Appendix 1: 2005 Nitrogen Dioxide Diffusion Tubes Results – Bias corrected only. All results as NO_2 µg/m^3

Site Name	Site Type	Bias Corrected Monthly Mean												Period Mean	Data Capture
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec		
Jawbones Hill	Kerbside	52	Null	48	47	37	38	37	31	45	60	49	48	**44.77**	11
Derby Rd, St Augustines	Kerbside	60	Null	54	45	48	46	31	28	41	52	57	53	**46.69**	11
Chesterfield Rd, Brimmington	Kerbside	41	Null	42	36	32	34	32	31	35	49	44	45	**38.23**	11
Stavely Stables	Industrial	27	Null	17	23	19	19	20	18	22	26	31	30	**22.95**	11
Bell House Lane	Roadside	33	Null	30	25	23	21	19	22	25	36	41	34	**28.01**	11
Chesterfield Rd, Stavely	Roadside	39	Null	44	43	43	43	39	36	40	42	48	42	**41.98**	11
Hasland By-Pass	Roadside	36	Null	24	30	28	26	30	32	27	28	35	29	**29.32**	11
Queen Mary Rd	Kerbside	32	Null	31	24	21	19	25	20	24	22	37	34	**26.27**	11
Middlecroft	Roadside	26	Null	21	19	16	16	18	14	18	25	27	Null	**20.16**	10
Chatsworth Rd	Kerbside	Null	Null	60	54	50	60	49	54	53	64	31	57	**53.09**	10
Walton Rd	Roadside	Null	Null	28	25	21	14	21	29	20	32	62	33	**28.51**	10
Vincent Crescent	Kerbside	Null	Null	31	36	36	35	35	36	36	41	39	40	**36.29**	10
St Augustines Rd	Kerbside	26	Null	40	Null	29	26	51	36	31	40	Null	38	**35.31**	9
St Augustines Church	Roadside	38	Null	22	Null	19	19	22	Null	24	31	28	33	**26.24**	9
Travel Lodge	Roadside	49	Null	38	40	36	37	38	35	Null	Null	51	45	**41.07**	9
St Augustines Rain Pipe	Roadside	29	Null	26	Null	22	22	22	20	Null	32	30	30	**25.81**	9
Derby Rd, Licoln Street	Kerbside	56	Null	64	Null	47	56	55	44	Null	60	54	53	**54.29**	9
Station Road, Barrow Hill	Kerbside	40	Null	35	27	28	28	21	Null	34	Null	31	35	**30.83**	9

Staveley High Street	Roadside	33	Null	Null	23	Null	20	20	Null	20	35	36	32	**27.24**	8
Triple Exposure: Whittington Moor	Roadside	43	Null	36	29	Null	Null	39	23	Null	38	Null	41	**VOID**	7
Triple Exposure: Whittington Moor	Roadside	41	Null	30	32	Null	Null	36	27	Null	44	Null	36	**VOID**	7
Triple Exposure: Whittington Moor	Roadside	Null	Null	36	28	Null	Null	28	26	Null	41	Null	41	**VOID**	6
Triple Exposure: Birdholme	Background	Null	Null	Null	Null	Null	Null	39	23	0	38	0	41	**23.68**	6
Triple Exposure: Birdholme	Background	Null	Null	Null	Null	Null	Null	36	27	0	44	0	36	**23.68**	6
Triple Exposure: Birdholme	Background	Null	Null	Null	Null	Null	Null	28	26	0	41	0	41	**22.72**	6
Triple Exposure: Brimmington	Roadside	45	Null	25	22	22	21	Null	Null	Null	Null	Null	Null	**27.07**	5
Triple Exposure: Brimmington	Roadside	32	Null	29	23	20	18	Null	Null	Null	Null	Null	Null	**24.38**	5
Triple Exposure: Brimmington	Roadside	38	Null	29	29	22	21	Null	Null	Null	Null	Null	Null	**27.84**	5

Appendix 2 : Calculations and Adjustment Factors

Adjustment factors to calculate façade concentrations from kerbside tube results.

Distance from Kerb (m)	Adjustment Factor
2-5	0.95
5-10	0.9
10-20	0.75

Annual mean NO_2 diffusion tube results adjusted for kerbside locations.

Tube Location	Site Type	Distance to Façade (m)	Extrapolated Annual Mean 2005 ($\mu g/m^3$)	Adjustment Factor	Adjusted Annual Mean 2005 ($\mu g/m^3$)
Derby Rd, St Augustines	Kerbside	5.5	47.2	0.9	42.4
Station Road, Barrow Hill	Kerbside	3.3	30.2	0.95	28.7
Jawbones Hill	Kerbside	5.7	45.2	0.9	40.7
St Augustines Rd	Kerbside	6.6	34.2	0.9	30.8
Derby Rd, Lincoln St	Kerbside	5.2	52.7	0.9	47.4
Chesterfield Rd, Brimmington	Kerbside	11.9	42.5	0.9	38.2
Queen Mary Rd	Kerbside	9.3	26.5	0.9	23.9
Chatsworth Rd	Kerbside	1.5	54.1	0.95	51.4
Vincent Crescent	Kerbside	9.2	37.0	0.9	33.3

- **Laboratory Bias Adjustment Factor: Air Quality Review & Assessment Website**

Rotherham MBC/South Yorkshire laboratories: 50% TEA in acetone
Overall Bias Adjustment Factor (based on 2 studies) (A) = 0.96

- **Estimation of NO_2 annual mean concentrations from short-term monitoring data for Whittington Moor: LAQM.TG(03) Box 6.5**

Long-term data obtained from Sheffield Tinsley & Sheffield Centre AURN Sites

Annual mean Sheffield Tinsley 2005 = 31.90μg/m^3 (AM1)
Annual mean Leicester Centre 2005 = 31.09 μg/m^3 (AM2)
Annual mean Rotherham Centre 2005 = 34.06 μg/m^3 (AM3)

Period mean Sheffield Tinsley 2005 = 39.64μg/m^3 (PM1)
Period mean Leicester Centre 2005 = 34.72μg/m^3 (PM2)
Period mean Rotherham Centre 2005 = 39.80μg/m^3 (PM2)

(Monitoring Period: 14/04/04 – 31/12/04)

R1 = AM1/PM1	R2 = AM2/PM2	R3 = AM3/PM3
R1 = 0.80	R2 = 0.90	R3= 0.86

Average of Ratios Ra = R1+R2 + R3/3 = 0.85

Adjustment Factor Ra = 0.85

- **Estimation of PM_{10} Concentration in 2010 using Updated 2006 Guidance Note for use of Year Adjustment (www.airquality.co.uk/archive/laqm/tools)**

1. Annual Mean 2004 = 20.8μg/m^3 GRAV EQ

2. Secondary PM_{10} from internet maps at http://www.airquality.co.uk
   = 8.93μg/m^3 GRAV EQ

3. Local secondary PM_{10} in 2004 using correction factors in Box 8.7
   = 8.93 x 0.9754
   = 8.71μg/m^3 GRAV EQ

4. Local primary PM_{10} in 2004 by subtracting the secondary concentration and the PM10 coarse concentration from the measured concentration.
   = 20.8 - (5.8 + 8.71)
   = 6.29μg/m^3 GRAV EQ

5. Adjust local primary PM_{10} concentration in 2004 to 2010 using correction factors in box 8.7.
   = 6.29 x (0.9247/1.0174)

= 5.72µg/m^3 GRAV EQ

6. Calculate secondary PM_{10} in 2010 using correction factors in Box 8.7

   = 8.93 x 0.8522

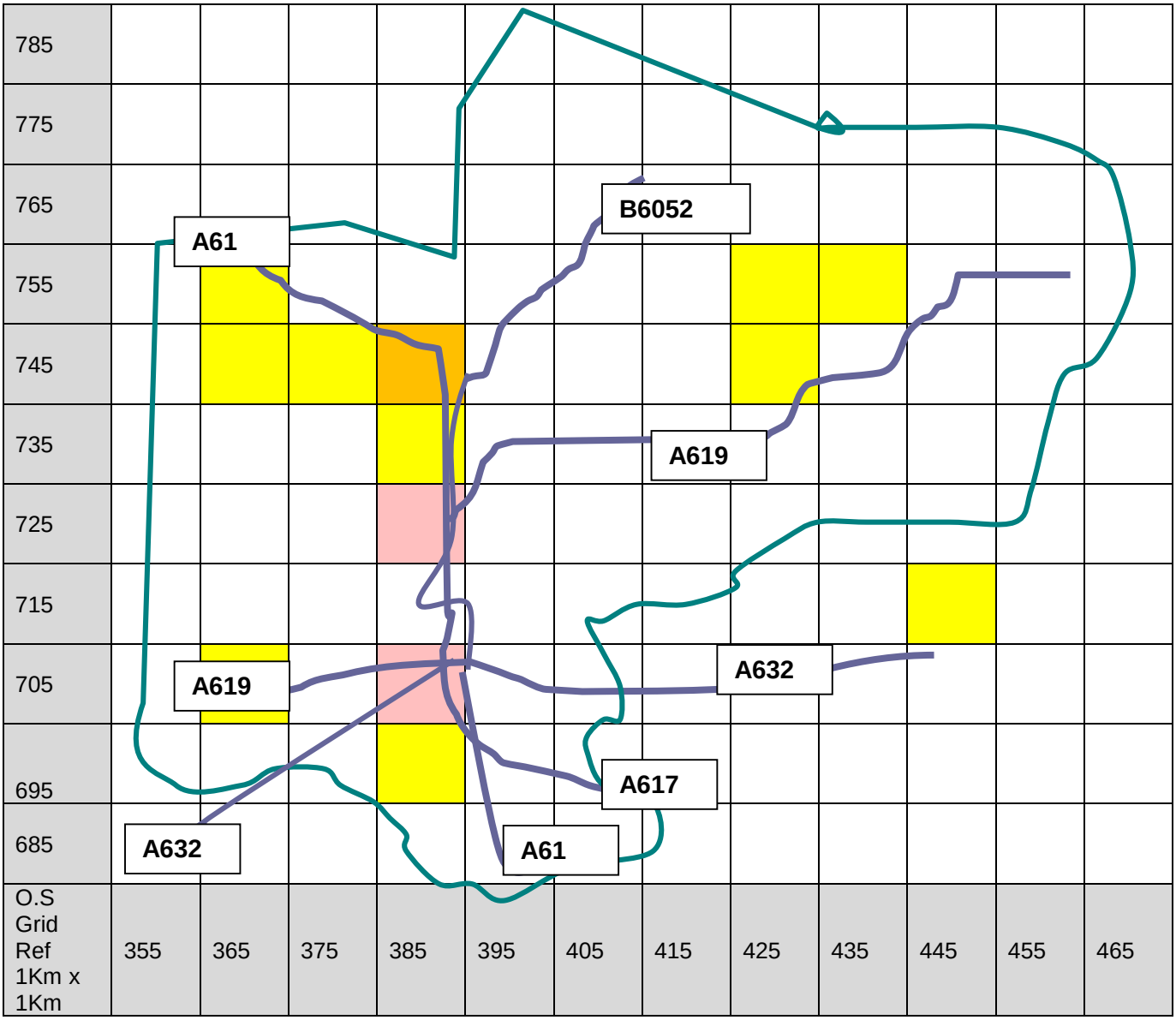
   = 7.61µg/m^3 GRAV EQ

7. Calculate the total estimated PM_{10} in 2010 by adding steps 4 and 6 and the assumed coarse concentration.

   = 5.72 + 7.61 + 5.8

   = 19.1µg/m^3 GRAV EQ

Appendix 3: Map depicting Chesterfield BC district boundary, highlighting location of major roads



	Industrial Area with Processes Authorised under IPPC
	Area with major Traffic node
	Major Road
	District Boarder

Appendix 4: Maps of background concentration of PM_{10}, NOx and NO_2 across Chesterfield BC.

785												
775							22.3			23.4		
765				23.1	22.5	23.0	23.0	23.1	23.8	23.6	31.3	
755	23.3	36.8	38.2	36.1	25.0	28.2	29.3	29.3	26.6	25.4 *	35.8 *	
745	23.5	37.6	42.2	40.7 *	29.5	30.4	31.5	30.8	27.4	30.9	38.0	
735	19.7	34.4	40.4	40.7	29.7	29.7	30.7	29.7	31.3	35.4		
725	20.5	25.9	33.3	32.1	31.0	26.0	25.6	23.8	33.5	38.6	38.8	
715	21.3	27.3	36.1	35.8	33.9							
705	20.5	26.2	35.4	35.1	34.9							
695			28.7	30.1	31.3							
685												
1Kmx 1Km	355	365	375	385	395	405	415	425	435	445	455	465

Annual Mean Background Concentration of Nox 2005 ($\mu g/m^3$)

785												
775							16.5			16.9		
765				16.8	16.6	16.7	16.8	16.8	17.1	17.0	20.3	
755	16.9	22.7	23.3	22.4	17.6	19.0	19.5	19.5	18.3	17.8	22.3 *	
745	17.0	23.1	25.0	24.7 *	19.6	20.0	20.5	20.1	18.7	20.2	23.2	
735	15.3	21.7	24.2	24.3	19.7	19.7	20.1	19.7	20.4	22.1		
725	15.7	18.0	21.2	21.1	20.2	18.1	17.9	17.1	21.3	23.5	23.6	
715	16.0	18.6	22.4	22.3	21.5							
705	15.7	18.2	22.1	22.4	21.9							
695			19.2	19.9	20.4							
685												
1Kmx 1Km	355	365	375	385	395	405	415	425	435	445	455	465

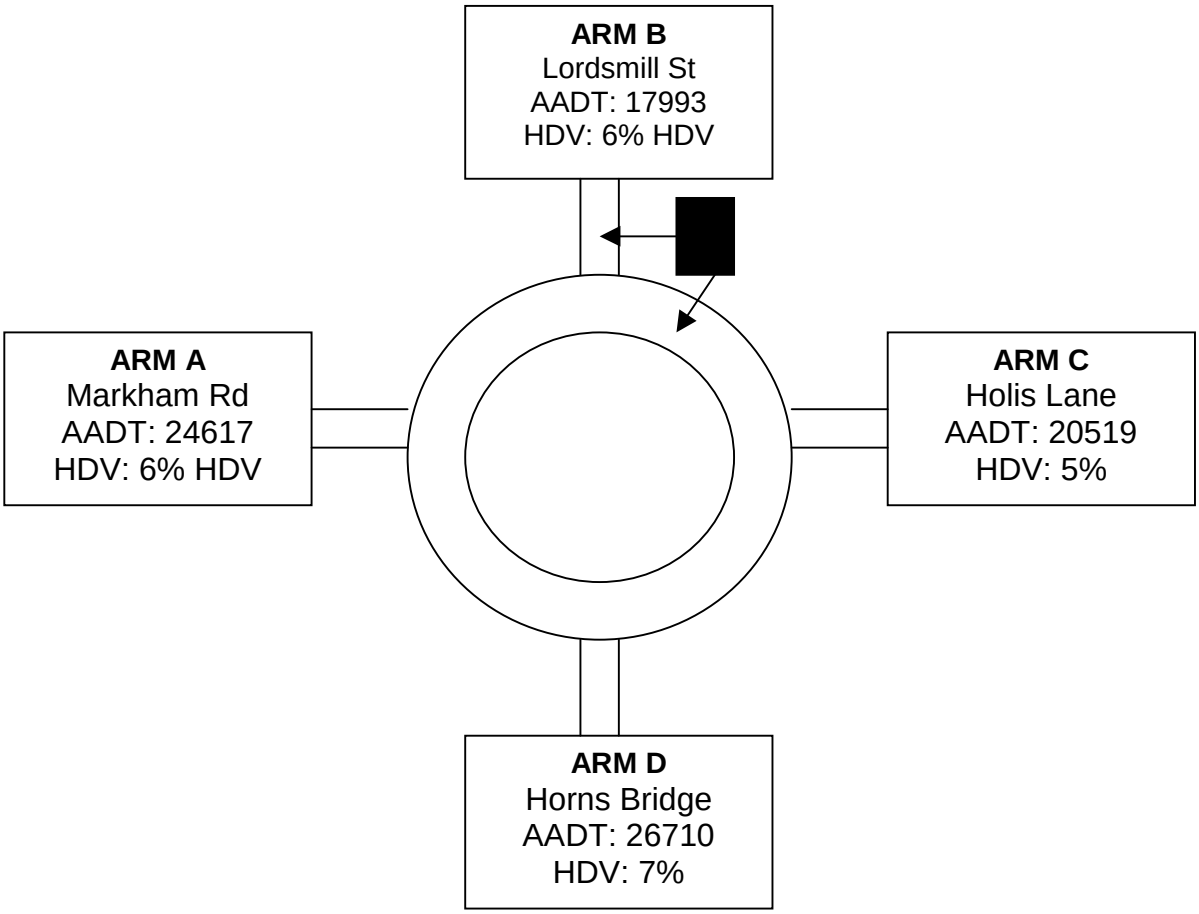
Annual Mean Background Concentration of NO_2 2005 ($\mu g/m^3$)

785												
775							20.4			20.9		
765				20.7	19.9	20.5	21.4	21.5	21.9	21.1		
755	20.0	23.8	24.1	23.7	20.6	22.0	23.0	23.1	22.4	21.4	22.0	
745	20.2	24.1	25.3	25.0	22.0	22.7	23.8	23.8	22.9	22.3	22.3	
735	19.3	23.4	25.0	25.1	22.0	22.6	23.0	23.0	22.5	22.7	22.7	
725	19.6	21.0	22.8	22.7	22.0	21.7	21.9	22.5	23.5	23.9	22.9	
715	19.7	21.2	23.1	23.0	22.2							
705	19.5	20.9	23.1	23.1	23.0							
695			21.6	21.9	22.3							
685												
1Kmx 1Km	355	365	375	385	395	405	415	425	435	445	455	465

Annual Mean Background Concentration of PM10 2005 ($\mu g/m^3$)

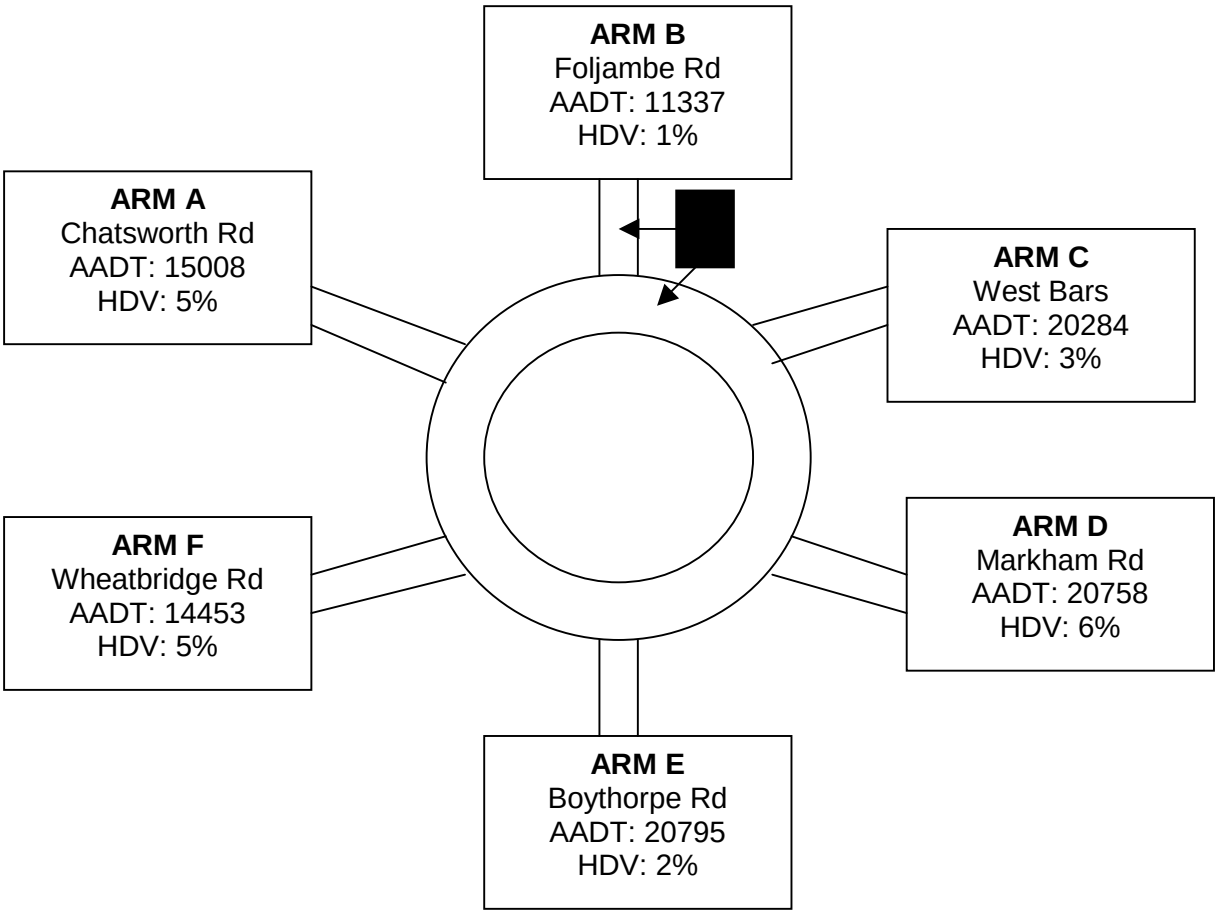
Appendix 5: DMRB model input parameters for busy roads and junctions in Chesterfield BC.

Markham Road Roundabout



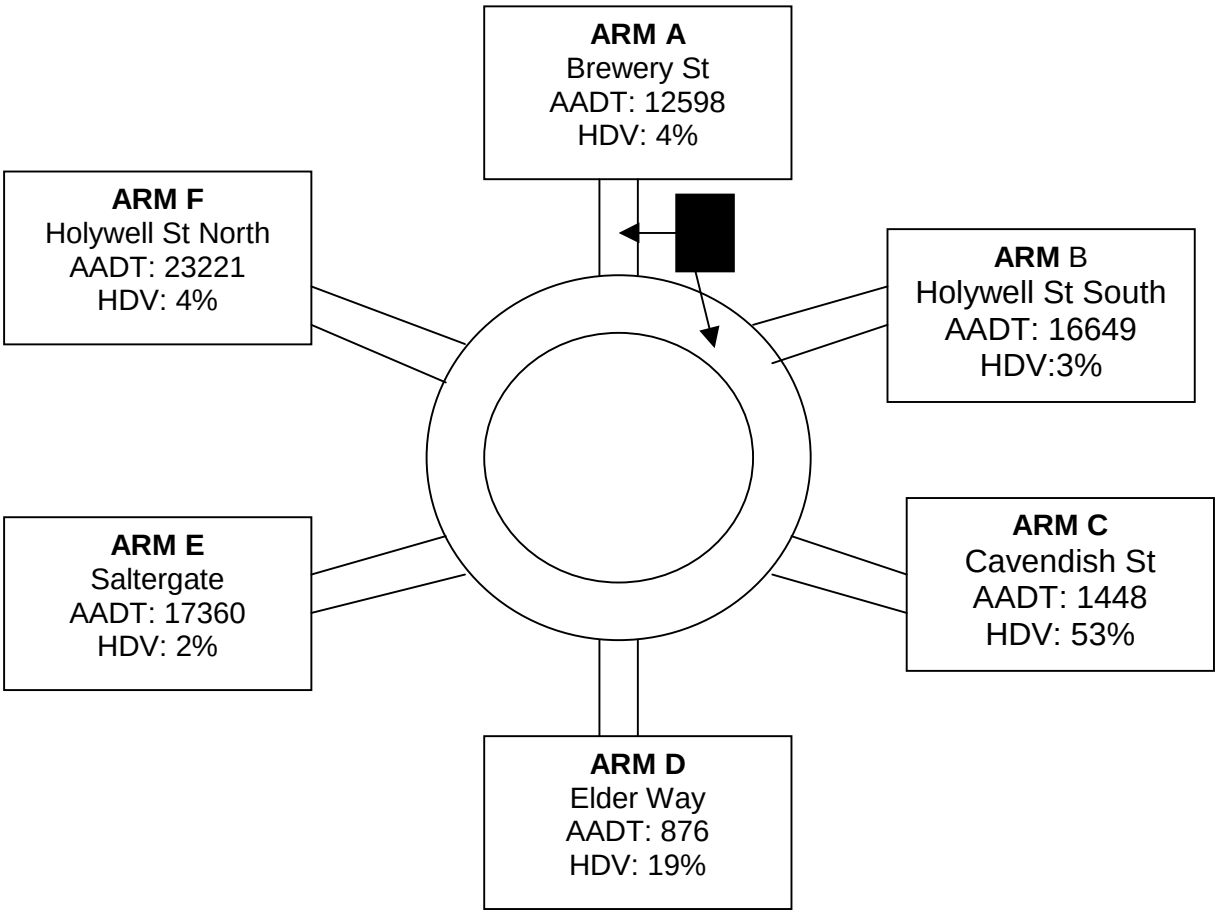
	DISTANCE	AADT	% HDV	% LDV
LINK 1 (BC)	14	17993	6	94
LINK 2 (DA)	24	25664	6.5	93.5

West Bars Road Roundabout



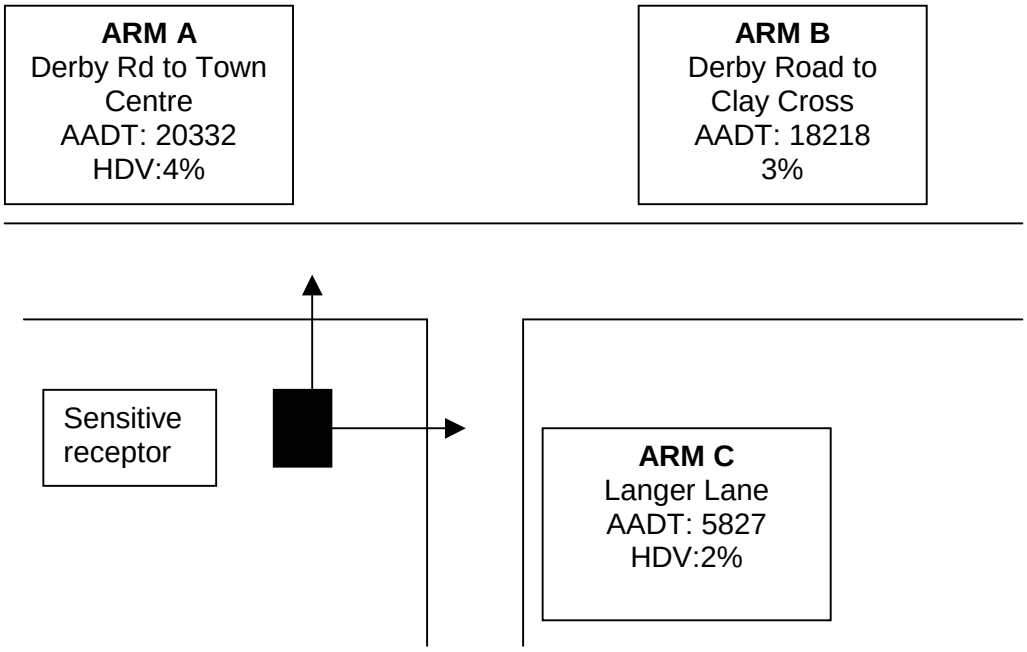
	DISTANCE	AADT	% HDV	% LDV
LINK 1 (AC)	13	17646	4	96
LINK 2 (DE)	13	20777	4	96
LINK 3 (BF)	8	11337	1	99

Holywell Cross Roundabout



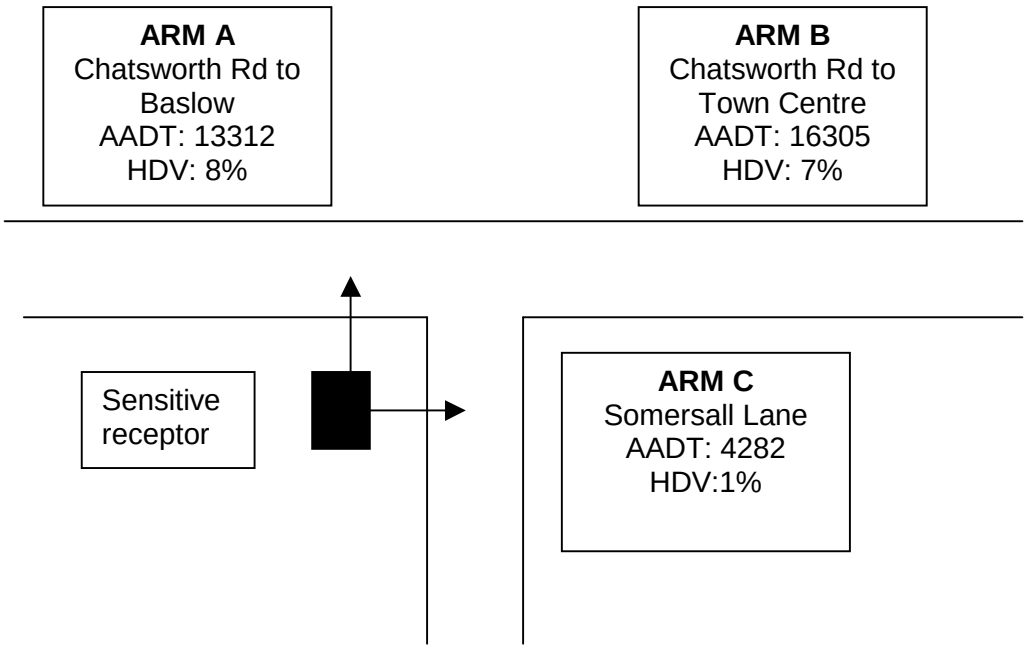
	DISTANCE	AADT	% HDV	% LDV
LINK 1 (CD)	5.4	1162	40	60
LINK 2 (BF)	5.4	19935	3.5	97.5
LINK 3 (AE)	8.7	12598	4	96

Derby Road/Langer Lane



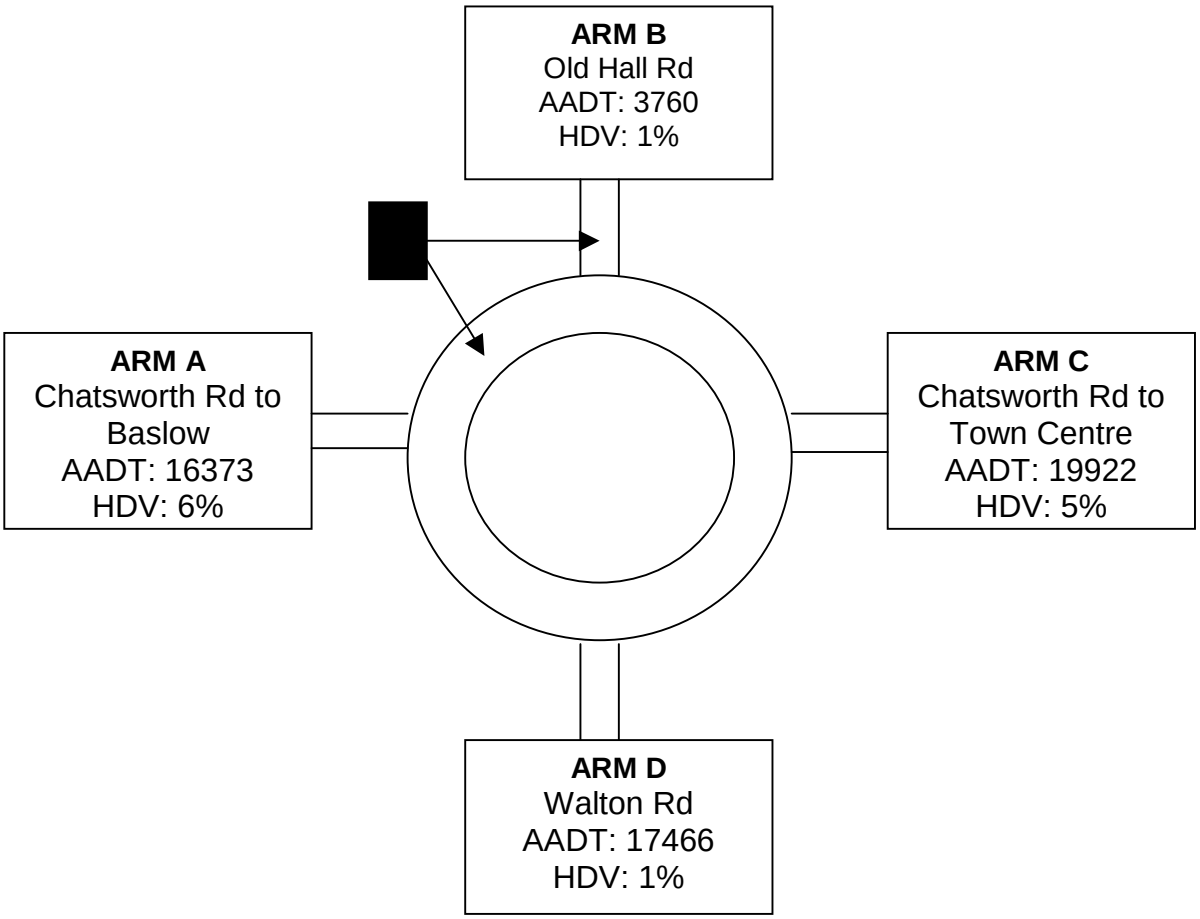
	DISTANCE	AADT	% HDV	% LDV
LINK 1 (A)	9	20332	3.5	96.5
LINK 2 (C)	14.5	5827	2	98

Chatsworth Road/Somersall Lane



	DISTANCE	AADT	% HDV	% LDV
LINK 1 (A)	13.5	13312	8	92
LINK 2 (C)	6.5	4282	1	99

Walton Roundabout



	DISTANCE	AADT	% HDV	% LDV
LINK 1 (CD)	8.5	18694	3	97
LINK 2 (AB)	3.6	3760	1	99

Appendix 6: DMRB model output results for busy roads and junctions in Chesterfield BC.

DMRB: Assessment of Local Air Quality			OUTPUT SHEET						
All receptors			**Pollutant concentrations at receptor**						
Receptor number	**Name**	**Year**	**CO ***	**Benzene**	**1,3-butadiene**	**NO_x**	**NO_2 ***	**PM_{10}**	
			Annual mean mg/m^3	Annual mean $\mu g/m^3$	Annual mean $\mu g/m^3$	Annual mean $\mu g/m^3$	Annual mean $\mu g/m^3$	Annual mean $\mu g/m^3$	Days $>50\mu g/m^3$
1	Markham Rd Rnbt	2005	0.58	0.92	0.60	80.28	**29.77**	**29.08**	**24.25**
2	West Bars Rnbt	2005	0.77	1.10	0.67	90.59	**31.57**	**31.46**	**33.22**
3	Holywell Cross	2005	0.65	0.96	0.55	78.57	**29.46**	**28.93**	**23.73**
4	Derby Rd/Langer Ln	2005	0.53	0.84	0.45	58.25	**25.49**	**26.55**	**16.40**
5	Chatsworth Rd/Somersall Ln	2005	0.47	0.72	0.41	61.19	**26.10**	**26.53**	**16.34**
6	Walton Rnbt	2005	0.51	0.81	0.42	61.51	**27.82**	**25.97**	**14.82**
7	Whit Moor Rnbt	2005	0.66	1.06	0.66	89.39	**33.22**	**29.64**	**26.22**
8	Whit Hill	2005	0.46	0.75	0.35	52.73	**25.88**	**24.48**	**11.19**
9	Sheff Rd	2005	0.46	0.77	0.38	56.01	**26.62**	**24.82**	**11.97**
10	Netto Rnbt	2005	0.55	0.87	0.43	61.13	**27.74**	**25.83**	**14.47**
11	Hornsbridge Rnbt	2005	0.61	1.07	0.76	93.54	**33.95**	**30.17**	**28.15**