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Group Name	Right aligned in headers – first line	HR1		jdt Mott MacDonald
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Project Number	Footers	PRJNR		200533/CA09
Report Number	Footers	RPTNR		01
Revision Letter	Issue and Revision Record on page ii and footers	REV		A
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Summary

The following is a summary of the information contained in this report. Estimates of people have only been calculated for the morning peak and off-peak. The estimates are calculated using manual surveys. The extent of these surveys defines the extent of information available. Occupancy surveys are carried out for the morning period only therefore evening peak figures for numbers of people are not available. For details on methodology and a breakdown of the time periods, see the main report.

0730-0930 inbound

total vehicles	7777
estimated pedal cycles	61
estimated bus	368
estimated light vehicles	6984
estimated goods vehicles	365
estimated people (all vehicles)	9511

1000-1200 inbound

total vehicles	6610
estimated pedal cycles	20
estimated bus	339
estimated light vehicles	5845
estimated goods vehicles	406
estimated people (all vehicles)	8583

1000-1200 outbound

total vehicles	6479
estimated pedal cycles	12
estimated bus	425
estimated light vehicles	5682
estimated goods vehicles	361
estimated people (all vehicles)	7830

1630-1830 outbound

total vehicles	8617
estimated pedal cycles	92
estimated bus	527
estimated light vehicles	7786
estimated goods vehicles	212
estimated people (all vehicles)	N/A

1 Introduction

This report is being undertaken as part of the Local Transport Plan monitoring process. The purpose of the report is to give an indication of the level of vehicular activity in the town centre, to indicate existing and future levels of transport demand and to monitor the effects of transport policy. The surveys and analysis have been undertaken by **jdt Mott MacDonald**.

2 Methodology

The most effective method of obtaining the necessary data to monitor traffic flows is to monitor traffic crossing a cordon around the town centre. Sites are positioned on all the main roads. Sites on some of the minor roads so as to obtain a close 'closed' cordon then supplement this network. The idea is to capture all vehicles entering the town centre. The location of the sites is shown in Figure 1.

The counters used record the vehicles automatically. In this way, data for a full week is collected, enabling 24 hr average weekday data to be presented.

Four sites are also surveyed manually by **jdt Mott MacDonald**. This data is used to estimate the modal split of the automatic data and also to estimate the number of people travelling into the town centre by vehicle.

A complementary bus cordon survey is undertaken by CENTRO, into which this report feeds.

Results of the 2002 West Bromwich Cordon Survey are presented on the following pages. Where appropriate, comparisons with 1996, 1998 and 2000 data have been made.

3 Background

Collection of the data took place in the week beginning Monday 25th March. Bus data was collected at the same as the ATC data. It is important to avoid school holidays and the Christmas shopping season.

The exact position of the automatic counts can be seen in Appendix 1. The intention will be to use the same sites for this monitoring purpose each time the cordon survey is carried out.

Since the last cordon survey was carried out, the traffic system around West Bromwich Ring Road has changed from being one-way to two-way. This change in traffic flow may have had an effect on numbers of vehicles entering the cordon area and their trip patterns. The evidence of this can be seen in Table 6.

4 Results

In Table 1 the figures for the number of vehicles crossing the cordon line in the morning peak period are presented. Traditionally, the morning peak period has been considered as being 07.30-09.30. During 2002, traffic has decreased by 16.8% compared with 2000 flows. However, it should be noted that road conditions have changed within the cordon area since 2000 (See page 1). Outbound traffic decreased by 14.9%.

Table 1 Number of vehicles crossing the cordon in the Morning Peak Period (07.30 - 09.30)

	1996	1998	2000	2002
Inbound Total	8781	9277	9353	7777
Outbound Total	6570	6785	6858	5831

Table 2 shows the number of vehicles crossing the cordon line in the traditional off-peak morning period (10.00-12.00). Again, this time period shows decreases in both inbound and outbound traffic over 2000 of 14.6% and 12.4% respectively.

Table 2 Number of vehicles crossing the cordon in the Morning Off-Peak Period (10.00-12.00)

	1996	1998	2000	2002
Inbound Total	7508	7601	7737	6610
Outbound Total	7164	7258	7400	6479

The figures in Table 3 show that in 2002 around 15.9% of traffic flowing into the town centre on a typical weekday is crossing the cordon line between the hours of 7.30a.m. and 9.30a.m. This corresponds to the figure outbound in the evening peak period (4p.m. to 6p.m.), which is 17.9%. The off-peak time period considered (1000-1200) shows 13.5% of the daily traffic travelling into the town centre. A similar percentage is evident in the outbound direction for this time period. Around 84% of an average day's traffic is crossing the cordon during the main 12hr day. The figures in this table show that, in general, the numbers of vehicles counted were lower in 2002 than in 2000, 1998 and 1996.

Whilst the net figure over 24 hours might be expected to be zero, the figures are an average of the flow characteristics over five weekdays and the net figure is within the expected level of accuracy of automatic counts.

Table 3 Total Vehicles by Time Period on an Average Weekday

	07.30 - 09.30	10.00 - 12.00	16.00 - 18.00	07.00 – 1900 (12 hour)	00.00 –24.00 (24 hour)
1996					
Inbound	8781	7508	7133	45185	54077
% of 24 hr	16.2	13.9	13.2	83.6	100
Outbound	6570	7164	8961	45578	55249
% of 24 hr	11.9	13.0	16.2	82.5	100
NET	2211	344	-1828	-393	-1172
1998					
Inbound	9277	7601	7830	47359	56659
% of 24 hr	16.4	13.4	13.8	83.6	100
Outbound	6785	7258	10035	47327	57107
% of 24 hr	11.9	12.7	17.6	82.9	100
NET	2492	343	-2205	32	-448
2000					
Inbound	9353	7737	7865	47643	57015
% of 24hr	16.4	13.6	13.8	83.6	100
Outbound	6858	7400	10043	47435	57148
% of 24hr	12.0	12.9	17.6	83.0	100
NET	2495	337	-2178	-208	-133
2002					
Inbound	7777	6610	7130	41047	48966
% of 24hr	15.9	13.5	14.6	83.8	100
Outbound	5831	6479	9077	42097	50553
% of 24hr	11.5	12.8	17.9	83.2	100
NET	1946	131	-1947	-1050	-1587

Figure 1 Inbound Morning Peak Period: Vehicle Volumes by Quarter Hour

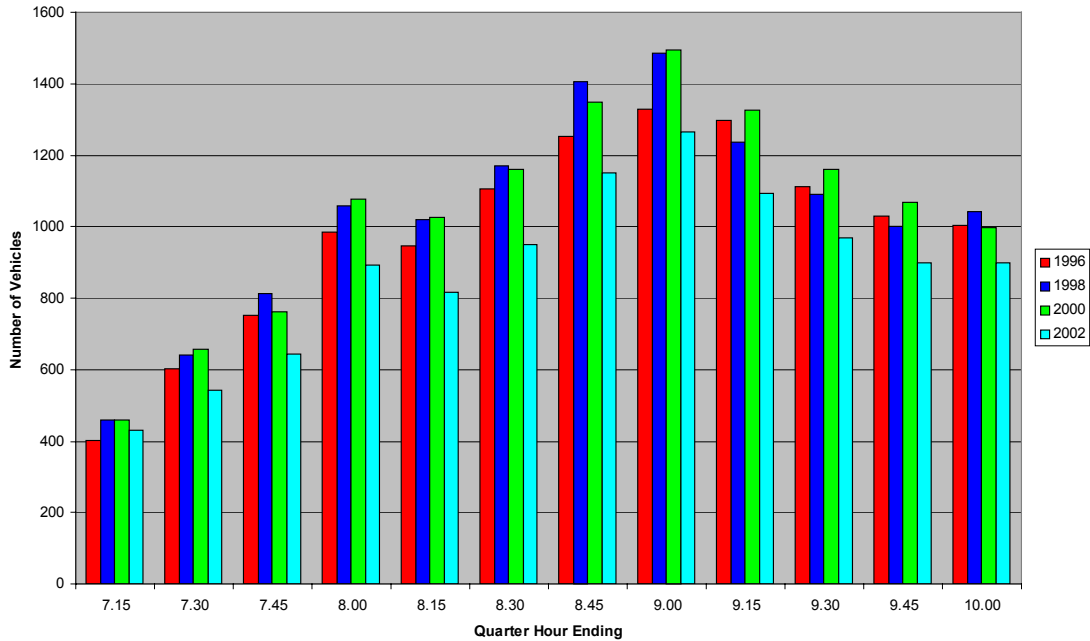


Figure 1 and Figure 2 show the two main peak periods by quarter hour. The morning figures are given from 7a.m. until 10a.m. and the evening from 4p.m. to 7p.m. These time periods are wider than those presented in previous tables. This allows a check on the traditional time periods as peak spreading may be seen on these graphs. Figures 1 and 2 show decreases in all time periods compared with 2000.

Figure 2 Outbound Evening Peak Period: Vehicle Volumes by Quarter Hour

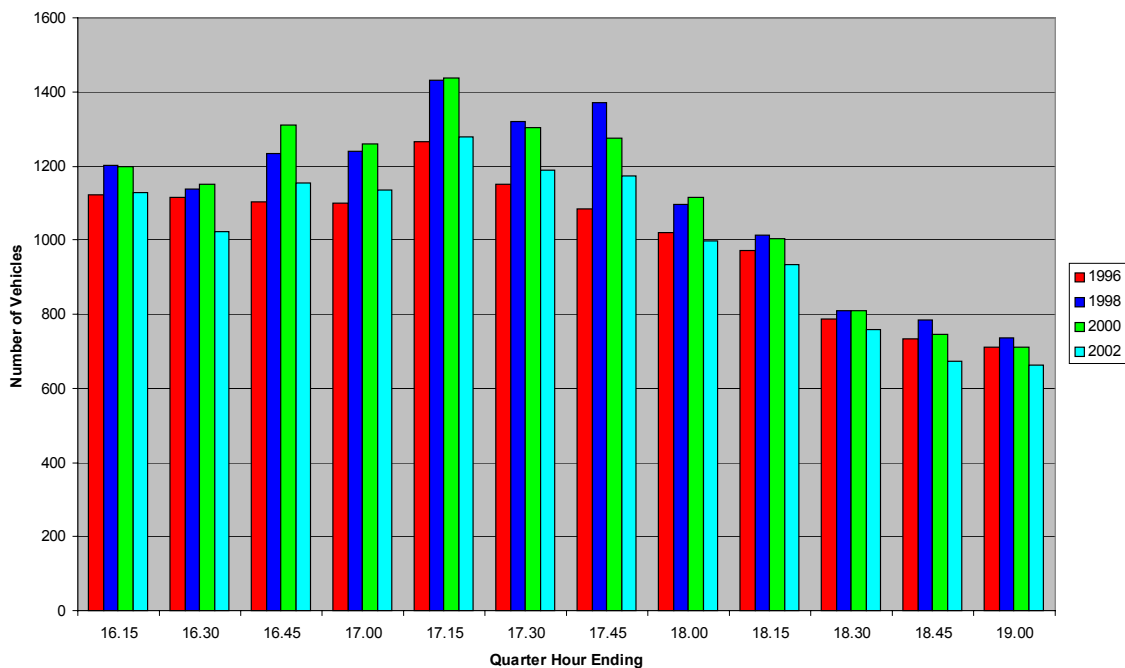


Figure 3 Inbound levels of vehicles, by hour

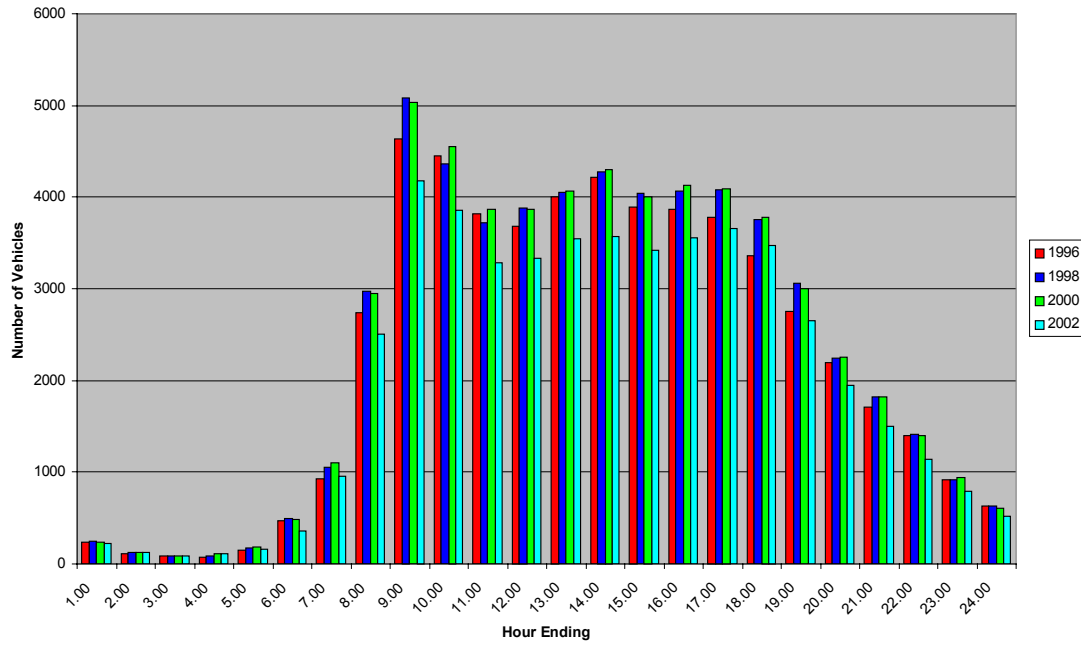
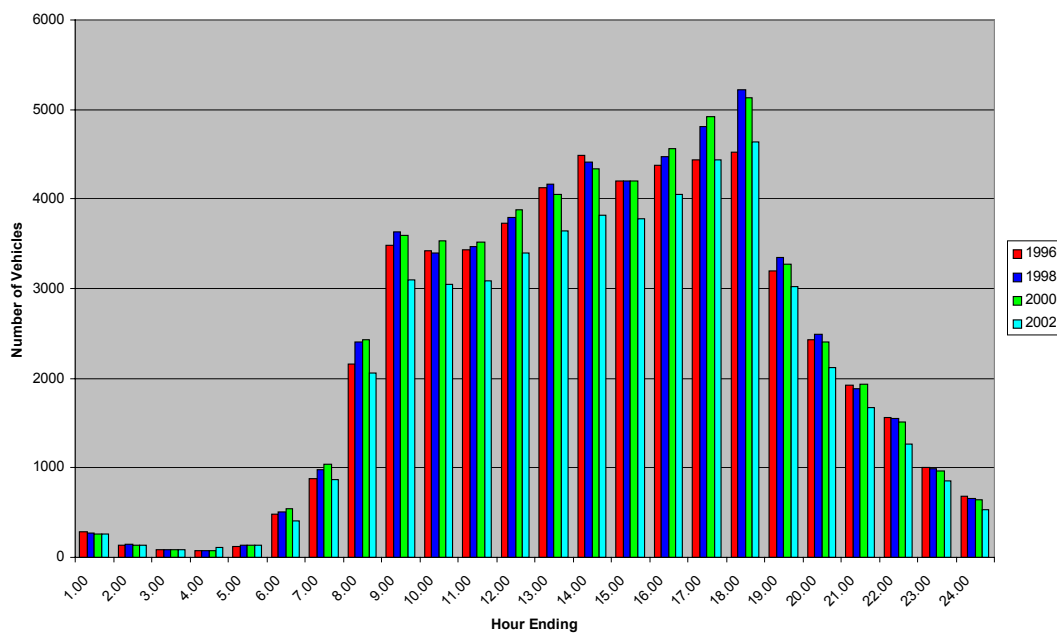


Figure 4 Outbound levels of vehicles, by hour



4.1 Daily and Hourly Variations

The figures in Table 4 give the proportions that each day contributes to an average weekday (Mon-Fri) for each of the traditional time periods. These figures can be used to factor a count taken on any particular day to an average weekday. The figures also show which days have the heaviest flows during each time period.

Table 4 Variations in traffic flow, by time of day 2002

	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
Inbound							
07.30 - 09.30	1.021	1.003	0.990	0.976	1.013	0.549	0.179
10.00 - 12.00	1.021	0.932	1.016	0.982	1.049	1.137	0.610
16.00 - 18.00	1.007	0.976	0.970	1.030	1.019	0.731	0.486
07.00 - 19.00	0.990	0.962	0.982	0.995	1.072	0.872	0.480
00.00 - 24.00	0.973	0.956	0.979	1.000	1.092	0.925	0.546
Outbound							
07.30 - 09.30	1.016	0.991	1.012	0.955	1.029	0.539	0.215
10.00 - 12.00	1.014	0.923	1.010	0.990	1.064	1.133	0.661
16.00 - 18.00	1.010	0.972	1.009	0.998	1.014	0.748	0.414
07.00 - 19.00	0.991	0.957	1.007	0.973	1.072	0.883	0.498
00.00 - 24.00	0.979	0.959	1.009	0.975	1.079	0.931	0.574

Figure 5 and Figure 6 show the gain in vehicles to the cordon by hour and the total accumulation of vehicles to the cordon. The figures used in these graphs are given in Table 5.

Table 5 Net loss / gain and accumulation in vehicles crossing the cordon, by hour

Hour ending	Inbound	Outbound	Net	Cum
1.00	226	258	-32	-32
2.00	123	134	-11	-43
3.00	84	82	3	-40
4.00	114	105	8	-32
5.00	169	136	33	1
6.00	365	406	-41	-40
7.00	970	857	113	74
8.00	2547	2032	515	589
9.00	4249	3050	1198	1787
10.00	3924	3002	921	2708
11.00	3332	3035	298	3006
12.00	3385	3343	42	3048
13.00	3608	3587	21	3069
14.00	3631	3763	-132	2937
15.00	3472	3725	-252	2685
16.00	3622	3986	-365	2320
17.00	3716	4371	-655	1665
18.00	3529	4563	-1034	631
19.00	2698	2979	-281	349
20.00	1983	2092	-109	240
21.00	1518	1642	-124	117
22.00	1157	1242	-85	32
23.00	809	847	-39	-6
24.00	529	523	7	0

Figure 5 Net loss / gain in vehicles crossing the cordon, by hour

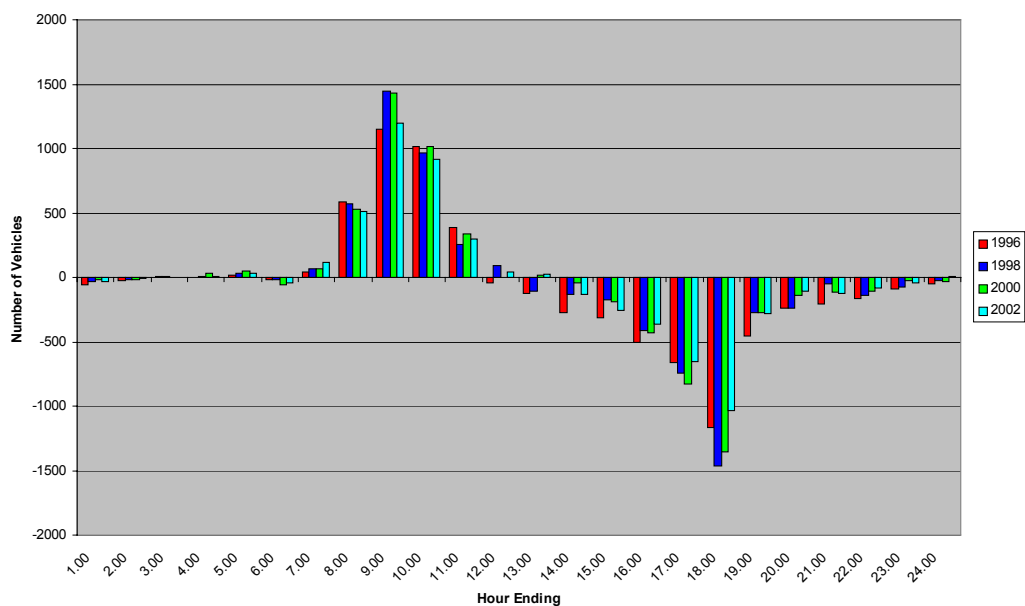


Figure 6 Net accumulation of vehicles, by hour

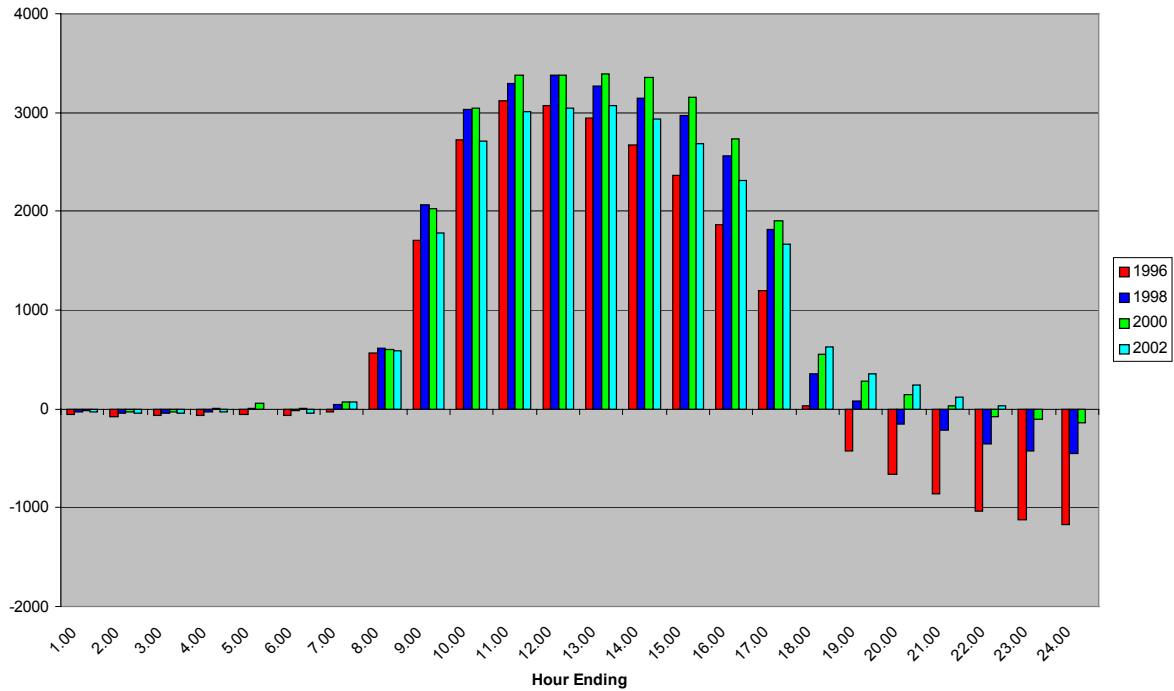


Figure 6 shows that the net accumulation of vehicles in West Bromwich town centre has dropped during 2002. These figures are supported by the manual counts taken during the 2000 and 2002 cordon surveys (see Appendix 1). The number of inbound trips have reduced while the outbound trips have remained nearly the same suggesting a decline in the number of people staying within the centre while the number of through trips remain constant.

4.2 Patterns of Travel

The figures in Table 6 show the number of vehicles travelling into and out of the town centre by each individual site on an average weekday. By examining these figures, some patterns of travel may be evident. For example, people may prefer to use a particular road inbound in the morning, but choose a different route for their outward evening journey. For comparison purposes, figures for 2000 are also shown here to show changes in travel patterns since the introduction of the two-way system around the ring road.

Table 6 Net loss / gain in vehicles on an average weekday, by site

Site	Location	Inbound 2000	Outbound 2000	Net loss / gain 2000	Inbound 2002	Outbound 2002	Net loss / gain 2002
WE01	Cronehills	8030	10312	-2282	5498	8370	-2872
WE02	Reform Street	7052	6043	1009	7215	6199	1016
WE03	High St South	9817	8427	1390	8298	6049	2249
WE04	Boulton Road	151	803	-652	329	1009	-680
WE05	Spon Lane	7422	6051	1371	6767	6160	607
WE06	Johnston Street	426	810	-384	679	921	-242
WE07	Dawes Avenue	291	250	41	344	354	-10
WE08	Bromford Lane	7108	6664	444	5632	5631	1
WE09	Oak Road	1518	1835	-317	1392	1513	-121
WE10	Ireland Green Road	83	185	-102	174	245	-71
WE11	Beechwood Road	100	101	-1	200	178	22
WE12	Oak Lane	2563	2653	-90	2389	2805	-416
WE13	Chapman Street	692	657	35	884	597	287
WE14	Grange Road	641	419	222	533	814	-281
WE15	Edward Road		946	-946		1312	-1312
WE16	High Street North	9228	8885	343	8202	8001	201
WE17	Brett Street	1901	2115	-214			
WE18	Clifford Road				434	394	40

4.3 Mode of travel

The four manual surveys give us an indication of mode of travel data.

Table 7 summarises the data recorded at the four manual sites. For the purpose of this table, 'light vehicles' includes motorcycles, cars, taxis and light vans less than 1.5T. The Heavy goods category includes all vehicles over 1.5T. These are the usual categories for light and heavy vehicles.

In Table 7 the percentage each vehicle category contributes to the total vehicles in that ¼ hour is given in brackets. In Table 8 these percentages are multiplied by the number of vehicles counted by the automatic counters, giving an estimate of the number of vehicles of that type crossing the cordon line in that ¼ hour.

Table 7 Summary of Inbound mode of transport data from manual surveys

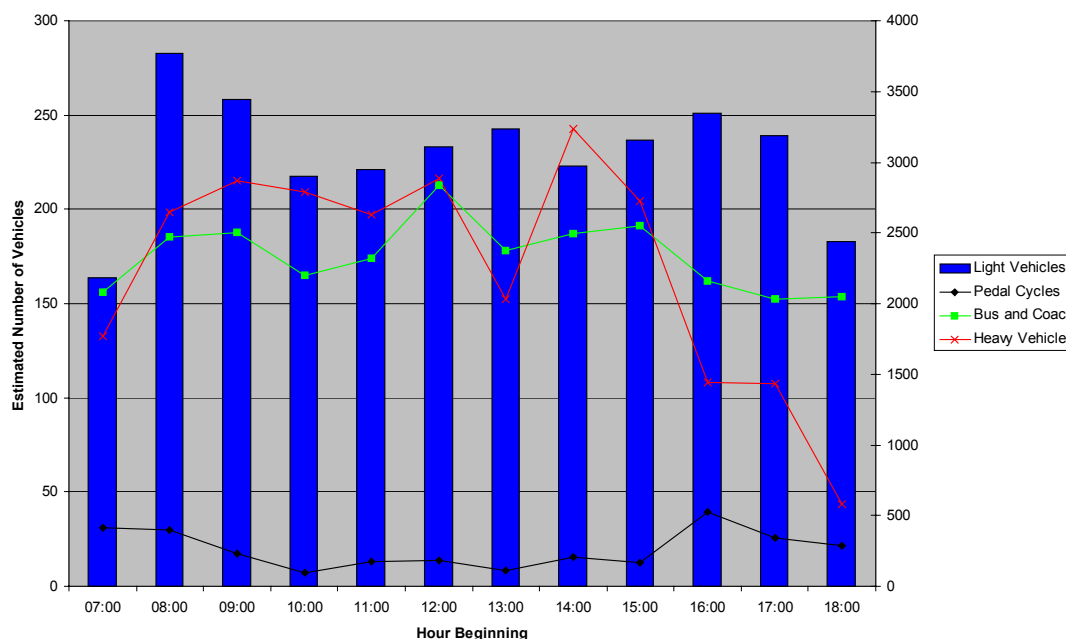
TIME STARTING	TOTAL VEH	PEDAL CYC	BUS & COACH	Light Vehs	Heavy Vehs	% pedal cycle	% bus	% light	% goods
07.00	1302	16	81	1136	69	1.23%	6.22%	87.25%	5.30%
08.00	2235	16	99	2014	106	0.72%	4.43%	90.11%	4.74%
09.00	2224	10	108	1982	124	0.45%	4.86%	89.12%	5.58%
10.00	1851	4	93	1636	118	0.22%	5.02%	88.38%	6.37%
11.00	1992	8	104	1762	118	0.40%	5.22%	88.45%	5.92%
12.00	1837	7	110	1608	112	0.38%	5.99%	87.53%	6.10%
13.00	2085	5	104	1887	89	0.24%	4.99%	90.50%	4.27%
14.00	1972	9	108	1715	140	0.46%	5.48%	86.97%	7.10%
15.00	1955	7	105	1731	112	0.36%	5.37%	88.54%	5.73%
16.00	2031	22	90	1859	60	1.08%	4.43%	91.53%	2.95%
17.00	2032	15	89	1865	63	0.74%	4.38%	91.78%	3.10%
18.00	1590	13	92	1459	26	0.82%	5.79%	91.76%	1.64%
Total	23106	132	1183	20654	1137	0.57%	5.12%	89.39%	4.92%

Table 8 Estimated Inbound mode of transport figures

TIME STARTING	number of automatic vehs	estimated ped cyc	estimated bus	estimated light	estimated heavy
07.00	2506	31	156	2186	133
08.00	4181	30	185	3768	198
09.00	3861	17	187	3441	215
10.00	3279	7	165	2898	209
11.00	3331	13	174	2946	197
12.00	3550	14	213	3107	216
13.00	3573	9	178	3234	153
14.00	3417	16	187	2972	243
15.00	3564	13	191	3156	204
16.00	3657	40	162	3347	108
17.00	3473	26	152	3188	108
18.00	2655	22	154	2436	43
Total	41047	236	2104	36679	2028

The figures in Table 7 and Table 8 are represented in Figure 7. As the numbers for Light Vehicles are so much higher than the other categories, the light vehicles are read from the right hand axis and all the other categories form the left-hand axis.

Figure 7 Estimated Inbound mode of transport figures 2002



The summary for outbound modes from the manual data can be found in Table 9 with the estimated outbound in Table 10 and the graph representing these figures in Figure 8. The figures collected in the manual surveys can be found in Appendix 2.

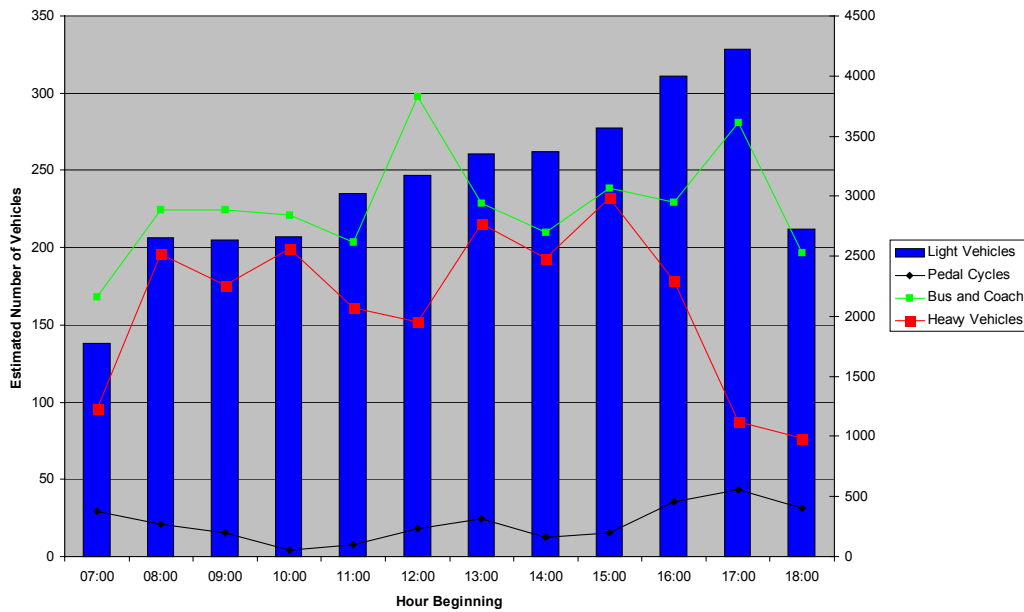
Table 9 Summary of Outbound mode of transport data from manual surveys

TIME STARTING	TOTAL VEH	PEDAL CYC	BUS & COACH	Light Vehs	Heavy Vehs	% pedal cycle	% bus	% light	% goods
07.00	1120	16	91	961	52	1.43%	8.13%	85.80%	4.64%
08.00	1629	11	118	1397	103	0.68%	7.24%	85.76%	6.32%
09.00	1561	8	115	1348	90	0.51%	7.37%	86.35%	5.77%
10.00	1422	2	102	1226	92	0.14%	7.17%	86.22%	6.47%
11.00	1834	4	110	1633	87	0.22%	6.00%	89.04%	4.74%
12.00	1627	8	133	1418	68	0.49%	8.17%	87.15%	4.18%
13.00	1741	11	104	1528	98	0.63%	5.97%	87.77%	5.63%
14.00	1805	6	100	1607	92	0.33%	5.54%	89.03%	5.10%
15.00	1850	7	109	1628	106	0.38%	5.89%	88.00%	5.73%
16.00	1994	16	103	1795	80	0.80%	5.17%	90.02%	4.01%
17.00	1916	18	116	1746	36	0.94%	6.05%	91.13%	1.88%
18.00	1338	14	87	1203	34	1.05%	6.50%	89.91%	2.54%
Total	19837	121	1288	17490	938	0.61%	6.49%	88.17%	4.73%

Table 10 Estimated Outbound mode of transport figures

TIME STARTING	No. auto vehs.	estimated ped cyc	estimated bus	estimated light	estimated goods
07.00	2064	29	168	1771	96
08.00	3099	21	224	2658	196
09.00	3050	16	225	2634	176
10.00	3083	4	221	2658	199
11.00	3396	7	204	3024	161
12.00	3644	18	298	3176	152
13.00	3823	24	228	3355	215
14.00	3784	13	210	3369	193
15.00	4050	15	239	3564	232
16.00	4441	36	229	3998	178
17.00	4636	44	281	4225	87
18.00	3027	32	197	2722	77
Total	42097	259	2723	37152	1963

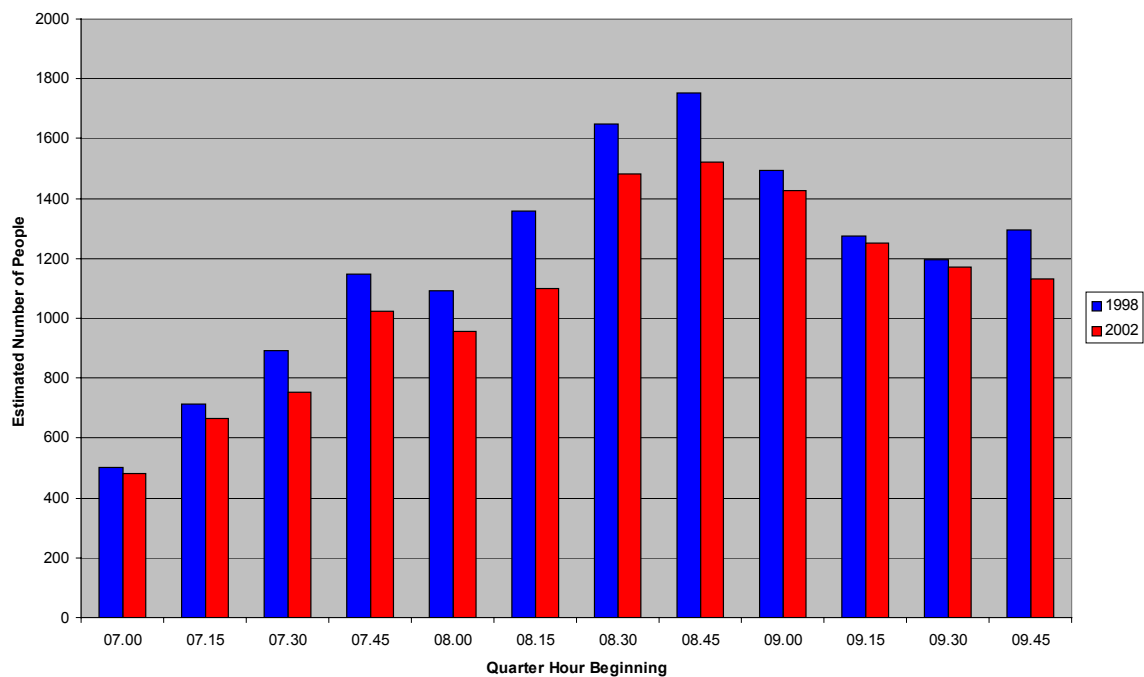
Figure 8 Estimated Outbound mode of transport figures 2002



4.4 Occupancy Levels

Figure 9 shows the estimated numbers of persons crossing the cordon calculated from the occupancy counts at four manual sites and the number of vehicles counted automatically per time period. There is no data available for 2000 as these surveys were suspected to be unreliable.

Figure 9 Estimates of persons Inbound Morning Peak Period



5 West Bromwich: Modal Share

Table 11 Estimates of Numbers of Persons by Modal Split 0730-0930

Mode of Trip	Number of Person Trips Inbound		Number of Person Trips Outbound	
	2000	2002	2000	2002
Persons in Car Trips	8,874	8,046	6,374	5,314
Persons in Light Vehicle Trips	10,068	9,009	N/A	6,127
Occupancy Factor*	1.21	1.29	1.18	1.22
Bus Trips	3,958	3,528	3,932	1,922
Metro Trips	220	288	N/A	401

*2000 occupancy factor taken from 1998 surveys

Table 12 Estimates of Numbers of Persons by Modal Split 1000-1200

Mode of Trip	Number of Person Trips Inbound		Number of Person Trips Outbound	
	2000	2002	2000	2002
Persons in car Trips	7,896	7,050	7,037	6,384
Persons in Light Vehicle Trips	N/A	8,066	N/A	7,387
Occupancy Factor*	1.35	1.38	1.29	1.30
Bus Trips	4,740	4,884	2,686	4,067
Metro Trips	N/A	434	N/A	404

*2000 occupancy factor taken from 1998 surveys

Table 13 Estimates of Numbers of Persons by Modal Split 0700-1230

Mode of Trip	Number of Trips Inbound		Number of Trips Outbound	
	2000	2002	2000	2002
Persons in Car Trips	21,843	19,764	17,896	15,688
Persons in Light Vehicle Trips	N/A	N/A	N/A	N/A
Occupancy Factor	1.28	1.34	1.24	1.26
Bus Trips	11,377	11,583	7,905	8,027
Metro Trips	N/A	952	N/A	1031

*2000 occupancy factor taken from 1998 surveys

Appendix 1 Comparison of Manual Counts 2000/2002

Site Reference	Direction	2000	2002
WE03 High St North	Inbound	7193	6830
	Outbound	4305	4808
WE05 Spon Lane	Inbound	5625	5143
	Outbound	5048	4946
WE08 Bromford Lane	Inbound	5730	4335
	Outbound	5095	4423
WE16 High St South	Inbound	6893	6500
	Outbound	5710	566
Total	Inbound	25441	22808
	Outbound	20158	19837

Appendix 2 Position of Cordon Sites

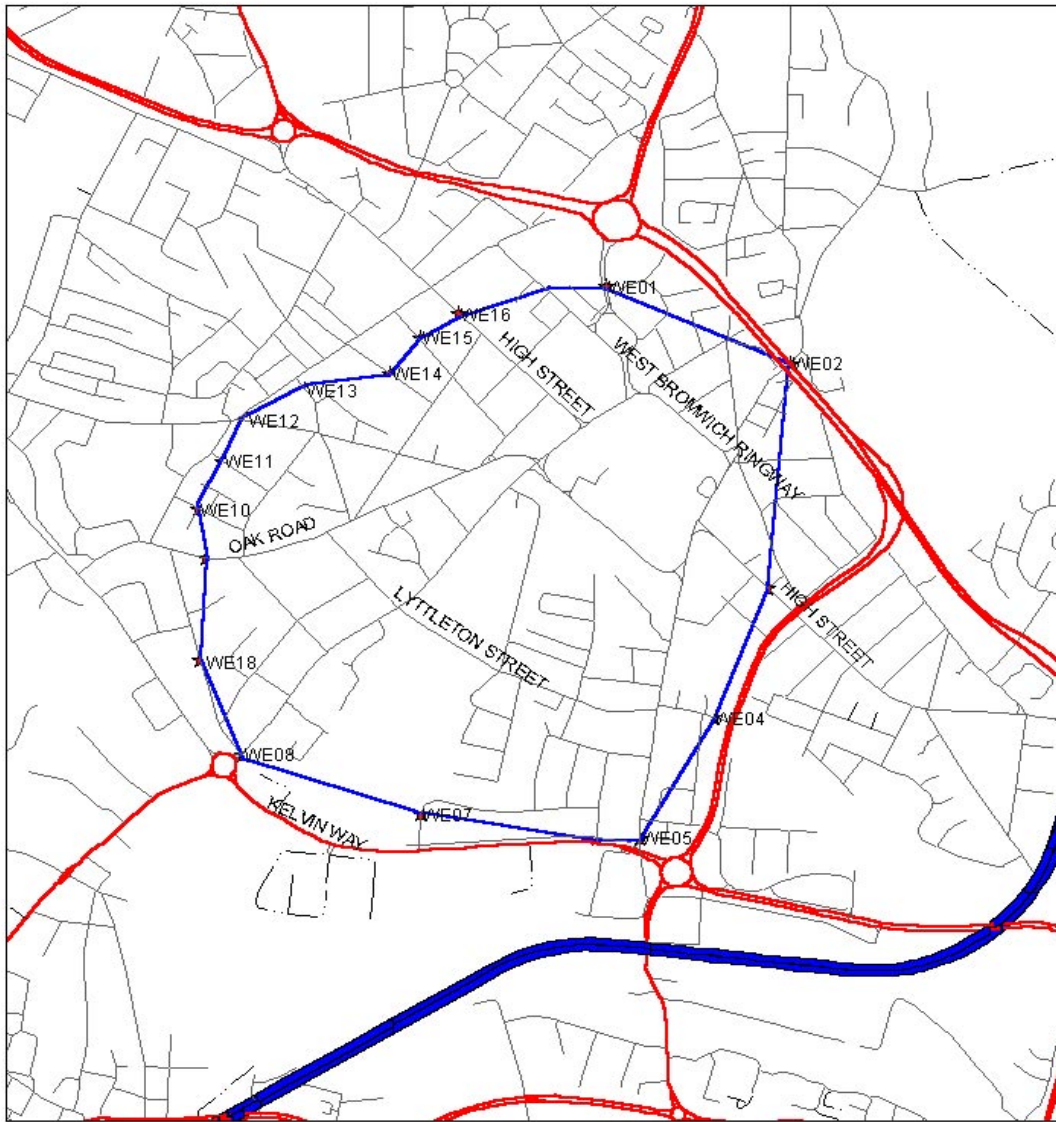
Table 14 Automatic count sites

Site	Location	Exact Position
WE01	Cronehills	Between Expressway to Link Way
WE02	Reform Street	On Expressway Overbridge
WE03	High Street	Between Trinity Way and George Street
WE04	Boulton Road	Between Trinity Way and Spon Lane
WE05	Spon Lane	Between Kelvin Way and Parliament
WE06	Johnston Street	Between Kelvin Way and Dawes Avenue
WE07	Dawes Avenue	North of Kelvin Way
WE08	Bromford Lane	Between Kelvin Way and Clifford Road
WE09	Oak Road	Between Clifford Road and Margaret St.
WE10	Ireland Green Road	Between Gads Lane and Hazel Lane
WE11	Beechwood Road	Between Gads Lane and Beech Road
WE12	Oak Lane	Between Gads Lane and Beech Road
WE13	Chapman Street	Between Dartmouth Street and Oak Lane
WE14	Grange Road	Between Dartmouth Street and Lodge Rd.
WE15	Edward Road	Between Dartmouth Street and Lodge Rd
WE16	High Street North	Between Dartmouth Street and Lodge Rd
WE18	Clifford Road	North of Westbourne Road

Table 15 Manual Count sites

WE03	High Street	Between Trinity Way and George Street
WE05	Spon Lane	Between Kelvin Way and Parliament
WE08	Bromford Lane	Between Kelvin Way and Clifford Road
WE09	Oak Road	Between Clifford Road and Margaret St.

Figure 10 Location of West Bromwich ATC Cordon Sites



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Appendix 3 Estimates of Vehicle Type from Passage Count Data

Inbound														
Start Time	Tot Vehs	Pedal Cyc	Bus & Coach	Light Vehs	Heavy Vehs	% Pedal Cyc	% Bus & Coach	% Light Vehs	% Heavy Vehs	No. Auto Vehs	Est. Ped. Cyc	Est. Bus & Coach	Est. Light Vehs	Est. Heavy Vehs
07:00	1302	16	81	1136	69	1.23%	6.22%	87.25%	5.30%	2506	31	156	2186	133
08:00	2235	16	99	2014	106	0.72%	4.43%	90.11%	4.74%	4181	30	185	3768	198
09:00	2254	10	108	1982	124	0.45%	4.86%	89.12%	5.58%	3861	17	187	3441	215
10:00	1851	4	93	1636	118	0.22%	5.02%	88.38%	6.37%	3279	7	165	2898	209
11:00	1992	8	104	1762	118	0.40%	5.22%	88.45%	5.92%	3331	13	174	2946	197
12:00	1837	7	110	1608	112	0.38%	5.99%	87.53%	6.10%	3650	14	213	3107	216
13:00	2085	5	104	1887	89	0.24%	4.99%	90.50%	4.27%	3573	9	178	3234	153
14:00	1972	9	108	1715	140	0.46%	5.48%	86.97%	7.10%	3417	16	187	2972	243
15:00	1955	7	105	1731	112	0.36%	5.37%	88.54%	5.73%	3564	13	191	3156	204
16:00	2031	22	90	1859	60	1.08%	4.43%	91.53%	2.95%	3657	40	162	3347	108
17:00	2032	15	89	1865	63	0.74%	4.38%	91.78%	3.10%	3473	26	152	3188	108
18:00	1590	13	92	1459	26	0.82%	5.79%	91.76%	1.64%	2655	22	154	2436	43
Total	23106	132	1183	20654	1137	0.57%	5.12%	89.39%	4.92%	41047	236	2104	36679	2028
10-12 Total	3843	12	197	3398	236	0.31%	5.13%	88.42%	6.14%	6610	20	339	5845	406
07:00	215	1	16	180	18	0.47%	7.44%	83.72%	8.37%	429	2	32	359	36
07:15	319	4	22	274	19	1.25%	6.90%	85.89%	5.96%	543	7	37	466	32
07:30	349	6	22	301	20	1.72%	6.30%	86.25%	5.73%	643	11	41	555	37
07:45	419	5	21	381	12	1.19%	5.01%	90.93%	2.86%	891	11	45	810	26
08:00	421	3	26	371	21	0.71%	6.18%	88.12%	4.99%	816	6	50	719	41
08:15	563	4	31	489	39	0.71%	5.51%	86.86%	6.93%	950	7	52	825	66
08:30	615	6	19	565	25	0.98%	3.09%	91.87%	4.07%	1150	11	36	1057	47
08:45	636	3	23	589	21	0.47%	3.62%	92.61%	3.30%	1265	6	46	1172	42
09:00	630	1	27	568	34	0.16%	4.29%	90.16%	5.40%	1092	2	47	985	59
09:15	602	5	32	535	30	0.83%	5.32%	88.87%	4.98%	970	8	52	862	48
09:30	462	4	24	410	24	0.87%	5.19%	88.74%	5.19%	900	8	47	799	47
09:45	530	0	25	469	36	0.00%	4.72%	88.49%	6.79%	899	0	42	796	61
7:00-10:00	5761	42	288	5132	299	0.73%	5.00%	89.08%	5.19%	10548	78	526	9403	541
7:30-9:30 Total	4235	33	201	3799	202	0.78%	4.75%	89.70%	4.77%	7777	61	368	6984	365
16:00	480	4	27	432	17	0.83%	5.63%	90.00%	3.54%	935	8	53	842	33
16:15	483	5	24	438	16	1.04%	4.97%	90.68%	3.31%	877	9	44	795	29
16:30	508	5	18	474	11	0.98%	3.54%	93.31%	2.17%	915	9	32	854	20
16:45	560	8	21	515	16	1.43%	3.75%	91.96%	2.86%	930	13	35	855	27
17:00	487	1	22	457	7	0.21%	4.52%	93.84%	1.44%	938	2	42	880	13
17:15	547	4	32	493	18	0.73%	5.85%	90.13%	3.29%	888	6	52	800	29
17:30	496	7	25	463	11	1.41%	5.04%	91.33%	2.22%	854	12	43	780	19
17:45	502	3	10	462	27	0.60%	1.99%	92.03%	5.38%	793	5	16	730	43
18:00	461	4	25	427	5	0.87%	5.42%	92.62%	1.08%	750	7	41	695	8
18:15	405	4	24	370	7	0.99%	5.93%	91.36%	1.73%	661	7	39	604	11
18:30	372	1	18	345	8	0.27%	4.84%	92.74%	2.15%	631	2	31	585	14
18:45	352	4	25	317	6	1.14%	7.10%	90.06%	1.70%	613	7	44	552	10
Tot 16.3-18.3	3966	36	177	3651	102	0.91%	4.46%	92.06%	2.57%	6729	61	300	6198	170

Outbound

Start Time	Tot Vehs	Pedal Cyc	Bus & Coach	Light Vehs	Heavy Vehs	% Pedal Cyc Coach	% Bus & Coach	% Light Vehs	% Heavy Vehs	No. Auto Vehs	Est. Ped. Cyc	Est. Bus & Coach	Est. Light Vehs	Est. Heavy Vehs
07:00	1120	16	91	961	52	1.43%	8.13%	85.80%	4.64%	2064	29	168	1771	96
08:00	1629	11	118	1397	103	0.68%	7.24%	85.76%	6.32%	3099	21	224	2658	196
09:00	1561	8	115	1348	90	0.51%	7.37%	86.35%	5.77%	3050	16	225	2634	176
10:00	1422	2	102	1226	92	0.14%	7.17%	86.22%	6.47%	3083	4	221	2658	199
11:00	1834	4	110	1633	87	0.22%	6.00%	89.04%	4.74%	3396	7	204	3024	161
12:00	1627	8	133	1418	68	0.49%	8.17%	87.15%	4.18%	3644	18	298	3176	152
13:00	1741	11	104	1528	98	0.63%	5.97%	87.77%	5.63%	3823	24	228	3355	215
14:00	1805	6	100	1607	92	0.33%	5.54%	89.03%	5.10%	3784	13	210	3369	193
15:00	1850	7	109	1628	106	0.38%	5.89%	88.00%	5.73%	4050	15	239	3564	232
16:00	1994	16	103	1795	80	0.80%	5.17%	90.02%	4.01%	4441	36	229	3998	178
17:00	1916	18	116	1746	36	0.94%	6.05%	91.13%	1.88%	4636	44	281	4225	87
18:00	1338	14	87	1203	34	1.05%	6.50%	89.91%	2.54%	3027	32	197	2722	77
Total	19837	121	1288	17490	938	0.61%	6.49%	88.17%	4.73%	42097	259	2723	37152	1963
10-12 Total	3256	6	212	2859	179	0.18%	6.51%	87.81%	5.50%	6479	12	425	5682	361
07:00	165	2	21	132	10	1.21%	12.73%	80.00%	6.06%	391	5	50	313	24
07:15	280	4	21	239	16	1.43%	7.50%	85.36%	5.71%	478	7	36	408	27
07:30	333	6	27	287	13	1.80%	8.11%	86.19%	3.90%	541	10	44	466	21
07:45	342	4	22	303	13	1.17%	6.43%	88.60%	3.80%	654	8	42	579	25
08:00	396	3	30	333	30	0.76%	7.58%	84.09%	7.58%	671	5	51	564	51
08:15	416	2	28	352	34	0.48%	6.73%	84.62%	8.17%	795	4	54	673	65
08:30	401	4	34	340	23	1.00%	8.48%	84.79%	5.74%	787	8	67	667	45
08:45	416	4	26	372	16	0.48%	6.25%	89.42%	3.85%	846	4	53	757	33
09:00	348	3	23	296	26	0.86%	6.61%	85.06%	7.47%	791	7	52	673	59
09:15	442	1	30	381	30	0.23%	6.79%	86.20%	6.79%	746	2	51	643	51
09:30	384	0	39	329	16	0.00%	10.16%	85.68%	4.17%	744	0	76	637	31
09:45	387	4	23	342	18	1.03%	5.94%	88.37%	4.65%	769	8	46	680	36
7.00-10.00	4310	35	324	3706	245	0.81%	7.52%	85.99%	5.68%	8213	66	620	7060	467
7.30-9.30 Total	3094	25	220	2664	185	0.81%	7.11%	86.10%	5.98%	5831	47	413	5022	349
16:00	516	1	31	468	16	0.19%	6.01%	90.70%	3.10%	1129	37	444	5193	359
16:15	506	5	19	456	26	0.99%	3.75%	90.12%	5.14%	1023	37	448	5294	370
16:30	506	5	35	443	23	0.99%	6.92%	87.55%	4.55%	1153	11	80	1009	52
16:45	466	5	18	428	15	1.07%	3.86%	91.85%	3.22%	1136	12	44	1043	37
17:00	588	6	28	545	9	1.02%	4.76%	92.69%	1.53%	1277	13	61	1184	20
17:15	528	5	42	468	13	0.95%	7.95%	88.64%	2.46%	1190	11	95	1055	29
17:30	426	3	25	396	2	0.70%	5.87%	92.96%	0.47%	1172	8	69	1089	6
17:45	374	4	21	337	12	1.07%	5.61%	90.11%	3.21%	997	11	56	898	32
18:00	440	7	29	396	8	1.59%	6.59%	90.00%	1.82%	933	15	61	840	17
18:15	355	5	29	312	9	1.41%	8.17%	87.89%	2.54%	759	11	62	667	19
18:30	273	2	13	247	11	0.73%	4.76%	90.48%	4.03%	671	5	32	607	27
18:45	270	0	16	248	6	0.00%	5.93%	91.85%	2.22%	664	0	39	610	15
Tot 16.3-18.3	3683	40	227	3325	91	1.09%	6.16%	90.28%	2.47%	8617	92	527	7786	212

Appendix 4 Estimates of Persons from Occupancy data

Vehicle Classes Surveyed
 02 - Motor cycles etc
 03 - Cars & taxis
 05 - LGV <30 cwt

Inbound

Start Time	Number of vehicles with Occupants					5 Total Veh	Total Pass Ave Occupancy	A Automatically Counted Vehicles	B Estimated Number of Buses	C Estimated Pedal Cycles	D Est. Light Vehs.	E Est.Ave Occ	F Est People Light Vehs + Ped Cyc	G Estimated Heavy Vehs	Est People Light&Heavy	Est People Heavy Vehs	Est People Light&Heavy
	1	2	3	4	5												
07.00	171	36	5	1	0	213	262	429	32	2	359	442	444	36	38	482	503
07.15	195	61	10	1	0	267	351	543	37	7	466	613	620	32	44	664	713
07.30	259	57	9	3	0	328	412	643	41	11	555	697	708	37	46	754	891
07.45	316	67	6	2	0	391	476	891	45	11	810	986	997	26	29	1026	1148
08.00	309	75	8	2	1	395	496	816	50	6	719	903	909	41	48	957	1092
08.15	420	90	10	5	0	525	650	950	52	7	825	1022	1028	66	69	1098	1360
08.30	445	109	23	4	7	588	783	1150	36	11	1057	1407	1418	47	62	1480	1651
08.45	458	103	16	3	1	581	729	1265	46	6	1172	1470	1476	42	45	1521	1753
09.00	388	134	24	7	0	553	756	1092	47	2	985	1346	1348	59	78	1426	1494
09.15	375	144	18	7	1	545	750	970	52	8	862	1186	1194	48	56	1251	1275
0730-0930	2970	779	114	33	10	3906	5052	7777	368	61	6984	9017	9078	365	434	9511	10664
09.30	277	99	19	4	1	400	553	900	47	8	799	1104	1112	47	59	1171	1197
09.45	318	112	17	2	0	449	601	899	42	0	796	1065	1065	61	66	1131	1294
10.00	302	106	8	3	1	420	555	899	42	0	796	1065	1065	61	66	1131	1294
10.15	300	109	9	2	0	420	553	899	42	0	796	1065	1065	61	66	1131	1294
10.30	297	136	12	8	0	453	637	970	52	8	862	1186	1194	48	56	1251	1275
10.45	265	124	19	3	0	411	582	816	50	6	719	903	909	41	48	957	1092
11.00	289	133	20	5	1	448	640	950	52	7	825	1022	1028	66	69	1098	1360
11.15	311	118	17	6	2	454	632	1092	47	2	985	1346	1348	59	78	1426	1494
11.30	310	130	12	4	2	458	632	1092	47	2	985	1346	1348	59	78	1426	1494
11.45	280	105	14	8	1	408	569	970	52	8	862	1186	1194	48	56	1251	1275
1000-1200	2354	961	111	39	7	3472	4800	6610	339	20	5845	8080	8100	406	482	8583	9511
12.00	326	111	17	10	3	467	654	900	47	8	799	1104	1112	47	59	1171	1197
12.15	290	101	16	6	0	413	564	899	42	0	796	1065	1065	61	66	1131	1294
0700-1230	7517	2472	342	112	24	10467	14055	20000	1400	100	14000	18000	18000	1400	1800	18000	20000

Outbound

Start Time	Number of vehicles with Occupants					5	Total Veh	Total Pass Ave Occupancy	A	B	C	E		F		G		H	
	1	2	3	4	4							Estimated Pedal Cycles	Est. Light Vehs.	Est. Ave Occ	Light Vehs + Ped Cyc	Estimated Heavy Vehs	Est People Light&Heavy	Est People Heavy	Est People Light&Heavy
07.00	108	18	0	3	0	129	1.21	391	50	5	313	378	383	24	28	411			
07.15	189	27	0	0	0	216	1.13	478	36	7	408	459	466	27	33	499			
07.30	218	51	6	0	0	275	1.23	541	44	10	466	573	583	21	30	613			
07.45	273	55	4	0	0	332	1.19	654	42	8	579	689	697	25	31	728			
08.00	266	42	6	1	1	316	1.19	671	51	5	564	673	678	51	58	736			
08.15	274	58	3	4	0	339	1.22	795	54	4	673	824	827	65	75	902			
08.30	259	57	9	0	2	327	1.25	787	67	8	667	837	845	45	54	899			
08.45	298	45	6	1	2	352	1.20	846	53	4	757	903	907	33	53	960			
09.00	233	48	1	2	0	284	1.20	791	52	7	673	805	812	59	82	895			
09.15	291	63	15	1	0	370	1.26	746	51	2	643	810	812	51	56	868			
0730-0930	2112	419	50	9	5	2595	1.22	5831	413	47	5022	6114	6161	349	440	6601			
09.30	269	40	6	1	0	316	1.17	744	76	0	637	748	748	31	38	786			
09.45	277	57	5	2	0	341	1.21	769	46	8	680	825	833	36	51	884			
10.00	235	63	4	2	1	305	1.27												
10.15	255	59	6	3	1	324	1.26												
10.30	240	61	7	3	0	311	1.27												
10.45	265	76	8	3	0	352	1.29												
11.00	303	90	9	1	1	404	1.28												
11.15	264	98	12	7	0	381	1.38												
11.30	268	81	13	5	0	367	1.33												
11.45	273	80	12	3	1	369	1.32												
1000-1200	2103	608	71	27	4	2813	1.30	6479	425	12	5682	7393	7404	361	425	7830			
12.00	306	92	9	3	0	410	1.29												
12.15	241	92	12	4	0	349	1.37												
0700-1230	5605	1353	153	49	9	7169	1.26												

Heavy Vehicles

- Vehicle Classes Surveyed
- 06 - GV 30 cwt. >3 tons
- 07 - HGV 2-axle >3 tons
- 08 - HGV 3-axle rigid
- 09 - HGV 4-axle rigid
- 10 - HGV 3-axle artic
- 11 - HGV 4-axle artic
- 12 - HGV 5-axle artic

Start Time	Number of vehicles with Occupants					5 Total Veh	Total Pass	Ave Occupancy
	1	2	3	4	5			
07.00	15	1	0	0	0	16	17	1.06
07.15	14	3	2	0	0	19	26	1.37
07.30	15	5	0	0	0	20	25	1.25
07.45	21	3	0	0	0	24	27	1.13
08.00	18	4	0	0	0	22	26	1.18
08.15	18	1	0	0	0	19	20	1.05
08.30	16	3	2	0	0	21	28	1.33
08.45	24	2	0	0	0	26	28	1.08
09.00	28	6	3	0	0	37	49	1.32
09.15	33	2	2	0	0	37	43	1.16
0730-0930	173	26	7	0	0	206	246	1.19
09.30	22	3	2	0	0	27	34	1.26
09.45	31	3	0	0	0	34	37	1.09
10.00	39	4	0	0	0	43	47	1.09
10.15	29	3	0	0	0	32	35	1.09
10.30	21	7	0	0	0	28	35	1.25
10.45	22	8	2	0	0	32	44	1.38
11.00	29	8	0	0	0	37	45	1.22
11.15	25	5	0	0	0	30	35	1.17
11.30	24	4	0	0	0	28	32	1.14
11.45	27	6	0	0	0	33	39	1.18
1000-1200	216	45	2	0	0	263	312	1.19
12.00	20	2	2	0	0	24	30	1.25
12.15	43	4	0	0	0	47	51	1.09
0700-1230	534	87	15	0	0	636	753	1.18

Outbound

Survey 1

Start Time	Number of vehicles with Occupants						5 Total Veh	Total Pass	Ave Occupancy
	1	2	3	4					
07.00	10	0	1	0	0	0	11	13	1.18
07.15	15	2	1	0	0	0	18	22	1.22
07.30	14	5	2	0	0	0	21	30	1.43
07.45	14	2	1	0	0	0	17	21	1.24
08.00	24	4	0	0	0	0	28	32	1.14
08.15	27	5	0	0	0	0	32	37	1.16
08.30	24	4	1	0	0	0	29	35	1.21
08.45	14	6	3	1	0	0	24	39	1.63
09.00	18	9	1	0	0	0	28	39	1.39
09.15	24	3	0	0	0	0	27	30	1.11
0730-0930	159	38	8	1	0	0	206	263	1.28
09.30	23	3	0	1	0	0	27	33	1.22
09.45	19	2	2	0	1	0	24	34	1.42
10.00	21	4	0	1	0	0	26	33	1.27
10.15	29	3	0	0	0	0	32	35	1.09
10.30	18	3	0	0	0	0	21	24	1.14
10.45	25	3	0	0	0	0	28	31	1.11
11.00	21	3	1	0	0	0	25	30	1.20
11.15	21	4	1	0	0	0	26	32	1.23
11.30	22	3	1	0	0	0	26	31	1.19
11.45	21	6	0	0	0	0	27	33	1.22
1000-1200	178	29	3	1	0	0	211	249	1.18
12.00	27	3	0	0	0	0	30	33	1.10
12.15	21	5	0	0	0	0	26	31	1.19
0700-1230	452	82	15	3	1	0	553	678	1.23