

Welsh Government

**A40 Llanddewi Velfrey to Penblewin  
Improvements**

Environmental Statement

Appendix 13.1: Traffic Data

A40LVP-ARP-EAQ-SWI-RP-LA-0002

P02 | S4

15/03/19

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## 13 Appendix 13.1 Traffic Data

### 13.1 Do Minimum and Do Something Traffic Data Tables

Table 13.1 Baseline and Do Minimum Traffic Data

Road ID	Base 2016			DM 2021			DM2036		
	24 hr AADT	% HGV	Speed (kph)	24 hr AADT	% HGV	Speed (kph)	24 hr AADT	% HGV	Speed (kph)
1	11107	5.5	80.3	11881	5.2	79.8	13439	4.8	78.7
2	10807	5.3	67.6	11574	5.0	67.3	13165	4.7	66.5
3	10940	5.3	57.6	11792	4.9	57.1	13788	4.5	56.0
4	11520	5.1	58.3	12398	4.8	57.8	14394	4.4	56.6
5	10912	5.5	80.7	11685	5.2	80.2	13289	4.8	79.0
6	11301	5.1	81.8	12172	4.8	81.2	14182	4.4	79.7
7	11112	5.2	59.0	11970	4.9	58.6	13953	4.5	57.5
8	11155	5.2	48.4	12023	4.9	47.8	14049	4.5	46.3
9	11045	5.3	85.6	11908	5.0	80.2	13931	4.5	78.7
10	10757	5.4	83.8	11521	5.1	83.3	13104	4.7	82.3
11	10941	5.3	88.0	11795	5.0	87.5	13797	4.5	86.4
12	11681	5.2	43.6	12503	4.9	42.7	14174	4.6	40.7
13	10962	5.3	81.3	11818	4.9	76.5	13825	4.5	74.9
14	136	4.7	37.5	146	4.5	37.2	164	4.2	36.2

Road ID	Base 2016			DM 2021			DM2036		
	24 hr AADT	% HGV	Speed (kph)	24 hr AADT	% HGV	Speed (kph)	24 hr AADT	% HGV	Speed (kph)
15	2305	1.1	37.0	2470	1.0	36.7	2795	0.9	35.8
16	1239	0.7	36.2	1328	0.7	35.9	1502	0.6	35.4
17	4404	2.9	58.9	4712	2.8	58.9	5314	2.6	58.8
18	5763	4.7	60.9	6158	4.5	60.9	6943	4.2	61.0
19	856	5.0	21.9	915	4.8	21.7	1036	4.4	21.2
20	768	0.3	35.5	822	0.3	35.2	922	0.2	34.3
21	216	2.7	32.0	232	2.5	31.8	261	2.4	31.4
22	27	0.2	48.0	30	0.2	48.0	34	0.2	48.0
23	54	3.8	30.3	58	3.5	30.3	68	3.2	30.2
24	77	2.2	46.7	83	2.1	46.6	96	1.9	46.7
25	63	1.1	39.7	68	1.0	39.3	80	0.9	38.5
26	11003	5.2	78.8	11860	4.9	78.5	13868	4.5	77.5
27	11003	5.2	58.7	11860	4.9	58.3	13868	4.5	57.3
28	11103	5.2	83.7	11960	4.9	83.2	13941	4.5	81.9
29	5704	5.0	20.0	6143	4.7	20.0	7143	4.4	20.0
30	5816	5.1	48.0	6255	4.8	48.0	7251	4.4	48.0

Table 13.2 Do Something Traffic Data

ID	DS 2021			DS2036		
	24 hr AADT	% HGV	Speed (kph)	24 hr AADT	% HGV	Speed (kph)
1	5,582	5	74	6,542	5	72
2	5,903	5	68	6,893	4	67
3	5,957	5	83	6,954	4	82
4	6,114	5	92	7,113	5	91
5	601	2	69	657	2	68
6	111	1	28	127	1	27
7	11,881	5	80	13,439	5	79
8	11,574	5	66	13,165	5	66
9	442	3	61	518	2	61
10	1,021	4	52	1,158	4	52
11	11,685	5	80	13,289	5	79
12	111	1	86	127	1	86
13	601	2	63	657	2	63
14	654	2	45	753	2	45
15	11,908	5	80	13,931	5	79
16	11,521	5	83	13,104	5	82
19	11,800	5	88	13,803	5	86
20	12,503	5	43	14,174	5	41
21	11,818	5	76	13,825	5	75

ID	DS 2021			DS2036		
	24 hr AADT	% HGV	Speed (kph)	24 hr AADT	% HGV	Speed (kph)
22	146	4	37	164	4	36
23	2,470	1	37	2,795	1	36
24	1,328	1	36	1,502	1	35
25	4,712	3	58	5,314	3	58
26	6,158	4	58	6,943	4	58
27	915	5	24	1,036	4	24
28	822	0	39	922	0	39
29	251	3	34	286	2	34
30	30	0	48	34	0	48
31	40	6	34	43	7	33
32	83	2	47	96	2	47
33	49	2	44	55	1	44
34	5,787	5	83	6,754	5	82
35	5,787	5	57	6,754	5	56
36	491	3	45	573	2	45
37	18	0	34	20	0	34
38	5,788	5	84	6,783	4	82
39	5,788	5	25	6,783	4	24
40	6,064	5	83	7,077	5	82
41	6,064	5	83	7,077	5	82

ID	DS 2021			DS2036		
	24 hr AADT	% HGV	Speed (kph)	24 hr AADT	% HGV	Speed (kph)
42	2,966	5	20	3,468	5	20
43	5,582	5	84	6,542	5	83
44	5,582	5	92	6,542	5	92
45	5,787	5	83	6,754	5	82
46	6,066	5	66	7,059	5	64
47	6,114	5	77	7,113	5	76
48	5,957	5	61	6,954	4	60
49	3,554	5	20	4,065	4	20

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Appendix 13.2: Processing of Monitored Data

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## 13 Appendix 13.2

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### 13.2 Processing of Monitored Data

- 13.2.1 Due to programme constraints, air quality monitoring has only been possible for a six-month period.
- 13.2.2 To process the monitored data to be representative of an annual mean, a process of annualisation has been undertaken following LAQM.TG16. Annualisation has been undertaken using the nearest background/urban background continuous monitors with acceptable data capture (>90%) for 2017. These continuous monitoring locations are all part of the Automatic Urban and Rural monitoring Network (AURN). One of the continuous monitoring locations is within 50 miles of the Scheme (as required by LAQM.TG16), however a further two continuous monitoring locations more than 50 miles from the Scheme have also been used. An annualisation factor has been derived by comparing the period mean (the period for which Scheme specific monitoring data is available) with annual mean concentrations monitored at the continuous monitors for 2017. This allows seasonal variation in NO<sub>2</sub> concentrations to be accounted for in processing the Scheme specific monitoring data. Monitored NO<sub>2</sub> concentrations are generally higher in the winter months compared to the summer months. Annualising monitored data to be representative of a 2017 annual mean is appropriate as the baseline assessment scenario has been undertaken for 2017.
- 13.2.3 The choice of continuous monitors and the process of annualisation is shown in Table A3.
- 13.2.4 An annualisation factor of 1.3 is indicative of the Scheme specific monitoring results used being based on summer/autumn months where lower NO<sub>2</sub> concentrations are likely to have been monitored.

Table 13.1 Derivation of Annualisation Factor

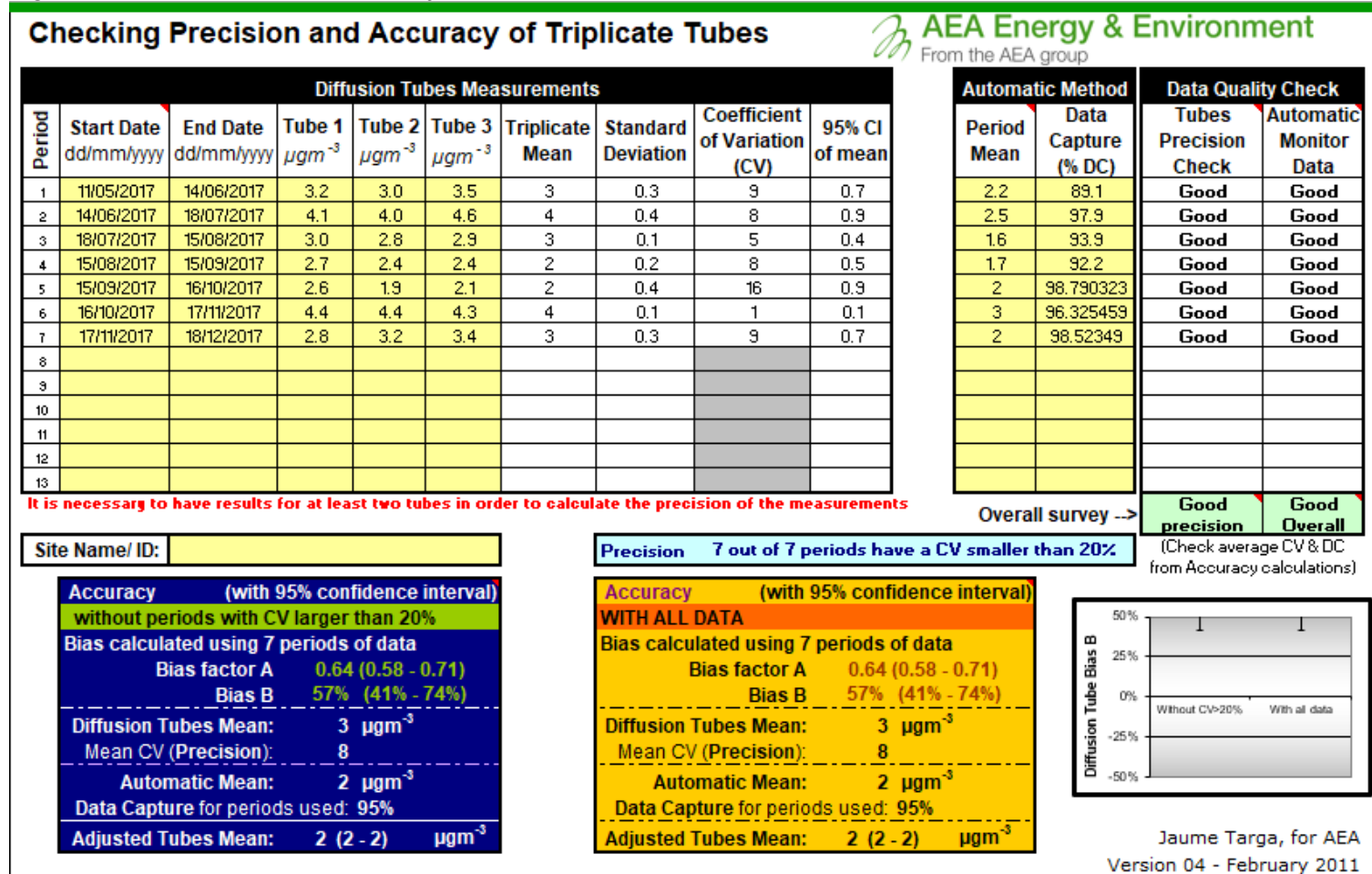
<b>Continuous Monitor</b>	<b>Period Mean (<math>\mu\text{g}/\text{m}^3</math>) (11/05/17 – 18/12/2017)</b>	<b>Data Capture (%) during period</b>	<b>2017 Annual Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>2017 Data Capture (%)</b>	<b>Ratio (Annual Mean/Period Mean)</b>
Cardiff Centre	16.2	98.8%	20.2	99.0%	1.3
Cwmbran	9.0	94.1%	12.1	96.8%	1.3
Narberth	2.1	94.5%	3.0	97.4%	1.4
Port Talbot	12.9	94.8%	15.9	96.2%	1.2
<b>Annualisation Factor</b>					<b>1.3</b>

13.2.5 Diffusion tubes were co-located with the continuous monitoring location at Princes Gate, Narberth, to allow a local bias-adjustment factor to be derived. A bias-adjustment factor takes into account the uncertainty associated with a passive monitoring method such as diffusion tubes.

13.2.6 The local bias-adjustment spreadsheet<sup>1</sup> published by Defra has been used to determine the local bias-adjustment factor. Figure A1 shows that a local bias-adjustment factor of 0.64 has been used to process the Scheme specific monitoring data.

<sup>1</sup> Defra, Local Air Quality Management, <https://laqm.defra.gov.uk/bias-adjustment-factors/local-bias.html> [Accessed November 2018]

Figure 13.1 Derivation of local bias adjustment factor



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Appendix 13.3: Modelled NO<sub>2</sub> Results  
(Standard Approach)

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## 13 Appendix 13.3

### 13.3 Modelled NO<sub>2</sub> Results (Standard Approach)

13.3.1 Table 13.1 and 13.2 shows the predicted NO<sub>2</sub> results using the standard approach, which does not account for delays in the improvement of vehicle NO<sub>x</sub> emissions from the UK fleet. Predicted pollutant concentrations in the future are therefore lower using this method. The impact descriptor also changes, compared to that reported in 13.10, at some receptors.

13.3.2 The results presented in section 13.10, are worst-case as these take account of the lack of improvement in vehicle emissions for future assessment years and therefore result in higher annual mean NO<sub>2</sub> concentrations.

Table 13 1 Predicted Annual Mean NO<sub>2</sub> Concentrations using the Standard Method

Receptor ID	Predicted Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )				
	2017 Base	2021 DM	2021 DS	2036 DM	2036 DS
1	17.7	13.9	14.0	8.4	8.4
2	12.4	9.7	6.5	5.8	4.3
3	13.6	10.7	6.1	6.6	4.1
4	11.5	9.1	8.6	5.7	5.4
5	10.3	8.2	6.8	5.3	4.5
6	5.5	4.5	5.1	3.1	3.5
7	12.2	9.7	4.9	6.1	3.4
8	11.9	9.4	4.4	5.9	3.1
9	9.3	7.4	4.2	4.8	3.0
10	4.3	3.6	4.3	2.7	3.0
11	19.3	15.2	4.1	9.2	3.0
12	18.1	14.2	4.1	8.7	2.9
13	10.5	8.3	8.1	5.3	5.2
14	6.5	5.2	5.3	3.6	3.6

Table 13 2 Magnitude of Change for Annual Mean NO<sub>2</sub> Concentrations

Receptor ID	Change in Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )			
	2021 Magnitude of Change	Impact Descriptor	2036 Magnitude of Change	Impact Descriptor
1	0.1	Negligible	<0.1	Negligible
2	-3.2	Moderate Beneficial	-1.6	Minor Beneficial
3	-4.6	Major Beneficial	-2.6	Moderate Beneficial
4	-0.5	Negligible	-0.3	Negligible
5	-1.4	Minor Beneficial	-0.8	Minor Beneficial
6	0.7	Minor Adverse	0.4	Negligible
7	-4.8	Major Beneficial	-2.7	Moderate Beneficial
8	-5.0	Major Beneficial	-2.8	Moderate Beneficial
9	-3.2	Moderate Beneficial	-1.8	Minor Beneficial
10	0.6	Minor Adverse	0.3	Negligible
11	-11.1	Major Beneficial	-6.3	Major Beneficial
12	-10.1	Major Beneficial	-5.8	Major Beneficial
13	-0.2	Negligible	-0.1	Negligible
14	0.1	Negligible	0.1	Negligible