



Appendix I.5 Model Verification

Appendix I.5: Model Verification Procedure

Initial Comparison Prior to Verification

A comparison has been undertaken between the monitored annual mean NO₂ concentration at the roadside monitoring locations, and the uncorrected modelled NO₂ concentration.

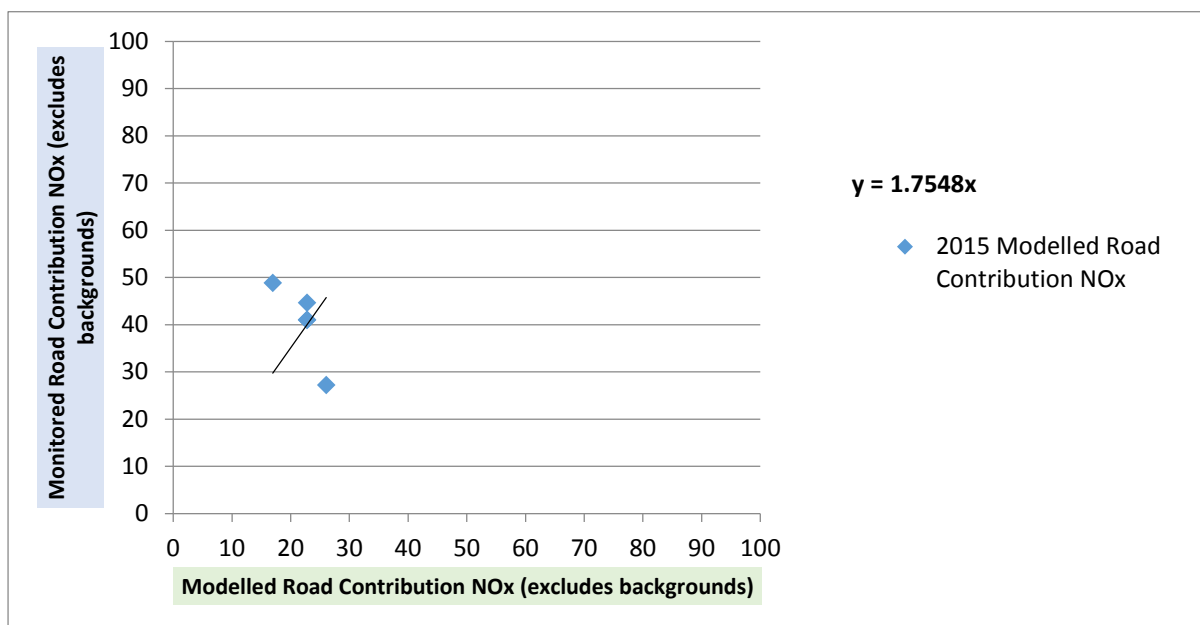
<u>Local Authority Reference</u>	Monitored	Modelled	% Difference
11 (Hermitage Way)	37.63	29.52	-27.47
12 (Hermitage Way)	39.13	29.52	-32.55
13 (Hermitage Way)	37.58	29.52	-27.30
14 (Chestnut Avenue)	31.55	31.02	-1.71
15 (A45)	40.86	26.79	-52.52

The results show that for the roadside monitoring locations considered, the modelled annual mean NO₂ concentrations are under predicting compared to monitored NO₂ concentrations.

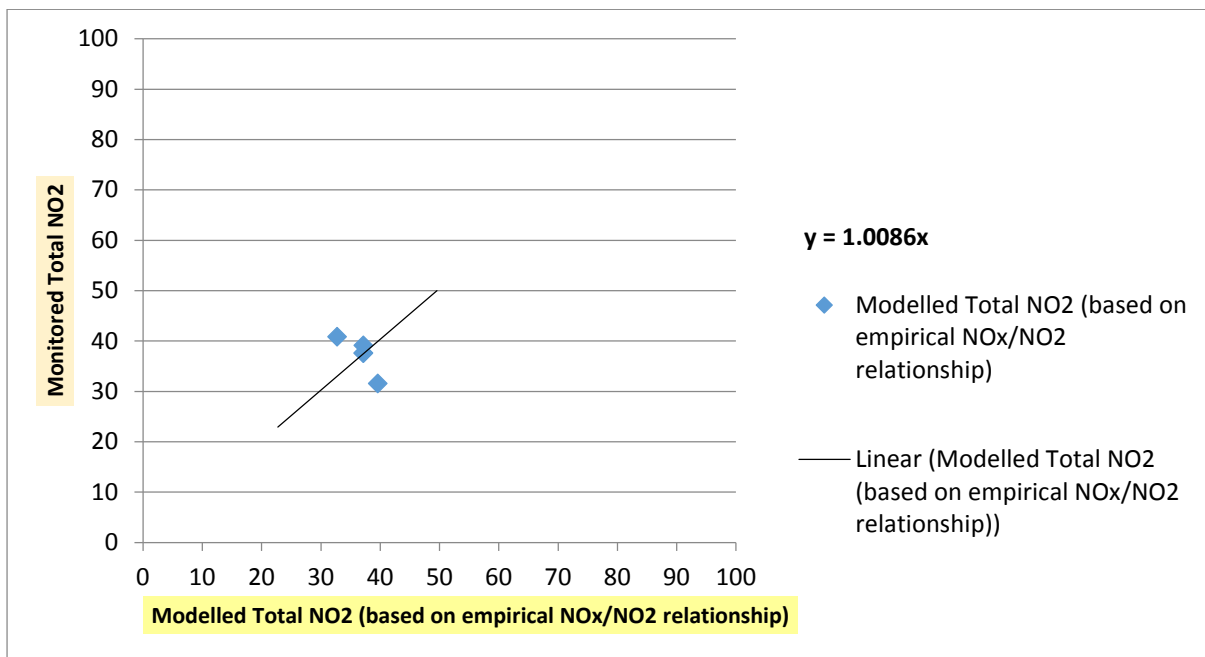
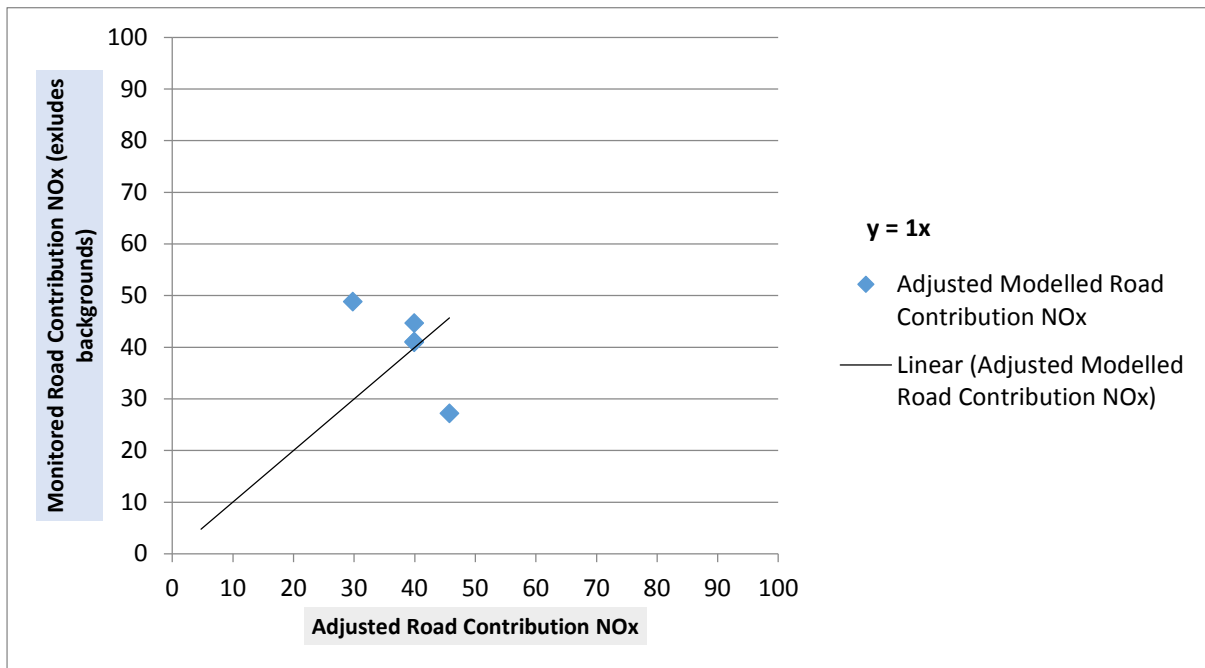
Model Verification in Accordance with LAQM.TG(16)

Model verification has been undertaken in accordance with the guidance detailed in Defra Local Air Quality Management technical guidance document LAQM.TG(16), as detailed below.

Address	2015 Monitored Total NO₂ (Bias Adjusted)	2015 Monitored Total NO_x	2015 Background NO₂	2015 Background NO_x	Monitored Road Contribution NO₂ (total - background)	Monitored Road Contribution NO_x (excludes background)	Modelled Road Contribution NO_x (excludes background)
11 (Hermitage Way)	37.63	67.56	18.36	26.47	19.27	41.09	22.75
12 (Hermitage Way)	39.13	71.14	18.36	26.47	20.77	44.67	22.75
13 (Hermitage Way)	37.58	67.45	18.36	26.47	19.22	40.98	22.75
14 (Chestnut Avenue)	31.55	53.67	18.36	26.47	13.19	27.20	26.05
15 (A45)	40.86	75.34	18.36	26.47	22.50	48.87	16.96



Address	Ratio of Monitored Road Contribution NOx / Modelled Road Contribution NOx	Adjustment Factor for Modelled Road Contribution	Adjusted Modelled Road Contribution NOx	Adjusted Modelled Total NOx (including background NOx)	Modelled Total NO2 (based on empirical NOx / NO2 relationship)	Monitored Total NO2	% Difference [(modelled - monitored) / monitored] x 100
11 (Hermitage Way)	1.81		39.93	66.40	37.14	37.63	-1.30
12 (Hermitage Way)	1.96		39.93	66.40	37.14	39.13	-5.09
13 (Hermitage Way)	1.80		39.93	66.40	37.14	37.58	-1.17
14 (Chestnut Avenue)	1.04		45.71	72.18	39.56	31.55	25.39
15 (A45)	2.88		29.76	56.23	32.71	40.86	-19.95
		1.7548					





Appendix I.5: Modelling Results

2015 Verification and Base Year

Address	2015 Background NO2	2015 Background NOx	Modelled Road Contribution NOx (excludes background)	Adjustment Factor for Modelled Road Contribution NOx	Adjusted Modelled Road Contribution NOx	Adjusted Modelled Total NOx (including background NOx)	Modelled Total NO2 (based on empirical NOx / NO2 relationship)
caravan 1(ESR6)	16.30	24.04	16.40	1.7548	28.78	52.82	30.34
caravan 2(ESR7)	16.30	24.04	8.01	1.7548	14.06	38.10	23.41
caravan 3(ESR8)	16.30	24.04	21.88	1.7548	38.39	62.43	34.59
School (ESR4)	16.30	24.04	5.63	1.7548	9.88	33.92	21.35
33 Pennycress (ESR5)	16.30	24.04	5.84	1.7548	10.25	34.30	21.53
97 Station Rd (ESR1)	16.30	24.04	11.16	1.7548	19.58	43.63	26.07
8 Crow Lane (ESR3)	16.30	24.04	10.65	1.7548	18.69	42.73	25.64
4 Station End (ESR2)	16.30	24.04	8.14	1.7548	14.29	38.33	23.52

2018 Without Development (2015)

Address	2015 Background NO2	2015 Background NOx	Modelled Road Contribution NOx (excludes background)	Adjustment Factor for Modelled Road Contribution NOx	Adjusted Modelled Road Contribution NOx	Adjusted Modelled Total NOx (including background NOx)	Modelled Total NO2 (based on empirical NOx / NO2 relationship)
caravan 1(ESR6)	16.30	24.04	17.33	1.7548	30.41	54.45	31.07
caravan 2(ESR7)	16.30	24.04	8.46	1.7548	14.85	38.90	23.80
caravan 3(ESR8)	16.30	24.04	23.13	1.7548	40.58	64.62	35.54
School (ESR4)	16.30	24.04	5.96	1.7548	10.47	34.51	21.64
33 Pennycress (ESR5)	16.30	24.04	6.18	1.7548	10.84	34.89	21.83
97 Station Rd (ESR1)	16.30	24.04	11.91	1.7548	20.90	44.95	26.69



8 Crow Lane (ESR3)	16.30	24.04	11.24	1.7548	19.72	43.76	26.13
4 Station End (ESR2)	16.30	24.04	8.64	1.7548	15.16	39.20	23.94

2030 Without Development (2015)

Address	2015 Background NO2	2015 Background NOx	Modelled Road Contribution NOx (excludes background)	Adjustment Factor for Modelled Road Contribution NOx	Adjusted Modelled Road Contribution NOx	Adjusted Modelled Total NOx (including background NOx)	Modelled Total NO2 (based on empirical NOx / NO2 relationship)
caravan 1(ESR6)	16.30	24.04	20.54	1.7548	36.04	60.08	33.57
caravan 2(ESR7)	16.30	24.04	10.04	1.7548	17.62	41.66	25.13
caravan 3(ESR8)	16.30	24.04	27.31	1.7548	47.92	71.76	38.62
School (ESR4)	16.30	24.04	7.09	1.7548	12.44	36.48	22.61
33 Pennycress (ESR5)	16.30	24.04	7.32	1.7548	12.85	36.90	22.82
97 Station Rd (ESR1)	16.30	24.04	14.15	1.7548	24.84	48.88	28.53
8 Crow Lane (ESR3)	16.30	24.04	13.30	1.7548	23.33	47.37	27.83
4 Station End (ESR2)	16.30	24.04	10.25	1.7548	17.98	42.03	25.31

2037 Without Development (2015)

Address	2015 Background NO2	2015 Background NOx	Modelled Road Contribution NOx (excludes background)	Adjustment Factor for Modelled Road Contribution NOx	Adjusted Modelled Road Contribution NOx	Adjusted Modelled Total NOx (including background NOx)	Modelled Total NO2 (based on empirical NOx / NO2 relationship)
caravan 1(ESR6)	16.30	24.04	21.80	1.7548	38.26	62.30	34.54
caravan 2(ESR7)	16.30	24.04	10.68	1.7548	18.75	42.79	25.67
caravan 3(ESR8)	16.30	24.04	28.93	1.7548	50.77	74.81	39.79
School (ESR4)	16.30	24.04	7.53	1.7548	13.21	37.26	22.99
33 Pennycress (ESR5)	16.30	24.04	7.77	1.7548	13.64	37.68	23.20



97 Station Rd (ESR1)	16.30	24.04	15.02	1.7548	26.36	50.41	29.24
8 Crow Lane (ESR3)	16.30	24.04	14.10	1.7548	24.75	48.79	28.49
4 Station End (ESR2)	16.30	24.04	10.88	1.7548	19.09	43.13	25.83

2018 With Development (2015)

Address	2015 Background NO2	2015 Background NOx	Modelled Road Contribution NOx (excludes background)	Adjustment Factor for Modelled Road Contribution NOx	Adjusted Modelled Road Contribution NOx	Adjusted Modelled Total NOx (including background NOx)	Modelled Total NO2 (based on empirical NOx / NO2 relationship)
caravan 1(ESR6)	16.30	24.04	17.54	1.7548	30.78	54.82	31.24
caravan 2(ESR7)	16.30	24.04	8.59	1.7548	15.07	39.12	23.90
caravan 3(ESR8)	16.30	24.04	23.26	1.7548	40.82	64.86	35.64
School (ESR4)	16.30	24.04	6.01	1.7548	10.55	34.59	21.68
33 Pennycress (ESR5)	16.30	24.04	6.22	1.7548	10.91	34.95	21.86
97 Station Rd (ESR1)	16.30	24.04	12.11	1.7548	21.26	45.30	26.86
8 Crow Lane (ESR3)	16.30	24.04	11.53	1.7548	20.23	44.27	26.37
4 Station End (ESR2)	16.30	24.04	8.72	1.7548	15.30	39.35	24.01

2030 With Development (2015)

Address	2015 Background NO2	2015 Background NOx	Modelled Road Contribution NOx (excludes background)	Adjustment Factor for Modelled Road Contribution NOx	Adjusted Modelled Road Contribution NOx	Adjusted Modelled Total NOx (including background NOx)	Modelled Total NO2 (based on empirical NOx / NO2 relationship)
caravan 1(ESR6)	16.30	24.04	20.71	1.7548	36.34	60.38	33.70
caravan 2(ESR7)	16.30	24.04	10.14	1.7548	17.80	41.84	25.22
caravan 3(ESR8)	16.30	24.04	27.42	1.7548	48.12	72.16	38.71



School (ESR4)	16.30	24.04	7.13	1.7548	12.51	36.55	22.65
33 Pennycress (ESR5)	16.30	24.04	7.36	1.7548	12.91	36.95	22.85
97 Station Rd (ESR1)	16.30	24.04	14.31	1.7548	25.11	49.15	28.66
8 Crow Lane (ESR3)	16.30	24.04	13.60	1.7548	23.87	47.91	28.08
4 Station End (ESR2)	16.30	24.04	10.32	1.7548	18.10	42.15	25.36

2037 With Development (2015)

Address	2015 Background NO2	2015 Background NOx	Modelled Road Contribution NOx (excludes background)	Adjustment Factor for Modelled Road Contribution NOx	Adjusted Modelled Road Contribution NOx	Adjusted Modelled Total NOx (including background NOx)	Modelled Total NO2 (based on empirical NOx / NO2 relationship)
caravan 1(ESR6)	16.30	24.04	21.99	1.7548	38.58	62.62	34.68
caravan 2(ESR7)	16.30	24.04	10.80	1.7548	18.95	42.99	25.77
caravan 3(ESR8)	16.30	24.04	29.05	1.7548	50.98	75.02	39.88
School (ESR4)	16.30	24.04	7.57	1.7548	13.29	37.33	23.03
33 Pennycress (ESR5)	16.30	24.04	7.81	1.7548	13.70	37.75	23.24
97 Station Rd (ESR1)	16.30	24.04	15.21	1.7548	26.70	50.74	29.39
8 Crow Lane (ESR3)	16.30	24.04	14.42	1.7548	25.30	49.34	28.75
4 Station End (ESR2)	16.30	24.04	10.96	1.7548	19.23	43.27	25.90