordance with Rhondda Cynon Taf County Borough Council’s Strategic Equality Plan 2014 – 2017 and the Equality Act 2010.

In accordance with Rhondda Cynon Taff’s Welsh Language Scheme the 2018 Air Quality Action Plans Addendum is deemed to be a technical document of limited public interest and has therefore been produced in English. A Welsh version, however, can be made available on request.

Local Authority Officer	Neil Pilliner Pollution & Public Health Manager

Department	Public Health and Protection
Address	Ty Elai Dinas Isaf East Williamstown Tonypandy CF40 1NY
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Report Reference Number	2018AP
Date	26th February 2018

CYNGOR BWRDEISTREF SIROL RHONDDA CYNON TAF

RHAN IV, DEDDF YR AMGYLCHEDD 1995
RHEOLI ANSAWDD AER LLEOL

Adendwm Cynlluniau Gweithredu Ansawdd Aer 2018

Ionawr 2018

Crynodeb Gweithredol

0.1 Crynodeb annhechnegol

Mae Cyngor Bwrdeistref Sirol Rhondda Cynon Taf [yr Awdurdod Lleol] yn cydnabod bod modd i ansawdd aer gwael effeithio ar iechyd pobl a bod modd i ansawdd aer da fod yn bwysig o ran gwella hyd ac ansawdd bywyd. Os yw'r Awdurdod Lleol wedi dod o hyd i ardaloedd o ansawdd aer gwael, bydd yn eu dynodi nhw'n Ardaloedd Rheoli Ansawdd Aer. Yn ôl y gyfraith, mae rhaid i'r Awdurdod Lleol weithio tuag at wella'r sefyllfa o fewn Ardal Rheoli Ansawdd Aer. Er mwyn cyflawni hyn, mae rhaid i'r Awdurdod Lleol ddarparu Cynllun Gweithredu Ansawdd Aer sydd â manylion am y camau gweithredu a fydd yn gweithio tuag at gydymffurfio ag Amcanion Ansawdd Aer cyfreithiol.

Mae'r Adendwm Cynlluniau Gweithredu Ansawdd Aer 2018 yn nodi'r dulliau a'r dystiolaeth wedi'u defnyddio i lunio Cynlluniau Gweithredu Ansawdd Aer ar gyfer pedair Ardal Rheoli Ansawdd Aer sydd newydd gael eu cyhoeddi. Mae'r Ardaloedd Rheoli Ansawdd Aer yma wedi cael eu dynodi o ganlyniad i lefelau o Nitrogen Deuocsid sy'n uwch na'r Amcan Ansawdd Aer hirdymor. Ar wahân i'w gilydd maen nhw'n cynnwys ardaloedd o Bentre'r Eglwys, Llanharan, Tonyrefail a Threfforest. Trwy wneud hynny, mae'r adendwm yn ystyried swm sylweddol o wybodaeth wedi'i nodi yn yr Adroddiad Cynnydd Blynyddol 2017 sydd newydd ei gyhoeddi. Dylai'r ddogfen yma gael ei hystyried mewn perthynas ag Adroddiad Cynnydd Blynyddol 2017.

O ganlyniad i ystyriaeth ofalus, mae'r adendwm wedi pennu cyfuniad o gamau gweithredu a fydd yn cael eu cynnwys o fewn pob Cynllun Gweithredu Ansawdd Aer arfaethedig. Mae'r camau gweithredu wedi'u pennu yn cynnwys gwelliannau posibl i drafnidiaeth gyhoeddus, mesurau rheoli traffig lleol i leihau tagfeydd ac ymwybyddiaeth o opsiynau trafnidiaeth gynaliadwy. Mae'r camau yma yn cael eu hystyried i gynrychioli'r camau gorau i gydymffurfio â'r Amcan Ansawdd Aer Nitrogen Deuocsid hirdymor cyn gynted ag y bo modd. Maen nhw hefyd wedi cael eu dewis yn ôl sut mae modd iddyn nhw ddarparu deilliannau buddiol sy'n berthnasol i wahanol agendâu, gan gynnwys lleihau baich llygredd aer, teithio llesol, newid hinsawdd, Cynllun Gweithredu ynghylch Sŵn, ac agendâu Llesiant ac Iechyd y Cyhoedd ehangach. Mae'r dull yma yn croesawu'r egwyddorion a'r arferion gweithio sydd i'w disgwyl o ganlyniad i Ddeddf Llesiant Cenedlaethau'r Dyfodol (Cymru) 2015.

Yn sgil yr ansicrwydd sylweddol ynghylch lefelau o lygredd aer yn y dyfodol a'r effaith bydd y camau gweithredu o bosibl yn ei chael, bydd y Cynlluniau Gweithredu Ansawdd Aer arfaethedig yn 'ddogfennau byw' fydd yn cael eu monitro, eu hadolygu a'u diwygio'n rheolaidd, os oes angen, i ystyried yr amgylchiadau newidiol.

Mae'n bosibl na fydd modd cyflawni'r camau gweithredu sydd yn y Cynlluniau Gweithredu Ansawdd Aer yn syth oherwydd argaeledd adnoddau. Felly, bydd hi'n hollbwysig sicrhau trefniadau gweithio agos gydag agendâu perthnasol eraill er mwyn manteisio ar arbenigedd ar y cyd, y defnydd effeithlon o'r adnoddau sydd ar gael ac er mwyn gwneud y mwyaf o fudd posibl i bawb.

Mae'r Awdurdod Lleol wedi ymrwymo i gynnal ymgynghoriad cyhoeddus ynglŷn â'r Adroddiad, a'i gynigion.

RHONDDA CYNON TAF COUNTY BOROUGH COUNCIL

PART IV, ENVIRONMENT ACT 1995
LOCAL AIR QUALITY MANAGEMENT

Air Quality Action Plans Document

January 2018

Executive Summary

0.1 Non-Technical Summary

Rhondda Cynon Taff County Borough Council [the Local Authority] recognises poor air quality can affect people's health and that good air quality can be important in improving the length and quality of people's lives. Where the Local Authority has found poor air quality, these areas may be designated as Air Quality Management Areas. The law requires the Local Authority to work towards improving the situation within an Air Quality Management Area. To achieve this, the Local Authority must produce an Air Quality Action Plan, which details actions that will work towards achieving compliance to legal Air Quality Objectives.

The 2018 Air Quality Action Plan Addendum contains the methods and evidence used to create Air Quality Action Plans for four recently declared Air Quality Management Areas. These Air Quality Management Areas have been designated due to levels of Nitrogen Dioxide above the long-term Air Quality Objective. Separately they cover areas of Church Village, Llanharan, Tonyrefail and Treforest. In doing so the 2018 Air Quality Action Plan Addendum draws upon a considerable amount of information contained within the recently published 2017 Annual Progress Report. This Document should be considered in conjunction with the 2017 Annual Progress Report.

As a result of careful consideration, the 2017 Air Quality Action Plan Addendum has identified a combination of actions that will be included within each proposed Air Quality Action Plan. The identified actions include possible improvements to public transport, local traffic management to reduce congestion and awareness of sustainable transport options. These actions are believed to represent the best actions to achieve compliance to the long-term Nitrogen Dioxide Air Quality Objective as soon as practicably reasonable. They have also been selected on how they could potentially deliver beneficial outcomes relevant to several different agendas, including air pollution Burden-Reduction, Active Travel, Climate Change, Noise Action Plan and broader Well-being and Public Health Agendas. This approach fully embraces the principles and working practices expected as a result of the Well-being of Future Generations (Wales) Act 2015.

As significant uncertainly exists about future levels of air pollution and the effect actions may have upon it, the proposed Air Quality Action Plans will be

'living documents' that will be regularly monitored, reviewed and if necessary modified to take account of changing circumstances.

Given the availability of resources it may not be possible to deliver the actions within the proposed Air Quality Action Plans immediately. As such, it will be very important to ensure close working arrangements with other relevant agendas, so as to benefit from shared expertise, the efficient use of available resources and to maximise benefit to all.

The Local Authority is fully committed to publicly consult upon this Report and its proposals.

Index

Chapter 1 - Introduction

1.1 Background

Rhondda Cynon Taff County Borough Council [the Local Authority] is the unitary authority covering the areas of Cynon Valley, Rhondda Valleys and Taf Vale and is the Local Authority in regards to Section 84 (1) & (2)(b) of the Environment Act 1995.

Where the Local Authority has declared an Air Quality Management Area [AQMA] it is under an obligation to adopt an appropriate Air Quality Action Plan [AQAP]. The AQAP includes actions that, after careful consideration, are believed to represent a cost-effective and potentially beneficial way of working towards achieving compliance to the relevant Air Quality Objective [AQO] as rapidly as is reasonable. An AQAP may also take a "view to maximising [its] contribution to reducing overall levels of nitrogen dioxide, particulate matter and environmental noise pollution for the population as a whole, so as to achieve the greatest public health benefit"[1].

The Local Authority has already adopted and is implementing a number of AQAPs in respect of its extant AQMAs, however, there is a current need to produce respective AQAPs for the recently declared Church Village, Llanharan, Treforest and Tonyrefail AQMAs. All four AQMAs were recently subject to in-depth review and assessment, including their source apportionment, as part of the 2017 Annual Progress Report. Therefore, to ensure an efficient and holistic approach, the Local Authority has compiled the proposed individual AQAPs for the Church Village, Llanharan, Treforest and Tonyrefail AQMAS, within this 2017 Air Quality Action Plan Addendum [2017 AQAP Addendum] issued in conjunction with the 2017 Progress Report. However, it should be noted that each of the proposed AQAPs shall be considered as separate standalone statutory plans; as such each proposed AQAP has been reproduced individually in Annex IV.

1.2 Statutory Context

The 2017 AQAP Addendum contains the method, evidence and evaluations used to produce the proposed AQAPs for the Church Village, Llanharan, Treforest and Tonyrefail AQMAs. Although it is a standalone document issued in accordance with the Local Authorities obligations under Section 84(2) of the Environment Act 1995, it does draw heavily upon and is referenced to the 2017 Annual Progress Report.

Appropriate bodies, including the Department of the Environment, Food and Rural Affairs [Defra] and the Welsh Government issue statutory and non-statutory guidance on how the Local Authority should perform its Local Air Quality Management duties, including the production of AQAPs. The 2017

[1]Welsh Government, *Box 6.1 of Local Air Quality Management in Wales Policy Guidance*, June 2017

AQAP Addendum and the AQAPs within it, has been compiled in accordance with relevant guidance, including: -

- Local Air Quality Policy Guidance for Wales [LAQM.PG(17)(W)], issued by Welsh Government, and Local Air Quality Technical Guidance [LAQM.TG(16)], issued by Defra and the Devolved Administrations;
- Local Air Quality Management Practice Guidance 1 Economic Principles for the Assessment of Local Measures to Improve Air Quality [LAQM.PrG1(09)] issued by the Welsh Government;
- The Green Book issued by Her Majesties Treasury;
- Accounting for environmental impacts: Supplementary Green Book Guidance issued by Her Majesty's Treasury & Defra.

Once adopted the Local Authority will be expected to report annually on progress with the implementation of any AQAP and any changes it may bring about to local air quality.

1.3 2017 Annual Progress Report

The recently published and consulted upon 2017 Annual Progress Report provides comprehensive context to Local Air Quality Management within Rhondda Cynon Taf. In addition, it contains up to date assessments, including source apportionment, of the Church Village, Llanharan, Treforest and Tonyrefail AQMAs. It identified that each AQMA was likely to be currently in breach of the annual mean AQO for Nitrogen Dioxide [NO_2] and without intervention this non-compliance could possibly continue. Although each AQMA incorporated a distinct geographical area within differing local communities, the 2017 Annual Progress Report highlights the similarities in the causes and influences upon the elevated levels of NO_2 experienced within them.

As mentioned above, the 2017 Annual Progress Report has been subject to public consultation including peer review by Welsh Government; the consultation outcomes are provided within Annex III of this Document. The Local Authority believes that its local air quality management actions, including the publication of the 2017 AQAP Addendum, is consistent with these consultation outcomes.

To avoid unnecessary duplication and maintain an expedient approach, the 2017 AQAP Addendum must be considered in tandem with the 2017 Annual Progress Report to which this document acts as an addendum. Nonetheless, to ensure transparency and enable effective engagement with stakeholders, the 2017 AQAP Addendum will be published as a separate document for consultation and consideration.

Chapter 2 – Policies and Strategies

The 2017 Annual Progress Report[2] provides a review of policies, strategic positions and statutory plans adopted by the Local Authority which could have a bearing upon local air quality management. In relation to the formation of the proposed AQAPs, additional information is provided within this Chapter on several areas which could be of particular relevance.

2.1 Well-being of Future Generation (Wales) Act 2015 and Cwm Taf Public Services Board

The Cwm Taf Public Services Board was launched in May 2016, in response to the need to facilitate and coordinate the achievement of well-being objectives associated with sustainable development goals introduced by the Well-being of Future Generation (Wales) Acts 2015. Set up as a partnership between a number of statutory participants, including Rhondda Cynon Taf CBC as a core participant. Cwm Taf Public Services Board's stated purpose is to improve the quality of life and outcomes for the citizens of Rhondda Cynon Taf and Merthyr Tydfil via proactive collective leadership, stimulating dialogue and cooperation, removing administrative obstacles to success and ensuring best value in the delivery of services.

After the completion of the Cwm Taf Well-being Assessment, the Cwm Taf Public Services Board produced the Draft Cwm Taf Draft Well-being Plan[3]. This has identified three areas of work Cwm Taf Public Services Board feels should be prioritised: -

- To promote safe, confident, resilient, and thriving communities, improving the well-being of residents and visitors and building on our community assets;
- To help people live long and healthy lives and overcome any challenges;
- To grow a strong local economy with sustainable transport that attracts people to live, work and play in Cwm Taf.

Within the Draft Cwm Taf Well-being Plan, poor air quality has been identified as a challenge in respect to two of these priority areas, "Lifestyle & Health" and "Economy & Infrastructure". Although the draft objectives, describing the likely scope of intervention, do not directly refer to local air quality management, they do provide additional policy context to its implementation.

Draft Objective 2 of the Draft Cwm Taf Draft Well-being Plan makes reference to "target action at our most vulnerable people". This would imply that within the evaluation of proposed AQAP actions, due regard must be had to any

[2] Rhondda Cynon Taf CBC, *Chapter 4 of the 2017 Annual Progress Report*, September 2017
[3] Cwm Taf Public Services Board, *Cwm Taf Draft Well-being Plan 2018-2023*,

influence, both positive or negative, which the action could have on "community zones, pregnant women, babies, children and older people". Furthermore, when considering the prioritisation of actions within a proposed AQAP or between AQAPs, similar regard should be had to the need to positively impact vulnerable groups at the earliest opportunity.

Draft Objective 3 of the Draft Cwm Taf Draft Well-being Plan makes reference to the City Deal and Metro by "making sure we get new local jobs and easier transport to jobs further afield". This would imply that within the evaluation of proposed AQAP actions, due regard must be had to the need to support local industry and sustainable commuting.

In addition to the above and as part of the delivery of the well-being objectives, National Indicators and Milestones have been produced, including one for air quality. It is expected that this may require air quality management to additionally consider the broader burden reduction approach to air pollution and the positive consequences this could have to public health.

This statutory regime is currently in the implementation phase and it is uncertain as to the practical extent of interaction between this regime and the local air quality management regime. As a result the Local Authority will, for the foreseeable future, continue to produce AQAPs as standalone statutory plans as well as separate local air quality management progress reports. This position will be reviewed should future statutory guidance require a harmonised approach to intervention or reporting.

2.2 Cardiff Capital Region City Deal

The Cardiff Capital Region is a cooperative group of ten local authorities centred upon the South East Wales region, of which Rhondda Cynon Taf CBC is a member. It is expected that over a twenty year period it will enable potentially £5 billion pounds worth of public and private sector inward investment, with the aim to stimulate economic regeneration as part of the City Deal. Although possessing a wide remit, including the delivery of sustainable economic development and improvement to the local employment skill base, it is envisaged that a significant area of work by the Cardiff Capital Region will focus on improvements to strategic intra-regional transport links.

Of particular note is the stated key priority of the Cardiff Capital Region in the delivery of the South East Wales Metro[4], a combination project of Valleys Line railway electrification and a wider metro scheme potentially relying upon existing and new infrastructure. It is expected that the combined South East Wales Metro will dramatically improve the provision of local public transport, with an emphasis on building transport connectivity throughout the region. In particular, the South East Wales Metro may focus on the critical commuter routes associated with the City of Cardiff and its neighbours, including Rhondda Cynon Taf.

[4] Welsh Government, *Rolling out our Metro*,

Although at this stage it is not possible to determine the exact effects the South East Wales Metro could have, with regard to local air quality management, on any specific area. It is possible that the Church Village, Llanharan and Treforest AQMAs may be affected, to some extent, by changes to road use patterns and the possible removal of diesel fuelled locomotives. Elements of the South East Wales Metro are expected to be delivered within their own dedicated timescales, likely involving a multi-phased project delivery approach with initial phased work, to improve certain elements of existing infrastructure, currently underway.

It is also expected that the Cardiff Capital Region will establish a new non-statutory Regional Transport Authority to co-ordinate transport planning and investment, in partnership with the Welsh Government. It is likely that the Regional Transport Authority will consider actions to improve connectivity and the removal of dissuasive barriers to use, for instance the potential for integrated regional public transport pricing and ticketing.

Another significant area of work for the Cardiff Capital Region will be to explore a more balanced regional planning framework and to realise the opportunity for its partners to come together to develop and deliver a strategic approach to housing, regeneration and economic growth which will create an accessible, liveable, 'work life integrated' and highly connected Capital Region.

It is expected that local air quality management has the ability to be affected by as well as influence the practical delivery of the City Deal, in maximising any potential to reduce air pollution and the improvement of sustainable economic and transport options to priority areas.

2.3 Local Development Plan [LDP] and regionally collaborative Local Transport Plan [rc-LTP]

The 2017 Annual Progress[5] Report provides a review of likely development and transport schemes which could influence local air quality management within Rhondda Cynon Taf and how currently the Local Authority delivers transport planning via a rc-LTP.

In addition, Rhondda Cynon Taf County Borough Council is a Community Infrastructure Levy [CIL] Charging Authority and has recently updated its Regulation 123 List[6] of certain infrastructure requirements, including transport related ones. If appropriate, the Local Authority may determine to attempt to part or fully fund any listed project, via CIL payments made during the development control process.

In regard to the Llanharan AQMA it is noted that the Local Authority has identified the "Llanharan By-Pass" as a transport funding project included

[5] Rhondda Cynon Taf CBC, *Chapter 3 of the 2017 Annual Progress Report*, September 2017
[6] Rhondda Cynon Taf CBC, *Community Infrastructure Levy Regulation 123 List*,

within the Regulation 123 List. Although no particular route for the Llanharan By-Pass has been chosen. It could, dependent upon design, significantly reduce road traffic volume and congestion within the Llanharan AQMA. The Local Authority is currently undertaking a Welsh Transport Planning and Appraisal Guidance [WelTAG] study into the possible extent and design options of the possible Llanharan By-Pass. Although at an early stage it is expected that local air quality management considerations and the proposed Llanharan AQAP will be considered as part of the WelTAG or subsequent decision making processes.

In regard to the Tonyrefail AQMA it is noted that the Local Authority has identified the "South Coed Ely Link Dualling" and the "A4119/A4093 Tonyrefail Roundabout improvements" as transport funding projects included within the Regulation 123 List. Although both schemes are outside of the Tonyrefail AQMA they may have the potential to reduce, to some degree, road traffic congestion experienced within the Tonyrefail AQMA. As considerations progress into both schemes, any effect on air quality within the Tonyrefail AQMA will be explored and highlighted during the decision making process.

Neither the Church Village or Treforest AQMAs are expected to be substantively affected by particular proposed local developments or infrastructure projects.

2.4 Noise Action Planning

It has been recognised that environmental noise can have a significant impact upon public health. The Environmental Noise Directive[7] [END], obligates member states to consider measures to ameliorate adverse environmental noise and preserve areas of good environmental noise quality.

The Environmental Noise Regulations (Wales) 2006, as amended, transposes the END and requires the Welsh Government to implement the aims of the END in respect of noise from strategic roads, railways and airports as well as environmental noise within agglomerations. To facilitate these goals the Welsh Government has produced noise maps[8] to identify agglomerations and strategic transport routes which are at risk from poor environmental noise quality.

The END requires member states to review, and revise if necessary, its strategic noise maps at least every five years. The Welsh Government undertook such a review in 2015 and concluded that there was no need to revise the maps of railway noise in Wales prior to proposed electrification works, nor to recalculate noise from non-major roads in urban agglomerations. However, the maps of noise from major roads across Wales and from industry in urban agglomerations were judged to be out of date and in need of revision, these were recalculated in 2017.

[7] European Commission, Directive 2002/49/EC of the European Parliament and of the Council, 25th June 2002
[8] Welsh Government, *Data Flow 4 and 8 Supplementary Report Major Roads in Wales*, 2013

The 2017 noise maps for major roads and agglomeration industry in Wales may be viewed, overlaid with air pollution background maps[9]. The 2012 map layers showing noise action planning priority areas and quiet areas remain as they are for the time being, though they will be reviewed and updated during the course of 2018 as Welsh Government draw up a new five-year noise action plan for Wales.

It is a requirement for public services boards to take the noise maps into account when producing their assessments of local well-being. Local Authorities are also required to consider the noise maps, when reporting policies on tackling airborne pollution in their local air quality management annual progress reports. They must also consider potential synergies and conflicts with noise management when drawing up local air quality action plans.

A new five-year noise action plan for Wales is expected in the summer of 2018 and will bring noise policy in Wales firmly into line with the principles and ways of working established by the Well-being of Future Generations (Wales) Act 2015 and will also reflect changes being made to Planning Policy Wales.

[9] at http://lle.gov.wales/map/airbornepollution

Chapter 3 – Air Quality Action Plan Process

The Local authority has, based upon guidance, designed an iterative procedure to produce the necessary AQAPs. Each step of the iterative process represents a significant decision-making link which can be reiterative dependent upon the outcome.

3.1 Stage I Scoping Exercise

Stage I involves the consideration of possible rational actions to deliver partial or full compliance to the relevant AQO for NO_2. The list of actions is examined and a practicality test is undertaken. During this stage a “practical” action is determined as technically possible in a limited resource system, whilst being consistent with the Local Authority's stated policies.

The test uses a “traffic light” assessment process indicating actions coloured yellow as being practicable and to be considered further during the next stage of assessment. Actions coloured magenta have been considered not to be practical for the relevant AQMA and further consideration is discontinued.

3.2 Stage IIa Inter-Consistency Analysis

Stage IIa involves the consideration of identified practical actions to determine if they are viable in regards to implementation. Certain practical actions may have a broader affect than that experienced within a single targeted AQMA. It is also possible for some actions to benefit a particular AQMA at the detriment of other AQMAs or more generally local air quality. Alternatively some actions may significantly improve air quality at a number of closely positioned AQMAs or may only improve air quality slightly in any one AQMA but could also deliver similar benefit to other AQMAs. Therefore, to adequately encapsulate the viability of an action a cross-referencing test is performed to identify viable actions, being an action that would likely bring about a positive change without causing unacceptable detriment, and to set the parameters of the viable action during subsequent desirability analysis.

3.3 Stage IIb Strategic Environmental Assessment

It has been identified[10] that, in certain circumstances, an AQAP may be subject to Regulations transposing the Strategic Environmental Assessment Directive. This could be as a result of an AQAP affecting an area designated to protect its conservation value or because it includes actions which would be subject to Annex I or II of the Environmental Impact Assessment Directive[11] and could set the framework for their consent.

[10] Office of the Deputy Prime Minister and the Devolved Administrations, *A Practical Guide to the Strategic Environmental Assessment Directive*, September 2005

[11] Directive 20011/92/EU, as amended, of the EUROPEAN PARLIAMENT AND OF THE COUNCIL

As such, a preliminary screening assessment should be undertaken at an early opportunity. This ensures any actions considered during the advanced stages of the AQAP process, can take account of the necessary Strategic Environmental Assessment [SEA] requirements and be properly evaluated during the decision making process.

To fulfil this requirement, it is necessary for each viable action to be examined in a screening process to determine if it should be subject to a full SEA. As such, Stage IIb of the AQAP process should be considered a screening exercise in accordance with the SEA. If identified as necessary, the SEA will be undertaken during Stage III of the AQAP procedure and published concurrently during any consultation process.

It should be noted that, it is not necessary to undertake a SEA for an action which meets the assessment criteria but has already had a SEA undertaken during the formulation of an existing plan or programme or if the "first formal preparatory act" for that action was undertaken before the 21st July 2006.

It is acknowledged that it may become apparent in later stages of the AQAP process that some proposed action may, as it develops, require a SEA to be undertaken. Careful monitoring and a reiterative AQAP process should ensure that, if this occurs, necessary steps are taken to maintain compliance with the relevant SEA Regulations.

3.4 Stage III Detailed Analysis

Once viable actions have been identified, it is necessary to compare these actions to determine if they are desirable actions to be included within the proposed AQAP. A desirable action is that which, after repeat ‘pair wise’ comparisons, is considered better than the other compared actions at achieving, in a proportionate way, the desired goals of being compliance effective and cost beneficial.

To determine desirability, detailed analysis of each action is undertaken to effectively capture the various outcome parameters which may influence the desirability of an action. As the AQAP process involves the multi-agenda consideration of action outcomes, it is necessary for the detailed analysis to incorporate practical elements of both compliance-effectiveness analysis and cost-benefit analysis.

3.4.1 Compliance-Effectiveness Analysis

To enable the formation of effective AQAPs, it is necessary to evaluate each viable action to determine the most effective or the combination of actions which are the most effective in achieving compliance to the relevant AQO within the assessed AQMA. An effective action is one which is considered to achieve the maximum reduction in levels of NO_2, that are above the relevant

AQO, within the AQMA for the least nominal cost. To undertake compliance-effectiveness analysis, consideration must be had to both the likely reductions in NO_2 the action could achieve within the AQMA, as well as the likely nominal cost of the action to the budget holder over its lifetime.

When considering the reductions in NO_2 with the aim of achieving compliance, it is necessary to take account of possible predicted reductions in NO_2 that are proposed to occur into the future as a result of ongoing national intervention. Conversely, it may also be necessary to consider any potential for increases in NO_2 emissions which may manifest within or adjacent to the relevant AQMA as a result of local and regional development.

In considering the national picture, guidance provides a series of background maps[12] which can be used to forward predict modelled future year NO_2 background concentrations, as well as generic correction factors to be used in conjunction with measured roadside levels of NO_2 to enable the prediction of future NO_2 concentrations. These generic roadside NO_2 correction factors are based upon national modelling, taking account of ongoing and future committed national interventions and predicted behavioural patterns. Two relevant sets of factors have been produced, one which is applicable to scenarios where the total HDV component of traffic flow is less than 10%, the other where the HDV component is great than 10%. As all four AQMAs considered within this Addendum have a HDV traffic flow component of less than 10%, that roadside correction factor set has been used. Due to its generic nature, this form of correction does not inherently take account of specific changes to local sources of NO_2, for instance possible traffic growth as a result of continued urbanisation. In addition, this form of correction has historically been shown to be optimistic, with the predicted local reduction in NO_2 being greater than actually observed during the recent past. For the purposes of this Addendum, this correction process is referred to as the "Dynamic Environment".

Guidance also notes[13] that, given the disparity between measured and historically projected concentrations, it may be relevant to consider any local NO_2 trend analysis. Analysis[14] of local monitoring data has suggested that the observed reductions in NO_2 at rural and suburban areas within Rhondda Cynon Taf are broadly in agreement with the predicted national picture. However, the five year trend in urban NO_2 levels continues to show a slight increase within Rhondda Cynon Taf. This may be as a result of local socioeconomic circumstances, continued urbanisation, changing commuting patterns and fleet evolution. It should also be clearly understood that this analysis is based upon the historical perspective and does not have regard to any future 'step change' interventions or behavioural changes which could be expected to influence the future prevalence of NO_2. Taking account of current trends and the expectation of future NO_2 improvement at some point, it is considered appropriate to consider the application of a 1.5% NO_2

[12] Defra and the Devolved Administration, *2015 Background Maps forward projected*,
[13] Defra and the Devolved Administration, *paragraph 7.5 of LAQM.TG(16)*, April 2016
[14] Rhondda Cynon Taf CBC, *Section 2.2.1.3 of Chapter 2 of the 2017 Annual Progress Report*, September 2017

reduction rate to be projected between 2017 and 2023 increasing to a 2.5% projected reduction rate in NO_2 post 2023. This correction rate may be considered pessimistic, as it is likely that, as result of national policy drivers, there will be, at some point, significant influences on the NO_2 reduction rate. For the purposes of this Addendum this correction process is referred to as the "Static Environment".

The uncertainty in forward predictions of local NO_2 levels can introduce a critical variable which can not readily be corrected for. To take account of possible divergent future predictions, both the Dynamic and Static Environments are utilised, in the form of bracketing of the outcome, to enable sensitivity testing of the result.

The other element to compliance-effectiveness analysis is the consideration of costs. In compliance cost analysis, the costs of an action are expressed in terms of financial analysis. This financial analysis will only have regard to tangible costs and when forward projecting, it will only consider inflationary or other known cost multipliers, as well as asset depreciation.

Some actions may only be efficiently applied if undertaken across multiple AQMAs, as identified during the Stage IIb Inter-consistency analysis. Therefore, to ensure an accurate evaluation of their effectiveness of an action observing such behaviour, the action will be jointly analysed across the multiple AQMAs rather than each AQMA individually.

3.4.2 Cost-Benefit Analysis

Pure compliance-effectiveness analysis may not appreciate the added value certain viable actions may have to wider public health, environment and societal aspirations. This can be especially important in maintaining an holistic policy approach and avoiding the advancement of, otherwise compliance-effective actions, which could unduly impact wider policy objectives. Therefore, it can be informative to undertake a level of cost-benefit analysis to more accurately differentiate effective actions and enable a considered decision-making approach, which takes account of the delivery of other specified agendas.

A beneficial action is one which is considered to work towards achievement of the goal in a proportionate fashion whilst maximising any potential ancillary benefits or mitigating disadvantageous effects. Although an action may have a wide range of positive and negative effects, beyond its impact on levels of NO_2 within an AQMA, particular attention shall be had to how it could facilitate or impede the goals of one or more specified other agendas. This will include the actions ability to maximise any wider burden reduction associated with air pollution, alignment to the goals of the Public Services Board, synergy with the Noise Action Planning Agenda and the actions potential effects on Climate Change.

To enable the attribution of damage costs and the cost to climate change, an estimation of the total relevant emissions, both within and outside of an AQMA, of the action will be derived from the published Emission Factor Toolkit[15]. The estimated emissions will be multiplied by the relevant published cost or price to determine the present benefit or cost of the action.

When considering the projected benefits and costs of an action, in accordance with guidance, it is appropriate to have regard to the principles of Economic Analysis. Although it is possible to monetize the benefits of a viable action with regard to certain parameters, for instance through the use of published "damage costs saved" which encapsulate the believed avoided cost to society of reducing the amount of certain air pollutants. However, many of the benefits will be intangible and impractical to monetize, as such the cost-benefit analysis will inherently rely on a semi-quantitative approach.

The cost-benefit will attempt to reflect the principle of 'the willingness to pay or antipathy of inaction', derived from the belief that society will appreciate, and hence pay more for, benefits now rather than at a later point. For qualitative aspects of the cost-benefit analysis, attempt has made to have regard to this concept. For the quantitative measurement of "damage costs"[16] saved, this concept has been accounted for by the application of a social discount rate, referred to as the "Government Discount Rate", resulting in benefits being valued less as they further manifest into the future. Likewise, a similar process has also been used in relation to the possible impacts of Climate Change, which has been quantified in respect of the published predicted future "shadow price of carbon"[17].

When considering costs of a benefit, the Economic Analysis approach also differs from the Financial Analysis used in the compliance-effectiveness considerations, as it will attempt to consider the "real" rather than nominal cost of the action to society as a whole rather than just the budget holder(s). Furthermore, it will consider the present relative cost derived from the belief that actions will become more affordable, as a proportion of total societal activity, in the future when compared to the present.

3.4.3 Detailed Analysis Parameters

To enable logical comparisons to be made, the detailed analysis will have consideration of a number of outcome parameters identified to illustrate both the effectiveness and benefit of an action. With several of the outcome parameters specifically reflecting the need to have consideration of other specified agendas, as well as the overarching principles and ways of working associated with the Well-being of Future Generations (Wales) Act 2015. Table 3.4.3.(1) provides an overview of these parameters.

[15] Defra and the Devolved Administration, *EFT Version 8.0.1*, December 2017
[16] www.gov.uk, *Air Quality: Economic Analysis webpage*, September 2015
[17] Department for Business, Energy & Industrial Strategy, *Updated Short-Term Traded Carbon Values used for modelling purposes*, March 2017

Table 3.4.3.(1) Detailed Analysis Parameters

Parameter	Narrative
Action Name	The name of the Action
Action Ref	A unique action reference number. Where an action can be independently associated with more than one AQMA, each independent association will be provided a unique reference number.
Description	A brief outline of the proposed action and its possible attributes
Implementation Year	A theoretical year which the action could be implemented if it is determined, within the 1st quarter of 2018, to do so.
NO_x Impact	The possible estimated impact the action could have on roadside NO_x levels at the worst case location within the AQMA. This is a theoretical estimation based upon modelling of the generic action and various assumptions taking account of local circumstances.
Noise Exposure	The likely change in ambient noise observed by residential locations associated with the actions operation (not preparatory works associated with implementation of the action that may have a significantly different yet temporary effect on ambient noise).
PSB Priorities	The alignment of the action to the published PSB priorities stated within the draft Cwm Taf PSB Well-being Plan
Climate Change	The potential effect the action may have on climate change, either by a change in climate change emissions, carbon sinks or the current ability for society to manage climate change
Financial Appraisal	The direct resource cost (monetary or asset) to the principal intervener(s) of the action
Economic Appraisal	The overall change in tangible and intangible resources available to society, as a whole, as a result of the action
Lifespan	Where an action is temporary, the length of time the action is required. Where the action is finite, the length of time of that action. Where the action is permanent, projections are made to 2030.
Likelihood	Given current policies, stated priorities and available resources, an estimation has been made of the likelihood of the action occurring

The above parameters are analysed, with some subject to quantitative estimation and others semi-qualified or qualified evaluation. Where a parameter has been subject to semi-qualified or qualified evaluation, a fixed score will be produced to enable comparisons. The higher the score, based on a fixed scale of zero to a hundred, the better the action is in regard to that parameter.

Due to the wide range of uncertainties and data limitations involved, all values (both quantified and qualified) must be considered approximations produced solely for the context of this analysis. These values may not be reflective of actual known values or otherwise indicative of a value to be attributed in any other context or piece of work. Table 3.4.3.(2) provides the outcome parameters and identifies their associated agenda and purpose within the detailed analysis.

Table 3.4.3.(2) Detailed Analysis Outcome Parameters

Outcome Parameter	Narrative	Agenda
AQMAs Affected	The AQMAs the action is targeted at	LAQM
Percentage Reduction in NO_x (within AQMA)	The percentage reduction in NO_x at the worse case location within the AQMA(s)	LAQM
Lifetime Financial Cost	The full estimated potential cost to the budget holder(s)	LAQM
Total μgm^{-3} of NO_2 saved (above AQO)	The total amount of μgm^{-3} of NO_2 above 40 μgm^{-3} of NO_2, at the worse case location within the AQMA, which would be reduced by the action over its lifespan	LAQM
Cost per μgm^{-3} compliance	The cost per μgm^{-3} of NO_2 to achieve compliance to the annual mean AQO for NO_2.	LAQM
Compliance Year Brought Forward	The predicted possible total number of years brought forward, in achieving compliance to the annual mean AQO for NO_2 within the AQMA, as a result of implementing the action	LAQM
Area of Effect	The geographical location beyond the AQMA which could be materially affected by the action	Burden Reduction
Economic Appraisal	A fixed scale (0 to 100 with 100 being best) score of the estimated potential economic impact to society of the action	LAQM
Damage Costs Saved	The modelled estimated damage cost saved as a result of changes to the levels of NO_2, $PM_{2.5}$ and PM_{10} brought about by the action across the entire area the action may affect. The higher the value the more beneficial the action is in reducing the costs associated with air pollution. A negative value infers additional damage cost as a result to the action.	Burden Reduction
Noise Exposure	A fixed scale (0 to 100 with 100 being best) score of the estimated noise exposure of the action	Noise Management

PSB Alignment	A fixed scale (0 to 100 with 100 being best) score of the PSB alignment of the action	PSB Alignment
Climate Change	The modelled estimated shadow price of carbon as a result of changes to climate change brought about by the action across the entire area the action may affect (not cradle to grave evaluation). The higher the value the more beneficial the action is in reducing a climate change effect. A negative value infers additional climate change damage as a result of the action.	Climate Change Management
Implementation Likelihood	A fixed fractional scale score (0 being less and 1 being more likely) of the estimated likelihood of implementing the action	-

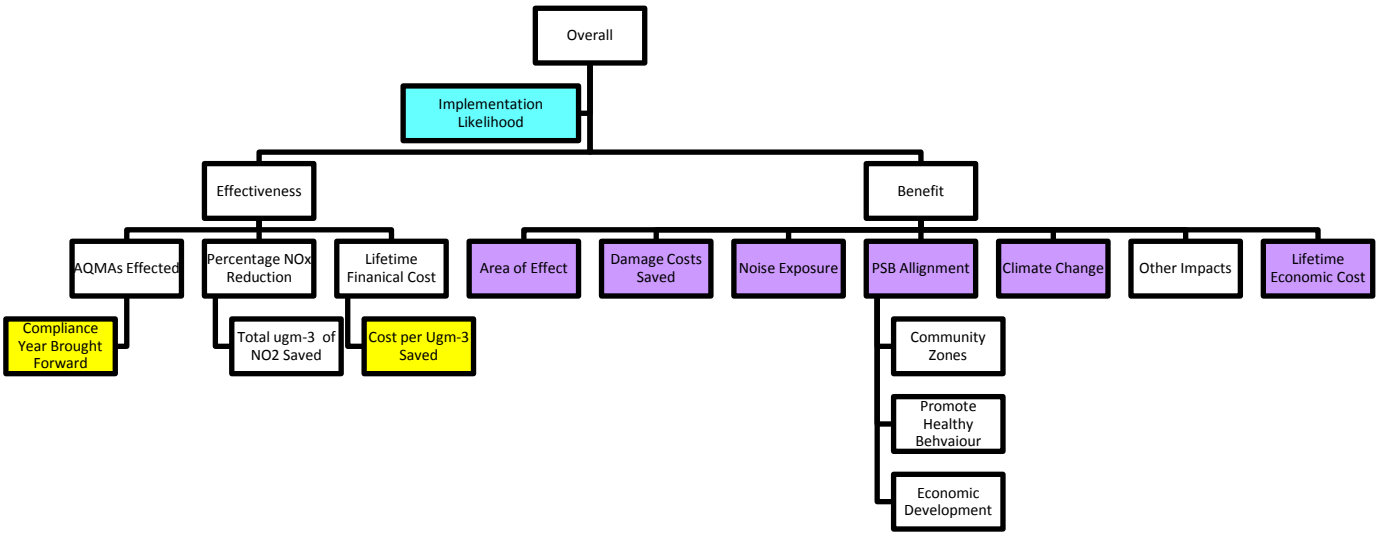
3.5 Stage IV AQAP Formation

To facilitate proportional intervention whilst attempting to maximise any additional wider benefits, the results of the Stage III detailed analysis are assessed using a simplified Multiple-Criteria Decision Analysis [MCDA] approach[18]. The MCDA enables the evaluation of potentially competing agenda outcomes, by assessing the importance of outcomes to the overall decision and defining the bias judgements to be made in identifying the most relatively desirable actions.

The outcome parameters, identified during the detailed analysis have been considered in the form of a 'relationship hierarchy tree', produced in Table 3.5.(1) below. This has enabled the identification of decision criteria which will be used to structure the MCDA. Those decision criteria shaded yellow on the relationship hierarchy tree will be used to evaluate compliance-effectiveness whilst those coloured magenta will be used to evaluate cost-benefit. The "Implementation Likelihood" criteria will be used as a correction factor for both sets of results. Although several of the decision criteria may show strong correlation between each other, it is believed they will still be mutually preference independent of each other.

[18] Communities and Local Government, *Multi-criteria analysis: a manual*, January 2009

Table 3.5.(1) Detailed Analysis Outcome Parameter Relationship Hierarchy Tree



To enable appropriate comparisons to be made, the raw parameter results within each decision criteria will be ranked against each other. For several decision criteria, it will be necessary to modify the rank to take account of intra-criteria preference. This could be where changes, within the parameter, in one position in the rank to another may not reflect the importance of the difference between the ranked positions. To undertake this modification the ranked results, within the parameter, are scored on a 'local scale' relative to each other with this scale intra-preference-weighted, dependent upon the importance of changes within the scale. In assessing each criteria, it has been determined that a simple fixed intra-preference-weight rather than a variable term intra-preference-weight will be sufficient for purpose.

As the decision criteria are not all equal to each other, in importance when determining the final desirability of an action, it is also necessary for the criteria to be inter-weighted. This additional modification enables important decision criteria to be properly assessed rather than diluted by less important decision criteria. To conform to best practice, a swing-weighting has been applied across the decision criteria which reflect the relevance of any one decision criterion to the overall decision, with checks to ensure that decision criteria dominance has not occurred.

Finally, the swing-weighted preference-scores are adjusted by the "Implementation Likelihood" correction factor, a fraction based on the likelihood of the action being implemented. Table 3.5.(2) below provides the various intra-criteria and inter-criteria weights used, with yellow decision criteria relevant to compliance-effectiveness parameters and magenta decision criteria relevant to cost-benefit parameters.

Table 3.5.(2) Intra-criteria & Inter-criteria Weights Used In MCDA

Decision Criteria	Weight	
	Intra-criteria preference	Inter-criteria swing
Year brought forward	10	22
Cost per μgm^{-3} Saved	15	25
Area of Effect	5	15
Damage Costs Saved	4	15
Noise Exposure	2	10
PSB Alignment	4	10
Climate Change	2	1
Lifetime Economic Cost	8	2

As compliance-effectiveness and cost-benefit sub-total scores are produced by the analysis, the MCDA can provide a graphical representation of the 'decision space' to enable the easy differentiation of an optimal decision or where that is not possible the capturing of the preferred non-dominated alternatives.

The combined total MCDA score is ranked in respect to the AQMA the action is relevant to. This enables the production of an Action Step Graph illustrating the order of desirability of actions relevant to the AQMA. However, as many of the actions have a temporal relationship, an AQAP Action Model is created to identify at which point, along the order of desirable actions, no further action is necessary to achieve compliance within a practical timeframe.

As environment sensitivity is prevalent, the AQAP Action Model may identify some actions which are only relevant should a particular environmental sensitivity pervade. As such, those actions which are identified as relevant to both the Dynamic and Static Environments are considered Priority 1 desirable actions and should be implemented. Those actions which are identified as relevant to only one Environment are considered Priority 2 desirable actions may be implemented, should continued review and assessment indicate a need to do so.

It is acknowledged that it may not be practicable for an AQAP to bring about immediate compliance and that it may rely, in part, upon ongoing national intervention. In this instance an estimation of this reliance will also be made, as well as the likely change to the expected date of compliance within each AQMA.

3.6 Stage V AQAP Monitoring

An implemented AQAP is a 'live' plan which should be adaptable to changes in circumstances, including its own impact. It is acknowledged that the AQAP process relies upon various predictions and assumptions, as to the outcomes, the proposed actions will have in the real world. Furthermore, many proposed actions will have a temporal relationship, with their affect being experienced over a relative period of time. Consequently, many of the actions will be

prone to future uncertainties which are difficult to quantify in advance. Therefore, it is important that the proposed AQAP contain monitoring indicators to demonstrate any progress in its delivery and any potential resultant impact. Where appropriate, these indicators can involve the direct or proxy measurement of an expected effect.

Annual reporting of the implementation of the proposed AQAPs, within future annual progress reports, will enable proactive scrutiny and maintain the profile of local air quality management. In acknowledgement of the continually evolving nature of air quality, any adopted AQAP will be subject to a regular review, the timings of which will be stated within future annual progress reports.

3.7 Stage VI Implementation

It is recognised that in the current financial climate for Local Government, it may not be possible to implement all actions within all the proposed AQAPs immediately. Therefore, it is believed appropriate to target resources where they achieve the maximum benefit. In this regard, it is possible to prioritise the proposed and existing AQAPs so that a hierarchy can be established which allows focused direction from the Local Authority and its partners.

In accordance with its adopted objectives the Local Authority will prioritise the proposed AQAPs in relation to the estimated number of residents affected, the degree of breach of the annual mean AQO for NO_2 and the "health indicator"[19] for the LSOA in which the AQAP resides. This will ensure that the location with the most people experiencing poor air quality and who may be the most affected by poor air quality due to underlying issues of manifested ill health, will receive the highest priority.

3.8 Stage VII Equality Impact Assessment

It is recognised that the Local Authority has a duty under the Equality Act 2010 to ensure that any actions it undertakes should seek to advance "the elimination of discrimination" and its "commitment to equality". The Local Authority has published Equality Impact Assessment Guidance[20] which highlights the responsibilities the Local Authority, its employees and any strategy, plan or policy produced by the Local Authority shall have with regards to the stated aims above. In facilitating this, the Local Authority has identified a need for an Equality Impact Assessment [EqIA] should the Local Authority consider a course of action which could have the potential to affect the following specifically identified groups: -

- Gender
- Age

[19] StatsWales, *Welsh Index of Multiple Deprivation, WIMD2014 - Health*, 12th August 2015
[20] RCTCBC, *Equality Impact Assessment Guidance*, April 2015

- Disability
- Gender Reassignment
- Race
- Religion or Belief
- Sexual Orientation
- Pregnancy, Maternity & Paternity
- Marriage and Civil Partnership
- Welsh Language
- Carers

To ensure compliance the Local Authority will initially assess the proposed actions in the AQAP formation stage, as part of a screening EqIA. Where any assessed action has been identified within the screening EqIA as requiring amelioration to reflect any identified impacts, then the necessary amendments to these actions will also be set out. If necessary, the actions will also be reviewed through the iterative air quality action plan procedure to ensure accurate evaluation.

The screening EqIA that is published within this Document will form part of the proposed consultation. If as a result of any consultation the Document and associated proposed AQAPs are modified then the EqIA will also be reviewed to maintain compliance. Also, if as a result of any consultation the EqIA is modified then any necessary amendments to the proposed AQAPs will also be undertaken prior the final consideration of their adoption.

A final EqIA, produced subsequent to completion of the consultation, will be reported upon prior to the final consideration in determining adoption of the proposed AQAPs.

3.9 Stage VIII Statutory Consultation

The Local Authority is fully committed to openness and transparency in regard to its air quality duties and will consult upon the Document. In accordance with Schedule 11 of the Environment Act 1995 the consultation process will involve direct engagement with named statutory consultees and measures to raise awareness of the consultation within the communities affected as well as their elected representatives. Annex I provides details of the people or organisations the Local Authority will make efforts to consult with. Particular attention will also be had to consulting upon and gaining appropriately reflective reviews of the initial Equality Impact Assessment contained within the Document.

The Document, along with all previous review and assessments will remain accessible for inspection as part of the public register maintained in regards to local air quality management

Comments received as a consequence of the statutory consultation will be assessed and published. If necessary the Local Authority will take account of

these comments in its decision making process and if appropriate will modify any proposed AQAPs or the accompanying Equality Impact Assessment.

3.10 Air Quality Action Plan Baseline Year

To produce effective yet proportionate AQAPs it is necessary to draw upon robust evidence, a key component being contemporaneous monitoring or modelled results within the Church Village, Llanharan, Treforest and Tonyrefail AQMAs.

It has been identified[21] that "2016 may represent a 'normal' air quality year in line with the recent past" and it is not believed that observations of the Church Village, Treforest and Tonyrefail AQMAs in 2016 were unduly influenced. As such, 2016 is considered an appropriate baseline year for use in regards to these AQMAs and their respective AQAPs.

However, due to administrative error, sufficient information from 2016 is unavailable for the Llanharan AQMA. Therefore, available data from 2015, which has also previously been deemed representative, will be used to produce a 2015 baseline year for the Llanharan AQAP only.

3.11 Do Nothing Scenario

Taking account of the adopted Baseline Year for each AQMA, as discussed in Section 3.9, and the sensitivity analysis as discussed in Section 3.4.1, it is possible to forward predict probable future levels of NO_2 at each AQMA and, by inference, the year in which compliance to the annual mean AQO could be reached without local intervention. This 'Do Nothing' scenario is not an advocated position, per se, but rather enables comparison to be made to determine the effectiveness of various actions, which may otherwise manifest at different times and for different durations. Table 3.11.(1) below provides the projected Do Nothing scenario's at each AQMA and identifies the expected year which compliance to the annual mean AQO for NO_2 could be achieved if no local intervention were to occur.

In addition, Table 3.11.(1) provides the total number of μgm^{-3} of NO_2 above the $40\mu gm^{-3}$ annual mean AQO for NO_2 for each AQMA. This figure can be used to help assess situations where an AQAP comprising a combination of actions to work towards compliance may be necessary or would otherwise be desirable.

[21] Rhondda Cynon Taf CBC, *Section 2.2.1.3 of Chapter 2 of the 2017 Annual Progress Report*, September 2007

Table 3.11.(1) Projected Do Nothing Scenario's At Each AQMA

Year	Church Village		Llanharan		Tonyrefail		Treforest	
	Dynamic	Static	Dynamic	Static	Dynamic	Static	Dynamic	Static
2015	-	-	40.3	40.3	-	-	-	-
2016	48.4	48.4	39.3	43.5	43.5	43.5	44.8	44.8
2017	47.1	47.7	38.2	42.9	42.3	42.8	43.6	44.1
2018	45.1	47.0	36.6	42.2	40.6	42.2	41.8	43.5
2019	43.2	46.3	35.1	41.6	38.9	41.6	40.0	42.8
2020	41.1	45.6	33.3	41.0	36.9	40.9	38.0	42.2
2021	38.8	44.9	31.5	40.4	34.9	40.3	35.9	41.5
2022	36.6	43.8	29.7	39.3	32.9	39.3	33.9	40.5
2023	34.8	42.7	28.3	38.4	31.3	38.3	32.2	39.5
2024	33.1	41.6	26.8	37.4	29.7	37.4	30.6	38.5
2025	31.5	40.6	25.6	36.5	28.3	36.4	29.2	37.5
2026	30.1	39.5	24.4	35.6	27.1	35.5	27.9	36.6
2027	28.8	38.6	23.4	34.7	25.9	34.6	26.7	35.7
2028	27.7	37.6	22.4	33.8	24.9	33.8	25.6	34.8
2029	26.7	36.6	21.6	33.0	24.0	32.9	24.7	33.9
2030	25.9	35.7	21.0	32.1	23.3	32.1	24.0	33.1
Compliance Year	2021	2026	2016	2022	2019	2022	2020	2023
No. of μgm^{-3} above Compliance	24.95	48.70	0.31	11.97	6.43	11.36	10.24	19.47

Chapter 4 – Stage I Scoping Exercise

The Local Authority has collated and assessed a number of possible rational actions which may have the potential to deliver partial or full compliance to the annual mean AQO for NO_2 within a respective AQMA. Many of these actions focus on affecting the local sources of NO_x in different ways to achieve a similar aim. These include actions which attempt to directly reduce the sources of the pollution, attempt to decrease the amount of pollution produced for the same desired outcome or move the source of the pollution away from a vulnerable area to a less vulnerable area.

The list of rational actions has been examined and a practicality test undertaken. Table 4.(1) contains the colour coded outcomes of the Stage I assessment for the four AQMAs. The test uses a “Traffic Light” assessment process indicating which actions, coloured yellow, are considered practicable and progressed for further consideration during the next stage of assessment. Whilst those actions, coloured magenta, have been considered not to be practical for the relevant AQAP and further consideration discontinued.

Table 4.(1) **Stage 1 Scoping Exercise Results**

Practical Action Description	AQMAs			
	Church Village	**Llanharan**	**Tonyrefail**	**Treforest**
Road widening Introduction of additional carriageway along an existing road to reduce traffic congestion.	Insufficient Area	Insufficient Area	Insufficient Area	Insufficient Area
Road bypass Construction of a new road or road network within a less vulnerable air quality area outside of the AQMA to transfer existing traffic out of the AQMA.	Suitable Existing Bypass Already Present	Potential for Bypass	Capacity Increase of Existing Bypass	Trunk road
Light-rail system New or modified railway line to provide additional local rail capacity.	No Nearby Rail Infrastructure	Existing Railway Which Could Be Upgraded	No Nearby Rail Infrastructure	Rail Infrastructure Nearby
Reduction in road capacity Engineering of the existing road network within an AQMA to reduce its capacity and displace users elsewhere.	Locally Important Junction	Locally Important Route	Locally Important Junction	Trunk road
Pedestrianisation Restriction of part or all of the road network for all or part of the time within the AQMA	Locally Important Junction	Locally Important Route	Locally Important Junction	Trunk road
Off road bus stops Movement of existing on-road bus stops which may impede traffic flow.	Insufficient Area	No Relevant Bust Stop	Insufficient Area	Trunk road
Cycle lanes Prevision of dedicated cycle lane to increase the attractiveness of the road network to cycle users with the aim to reduce private passenger road traffic.	Insufficient Area	Insufficient Area	Insufficient Area	Trunk road
Provision of local off street parking	On Road Parking Not	On Road Parking Not	Residential Area	Trunk road

Practical Action Description	AQMAs			
	Church Village	Llanharan	Tonyrefail	Treforest
Construction of off street parking to residents within an AQMA as an alternative to on-street parking which may impede traffic flow.	Significant	Significant	Not Significant	
Rerouting of traffic Legal restrictions on the use of the existing road network within the AQMA to an 'access only' designation.	No Local Alternative Route	No Local Alternative Route	No Local Alternative Route	Trunk road
Vehicle type restriction Legal restrictions on the use of the existing road network within the AQMA to prohibit Heavy Good Vehicles	HGV Source Apportionment Component >10% And Potential Alternative Routes Exist	HGV Source Apportionment Component <10%	HGV Source Apportionment Component >10% But Alternative Routes Inappropriate	Trunk road
Active traffic management to increase traffic flow Modification of active traffic management to produce a bias towards decreasing congestion within the AQMA	Existing Junction Could Be Modified	No Existing Traffic Management	Existing Junction Could Be Modified	Trunk road
Active traffic management to decrease traffic volume Modification of active traffic management to produce a bias towards decreasing traffic volume within the AQMA.	Likely to Cause Pollution Displacement to Other Relevant Receptors	Traffic Management To Disruptive	Likely to Cause Pollution Displacement to Other Relevant Receptors	Trunk Road
Parking restrictions Legal restrictions on the parking or waiting of vehicles within the AQMA which could otherwise impede traffic	Parking Restrictions Already In Force	Parking Restrictions Already In Force	Parking Restrictions Already In Force	Trunk Road
Urban Clearway, Legal restrictions on the parking of vehicles at peak traffic times within the AQMA which could otherwise impede traffic. By tailoring the times of the restriction its disruptive impact to the community can be partially militated.	Parking Restrictions Already In Force	Parking Restrictions Already In Force	Parking Restrictions Already In Force	Trunk Road
Increased parking enforcement activities	Non-conformance To	Non-conformance To	Non-conformance To	Trunk Road

Practical Action Description	AQMAs			
	Church Village	Llanharan	Tonyrefail	Treforest
Allocating additional resources to enforce existing parking provision with the aim to reduce traffic disruption from non-conformance	Restrictions Could Impact Traffic Flow	Restrictions Could Impact Traffic Flow	Restrictions Could Impact Traffic Flow	
Removal of pedestrian management Reduction of the possible impediments to traffic flow within the AQMA.	Could Reduce Vehicle Waiting Time	Not Present	Could Reduce Vehicle Waiting Time	Trunk Road
Variable speed limit control Legal restrictions to control the maximum speed limit of a particular road at specific times to reduce congestion	30mph Speed Limit In Force	30mph Speed Limit In Force	30mph Speed Limit In Force	Congestion Not A Substantive Factor In Elevated Emissions From Relevant Section of Trunk Rd
Optimisation of traffic speed Legal restrictions to control the maximum speed limit with the aim maximises the efficiency of the road vehicle in relation to the emission of NO_x.	30mph Speed Limit In Force	30mph Speed Limit In Force	30mph Speed Limit In Force	Trunk Rd Currently has 70mph National Speed Limit
Utilise existing reserved road capacity Use of a 'hard shoulder' to provide additional carriageway for road users	No Reserved Road Capacity	No Reserved Road Capacity	No Reserved Road Capacity	Congestion Not Identified As Relevant
Establishment of 'safe' pedestrian routes Planning, engineering and publication of viable community routes to increase the desirability of walking as a replacement for short journeys.	Urban Area With Potential For Pedestrian Routes	Urban Area With Potential For Pedestrian Routes	Urban Area With Potential For Pedestrian Routes	Trunk Road
Low Emission Zone Legal restrictions on HGVs or Buses to require a minimum emission standard when entering a defined area	Too Small An Area To Support Intervention	To Small An Area To Support Intervention	To Small An Area To Support Intervention	Trunk Road has sufficient traffic volume, mix and extent
Zero Emission Zone legal restrictions on all traffic using the local road	Too Small An Area To Support Intervention	To Small An Area To Support Intervention	To Small An Area To Support Intervention	Trunk Road has strategic value

Practical Action Description	AQMAs			
	Church Village	Llanharan	Tonyrefail	Treforest
network to meet a certain emission standard				which could be disproportionally affected
Alternative Vehicle Fuel Provision Establishing, either by direct intervention of via new planning obligations, the provision of local urban electric vehicle charging points	AATDF >10,000 Urban Area May Support	AATDF >10,000 Urban Area May Support	AATDF <10,000 Urban Area May Be To Small	Mainly Regional Traffic Unaffected by Local Provision
Freight coordination Coordination and/or aggregation of freight deliveries to a locality to reduce the number or impact of freight vehicles.	Low Number Of Local Freight Movements	Significant Number of Freight Movements Will Be Regional Journeys	Low Number Of Local Freight Movements	Significant Number of Freight Movements Will Be Regional Journeys
Existing LA fleet improvement Changing the existing fleet to meet a certain emission standard	Component of LA Fleet Not Significant	Component of LA Fleet Not Significant	Component of LA Fleet Not Significant	Component of LA Fleet Not Significant
Improvement of public bus frequency Increase the practicality and desirability of public bus transport.	AATDF >10,000 Urban Area May Support Increased Bus Provision	AATDF >10,000 Urban Area May Support Increased Bus Provision	AATDF <10,000 Urban Area Unlikely to Support Increased Bus Provision	Trunk Route May Support Increased Bus Provision
Existing public transport fleet improvement Either subsidisation or enforcing the new procurement or retrofitting existing fleet to meet a certain emission standard.	Bus Source Apportionment Component >10%	Bus Source Apportionment Component <10%	Bus Source Apportionment Component >10%	Bus Source Apportionment Component <10%
Removal or restructuring of existing public transport Decrease the number of public bus movements within the AQMA with the aim of reducing this vehicle sectors emissions contribution.	Bus Source Apportionment Component >10%	Bus Source Apportionment Component <10%	Bus Source Apportionment Component >10%	Bus Source Apportionment Component <10%
Reprioritisation of bus strategy	May Benefit From	May Benefit From	May Benefit From	Trunk Road

Practical Action Description	AQMAs			
	Church Village	**Llanharan**	**Tonyrefail**	**Treforest**
Advance proposed public transport improvements within the region most likely to positively impact upon an AQMA.	Prioritisation of Regional Plans	Prioritisation of Regional Plans	Prioritisation of Regional Plans	Already A Priority
Behavioural Influences A packing of informative measures aimed to advise the public about the accessibility of modal change, benefits of active travel or otherwise reducing emissions.	Local Community Can Be Targeted	Local Community Can Be Targeted	Local Community Can Be Targeted	Large Regional Traffic Component
Park and Ride Scheme Construct, integrate and publicise facilities to allow mid journey transfer from cars to public transport to encourage modal shift.	No Nearby Transport Infrastructure	Nearby Transport Infrastructure	No Nearby Transport Infrastructure	Nearby and Regional Interpretable Transport Infrastructure
Domestic Heating Improvements Using grant mechanisms to replace solid fuel or inefficient gas boilers with lower No_x emitting technology	Not Identified As A Significant Source	Not Identified As A Significant Source	Not Identified As A Significant Source	Not Identified As A Significant Source
Industrial Emission Controls Using existing regulatory regimes and/or the development control process to restrict or prohibit NO_x emissions in a particular area	Not Identified As A Significant Source	Not Identified As A Significant Source	Not Identified As A Significant Source	Not Identified As A Significant Source
Relocation of Relevant Population Using CPO powers to acquire properties giving rise to the relevant population, within the AQMA, and changing the use or removing the availability of properties so as to remove the relevant population	Relevant Population Too Large	Relevant Population <10	Relevant Population Too Large	Relevant Population <10

Chapter 5 – Stage IIa Inter-consistency Test

It is acknowledged that certain practicable actions, as identified during Stage I above, may have: -

- A manner of implementation that could be consistent across more than one AQMA;
- An accumulative impact upon more than one AQMA;
- An approach which could be antagonistic with previously adopted AQAPs or other Local Authority policies.

To adequately consider an action, a cross-referencing test has been performed to determine viability. A viable action being one that would likely bring about a reduction in NO_2 within the AQMA, without causing unacceptable detriment to any other AQMA and is otherwise consistent with current Local Authority policy.

Table 5.(1) produces the results of the inter-consistency analysis for each practicable action and the AQMA they relate to. The test indicates which actions, coloured yellow, are considered viable and progressed for further consideration during the next stage of assessment. Whilst those actions, coloured magenta, have been considered not to be viable for the relevant AQAP and further consideration discontinued. Table 5.(1) also indicates if the viable action will be 'grouped', due to a shared implementation approach, during any subsequent detailed analysis.

Table 5.(1) Inter-consistency Analysis Results

Practical Action	Group		Consistent with other AQAPS	Consistent with LA Policy
Road bypass	1.	Llanharan	✓	✓
	2.	Tonyrefail	✓	✓
Light-rail system	1.	Llanharan	✓	✓
	2.	Treforest	✓	✓
Vehicle type restriction	1.	Church Village	✓	✗ (Local Economic Viability)
	2.	Tonyrefail	✓	✗ (Local Economic Viability)
Active traffic management	1.	Church Village	✓	✓
	2.	Tonyrefail	✓	✓
Increased parking enforcement	1.	Church Village	✓	✓
		Llanharan	✓	✓
		Tonyrefail	✓	✓
Removal of pedestrian management	1.	Church Village	✓	✗ (Highway Safety)
	2.	Tonyrefail	✓	✗ (Highway Safety)
Optimisation of traffic speed	1.	Treforest	✓	✓

Practical Action	Group		Consistent with other AQAPS	Consistent with LA Policy
Establishment of 'safe' pedestrian routes	1.	Church Village	✓	✓
		Llanharan	✓	✓
		Tonyrefail	✓	✓
Low Emission Zone	1.	Treforest	✓	✓
Alternative Vehicle Fuel Provision	1.	Church Village	✓	✓
		Llanharan	✓	✓
Improvement of public bus frequency	1.	Church Village	✓	✓
		Llanharan	✓	✓
		Treforest	✓	✓
Existing public transport fleet improvement	1.	Church Village	✓	✓
		Tonyrefail	✓	✓
Removal or restructuring of existing public transport	1.	Church Village	✓	✗ (Viability Of Local Communities)
	2.	Llanharan	✓	✗ (Viability Of Local Communities)
Reprioritisation of bus strategy	1.	Church Village	✓	✗ (Forward Priorities Already Advanced)
		Llanharan	✓	✗ (Forward Priorities Already Advanced)
		Tonyrefail	✓	✗ (Forward Priorities Already Advanced)
Behavioural Influences	1.	Church Village	✓	✓
		Llanharan	✓	✓
		Tonyrefail	✓	✓
Park and Ride Scheme	1.	Llanharan	✓	✓
	2.	Treforest	✓	✓
Relocation of Relevant Population	1.	Llanharan	✓	✓
	2.	Treforest	✓	✓

Chapter 6 – Stage IIb SEA Scoping Exercise

It is acknowledged that certain viable actions may also be subject to the requirements of a Strategic Environmental Assessment [SEA]. It is also necessary to consider the need for a SEA at an early stage of project consideration, to ensure adequate examination of all 'significant environmental effects' and, where necessary, enable early modification of any proposals to ameliorate any identified adverse impacts.

As not all actions will be subject to the requirements of a SEA, an initial step in the consideration of the need for a SEA is a screening exercise to identify viable actions that, due to their nature, extent or location, could require a full SEA. Table 6.(1) provides the results of a SEA Screening Exercise and where there may be a possible need for a SEA, it details if this SEA has been or will be undertaken within another relevant plan or strategy or otherwise be undertaken within the 2017 AQAP Addendum.

Table 6.(1) SEA Screening Exercise Results

Viable Action	Group		A	B	If Identified In Column A or B	Assessed In Another Relevant Plan
			Annex I or II EIA AND Framework For Future Consent	Article 6 or 7 Habitats Directive	Geographical Affect Greater Than A Small Local-level Area	
Road bypass	1.	Llanharan	✓	×	✓	✓ (LDP)
	2.	Tonyrefail	✓	×	×	✓ (LDP)
Light-rail system	1.	Llanharan	✓	×	✓	✓ (Phase 2 or 3 Cardiff Capital Region Metro Impact Study)
	2.	Treforest	✓	×	✓	✓ (Phase 2 Cardiff Capital Region Metro Impact Study)
Active traffic management to increase traffic flow	1.	Church Village	×	×	-	-
	2.	Tonyrefail	×	×	-	-
Increased parking enforcement activities	1.	Church Village	×	×	-	-
	2.	Llanharan	×	×	-	-
	3.	Tonyrefail	×	×	-	-
Optimisation of traffic speed	1.	Treforest	×	×	-	-
Establishment of 'safe' pedestrian routes	1.	Church Village	×	×	-	-
		Llanharan	×	×	-	-
		Tonyrefail	×	×	-	-
Low Emission Zone	1.	Treforest	×	×	-	-
Alternative Vehicle Fuel	1.	Church	×	×	-	-

Viable Action	Group		A	B	If Identified In Column A or B	Assessed In Another Relevant Plan
			Annex I or II EIA AND Framework For Future Consent	Article 6 or 7 Habitats Directive	Geographical Affect Greater Than A Small Local-level Area	
Provision		Village				
		Llanharan	×	×	-	-
Improvement of public bus frequency	1.	Church Village	×	×	-	-
		Llanharan	×	×	-	-
		Treforest	×	×	-	-
Existing public transport fleet improvement	1.	Church Village	×	×	-	-
		Tonyrefail	×	×	-	-
Behavioural Influences	1.	Church Village	×	×	-	-
		Llanharan	×	×	-	-
		Tonyrefail	×	×	-	-
Park and Ride Scheme	1.	Llanharan	✓	×	×	-
	2.	Treforest	✓	×	✓	✓ (Phase 1 Cardiff Capital Region Metro Impact Study and LDP)
Relocation of Relevant Population	1.	Llanharan	×	×	-	-
	2.	Treforest	×	×	-	-

It is not considered that any of the identified viable actions require a Strategic Environmental Assessment within the 2017 AQAP Addendum. However, it is acknowledged that should any viable action significantly deviate from the current expectation, so as to be considered a different action, then reconsideration of the need for a SEA will be undertaken.

Chapter 7 – Stage III Detailed Analysis

In accordance with the AQAP procedure, concurrent compliance-effectiveness and cost-benefit analysis has been performed on the viable actions, identified by the proceeding process, to define their desirability. Where, as a result of practicality or economies of scale, an action would be expected to be applied dependently in relation to more than one AQMA, the entire impact of the action across all the affected AQMAs is considered.

It should be noted that Economic Appraisal, Noise Exposure, PSB Alignment and Implementation Likelihood are based on relative evaluations using a range of 0 to 100 or, in the case of Implementation Likelihood, 0 to 1.

Table 7.(1)

Action Name	Llanharan Road Bypass
Action Ref	A.1
Description	The constructing of a two way single carriageway Bypass circumventing the centre of Llanharan, where the Llanharan AQMA is located. The Bypass, which would be designated as the A473, would be expected to take a route from the Dragon Film Studios (west of Llanharan) to a point east of Llanharan, where a connection to the existing A473 would be made. The western part of the bypass has already been constructed but the eastern route has not been finalised, with two route options currently under consideration.
Implementation Year	Given experience of other similar bypass schemes, a considerable amount of time would be required to implement the action. However, as this project is already being investigated in relation to a different agenda, a relatively near-time **implementation date of 2020** could be possible.
NO_x Impact	At this time In-depth route analysis is not available, however, given experience of other local bypass schemes and the amount of regional traffic flow along the A473, it is expected that any eventual route could dramatically reduce the total number of vehicle movements through the AQMA. This has been provisionally estimated as a 33% reduction in all traffic flow and a 50% reduction in HDVs (as most HGVs are expected to be associated with regional traffic movements), due to the design of the existing road the same average vehicle speed has been maintained. This potential outcome could result in **reducing existing roadside NO_x levels by approximately 37%.**
Noise Exposure	The existing A473 currently brings a moderate volume of road traffic within very close proximity to a large number of properties, many of which will be residential in nature. Due to historic circumstances and resultant current infrastructure constraints, the existing A473 within Llanharan does not exhibit any noise reduction or attenuation measure. The proposed bypass would be constructed to modern standards and as far as possible will take a route through peri-urban areas whilst observing vehicle speed restrictions which are sensitive to noise disturbance. It is likely that, through the displacement of road vehicles, **the overall noise exposure within Llanharan would be significantly reduced, albeit some properties not currently exposed to elevated noise levels may become so as a result of the action**. As such this action would likely have an overall beneficial impact on local noise levels which maybe mollified by some significant increase in exposure at a smaller number of residential properties (dependent upon circumstances these properties maybe entitled to at exposure noise reduction improvements).
PSB Priorities	This action **would not affect a proposed Community Zone**s. This action **would not likely affect healthier lifestyle choices** By improving the amenity of a desirable local area, enabling the more efficient transport of goods, services and people and increasing access to development (both residential and industrial) opportunities this action would likely **have substantial positive economic affects but the action may not be considered a strong sustainable transport solution** in-itself.
Climate Change	More efficient road vehicle travel could potentially reduce climate change emissions,

	however, the action may also lead to increased traffic growth and urban development.	
Financial Appraisal	No direct revenues are expected to be raised as a result of this action Cost identified in relation to conceptualisation, design, assessment, land acquisition, land preparation (including possible remediation), construction and maintenance. The action will make use of well established market technologies and mechanisms and service arrangements for similar existing assets. Capital costs are estimated at **£25,000,000 and Operating** c**osts estimated at £25,000 per year** with no depreciating costs (as a non-replacement asset)	
Economic Appraisal	Benefits will include improved road safety resulting in a reduction in the cost of death and injury; improved journey times reducing the cost to productivity of time lost to congestion; additional infrastructure allowing the transportation of larger volumes of goods; increased access to desirable land development; medium term future proof technology; Costs will include construction and continued maintenance of capital assets based upon market established technology; loss of peri-urban spaces; perceived urban encroachment	
Lifespan	This **action would likely persist** regardless of general policy or societal changes and has been projected to 2030	
Likelihood	This action is currently being pursued via another agenda, highway and economic development, with significant resources allocated for further investigation and conceptualisation. This action has a **moderate likelihood of implementation**.	
	Cost Effectiveness	
	Dynamic	**Static**
AQMAs Affected	Llanharan	
Percentage Reduction in NO_x (within AQMA)	37%	
Lifetime Financial Cost	£25,312,000	
Total µgm^{-3} of NO_2 saved (above AQO)	×	1.33
Cost per µgm^{-3} compliance	×	£19.03M
Compliance Year Brought Forward	×	+2
	Cost Benefit	
Area of Effect	County Wide	
Economic Appraisal	95	
Damage Costs Saved	-£412,890 (-£221,075 to -£592,940) (penalty incurred due to displacement and expected traffic growth along new road negating more efficient travel)	
Noise Exposure	60	
PSB Alignment	30	
Climate Change	-£2,327,355 (-£1,068,778 to -£3,588,708) (penalty incurred due to displacement and expected traffic growth along new road negating more efficient travel)	
Implementation Likelihood	0.65	

Table 7.(2)

Action Name	Tonyrefail Road Bypass (A4119) Capacity Increase
Action Ref	B.1
Description	Tonyrefail is currently served by the A4119 which acts as a bypass to the west of the settlement. The two way single carriageway road is routed through a peri-urban area and currently operates beyond capacity during peak rush-hour. An increase in capacity of the road, by dualling, could reduce congestion and improve journey times hence the desirability of the route to regional and local traffic. This would have the potential to displace some road traffic from the Tonyrefail AQMA.
Implementation Year	Given experience of other similar bypass schemes, a considerable amount of time would be required to implement the action. However, as this project is already being investigated in relation to a different agenda, a relatively near-time **implementation date of 2020** could be possible.
NO_x Impact	At this time In-depth route analysis is not available, however, given experience of other local bypass schemes and the relatively low amount of regional traffic likely to traverse the Tonyrefail AQMA, it is expected that any eventual duelling could moderately reduce the total number of vehicle movements through the Tonyrefail AQMA. This has been provisionally estimated as a 10% reduction in all traffic flow. Due to the design of the existing road the same average vehicle speed has been maintained. This potential outcome could result in **reducing existing roadside NO_x levels by approximately 10%.**
Noise Exposure	The existing road network currently brings a small volume of road traffic within very close proximity to a large number of properties, many of which will be residential in nature. Due to historic circumstances and resultant current infrastructure constraints, the existing road network within Tonyrefail does not exhibit any noise reduction or attenuation measure. The proposed bypass capacity increase would be constructed to modern standards, take advantage of the existing route through peri-urban areas and have vehicle speed restrictions which are sensitive to noise disturbance. It is likely that, through the displacement of road vehicles, **the overall noise exposure within Tonyrefail would be slightly reduced, albeit some properties exposed to elevated noise levels from the existing A4119 may experience further noise detriment.** As such this action would likely have an overall slight beneficial impact on local noise levels which maybe mollified by some increase in exposure to residential properties already subject to elevated noise levels (dependent upon circumstances these properties maybe entitled to at exposure noise reduction improvements).
PSB Priorities	This action **would not affect a proposed Community Zone**. This action **would not likely affect healthier lifestyle choices** By improving the amenity of a desirable local area, enabling the more efficient transport of goods, services and people and increasing access to development (both residential and industrial) opportunities this action would likely **have significant positive economic affects but the action may not be considered a strong sustainable transport solution**.
Climate Change	More efficient road vehicle travel could potentially reduce climate change emissions, however, the action may also lead to increased traffic growth and urban development.
Financial Appraisal	No direct revenues are expected to be raised as a result of this action Cost identified in relation to conceptualisation, design, assessment, land acquisition, land preparation (including possible remediation), construction and maintenance. The action will make use of well established market technologies and mechanisms and service arrangements for similar existing assets. Capital costs are estimated at **£8,000,000 with operating** c**osts absorbed by existing resource allocation** and with no depreciating costs (as a non-replacement asset).
Economic Appraisal	Benefits will include improved road safety resulting in a reduction in the cost of death and injury; improved journey times reducing the cost to productivity of time lost to congestion; additional infrastructure allowing the transportation of larger volumes of goods; increased access to desirable land development; medium term future proof technology; Costs will include construction of capital assets based upon market established technology; loss of peri-urban spaces; perceived urban encroachment
Lifespan	This **action would likely persist** regardless of general policy or societal changes and has been projected to 2030
Likelihood	This action is currently being pursued via another agenda, highway and economic

	development, with significant resources allocated for further investigation and conceptualisation. This action has a **moderate likelihood of implementation**.	
	Cost Effectiveness	
	Dynamic	**Static**
AQMAs Affected	Tonyrefail	
Percentage Reduction in NO_x (within AQMA)	10	
Lifetime Financial Cost	£8M	
Total μgm^{-3} of NO_2 saved (above AQO)	×	1.28
Cost per μgm^{-3} compliance	×	£6.25M
Compliance Year Brought Forward	×	+2
	Cost Benefit	
Area of Effect	County Wide	
Economic Appraisal	90	
Damage Costs Saved	-£247,016 (-£128,527 to -£359,253) (penalty incurred due to displacement and expected traffic growth along new road negating more efficient travel)	
Noise Exposure	40	
PSB Alignment	40	
Climate Change	-£1,453,052 (-£686,464 to -£2,227,729) (penalty incurred due to displacement and expected traffic growth along new road negating more efficient travel)	
Implementation Likelihood	0.65	

Table 7.(3)

Action Name	Improved Rail System
Action Ref	C.1; C.2
Description	Llanharan currently has a passenger rail service via the Swansea-Paddington Mainline, which runs through the AQMA. Although Treforest also has a local valleys line passenger service, of more relevance to the Treforest AQMA is the overall railway infrastructure through the central South Wales Valleys. As part of the South Wales Capital Metro it is envisaged that Llanharan and the central South Wales Valley, associated with Treforest, will experience some level of rapid transit improvement. Although at this stage it is not possible to identify what actual improvements will take place, it may be a combination of improvement to train services utilising already in place infrastructure (including railway electrification within the central South Wales Valleys) and/or the introduction of light rail or bus rapid transit systems. This action can be enacted independently at each AQMA
Implementation	Given experience of other rail schemes, a considerable amount of time would be required

Year	to implement the action. However, as the Metro is already being investigated in relation to a different agenda, a relatively near-time implementation date could be possible. The Metro has prioritised the central South Wales Valley, as such, an estimated project **implementation year of 2022 has been chosen for Treforest**, whereas, the **implementation year of 2023 has been chosen for Llanharan**.
NO_x Impact	In-depth route analysis is not available, however, given the amount of regional traffic flow along the A473 and the increasing urban area of Llanharan, it is expected that any eventual route could significantly reduce the total number of vehicle movements through the AQMA. This has been provisionally estimated as an 8% reduction in all traffic flow but with no change to the number of HDVs (as this scheme will only affect passenger travel), due to the design of the existing road the same average vehicle speed has been maintained. This potential outcome could result in **reducing existing roadside NO_x levels at Llanharan by approximately 15%**. It is possible that the impact along the A470 as it affects the Treforest AQMA will be greater due to proposed the scale and impact of the Metro within the Central South Wales Valley. This has been provisionally estimated as a 17% reduction in all traffic flow but with no change to the number of HDVs (as this scheme will only affect passenger travel), due to the design of the existing road the same average vehicle speed has been maintained. This potential outcome could result in **reducing existing roadside NO_x levels at Treforest by approximately 17%.**
Noise Exposure	The existing road network currently brings a substantial volume of road traffic within close proximity to a massive number of properties, many of which will be residential in nature, both within Llanharan, Treforest and further afield. Due to historic circumstances and resultant current infrastructure constraints, the existing relevant road network does not exhibit a significant degree of noise reduction or attenuation measure. The proposed infrastructure improvements would be constructed to modern standards potentially taking take advantage of electrification and modern vehicle technology. It is likely that, through the removal of road passenger vehicles, **the overall noise exposure would be moderately reduced over a wide region, including locations with existing NAPAs.**
PSB Priorities	This action **would not directly affect a proposed Community Zone**. This action **would not likely affect healthier lifestyle choices** This action has been highlighted by the PSB as a strategic action to deliver **substantive positive economic affects via a strong sustainable transport solution**.
Climate Change	Use of low carbon green technology, including low emission buses and, where possible, electrified railways may help to reduce overall long term climate change emissions.
Financial Appraisal	Substantive direct revenues, in the form of fares, advertising and concessionary activities, are expected to be raised as a result of this action, however, it is not possible to estimate this aspect at this time. Cost identified in relation to conceptualisation, design, assessment, land acquisition, land preparation (including possible remediation), construction and maintenance. The action will make use of established 'premium' market technologies and mechanisms and service arrangements for similar existing assets. Capital costs are estimated at **£30,000,000 for Llanharan and £200,000,000 for the central South Wales Valley (relevant to Treforest).** It has not been possible to estimate future operating costs and depreciation costs of some parts of the action (transport stock and facilities).
Economic Appraisal	Benefits will include improved road safety resulting in a reduction in the cost of death and injury; improved journey times reducing the cost to productivity of time lost to congestion; additional infrastructure allowing the transportation of larger volumes of people; increased access to desirable land development; additional economic space (advertising, concessionary activities, etc); increased provision of affordable transport to the economic less active (who otherwise may be hindered from premium economic development); longer term future proof technology; resilience to future fossil fuel pricing. Costs will include user fares; construction and continued maintenance of capital assets, technology cost of 'premium' transport stock and facilities; fare enforcement; loss of peri-urban and some semi-rural spaces; perceived urban encroachment; loss of receipts from passenger vehicle consumables
Lifespan	This **action would likely persist** regardless of general policy or societal changes and has been projected to 2030
Likelihood	This action is currently being pursued via another agenda, regional economic development,

	with significant resources allocated for further investigation, conceptualisation and enactment. This action has a **high likelihood of implementation**.			
	Cost Effectiveness			
	Dynamic	**Static**	**Dynamic**	**Static**
AQMAs Affected	Llanharan		Treforest	
Percentage Reduction in NO_x (within AQMA)	15		12	
Lifetime Financial Cost	£30M		£200M	
Total μgm^{-3} of NO_2 saved (above AQO)	×	×	×	0.5
Cost per μgm^{-3} compliance	×	×	×	£400M
Compliance Year Brought Forward	×	×	×	+1
	Cost Benefit			
Area of Effect	County Wide		Region Wide	
Economic Appraisal	92		98	
Damage Costs Saved	£78,362 (£39,713 to £115,250)		£6,414,743 (£2,893,723 to £9,866,951)	
Noise Exposure	50		65	
PSB Alignment	90		95	
Climate Change	£507,526 (£241,610 to £775,083)		£16,191,796 (£7,765,352 to £24,670,472)	
Other Impacts	65		75	
Implementation Likelihood	0.90		0.90	

Table 7.(4)

Action Name	Active traffic management to increase traffic flow
Action Ref	D.1; D.2
Description	The Church Village AQMA is centred upon a traffic light controlled cross-roads with significantly higher traffic volume associated with the east-west route and to some extent south route (which is outside the Church Village AQMA) as opposed to the smaller local road north route. It may be possible to marginally reduce the waiting time associated with the east-west route at the expense of the waiting time to the north-south route, this could potentially result in a slight improvement to the east-west traffic speed. The Tonyrefail AQMA is also closely associated with a traffic light controlled cross-roads which is believed to show a reasonably symmetric traffic flow. This arrangement could also be modified to bias a reduction in northerly direction traffic waiting within the AQMA (the southern link of the Junction) at the expense of traffic joining the junction from the other (northern, eastern and western) road links. It is likely that any changes to the bias of the existing traffic management at both locations would have to remain supportive of the overall need to enable traffic to move through the junction in a reasonable period of time. To some extent this action may result in the displacement of air pollution and would be limited by the need not to give rise to breach of an AQO outside of the AQMA.

	This action can be enacted independently at each AQMA			
Implementation Year	Given the existing infrastructure at both AQMAs, an **estimated implementation year of 2018 is possible at Church Village and Tonyrefail**.			
NO_x Impact	Although difficult to estimate, experience suggests that it may be possible to achieve a 0.75KmHr^{-1} increase in mean vehicle speed along both the east and west routes of the Church Village AQMA. This potential outcome could **result in a 0.7% NO_x reduction within the Church Village AQMA**. Likewise a 0.3KmHr^{-1} increase in mean vehicle speed along the northern route within the Tonyrefail AQMA may be possible. South flowing traffic being unaffected, as it journeys away from the junction. This potential outcome could **result in a 0.6% NO_x reduction within the Tonyrefail AQMA**.			
Noise Exposure	This action may displace a small number of waiting road vehicles from one part of the AQMA to another, with likely **insignificant changes in noise exposure at any specific location**.			
PSB Priorities	This action **would not directly affect a proposed Community Zone**. This action **would not likely affect healthier lifestyle choices** This action **would not likely affect economic activity**.			
Climate Change	The action would result in very low changes in overall traffic numbers			
Financial Appraisal	No direct revenues are expected to be raised as a result of this action Cost identified in relation to evaluation, construction, re-evaluation and maintenance costs. The action will make use of well established market technologies and service arrangements for similar existing assets. **Capital costs are estimated at £3,500 at each AQMA with operating costs and depreciating costs absorbed by existing resource allocation**.			
Economic Appraisal	Benefits are not significant Costs will include installation and continued maintenance of capital assets based upon market established technology;			
Lifespan	This **action would likely persist** regardless of general policy or societal changes and has been projected to 2030			
Likelihood	Given its scale and previous successful application elsewhere this action has a **possible likelihood of implementation**.			
	Cost Effectiveness			
	Dynamic	**Static**	**Dynamic**	**Static**
AQMAs Affected	Church Village		Tonyrefail	
Percentage Reduction in NO_x (within AQMA)	0.6		0.6	
Lifetime Financial Cost	£3,500		£3,500	
Total µgm^{-3} of NO_2 saved (above AQO)	4.58	12.84	0.55	4.62
Cost per µgm^{-3} compliance	£764	£272	£6,363	£757
Compliance Year Brought Forward	+1	+2	+1	+3
	Cost Benefit			
Area of Effect	Local Wide		Local Wide	
Economic Appraisal	55		55	
Damage Costs Saved	£9,803 (£4,093 to £15,477)		£265 (£111 to £418)	
Noise Exposure	38		39	
PSB Alignment	30		31	
Climate Change	£71,440 (£32,807 to £110,158)		£1,949 (£895 to £3,006)	

Implementation Likelihood	0.45	0.45

Table 7.(5)

Action Name	Increased Parking Enforcement Activities	
Action Ref	E.1; E.2; E.3	
Outline		
Description	The Church Village AQMA encompasses the B4595, at a locally important junction where the carriageway width becomes restricted due to the encroachment of buildings either side of the road. The Llanharan AQMA encompasses the A473 as it bridges the Swansea-Paddington Mainline. Due to historic infrastructure, the A473 at this point particularly narrows and makes several significant changes of direction. The Tonyrefail AQMA encompasses Mill St, Tonyrefail, just prior to a locally important junction where the carriageway width becomes severely restricted due to the encroachment of buildings either side of the road. These circumstances can result in 'pinch-point' congestion which could be exacerbated by obstructive traffic. To avoid this occurrence the relevant length of road within each AQMA is subject to full parking restrictions prohibiting the stopping of vehicles, although it is possible that vehicles may determine to park for short periods of time. This disruption is likely to be short-lived but may still be significant. To reduce the likelihood of disruption, targeted intensive enforcement action may discourage inappropriate parking. As parking enforcement has been decriminalised the Local Authority already maintains an enforcement team capable of delivering the intervention. However, any intensive targeting would require additional resourcing above current operational requirements. This action can be enacted independently at each of the relevant AQMAs.	
Implementation Year	The Local Authority maintains a civil parking enforcement ream capable of undertaking the action, therefore an **estimated implementation year of 2018 is possible at each of the AQMAs**.	
NO_x Impact	It is very difficult to estimate the likely impact of the intervention. An estimated 0.25KmHr^{-1} target increase in traffic flow along the B4595 within the Church Village AQMA may be achievable. This could **result in a 0.5% reduction in NO_x within the Church Village** An estimated 0.15KmHr^{-1} target increase in traffic flow along the A473 within the Llanharan AQMA may be achievable. This could **result in a 0.2% reduction in NO_x within the Llanharan** An estimated 0.25KmHr^{-1} target increase in traffic flow along Mill St within the Tonyrefail AQMA may be achievable. This could **result in a 0.6% reduction in NO_x within the Tonyrefail.**	
Noise Exposure	Although this action may prevent some additional noise generated when traffic flows are disrupted, it is likely there will be **insignificant changes in noise exposure at any specific location**.	
PSB Priorities	This action **would not directly affect a proposed Community Zone**. This action **would not likely affect healthier lifestyle choices** (other than via environmental improvement) This action **would not likely affect economic activity**.	
Climate Change	The action would result in very low changes in overall traffic numbers	
Financial Appraisal	Direct revenues, in the form of fines are expected to be raised as a result of this action, however, as the aspired dissuading impact would prevent significant income generation it is expected **that annual revenue will be minimal**.	

	Cost identified in relation to utilising established service provisions to provide staff resources, administrative and legal support. The action will make use of well established market technologies and mechanisms and service arrangements already utilised elsewhere. Based on previous and current operational costs of civil enforcement action there is an expectation there are no significant capital costs and that a 2 hour a day enforcement activity for five days a week over 48 weeks a year could result in **an annual Operating cost of £10,492 per AQMA**.					
Economic Appraisal	Benefits will include improved road safety resulting in a reduction in the cost of death and injury; slightly improved journey times reducing the cost to productivity of time lost to congestion; Costs will include fines; staffing, administration and legal support; appeals costs; influence on perceived commercial accessibility.					
Lifespan	This **action would likely temporarily last for the needed duration to maintain compliance** and has been projected to the time that compliance has been predicted to occur without intervention.					
Likelihood	Given its scale and established application this action has a **possible likelihood of implementation**.					
	Cost Effectiveness					
	Dynamic	**Static**	**Dynamic**	**Static**	**Dynamic**	**Static**
AQMAs Affected	Church Village		Llanharan		Tonyrefail	
Percentage Reduction in NO_x (within AQMA)	0.5		0.2		0.6	
Lifetime Financial Cost	£33,079	£93,958	£10,755	£44,661	£10,755	£44,661
Total µgm^{-3} of NO_2 saved (above AQO)	3.99	10.83	×	3.71	0.55	4.62
Cost per µgm^{-3} compliance	£8,481	£8,675	×	£12,038	£19,554	£9,666
Compliance Year Brought Forward	+1	+1	×	+3	+2	+4
	Cost Benefit					
Area of Effect	Local Wide		Local Wide		Local Wide	
Economic Appraisal	42		43		42	
Damage Costs Saved	£967 (£404 to £1,527)	£2,365 (£988 to £3,735)	£25 (£10 to £39)	£94 (£40 to £149)	£68 (£28 to £107)	£162 (£68 to £255)
Noise Exposure	42		41		42	
PSB Alignment	30		30		30	
Climate Change	£380 (£60 to £679)	£7,287 (£3,046 to £11,548)	£2 (£0 to £3)	£71 (£19 to £121)	£13 (£0 to £25)	£174 (£58 to £290)
Implementation Likelihood	0.35		0.35		0.35	

Table 7.(6)

Action Name	Optimisation of Speed Limit
Action Ref	F.1
Description	It is recognised that the emission profile of road traffic can depend significantly upon the speed of the vehicle. At very low speeds NO_x emissions can be very high but will gradually fall as the speed of the vehicle increases and its engine observes greater

	efficiency. However, upon reaching an 'optimal speed' the inherent design of most combustion engines will result in a gradual increase in NO_x emissions as the vehicle becomes faster than the 'optimal speed'. Although the optimal speed will be different for each vehicle, it is believed that a 50mph (80KmHr^{-1}) speed limit would represent an approximation of the optimal speed whilst also balancing the need for timely journey times. The Treforest AQMA is substantively affected by the A470 trunk road, the relevant section of which observes a 70mph (112KmHr^{-1}). The A470 is a strategically important trunk road under direct Welsh Government control, with day to day maintenance undertaken on its behalf by the South Wales Trunk Road Agent. Although the Local Authority cannot instigate changes to the trunk road, it may be possible for it to advocate modifications for the relevant decision makers to consider.
Implementation Year	The action would require the installation of new infrastructure, including signage and enforcement capabilities. As well as extensive assessment and consultation as to the possible impacts of such a change to a nationally important trunk road. Given such requirements, an **estimated implementation year of 2021 is possible**.
NO_x Impact	By enacting and enforcing a 50mph (80KmHr^{-1}) speed limit, it is possible a **15.5% reduction in roadside NO_x** within the Treforest AQMA could be observed.
Noise Exposure	The A470 is a significant source of noise which can affect a very large urban area and has been directly linked to a number of NAPAs. As such the Treforest AQMA is also within a NAPA. Noise emissions from road vehicles can partly relate to the speed of the vehicles, with generally a lower vehicle speed producing a lower noise emission profile, as such, it is likely there will be **significant reductions in noise exposure throughout the urban area**.
PSB Priorities	This action **would not directly affect a proposed Community Zone**. This action **would not likely affect healthier lifestyle choices** This action may slightly lengthen journey times which **could slightly impede economic activity**.
Climate Change	By improving vehicle efficiency and reducing the chances of congestion the action could result in significant beneficial changes in climate change emissions**.**
Financial Appraisal	Direct revenues, in the form of fines are expected to be raised as a result of this action, however, as the aspired dissuading impact would prevent significant income generation it is expected **that annual revenue will be minimal**. Costs, involving the modification and addition to existing road infrastructure, would likely relate to design, assessment, construction and maintenance. The action will make use of established market technologies and service arrangements for similar existing assets. Capital costs are estimated at **£750,000 with operating costs and depreciating costs absorbed by existing resource allocation**.
Economic Appraisal	Benefits will include improved road safety resulting in a reduction in the cost of death and injury; improved journey times reducing the cost to productivity of time lost to congestion;. Costs will include construction and continued maintenance of capital assets, established market place technology cost of signage and enforcement infrastructure; enforcement; extending some journey times.
Lifespan	This **action would likely persist** regardless of general policy or societal changes and has been projected to 2030
Likelihood	Given its scale, competing agendas and 3rd party control over decision making and infrastructure this action has an **unlikely likelihood of implementation**.

	Cost Effectiveness	
	Dynamic	**Static**
AQMAs Affected	Treforest	
Economic Appraisal	25	
Percentage Reduction in NO_x (within AQMA)	15	
Lifetime Financial Cost	£750K	
Total µgm^{-3} of	**×**	2.04

NO_2 saved (above AQO)		
Cost per μgm^{-3} compliance	×	£367,647
Compliance Year Brought Forward	×	+2
	Cost Benefit	
Area of Effect	**Area Wide**	
Damage Costs Saved	£1,973,196 (£807,662 to £3,134,939)	
Noise Exposure	50	
PSB Alignment	26	
Climate Change	£10,047,247 (£4,818,515 to £15,308,390)	
Implementation Likelihood	0.15	

Table 7.(7)

Action Name	Establishment of 'safe' pedestrian routes
Action Ref	G.1
Description	Safe, accessible, practicable and desirable pedestrian routes can, in many circumstances, act as a viable alternative to some local short distance travel by car. The Church Village, Llanharan and Tonyrefail AQMAs all observe existing pedestrian route infrastructure which are supportive of the above requirements, albeit some physical improvements may be desirable at each location. However, it is possible that enabling mechanisms could be adopted to encourage their use. Such enabling mechanisms could include, information dissemination, signage, accessibility improvement and engaged encouragement and organised use (for instance school walking-buses) To be potentially effective as well as sustainable it is considered that this action would be delivered jointly across the Church Village, Llanharan and Tonyrefail AQMAs.
Implementation Year	Given the scale of the action and reliance in part on existing infrastructure, an **estimated implementation year of 2018 is possible at each of the AQMAs**.
NO_x Impact	It is not possible to determine the likely effect of this action, however, a hypothesised **0.1% reduction in roadside NO_x within each AQMA** has been used to evaluate the action.
Noise Exposure	Although this action may prevent some noise generated by slightly reducing traffic numbers, it is likely there will be **insignificant changes in noise exposure at any specific location**.
PSB Priorities	This action **would not directly affect a proposed Community Zone**. This action may encourage a more active lifestyle, especially if school journeys are targeted, and act as a gateway action to encourage the public to think about active travel for other non-targeted journeys, as such it **would likely slightly affect healthier lifestyle choices.** This action **would not likely affect economic activity**.
Climate Change	The action would result in very low changes in overall traffic numbers
Financial Appraisal	No direct revenues are expected to be raised as a result of this action Cost identified in relation to initial conceptualisation, evaluation and some small scale construction as well as ongoing staffing, with administration support, and engagement. **Capital costs are estimated at £68,379 to cover all AQMAs with Operating costs and depreciation estimated as £23,963 per year at each AQMA.** A Local Authority coordinating role heavily drawing upon self sustaining local stewardship may have an important role in reducing the on-going costs of the action.
Economic Appraisal	Benefits will include improved road safety (by segregating pedestrians to dedicated routes) resulting in a reduction in the cost of death and injury; improved sustainability of existing

	active travel infrastructure; improved community engagement and possible stewardship. Costs will include some initial construction as well as subsequent staffing and engagement; use of low cost novel technology engagement techniques					
Lifespan	This **action would likely temporarily last for the needed duration to maintain compliance** and has been projected to the time that compliance has been predicted to occur without intervention.					
Likelihood	Given its scale and previous successful application elsewhere this action has a **possible likelihood of implementation**.					
	Cost Effectiveness					
	Dynamic			**Static**		
AQMAs Affected	Church Village & Llanharan & Tonyrefail					
Percentage Reduction in NO_x (within AQMA)	0.1%					
Lifetime Financial Cost	£140,867			£420,603		
Total μgm^{-3} of NO_2 saved (above AQO)	2.34			9.99		
Cost per μgm^{-3} compliance	£60,199			£42,102		
	Church Village		**Llanharan**		**Tonyrefail**	
	Dynamic	**Static**	**Dynamic**	**Static**	**Dynamic**	**Static**
Compliance Year Brought Forward	+1	+1	×	0	+1	+1
	Cost Benefit					
Area of Effect	Local Wide					
Economic Appraisal	45					
Damage Costs Saved	£10,492 (£5,048 to £15,757)			£37,832 (£18,202 to £56,818)		
Noise Exposure	42					
PSB Alignment	45					
Climate Change	£1,620 (£0 to £2,995			£35,294 (£14,076 to £56,,596)		
Implementation Likelihood	0.35					

Table 7.(8)

Action Name	Low Emission Zone
Action Ref	H.1
Description	For this purpose a Low Emission Zone [LEZ] is an area which penalises certain vehicle sectors, normally HDVs, which don't meet or exceed a specific emission standard. This penalty, either a charge or restriction, may discourage the most polluting vehicles and result in overall emissions improving within the LEZ, albeit this may displace some polluting vehicles to outside the LEZ. To perform the action, infrastructure would be necessary to communicate compliance requirements as well as monitor and enforce the target area. The Treforest AQMA is heavily associated with the A470 trunk road, which experiences 9% of total roadside NO_x emissions attributed to HDV journeys. Due to design of the A470, it may be practical to monitor and control vehicles traversing across it. The A470 is

	a strategically important trunk road under direct Welsh Government control, with day to day maintenance undertaken on its behalf by the South Wales Trunk Road Agent. Although the Local Authority cannot instigate changes to the trunk road, it may be practical for it to advocate modifications.	
Implementation Year	The action would require the installation of new infrastructure, including signage and enforcement capabilities. As well as extensive assessment and consultation as to the possible impacts of such a change to a nationally important trunk road. Given such requirements an **estimated implementation year of 2021 is possible**.	
NO_x Impact	Due to the strategic nature and largely regional traffic volume along the A470 it is expected that although the HDV component would encompass a range of EURO standard vehicles the distribution would likely be dominated by Euro IV and V, similar to that of the national distribution. The 2015 NAEI emission database suggests this may observe an approximate 3.5gkm^{-1} NO_x emission profile. By encouraging or mandating the use of Euro V or above HDVs this could potentially **reduce the overall roadside NO_x contribution by 3.7%**.	
Noise Exposure	The A470 is a significant source of noise which can affect a very large urban area and has been directly linked to a number of NAPAs. As such the Treforest AQMA is also within a NAPA. Noise emissions from road vehicles can partly relate to the age of the vehicles, with generally older HDVs being slightly nosier than more modern models, as such, it is likely there may be a **slight reduction in noise exposure throughout the urban area**.	
PSB Priorities	This action **would not directly affect a proposed Community Zone**. This action **would not likely affect healthier lifestyle choices** This action may **slightly impede economic activity** due to affecting the marginal return on some low-wealth economic activity.	
Climate Change	Bringing forward the adoption of cleaner vehicle technology associated with a significant emission source could result in significant beneficial changes in climate change emissions.	
Financial Appraisal	Direct revenues, in the form of fines are expected to be raised as a result of this action, however, as the aspired dissuading impact would prevent significant income generation it is expected **that annual revenue will be minimal**. Cost identified in relation to conceptualisation, design, assessment, engagement, construction, commissioning, evaluation and maintenance. The action will make use of novel technologies and mechanisms and rely upon complex new service arrangements. Capital costs are estimated at **£5,000,000 and Operating and depreciation costs of £250,000 per year.**	
Economic Appraisal	Benefits will include faster uptake of cleaner vehicle technology; greater fuel efficiency of road transport fleet; Costs will include conceptualisation; design; assessment; engagement; communication to regional users; construction; commissioning; compliance cost to operators; evaluation; maintenance; discouragement of marginal economic activity; loss of receipts from passenger vehicle consumables.	
Lifespan	This **action would likely persist** regardless of general policy or societal changes and has been projected to 2030	
Likelihood	Given its scale, novel application and 3rd party control over decision making and infrastructure this action has an **unlikely likelihood of implementation**.	
	Cost Effectiveness	
	Dynamic	**Static**
AQMAs Affected	Treforest	
Percentage Reduction in NO_x (within AQMA)	3.7	
Lifetime Financial Cost	£6,200,00	
Total µgm^{-3} of NO_2 saved (above AQO)	×	1.46
Cost per µgm^{-3} compliance	×	£4,246,575
Compliance	×	+3

Year Brought Forward		
	Cost Benefit	
Area of Effect	Region	
Economic Appraisal	12	
Damage Costs Saved	£533,088 (£331,399 to £709,900)	
Noise Exposure	45	
PSB Alignment	25	
Climate Change	£8,936,486 (£4,221,857 to £13,700,863)	
Implementation Likelihood	0.10	

Table 7.(9)

Action Name	Alternative Vehicle Fuel Provision
Action Ref	I.1
Description	It is possible that recently introduced technology will significantly change vehicle fleet emissions, with electric powered vehicles [EV] providing a significant opportunity to reduce NO_x emissions from light passenger and goods vehicles. This technology will be reliant on new fuelling infrastructure, the absence of which may impede uptake. Therefore, a support to enable the introduction of example infrastructure (for instance accessible charging points) maybe desirable to increase adoption rates. Both the Church Village and Llanharan AQMAs are affected by local traffic and are within a substantive urban area. Both locations currently have little or no public EV charging infrastructure and could potentially benefit from public 'fast' charging points. The action would look to install fifty double headed public 'fast' charging columns (creating a 100 vehicle EV charging capacity), either in appropriate residential streets or publicly accessible car parks within both communities. This action could result in a ninety car reduction in traffic through each AQMA. To be potentially effective as well as sustainable it is considered that this action would be delivered jointly across the Church Village and Llanharan AQMAs.
Implementation Year	Given the scale of the action and existing private sector resources to provide delivery, an **estimated implementation year of 2019 is possible at Church Village and Llanharan**.
NO_x Impact	It is difficult to estimate the likely effect of this action, but if all ninety electrified cars displaced at least one trip through the relevant AQMA then the **Church Village and Llanharan AQMAs each could potentially observe a 0.5% reduction in roadside NO_x.**
Noise Exposure	Although electric vehicles are normally significantly quieter than combustion engine vehicles this action may only affect a small number of road vehicles, as such there would likely be an **insignificant change in noise exposure**.
PSB Priorities	This action **would not directly affect a proposed Community Zone**. This action **would not likely affect healthier lifestyle choices** This action may act as a catalyst or introduction to a novel partly sustainable transport solution and so may have a **slight affect on economic activity**.
Climate Change	Electric vehicles have the potential to emit overall less carbon emissions, however, this potential is highly dependent on the means used to generate the electricity. In addition, the action may only affect a small number of road vehicles therefore, in the best case example, only a slight reduction in climate change emissions would be expected
Financial Appraisal	Moderate direct revenues, fees from electricity consumption, are expected to be raised as a result of this action, however, it is not possible to estimate this aspect at this time.

	Cost identified in relation to conceptualisation, design, assessment, communication, construction (associated with installing the charging points, changes to local parking arrangements and advertising), running costs and maintenance. The action will make use of novel market technologies and new service arrangements. **Capital costs are estimated at £650,000 to cover both AQMAs and annual operational cost of £15,000 per AQMA.**			
Economic Appraisal	Benefits will include improving uptake of a novel desirable technology; support assimilation of an emerging market; improve the desirability of an area via association with an additional travel option; longer term future proof technology; resilience to future fossil fuel pricing. Costs will include user consumption cost; construction and continued maintenance of capital assets, novel technology costs; enforcement; loss of petrol receipts; conferred benefit to higher income households; market distortion			
Lifespan	To encourage participation this **action would have to be sustained for at least ten years** and has been projected to 2029			
Likelihood	Given its use of a novel policy area and uncertainty as to demand, this action has a **unlikely likelihood of implementation**.			
	Cost Effectiveness			
	Dynamic		**Static**	
AQMAs Affected	Church Village & Tonyrefail			
Percentage Reduction in NO_x (within AQMA)	0.5			
Lifetime Financial Cost	£994,504			
Total μgm^{-3} of NO_2 saved (above AQO)	2.53		15.54	
Cost per μgm^{-3} compliance	£393,084		£63,996	
	Church Village		**Tonyrefail**	
	Dynamic	**Static**	**Dynamic**	**Static**
Compliance Year Brought Forward	+2	+2	×	+2
	Cost Benefit			
Area of Effect	Ward Wide			
Economic Appraisal	25			
Damage Costs Saved	£161,700 (£76,531 to £244,545)			
Noise Exposure	42			
PSB Alignment	43			
Climate Change	£102,411 (£48,694 to £156,544)			
Other Impacts	55			
Implementation Likelihood	0.20			

Table 7.(10)

Action Name	Improvement of public bus frequency	
Action Ref	J.1	
Description	Public transport use can depend upon a number of factors including cost, comfort, accessibility, safety and frequency of service. The Local Authority may have a limited role in increasing frequency of service by the use of targeted subsidisation of specific routes.	

	However, this action may require a number of legal, practical and administrative issues to be resolved which would have to be examined in depth should it be implemented. The Church Village, Llanharan and Tonyrefail AQMAs all experience a number of local bus journeys and an increased bus service could result in some displacement of existing car journey movements to bus transport within each AQMA. By increasing bus frequency there may be an increase in roadside NO_x within the AQMA attributed to the HDV component, as well as further afield, which could partially offset car emission reductions. To be potentially effective as well as sustainable it is considered that this action would be delivered jointly across the Church Village, Llanharan and Tonyrefail AQMAs.					
Implementation Year	Given the scale of the action and reliance on existing delivery frameworks, an **estimated implementation year of 2018 is possible at each of the AQMAs**.					
NO_x Impact	Commuting is the most significant journey reason through each of the AQMAs, therefore, it is possible an increase bus frequency could reduce approximately 50 car movements within both the Church Village and Llanharan AQMAs and 20 car movements within the Tonyrefail AQMA which approximates to **0.1% reduction in roadside NO_x**.					
Noise Exposure	Given a likely reliance on the existing public bus fleet and the nature of the public bus service, an increase in these vehicle movements through each AQMA may result in a **slight adverse change in noise exposure at any specific location**.					
PSB Priorities	This action **would not directly affect a proposed Community Zone**. This action **would not likely affect healthier lifestyle choices** This action may improve the short-term sustainability of existing public transport and reduce the barriers to travel for work, therefore, it may have **slight positive economic affects via a sustainable transport solution**.					
Climate Change	Overall impact of the action would only result in a small change in climate change emissions.					
Financial Appraisal	No direct revenues are expected to be raised as a result of this action Cost identified in relation to assessment; tendering, legal support, subsidisation and monitoring with the action making use of existing frameworks. **Capital and depreciation costs are not relevant with Operational costs estimated for each AQMA at £85,000 per year.**					
Economic Appraisal	Benefits may include some improved road safety resulting in a reduction in the cost of death and injury; improved journey times reducing the cost to productivity of time lost to congestion; increase short term sustainability of public transport. Costs will include user fares; subsidies, administration, market place distortion, possible displacement of public transport from over locations.					
Lifespan	This **action would likely temporarily last for the needed duration to maintain compliance** and has been projected to the time that compliance has been predicted to occur without intervention.					
Likelihood	Given its scale and reliance on existing service delivery mechanisms this action has a **possible likelihood of implementation**.					
	Cost Effectiveness					
	Dynamic			**Static**		
AQMAs Affected	Church Village & Llanharan & Tonyrefail					
Percentage Reduction in NO_x (within AQMA)	0.25					
Lifetime Financial Cost	£431,428			£1,448,498		
Total μgm^{-3} of NO_2 saved (above AQO)	1.12			4.70		
Cost per μgm^{-3} compliance	£385,203			£308,191		
	Church Village		Llanharan		Tonyrefail	
	Dynamic	**Static**	**Dynamic**	**Static**	**Dynamic**	**Static**
Compliance	×	+1	×	+1	+1	+1

Year Brought Forward						
	Cost Benefit					
Area of Effect	Area Wide					
Economic Appraisal	24			16		
Damage Costs Saved	£729 (£352 to £1,094)			£1,588 (£767 to £2,381)		
Noise Exposure	27					
PSB Alignment	35					
Climate Change	£215 (£34 to £384)			£2,748 (£1,096 to £4,406)		
Implementation Likelihood	0.25					

Table 7.(11)

Action Name	Existing public transport fleet improvement
Action Ref	K.1
Description	Bus transport can, in certain circumstances, represent a significant contributor to roadside NO_x whilst also being a sector which could be influenced via the Local Authority through Quality Bus Partnership arrangement or similar framework. The Church Village and Tonyrefail AQMAs both attribute >15% roadside NO_x emission to local bus movements. With lengthy regional bus routes dominating most service provision, it is possible that more than 100 individual buses access both AQMAs to provide the currently published schedule. Having regards to the local bus fleet it is likely that local bus movements would likely be dominated by Euro V standard buses. This action would look to provide encouragement to existing private sector service providers to upgrade, either by retrofitting or displacement with new bus stock, a substantive number of the buses accessing both locations to the newer Euro VI standard As the on-going cost of running a Euro VI bus are comparable (if not better due to fuel efficiency) with existing cots, the potential encouragement mechanisms would look to provide one-off grants to relevant operators to cover initial one-off upgrading costs. The nature of the upgrade would be largely at the discretion of the operator, as long as bus displacement was avoided, so long as the Euro VI emission profile for NO_x outcome is achieved. To be potentially effective as well as sustainable it is considered that this action would be delivered jointly across the Church Village, Llanharan and Tonyrefail AQMAs.
Implementation Year	Given the scale of the action and reliance on existing delivery frameworks, an **estimated implementation year of 2019 is possible at each of the AQMAs**.
NO_x Impact	The 2015 NAEI emission database suggests the existing bus fleet may observe an approximate 2.0gkm^{-1} NO_x emission profile. By encouraging or mandating the use of Euro VI or above buses this could potentially **reduce the overall roadside NO_x contribution by 5.7% at Church Village and 1.1% at Tonyrefail**.
Noise Exposure	It is believed that a Euro VI bus may have a slightly lower noise profile than particularly older buses but that given the nature of use this may only result in a **negligible change in noise exposure at any specific location**.
PSB Priorities	This action may indirectly affect some bus routes (Maerdy to Cardiff via Tonyrefail) that serve the Rhondda Fach and so could also have a **slight positive affect on a proposed Community Zone**. This action **would not likely affect healthier lifestyle choices** (other than via environmental improvement) This action may improve the short-term sustainability of existing public transport by

	reducing on-going costs (for instance Euro VI buses may be more fuel efficient than older models) therefore having a **slight positive economic affect via a sustainable transport solution**.			
Climate Change	Overall impact of the action may slightly reduce climate change emissions from the bus transport sector.			
Financial Appraisal	No direct revenues are expected to be raised as a result of this action Cost identified in relation to assessment; tendering, legal support, grants and monitoring with the action making use of new frameworks. Without significant analysis and consultation with private sector service suppliers, it is very difficult to estimate the necessary level of grants to achieve the desired impact. However, with an estimation of £11,000 to £16,000 per bus and with assumptions on take-up rates and other costs and estimated total **Capital of £1,500,000 has been hypothesized for the evaluation with no identified Operating and depreciation costs.**			
Economic Appraisal	Benefits may include the advance uptake of more fuel efficient vehicles; may help to support an established marker; may help to introduce newer vehicles which could improve public perception of the service. Costs will include grants; administration; additional operators cost (if not fully bridged by the grant); market distortion;			
Lifespan	As a mostly capital action to encourage advance uptake of a future required technology, **the action would likely have an effect up until 2024**, at which point natural fleet replacement would replicate the same effect.			
Likelihood	Given its novel application and potential to distort market conditions this action has an **unlikely likelihood of implementation**.			
	Cost Effectiveness			
	Dynamic		**Static**	
AQMAs Affected	Church Village & Tonyrefail			
Percentage Reduction in NO_x (within AQMA)	0.25			
Lifetime Financial Cost	£1,500,000			
Total μgm^{-3} of NO_2 saved (above AQO)	2.56		10.43	
Cost per μgm^{-3} compliance	£585,938		£143,816	
	Church Village		**Tonyrefail**	
	Dynamic	**Static**	**Dynamic**	**Static**
Compliance Year Brought Forward	+2	+2	✕	✕
	Cost Benefit			
Area of Effect	County Wide			
Economic Appraisal	18			
Damage Costs Saved	£3,127,822 (£1,456,662 to £4,755,803)			
Noise Exposure	32			
PSB Alignment	50			
Climate Change	£3,815,065 (£1,475,882 to £6,226,470)			
Implementation Likelihood	0.20			

Table 7.(12)

Action Name	Behavioural Influences	
Action Ref	L.1	
Description	It is acknowledged that various intangible barriers exist to active and public transport which may affect the public's willingness to utilise sustainable travel options. By reducing barriers (for instance charging complexity of public transport) or disseminating useful information (travel maps highlighting active travel routes or local travel interchanges) it may be possible to reduce local car journeys. The Church Village, Llanharan and Tonyrefail AQMAs all experience significant volumes of local traffic which could be encouraged to utilise sustainable travel options. This could be a package of options which support the dissemination of relevant travel information or simple actions that improve travel interconnectivity. Although no particular project delivery route has been determined, it is probable that there will be an ongoing cost (associated with supporting advertising or minor structural improvements). A hypothesised Local Authority coordinating role heavily drawing upon self sustaining local stewardship may have an important role in reducing on-going costs of the action.	
Implementation Year	Given the scale of the action and progress made in the delivery of similar actions elsewhere, **an implementation date of 2018** may be achievable.	
NO_x Impact	It is not possible to determine the likely effect of this action, however, a hypothesised **0.1% reduction in roadside NO_x within each AQMA** has been used to evaluate the action.	
Noise Exposure	It is possible that this action would support measures that, in general, may encourage less noisy forms of transport, as such this action may result in a **slight reduction in noise exposure at any specific location**.	
PSB Priorities	This action **would not affect a proposed Community Zone**s. Where possible this action may look to advocate active travel solutions which may **slightly increase the likelihood affecting healthier lifestyle choices** By increasing awareness of active and public transport routes and facilities this action would likely **have a slight positive economic affects that support a strong sustainable transport solution**.	
Climate Change	Overall impact of the action may slightly reduce carbon emissions by encouraging the uptake of active and public transport solutions as opposed to car travel.	
Financial Appraisal	No direct revenues are expected to be raised as a result of this action Cost identified in relation to conceptualisation, data collection, design, production and dissemination making use of established technology and service delivery. Based upon the implementation of similar actions so far, an estimated **annual Operational cost of £8,500 per AQMA** has been used to evaluate the action.	
Economic Appraisal	Benefits will include improved awareness of existing public transport provision; increased sustainability of public transport plurality; awareness and possible engagement with local ecological assets. Costs will include officer time facilitating data acquisition; design and publication of information.	
Lifespan	This **action would likely temporarily last for the needed duration to maintain compliance** and has been projected to the time that compliance has been predicted to occur without intervention.	
Likelihood	Given its scale and previous successful application elsewhere this action has a **moderate likelihood of implementation**.	
	Cost Effectiveness	
	Dynamic	**Static**
AQMAs Affected	Church Village & Llanharan & Tonyrefail	
Percentage Reduction in NO_x (within AQMA)	0.1%	
Lifetime Financial Cost	£43,142	£144,849
Total μgm^{-3} of NO_2 saved	2.34	9.99

(above AQO)						
Cost per µgm^{-3} compliance	£18,436			£14,499		
	Church Village		**Llanharan**		**Tonyrefail**	
	Dynamic	**Static**	**Dynamic**	**Static**	**Dynamic**	**Static**
Compliance Year Brought Forward	+1	+1	×	0	+1	+1
	Cost Benefit					
Area of Effect	Ward Wide					
Economic Appraisal	65			58		
Damage Costs Saved	£10,492 (£5,048 to £15,757)			£37,832 (£18,202 to £56,818)		
Noise Exposure	33					
PSB Alignment	45					
Climate Change	£1,620 (£0 to £2,995			£35,294 (£14,076 to £56,,596)		
Other Impacts	55					
Implementation Likelihood	0.55					

Table 7.(13)

Action Name	Park & Ride Schemes
Action Ref	M.1; M.2
Description	Transport integration can be an important factor in enabling multi-modal travel. One way to improve interconnectivity can be to establish sufficient car parking at locally strategic railway stations or bus interchanges to enable suburban drivers, looking to access conurbation centres, to part commute the journey by train or rapid transit bus. This could potentially reduce the overall NO_x emissions for the journey as well as reduce the probability of road traffic congestion at some downstream commuter pinch points. As part of phase 1 of the South Wales Capital Metro, investigation and works are being advanced that could result in the increase of park and ride provision at a number of locations within South Wales. Llanharan train station has an existing park and ride service that has been identified as having the potential to be improved to increase capacity and encourage public participation. It is likely that the majority of users of the park and ride would be commuters from Llanharan and the west heading to Cardiff, who would otherwise have passed through the Llanharan AQMA. The transference of these car journeys to rail services would make a direct improvement to the Llanharan AQMA. Significant progress is also being made in investigating the potential for large scale expansion of existing and new park and ride provision within the central South Wales Valley. This could have a particular impact in replacing regional car traffic traversing the A470, associated with the Treforest AQMA. This action can be enacted independently at each AQMA
Implementation Year	Given the regional scope of the schemes, a significant amount of time would be required to implement the action. However, as this project is already being investigated in relation to a different agenda, a relatively near-time **implementation date of 2019** could be possible.
NO_x Impact	In-depth analysis is not available, however, given the large predominance of regional

	commuting traffic and local land and infrastructure availability, it may be possible for approximately 60 car journeys to be replaced at Llanharan, resulting in a potential **0.5% reduction in roadside NO_x at the Llanharan AQMA.** Due to a larger number of park and ride options there may be the potential for 120 car journeys to be replaced along the A470, resulting in a potential **0.2% reduction in roadside NO_x within the Treforest AQMA**.			
Noise Exposure	It is likely that, through the removal of road car vehicles, **the overall noise exposure within Llanharan and Treforest would be slightly reduced.**			
PSB Priorities	This action **would not directly affect a proposed Community Zone**. This action **would not likely affect healthier lifestyle choices** By improving the amenity of a desirable local area and enabling the more efficient transport of people, this action could **have moderate positive economic affects whilst utilising a strong sustainable transport solution**.			
Climate Change	Overall impact of the action may slightly reduce carbon emissions by reducing the extent of some car travel.			
Financial Appraisal	Direct revenues, in the form of parking fees, are not expected as parking may be free contingent on onward travel by appropriate public transport. Cost identified in relation to conceptualisation, design, assessment, land acquisition, land preparation (including possible remediation), construction, maintenance enforcement and administration. The action will make use of established market technologies and mechanisms and service arrangements for similar existing assets. **Capital costs are estimated at £200,000 with associated Operating costs estimated at £7,000 for Llanharan and Capital costs are estimated at £5,000,000 with associated Operating costs estimated at £35,000 for the central South Wales Valley (relevant to Treforest**			
Economic Appraisal	Benefits will include improved road safety resulting in a reduction in the cost of death and injury; improved journey times reducing the cost to productivity of time lost to congestion; supporting transport infrastructure allowing the sustainable transportation of larger volumes of people; medium term future proof technology; resilience to future fossil fuel pricing. Costs will include user fares; construction and continued maintenance of capital assets, technology cost of facilities; fare enforcement; loss of peri-urban and some semi-rural spaces.			
Lifespan	This **action would likely persist** regardless of general policy or societal changes and has been projected to 2030			
Likelihood	This action is currently being pursued via another agenda, South Wales Capital Metro, with significant resources allocated for further investigation, conceptualisation and in some cases delivery. This action has a **high likelihood of implementation at both locations**.			
	Cost Effectiveness			
	Dynamic	**Static**	**Dynamic**	**Static**
AQMAs Affected	Llanharan		Treforest	
Percentage Reduction in NO_x (within AQMA)	0.5%		0.2%	
Lifetime Financial Cost	£296,569		£5,482,844	
Total μgm^{-3} of NO_2 saved (above AQO)	×	2.74	0.02	7.03
Cost per μgm^{-3} compliance	×	£108,236	£27,412,200	£779,920
	Church Village		**Treforest**	
	Dynamic	**Static**	**Dynamic**	**Static**
Compliance Year Brought Forward	×	+2	+1	+4
	Cost Benefit			
Area of Effect	Area Wide		County Wide	
Economic	46		52	

Appraisal		
Damage Costs Saved	£26,986 (£13,242 to £40,216)	£157,262 (£78,141 to £233,178)
Noise Exposure	45	42
PSB Alignment	40	55
Climate Change	£153,522 (£71,136 to £236,709)	£900,059 (£417,052 to £1,387,767
Implementation Likelihood	0.70	0.60

Table 7.(14)

Action Name	Relocation of Relevant Population
Action Ref	N.1; N.2
Description	It is recognised that for an AQO to be breached a relevant population in relation to the AQO must be present. Each of the AQMAs have been declared in respect of a breach of the annual mean AQO for NO_2, as such the relevant population would be the public residing within each AQMA. Utilising legal powers to obtain land with or without the consent, it could be possible of the Local Authority to relocate the relevant population from an AQMA, negating its need to exist. In accordance to existing legal frameworks, any such action would have to ensure the relevant population is adequately compensated for the loss of rights and property and could be subject to oversight and legal intervention. This action is only practicable in relation to small areas, where the overall viability of the community could be feasibly maintained. Both the Llanharan and Treforest AQMAs are expected to have less than 10 relevant properties which would be expected to be acquired. In certain circumstances, a change of land use may be an appropriate way to continue use of the land whilst ensuring a future relevant population does not arise. If this is not possible, the current land use would be mothballed or sterilised until compliance to the AQO has been reached via national intervention. This action can be enacted independently at each AQMA
Implementation Year	Given the required legal framework, including consultation and right of challenge, an **implementation date of 2019** could be possible.
NO_x Impact	This action has **no direct NO_x impact**, instead it will remove the relevant population from the existing AQMA.
Noise Exposure	It is likely that, through the relocation of residents exposed to elevated levels of noise, especially at Treforest which is within a NAPA, **the overall noise exposure within Llanharan and Treforest would be moderately reduced.**
PSB Priorities	This action **would not directly affect a proposed Community Zone**. This action may result in the erosion of well-being of both those directly required to relocate, due to the sizeable disruption which would occur from a forced relocation, as well as the remaining community who may under threat from a similar action. As such this action **would likely adversely affect healthier lifestyle choices** By potentially sterilising developed land and causing uncertainty in relation to long term private sector investment (for fear property may be forcibly acquired), this action could **have substantial negative economic affects.**
Climate Change	The impact is not expected to have any significant effects on climate change emissions.
Financial Appraisal	Potential future land use and the predicted timeframe for compliance without intervention will have a significant bearing on financial impacts, creating a high degree of uncertainty of any appraisal. As such, a worse case scenario has been utilised that does not identify any direct revenues from the action. Cost have been identified in relation to property evaluation, negotiation, acquisition, oversight and appeals, administration and legal support. The action will make use of established legal frameworks, mechanisms and service arrangements. Based on current

	generic area-specific market prices, **capital and depreciation costs are estimated at £2,824,080 within Llanharan and £2,770,944 within Treforest, with no operating costs associated with the action.**			
Economic Appraisal	No economic benefits have been identified within this action Costs will include financial costs as well as loss of developed land, community erosion, associated blight, market distortion, undermine long-term private investment and erode public confidence within other AQMAs of sustainable LAQM solutions			
Lifespan	This **action would likely temporarily last for the needed duration to maintain compliance** and has been projected to the time that compliance has been predicted to occur without intervention.			
Likelihood	Given its controversial and disruptive nature this action has a **unlikely likelihood of implementation**.			
	Cost Effectiveness			
	Dynamic	**Static**	**Dynamic**	**Static**
AQMAs Affected	Llanharan		Treforest	
Percentage Reduction in NO_x (within AQMA)	-		-	
Lifetime Financial Cost	£2,824,080		£2,770,944	
Total μgm^{-3} of NO_2 saved (above AQO)	×	2.92	0.02	6.53
Cost per μgm^{-3} compliance	×	£967,151	£138,547,200	£424,341
	Church Village		**Treforest**	
	Dynamic	**Static**	**Dynamic**	**Static**
Compliance Year Brought Forward	×	+1	+3	+4
	Cost Benefit			
Area of Effect	Immediate		Immediate	
Economic Appraisal	6		3	
Damage Costs Saved	£0 (£0 to £0)		£0 (£0 to £0)	
Noise Exposure	68		75	
PSB Alignment	12		10	
Climate Change	£0 (£0 to £0)		£0 (£0 to £0	
Implementation Likelihood	0.10		0.10	

Chapter 8 – Stage IV AQAP Formation

Utilising the analysis of viable actions undertaken above, it is possible to identify those actions which have the greatest potential desirability and enable the forming of a bespoke AQAP for each AQMA.

AQAP formation is not only required to consider effective ways to work towards compliance with the relevant AQO. The process should also consider the possible delivery of benefits for several other specific agendas, as well as the potential for any broader benefit to society. As a multi-agenda approach is necessary, the following AQAP formation process involves the use of 'swing-weighted preference-scaled multi-criteria decision making analysis' [MCDA], as described in Section 3.5.3.

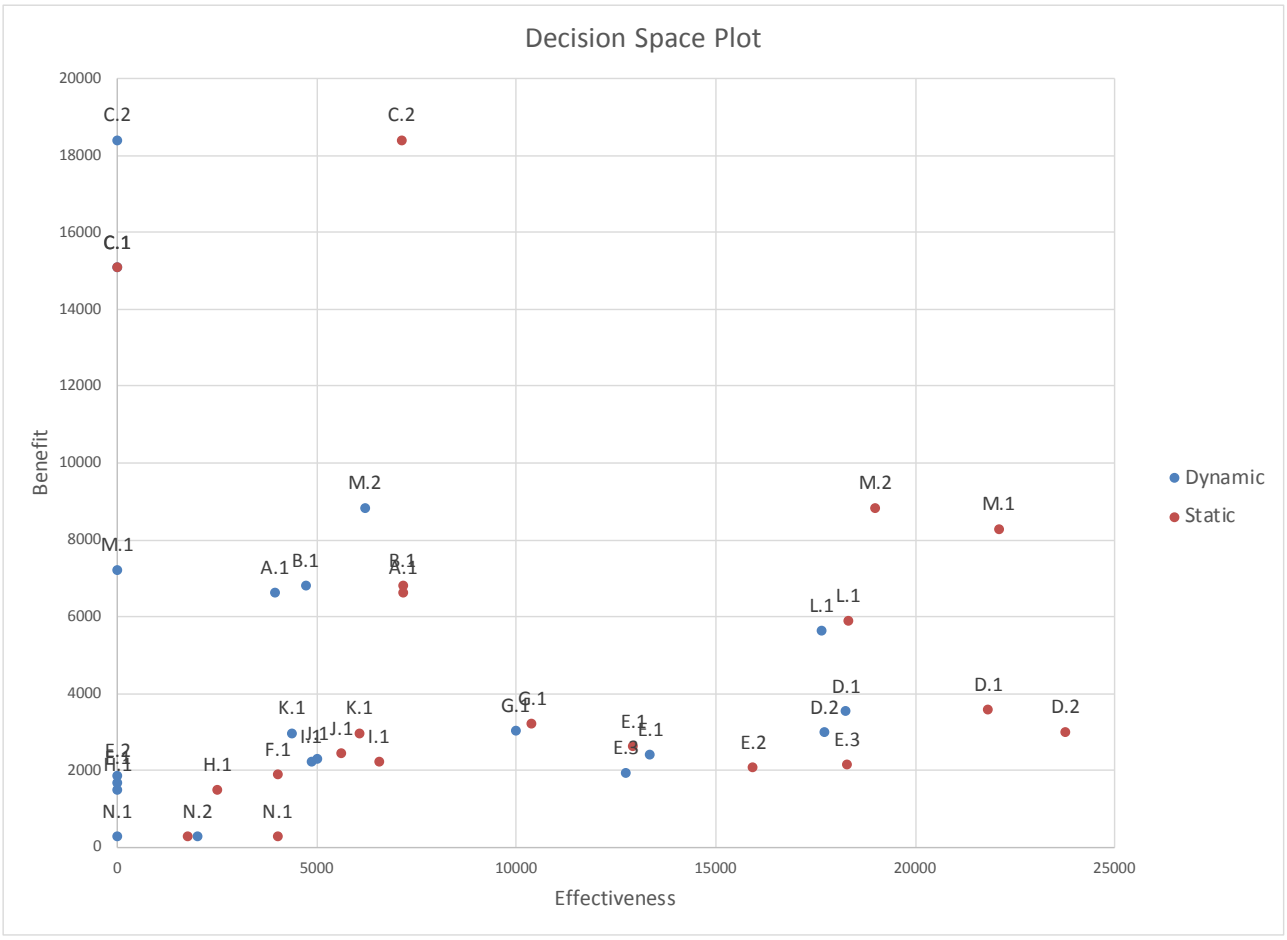
Annex II provides the respective swing-weighted preference-scores of each action. It also provides subtotals for effectiveness and cost-benefit as well as an "Overall Score" which is used to enable subsequent AQAP formation. All scores work on the basis that the higher the score the better the action, at least in relation to that criteria or sub-total.

To better observe the relationship between effectiveness and cost-benefit of the various actions, Table 8.(1) provides a 'decision space' scatter plot of the compliance-effectiveness subtotal against the cost-benefit subtotal, with each data point labelled for their respective action reference.

The decision space scatter plot below illustrates those actions, the ones furthest to the top-right corner of the decision space plot, which are likely to be the most desirable; in that they provide the most cost-effective intervention whilst maximising other relevant benefits. It also illustrates that the closer together the respective blue and red data points are (the difference between the dynamic and the static environment), the more resilient the corresponding action is to environment sensitivity. The decision space plot also indicates that, for most actions, as cost-effectiveness increases the increase in relevant benefits remains largely marginal.

It is clear from the decision space scatter plot that no specific type of action dominates all other actions, indicating that a compromise must be had been maximising compliance-effectiveness and cost-benefit.

Table 8.(1) MCDA Decision Space Scatter Plot



To facilitate direct comparison of the actions, the overall score has again been ranked; as displayed in Table 8.(2) below. The ranking provides the comparative desirability of the action, taking account of its compliance-effectiveness and cost-benefit, should it be necessary to include it within an AQAP. Table 8.(2) also provides the actions potential contribution, if implemented in isolation, in reducing levels of NO_2 within an AQMA to below the 40µgm^{-3} annual mean AQO for NO_2.

Table 8.(2) Results of Actions Ranked By Desirability

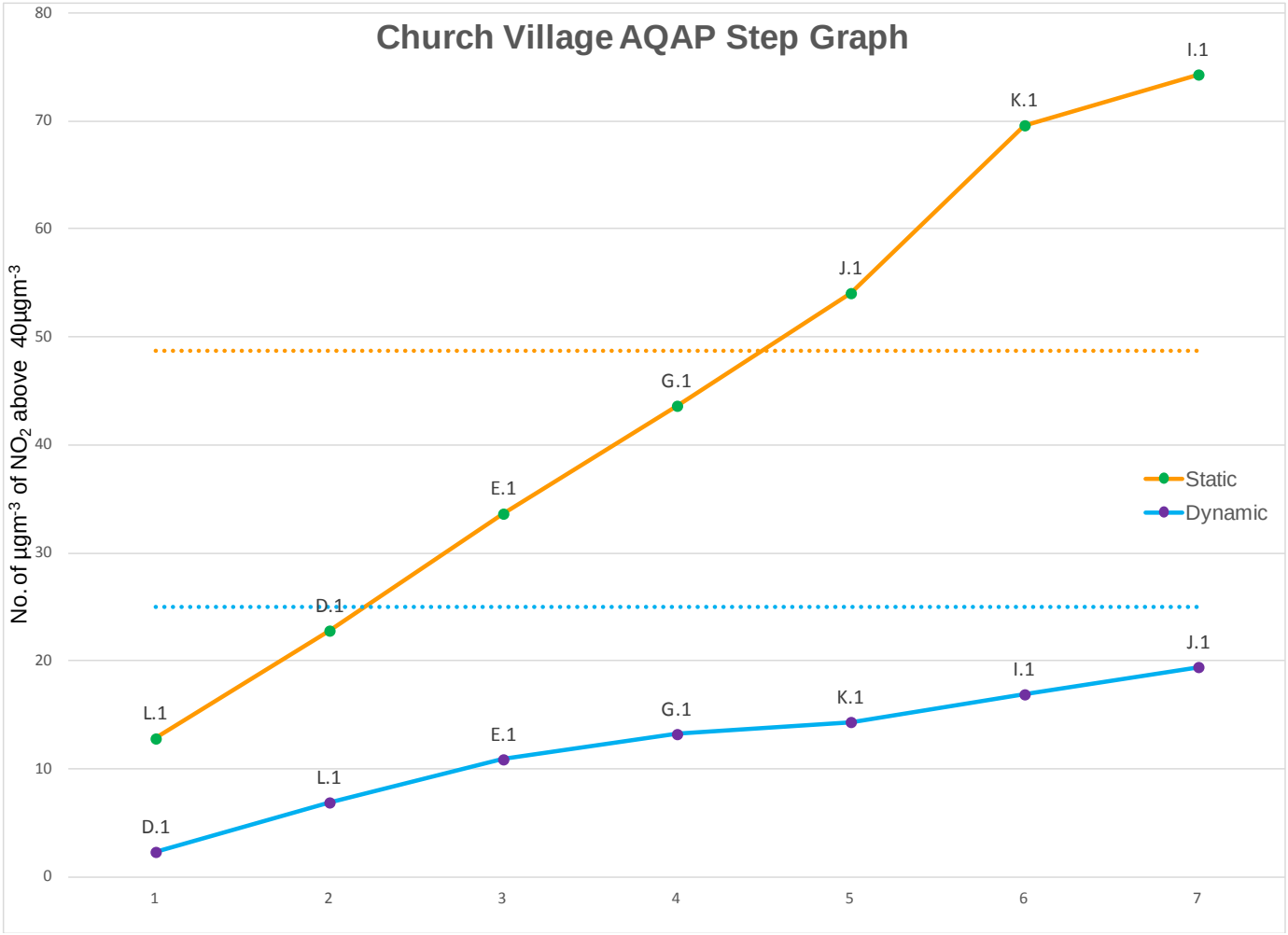
Ref	Action	AQMA	Sensitivity	Rank (1 = Best, 20 = Worst)			Total μgm^{-3} Saved above $40\mu gm^{-3}$
				Effectiveness	Benefit	Overall	
A.1	Llanharan Road Bypass	Llanharan	Dynamic	12	6	15	0
			Static	10	6	10	1.33
B.1	Tonyrefail Road Bypass	Tonyrefail	Dynamic	12	5	14	0
			Static	9	5	8	1.28
C.1	Improved Rail System	Llanharan	Dynamic	12	2	6	0
			Static	20	2	12	0
C.2	Improved Rail System	Treforest	Dynamic	12	1	4	0
			Static	13	1	5	0.5
D.1	Active traffic management	Church Village	Dynamic	1	8	2	4.58
			Static	2	8	4	12.84
D.2	Active traffic management	Tonyrefail	Dynamic	2	10	3	0.55
			Static	1	10	3	4.62
E.1	Increased Enforcement	Church Village	Dynamic	4	12	5	3.99
			Static	8	12	11	10.83
E.2	Increased Enforcement	Llanharan	Dynamic	12	16	17	0
			Static	7	16	9	3.71
E.3	Increased Enforcement	Tonyrefail	Dynamic	5	15	7	0.55
			Static	5	15	7	4.62
F.1	Optimisation of Speed Limit	Treforest	Dynamic	12	17	18	0
			Static	16	17	17	2.04
G.1	‘safe’ pedestrian routes	Church Village Llanharan Tonyrefail	Dynamic	6	9	9	2.34
			Static	11	9	13	9.99
H.1	Low Emission Zone	Treforest	Dynamic	12	18	19	0
			Static	18	18	18	1.46
I.1	Alternative Vehicle	Church Village	Dynamic	8	14	13	2.53

	Fuel Provision	Llanharan	Static	12	14	15	15.54
J.1	public bus frequency	Church Village Llanharan Tonyrefail	Dynamic	7	13	10	1.12
			Static	15	13	16	4.7
K.1	public transport fleet improvement	Church Village Tonyrefail	Dynamic	10	11	11	2.56
			Static	14	11	14	10.43
L.1	Behavioural Influences	Church Village Llanharan Tonyrefail	Dynamic	3	7	1	2.34
			Static	6	7	6	9.99
M.1	Park and Ride	Llanharan	Dynamic	12	4	12	0
			Static	3	4	1	2.74
M.2	Park and Ride	Treforest	Dynamic	9	3	8	0.02
			Static	4	3	2	7.03
N.1	Relocation of Relevant Population	Llanharan	Dynamic	12	19	20	0
			Static	19	20	20	2.92
N2	Relocation of Relevant Population	Treforest	Dynamic	11	20	16	0.02
			Static	17	19	19	6.53

8.1 Church Village AQAP Formation

Based upon the above analysis it is possible to consider the available desirable actions and determine which should be included within the Church Village AQAP. As not all actions may be necessary to achieve compliance, to identify the order of inclusion of an action within an AQAP it is possible to plot an AQAP Step Graph. The AQAP Step Graph plot illustrates the order of desirability and the accumulative effect of the actions, if each desirable action could be implemented in succession at the same time. The respectively coloured dashed lines also indicate the total amount of μgm^{-3} of NO_2 above $40\mu gm^{-3}$, which would need to be saved to achieve compliance in respect of either environment sensitivity scenario. Table 8.1.(1), identifies the AQAP Step Graph for the Church Village AQAP.

Table 8.1.(1) Church Village AQAP Step Graph



As mentioned, Table 8.1.(1) above also illustrates the apparent divergence associated with environment sensitivity, when considering the expected ability of the action to work towards achieving compliance to the annual mean AQO for NO_2. Without taking account of national interventions, the AQAP Step Graph, indicates those actions along the solid line which are above the related dashed line, that may not be necessary. Whereas, those actions along the solid line which are below the related dashed line, may be necessary if national intervention in itself has not been predicted to be sufficient. In the case of the Church Village AQAP it is apparent that the desirable actions may be sufficient but, due to a high degree of divergence, there will be considerable reliance on contingent national interventions.

As the identified desirable action will inherently have a temporal relationship, as in it may not be possible for all actions to be implemented at the same time, it is necessary for an AQAP Action Model to examine the possible impact of one or more actions over the predicted period of non-compliance. The AQAP Action Model examines desirable actions in the order of succession as indicated by the AQAP Step Graph above. As environment sensitivity is an important factor, the AQAP Action Model identifies in green, desirable actions that are required to be included within an AQAP to achieve compliance regardless of environment sensitivity, these are referred to as Priority 1 AQAP actions. The AQAP Action Model identifies in light blue, desirable actions that may be required, as indicated by one of the environment sensitivity scenarios, these are referred to as Priority 2 AQAP actions. The remaining actions, coloured dark grey are not required under either environment sensitivity scenario and will not be included within the AQAP. Should the Priority 1 and where applicable Priority 2 AQAP actions be implemented, the AQAP Action Model also indicates the possible year, coloured green, which compliance may be expected to be achieved in comparison to the year, coloured yellow, where compliance may be expected to be achieved if no local intervention occurred. Table 8.1.(2) provides the AQAP Action Model for the Church Village AQAP.

Table 8.1.(2) Church Village AQAP Action Model

			Church Village															
Dynamic Environment		Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		Do Nothing	-	48.40	47.06	45.12	43.23	41.10	38.81	36.62	34.83	33.09	31.50	30.11	28.82	27.68	26.68	25.89
		Do Something	-	-	-	41.57	39.83	37.86	35.76	33.74	32.09	30.49	29.03	27.74	26.55	25.50	24.58	23.85
	Ref	Action	Percentage Accumulative Impact															
	L.1	Behavioural Influences				8												
	D.1	Active traffic management				58												
	E.1	Increased Parking Enforcement				100												
	G.1	New/Improved 'safe' pedestrian routes				108												
	K.1	public transport fleet improvement					149											
	J.1	Improvement of public bus frequency				158												
	I.1	Alternative Vehicle Fuel Provision					198											
Static Environment		Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		Do Nothing	-	48.40	47.67	46.96	46.25	45.56	44.88	43.76	42.66	41.59	40.56	39.54	38.55	37.59	36.65	35.73
		Do Something	-	-	-	42.93	40.72	40.0	39.51	38.52	37.56	36.62	35.71	34.81	33.94	33.10	32.27	31.46
	Ref	Action	Percentage Accumulative Impact															
	D.1	Active traffic management				33												
	L.1	Behavioural Influences				39												
	E.1	Increased Parking Enforcement				66												
	G.1	New/Improved 'safe' pedestrian routes				72												
	K.1	public transport fleet improvement					100											
	I.1	Alternative Vehicle Fuel Provision					139											
	J.1	Improvement of public bus frequency				145												

Given the identification of desirable actions in the AQAP Action Model above, it is possible to list the proposed AQAP actions, their priority, possible total financial cost and cost per μgm^{-3} Compliance and if any particular proposed AQAP action is shared with any other AQAP. It is also possible to deduce the likely impact the proposed AQAP will have in bringing about compliance in a timely yet practical manner and the reliance the proposed AQAP will have on predicted future national air quality interventions. Table 8.1.(3) collates this information in relation to the proposed for the proposed Church Village AQAP, as such, the table provides the actions that will comprise the proposed Church Village AQAP.

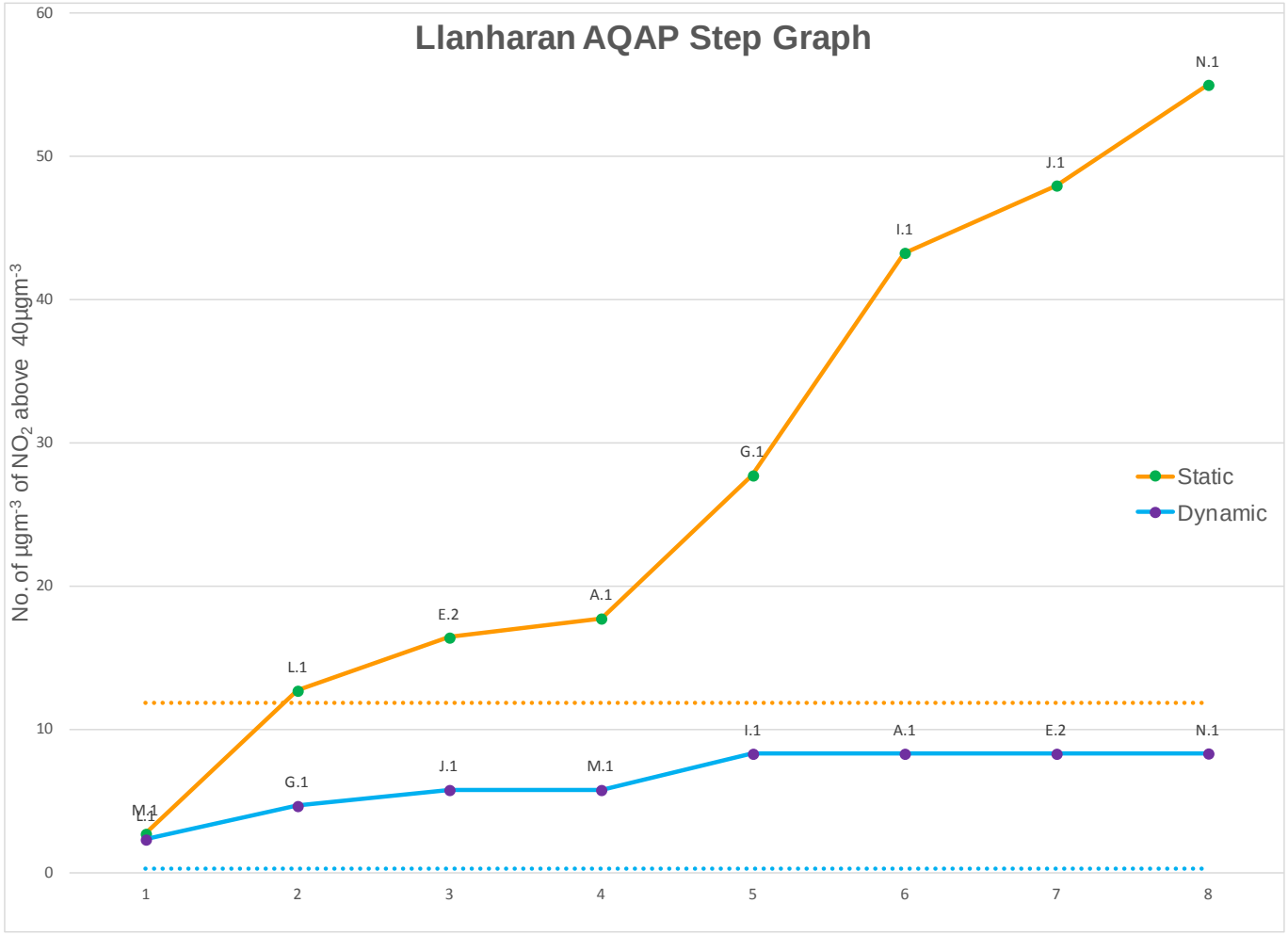
Table 8.1.(3) Proposed Church Village AQAP Action Plan Actions

Church Village AQAP Actions				Dynamic		Static		Shared with other AQAP
Ref	**Description**	**Implementation Year**	**Priority**	**Cost**	**Cost per µgm^{-3} Compliance**	**Cost**	**Cost per µgm^{-3} Compliance**	
D.1	Active traffic management	2018	1	£3,500	£764	£3,500	£273	×
E.1	Increased Parking Enforcement	2018	1	£33,079	£8,290	£93,958	£8,676	×
L.1	Behavioural Influences	2018	1	£14,381	£6,146	£48,283	£14,499	Llanharan Tonyrefail
G.1	New/Improved 'safe' pedestrian routes	2018	2	£140,867	£60,200	£420,603	£42,102	×
K.1	public transport fleet improvement	2018	2	£1,500,000	£585,938	£1,500,000	£143,816	×
Total				£1,691,827	£661,337	£2,066,344	£209,366	✓
Average				£338,365	£132,267	£413,269	£41,873	
Predicted Year of Compliance (Brought Forward)				2019 (+2)		2020 (+6)		
Reliance on National Intervention				31%		58%		

8.2 Llanharan AQAP Formation

Based upon the above analysis it is possible to consider the available desirable actions and determine which should be included within the Llanharan AQAP. As not all actions may be necessary to achieve compliance, to identify the order of inclusion of an action within an AQAP it is possible to plot an AQAP Step Graph. The AQAP Step Graph plot illustrates the order of desirability and the accumulative effect of the actions, if each desirable action could be implemented in succession at the same time. The respectively coloured dashed lines also indicate the total amount of μgm^{-3} of NO_2 above $40\mu gm^{-3}$, which would need to be saved to achieve compliance in respect of either environment sensitivity scenario. Table 8.2.(1), identifies the AQAP Step Graph for the Llanharan AQAP.

Table 8.2.(1) Llanharan AQAP Step Graph



As mentioned, Table 8.2.(1) above also illustrates the apparent divergence associated with environment sensitivity, when considering the expected ability of the action to work towards achieving compliance to the annual mean AQO for NO_2. Without taking account of national interventions, the AQAP Step Graph, indicates those actions along the solid line which are above the related dashed line, that may not be necessary. Whereas, those actions along the solid line which are below the related dashed line, may be necessary if national intervention in itself has not been predicted to be sufficient. In the case of the Llanharan AQAP it is apparent that the desirable actions may be sufficient in themselves, regardless of national interventions.

As the identified desirable action will inherently have a temporal relationship, as in it may not be possible for all actions to be implemented at the same time, it is necessary for an AQAP Action Model to examine the possible impact of one or more actions over the predicted period of non-compliance. The AQAP Action Model examines desirable actions in the order of succession as indicated by the AQAP Step Graph above. As environment sensitivity is an important factor, the AQAP Action Model identifies in green, desirable actions that are required to be included within an AQAP to achieve compliance regardless of environment sensitivity, these are referred to as Priority 1 AQAP actions. The AQAP Action Model identifies in light blue, desirable actions that may be required, as indicated by one of the environment sensitivity scenarios, these are referred to as Priority 2 AQAP actions. The remaining actions, coloured dark grey are not required under either environment sensitivity scenario and will not be included within the AQAP. Should the Priority 1 and where applicable Priority 2 AQAP actions be implemented, the AQAP Action Model also indicates the possible year, coloured green, which compliance may be expected to be achieved in comparison to the year, coloured yellow, where compliance may be expected to be achieved if no local intervention occurred. Table 8.2.(2) provides the AQAP Action Model for the Llanharan AQAP.

Table 8.2.(2) Llanharan AQAP Action Model

			Llanharan															
Dynamic Environment		Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		Do Nothing	40.3	39.3	38.2	36.6	35.1	33.3	31.5	29.7	28.3	26.8	25.6	24.4	23.4	22.4	21.6	21.0
		Do Something	-	-	-	36.6	35.1	33.3	31.5	29.7	28.3	26.8	25.6	24.4	23.4	22.4	21.6	21.0
	Ref	Action	Percentage Accumulative Impact															
	L.1	Behavioural Influences				†												
	G.1	Establishment of 'safe' pedestrian routes				†												
	J.1	Improvement of public bus frequency				†												
	M.1	Park and Ride					†											
	I.1	Alternative Vehicle Fuel Provision					†											

	A.1	Llanharan Road Bypass						†										
	E.2	Increased Parking Enforcement Activities				†												
	N.1	Relocation of Relevant Population					‡											
Static Environment	**Year**		**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
	Do Nothing		40.3	43.5	42.9	42.2	41.6	41.0	40.4	39.3	38.4	37.4	36.5	35.6	34.7	33.8	33.0	32.1
	Do Something		-	-	-	41.9	39.9	39.3	38.7	37.7	36.8	35.9	35.0	34.1	33.3	32.4	31.6	30.8
	Ref	**Action**	**Percentage Accumulative Impact**															
	M.1	Park and Ride				83												
	L.1	Behavioural Influences				100												
	E.3	Increased Parking Enforcement Activities				171												
	A.1	Llanharan Road Bypass					841											
	G.1	Establishment of 'safe' pedestrian routes					858											
	I.1	Alternative Vehicle Fuel Provision						942										
	J.1	Improvement of public bus frequency				959												
	N.1	Relocation of Relevant Population					‡											

† Compliance to the annual mean AQO for NO_2 has been predicted to already have occurred
‡ This action would negate the need for reductions in roadside NO_2

Given the identification of desirable actions in the AQAP Action Model above, it is possible to list the proposed AQAP actions, their priority, possible total financial cost and cost per μgm^{-3} Compliance and if any particular proposed AQAP action is shared with any other AQAP. It is also possible to deduce the likely impact the proposed AQAP will have in bringing about compliance in a timely yet practical manner and the reliance the proposed AQAP will have on predicted future national air quality interventions. Table 8.2.(3) collates this information in relation to the proposed for the proposed Llanharan AQAP, as such, the table provides the actions that will comprise the proposed Llanharan AQAP.

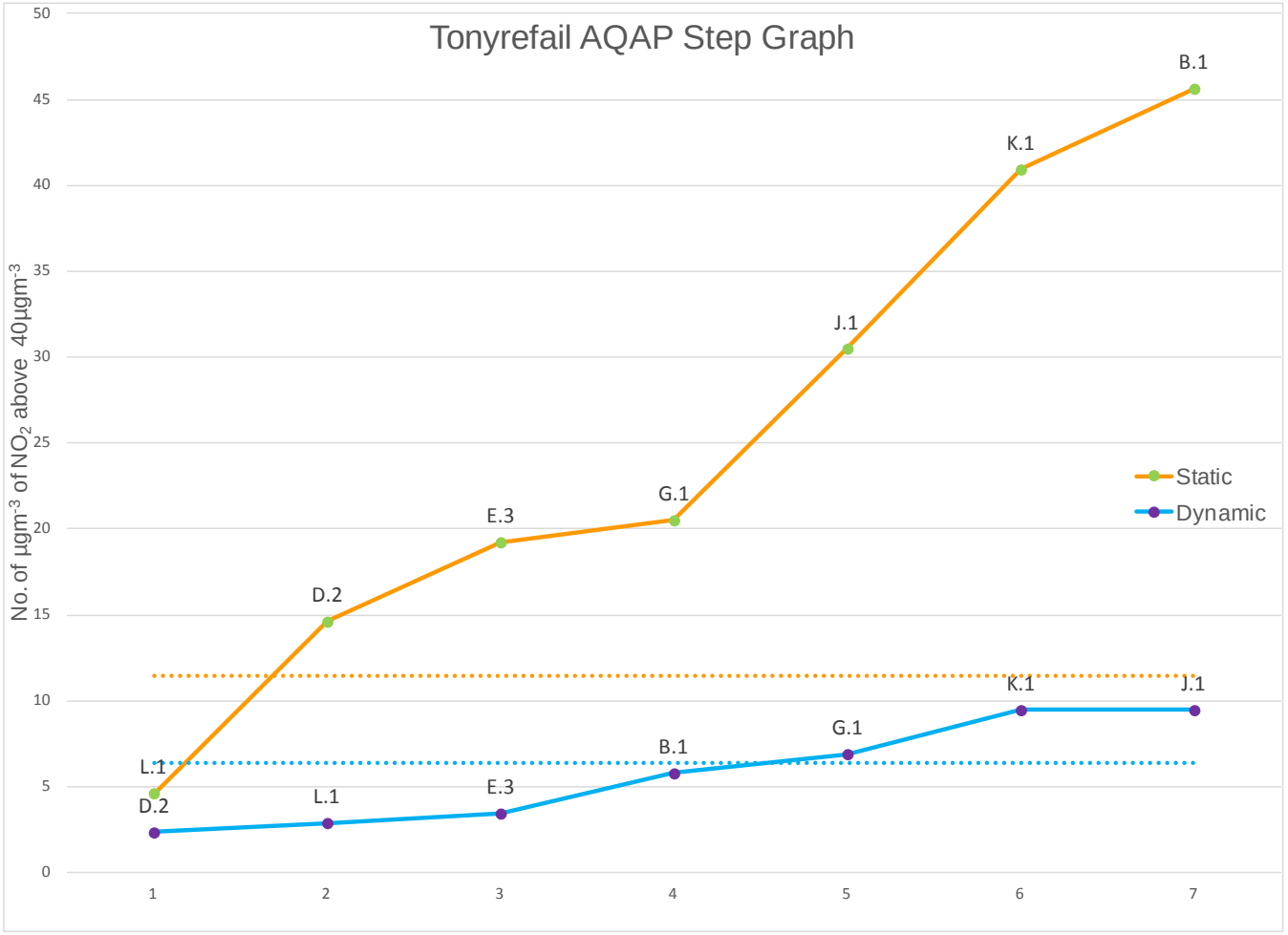
Table 8.2.(3) Proposed Llanharan AQAP Action Plan Actions

Llanharan AQAP Actions				Dynamic		Static		Shared with other AQMA
Ref	**Description**	**Implementation Year**	**Priority**	**Cost**	**Cost per µgm^{-3} Compliance**	**Cost**	**Cost per µgm^{-3} Compliance**	
L.1	Behavioural Influences	2018	2	£14,381	£18,437	£48,283	£14,499	Church Village Tonyrefail
M.1	Park and Ride	2019	2	£296,569	NIL	£296,569	£108,237	✗
Total				£310,950	£18,437	£344,852	£122,736	
Average				£155,475	£18,437	£172,426	£61,368	
Predicted Year of Compliance (Brought Forward)				2016 (0)		2019 (+3)		✓
Reliance on National Intervention				100%		33%		

8.3 Tonyrefail AQAP Formation

Based upon the above analysis it is possible to consider the available desirable actions and determine which should be included within the Tonyrefail AQAP. As not all actions may be necessary to achieve compliance, to identify the order of inclusion of an action within an AQAP it is possible to plot an AQAP Step Graph. The AQAP Step Graph plot illustrates the order of desirability and the accumulative effect of the actions, if each desirable action could be implemented in succession at the same time. The respectively coloured dashed lines also indicate the total amount of μgm^{-3} of NO_2 above $40\mu gm^{-3}$, which would need to be saved to achieve compliance in respect of either environment sensitivity scenario. Table 8.3.(1), identifies the AQAP Step Graph for the Tonyrefail AQAP.

Table 8.3.(1) Tonyrefail AQAP Step Graph



As mentioned, Table 8.3.(1) above also illustrates the apparent divergence associated with environment sensitivity, when considering the expected ability of the action to work towards achieving compliance to the annual mean AQO for NO_2. Without taking account of national interventions, the AQAP Step Graph, indicates those actions along the solid line which are above the related dashed line, that may not be necessary. Whereas, those actions along the solid line which are below the related dashed line, may be necessary if national intervention in itself has not been predicted to be sufficient. In the case of the Tonyrefail AQAP it is apparent that the desirable actions may be sufficient in themselves, regardless of national interventions.

As the identified desirable action will inherently have a temporal relationship, as in it may not be possible for all actions to be implemented at the same time, it is necessary for an AQAP Action Model to examine the possible impact of one or more actions over the predicted period of non-compliance. The AQAP Action Model examines desirable actions in the order of succession as indicated by the AQAP Step Graph above. As environment sensitivity is an important factor, the AQAP Action Model identifies in green, desirable actions that are required to be included within an AQAP to achieve compliance regardless of environment sensitivity, these are referred to as Priority 1 AQAP actions. The AQAP Action Model identifies in light blue, desirable actions that may be required, as indicated by one of the environment sensitivity scenarios, these are referred to as Priority 2 AQAP actions. The remaining actions, coloured dark grey are not required under either environment sensitivity scenario and will not be included within the AQAP. Should the Priority 1 and where applicable Priority 2 AQAP actions be implemented, the AQAP Action Model also indicates the possible year, coloured green, which compliance may be expected to be achieved in comparison to the year, coloured yellow, where compliance may be expected to be achieved if no local intervention occurred. Table 8.3.(2) provides the AQAP Action Model for the Tonyrefail AQAP.

Table 8.3.(2) Tonyrefail AQAP Action Model

			Tonyrefail															
Dynamic Environment		Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		Do Nothing		43.50	42.29	40.55	38.86	36.93	34.88	32.92	31.31	29.74	28.32	27.06	25.90	24.88	23.98	23.27
		Do Something				38.59	36.97	35.15	33.19	31.32	29.79	28.30	26.94	25.75	24.65	23.67	22.82	22.14
	Ref	Action	Percentage Accumulative Impact															
	L.1	Behavioural Influences				14												
	D.2	Active traffic management to increase traffic flow				100												
	E.3	Increased Parking Enforcement Activities				186												
	G.1	Establishment of 'safe' pedestrian routes				200												
	J.1	Improvement of public bus frequency				214												
	K.1	Existing public transport fleet improvement					229											
	B.1	Tonyrefail Road Bypass						480										
Static Environment		Year	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		Do Nothing		43.50	42.85	42.20	41.57	40.95	40.33	39.33	38.34	37.38	36.45	35.54	34.65	33.78	32.94	32.12
		Do Something				40.16	39.24	38.65	38.07	37.12	36.19	35.29	34.41	33.55	32.71	31.89	31.09	30.31
	Ref	Action	Percentage Accumulative Impact															
	D.2	Active traffic management to increase traffic flow				86												
	L.1	Behavioural Influences				100												
	E.3	Increased Parking Enforcement Activities				186												
	B.1	Tonyrefail Road Bypass						513										
	G.1	Establishment of 'safe' pedestrian routes				527												
	K.1	Existing public transport fleet improvement					542											
	J.1	Improvement of public bus frequency				556												

Given the identification of desirable actions in the AQAP Action Model above, it is possible to list the proposed AQAP actions, their priority, possible total financial cost and cost per μgm^{-3} compliance and if any particular proposed AQAP action is shared with any other AQAP. It is also possible to deduce the likely impact the proposed AQAP will have in bringing about compliance in a timely yet practical manner and the reliance the proposed AQAP will have on predicted future national air quality interventions. Table 8.3.(3) collates this information in relation to the proposed for the proposed Tonyrefail AQAP, as such, the table provides the actions that will comprise the proposed Tonyrefail AQAP.

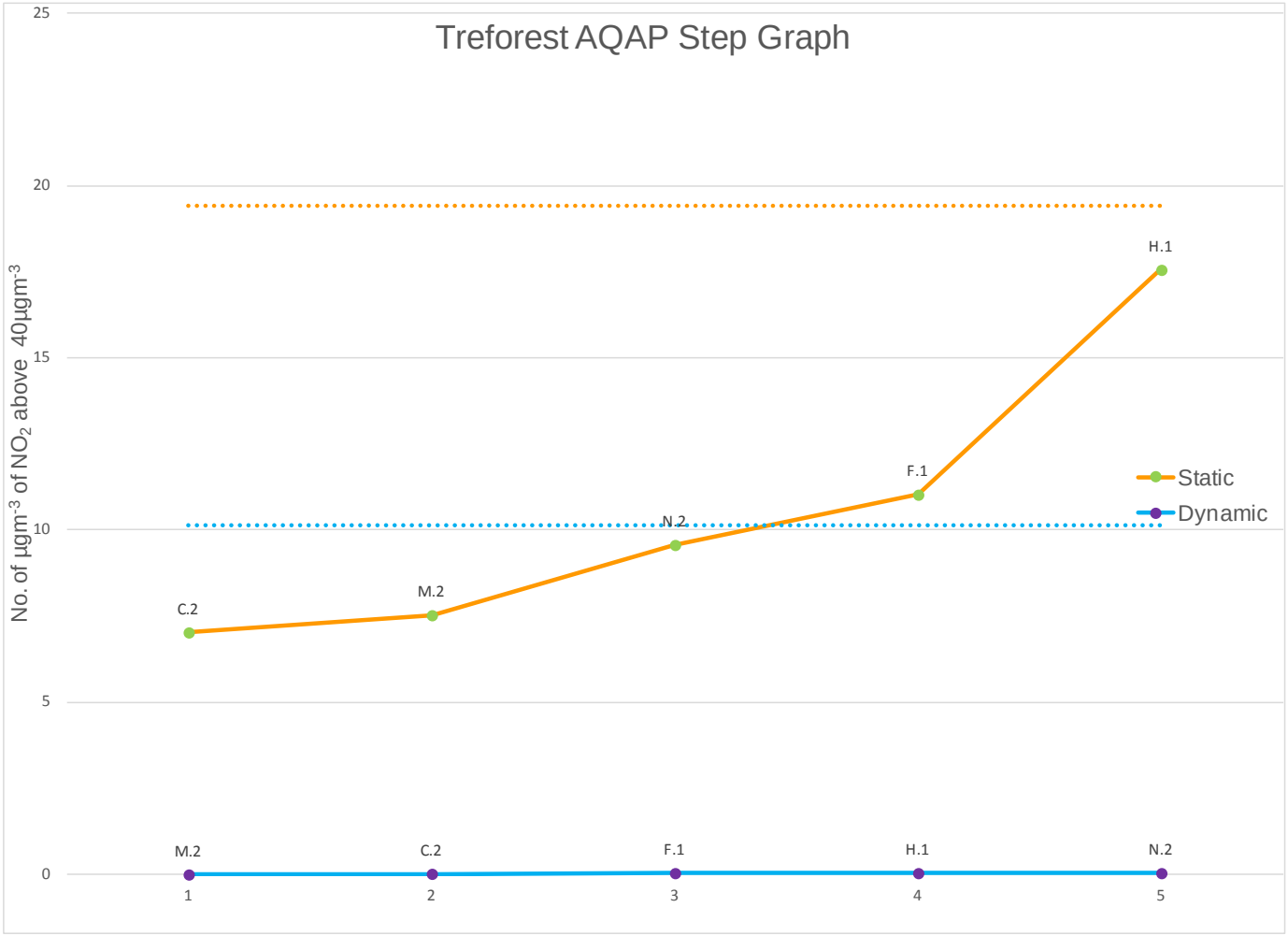
Table 8.3.(3) Proposed Tonyrefail AQAP Action Plan Actions

Tonyrefail AQAP Actions				**Dynamic**		**Static**		**Shared with other AQMA**
Ref	**Description**	**Implementation Year**	**Priority**	**Cost**	**Cost per μgm^{-3} Compliance**	**Cost**	**Cost per μgm^{-3} Compliance**	
D.2	Active traffic management to increase traffic flow	2018	1	£3,500	£6,364	£3,500	£758	✗
L.1	Behavioural Influences	2019	1	£14,381	£18,437	£48,283	£14,499	Church Village Llanharan
Total				£17,881	£24,800	£51,783	£15,257	✓
Average				£8,490	£25,892	£12,400	£7,628	
Predicted Year of Compliance (Brought Forward)				2018 (1)		2019 (+3)		
Reliance on National Intervention				0%		7%		

8.4 Treforest AQAP Formation

Based upon the above analysis it is possible to consider the available desirable actions and determine which should be included within the Treforest AQAP. As not all actions may be necessary to achieve compliance, to identify the order of inclusion of an action within an AQAP it is possible to plot an AQAP Step Graph. The AQAP Step Graph plot illustrates the order of desirability and the accumulative effect of the actions, if each desirable action could be implemented in succession at the same time. The respectively coloured dashed lines also indicate the total amount of μgm^{-3} of NO_2 above $40\mu gm^{-3}$, which would need to be saved to achieve compliance in respect of either environment sensitivity scenario. Table 8.4.(1), identifies the AQAP Step Graph for the Treforest AQAP.

Table 8.4.(1) Treforest AQAP Step Graph



As mentioned, Table 8.4.(1) above also illustrates the apparent divergence associated with environment sensitivity, when considering the expected ability of the action to work towards achieving compliance to the annual mean AQO for NO_2. Without taking account of national interventions, the AQAP Step Graph, indicates those actions along the solid line which are above the related dashed line, that may not be necessary. Whereas, those actions along the solid line which are below the related dashed line, may be necessary if national intervention in itself has not been predicted to be sufficient. In the case of the Treforest AQAP it is apparent that the desirable actions may be sufficient but, due to a high degree of divergence, there will be considerable reliance on contingent national interventions.

As the identified desirable action will inherently have a temporal relationship, as in it may not be possible for all actions to be implemented at the same time, it is necessary for an AQAP Action Model to examine the possible impact of one or more actions over the predicted period of non-compliance. The AQAP Action Model examines desirable actions in the order of succession as indicated by the AQAP Step Graph above. As environment sensitivity is an important factor, the AQAP Action Model identifies in green, desirable actions that are required to be included within an AQAP to achieve compliance regardless of environment sensitivity, these are referred to as Priority 1 AQAP actions. The AQAP Action Model identifies in light blue, desirable actions that may be required, as indicated by one of the environment sensitivity scenarios, these are referred to as Priority 2 AQAP actions. The remaining actions, coloured dark grey are not required under either environment sensitivity scenario and will not be included within the AQAP. Should the Priority 1 and where applicable Priority 2 AQAP actions be implemented, the AQAP Action Model also indicates the possible year, coloured green, which compliance may be expected to be achieved in comparison to the year, coloured yellow, where compliance may be expected to be achieved if no local intervention occurred. Table 8.4.(2) provides the AQAP Action Model for the Treforest AQAP.

Table 8.4.(2) Treforest AQAP Action Model

Treforest																		
Dynamic Environment	Year		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	Do Nothing			44.8	43.6	41.8	40.0	38.0	35.9	33.9	32.2	30.6	29.2	27.9	26.7	25.6	24.7	24.0
	Do Something					41.8	35.1	33.4	31.5	29.8	28.3	26.9	25.6	24.5	23.4	22.5	21.7	21.0
	Ref	Action	Percentage Accumulative Impact															
	C.2	Improved Rail System								50								
	M.2	Park and Ride					100											
	N.2	Relocation of Relevant Population					‡											
	F.1	Optimisation of Speed Limit							216									
	H.1	Low Emission Zone							224									
Static Environment	Year		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	Do Nothing			44.8	44.1	43.5	42.8	42.2	41.5	40.5	39.5	38.5	37.5	36.6	35.7	34.8	33.9	33.1
	Do Something					43.5	40.2	39.6	39.0	38.0	37.1	36.1	35.2	34.3	33.5	32.7	31.8	31.0
	Ref	Action	Percentage Accumulative Impact															
	M.2	Park and Ride					100											
	C.2	Improved Rail System								269								
	F.1	Optimisation of Speed Limit							824									
	H.1	Low Emission Zone							861									
	N.2	Relocation of Relevant Population					‡											

It is noted that the above AQAP Action Model for Treforest provides a slightly divergent initial order to the desirable actions to be included within the proposed AQAP. As such, that action which could be implemented first, shall be selected for inclusion included within the proposed Treforest AQAP. Given the identification of desirable actions in the AQAP Action Model above, it is possible to list the proposed AQAP actions, their priority, possible total financial cost and cost per μgm^{-3} compliance and if any particular proposed AQAP action is shared with any other AQAP. It is also possible to deduce the likely impact the proposed AQAP will have in bringing about compliance in a timely yet practical manner and the reliance the proposed AQAP will have on predicted future national air quality interventions. Table 8.4.(3) collates this information in relation to the proposed for the proposed Tonyrefail AQAP, as such, the table provides the actions that will comprise the proposed Treforest AQAP.

Table 8.4.(3) Proposed Treforest AQAP Action Plan Actions

Treforest AQAP Actions				Dynamic		Static		Shared with other AQMA
Ref	**Description**	**Implementation Date**	**Priority**	**Cost**	**Cost per µgm^{-3} Compliance**	**Cost**	**Cost per µgm^{-3} Compliance**	
M.2	Park and Ride	2019	1	£5,482,844	£274,142,200	£5,482,844	£779,921	×
Total				£5,482,844	£274,142,200	£5,482,844	£779,921	
Average				£5,482,844	£274,142,200	£5,482,844	£779,921	
Predicted Year of Compliance (Brought Forward)				2019 (1)		2020 (+3)		×
Reliance on National Intervention				0%		58%		

Chapter 9- Stage V Air Quality Action Plan Monitoring

The ability to assess the progress in delivering an AQAP in accordance with expectation is an important element of any AQAP. Robust monitoring will allow the Local Authority to consider the success of Priority 1 actions and if there is a need to implement Priority 2 actions. It will also enable rapid review of progress and if there is an underlying need to adjust or amend an AQAP, to reflect potential deviation from expected outcomes. In addition, monitoring facilitates scrutiny and accountability of the Local Authority's actions, supporting the required ways of working introduced by the Well-being of Future Generations (Wales) Act 2015.

The primary monitoring of the affect of the AQAPs will be undertaken by the continued maintenance of the existing Local Authorities NO_2 monitoring network and the periodic review of the monitoring results. This monitoring will enable the Local Authority to determine if future circumstances conform to predictions, made by the respective AQAP Action Model, and if there becomes an apparent need to implement Priority 2 actions or otherwise review the AQAP.

As the direct monitoring of ambient levels of NO_2 can require a length of time to elapse and may be affected by general fluctuations in local NO_2 prevalence. Additional proxy monitoring of the actions within each AQAP will be undertaken to identify progress and the effectiveness of the action in meeting the desired outcome. Table 9.(1) identifies each AQAP action and the proxy methods to be used to quantify outcomes.

Table 9.(1) AQAP Actions & Associated Monitoring Methods

AQMA	Action		
	AQAP Code	Description	Monitoring Methods
Church Village	D.1	Active traffic management	Improvement in mean vehicle speed along B4595
			Reduction in vehicles traversing the B4595 waiting for longer than 5 minutes at designated junction
Tonyrefail	D.2	Active traffic management	Improvement in mean vehicle speed along Mill St
			Reduction in vehicles traversing Mill St waiting for longer than 5 minutes at designated junction
Church Village	E.1	Increased Parking Enforcement	Improvement in mean vehicle speed within AQMA
			Reduction in number of vehicles within AQMA identified as in contravention of parking restrictions
			Number of hours AQMA is actively patrolled by parking enforcement staff
			Percentage increasing in parking enforced area within AQMA
Church Village	G.1	New/Improved pedestrian routes	The total of length of new or improved 'safe pedestrian routes
			The amount of investment in new or improved 'safe pedestrian routes
All	L.1	Behavioural Influences	Delivery of schemes to increase travel information
			Favourable perspective of current public transport operators

			Number of candidate sites encouraged to take up Travel Planning
			Delivery of schemes to increase modal shift
			Opportunities undertaken to encourage active travel route usage
Church Village	K.1	public transport fleet improvement	No. of public buses below Euro VI standard that serve the AQMA which are upgraded or replaced with Euro VI standard buses
Llanharan	M.1	Park and Ride	No. of additional park and ride spaces, based on a 2016 baseline, provided at Llanharan Train station
			Increase, based on a 2016 baseline, on uptake of park and ride spaces at Llanharan
Treforest	M.2	Park and Ride	No. of additional park and ride spaces, based on a 2016 baseline, provided at train stations or dedicated public transport nodes within the central South Wales Valley
			Increase, based on a 2016 baseline, on uptake of park and ride spaces at provided at train stations or dedicated public transport nodes

Chapter 10 – Stage VI Air Quality Action Plan Implementation

The AQAPs contain a number of different individual actions, many of which share a common theme. All the proposed actions have been displayed in Table 10.(1) below, which also includes an estimated cost of each action for the four AQMAs.

Table 10.(1) Collated Proposed AQAP Actions

Church Village AQAP Actions				Dynamic		Static		Shared with other AQAP
Ref	**Description**	**Implementation Year**	**Priority**	**Cost**	**Cost per µgm^{-3} Compliance**	**Cost**	**Cost per µgm^{-3} Compliance**	
D.1	Active traffic management	2018	1	£3,500	£764	£3,500	£273	×
D.2	Active traffic management to increase traffic flow	2018	1	£3,500	£6,364	£3,500	£758	×
E.1	Increased Parking Enforcement	2018	1	£33,079	£8,290	£93,958	£8,676	×
G.1	New/Improved 'safe' pedestrian routes	2018	2	£140,867	£60,200	£420,603	£42,102	×
K.1	public transport fleet improvement	2018	2	£1,500,000	£585,938	£1,500,000	£143,816	×
L.1	Behavioural Influences	2018	1	£14,381	£18,437	£48,283	£14,499	Church Village Llanharan Tonyrefail
M.1	Park and Ride	2019	2	£296,569	NIL	£296,569	£108,237	×
M.2	Park and Ride	2019	1	£5,482,844	£274,142,200	£5,482,844	£779,921	×
Priority 1		Total		£5,537,304	£274,176,055	£5,632,085	£804,127	-
		Average		£1,107,461	£54,835,211	£1,126,417	£160,825	
Priority 2		Total		£1,937,436	£646,138	£2,217,172	£294,155	
		Average		£645,812	£323,069	£739,057	£98,052	
Total				£7,474,740	£274,822,193	£7,849,257	£1,098,282	
Average				£934,343	£39,260,313	£981,157	£137,285	

It is recognised that, in the current financial climate for Local Government, it may not be possible to implement all actions within all the proposed AQAPs immediately. Therefore, it is believed appropriate to target resources where they achieve the maximum benefit. In this regard, it is possible to prioritise the proposed and existing AQAPs, so that a hierarchy can be established which allows focused direction from the Local Authority and its partners.

In accordance with its adopted objectives the Local Authority has prioritised the proposed AQAPs in relation to the estimated number of residents affected, the degree of breach of the annual mean AQO for NO_2 and the "health

indicator"[22] for the LSOA in which the AQAP resides. This will ensure that the location with the most people experiencing poor air quality and who may be the most affected by poor air quality due to underlying issues of manifested ill health, will receive the highest priority. Table 10.(2) provides the updated list of the extant and proposed AQAPs, with one being the most prioritised and sixteen being the least.

Table 10.(2) *List of AQMAs and the Priority of their AQAPs; one being the most prioritised and sixteen being the least.*

Priority	Air Quality Action Plans
1.	Cymmer
2.	Cilfynydd
3.	Tylorstown
4.	Ferndale
5.	Mountain Ash Town Centre
6.	Tonyrefail
7.	Broadway
8.	Treforest
9.	Llwynypia
10.	Aberdare Town Centre
11.	Pontypridd Town Centre
12.	Nightingales Bush
13.	Church Village
14.	Nantgarw
15.	Mwyndy
16.	Llanharan

It should be noted that this prioritisation does not preclude the undertaking of actions within a lower priority AQAP or actions which have been identified as duelled with another intervention. However, where two equally effective actions have been identified but only funding for one can be secured, then the one within the AQAP with the higher priority would normally be considered more favourably.

AQAPs are considered 'living plans, which may have to take account of possible changes, which are currently unknown or not expected to occur. As such, the Local Authority will review its adopted AQAPs in the event of a substantive change in the circumstances identified with any specific AQMA or otherwise in accordance with a published schedule, as produced within future Annual Progress Reports.

[22] StatsWales, *Welsh Index of Multiple Deprivation, WIMD2014 - Health*, 12th August 2015

Chapter 11 – Stage VII Equality Impact Assessment

The Local Authority has a statutory duty, under the Equality Act 2010, to ensure that any actions it determines to undertake should seek to advance "the elimination of discrimination" and reaffirm the Local Authorities "commitment to equality". It has been recognised that the proposed AQAPs and their associated actions must be evaluated in accordance with the Local Authorities Equality Impact Assessment Guidance[23] and as such screening EqIA has been undertaken.

The screening EqIA has examined the impact of each of the proposed AQAPs, their associated actions and their likely outcomes upon the prescribed groups with regards to the designated aims detailed within Equality Impact Assessment Guidance. Reproduced below is the completed screening EqIA: -

EQUALITY IMPACT AND ASSESSMENT SCREENING

Please ensure that you referee to the 'Equality Impact Assessment Guidance' when completing this form. If you would like further assistance please contact the Equality & Diversity Team

Details	
Name of initiative to be assessed:	The 2018 Air Quality Action Plan Addendum and adoption of the Church Village, Llanharan, Tonyrefail & Treforest Air Quality Action Plans
Name of responsible officer:	Neil Pilliner
Group/Directorate:	Public Health, Protection and Community Services
Service Area:	Public Health and Protection
Date:	24th April 2018

a) What are you assessing for impact?

Plan

b) Please name and describe below?

2018 Air Quality Action Plan Addendum contains detailed analysis and evaluation of potential actions and possible outcomes which could be included within proposed Air Quality Action Plans [AQAPs] for Church Village, Llanharan, Tonyrefail and Treforest Air Quality Management Areas [AQMAs]. The 2018 Air Quality Action Plan Addendum makes use of a systematic method capable of illustrating multi-agenda benefits as well as associated uncertainties. Facilitating the identification of a number of actions, for inclusion within bespoke AQAPs, for the above AQMAs, and enabling the Local Authority to discharge its statutory duty to works towards achieving

[23] RCTCBC, Workwell Equality Impact Assessment Guidance, May 2015

compliance to the relevant Air Quality Objectives within its area. In undertaking such action it is envisaged that the Local Authority will not only work to tackle potentially negative health impacts, associated with exposure to poor air quality, but also potentially assist in the delivery of multi-agenda benefits in a way that maximises overall positive outcomes.

c) Is the delivery of this initiative affected by legislation or other drivers such as codes of practice?
If so, please identify what and how

Rhondda Cynon Taff County Borough Council is under a legal obligation, in accordance with Section 84(2) of the Environment Act 1995 [the Act], to prepare "a written plan for the exercise by the authority, in pursuit of the achievement of air quality standards and objectives in the [...AQMA...], of any powers exercisable by the authority". Such plans should be produced in accordance with statutory guidance, including Local Air Quality Management Policy (Wales) and Technical (UK) Guidance.

d) Does the initiative directly affect service users, employees of the wider community?

Yes

Screening/Relevance Test: Is an equality impact assessment required?

Screening is used to decide whether the initiative you are responsible for has a high or medium impact on any of the protected groups and will require a full EqIA.

What will be the effect on?

Protected Characteristic	Impact
Age	No specific positive or negative impacts
Disability	**Specific positive impacts have been identified** The prescribed group may contain individuals who suffer from underlining health issues which may become exacerbated by poor air quality and result in a potential deterioration of the length and quality of their life. Improvements in air quality derived by the implementation of the AQAPs should have a beneficial impact upon those individuals by alleviating some of the potential impact of poor air quality upon their health. **Specific negative impacts have been identified** The prescribed group may contain individuals who rely upon vehicle access to support their mobility and facilitate practical access to their community and the wider environment. The Church Village AQAP identifies an action (E.1 - Parking Enforcement) which has the potential to prohibit the parking of vehicles. This action could reduce the ability for vehicles used by

	the prescribed group by either preventing long term parking near to residential areas or short term waiting in a commercial area. To ameliorate this impact, the existing parking enforcement policy has regard to various special circumstances, including facilitating where possible the safe accessibility to an area by those requiring additional motability support. This enforcement policy and the working framework developed to implement it should, where practicable, safeguard access to the prescribed group whilst maintaining the aspiration of the action.
Gender Reassignment	No specific positive or negative impacts
Marriage and Civil Partnership	No specific positive or negative impacts
Pregnancy, Maternity & Paternity	No specific positive or negative impacts
Race	No specific positive or negative impacts
Religion or Belief	No specific positive or negative impacts
Gender	No specific positive or negative impacts
Sexual Orientation	No specific positive or negative impacts
Welsh Language	No specific positive or negative impacts
Carers	No specific positive or negative impacts

If after completing the EqIA screening/relevance test, you determine that this service/function/policy/project is not relevant for an EqIA you must provide adequate explanation below.

All protected characteristics, other than “Disability”, are not expected to be impacted by the preferred actions contained within the 2018 Air Quality Action Plan Addendum or the proposed AQAPs contained therein. Although impacts have been identified in regards to “Disability”, it is believed that innate mechanisms associated with the relevant impacting actions will mitigate this negative impact to a low level. In addition positive impacts have also been identified in relation to “Disability”. It is believed that the proposed AQAPs do adequately attempt to maximise these potential positive impacts in a practical way whilst acknowledging the need for the prioritisation of resources.

Are you happy that you have sufficient evidence to justify your decision?

Yes

The screening EqIA will form part of the public consultation to be undertaken upon the publication of the Document. The results of this consultation and any adaptation of the EqIA as a result of comments made or changes to the AQAPs will be used to finalise the EqIA prior to the consideration of adoption of each of the AQAPs.

Chapter 12 – Conclusions & Recommendations

12.1 Conclusions

The Local Authority recognises the importance of local air quality and its ability to assist in delivering healthy, vibrant and sustainable communities and the fulfilment of the Local Authorities shared vision, as described by the Cwm Taf Public Services Board. Furthermore, the Local Authority has a statutory duty to assess local air quality, determine compliance to health based Air Quality Objectives and, where necessary, implement an interventional agenda to work towards restoring local air quality to the accepted standard.

The Local Authority has determined during previous rounds of review and assessment, of local air quality, that several highly localised areas are vulnerable to poor air quality. As a result, over time the Local Authority has declared a number of Air Quality Management Areas. Recently the Local Authority declared four separate AQMAs in relation to specific areas of Church Village, Llanharan, Tonyrefail and Treforest for breaches of the annual mean AQO for NO_2.

To provide an efficient, expeditious and holistic overview of local air quality management within Rhondda Cynon Taf, the Local Authority produced and consulted upon the 2017 Annual Progress Report. The 2017 Annual Progress Report provides significant elements, including source apportionment and urban NO_2 trend analysis, which are the foundation for this 2018 Air Quality Action Plan Addendum. The 2017 Annual Progress Report makes it apparent that active intervention is required to work towards bringing about compliance to the annual mean AQO for NO_2, within the four AQMAs, in the shortest practical timeframe.

The Local Authority recognises that to achieve the necessary improvement to local air quality in a proportional manner yet within the shortest practical timeframe, any interventional agenda must be reliant to some extent on both nationally adopted measures and where possible targeted local actions.

Any intervention by the Local Authority should have regard to maximising potential ancillary benefits or mitigating disadvantageous effects, with particular regard to new statutory local air quality management guidance and the advent of the Well-being of Future Generation (Wales) Act 2015. It is recognised that an action may have a wide range of positive and negative effects, beyond its impact on levels of NO_2 within an AQMA. Therefore, particular attention must be had to how the action could facilitate or impede the goals of one or more specified other agendas. This will include the actions ability to maximise any wider burden reduction associated with air pollution, alignment to the goals of the Public Services Board, synergy with the Noise Action Planning Agenda, the actions potential effects on Climate Change as well as the overarching principles and working practices implied by the Future Generation (Wales) Act.

As such this 2018 AQAP Addendum has regard to a dual analytical approach using techniques to fully evaluate a range of actions for their compliance-effectives and cost-benefit. This approach has included the collation of evidence, polices, procedures, considerations and evaluations utilised in the subsequent decision making process. This collation and evaluation process has inevitably relied upon estimation and modelling to make logical assumptions about the likely nature and impact of various potential actions. To evaluate this information in a logical way, the Local Authority has also made use of recognised decision making tools to assist in the identification of the actions to be included within an AQAP.

It has been identified that there is considerable uncertainty as to the effect of measures at a national level to improve local air quality. In addition there is uncertainty at a local level as a result of topographical, urban and socio-economic reasons. As a result, analysis strongly reaffirms an heuristic approach that builds in flexibility, to take account of an environment which may not confirm to current expectations.

Identified proposed AQAP actions include possible improvements to public transport, local traffic management to reduce congestion and awareness of sustainable transport options. These actions are believed to represent the best actions to achieve compliance to the annual mean AQO for NO_2 within each AQMA as soon as practicably reasonable. During the production of the proposed AQAPs, several actions have been identified as not being proportionate but at some point may be advanced by other agendas. Additionally, it has been identified that compliance to the annual mean AQO for NO_2 within most of the AQMAs will remain highly dependent upon the manifestation of the effects of national measures, to ultimately achieve compliance in a cost effective manner.

The Local Authority recognises that to effectively implement the AQAPs, requires the participation of a number of stakeholders as well as engagement with the local communities affected. Furthermore, it is critical, to ensure close integration with other agendas, for instance Active Travel, Climate Change, Noise Action Plan and broader Well-being and Public Health Agendas, to maximise the efficient use of available resources and advance synergistic potential.

The Local Authority also acknowledges that many different policies and actions undertaken by it will have a direct and indirect affect on local air quality. The Local Authority will continue to take account, where necessary, of local air quality during any decision making process. It will also aim, wherever possible, to promote policies and actions which will maintain or be conducive to good air quality and any synergistic effects such actions may have on other service deliveries.

It is also recognised that it may not be possible for the Local Authority, operating within a limited resource system, to implement all actions within all AQAPs immediately. Therefore, to maintain an equitable approach the Local Authority will utilise available resources in a way to maximise the potential

benefit at the most vulnerable locations, taking account of the degree of poor air quality and the potential vulnerability of the relevant population.

The Local Authority is fully committed to openness and transparency in regard to its air quality duties. It will widely disseminate and consult upon the 2018 Air Quality Action Plan Addendum with both interested parties and the public. In accordance with current statutory guidance the Local Authority will, resources permitting, also aim to ensure continuity of local air quality reporting by producing a Progress Report in 2018.

12.2 Recommendations

Further to the recommendations contained within the 2017 Progress Report, is also recommend to undertaken the following: -

- The Local Authority will consult upon the adoption, under Section 84(2) of the Environment Act 1995, the following proposed Air Quality Action Plans: -
    - Church Village Air Quality Action Plan;
    - Llanharan Air Quality Action Plan;
    - Tonyrefail Air Quality Action Plan;
    - Treforest Air Quality Action Plan.

- The Local Authority, having regards to its statutory duty, will take into account any adopted Air Quality Action Plans whilst undertaking its function and will strive to advance local air quality management during any relevant decision making process.

- The Local Authority will review its adopted Air Quality Action Plans in the event of a substantive change in the circumstances identified with any specific AQMA or otherwise in accordance with a published schedule within future Annual Progress Reports

- The Local Authority will conduct an encompassing and transparent consultation into the findings of this report and all other key steps, in the local air quality management process being undertaken; with all relevant parties and to respond where necessary to feedback given.

Chapter 13 - Bibliography

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Chapter 14 – Abbreviations & Glossary

4th Stage Further Assessment	A review of all evidence and reasoning for an AQMA to be completed 12 months after the declaration is made. The assessment also requires identification of the sources of the pollutant which has triggered the AQMA and the reductions required for compliance.
Accuracy	A measure of how well a set of data fits the "true" value.
Air Quality Action Plan [AQAP]	A cost effective plan devised by a Local Authority to improve air quality.
Air Quality Management Areas [AQMA]	An area which a Local Authority has designated for action, based upon predicted or measured breach of an Air Quality Objective.
Air Quality Objective [AQO]	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups.
Annual mean	The average of the concentrations measured for the pollutant in one year. In the case of an AQO this is for a calendar year.
National Background Concentrations	The level of the pollutant predicted to be present using advanced modelling at a national level. Background concentrations added to local contribution (dependent upon unique local factors) is the total concentration
Benzene [C_6H_6]	A liquid compound of Carbon and Hydrogen forming a stable aromatic "ring" structure. Mainly occurs due to the evaporation of petroleum.
1,3–Butadiene [C_4H_6]	A gaseous compound of Carbon and Hydrogen forming a simple conjugated diene. Produced for specific industrial processes and as a by-product in the combustion of petroleum.
Carbon Monoxide [CO]	A gaseous compound of Carbon and Oxygen normally formed by the incomplete combustion of Carbon with Oxygen in an atmosphere with a deficiency of Oxygen.
Climate Change	Is the effect on the statistical distribution of weather over a period of time and caused by the increase in the mean temperature of the Earth's near surface and oceans, triggered by the anthropogenic emission of greenhouse gasses.
Concentration	The amount of a (polluting) substance in a volume (of air), typically expressed as a mass of pollutant per unit volume of air (for example, microgrammes per cubic metre, $\mu g/m^3$) or a volume of gaseous pollutant per unit volume of air (parts per billion, ppb).
Confidence level	The degree of certainty at which the true value will be in a predicted range.
Data capture	The percentage of all the possible measurements for a

	given period that were validly measured.
Defra	Department of the Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges
Exceedence	A period of time where the concentration of the pollutant is greater than the appropriate Air Quality Objective.
Fine Particulate Matter [PM_{10}]	An atmosphere of regular and/or irregular particles with a significant probability of having a diameter of 10µm and less. They are produced from a large variety of natural and anthropogenic sources.
Kurtosis	An index of the sharpness of the peaks in a data set
Lead (Pb)	A solid elemental metal. Lead is second only to Iron among the most widely used metals, having a broad range of manufacturing and construction uses. Historically also used as an anti-knocking agent in petroleum, however, its use has now been phased out in the United Kingdom.
Metrological effects	Effects of seasonal variations on the atmosphere. These effects can include temperature, atmospheric turbulence, prevalence of sunlight, etc and is often referred to as Winter or Summer Smog.
Modeling	The use of advanced stochastic simulations to predict a future variable, for instance the concentration of a pollutant in ambient air.
Monitoring Data	Data gained from monitoring using various scientific apparatus
NAfW	National Assembly for Wales
Nitrogen Dioxide [NO_2]	A gaseous compound of Nitrogen and Oxygen normally formed by the oxidation of Nitric Oxide with Oxygen in the air.
Nitrogen Oxides [NO_x]	A generic term for all gaseous compounds of Nitrogen and Oxygen and normally comprising of Nitric Oxide and Nitrogen Dioxide
Nitric Oxide [NO]	An unstable gaseous compound of Nitrogen and Oxygen normally formed by the incomplete oxidation of Nitrogen with Oxygen in the air.
n^{th} Percentile	A value that is the rank at a particular point in a collection of data. For example the 99.8^{th} percentile of values for a year is the value that 99.8% of all the data in the year fall below, or equal.
Precision	A statistical definition of how closely readings within a range are to one another.
Progress Report	An annual report undertaken when no Updating and Screening Assessment is taking place. The Progress Report publishes the latest monitoring data for all pollutants of concern.
µg/m^3	Microgrammes per cubic metre of air. A measure of concentration in terms of mass per unit volume. A concentration of 1 µg/m^3 means that one cubic metre of air contains one microgram (millionth of a gram) of

	pollutant.
Updating and Screening Assessment [USA]	A 2nd Stage air quality report produced every three years providing a pollutant and scenario based examination of the quality of air in the County Brought, last produced in 2012.
Ratification (Monitoring)	A critical review of all information relating to a data set, in order to amend or reject the data. When the data have been ratified they represent the final data to be used (see also validation).
Running Mean	A mean composed of overlapping time periods. For instance, an 8-hour running mean is calculated every hour, and averages the values for eight hours. The period of averaging is stepped forward by one hour for each value.
Skewness	The bias to asymmetry of a data set
Sulphur Dioxide [SO_2]	A gaseous compound of Sulphur and Oxygen normally formed by the oxidation of Sulphur with Oxygen in combustion processes.
Stage 3 Detailed Assessment	A geographical examination, targeted in an area expected to be at risk, of a pollutant and its exceedence of an AQO.
Stage 4 Further Assessment	A review of previous review and assessment findings for an Air Quality Management Area to provide confirmation of the need for the declaration and source apportionment.
TEA	Triethanolamine. Used as an absorbant for NO_2 in Palmes type passive diffusion tubes.
Transboundary effects	The effects caused by the long distance transportation of air pollutants, typically across national borders. Examples are the Saharan dust episodes and the Central Europe particle episodes.
Validation (Monitoring)	Screening monitoring data by visual examination for spurious and unusual measurements (see also ratification).
Validation (Modeling)	The general comparison of modeled results against monitoring data carried out by the model developer to ensure the model is “fit for purpose”.
Verification (Modeling)	A comparison of modeled results versus monitoring results at relevant local locations.
WG	Welsh Government

Annexes

Annex I List of Statutory Consultees

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Annex I

Annex I – List of Statutory Consultees

Schedule 11 of the Environment Act 1995 lists the statutory consultees, this has been further clarified by guidance contained in LAQM.PG(16) Wales.

The following will be consulted: -

The Secretary of State

The National Assembly for Wales

National Resources Wales

The following neighbouring local authorities:

Bridgend County Borough Council
Caerphilly County Borough Council
Cardiff County Council
Merthyr County Borough Council
Neath Port Talbot County Borough Council
Powys County Council
Vale of Glamorgan Council

Brecon Beacons National Park

Cwm Taf University Health Board

Other Public Authorities

Local Business

The Public

Others as appropriate

Annex II

Annex II – MCDA Scores

Ref	Action	AQMA	Sensitivity	Scores								Implementation Likelihood	Total		
				Effectiveness		Cost- Benefit									
				Year brought forward	Cost per ugm-3 Saved	Area of Effect	Damage Costs Saved	Noise Exposure	PSB Alignment	Climate Change Score	Lifetime Economic Cost		Effectiveness Sub-total	Benefit Sub-total	Overall Total
A.1	Llanharan Road Bypass	Llanharan	Dynamic	0	0	6000	261	1200	1200	9	1520	0.65	0	6623	6623
			Static	0	0	6000	522	800	1600	17	1440	0.65	0	6807	6746
B.1	Tonyrefail Road Bypass	Tonyrefail	Dynamic	0	0	6000	4435	1000	3600	157	1472	0.9	0	15078	14997
			Static	0	0	7500	6000	1300	3800	200	1568	0.9	0	18409	18331
C.1	Improved Rail System	Llanharan	Dynamic	5500	35000	1500	3391	760	1200	130	880	0.45	18225	3538	21763
			Static	5500	33750	1500	2087	780	1240	96	880	0.45	17663	2992	20625
C.2	Improved Rail System	Treforest	Dynamic	5500	32500	1500	2609	840	1200	78	672	0.35	13300	2415	15715
			Static	0	0	1500	1043	820	1200	35	688	0.35	0	1871	1850
D.1	Active traffic management	Church Village	Dynamic	11000	25000	1500	1304	840	1200	43	672	0.35	12600	1946	14546
			Static	0	0	3000	5478	1000	1040	191	400	0.15	0	1672	1666
D.2	Active traffic management	Tonyrefail	Dynamic	5500	22500	1500	3652	840	1800	87	720	0.35	9800	3024	12810
			Static	0	0	7500	5217	900	1000	183	192	0.1	0	1502	1499
E.1	Increased Enforcement	Church Village	Dynamic	11000	13750	3000	4957	840	1720	139	400	0.2	4950	2225	7161
			Static	5500	15000	4500	2348	540	1400	70	384	0.25	5125	2310	7435
E.2	Increased Enforcement	Llanharan	Dynamic	11000	11250	6000	5739	640	2000	174	288	0.2	4450	2970	7418
			Static	5500	26250	3000	3652	660	1800	87	1040	0.55	17463	5632	23094
E.3	Increased Enforcement	Tonyrefail	Dynamic	0	0	3000	3913	900	1600	148	736	0.7	0	7215	7208
			Static	5500	2500	6000	4696	840	2200	165	832	0.6	4800	8848	13640
F.1	Optimisation of	Treforest	Dynamic	0	0	0	783	1360	480	26	96	0.65	0	276	274

	Speed Limit		Static	16500	3750	0	783	1500	400	26	48	0.65	2025	276	2301
G.1	'safe' pedestrian routes	Church Village Llanharan Tonyrefail	Dynamic	11000	5000	6000	261	1200	1200	9	1520	0.9	10400	6625	17023
			Static	11000	6250	6000	522	800	1600	17	1440	0.9	11213	6811	17959
H.1	Low Emission Zone	Treforest	Dynamic	0	0	6000	4435	1000	3600	157	1472	0.45	0	15084	14997
			Static	5500	1250	7500	6000	1300	3800	200	1568	0.45	6075	18406	24406
I.1	Alternative Vehicle Fuel Provision	Church Village Llanharan	Dynamic	11000	37500	1500	3391	760	1200	130	880	0.35	21825	3572	25363
			Static	16500	36250	1500	2087	780	1240	96	880	0.35	23738	2998	26700
J.1	public bus frequency	Church Village Llanharan Tonyrefail	Dynamic	5500	31250	1500	3130	840	1200	113	672	0.35	12863	2625	15472
			Static	16500	28750	1500	1565	820	1200	52	688	0.15	15838	2061	17876
K.1	public transport fleet improvement	Church Village Tonyrefail	Dynamic	22000	30000	1500	1826	840	1200	61	672	0.35	18200	2142	20335
			Static	11000	16250	4500	5478	1000	1040	191	400	0.1	4088	1900	5979
L.1	Behavioural Influences	Church Village Llanharan Tonyrefail	Dynamic	5500	23750	1500	4174	840	1800	122	720	0.2	10238	3221	13442
			Static	16500	7500	7500	5217	900	1000	183	192	0.25	2400	1504	3899
M.1	Park and Ride	Llanharan	Dynamic	11000	21250	3000	4957	840	1720	139	400	0.2	6450	2226	8661
			Static	5500	17500	4500	2870	540	1400	104	256	0.55	5750	2431	8167
M.2	Park and Ride	Treforest	Dynamic	11000	18750	6000	5739	640	2000	174	288	0.7	5950	2974	8918
			Static	5500	27500	3000	4174	660	1800	122	928	0.6	18150	5889	24026
N.1	Relocation of Relevant Population	Llanharan	Dynamic	11000	20000	4500	3913	900	1600	148	736	0.1	21700	8281	29958
			Static	22000	10000	6000	4696	840	2200	165	832	0.1	19200	8840	28040
N.2	Relocation of Relevant Population	Treforest	Dynamic	5500	8750	0	783	1360	480	26	48	0.1	1425	270	1695
			Static	22000	12500	0	783	1500	400	26	96	0.1	3450	280	3730

Annex III

Annex III - Consideration of the consultation for the 2017 Progress Report

Having regard to 'Directive 2003/35/EC on Public Participation in Environmental Plans and Programmes' as well as the 2016 Consultation Principles and in accordance with its statutory duty under 'Schedule 11 of the Environment Act 1995', Rhondda Cynon Taff County Borough Council [the Local Authority] has undertaken a consultation with regards to the "2017 Progress Report" [the 2017 PR], which is considered a review in accordance with Section 82(1) of the Environment Act 1995.

Consultation Time Frame

Start date of the consultation: 26th October 2017
End date of the consultation: 29th December 2017

Consultation Method

The consultation involved an invitation to the public and interested parties to make comment upon the 2017 PR within the consultation timeframe.

An invitation to make comment was forwarded to: -

- The Welsh Government on behalf of the National Assembly for Wales
- Cwm Taf Local Health Board
- Bridgend County Borough Council
- Caerphilly County Borough Council
- Cardiff County Council
- Merthyr Tydfil County Borough Council
- Neath Port Talbot County Borough Council
- Powys County Council
- Vale of Glamorgan Council
- Brecon Beacons National Park Authority in its capacity as the local planning authority
- Natural Resources Wales
- Public Health Wales
- The Rhondda Cynon Taff County Borough Council Councillor(s) for Llanharan, Llantwit Fardre and Tonyrefail
- Hanson Quarry Products Europe Ltd as the Operator of Craig yr Hesg Quarry

In addition to the above, the consultation involved the advertising of the invitation to make comment by: -

- Public notices, displaying details of the consultation on lamp posts within the Llanharan, Llantwit Fardre and Tonyrefail communities;
- Publication of the 2017 PR and details of the consultation on the dedicated air quality webpage of the Local Authority's website;

- Details of the consultation recorded on the online 'Cwm Taf Community Engagement Hub'.

Consultation Submissions and Consideration

During the period of the consultation three written submissions were received.

Written submission 1

The written submission was produced by Jamie Thomas, Air Quality Policy and Implementation Manager, People and Environment Division on behalf of the Welsh Government and received on the 21st December 2017. The submission has been recorded on the public register and is available for inspection.

The submission confirms that the 2017 PR has been subject to independent appraisal and makes several broad comments, it notes that the 2017 PR is considered "well structured, and comprehensive in details of monitoring and local assessment of air quality, covering all of the minimum requirements and the recommended additional items of the information specified in the Guidance".

The submission acknowledges the proposal to revoke the Llantwit Fardre AQMA and separately to declare the Tonyrefail and Treforest AQMAs and recommends that "action should be progressed on decisions affecting all the AQMAs before the next progress report is due in 2018".

The submission asserts that "Action Plans remain outstanding for new Church Village and Llanharan AQMAs". Continuing in this regard, the submission states that "the latest review of monitoring results shows that there has been a trend of increased pollution levels within AQMAs for the last two years. This should clearly be subject to further consideration, including a review of the potential of measures within action plans to deliver the required levels of emission reductions to achieve the air quality objectives within specified timescales. Action plan measures should be prioritised in relation to their impact on delivery of air quality objectives within each AQMA."

The submission expresses "a degree of uncertainty surrounding the extent to which the monitoring sites are representative of relevant exposure" due to their being "no reference for any site to indicate whether the monitoring site may be located at a position some distance away from what may be considered as relevant exposure. Thus there is no reference to any requirement for distance corrections for any of the monitoring sites, which is unusual as there are normally a few sites where distance corrections are required".

In regards to the 2017 PR published results associated with levels of Nitrogen Dioxide within Mountain Ash, the submission states "this should be subject to further review and assessment, and if required the Mountain Ash AQMA should also be declared for exceedance of the hourly mean objective".

Additionally on the subject of the 1-hour AQO for NO_2, the submission expresses that "the potential exceedance of the hourly mean objective should be kept under review for the AQMAs where monitoring results suggest the hourly mean objective is being approached, these are within the AQMAs for Pontypridd, Tylorstown and Ferndale."

The submission concludes "On the basis of the information provided, the report is accepted as meeting the minimum requirement for reporting on monitoring data and new local developments. Additionally, we note that the report covered some the recommended additional items of the information specified in the Guidance". The submission also iterates that the Local Authority "should submit their next annual progress report by the end of September 2018".

In considering the submission by the Welsh Government the Local Authority welcomes the general and specific comments stated. The Local Authority considers the comments are supportive of the 2017 PR and the need to undertake future stipulated investigation, action and reporting.

With regard to the proposed Air Quality Action Plans; with the completion of the consultation into the 2017 PR it is now possible to expedite their production. In addition, the Local Authority considers extant AQAPs to be 'living documents' and will endeavour to regularly review their content to ensure effective delivery. In this regard, the Local Authority will aim to set out, in the next Air Quality Progress Report, a proposed review schedule.

With regard to monitoring sites representing relevant exposure, Section 2.1.2.1 of the 2017 PR provides the position of the Local Authority on the appropriateness of NO_2 distance drop-off corrections. The Local Authority has attempted to monitor as close as possible to the relevant population with the vast majority of monitoring sites located well within one metre of a relevant population. These monitoring locations encompass a range of local circumstances, including topography and urban development, which could affect the NO_2 drop-off rate over comparably short distances. Specifically the prevalence of multiple road sources, street canyons and steep valley topography. Although it is noted that the Calculator[24] enables correction for distances greater than 0.1m, the Local Authority's current position, as stated in Section 2.1.2.1, is that the associated level of uncertainty derived from the generic assumptions utilised by the Calculator at such distances, could unduly erode the precautionary approach.

Where it has not been possible to locate monitoring sites in very close proximity to a relevant population the Local Authority has, where possible, made "use of advanced modelling techniques". The Local Authority will, during future air quality monitoring reporting, make the monitoring locations where such corrections have been made, more explicit.

[24] Bureau Veritas on behalf of Defra and the Devolved Administrations, *NO_2 Fall-off with Distance Calculator (Version 4.1)*, April 2016

With specific regard to compliance to the 1-hour AQO for NO_2, the Local Authority recognises the importance of vigilance via continued monitoring to enable rapid reaction to changing circumstances.

The Local Authority does not deem the submission requires further consideration.

Written submission 2

The written submission was produced by Huw Brunt, Lead Consultant in Environmental Health Protection for the Health Protection Division, Public Health Wales and received on the 22nd December 2017. The submission has been recorded on the public register and is available for inspection.

The submission makes several specific comments and notes that the 2017 PR is considered "a very comprehensive and informative document".

The submission notes that the Local Authority has identified a number of relatively small discrete areas which are non-compliant to the relevant AQOs. The submission advocates that given recent legislative changes, including the Well-being of Future Generations (Wales) Act 2015, it is imperative that the Local Authority focuses attention on the wider impacts of poor air quality rather than a sole 'compliance level' approach. The submission suggests consideration of the appropriateness of interventions which could bring about broader air quality improvement throughout Rhondda Cynon Taf. In addition, it advocates that the geographical extent of the AQMAs should be reconsidered with a view "to consider declaring an AQMA over a wider area so that the positive impacts of interventions can be maximised". Furthermore, it states "there is merit in targeting action not only in AQO breach areas, but also in areas where population health status is poor and where air pollution concentrations are creeping up towards AQOs."

The submission expresses a view that references to PM_{10} and $PM_{2.5}$ should semantically refer to the 'coarse faction' and 'fine faction' respectively.

The submission highlights the narrative of the 2017 PR with reference to the potential association of poor air quality and socio-economic deprivation. It also advises that consideration should be given within future LAQM reporting "to do more to link air pollution with health and multiple deprivation datasets in order to explore local associations and determine where the greatest health gain can be achieved through effective intervention". It also proffers "I would be happy to work with you to see if the current approach to risk assessment and management can be enhanced in your area through better public health collaboration (especially in relation to data sharing, linking, analysis and interpretation)"

The submission also comments upon the arrangement of the "joint Public Services Board (with Merthyr Tydfil); adopting a regional approach to LAQM would help avoid some of the potential problems highlighted [...] above and

help create a more public-health driven approach to air pollution assessment and management".

In considering the submission by Public Health Wales the Local Authority welcomes the general and specific comments stated. The Local Authority considers the comments are generally supportive of the 2017 PR and the need to undertake future stipulated investigation, action and reporting.

In regards to the burden reduction approach to local air quality management, the Local Authority recognises the fundamental changes that are being brought about by the Well-being of Future Generations (Wales) Act 2015 and recently issued updated statutory guidance LAQM.PG(17). The Local Authority is committed to working towards achieving improvements to both those areas where compliance to statutory AQOs may not have been achieved and also looking to maximise win-win solutions to provide broader burden reduction. It is also appreciated that future reporting requirements may require the Local Authority to look intently at ways broader air quality can be evaluated and improved. The Local Authority considers the 2017 PR to be a transitional report bridging the period prior to the new air quality reporting regime being fully established by Welsh Government. As any new local air quality management regime imbeds, it is expected that the Local Authority will review its current arrangements and adapt assessment, intervention and reporting mechanisms appropriately.

The Local Authority recognises the advantages and disadvantages focused AQMAs of limited geographical area can have on the delivery of targeted interventions and the communication of local air quality issues to effected communities. To maintain consistency and capitalise on the focused approach the Local Authority considers it appropriate to declare two new Air Quality Management Areas for the geographical area originally described. However, it is appreciated that this approach may need to be balanced with the expected implications of a burden reduction approach. In acknowledging this situation the Local Authority will consider, in partnership with other stakeholders, the potential for a regionally collaborative air quality strategy. An air quality strategy may enable the operational requirements of focused cost-effective AQMA actions being assessed alongside the need to further strategic actions which have the prospect of delivering wide ranging cost-beneficial burden reductions in an integrated and sustainable fashion. Any such regional air quality strategy would be expected to have regard to the entirety of Rhondda Cynon Taf and the common air quality themes which are apparent both locally and shared by neighbouring authorities.

The Local Authority concurs that attention should be afforded to the connections, relationships and outcomes between poor air quality and local socioeconomically deprived communities. Further understanding of this and potential resultant targeting of intervention, preferably feeding into a regionally coordinated air quality strategy, may likely become an increasingly important consideration in how the Local Authority approaches possible Well-being of Future Generations (Wales) Act 2015 obligations. Once further clarity on future LAQM reporting has been established it is probable the Local Authority

will wish to work holistically with stakeholders, and particularly Public Health Wales, to further this aspiration.

In regards to the terminology used within the 2017 PR, the Local Authority recognises the importance of consistent communication and as a continuing area of improvement, future reporting will look to harmonise, where appropriate, the communication of information including technical terms used.

As highlighted above in considering a strategic air quality strategy, the Local Authority concurs with the need to explore, with various stakeholders, the significant potential regional collaboration could provide. The Local Authority has begun investigating the potential cooperative arrangements which could be established with neighbouring local authorities and relevant health practitioners. As the requirements of future air quality reporting become apparent the Local Authority will review the scope and scale of possible working mechanisms, both internally and in partnership or coordination with others. However, it is recognised that in a financial climate of diminishing resources for Local Government, there will be a need to prioritise budgets and this may impact upon the availability of funding for Local Air Quality Management, including its future review and reporting.

The Local Authority does not deem the submission requires further consideration.

Written submission 3

The written submission was produced by Cllr Joel Stephen James, County Borough Council for the Llantwit Fardre Ward and received on the 26th December 2017. The submission has been recorded on the public register and is available for inspection.

The submission welcomed the report but expressed concern about the longer term sustainability of improved air quality within Llantwit Fardre, resulting in the recommendation to revoke the associated AQMA, due to the volume of traffic locally experienced.

The Local Authority appreciates the valid concern expressed, especially in light of the recent difficulties in predicting future air quality emissions from road traffic and the continued urbanisation of the area. The Local Authority strongly concurs with the need for continued vigilance and will, resources permitting, continue to closely monitor the situation, to the same extent as when the AQMA was extant.

The Local Authority does not deem the submission requires further consideration.

No other submissions were received.

Conclusions and Response

The Local Authority recognises the need to ensure comprehensive and inclusive consultation during all relevant stages of local air quality management. It is believed that the consultation has been broad, inclusive and achieved the requirements of Schedule 11 of the Environment Act 1995 and Directive 2003/35/EC.

Consultation submissions have been received and considered by the Local Authority. The Local Authority acknowledges that the 2017 PR has been widely accepted. As a result of these considerations the Local Authority does not consider it necessary to modify the 2017 PR and will move to implement its recommendations.

Annex IV

Annex IV – Proposed Air Quality Action Plans

A.1 Proposed Church Village AQAP

Church Village AQAP Actions				Action Monitoring Method
Ref	**Description**	**Implementation Year**	**Priority**	
D.1	Active traffic management	2018	1	Improvement in mean vehicle speed along B4595
				Reduction in vehicles traversing the B4595 waiting for longer than 5 minutes at designated junction
E.1	Increased Parking Enforcement	2018	1	Improvement in mean vehicle speed within AQMA
				Reduction in number of vehicles within AQMA identified as in contravention of parking restrictions
				Number of hours AQMA is actively patrolled by parking enforcement staff
				Percentage increasing in parking enforced area within AQMA
L.1	Behavioural Influences	2018	1	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Number of candidate sites encouraged to take up Travel Planning
				Delivery of schemes to increase modal shift
				Opportunities undertaken to encourage active travel route usage
G.1	New/Improved ‘safe’ pedestrian routes	2018	2	The total of length of new or improved ‘safe pedestrian routes
				The amount of investment in new or improved ‘safe pedestrian routes
K.1	public transport fleet improvement	2018	2	No. of public buses below Euro VI standard that serve the AQMA which are upgraded or replaced with Euro VI standard buses

A.2 Proposed Llanharan AQAP

Llanharan AQAP Actions				Action Monitoring Method
Ref	**Description**	**Implementation Year**	**Priority**	
L.1	Behavioural Influences	2018	2	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Number of candidate sites encouraged to take up Travel Planning
				Delivery of schemes to increase modal shift
				Opportunities undertaken to encourage active travel route usage
M.1	Park and Ride	2019	2	No. of additional park and ride spaces, based on a 2016 baseline, provided at Llanharan Train station
				Increase, based on a 2016 baseline, on uptake of park and ride spaces at Llanharan

A.3 Proposed Tonyrefail AQAP

Tonyrefail AQAP Actions				Action Monitoring Method
Ref	**Description**	**Implementation Year**	**Priority**	
D.2	Active traffic management to increase traffic flow	2018	1	Improvement in mean vehicle speed along Mill St
				Reduction in vehicles traversing Mill St waiting for longer than 5 minutes at designated junction
L.1	Behavioural Influences	2019	1	Delivery of schemes to increase travel information
				Favourable perspective of current public transport operators
				Number of candidate sites encouraged to take up Travel Planning
				Delivery of schemes to increase modal shift
				Opportunities undertaken to encourage active travel route usage

A.4 Proposed Treforest AQAP

Treforest AQAP Actions				Action Monitoring Method
Ref	**Description**	**Implementation Year**	**Priority**	
M.2	Park and Ride	2019	1	No. of additional park and ride spaces, based on a 2016 baseline, provided at Llanharan Train station
				Increase, based on a 2016 baseline, on uptake of park and ride spaces at Llanharan