Department for Environment Food & Rural Affairs

Department for Transport

Air Quality Plan for tackling roadside nitrogen dioxide concentrations in South Wales (UK0041)

July 2017

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Contents

1 Introduction

1.1 This document

This document is the South Wales non-agglomeration zone (UK0041) updated air quality plan for tackling roadside nitrogen dioxide (NO_2) concentrations. This is an update to the air quality plan published in December 2015 (https://www.gov.uk/government/collections/air-quality-plan-for-nitrogen- dioxide-no2-in-uk-2015).

This plan presents the following information:

- General information regarding the South Wales non-agglomeration zone
- Details of the NO_2 exceedance situations within the South Wales non-agglomeration zone
- Details of local air quality measures that have been implemented, will be implemented or are being considered for implementation in this non-agglomeration zone

This air quality plan for the South Wales non-agglomeration zone should be read in conjunction with the separate UK Air Quality Plan for tackling roadside nitrogen dioxide concentrations (hereafter referred to as the overview document) which sets out, amongst other things, the authorities responsible for delivering air quality improvements and the list of UK and national measures that are applied in some or all UK zones. The measures presented in this zone plan, and the accompanying UK overview document show how the UK will ensure that compliance with the NO_2 limit values is achieved in the shortest possible time.

This plan should also be read in conjunction with the supporting UK Technical Report which presents information on assessment methods, input data and emissions inventories used in the analysis presented in this plan.

1.2 Context

Two NO_2 limit values for the protection of human health have been set in the Air Quality Directive (2008/50/EC). These are:

- The annual mean limit value: an annual mean concentration of no more than 40 μgm^{-3}
- The hourly limit value: no more than 18 exceedances of 200 μgm^{-3} in a calendar year

The Air Quality Directive stipulates that compliance with the NO_2 limit values will be achieved by 01/01/2010.

1.3 Zone status

The assessment undertaken for the South Wales non-agglomeration zone indicates that the annual limit value was exceeded in 2015 but is likely to be achieved by 2026 through the introduction of measures included in the baseline.

The assessment undertaken for the South Wales non-agglomeration zone indicates that the hourly limit value was exceeded in 2015 but is likely to be achieved by 2026 through the introduction of measures included in the baseline.

Local Authorities are considering significant interventions in the zone which have not been accounted for in the national projections. Such interventions would be expected to help achieve compliance before the projected

dates of compliance in the baseline. They include measures to tackle concentrations at the location with the greatest exceedance of the annual and hourly limit values. The measured levels at this location are highly likely to be influenced by the siting of the monitoring station. The siting is being urgently reviewed to ensure further local, targeted, measures are effective and proportionate.

1.4 Plan structure

General administrative information regarding this non-agglomeration zone is presented in Section 2.

Section 3 then presents the overall picture with respect to NO_2 levels in this non-agglomeration zone for the 2015 reference year of this air quality plan. This includes a declaration of exceedance situations within the non-agglomeration zone and presentation of a detailed source apportionment for each exceedance situation.

An overview of the measures already taken and to be taken within the non-agglomeration zone both before and after 2015 is given in Section 4.

Baseline modelled projections for each year from 2017 to 2030 for each exceedance situation are presented in Section 5. The baseline projections presented here include, where possible, the impact of measures that have already been taken and measures for which the relevant authority has made a firm commitment to implement. However, it has not been possible to quantify the impact of all the measures. This section therefore also explains which measures have been quantified, and hence included in the model projections, and which measures have not been quantified.

2 General Information About the Zone

2.1 Administrative information

Zone name: South Wales
Zone code: UK0041
Type of zone: non-agglomeration zone
Reference year: 2015
Extent of zone: Figure 1 shows the area covered by the South Wales non-agglomeration zone.
Local Authorities within the zone: Figure 2 shows the location of Local Authorities within the non-agglomeration zone. A list of these Local Authorities is also given below. The numbers in the list correspond to the numbers in Figure 2.

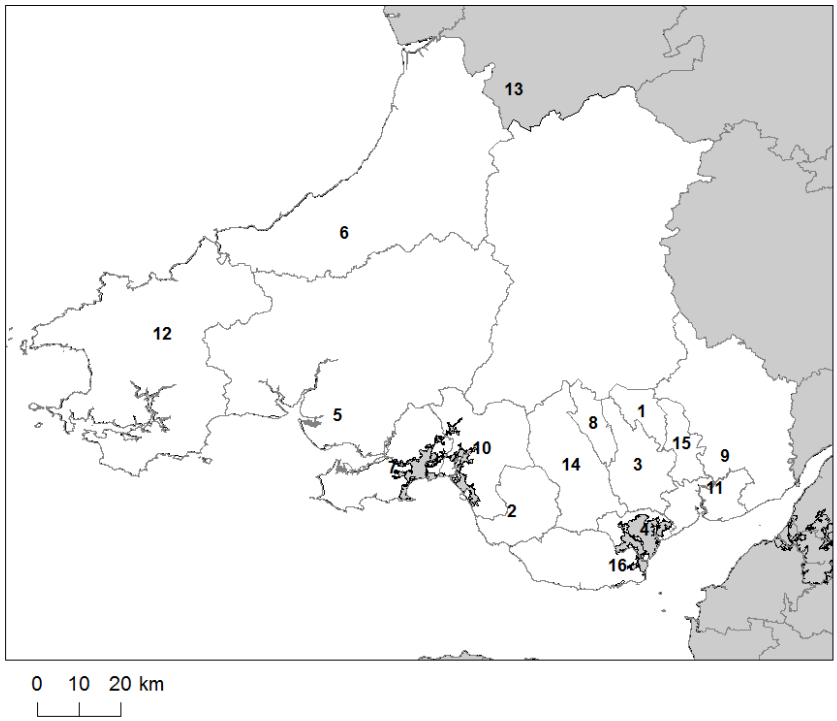
1. Blaenau Gwent County Borough Council
2. Bridgend County Borough Council
3. Caerphilly County Borough Council
4. Cardiff County Council
5. Carmarthenshire County Council
6. Ceredigion County Council
7. City and County of Swansea
8. Merthyr Tydfil County Borough Council

9. Monmouthshire Council
10. Neath & Port Talbot County Borough Council
11. Newport City Council
12. Pembrokeshire Council
13. Powys County Council
14. Rhondda-Cynon-Taff Council
15. Torfaen County Borough Council
16. Vale of Glamorgan Council

(Note: Local Authority boundaries do not necessarily coincide with zone boundaries. Hence Local Authorities may be listed within more than one zone plan.)

Figure 1: Map showing the extent of the South Wales non-agglomeration zone (UK0041).

Figure 2: Map showing Local Authorities within the South Wales non-agglomeration zone (UK0041).



2.2 Assessment details

Measurements

NO_2 measurements in this zone were available in 2015 from the following national network monitoring stations (NO_2 data capture[1] for each station in 2015 shown in brackets):

1. Chepstow A48 GB0921A (98%)
2. Cwmbran GB0744A (99%)
3. Narberth GB0043R (99%)
4. Newport GB0962A (86%)
5. Hafod-yr-ynys Roadside GB1038A (99%)

Full details of monitoring stations within the South Wales non-agglomeration zone are available from http://uk-air.defra.gov.uk/networks/network-info?view=aurn.

Modelling

Modelling for the 2015 reference year has been carried out for the whole of the UK. This modelling covers the following extent within this zone:

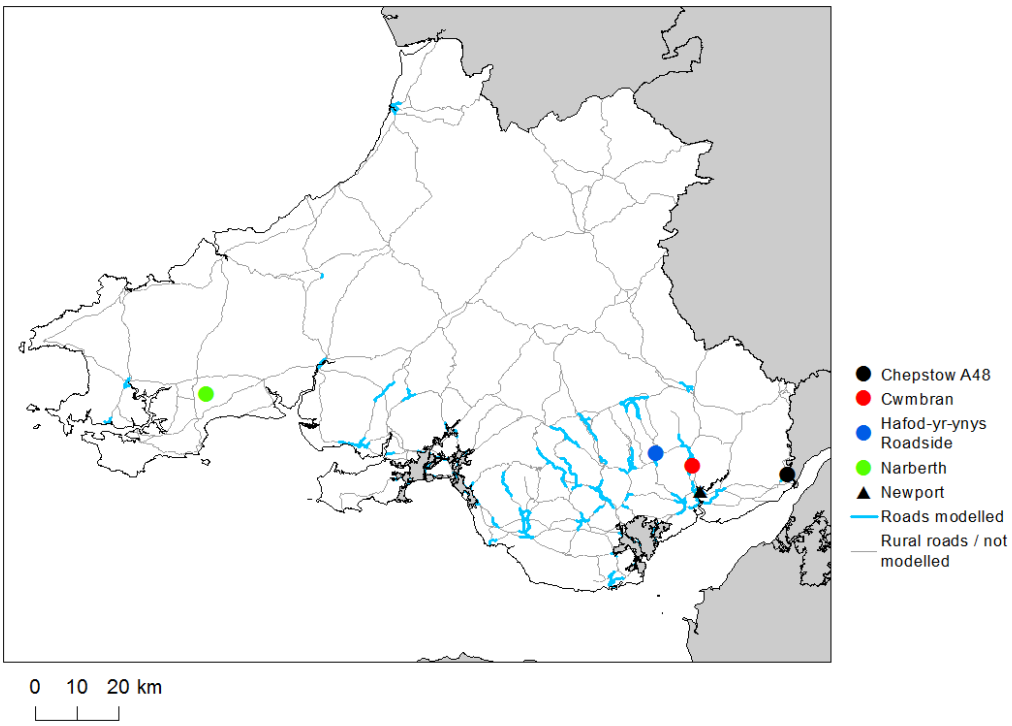
- Total background area within zone (approx): 12,645 km^2
- Total population within zone (approx): 1,772,244 people

Zone maps

Figure 3 presents the location of the NO_2 monitoring stations within this zone for 2015 and the roads for which NO_2 concentrations have been modelled. NO_2 concentrations at background locations have been modelled across the entire zone at a 1 km x 1 km resolution.

[1] Annual data capture is the proportion of hours in a year for which there are valid measurements at a monitoring station, expressed in this document as a percentage. The Implementing Provisions on Reporting (IPR) guidance requires that a minimum data capture of 85% is required for compliance reporting (that is 90% valid data, plus a 5% allowance for data loss due to planned maintenance and calibration). Monitoring stations with at least 75% data capture have been included in the modelling analysis to ensure that a greater number of operational monitoring sites have been used for model calibration and verification purposes. For more information on compliance reporting under European Directives see Section 2.3.

Figure 3: Map showing the location of the NO_2 monitoring stations with valid data in 2015 and roads where concentrations have been modelled within the South Wales (UK0041) non-agglomeration zone.



2.3 Air quality reporting

From 2001 to 2012 the UK has reported annually on air quality concentrations using a standard Excel questionnaire (Decision 2004/461/EC). These questionnaires are available online from http://cdr.eionet.europa.eu/gb/eu/annualair. Since 2013 reporting has been via an e-reporting system (Decision 2011/850/EU) http://cdr.eionet.europa.eu/gb/eu/.

In addition, the UK has reported on air quality plans and programmes (Decision 2004/224/EC) since 2003. The most recent previous UK air quality plan for nitrogen dioxide was published in 2015. The plan and supporting documents are available at https://www.gov.uk/government/collections/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2015 and the submission of this plan via e-reporting is published at http://cdr.eionet.europa.eu/gb/eu/aqd/h/envvryhbq/. Historic plans and programmes are available on http://cdr.eionet.europa.eu/gb/eu/aqpp.

3 Overall Picture for 2015 Reference Year

3.1 Introduction

There are two limit values for the protection of health for NO_2. These are:

- The annual limit value (annual mean concentration of no more than 40 μgm^{-3})
- The hourly limit value (no more than 18 hourly exceedances of 200 μgm^{-3} in a calendar year)

Within the South Wales non-agglomeration zone the annual limit value and the hourly limit value were exceeded in 2015. Hence, two exceedance situations for this zone have been defined, NO_2_UK0041_Annual_1, which covers exceedances of the annual limit value, and NO_2_UK0041_Hourly_1, which covers exceedances of the hourly limit value. These exceedance situations are described below.

3.2 Reference year: NO_2_UK0041_Annual_1

The NO_2_UK0041_Annual_1 exceedance situation covers all exceedances of the annual mean limit value in the South Wales non-agglomeration zone in 2015.

Compliance with the annual limit value in this exceedance situation has been assessed using a combination of air quality measurements and modelling. Table 1 presents measured annual concentrations at national network stations in this exceedance situation since the 1st Daughter Directive (1999/30/EC) came into force in 2001. This shows that there were measured exceedances of the annual limit value at Hafod-yr-ynys Roadside (GB1038A) in 2015.

Table 2 summarises the maximum modelled annual mean NO_2 concentrations in this exceedance situation for the period 2001 to 2014. For 2015, there were seven locations across the UK where the measured NO_2 concentration exceeded the annual mean limit value of 40 μgm^{-3} and the measured concentration was greater than the modelled concentration for the road link adjacent to the monitoring station. In these situations, the measured 2015 annual mean concentration is used as the reference year value. This is a precautionary approach taking the higher NO_2 concentration out of the modelled and measured concentration at the location of monitoring stations in 2015. Where these measured concentrations correspond to the maximum concentration in the zone, the measured 2015 concentrations are included in Table 2 in place of modelled concentrations, for

consistency with the projections (see Section 5.3). For years prior to 2015 only modelled results are presented in Table 2.

In the South Wales non-agglomeration zone the measured concentration at one monitoring station, Hafod-yr-ynys Roadside (GB1038A; 68 μgm^{-3}), exceeded the annual mean limit value in 2015 and was greater than the modelled concentration at the adjacent road link (traffic count point 78422 on the A472) of 28 μgm^{-3}. The measured concentration at Hafod-yr-ynys Roadside exceeded the maximum modelled concentration in South Wales non-agglomeration zone in 2015. Therefore, the maximum annual average NO_2 concentration in zone presented in Table 2 for 2015 is the measured concentration at Hafod-yr-ynys Roadside monitoring station. The presented road length in exceedance includes the length of road associated with traffic count point 78422 of 1.3 km. The difference between the measured and modelled concentration at this location was unusually large and was not representative of the model performance as a whole. The discrepancy between the measured and modelled concentration was likely to have been as a result of some specific local conditions that are not well represented in the national model, including that:

- the monitoring station is located on a road with considerable gradient;
- the unusual positioning of the monitoring station, which is in close proximity to the source (1m) and further away from the receptor (population exposure), and where emissions are likely to be much less well mixed with ambient air, represents concentrations much closer to the source than those predicted by the model (4m);
- the road is narrow and subject to street canyon effects;
- local fleet and speed distributions may not be well represented in the model at this location.

Factors arising from the unusual positioning of the monitoring equipment will exacerbate the large differences between the measured and modelled concentration. The site of the monitoring station was assessed in 2014 and found to be compliant with the Air Quality Directive. However, the proximity of the measurement equipment to the source of emissions and the elevation of the road compared to the inlet height will be reassessed to examine the potential risk of direct intake of exhaust gases from road transport and to ensure that the measured concentration is representative of population exposure. The impact of the monitoring station siting, and its overall suitability for the national network, are therefore being urgently assessed in order to identify and implement the most effective and proportionate interventions.

Table 2 shows that, in 2015, 15.1 km of road length was modelled to exceed the annual limit value. There were no modelled background exceedances of the annual limit value. The models are updated each year to take into account the most up-to-date science, so the modelled results for different years may not be directly comparable. Maps showing the modelled annual mean NO_2 concentrations for 2015 at background and at roadside locations are presented in Figures 4 and 5 respectively (note that Figure 5 also includes the measured exceedance at Hafod-yr-ynys Roadside). All modelled (and measured) exceedances of the annual limit value are coloured orange or red in the maps.

The modelling carried out for this exceedance situation has also been used to determine the annual mean NO_X source apportionment for all modelled locations. Emissions to air are regulated in terms of oxides of nitrogen (NO_X), which is the term used to describe the sum of nitrogen dioxide (NO_2) and nitric oxide (NO). Ambient NO_2 concentrations include contributions from both directly emitted primary NO_2 and secondary NO_2 formed in the atmosphere by the oxidation of NO. As such, it is not possible to calculate an unambiguous source apportionment specifically for NO_2 concentrations; therefore the source apportionment in this plan is presented for NO_X, rather than for NO_2 (for further details please see the UK Technical Report). Table 3 summarises the modelled NO_X source apportionment for the section of road with the highest NO_2 concentration in this exceedance situation in 2015. For South Wales non-agglomeration zone, the measured concentration at Hafod-yr-ynys Roadside monitoring station exceeded the maximum modelled concentration in the zone. As

noted above, the modelled concentration at the road link adjacent to Hafod-yr-ynys Roadside (traffic count point 78422 on the A472) was less than the measured concentration. The modelled concentrations of NO_X for the local traffic sources category have been scaled such that the total NO_X concentration matches the measured NO_X concentration at Hafod-yr-ynys Roadside monitoring station in order to provide the best available estimate of source apportionment for this exceedance. This is important information because it shows which sources need to be tackled at the location with the largest compliance gap in the exceedance situation.

Figure B.1 in Annex B presents the annual mean NO_X source apportionment for each section of road within the NO_2_UK0041_Annual_1 exceedance situation (i.e. the source apportionment for all exceeding roads only) in 2015.

Table 1: Measured annual mean NO_2 concentrations at national network stations in NO2_UK0041_Annual_1 for 2001 onwards, μgm^{-3} (a). Data capture shown in brackets.

Site name (EOI code)	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Chepstow A48 (GB0921A)								41 (98)	38 (97)	39 (99)	40 (99)	41 (72)	36 (96)	39 (91)	37 (98)
Cwmbran (GB0744A)	18 (43)	20 (90)	19 (88)	17 (99)	17 (99)	14 (96)	14 (82)	14 (88)	14 (91)	16 (98)	13 (99)	14 (95)	13 (99)	12 (99)	12 (99)
Narberth (GB0043R)	7 (64)	7 (86)	9 (79)	5 (89)	5 (92)	5 (94)	5 (89)	6 (94)	5 (92)	5 (95)	4 (98)	6 (76)	5 (98)	4 (98)	3 (99)
Newport (GB0962A)								24 (97)	25 (99)	26 (96)	22 (91)	22 (96)	23 (89)	22 (95)	21 (86)
Hafod-yr-ynys Roadside (GB1038A)														78 (21)	68 (99)

(a) Annual Mean Limit Value = 40 μgm^{-3}

Table 2: Annual mean NO_2 model results in NO_2_UK0041_Annual_1 for 2001 onwards.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015(b)
Road length exceeding (km)	30.3	14.5	96.2	50.7	47.7	44.2	44.2	31.5	38.1	42.4	38.5	32.6	30.3	25.3	15.1
Background exceeding (km^2)	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0
Maximum modelled concentration (μgm^{-3}) (a)	54.0	63.8	81.1	67.6	71.6	69.5	67.9	72.0	70.9	73.7	70	69	66	60	68

(a) Annual Mean Limit Value = 40 μgm^{-3}

(b) For 2015 the maximum concentration presented is for measured NO_2 at Hafod-yr-ynys Roadside monitoring station. The road length exceeding includes the road length associated with the traffic count point located adjacent to Hafod-yr-ynys Roadside monitoring station (traffic count point 78422 on the A472). See text for more detail. For years prior to 2015, model results only are presented.

Table 3: Modelled annual mean NO_X source apportionment at the location with the highest NO_2 concentration in 2015 in NO2_UK0041_Annual_1 (μgm^{-3}) Hafod-yr-ynys Roadside (d).

Spatial scale	Component	Concentration at highest road link (a)
Regional background sources NOx (i.e. contributions from distant sources of > 30 km from the receptor).	Total	3.7
	From within the UK	1.6
	From transboundary sources (includes shipping and other EU member states)	2.1
Urban background sources NOx (i.e. sources located within 0.3 - 30 km from the receptor).	Total	11.2
	From road traffic sources	5.7
	From industry (including heat and power generation)	1.7
	From agriculture	NA
	From commercial/residential sources	1.6
	From shipping	0.0
	From off road mobile machinery	1.6
	From natural sources	NA
	From transboundary sources	NA
	From other urban background sources	0.5
Local sources NOx (i.e. contributions from sources < 0.3 km from the receptor).	Total	203.1
	From petrol cars	18.0
	From diesel cars	80.1
	From HGV rigid (b)	24.6
	From HGV articulated (b)	14.1
	From buses	7.5
	From petrol LGVs (c)	0.3
	From diesel LGVs (c)	57.9
	From motorcycles	0.6
	From London taxis	0.0
Total NOx (i.e. regional background + urban background + local components)		218.0
Total NO_2 (i.e. regional background + urban background + local components)		68

(a) Components are listed with NO_X concentration of NA when there is no source from this sector.

(b) HGV = heavy goods vehicle

(c) LGV = light goods vehicle

(d) The total NO_X and NO_2 are the measured concentrations of NO_X and NO_2, respectively, at Hafod-yr-ynys Roadside monitoring station. A best estimate of the NO_X source apportionment at Hafod-yr-ynys Roadside monitoring station has been achieved by scaling the modelled NO_X concentrations for local sources such that the total modelled NO_X at traffic count point 78422 on the A472 matches the measured concentration of NO_X at Hafod-yr-ynys Roadside.

Figure 4: Map of modelled background annual mean NO_2 concentrations 2015. Modelled exceedances of the annual limit value are shown in orange and red.

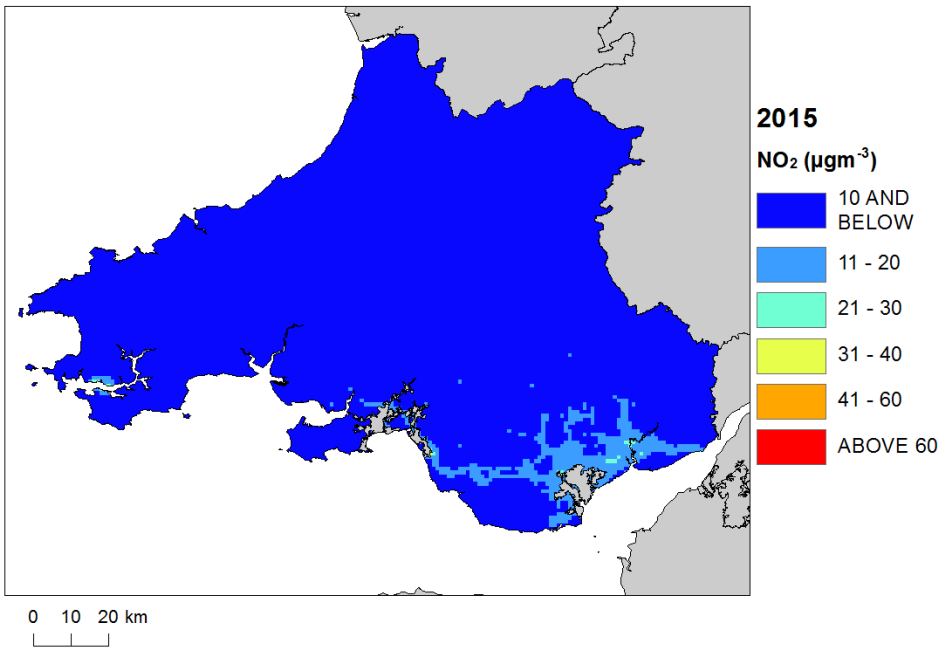
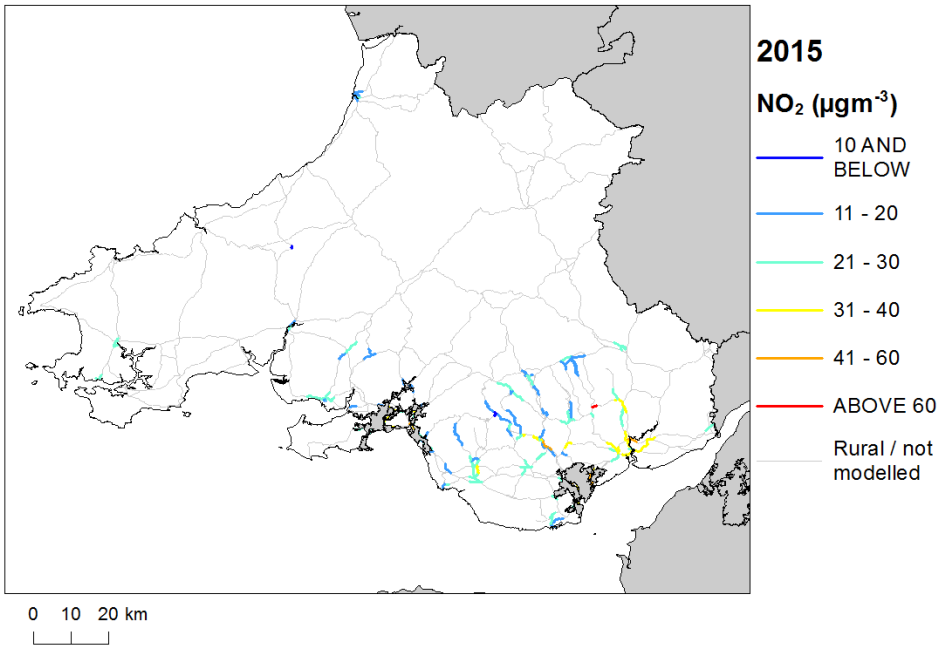


Figure 5: Map of roadside annual mean NO_2 concentrations 2015. Modelled exceedances of the annual limit value are shown in orange and red.[2]



[2]The NO_2 concentration presented for the traffic count point located adjacent to Hafod-yr-ynys Roadside monitoring station (traffic count point 78422 on the A472) is the measured annual mean NO_2 concentration at Hafod-yr-ynys Roadside monitoring station. See text for more detail.

3.3 Reference year: NO_2_UK0041_Hourly_1

This exceedance situation covers all exceedances of the hourly NO_2 limit value in South Wales non-agglomeration zone in 2015.

Compliance with the hourly limit value in this exceedance situation has been assessed using air quality measurements only. Table 4 presents the number of hours measured NO_2 concentrations exceeded 200 μgm^{-3} at national network stations in this exceedance situation since the 1st daughter directive (1999/30/EC) came into force in 2001. A site exceeds the hourly limit value for NO_2 when NO_2 concentrations exceed 200 μgm^{-3} for more than 18 hours per calendar year. Table 4 shows that there was a measured exceedance of the hourly limit value in 2015 at Hafod-yr-ynys Roadside (GB1038A).

The modelled annual mean concentration of NO_2 at the road link adjacent to Hafod-yr-ynys Roadside monitoring station (traffic count point 78422 on the A472) in 2015 was 28 μgm^{-3}. The measured annual mean concentration at Hafod-yr-ynys Roadside in 2015 was 68 μgm^{-3}. As noted in Section 3.2, the difference between measured and modelled concentrations at this location was unusually large. The discrepancy was a result of some specific local conditions that are not represented by the model. The location of the monitoring station site and the validity of the associated measured data are being urgently assessed to ensure the measurements are representative of local population exposure, and to ensure further remedial measures are effective and proportionate.

Table 3 in Section 3.2 presents the estimated annual mean source apportionment for Hafod-yr-ynys Roadside monitoring station, the monitoring station with the highest measured number of hours exceeding the hourly limit value in 2015. The annual mean source apportionment is presented here because hourly source apportionment is not available. In general, the annual mean source apportionment for this location is expected to provide a reasonable approximation of the sources contributing to the exceedance of the hourly limit value in the same location.

Table 4: Measured number of hours exceeding 200 μgm^{-3} NO_2 at national network sites in South Wales for each calendar year from 2001 onwards. (Data capture shown in brackets) (a).

Site name (EOI code)	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Chepstow A48 (GB0921A)								0 (98)	0 (97)	0 (99)	0 (99)	0 (72)	0 (96)	0 (91)	2 (98)
Cwmbran (GB0744A)	0 (43)	0 (90)	0 (88)	0 (99)	0 (99)	0 (96)	0 (82)	0 (88)	0 (91)	0 (98)	0 (99)	0 (95)	0 (99)	0 (99)	0 (99)
Narberth (GB0043R)	0 (64)	0 (86)	0 (79)	0 (89)	0 (92)	0 (94)	0 (89)	0 (94)	0 (92)	0 (95)	0 (98)	0 (76)	0 (98)	0 (98)	0 (99)
Newport (GB0962A)								1 (97)	0 (99)	5 (96)	0 (91)	0 (96)	0 (89)	1 (95)	0 (86)
Hafod-yr-ynys Roadside (GB1038A)														38 (21)	108 (99)

(a) Hourly Limit Value = 18 hours

4 Measures

4.1 Introduction

This section gives details of measures that address exceedances of the NO_2 limit values within South Wales non-agglomeration zone. This includes both measures that have already been taken and measures for which there is a firm commitment that they will be taken.

Section 5 then explains the extent to which it has been possible to incorporate the impacts of these measures into the baseline modelling carried out for this assessment.

4.2 Source apportionment

It is important to understand which sources are responsible for causing the exceedance in order to most effectively tailor measures to address the NO_2 exceedance situations described in Section 3 above. This can be achieved by considering the source apportionment for the exceedance situation, also presented in Section 3. A summary of what the source apportionment shows and the implications for which measures would therefore be appropriate is given here.

Local road traffic was the dominant source in this exceedance location in the reference year. The largest contribution was from diesel cars at the location of maximum exceedance with a contribution of 80.1 μgm^{-3} of NO_X out of a total of 218 μgm^{-3} of NO_X. Diesel cars and diesel LGVs were important sources on the motorway roads with the highest concentrations in this exceedance situation. Diesel cars and diesel LGVs, and for some roads articulated HGVs and rigid HGVs or buses, were important sources on the primary roads with the highest concentrations. Diesel cars and diesel LGVs were important sources on the trunk roads with the highest concentrations.

This indicates that appropriate measures should impact on local road traffic sources in this zone. Other measures to address the urban background sources may also be beneficial.

4.3 Measures

Measures potentially affecting NO_2 in this non-agglomeration zone have been taken and/or are planned at a range of administrative levels. These are:

- European Union
- National (i.e. England, Scotland, Wales, Northern Ireland or whole UK)
- Local (i.e. UK Local Authorities)

Details of European Union measures (e.g. Euro Standards, Fuel Quality Directives, Integrated Pollution Prevention and Control) can be found on the European Commission's website (http://ec.europa.eu/environment/air/index_en.htm). Details of national measures are given in the UK overview document.

Relevant Local Authority measures within this exceedance situation are listed in Table C.1 (see Annex C). Table C.1 lists measures which a local authority has carried out or is in the process of carrying out, plus additional measures which the local authority is committed to carrying out or is investigating with the expectation of carrying out in the future. Additional local measures which will deliver air quality improvements in South Wales non-agglomeration zone have been provided by the Welsh Government and these are listed in Table C.2.

There have been a significant number of initiatives carried out and proposed in the zone. There are widening choices for citizens that will help reduce traffic congestion e.g. pedestrian crossing schemes and strategic recreational routes for cycling and traffic management initiatives to reduce congestion.

Bus infrastructure improvements have been taking place in addition to park and ride that will give effect to modal shift along with dedicated express bus routes. These routes will continue to be made up to 2030.

Also there are ongoing bus corridor enhancements that will also encourage modal shifts, safer walking routes to schools and in the communities. School travel plans have also been implemented which encourages modal shift too from cars to other forms of transport that helps to improve air quality.

A cycling strategy is being implemented to increase the levels of uptake in place of using cars. An initiative on green fleet vehicles and alternative fuel vehicles is underway that will encourage the uptake of low emission vehicles. Traffic management initiatives have begun that will reduce traffic congestion.

Safe routes to schools have also been set up and will reduce car usage around schools. Numerous schemes have been implemented and will continue to 2030.

The National Transport Finance Plan refers to investment in the Cardiff Capital Metro project which, alongside existing initiatives which have already been applied, is being designed to enhance sustainable travel choices for transport users and reduce private vehicle use.

The Finance Plan also includes a number of infrastructure investments which, if approved, change the motorway and trunk network and are related to areas which are either showing exceedences in the 2015 modelling; or are in an area covered by an Air Quality Management Area for NO_2. Examples include the M4 Corridor around Newport and complementary measures and the A483 Llandeilo Bypass.

4.4 Measures timescales

Timescales for national measures are given in the UK overview document.

Local Authorities report on progress with the implementation of their action plans annually and review action plan measures regularly. Information on local measures was collected in February/March 2015. Local authorities were asked to review and, where necessary, provide updates to measures in March/April 2017. Hence, any Local Authority action plans and measures adopted by Local Authorities after this time have not been included in this air quality plan, unless additional information was provided during the consultation process.

The reference year for this air quality plan is 2015. Where measures started and finished before 2015, then the improvement in air quality resulting from these measures will have already taken place before the reference year and the impact of these measures will have been included in the assessment where the measure has had an impact on the statistics used to compile the emission inventory. Many measures started before the reference year and will continue to have a beneficial impact on air quality well beyond the reference year. Measures with a start date before 2015 and an end date after 2015 may have an impact on concentrations in the reference year and a further impact in subsequent years. Where the Status column in Annex C is ‘Implementation’, this shows that this measure is already underway or that there is a commitment for this measure to go ahead. Where the Status is ‘Planning’, ‘Preparation’ or ‘Other’ the level of commitment is less clear and it is possible some of these measures may not go ahead.

5 Baseline Model Projections

5.1 Overview of model projections

Model projections for each year from 2017 to 2030, starting from the 2015 reference year described in Section 3, have been calculated in order to determine when compliance with the NO_2 limit values is likely to be achieved on the basis of EU, regional and local measures currently planned. Details of the methods used for the baseline emissions and projections modelling are provided in the UK technical report.

For national measures, it has not been possible to quantify the impact of all measures on emissions and ambient concentrations. The impact for all quantifiable measures has been included in the baseline projections.

The impacts of the individual Local Authority measures have not been explicitly included in the baseline model projections. However, measures may have been included implicitly if they have influenced the traffic counts for 2015 (used as a basis for the compilation of the emission inventory) or in the traffic activity projections to 2020 and beyond (used to calculate the emissions projections). It should be recognised that these measures will have a beneficial impact on air quality, even if it has not been possible to quantify this impact here.

5.2 Baseline projections: NO_2_UK0041_Annual_1

Table 5 presents summary results for the baseline model projections for each year from 2017 to 2030 for the NO_2_UK0041_Annual_1 exceedance situation. At locations where the measured NO_2 concentration in 2015 exceeded the annual mean limit value of 40 μgm^{-3} and the measured concentration was greater than the modelled concentration for the road link adjacent to the monitoring station, projections have been calculated using the measured concentration in 2015 as the starting point. The trend in concentration reductions shown by the modelled projection for the adjacent traffic count point has been used to project the 2015 measured concentrations forward. This is a precautionary approach to provide the best prediction of future concentrations and the corresponding year that compliance with the NO_2 limit values is projected to be achieved for the measured 2015 exceedance. For all other locations the modelled projections of NO_2 and NO_X concentrations start from the modelled concentration for the base year 2015. In the South Wales non-agglomeration zone the measured concentration at one monitoring station, Hafod-yr-ynys Roadside (GB1038A, 68 μgm^{-3}), exceeds the annual mean limit value and is greater than the modelled concentration at the adjacent road link (traffic count point 78422 on the A472) of 28 μgm^{-3}. At this location concentration projections start from the measured concentration of 68 μgm^{-3}.

Table 5 shows that the maximum modelled annual mean NO_2 concentration predicted for 2020 in this exceedance situation is 56 μgm^{-3}. By 2025 the maximum modelled annual mean NO_2 concentration is predicted to drop to 42 μgm^{-3} and by 2026 it is predicted to further drop to 40 μgm^{-3}. Hence, the model results suggest that compliance with the NO_2 annual limit value is likely to be achieved by 2026 under baseline conditions.

Figure 6 and 7 presents maps of projected annual mean NO_2 concentrations at background and roadside locations respectively in 2026, the year at which compliance is achieved. For reference Figures 8 and 9 show maps of projected annual mean NO_2 concentrations in 2020, 2025 and 2030 for background and roadside locations respectively.

It should be noted that the baseline projections presented here include the impacts of some measures, where they can be quantified, that have already been or will be implemented.

Table 5: Annual mean NO_2 model results in NO_2_UK0041_Annual_1. (c, d)

	2015	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Road length exceeding (km)	15.1	13.9	9.9	9.9	6.8	3.8	3.8	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0
Background exceeding (km^2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum modelled concentration NO_2 (μgm^{-3}) (a)	68	65	62	59	56	53	50	47	44	42	40	38	36	35	33
Corresponding modelled concentration NOx (μgm^{-3}) (b)	218	202	191	181	169	157	146	136	128	120	113	106	101	96	92

(a) Annual Mean Limit Value = 40 μgm^{-3}

(b) NO_X is recorded here for comparison with the NO_X source apportionment graphs for 2015 presented in Annex B of this plan. Limit values for EU directive purposes are based on NO_2.

(c) Model results presented for 2015 include the measured concentration at Hafod-yr-ynys Roadside (GB1038A) in place of the modelled concentration for traffic count point 78422 on the A472 (the road link adjacent to Hafod-yr-ynys Roadside monitoring station). Therefore, the road length exceeding, maximum modelled NO_2 concentration and corresponding NO_X concentration may differ from those derived solely from modelling. See Section 3.2 for more information.

(d) Projected concentrations of NO_2 and NO_X at traffic count point 78422, the road link adjacent to Hafod-yr-ynys Roadside(GB1038A) monitoring station, are projected from the 2015 measured annual mean concentrations of NO_2 and NO_X, respectively. See main text for more details.

Figure 6: Background baseline projections of annual mean NO_2 concentrations in 2026, the year at which compliance is achieved under baseline conditions. Modelled exceedances of the annual limit value are shown in orange and red.

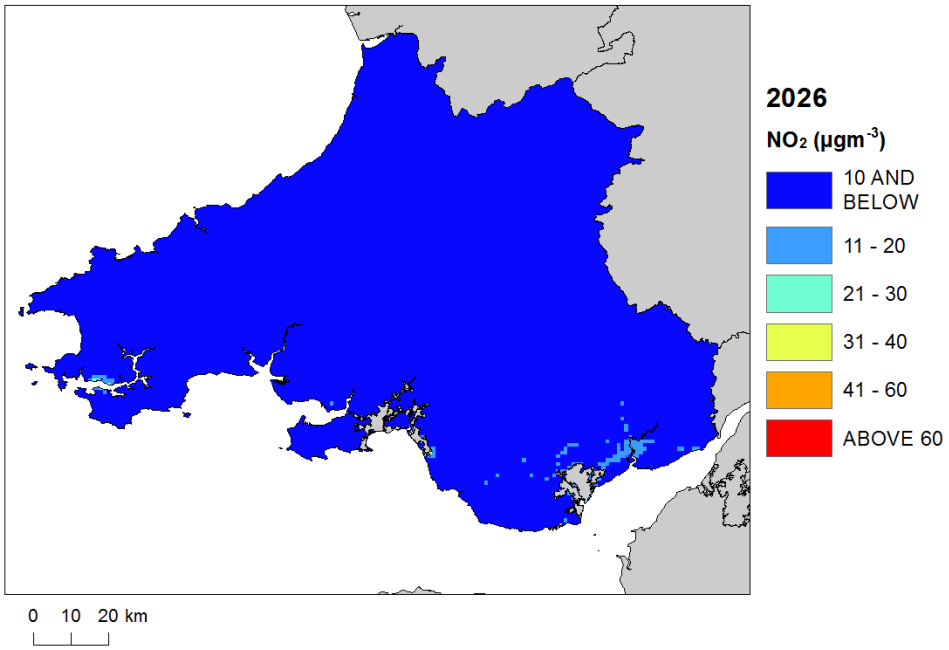
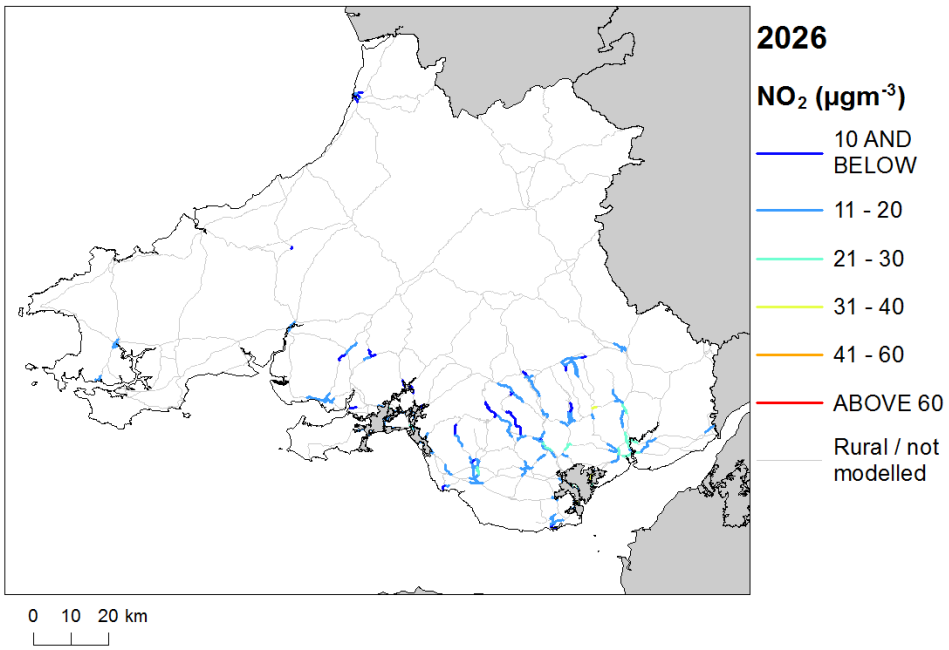


Figure 7: Roadside baseline projections of annual mean NO_2 concentrations in 2026, the year at which compliance is achieved under baseline conditions. Modelled exceedances of the annual limit value are shown in orange and red.[3]



[3]The projected concentration of NO_2 at traffic count point 78422, the road link adjacent to Hafod-yr-ynys Roadside (GB1038A) monitoring station, is projected from the 2015 measured annual mean concentration of NO_2. See main text for more details.

Figure 8: Background baseline projections of annual mean NO_2 concentrations in 2020, 2025 and 2030. 2015 is also included here for reference. Modelled exceedances of the annual limit value are shown in orange and red.

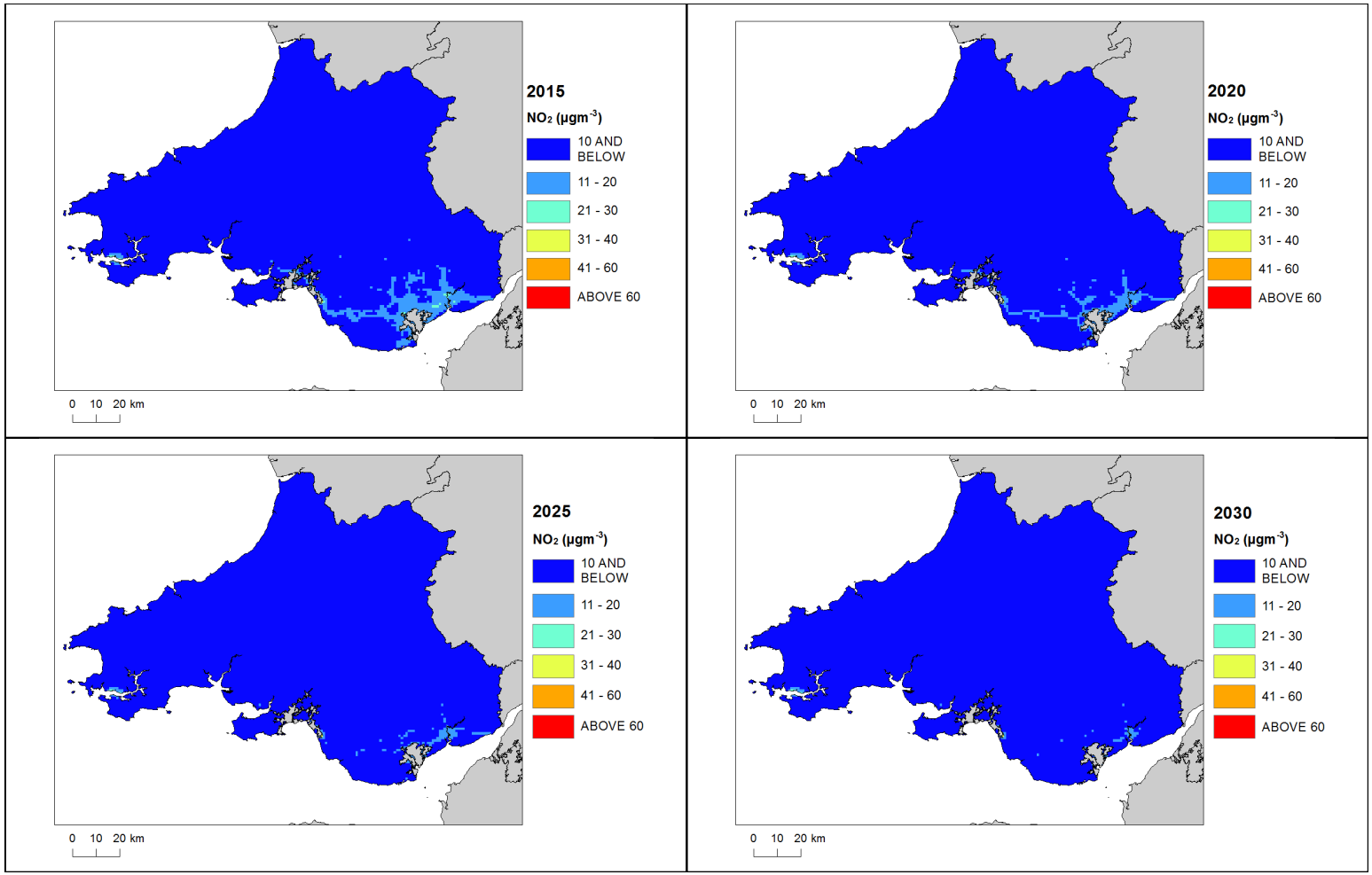
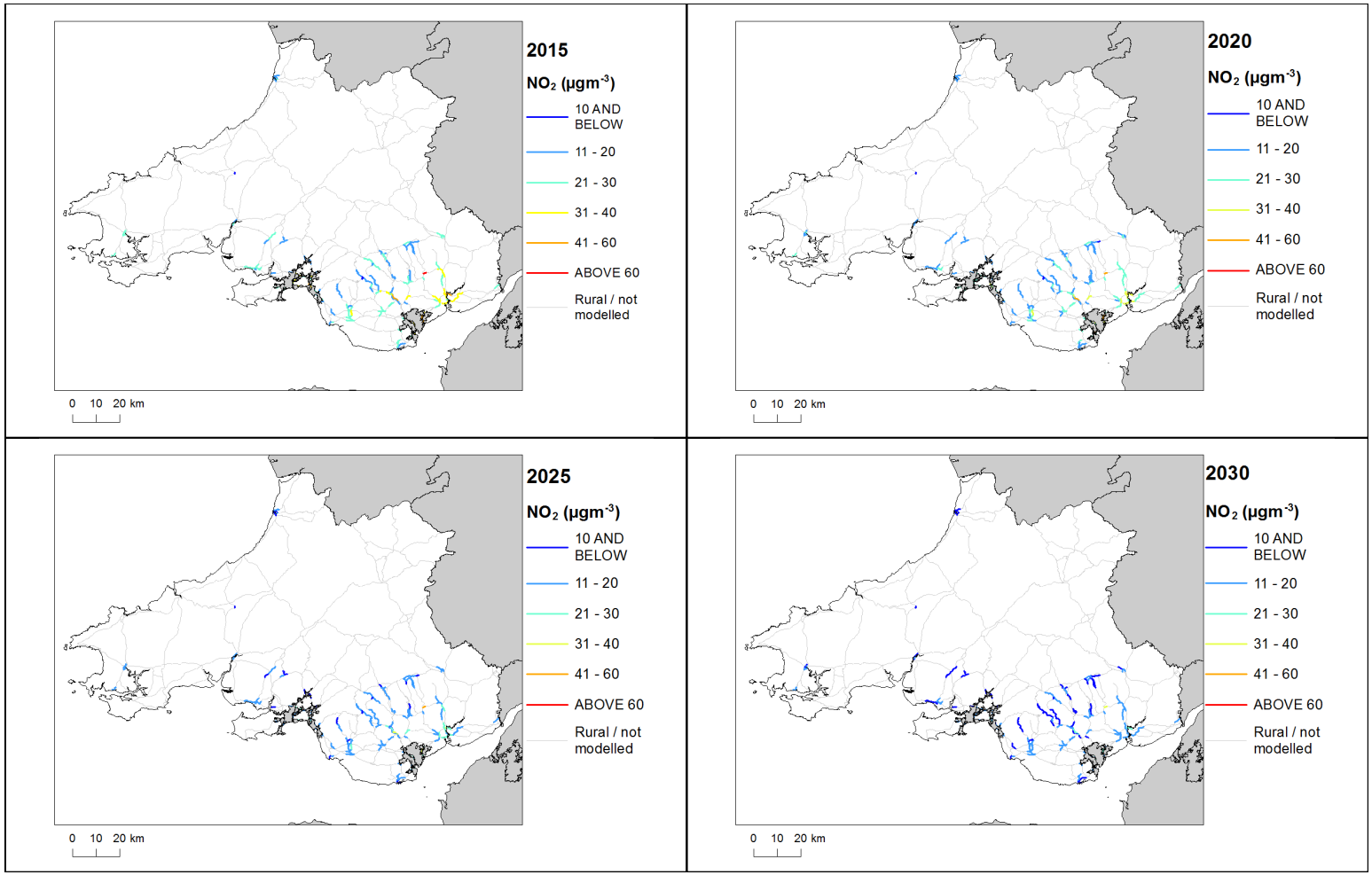


Figure 9: Roadside baseline projections of annual mean NO_2 concentrations in 2020, 2025 and 2030. 2015 is also included here for reference. Modelled exceedances of the annual limit value are shown in orange and red.[4]



[4]The projected concentration of NO_2 at traffic count point 78422, the road link adjacent to Hafod-yr-ynys Roadside (GB1038A) monitoring station, is projected from the 2015 measured annual mean concentration of NO_2. See main text for more details.

5.3 Baseline projections: NO_2_UK0041_Hourly_1

Hourly concentration projections for future years for comparison with the hourly limit value have not been modelled due to the considerable uncertainties involved in modelling at such a fine temporal scale.

The hourly limit value has been assessed based on the annual mean concentration projections at Hafod-yr-ynys Roadside, the monitoring station with the highest measured number of hours exceeding in 2015. The 2015 measured concentrations are projected forwards based on the trends in concentration reductions shown by the modelled projection, as discussed in Section 5.2. The baseline projected annual mean concentrations of NO_2 for this monitoring station are presented in Table 6. It is assumed that the hourly limit value will be met at the same time that compliance is achieved for the annual mean limit value (i.e. when the annual mean concentration is 40 μgm^{-3} or less). The annual mean limit value is expected to be more stringent than the hourly limit value in the majority of situations (AQEG,2004) therefore this is a conservative approach.

Table 6 shows that the baseline projected annual mean NO_2 concentration for the Hafod-yr-ynys Roadside (GB1038A) monitoring station for 2020 in this exceedance situation is 56 μgm^{-3}. By 2025 the modelled annual mean NO_2 concentration is predicted to drop to 42 μgm^{-3} and by 2026 it is predicted to further drop to 40 μgm^{-3}. Hence, the projections suggest that compliance with the NO_2 hourly limit value is likely to be achieved by 2026 under baseline conditions in this exceedance situation.

Table 6: Baseline projected annual mean NO_2 concentrations for the monitoring station with the maximum number of hours with exceedances in 2015 in this exceedance situation for each year from 2017 to 2030. The concentration in 2015 is shown for comparison. (a)

	2015	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Modelled NO_2 concentration (μgm^{-3})	68	65	62	59	56	53	50	47	44	42	40	38	36	35	33

(a) The monitoring station with the maximum number of hours with exceedances in 2015 in this exceedance situation was Hafod-yr-ynys (GB1038A). This station is located on a section of the A472 that has a traffic count point id of 78422 (OS grid (m): 321700, 198600).

Annexes

A References

1st Daughter Directive 1999/30/EC. Council Directive 1999/30/EC, of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air (The First Daughter Directive). From the Official Journal of the European Communities, 29.6.1999, En Series, L163/41.

Air Quality Directive 2008/50/EC. Council Directive 2008/50/EC, of 21 May 2008. On ambient air quality and cleaner air for Europe. From the Official Journal of the European Union, 11.6.2008, En Series, L152/1

Air Quality Expert Group (AQEG, 2004). Nitrogen Dioxide in the United Kingdom. http://uk-air.defra.gov.uk/library/aqeg/publications

CDR Central Data Repository. http://cdr.eionet.europa.eu/

Decision 2004/224/EC. Commission Decision of 20 February 2004 laying down arrangements for the submission of information on plans or programmes required under Council Directive 96/62/EC in relation to limit values for certain pollutants in ambient air. From the Official Journal of the European Union, 6.3.2004, En Series, L68/27

Decision 2004/461/EC. Commission Decision of 29 April 2004 laying down a questionnaire to be used for annual reporting on ambient air quality assessment under Council Directives 96/62/EC and 1999/30/EC and under Directives 2000/69/EC and 2002/3/EC of the European Parliament and of the Council. From the Official Journal of the European Union, 30.4.2004, En Series, L156/78

Decision 2011/850/EU. Commission Implementing Decision of 12 December 2011 laying down rules for Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council as regards the reciprocal exchange of information and reporting on ambient air quality. From the Official Journal of the European Union, 17.12.2011, En Series, L335/86

IPR 2013. Guidance on the Commission Implementing Decision laying down rules for Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council as regards the reciprocal exchange of information and reporting on ambient air (Decision 2011/850/EU). http://ec.europa.eu/environment/air/quality/legislation/pdf/IPR_guidance1.pdf

UK Air Quality Plan for tackling roadside nitrogen dioxide concentrations and the UK technical report are available at: http://www.gov.uk/defra.

B Source apportionment graphs

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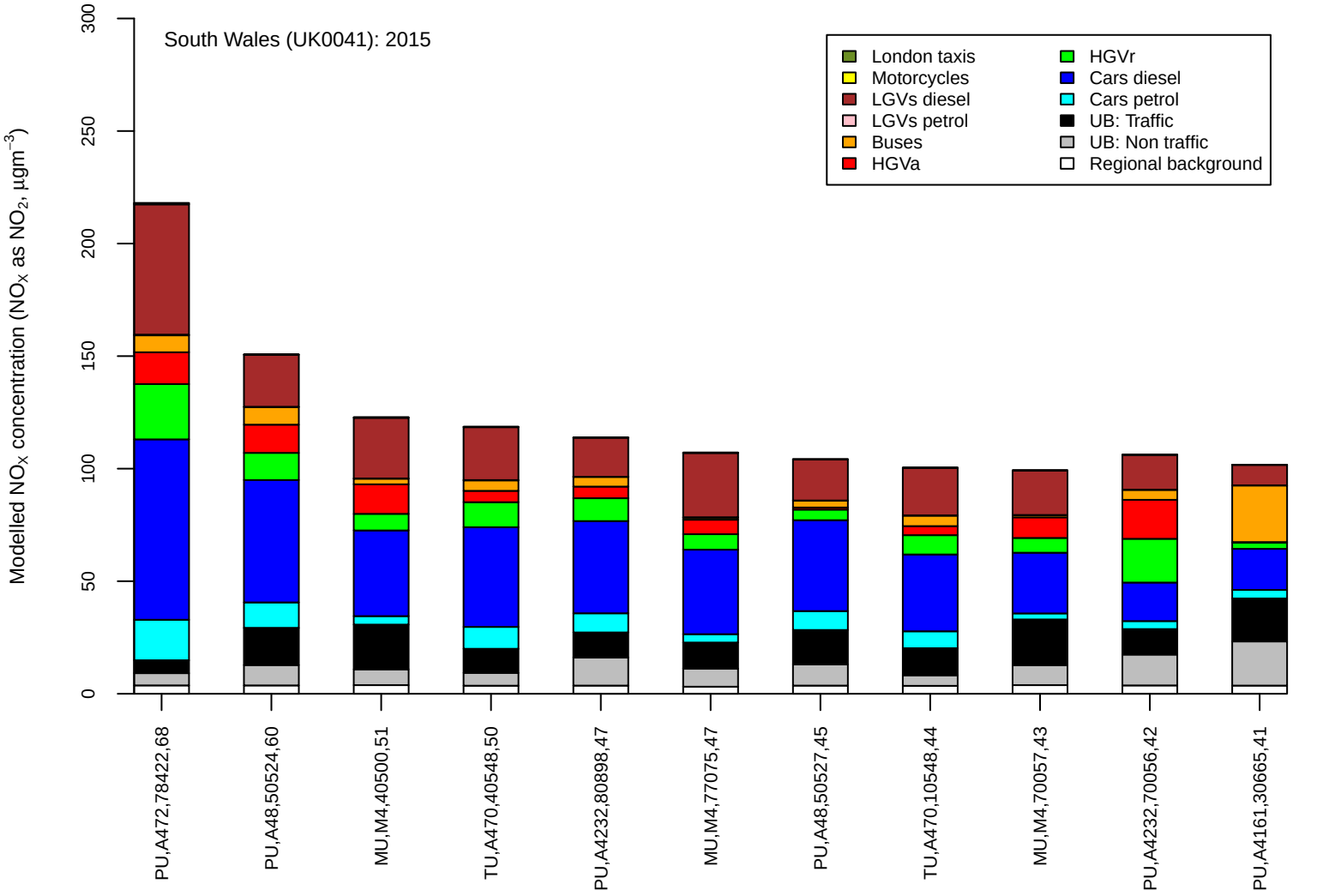
Figure B.1: Annual mean roadside NO_X source apportionment plots for all roads exceeding the annual mean NO_2 limit value in 2015.



Road class (MU = motorway, PU = primary road, TU = trunk road), road number, census id 15 and modelled NO_2 concentration (μgm^{-3})

C Tables of measures

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Table C.1 Relevant Local Authority measures within South Wales (UK0041)

Measure code	Description	Focus	Classification	Status	Other information
Bridgend County Borough Council_1	Llangeinor	N/A	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2010 Expected end date: 2011 Spatial scale: Local Source affected: Transport Indicator: NA Target emissions reduction: NA
Bridgend County Borough Council_2	Marlas	N/A	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2011 Expected end date: 2012 Spatial scale: Local Source affected: Transport Indicator: NA Target emissions reduction: NA
Bridgend County Borough Council_3	Coychurch	N/A	Traffic planning and management: Reduction of speed limits and control	Implementation	Start date: 2012 Expected end date: 2013 Spatial scale: Local Source affected: Transport Indicator: NA Target emissions reduction: NA
Bridgend County Borough Council_4	Porthcawl Primary	N/A	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2014 Expected end date: 2015 Spatial scale: Local Source affected: Transport Indicator: NA Target emissions reduction: NA
Bridgend County Borough Council_5	Cornelly Primary	N/A	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2014 Expected end date: 2015 Spatial scale: Local Source affected: Transport Indicator: NA Target emissions reduction: NA
Bridgend County Borough Council_6	Tremains Primary	N/A	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2014 Expected end date: 2015 Spatial scale: Local Source affected: Transport Indicator: NA Target emissions reduction: NA
Bridgend County Borough Council_7	Cynffigf Comp	N/A	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2014 Expected end date: 2015 Spatial scale: Local Source affected: Transport Indicator: NA Target emissions reduction: NA

Measure code	Description	Focus	Classification	Status	Other information
Caerphilly County Borough Council_1a	A) Assess (through modelling) the air quality benefits of replacing the zebra crossing at White Street with a signalised crossing and prohibit the left turn from Van Road onto White Street	Reduce emissions within the AQMA by making changes to the surrounding roads which will subsequently affect traffic movements in the AQMA.	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2015 Expected end date: 2015 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: ~10%
Caerphilly County Borough Council_1b	B) Assess (through modelling) the air quality benefits of closing Mountain Road over the rail bridge to Southbound traffic	Reduce emissions within the AQMA by making changes to the surrounding roads which will subsequently affect traffic movements in the AQMA.	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2015 Expected end date: 2015 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Caerphilly County Borough Council_1c	C) Refurbishment of the vehicle detection at Bartlett Street traffic signals	Reduce emissions within the AQMA by making changes to the surrounding roads which will subsequently affect traffic movements in the AQMA.	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2012 Expected end date: 2012 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Caerphilly County Borough Council_1d	D) Assess (through modelling) the effect of a right turn prohibition from Pontygwindy Road into Nantgarw Road	Reduce emissions within the AQMA by making changes to the surrounding roads which will subsequently affect traffic movements in the AQMA.	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2015 Expected end date: 2015 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Caerphilly County Borough Council_2	Assess (through modelling) the air quality benefits of dualling the A468 Caerphilly Northern Bypass (Bedwas Bridge - Pwll-y-Pant - Penrhos roundabout).	Prevent ‘through’ traffic in Caerphilly Town Centre by making other routes more efficient	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2015 Expected end date: 2015 Spatial scale: Whole Town or City Source affected: Transport Indicator: N/A Target emissions reduction: Unknown
Caerphilly County Borough Council_3	Assess (through modelling) the air quality benefits of construction of a bypass to the south-east of Caerphilly	Prevent ‘through’ traffic in Caerphilly Town Centre by making other routes more efficient	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2015 Expected end date: 2015 Spatial scale: Whole Town or City Source affected: Transport Indicator: N/A Target emissions reduction: Unknown

Measure code	Description	Focus	Classification	Status	Other information
Caerphilly County Borough Council_4	Encourage travel plans for businesses, schools and CCBC	Reducing the number of vehicles travelling on the roads	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole Town or City Source affected: Transport Indicator: N/A Target emissions reduction: Not quantifiable
Caerphilly County Borough Council_5	Use the planning system to secure AQ Improvements	Reduce emissions in and around the AQMAs and in areas where the air quality monitoring results show levels approaching the air quality objective limit.	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: Not quantifiable
Caerphilly County Borough Council_6	Work with police, community safety to enforce parking and vehicle standards	Eliminating potential causes of congestion	Traffic planning and management: Management of parking places	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole Town or City Source affected: Transport Indicator: N/A Target emissions reduction: Not quantifiable
Caerphilly County Borough Council_7	Reduce emissions from buses	Reducing vehicle emissions by working with commercial bus operators and seeking grants to assist with the purchase of ‘green’ buses (biodiesel / hybrid / alternative fuels)	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole Town or City Source affected: Transport Indicator: Further modelling is required to understand the effect of buses alone in the Caerphilly area. Target emissions reduction: N/A
Caerphilly County Borough Council_8	Increase and publicise the availability of cycling facilities	Reduce emissions by promoting alternative forms of transport	Traffic planning and management: Encouragement of shift of transport modes	Other	Start date: 2014 Expected end date: 2030 Spatial scale: Whole Town or City Source affected: Transport Indicator: Difficult to quantify Target emissions reduction: Not quantifiable
Caerphilly County Borough Council_9	Introduce cycling proficiency / National Standards in schools	Reduce emissions by promoting safe use of alternative forms of transport	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole Town or City Source affected: Transport Indicator: Difficult to quantify Target emissions reduction: Not quantifiable

Measure code	Description	Focus	Classification	Status	Other information
Caerphilly County Borough Council_10	Promote school walking buses	Reduce emissions by promoting walking	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Difficult to quantify Target emissions reduction: Not quantifiable
Caerphilly County Borough Council_11	Improve walking routes in the town centre	Reduce emissions by promoting walking	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole Town or City Source affected: Transport Indicator: Difficult to quantify Target emissions reduction: Not quantifiable
Caerphilly County Borough Council_12	Health Awareness - working with Health Improvement Team to include information on air pollution to existing health awareness packs / education	Education to encourage alternative forms of transport to reduce emissions	Public information and Education: Other mechanisms	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole Town or City Source affected: Transport Indicator: No. of schools visited and educated on Local Air Quality matters Target emissions reduction: Not quantifiable
Caerphilly County Borough Council_13	Improve CCBC vehicle fleet - lead by example	Upgrade vehicles to EURO 6 standard to reduce emissions	Other measure: Other measure	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole Town or City Source affected: Transport Indicator: 4 new wheelchair accessible Euro 6 minibuses purchased for Social Services transport Target emissions reduction: Not quantifiable
Caerphilly County Borough Council_14	Limit street cleaning to off peak hours	Reduce emissions due to congestion	Other measure: Other measure	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole Town or City Source affected: Transport Indicator: N/A Target emissions reduction: Not quantifiable
Caerphilly County Borough Council_15	Junction improvements to the A467 / A472 at Hafod-yr-ynys to add additional junction capacity which in turn prevents queuing and congestion within the AQMA	Reduce emissions due to congestion	Traffic planning and management: Other measure	Implementation	Start date: 2015 Expected end date: 2015 Spatial scale: Local Source affected: Transport Indicator: Completion of Scheme Target emissions reduction: ~10% reduction in the measured annual mean for NO2. ~90% reduction in the measured hourly means for NO2.

Measure code	Description	Focus	Classification	Status	Other information
Caerphilly County Borough Council_16	Speed and flow management within the AQMA	Reduce emissions	Traffic planning and management: Reduction of speed limits and control	Implementation	Start date: 2017 Expected end date: 2017 Spatial scale: Local Source affected: Transport Indicator: Completion of Scheme Target emissions reduction: N/A
Caerphilly County Borough Council_17	Further AQ and Traffic monitoring (volume and classification)	Reduce emissions	Other measure: Other measure	Implementation	Start date: 2017 Expected end date: 2018 Spatial scale: Local Source affected: Transport Indicator: Difficult to quantify Target emissions reduction: Not quantifiable
Cardiff County Council_1	Deliver pedestrian improvements as part of annual programme of infrastructure schemes	Widening Travel Choices	Traffic planning and management: Encouragement of shift of transport modes	Other	Start date: 2015 Expected end date: 2020 Spatial scale: Local Source affected: Transport Indicator: Traffic reduction Target emissions reduction: Not quantified
Cardiff County Council_2	The Rights of Way Improvement Plan (ROWIP) has been in operation since 2008. The document has a ten year life span and tasks detailed within the document remain relevant.	Widening Travel Choices	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2001 Expected end date: 2018 Spatial scale: Whole town or city Source affected: Transport Indicator: Traffic reduction Target emissions reduction: Not quantified
Cardiff County Council_3	Developing and implementing an ambitious Cycling Strategy to double the number of cycle trips by 2026, from a 9.2% modal share in 2015 to 18.4% in 2026	Cycling Improvements	Traffic planning and management: Encouragement of shift of transport modes	Planning	Start date: 2016 Expected end date: 2026 Spatial scale: Whole town or city Source affected: Transport Indicator: Increase in cycling Target emissions reduction: Not quantified
Cardiff County Council_4	City Centre Transport Interchange	Bus Improvements	Traffic planning and management: Improvement of public transport	Planning	Start date: 2001 Expected end date: 2018 Spatial scale: Local Source affected: Transport Indicator: Public Transport use Target emissions reduction: Not quantified
Cardiff County Council_5	Developing bus priority measures on strategic bus corridors to help reduce bus journey times, improve journey time reliability and make bus travel a more attractive alternative to the car for a greater range of journeys	Bus Improvements	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2001 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Public Transport use Target emissions reduction: Not quantified

Measure code	Description	Focus	Classification	Status	Other information
Cardiff County Council_6	Developing new Park and Ride sites to capture car-based traffic at key points on the periphery of the city	Widening Travel Choices	Traffic planning and management: Improvement of public transport	Planning	Start date: 2001 Expected end date: 2026 Spatial scale: Local Source affected: Transport Indicator: Usage statistics Target emissions reduction: Not quantified
Cardiff County Council_7	Safe routes to Schools	Widening Travel Choices	Traffic planning and management: Encouragement of shift of transport modes	Planning	Start date: 2001 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Walking statistics Target emissions reduction: Not quantified
Cardiff County Council_8	Safer Routes in Communities	Widening Travel Choices	Traffic planning and management: Encouragement of shift of transport modes	Planning	Start date: 2001 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Walking statistics Target emissions reduction: Not quantified
Cardiff County Council_9	School Travel Plans	Widening Travel Choices	Traffic planning and management: Encouragement of shift of transport modes	Evaluation	Start date: 2001 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Adoption of plans Target emissions reduction: Not quantified
Cardiff County Council_10	Traffic management	Intelligent Transport Systems	Traffic planning and management: Other measure	Evaluation	Start date: 2001 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Road transport numbers Target emissions reduction: Not quantified
Cardiff County Council_11	Real-time Information and Bus Priority System	Intelligent Transport Systems	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2001 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Bus usage statistics Target emissions reduction: Not quantified

Measure code	Description	Focus	Classification	Status	Other information
Cardiff County Council_12	Green Fleet and Alternative Fuel Vehicles	Air Quality	Public procurement: New vehicles, including low emission vehicles	Implementation	Start date: 2001 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Fleet management statistics Target emissions reduction: Not quantified
Cardiff County Council_13	Air Quality Monitoring linked to UTC	Air Quality	Traffic planning and management: Other measure	Other	Start date: 2002 Expected end date: 2007 Spatial scale: Local Source affected: Transport Indicator: AQ improvements Target emissions reduction: Not quantified
Cardiff County Council_14	City Centre Movement Strategy - Develop and seek funding for proposals to support sustainable transport movements to and through the city centre in conjunction with the implementation of the new bus interchange development	Widening Travel Choices	Traffic planning and management: Encouragement of shift of transport modes	Planning	Start date: 2016 Expected end date: 2021 Spatial scale: Local Source affected: Transport Indicator: Bus usage, walking and cycling statistics Target emissions reduction: Not quantified
Cardiff County Council_15	Working with key partners such as Welsh Government and Network Rail to bring forward proposals such as electrification and the redevelopment of Cardiff Central Station	Rail improvements	Traffic planning and management: Improvement of public transport	Planning	Start date: 2010 Expected end date: 2020 Spatial scale: National Source affected: Transport Indicator: Public Transport use Target emissions reduction: Not quantified
Cardiff County Council_16	Working with regional partners to co-ordinate the implementation of strategic bus corridor improvements on key routes to and across the city	Bus Improvements	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2001 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Bus usage and journey time statistics Target emissions reduction: Not quantified
Cardiff County Council_17	Extending 20mph limit areas to promote lower speeds in primarily residential areas	Widening Travel Choices	Traffic planning and management: Reduction of speed limits and control	Implementation	Start date: 2013 Expected end date: 2020 Spatial scale: Local Source affected: N/A Indicator: Traffic speeds, walking and cycling statistics Target emissions reduction: Not quantified

Measure code	Description	Focus	Classification	Status	Other information
Cardiff County Council_18	Continue the implementation of annual programme of cycling infrastructure improvements	Widening Travel Choices	Traffic planning and management: Encouragement of shift of transport modes	Planning	Start date: 2001 Expected end date: 2026 Spatial scale: Local Source affected: Transport Indicator: Cycling statistics Target emissions reduction: Not quantified
Cardiff County Council_19	Targeted enforcement of Moving Traffic Offences to ensure the efficient management of the transport network	Intelligent Transport Systems	Traffic planning and management: Other measure	Evaluation	Start date: 2015 Expected end date: 2015 Spatial scale: Local Source affected: N/A Indicator: Road transport numbers Target emissions reduction: Not quantified
Cardiff County Council_20	Implement Smart Parking project and progress actions in the Parking Strategy	Intelligent Transport Systems	Traffic planning and management: Other measure	Implementation	Start date: 2016 Expected end date: 2020 Spatial scale: Local Source affected: Transport Indicator: Road user and parking statistics Target emissions reduction: Not quantified
Carmarthenshire County Council_1	Assess and reduce parking provision along Bridge Street, if possible. (Gerwyn's Fruit & Veg)	Reduce congestion	Traffic planning and management: Other measure	Evaluation	Start date: 2016 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Monitoring results at location Target emissions reduction: 0.01
Carmarthenshire County Council_2	Assess and reduce parking provision along Rhosmaen Street, if possible. (St Teilo's Church)	Reduce congestion	Traffic planning and management: Other measure	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Monitoring results at location Target emissions reduction: 0.01
Carmarthenshire County Council_3	Assess and reduce parking provision along Rhosmaen Street, if possible. (Cawdor Hotel)	Reduce congestion	Traffic planning and management: Other measure	Evaluation	Start date: 2016 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Monitoring results at location Target emissions reduction: 0.023

Measure code	Description	Focus	Classification	Status	Other information
Carmarthenshire County Council_4	Assess and reduce parking provision along Rhosmaen Street, if possible. (opposite Principality Building Society)	Reduce congestion	Traffic planning and management: Other measure	Evaluation	Start date: 2016 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Monitoring results at location Target emissions reduction: 0.01
Carmarthenshire County Council_5	Review parking provision in town with respect to removing residents parking during the day to allow shared use thereby alleviating the need to park on Rhosmaen Street and supplementing Crescent Road car park.	Improve and make more efficient use of existing parking in town	Traffic planning and management: Other measure	Evaluation	Start date: 2016 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Uptake of shared parking facilities if implemented Target emissions reduction: ?
Carmarthenshire County Council_6	Assess parking charges in the town to determine any benefits from reduction or removal of charges particularly to encourage more appropriate parking	Encourage more appropriate lawful parking	Traffic planning and management: Management of parking places	Evaluation	Start date: 2016 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Impact on parking facilities Target emissions reduction: ?
Carmarthenshire County Council_7	Look at possibility of service delivery to rear of business premises rather than along Rhosmaen Street	Reduce congestion	Traffic planning and management: Freight transport measure	Evaluation	Start date: 2016 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Monitoring results at location Target emissions reduction: 0.018
Carmarthenshire County Council_8	Promote more cycling and walking to school. Provide incentives such as free cycle helmets if children cycle to school more than 75 times in a year	Promote sustainable transport and reduce local vehicle trips	Traffic planning and management: Encouragement of shift of transport modes	Evaluation	Start date: 2016 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Feedback from school surveys Target emissions reduction: ?
Carmarthenshire County Council_9	Promote car sharing to work/school. Website has been set up for the rural heartland north of Llandeilo for people commuting to Swansea/Llanelli/Carmarthen etc.	Promote sustainable transport and reduce local vehicle trips	Other measure: Other measure	Evaluation	Start date: 2015 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Yet to be established Target emissions reduction: ?
Carmarthenshire County Council_10	Improve parking issues on the street with additional or more frequent enforcement.	Encourage more appropriate lawful parking	Traffic planning and management: Management of parking places	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Improved parking and reduction in enforcement Target emissions reduction: 0.014

Measure code	Description	Focus	Classification	Status	Other information
Carmarthenshire County Council_11	Identify if bus stops along the street can be improved to allow free flow of traffic	Reduce congestion	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2016 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Yet to be established Target emissions reduction: ?
Carmarthenshire County Council_12	Publicise alternative routes (possibly through haulage associations) to destinations north of Llandeilo so that vehicles can avoid the town.	Reduce HGV trips through the town	Traffic planning and management: Freight transport measure	Implementation	Start date: 2016 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: N/A Target emissions reduction: ?
Carmarthenshire County Council_13	Identify peak use of the road e.g. School run, mart days, markets - then target improvements / restrictions / alternative routes during these times	Reduce congestion	Traffic planning and management: Other measure	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Yet to be established Target emissions reduction: ?
Carmarthenshire County Council_14	Assess feasibility of six month trial of HGV diversion away from town (except for deliveries)	Reduce HGV trips through the town	Traffic planning and management: Freight transport measure	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Yet to be established Target emissions reduction: ?
Carmarthenshire County Council_15	Assess the feasibility of implementing a 15t weight limit on the bridge below Bridge Street to ensure that larger vehicles are diverted away from the town	Reduce HGV trips through the town	Traffic planning and management: Freight transport measure	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Yet to be established Target emissions reduction: ?
Carmarthenshire County Council_16	Improvements to street layout i.e. Pedestrian crossing / pavement width improvements	Reduce stop start & improve road safety	Traffic planning and management: Other measure	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Yet to be established Target emissions reduction: 0.028
Carmarthenshire County Council_17	School buses arriving / leaving at definitive staggered times and their routes using Bethlehem / Llangadog, Llangathen option	Reduce congestion	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Yet to be established Target emissions reduction: 0.01
Carmarthenshire County Council_18	Encourage a park and ride scheme	Reduce congestion and local trips in to town	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Yet to be established Target emissions reduction: ?

Measure code	Description	Focus	Classification	Status	Other information
Carmarthenshire County Council_19	Diversion of HGV's to other routes and/or their restriction to certain hours through the town e.g. To avoid commuting and school run	Reduce HGV trips through the town	Traffic planning and management: Freight transport measure	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Monitoring results Target emissions reduction: 0.028
Carmarthenshire County Council_20	One way system with vehicles diverted around King Street	Implement one way system to improve traffic flow	Traffic planning and management: Other measure	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Monitoring results Target emissions reduction: 0.037
Carmarthenshire County Council_21	Traffic light system at peak times to reduce the pollution problems at pinch points in the centre of town	Improve traffic flow	Traffic planning and management: Other measure	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Monitoring results Target emissions reduction: ?
Carmarthenshire County Council_22	Implementation of traffic lights either end of Rhosmaen Street to regulate single stream of traffic thereby improving free flow	Improve traffic flow	Traffic planning and management: Other measure	Evaluation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Monitoring results Target emissions reduction: ?
Carmarthenshire County Council_23	Build a bypass	Remove majority of traffic from town centre	Traffic planning and management: Other measure	Evaluation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Monitoring results Target emissions reduction: 0.138
Carmarthenshire County Council_24	Close Rhosmaen Street to traffic (except deliveries)	Remove majority of traffic from town centre	Traffic planning and management: Other measure	Evaluation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Monitoring results Target emissions reduction: 0.138
Carmarthenshire County Council_25	Remove parking and loading bays	Reduce congestion	Traffic planning and management: Other measure	Evaluation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Monitoring results Target emissions reduction: ?
Carmarthenshire County Council_26	Variable diversion within set NO2 limits (using continuous monitoring equipment)	Use air quality to manage traffic	Traffic planning and management: Other measure	Evaluation	Start date: 2014 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Monitoring results Target emissions reduction: ?

Measure code	Description	Focus	Classification	Status	Other information
Carmarthenshire County Council_27	Water Street junction improvement, Carmarthen	Reduce congestion	Traffic planning and management: Other measure	Implementation	Start date: 2013 Expected end date: 2013 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Carmarthenshire County Council_28	St Catherine's Street roundabout improvement, Carmarthen	Reduce congestion	Traffic planning and management: Other measure	Implementation	Start date: 2012 Expected end date: 2012 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Carmarthenshire County Council_29	Old Oak roundabout improvement, Carmarthen	Reduce congestion	Traffic planning and management: Other measure	Implementation	Start date: 2012 Expected end date: 2012 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Carmarthenshire County Council_30	Start 2B Smart initiative promoting waste reduction, recycling, energy efficiency etc.	Promote sustainability	Public information and Education: Other mechanisms	Implementation	Start date: 2013 Expected end date: 2030 Spatial scale: Local Source affected: Other, please specify Indicator: N/A Target emissions reduction: N/A
Carmarthenshire County Council_31	Renewable energy initiatives for public buildings	CO2 reduction	Other measure: Other measure	Implementation	Start date: 2010 Expected end date: 2030 Spatial scale: Local Source affected: Other, please specify Indicator: N/A Target emissions reduction: N/A
Carmarthenshire County Council_32	School forward programme	Promote sustainability and CO2 reduction	Other measure: Other measure	Implementation	Start date: 2010 Expected end date: 2030 Spatial scale: Local Source affected: Other, please specify Indicator: N/A Target emissions reduction: N/A
Carmarthenshire County Council_33	Electric vehicle fleet	Promote sustainability and improve AQ	Public procurement: New vehicles, including low emission vehicles	Implementation	Start date: 2013 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A

Measure code	Description	Focus	Classification	Status	Other information
Carmarthenshire County Council_34	Housing Improvement Programme	Promote sustainability and energy efficiency	Other measure: Other measure	Implementation	Start date: 2010 Expected end date: 2030 Spatial scale: Local Source affected: Other, please specify Indicator: N/A Target emissions reduction: N/A
Carmarthenshire County Council_35	Local Development Plan	Promote sustainable development	Other measure: Other measure	Implementation	Start date: 2013 Expected end date: 2030 Spatial scale: Local Source affected: Other, please specify Indicator: N/A Target emissions reduction: N/A
Carmarthenshire County Council_36	Regional AQ Policy & Guidance document	Reduce AQ impacts from development in West Wales	Other measure: Other measure	Implementation	Start date: 2012 Expected end date: 2030 Spatial scale: Local Source affected: Other, please specify Indicator: N/A Target emissions reduction: N/A
Carmarthenshire County Council_37	Sustainable Procurement Policy	Promote sustainable procurement	Other measure: Other measure	Implementation	Start date: 2012 Expected end date: 2030 Spatial scale: Local Source affected: Other, please specify Indicator: N/A Target emissions reduction: N/A
Merthyr Tydfil County Borough Council_1	Twynyrodyn Hill road centre-line re-alignment and traffic calming (Phase 1)	Improve NO2 dispersion and reduce emission levels in the area of exceedance	Traffic planning and management: Other measure	Other	Start date: 2012 Expected end date: 2012 Spatial scale: Local Source affected: Transport Indicator: Reduction in measured NO2 levels at NO2 diffusion tube site 29 Target emissions reduction: 16ug/m3
Merthyr Tydfil County Borough Council_2	Twynyrodyn Hill road centre-line re-alignment and traffic calming (Phase 2a) - Install moveable traffic chicane	To determine optimum chicane position for further reduction in local emission levels and improved dispersion.	Traffic planning and management: Other measure	Preparation	Start date: 2015 Expected end date: 2015 Spatial scale: Local Source affected: Transport Indicator: Reduction in measured NO2 levels at sites 29, 29H, 38 and 39 Target emissions reduction: 7ug/m3

Measure code	Description	Focus	Classification	Status	Other information
Merthyr Tydfil County Borough Council_3	Twynyrodyn Hill road centre-line re-alignment and traffic calming (Phase 2b) - Install permanent traffic chicane with NO2 reducing planting	To maintain the reduction in local emission levels and improved dispersion obtained from the use of the temporary chicane.	Traffic planning and management: Other measure	Planning	Start date: 2015 Expected end date: 2015 Spatial scale: Local Source affected: Transport Indicator: Reduction in measured NO2 levels as above Target emissions reduction: N/A
Merthyr Tydfil County Borough Council_4	Twynyrodyn Hill traffic control - Introduction of traffic lights on the calmed road link.	To moderate traffic flow through the calmed road link	Traffic planning and management: Other measure	Planning	Start date: 2016 Expected end date: 2016 Spatial scale: Local Source affected: Transport Indicator: Reduction in measured NO2 levels as above Target emissions reduction: N/A
Merthyr Tydfil County Borough Council_5	Traffic diversion	Introduction of diversionary route for uphill traffic. Reduction of traffic flow between Windsor Terrace and Queen's Road	Traffic planning and management: Other measure	Planning	Start date: 2017 Expected end date: 2017 Spatial scale: Local Source affected: Transport Indicator: Reduction in measured NO2 levels as above Target emissions reduction: N/A
Merthyr Tydfil County Borough Council_6	Road speed reduction	Reduction of road speed to 20mph on Twynyrodyn Hill road link	Traffic planning and management: Reduction of speed limits and control	Preparation	Start date: 2016 Expected end date: 2017 Spatial scale: Local Source affected: Transport Indicator: Reduction in measured NO2 levels as above Target emissions reduction: N/A
Monmouthshire Council_1	Chepstow integrated Transport Strategy	N/A	Traffic planning and management: Improvement of public transport	Evaluation	Start date: 2011 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A
Monmouthshire Council_2	Limit HGV weight or emission	N/A	Traffic planning and management: Freight transport measure	Evaluation	Start date: 2014 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A
Monmouthshire Council_3	Amend MOVA at Tesco (Upper Street) traffic lights	N/A	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2011 Expected end date: 2012 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A

Measure code	Description	Focus	Classification	Status	Other information
Monmouthshire Council_4	Encourage car sharing	N/A	Other measure: Other measure	Implementation	Start date: 2014 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: None Target emissions reduction: N/A
Monmouthshire Council_5	Monitor developments in adjoining areas	N/A	Other measure: Other measure	Implementation	Start date: 2011 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Number of air quality assessment asked for Target emissions reduction: N/A
Monmouthshire Council_6	Improve Council integration on planning issues	N/A	Other measure: Other measure	Implementation	Start date: 2011 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Consultation between departments Target emissions reduction: N/A
Monmouthshire Council_7	Education of HGV operators	N/A	Traffic planning and management: Freight transport measure	Other	Start date: 2011 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A
Monmouthshire Council_8	Improve cross boundary working	N/A	Other measure: Other measure	Implementation	Start date: 2011 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A
Monmouthshire Council_9	Include LDP Policy covering air quality	N/A	Other measure: Other measure	Implementation	Start date: 2011 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A
Monmouthshire Council_10	Redesign High Beech Roundabout	N/A	Traffic planning and management: Encouragement of shift of transport modes	Evaluation	Start date: 2016 Expected end date: 2017 Spatial scale: Local Source affected: Transport Indicator: Completion of roundabout improvements Target emissions reduction: N/A

Measure code	Description	Focus	Classification	Status	Other information
Monmouthshire Council_11	Target schools Traffic	N/A	Traffic planning and management: Encouragement of shift of transport modes	Other	Start date: 2014 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Number of Travel Plans in place Target emissions reduction: N/A
Monmouthshire Council_12	Promote Sustainable transport as part of new developments	N/A	Other measure: Other measure	Implementation	Start date: 2011 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A
Monmouthshire Council_13	Promote town centre developments	N/A	Other measure: Other measure	Implementation	Start date: 2011 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A
Monmouthshire Council_14	Rail Park and Ride	N/A	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2011 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A
Monmouthshire Council_15	Support the climate change and sustainable energy strategy	N/A	Other measure: Other measure	Evaluation	Start date: 2011 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A
Monmouthshire Council_16	Travel Plans	N/A	Other measure: Other measure	Other	Start date: 2011 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Numbers of Travel Plans in place Target emissions reduction: N/A
Monmouthshire Council_17	Bypass	N/A	Traffic planning and management: Encouragement of shift of transport modes	Other	Start date: 2014 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A

Measure code	Description	Focus	Classification	Status	Other information
Monmouthshire Council_18	Improve bus services	N/A	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2011 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Bus patronage Target emissions reduction: N/A
Monmouthshire Council_19	Improve public transport integration	N/A	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2011 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Bus and train patronage Target emissions reduction: N/A
Monmouthshire Council_20	Origin and Destination survey	N/A	Traffic planning and management: Freight transport measure	Implementation	Start date: 2010 Expected end date: 2011 Spatial scale: Local Source affected: Transport Indicator: Survey undertaken Target emissions reduction: N/A
Monmouthshire Council_21	Provide information for residents	N/A	Public information and Education: Internet	Implementation	Start date: 2011 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A
Monmouthshire Council_22	Target HGVs using unsuitable satnav routes	N/A	Traffic planning and management: Freight transport measure	Other	Start date: 2011 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A
Monmouthshire Council_23	Improve rail services to the town	N/A	Other measure: Other measure	Implementation	Start date: 2011 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Numbers of train passengers Target emissions reduction: N/A
Monmouthshire Council_24	Upgrade the railway station	N/A	Other measure: Other measure	Implementation	Start date: 2011 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A
Monmouthshire Council_25	Improve cycling facilities	N/A	Traffic planning and management: Expansion of bicycle and pedestrian infrastructure	Implementation	Start date: 2011 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A

Measure code	Description	Focus	Classification	Status	Other information
Monmouthshire Council_26	Bus Park and Ride/ Share	N/A	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2011 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: Numbers of people using P&R Target emissions reduction: N/A
Monmouthshire Council_27	Distribution hub	N/A	Traffic planning and management: Freight transport measure	Other	Start date: 2014 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A
Monmouthshire Council_28	Lobby for change in toll system at Severn Bridge	N/A	Other measure: Other measure	Implementation	Start date: 2011 Expected end date: 2018 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A
Monmouthshire Council_29	Promote Rail Freight	N/A	Traffic planning and management: Freight transport measure	Other	Start date: 2014 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/a Target emissions reduction: N/A
Newport City Council_1,2,3,9,19,37&20	Buses	Fleet Composition / Volume	Public procurement: Cleaner vehicle transport services	Planning	Start date: 2006 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Greening of the bus fleet, use of public transport Target emissions reduction: N/A
Newport City Council_4,5,8,10,14,13,15&23	Road Improvements	Flow	Traffic planning and management: Other measure	Planning	Start date: 2006 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Improved flow in AQMAs Target emissions reduction: N/A
Newport City Council_16,17&34	Public bodies best practice	Fleet Composition / Volume	Traffic planning and management: Encouragement of shift of transport modes	Planning	Start date: 2006 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Reduction in vehicle trips by public body Target emissions reduction: N/A

Measure code	Description	Focus	Classification	Status	Other information
Newport City Council_38&39	Planning	Volume	Other measure: Other measure	Implementation	Start date: 2006 Expected end date: 2017 Spatial scale: Whole town or city Source affected: Commercial and residential sources Indicator: N/A Target emissions reduction: N/A
Newport City Council_21,35,30&31	Public Awareness across the board	Fleet Composition / Volume	Traffic planning and management: Encouragement of shift of transport modes	Planning	Start date: 2006 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Uptake of active travel / electric vehicles Target emissions reduction: N/A
Newport City Council_24,25,26,28,32&36	Active Travel	Infastructre / walking & Cycling - Active Travel Act	Traffic planning and management: Expansion of bicycle and pedestrian infrastructure	Planning	Start date: 2006 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Uptake of active travel / % of proposed cycle paths built Target emissions reduction: N/A
Newport City Council_11&12	HGV restrictions / partnership	Fleet composition	Traffic planning and management: Freight transport measure	Planning	Start date: 2006 Expected end date: 2030 Spatial scale: Whole town or city Source affected: Transport Indicator: Uptake of scheme / reduction of HGVs within AQMAs Target emissions reduction: N/A
Newport City Council_N/A	Updated Action Plan	Environmental Transport Plan	Other measure: Other measure	Planning	Start date: 2016 Expected end date: 2017 Spatial scale: Whole town or city Source affected: Transport Indicator: Change of Fleet Composition to Low Emission Forms, Updake of Active Tavel and Public Transport Usage Target emissions reduction: N/A
Pembrokeshire Council_1	Parking Amendments	NO2 Reduction	Traffic planning and management: Other measure	Implementation	Start date: 2014 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: Future Annual mean NO2 levels Target emissions reduction: To comply with annual NO2 objective

Measure code	Description	Focus	Classification	Status	Other information
Rhondda-Cynon-Taff Council_1	Improvement in the automated traffic management of traffic-light controlled junctions within several AQMAs	To upgrade and/or reprogram traffic light controls at various strategic junctions within AQMAS to favour the more efficient egress of traffic through the AQMA (or part thereof) and specifically the aspiration of reducing NO2 emissions in the relevant AQMA through the reduction of queuing vehicles.	Traffic planning and management: Other measure	Evaluation	Start date: 2014 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: Improvement in mean vehicle speed traversing AQMA, Reduction in vehicles traversing AQMA waiting for longer than 5 minutes at designated junctions Target emissions reduction: 0.07
Rhondda-Cynon-Taff Council_2	Redesign of highway with regard to the provision of one bus stop within Tylorstown AQMA	Engineer an off-street bus-stop which would allow accessing buses to leave the carriageway and reduce their resultant impact upon traffic flow	Traffic planning and management: Improvement of public transport	Planning	Start date: 2015 Expected end date: 2018 Spatial scale: Local Source affected: Transport Indicator: Improvement in mean vehicle speed traversing AQMA, Reduction in vehicles traversing AQMA stationary for longer than 30 seconds due to bus stopping Target emissions reduction: 0.05
Rhondda-Cynon-Taff Council_3	Full parking restrictions along designated roads within AQMA	Reducing the availability of legal parking areas along certain public highways with the aim to increase the available highway width to vehicles traversing narrow highways within an AQMA and ultimately reduce the likelihood of parked cars impeding traffic flow and increasing the potential for congestion	Traffic planning and management: Management of parking places	Planning	Start date: 2015 Expected end date: 2018 Spatial scale: Local Source affected: Transport Indicator: Percentage increasing in parking enforced area within AQMA, improvement in mean vehicle speed within the AQMA, reduction in number of vehicles within AQMA identified as in contravention of parking restrictions, increase in number of hours AQMA is actively patrolled by parking enforcement staff Target emissions reduction: 0.07
Rhondda-Cynon-Taff Council_4	Permanent reduction in speed limit along strategic A road bordering AQMAs	Imposition of a 50mph speed limit to the relevant part of a strategic A road which would otherwise have a greater nominal speed limit with the aim to increase the efficiency of traversing traffic impacting upon adjacent AQMAs	Traffic planning and management: Reduction of speed limits and control	Planning	Start date: 2016 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Duration mean vehicle speed along designated area of A road is at 50mph Target emissions reduction: 0.1

Measure code	Description	Focus	Classification	Status	Other information
Rhondda-Cynon-Taff Council_5	Reprioritisation of SEWTA Bus Strategy across area	Actively encourage SWETA, or successor body, to advance identified options within its existing bus strategy which would benefit the delivery of public bus service within or associated with AQMAs	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2015 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Favourable prioritisation of bus strategy measures Target emissions reduction: 0.005
Rhondda-Cynon-Taff Council_6	Travel information improvement across area	Enhancement of existing mechanisms and the use of internet and mobile technology to further expand access to reliable travel information	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2015 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Delivery of schemes to increase travel information Target emissions reduction: 0.005
Rhondda-Cynon-Taff Council_7	Increased integration (including ticketing) of existing public transport to increase attractiveness to users across area	Examine and promote the potential for logistical and ticketing integration to reduce impediments to transferring traffic and reduce the need for local road traffic movements	Traffic planning and management: Improvement of public transport	Planning	Start date: 2015 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Favourable perspective of current operators Target emissions reduction: 0.005
Rhondda-Cynon-Taff Council_8	Encouragement of uptake of Travel Planning for existing workplaces and schools and mandatory Travel Planning for future large scale developments across area	Local Authority identifying and engaging with large site operators and facilitating association with recognised lead organisations able to provide assistance in travel planning with the aim for reducing local and commuting private road vehicle movements	Traffic planning and management: Encouragement of shift of transport modes	Evaluation	Start date: 2014 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Number of candidate sites encouraged to take up Travel Planning, Establishment of criteria to apply scheme to relevant developments Target emissions reduction: 0.005
Rhondda-Cynon-Taff Council_9	Promotion of modal shift across area	Local Authority identifying existing initiatives and measures to increase community awareness of modal shift and to work with other stakeholders to influence and advance future initiatives	Traffic planning and management: Encouragement of shift of transport modes	Planning	Start date: 2015 Expected end date: 2017 Spatial scale: Whole town or city Source affected: Transport Indicator: Delivery of schemes to increase modal shift Target emissions reduction: 0.005
Rhondda-Cynon-Taff Council_10	Promotion of existing car sharing scheme across area	Awareness increasing measures of Liftshare.com/wales or successor organisations	Other measure: Other measure	Planning	Start date: 2015 Expected end date: 2017 Spatial scale: Whole town or city Source affected: Transport Indicator: Opportunities undertaken to encourage usage Target emissions reduction: 0.005

Measure code	Description	Focus	Classification	Status	Other information
Rhondda-Cynon-Taff Council_11	Mandatory considerate contractor scheme across area	Local Planning Authority implementing guidance to ensure the minimisation of traffic generation during the construction phase of future relevant development impacting upon current AQMAs	Other measure: Other measure	Planning	Start date: 2015 Expected end date: 2017 Spatial scale: Whole town or city Source affected: Transport Indicator: Adoption of scheme to reduce local construction impact, establishment of criteria to apply scheme to relevant developments, number of relevant developments conditioned to apply scheme Target emissions reduction: 0.005
Rhondda-Cynon-Taff Council_12	Increased enforcement of existing parking restrictions within various AQMAs	To reduce, via proactive enforcement, illegal parking reducing the available width of public highway and potentially impacting upon traffic flow within the AQMA	Traffic planning and management: Management of parking places	Planning	Start date: 2014 Expected end date: 2015 Spatial scale: Local Source affected: Transport Indicator: Improvement in mean vehicle speed within AQMA, reduction in number of vehicles within AQMA identified as in contravention of parking restrictions, increase in number of hours AQMA is actively patrolled by enforcement staff Target emissions reduction: 0.02
Rhondda-Cynon-Taff Council_13	Restrictions on times of loading and unloading of waiting vehicles within various AQMAs	Reducing the ability for good vehicles to load or unload at peak traffic times with the aim to increase the available highway width to vehicles traversing narrow highways within an AQMA during peak travel times and ultimately reduce the likelihood of congestion	Traffic planning and management: Management of parking places	Planning	Start date: 2015 Expected end date: 2017 Spatial scale: Local Source affected: Transport Indicator: Percentage increase in no-waiting enforced area within AQMA, improvement in mean vehicle speed within AQMA, reduction in number of vehicles within AQMA identified as in contravention of no-waiting restrictions, increase in number of hours AQMA is actively patrolled by enforcement staff Target emissions reduction: 0.09
Rhondda-Cynon-Taff Council_14	Church Village Bypass bordering AQMAs	Operation of the Church Village Bypass to relive traffic within affected AQMA	Traffic planning and management: Encouragement of shift of transport modes	Other	Start date: 2006 Expected end date: 2010 Spatial scale: Whole town or city Source affected: Transport Indicator: Opening of bypass Target emissions reduction: 0.34

Measure code	Description	Focus	Classification	Status	Other information
Rhondda-Cynon-Taff Council_15	Infrastructure improvement to strategic junction within AQMA at Pontypridd	Restructuring of strategic junction to increase capacity and reduce congestion from buses accessing bus station and introduction of new bus lanes	Traffic planning and management: Encouragement of shift of transport modes	Evaluation	Start date: 2013 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: Completion of construction Target emissions reduction: 0.015
Rhondda-Cynon-Taff Council_16	Infrastructure improvement to strategic junction at Aberdare	Restructuring of strategic junction to increase capacity and reduce congestion from civic complex	Traffic planning and management: Improvement of public transport	Evaluation	Start date: 2013 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: Completion of construction Target emissions reduction: 0.005
Rhondda-Cynon-Taff Council_17	Infrastructure improvement to strategic junction at Tonteg	Restructuring of strategic junction to increase capacity and reduce congestion within Tonteg	Traffic planning and management: Other measure	Evaluation	Start date: 2013 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: Completion of construction Target emissions reduction: 0.005
Rhondda-Cynon-Taff Council_18	Regional improvement to strategic bus corridor infrastructure across areas	Improvement to strategic bus corridor stops to increase accessibility and as a result reduce waiting times of buses and resultant impact upon traffic flow within AQMAs	Traffic planning and management: Improvement of public transport	Evaluation	Start date: 2013 Expected end date: 2014 Spatial scale: Whole town or city Source affected: Transport Indicator: Completion of construction Target emissions reduction: 0.005
Rhondda-Cynon-Taff Council_19	Infrastructure improvement to strategic railway station in Pontypridd to increase capacity	Operation of an additional railway platform at an existing rail station within an AQMA to increase capacity and improve accessibility	Traffic planning and management: Improvement of public transport	Evaluation	Start date: 2013 Expected end date: 2014 Spatial scale: Whole town or city Source affected: Transport Indicator: Completion of construction Target emissions reduction: 0.005
Rhondda-Cynon-Taff Council_20	Partial bypass around Mt Ash AQMA	Operation of the Mt Ash sotuhern cross valley link Partial Bypass to relive traffic within affected AQMA	Traffic planning and management: Encouragement of shift of transport modes	Planning	Start date: 2018 Expected end date: 2020 Spatial scale: Whole town or city Source affected: Transport Indicator: Completion of construction Target emissions reduction: 0.15
Swansea City and County Council_1	Traffic management on Neath Road	Improve safety, environment and facilities for pedestrians, cyclists and bus users	Traffic planning and management: Other measure	Implementation	Start date: 2005 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Swansea City and County Council_2	Park & Ride Provision	Effect modal shift	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2004 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Increased uptake in Park & Ride Target emissions reduction: N/A

Measure code	Description	Focus	Classification	Status	Other information
Swansea City and County Council_3	Improved Bus Provision	Effect modal shift	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2004 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Increased patronage figures Target emissions reduction: N/A
Swansea City and County Council_4	Bus Corridor Enhancements	Effect modal shift	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2004 Expected end date: 2009 Spatial scale: Local Source affected: Transport Indicator: Increased patronage figures Target emissions reduction: N/A
Swansea City and County Council_5	Enhancement of Bus and Rail Stations	Effect modal shift	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2004 Expected end date: 2011 Spatial scale: Local Source affected: Transport Indicator: Increased patronage figures Target emissions reduction: N/A
Swansea City and County Council_6	Safe Routes to School	Reduce car usage around school sites	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2004 Expected end date: 2030 Spatial scale: Local Source affected: Transport Indicator: Reduce car usage around school sites Target emissions reduction: N/A
Swansea City and County Council_7	Vehicle Emissions testing	Reduce number of polluting vehicles	Other measure: Other measure	Other	Start date: 2005 Expected end date: 2005 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Swansea City and County Council_8	Quay Parade Bridges Improvements	To make more effective use of the existing highway network by improving traffic flows/reduction in congestion around bridges/junctions	Traffic planning and management: Other measure	Implementation	Start date: 2005 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: Reduced congestion Target emissions reduction: N/A
Swansea City and County Council_9	Traffic Management Systems with Air Quality Monitoring Feedback	Development of computer modelling/forecast system that will aid management of traffic flows before/during/after forecasted pollution episodes	Traffic planning and management: Other measure	Implementation	Start date: 2004 Expected end date: 2015 Spatial scale: Local Source affected: Transport Indicator: Reduced Congestion/Modal shift/Improved air quality within areas Target emissions reduction: N/A

Measure code	Description	Focus	Classification	Status	Other information
Torfaen County Borough Council_1	Avondale Rd Cwmbran Bus Lane	N/A	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2009 Expected end date: 2011 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Torfaen County Borough Council_2	Council practice established	N/A	Other measure: Other measure	Implementation	Start date: 2009 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Torfaen County Borough Council_3	All Highways & Transportation	N/A	Other measure: Other measure	Implementation	Start date: 2001 Expected end date: 2014 Spatial scale: Whole agglomeration Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Torfaen County Borough Council_4	National Cycle routes	N/A	Traffic planning and management: Encouragement of shift of transport modes	Implementation	Start date: 2010 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Torfaen County Borough Council_5	Public Transport liaison	N/A	Other measure: Other measure	Implementation	Start date: 2004 Expected end date: 2014 Spatial scale: Whole agglomeration Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Torfaen County Borough Council_6	Public Transport promotion	N/A	Other measure: Other measure	Implementation	Start date: 2014 Expected end date: 2014 Spatial scale: Whole agglomeration Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Torfaen County Borough Council_7	Community Transport partnership	N/A	Other measure: Other measure	Implementation	Start date: 2014 Expected end date: 2014 Spatial scale: Whole agglomeration Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Torfaen County Borough Council_8	Albion Road Cycle facilities Pontypool	N/A	Traffic planning and management: Expansion of bicycle and pedestrian infrastructure	Implementation	Start date: 2012 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A

Measure code	Description	Focus	Classification	Status	Other information
Torfaen County Borough Council_9	Ty Blaen Office Cycle showers	N/A	Traffic planning and management: Expansion of bicycle and pedestrian infrastructure	Implementation	Start date: 2011 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Torfaen County Borough Council_10	Ty Blaen Office cycle lockers	N/A	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2014 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Torfaen County Borough Council_11	Bus Timetables	N/A	Public information and Education: Internet	Implementation	Start date: 2014 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Torfaen County Borough Council_12	Bus Timetables	N/A	Public information and Education: Internet	Implementation	Start date: 2014 Expected end date: 2014 Spatial scale: National Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Torfaen County Borough Council_13	Sustainability/low carbon agenda	N/A	Public procurement: Other measure	Implementation	Start date: 2014 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Torfaen County Borough Council_14	Regional/Local Transport Plan	N/A	Traffic planning and management: Other measure	Implementation	Start date: 2014 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A
Torfaen County Borough Council_15	Local Development Plan	N/A	Traffic planning and management: Other measure	Implementation	Start date: 2014 Expected end date: 2014 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: N/A

Table C.2 Additional measures provided by the Welsh Government which will deliver air quality improvements within South Wales (UK0041)

Measure code	Description	Focus	Classification	Status	Other information
WG_SWales_1	Bwcabus Bus Project	An innovative demand response transport scheme that provides community bus service in rural Camarthenshire. Looking at plans for expansion of the operational area.	Traffic planning and management: Improvement of public transport	Implementation	Start date: 2009 Expected end date: 2018 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: Not yet quantified
WG_SWales_2	WTTC M4 Motorway Variable Speed Limit Scheme	Operates between Junction 24 at Coldra and Junction 29 at Castleton and specifically aims to reduce congestion, improve saftey and improve air quality along the M4 motorway corridor near Newport.	Traffic planning and management: Other measure	Implementation	Start date: 2012 Expected end date: 2018 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: Not yet quantified
WG_SWales_3	Traffic Officer Service	Officers assist in ensuring congestion is minimised on M4 motorway	Traffic planning and management: Other measure	Implementation	Start date: 2009 Expected end date: 2018 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: Not yet quantified
WG_SWales_4	Cardiff City Region Metro Project, including Valley Line Modernisation (South Wales)	Reduced journey times; increased public transport use; improved quality of service; reduced operating and maintainence costs; improved reliability; capacity to meet demand; accessibility improvements; park and ride improvements; reduced emmisions; and direct service to economic centres.	Other measure: Other measure	Implementation	Start date: N/A Expected end date: N/A Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: Not yet quantified
WG_SWales_6	M4 Corridor around Newport - motorway & related improvements	Improved traffic flow and improved links to active travel options.	Traffic planning and management: Other measure	Planning	Start date: 2018 Expected end date: 2022 Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: Not yet quantified
WG_SWales_7	Exploration of location specific WG network issues	Seeking interventions which may assist in removing air quality issues in specific locations on WG network.	Traffic planning and management: Other measure	Preparation	Start date: N/A Expected end date: N/A Spatial scale: Local Source affected: Transport Indicator: N/A Target emissions reduction: Not yet quantified