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Item	Location	Bookmark name	X ^{1,2}	Record of input ^{3,4}
Report Title – first line	Pages i and ii	T1		Wolverhampton Cordon Survey
Report Title – second line	Pages i and ii	T2		Survey
Report Title – third line	Pages i and ii	T3		2000
Report Title or Heading – first line	Left aligned in headers	HL1		Wolverhampton Cordon Survey 2000
Report Title or Heading – second line	Left aligned in headers	HL2		
Group Name	Right aligned in headers – first line	HR1		jdt
Client/Associate (where applicable)	Right aligned in headers – second line	HR2		
Project Number	Footers	PRJNR		47995
Report Number	Footers	RPTNR		01
Revision Letter	Issue and Revision Record on page ii and footers	REV		A
Date of issue or report	Page i, Issue and Revision Record on page ii and footers	DATE		December 2000
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Issue and Revision Record

Rev	Date	Originator (Print) (Signature)	Checker (Print) (Signature)	Approver (Print) (Signature)	Description
		J. Stokes	J. Bates/ D. King	B. Storey	
A	December 2000				First Issue

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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 inbound and outbound morning peak periods. The estimates are calculated using manual surveys. The extent of these surveys defines the extent of information available. For details on methodology and a breakdown of the time periods, see the main report.

0730-0930 inbound

total vehicles	25,807
estimated pedal cycles	208
estimated bus	877
estimated light vehicles	22,852
estimated goods vehicles	1,870
estimated people (light vehs)	28,044
estimated people (goods vehs)	2,280

0730-0930 outbound

total vehicles	19,334
estimated pedal cycles	124
estimated bus	773
estimated light vehicles	16,911
estimated goods vehicles	1,526
estimated people (light vehs)	19,595
estimated people (goods vehs)	1,757

1000-1200 inbound

total vehicles	19,025
estimated pedal cycles	69
estimated bus	674
estimated light vehicles	16,305
estimated goods vehicles	1,978

1000-1200 outbound

total vehicles	17,944
estimated pedal cycles	53
estimated bus	735
estimated light vehicles	15,145
estimated goods vehicles	2,011

1630-1830 inbound

total vehicles	22,184
estimated pedal cycles	175
estimated bus	679
estimated light vehicles	20,626
estimated goods vehicles	704

1630-1830 outbound

total vehicles	26,559
estimated pedal cycles	323
estimated bus	834
estimated light vehicles	24,514
estimated goods vehicles	888

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 the **jdt**.

2 Methodology

Counts of vehicles crossing a cordon around Wolverhampton Town Centre are undertaken every two years using Automatic Traffic Counters (ATC's) installed on all major and most minor roads crossing the cordon. The counts record vehicles continuously, by direction, for a seven day period. The location of the sites is shown in figure 11.

Four sites are also surveyed manually by Wolverhampton M.B.C. staff. 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. This year the occupancy surveys grouped all categories together, normally the light vehicles and heavy vehicles are grouped separately to provide different factors for each grouping. Because of the lack of separation the **overall** occupancy factor has been used in all calculations.

A complimentary bus cordon survey is undertaken by **jdt**, into which this report feeds.

3 Background

The 2000 Wolverhampton Cordon ATC survey was undertaken in the week beginning 16th October. Care was taken to avoid school holidays and the Christmas shopping seasons. In future, every effort will be made to keep the cordon survey to the same week in October.

The exact position of the automatic counts can be seen in Appendix 1.

4 Diary and Quality of Data Collection

For 2000, data from a permanent ATC site at WV09 was available and was included into this years figures.

Unfortunately the data from the manual surveys, which were carried out at the same time, was lost and these surveys were carried out again in the week commencing 27th November.

Because the ATC and Manual surveys were carried out at different times no direct comparison of flows can be made. However flows seemed to follow The Department of Transport's Traffic Appraisal Manual (TAM) which quotes +/- 5% as being the error margin for a 95% confidence interval of the true flows for an automatic count taken over a period of more than 12 hours (TAM 1981 6.2.5). The corresponding error margin for a manual count taken over a short period of time is +/- 10% (TAM 1981 6.3.5).

5 Results

In the table below the figures for the number of vehicles crossing the cordon line in both directions during the morning peak period are presented. The period considered to be the morning peak has been taken as 0730 - 0930, in order to provide consistency with previous years, and allowing trends in vehicles entering and leaving Wolverhampton Town Centre to be analysed.

Table 1 No. of Vehicles Crossing the Cordon Line in the Morning Peak Period (0730 - 0930)

	1990	1992	1994	1996	1998	2000
Inbound Total	30,004	29,058	29,099	26,930	29,023	25,807
Outbound Total	17,834	17,212	19,673	17,866	18,926	19,334

From these figures, the total number of vehicles crossing the cordon towards the town centre during this time period shows a drop from previous years, inbound but a slight increase outbound.

Data prior to 1994 is based on manual surveys collected at each site for one day of the week. Data from 1994 onwards has been collected in the same way via automatic counters.

The figures for the 1000-1200 time period are given in Table 2. Again, this time period has been considered as it is the off-peak time period that has been surveyed in previous years.

Table 2 No. of Vehicles Crossing the Cordon Line in the Off-Peak Period (1000 – 1200).

	1990	1992	1994	1996	1998	2000
Inbound Total	19,452	19,602	20,465	21,118	19,853	19,025
Outbound Total	17,577	17,779	19,258	18,303	18,372	17,944

From these figures, the off-peak vehicles decreased by approximately 4% in the inbound direction, with the outbound direction decreasing by approximately 2%.

Table 3 Total Vehicles by Time Period on an Average Weekday, 1998 and 2000

	0730 - 0930	1000- 1200	1600- 1800	0700- 1900 (12 hr)	24 hour
1998					
Inbound 1998	29,023	19,853	22,261	132,658	165,384
% of 24 hr	17.54	12.0	13.46	80.21	100.00
Outbound 1998	18,926	18,372	28,747	128,274	162,946
% of 24 hr	11.61	11.27	17.64	78.72	100.00
Net 1998(Inbound Minus Outbound)	10,097	1,481	-6,486	4,384	2,438
2000					
Inbound 2000	25,807	19,025	22,674	126,417	158,273
% of 24 hr	16.3	12.0	14.3	79.9	100
Outbound 2000	19,334	17,944	26,783	124,481	158,092
% of 24 hr	12.2	11.4	16.9	78.7	100
Net 2000(Inbound minus Outbound)	6473	1081	-4109	1936	181

The figures in Table 3 show that 16.3% of traffic flowing into the town centre on a typical day is crossing the cordon line between the hours of 7.30am and 9.30am. This corresponds with the figures for the outbound traffic between 4pm and 6pm which account for 16.9% of a daily outbound flow.

The off-peak time period considered (1000-1200) shows 12.0% of the daily traffic travelling into the town centre with 11.4% travelling out of the centre .

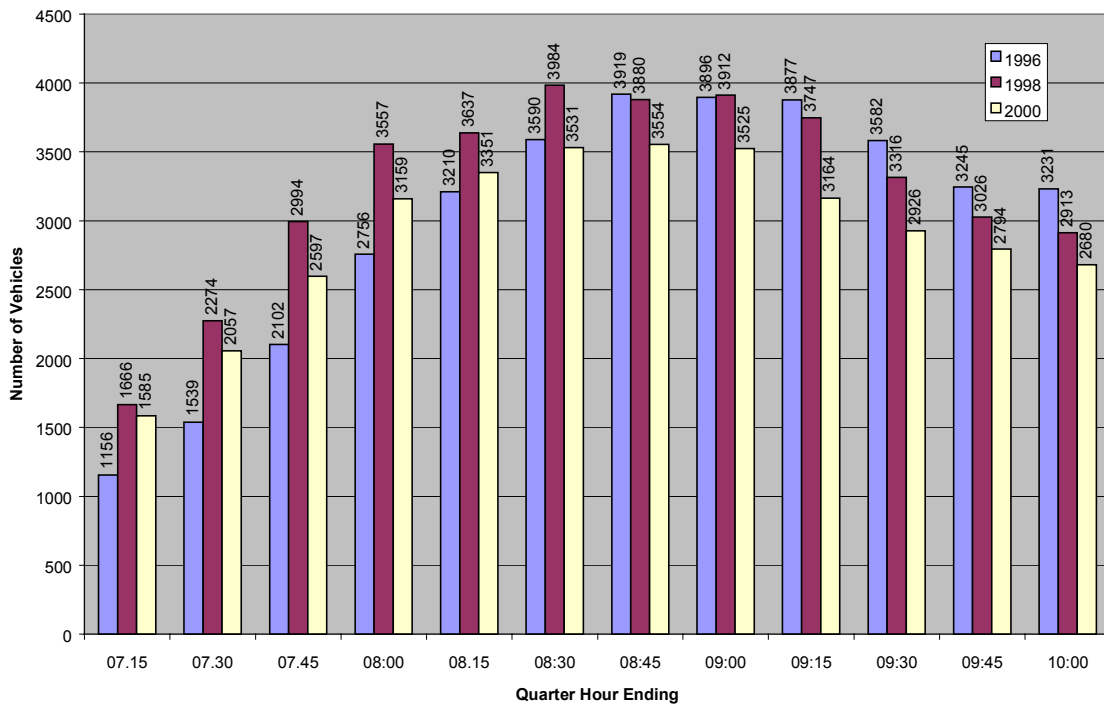
Around 80% of an average day's traffic is crossing the cordon during the main 12-hr day.

The net figure of 6,473 for the morning peak period gives some idea of the amount of the journey to work traffic to the town centre. Full figures for the net vehicles in the town centre are given in Table 5 by hour and Table 6 by station.

The time periods considered have been kept consistent with the time periods surveyed in previous years but, in future, any time period could be considered.

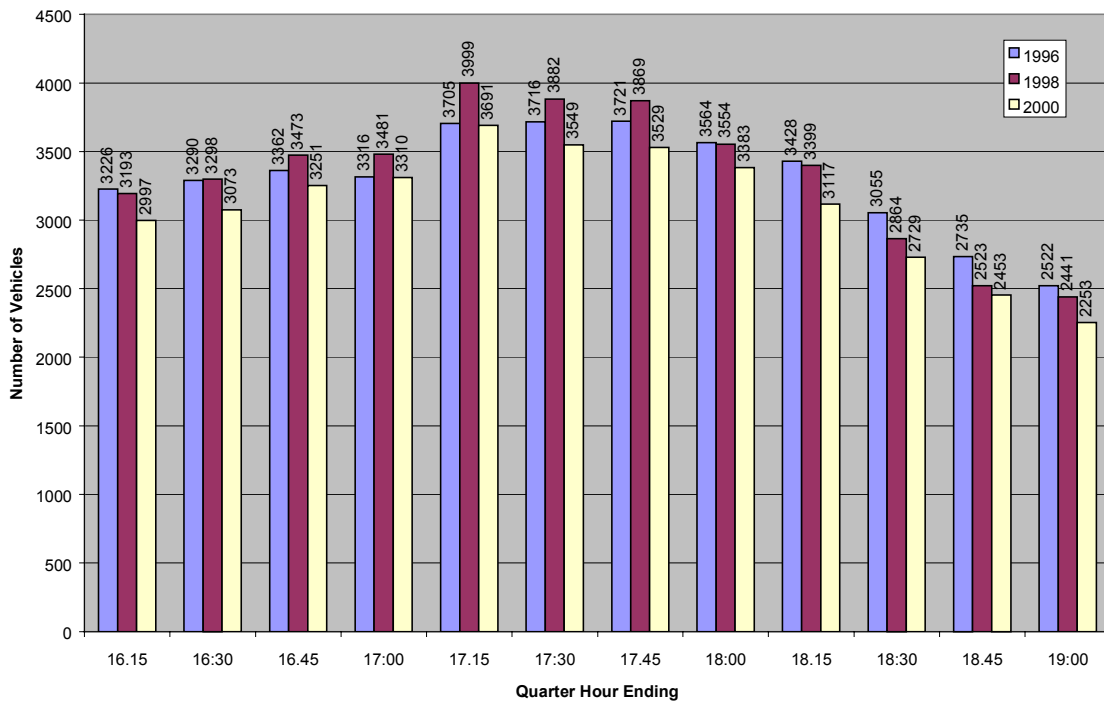
Figure 1 and 2 give a pictorial view of traffic flow in the two peak time periods, by quarter-hour periods.

Figure 1 Inbound Morning Peak: Vehicle Volumes by Quarter Hour



As expected, the graph shows the number of vehicles entering the town centre gradually increasing from 7am, with the peak number between 8.30 – 8.45am.

Figure 2 Outbound Evening Peak: Vehicle Volumes by Quarter Hour



The evening peak hour for vehicles leaving the town centre is from 5-6pm with the highest quarter hour period being 17.00-17.15.

The following Figure 3 and Figure 4 present the 24 hour variations in Total Traffic for the inbound and outbound data.

Figure 3 Inbound 24 Hour Variations in Total Traffic

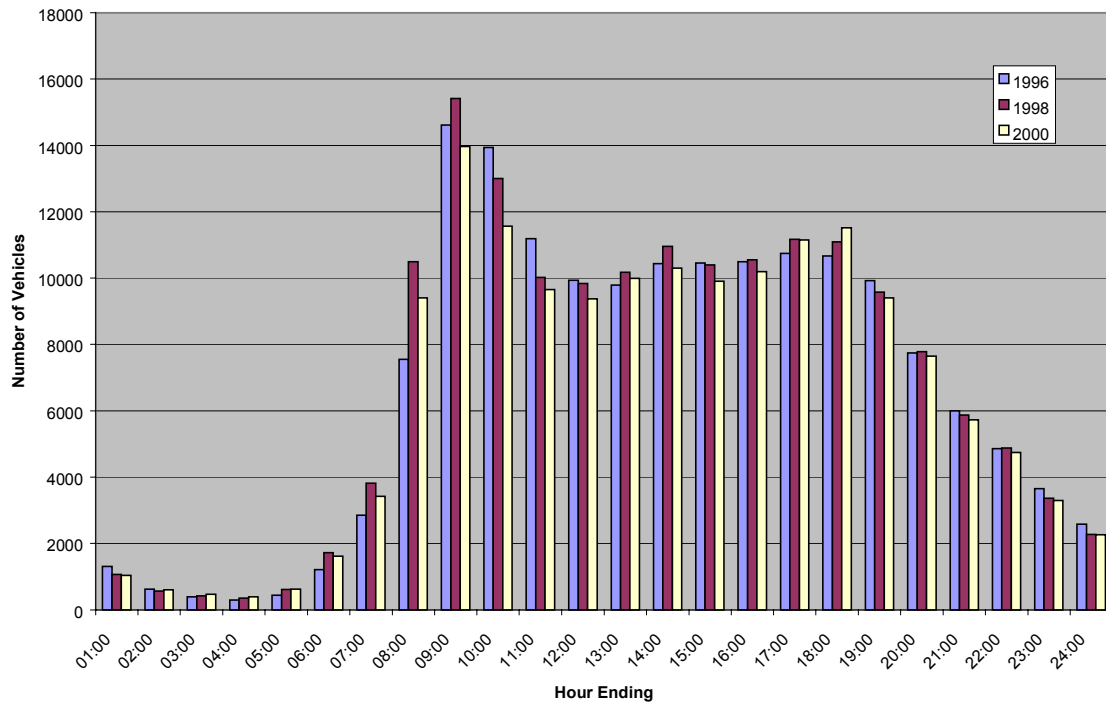
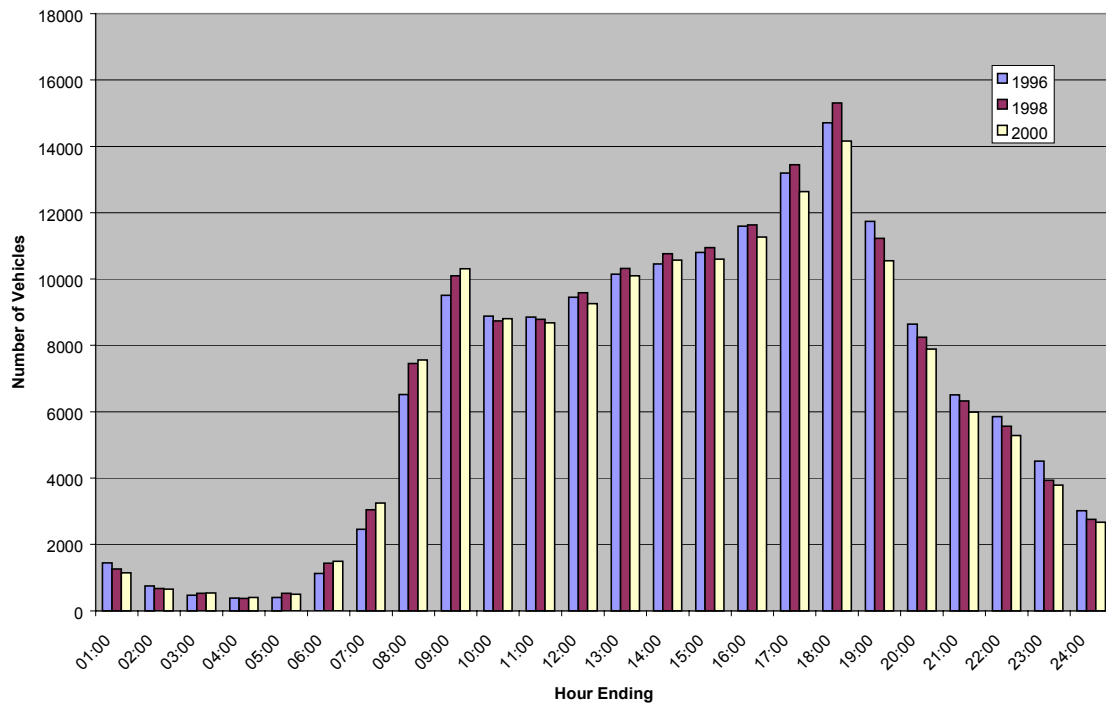
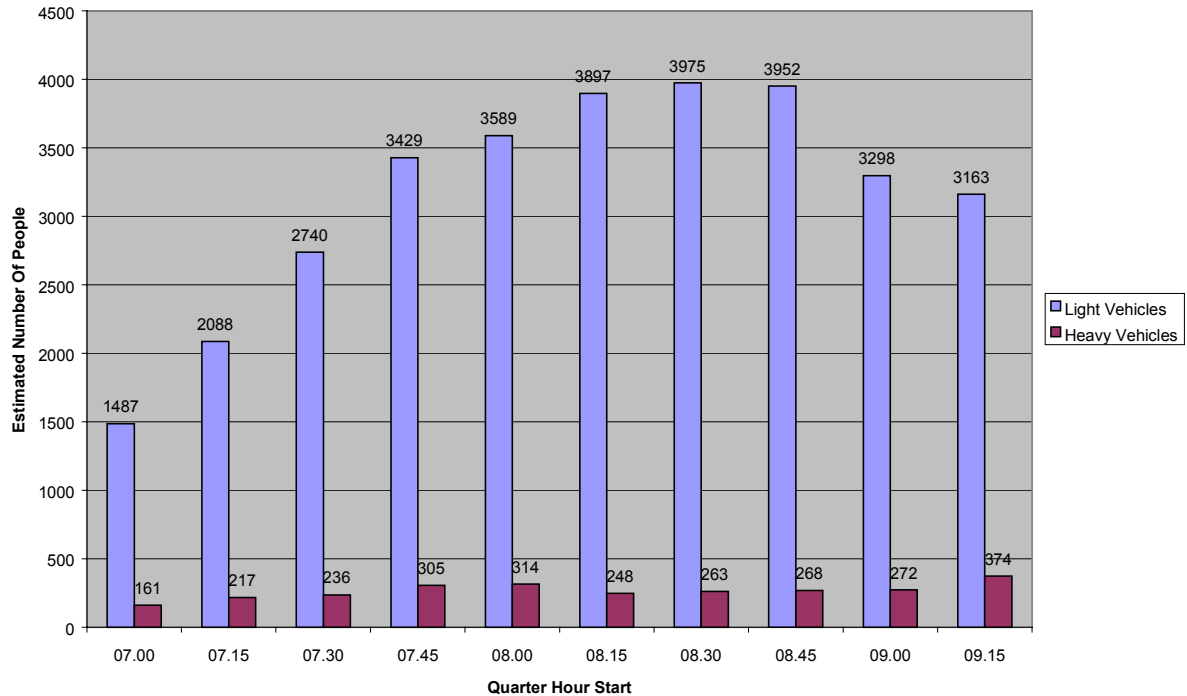


Figure 4 Outbound 24 Hour Variations in Total Traffic



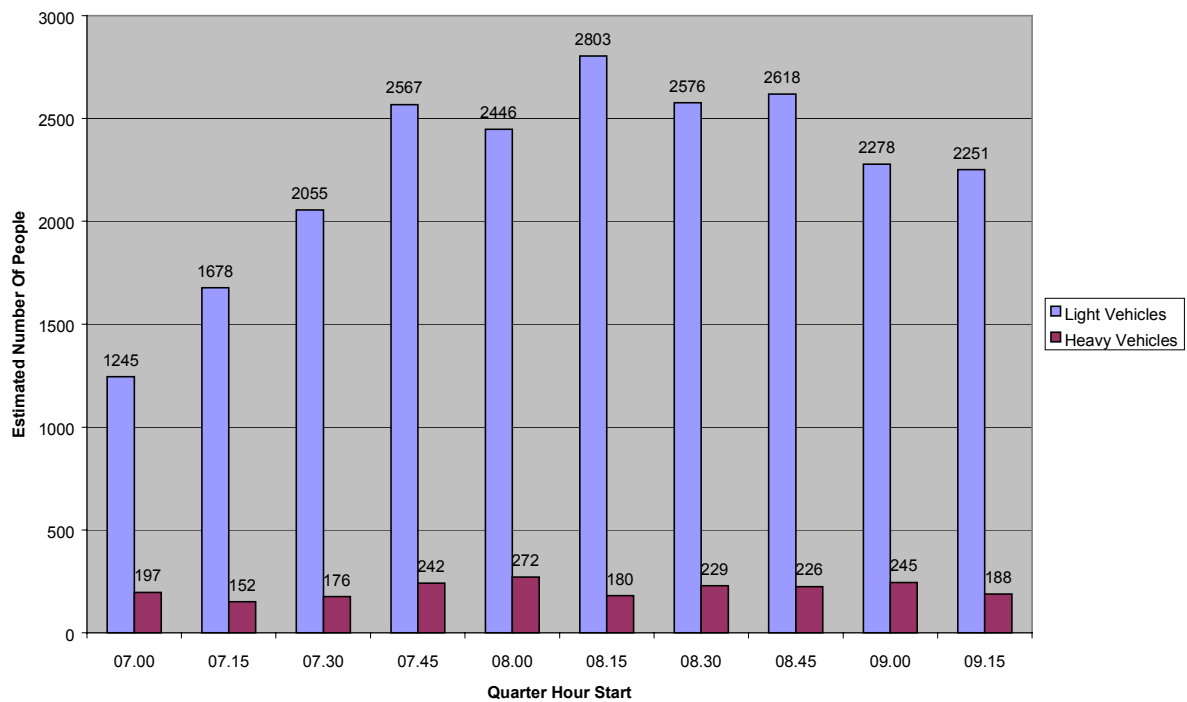
5.1 Occupancy Levels

Figure 5 Estimate of Numbers of Persons Travelling Inbound - Morning Peak



Figures 5 and 6 show the estimated numbers of persons crossing the cordon calculated from the occupancy counts at the four manual sites and the number of vehicles counted automatically per time period.

Figure 6 Estimate of Numbers of Persons Travelling Outbound - Morning Peak



5.2 Daily and Hourly Variations

Table 4 Variations in Traffic Flow by Time of Day, 2000

	MON	TUE	WED	THUR	FRI	SAT	SUN
Inbound							
0730-0930	1.000	1.021	0.989	0.995	0.996	0.495	0.162
1000-1200	0.985	0.991	0.996	0.993	1.035	1.068	0.787
1600-1800	0.982	0.991	0.993	1.006	1.030	0.702	0.557
0700-1900	0.985	0.991	0.990	0.992	1.042	0.849	0.593
0000-2400	0.968	0.980	0.986	1.002	1.064	0.897	0.651
Outbound							
0730-0930	0.966	0.981	1.028	1.020	1.006	0.484	0.202
1000-1200	0.962	1.026	1.005	0.972	1.034	0.983	0.738
1600-1800	0.980	1.023	0.984	0.993	1.021	0.888	0.532
0700-1900	0.964	1.011	0.992	0.989	1.044	0.852	0.599
0000-2400	0.952	1.000	0.989	1.002	1.057	0.892	0.658

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

Figure 7 Net Loss/gain in Vehicles Inside the Cordon, by Hour.

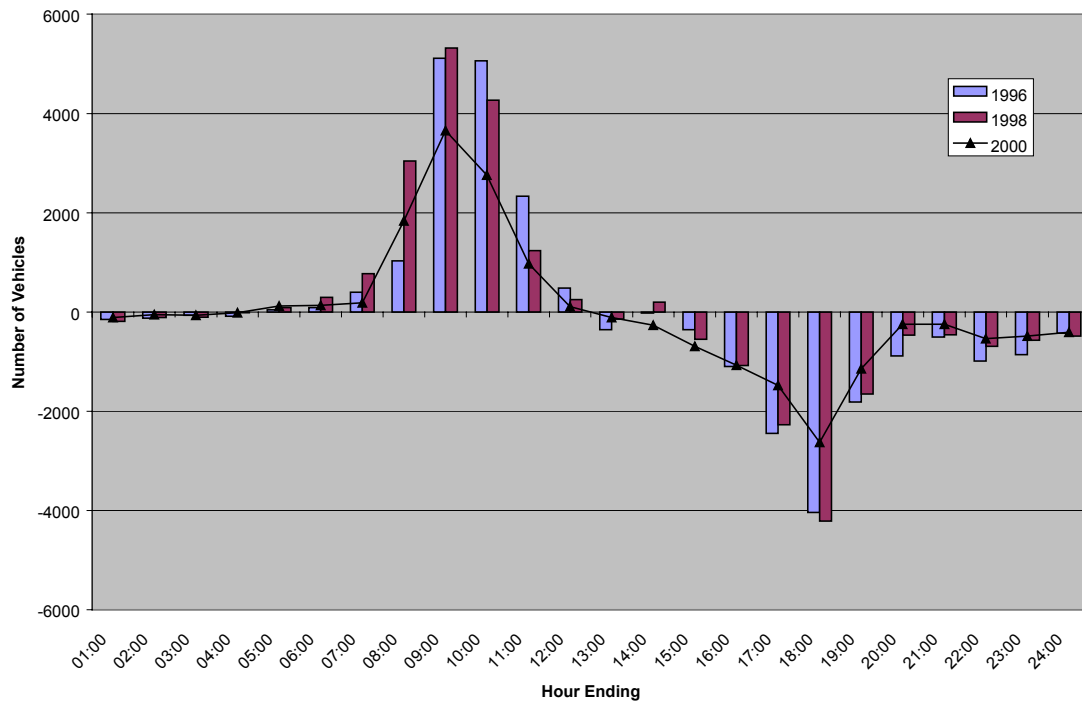


Figure 8 Net Accumulation of Vehicles Inside Cordon Area, by Hour.

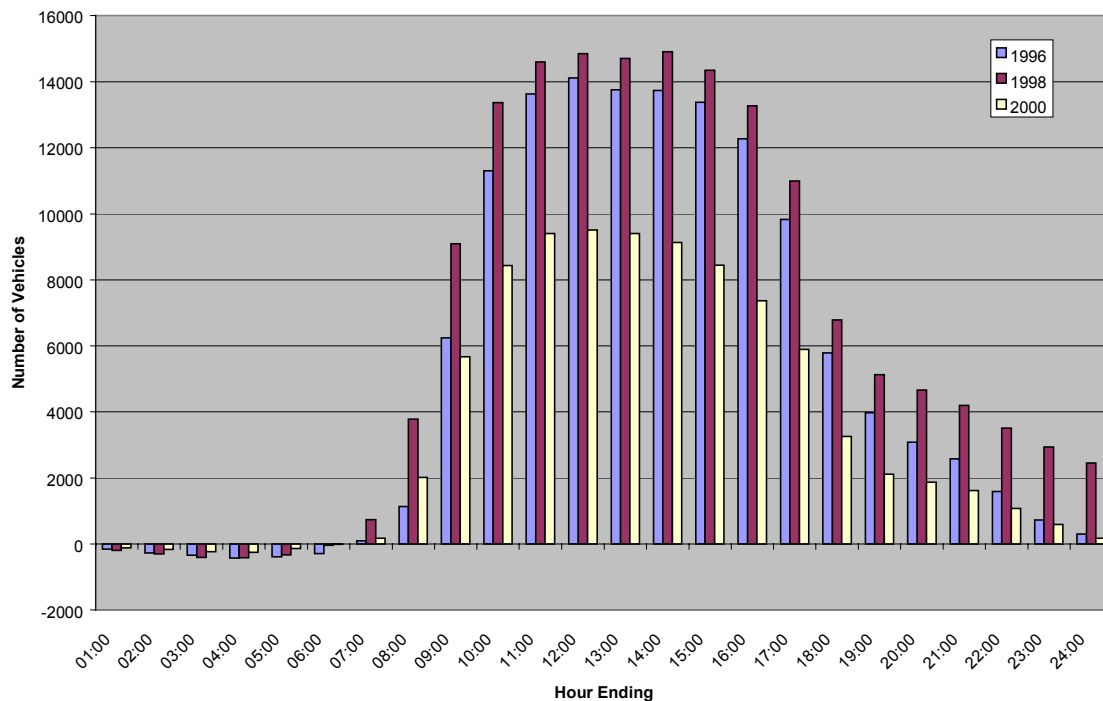


Figure 7 shows the net loss or gain to the town centre of vehicles throughout an average weekday. Stationary vehicles are not taken into account, only the movement of vehicles across the cordon line. Figure 8 shows the net accumulation of vehicles inside the cordon area by hour. The figures used for Figure 7 and Figure 8 are given in Table 5.

Table 5 Net Loss/Gain and Accumulation in Vehicles, by Hour 2000.

Hour Ending	Inbound	Outbound	Net Loss/Gain	Accumulation
1.00	1039	1151	-112	-112
2.00	602	656	-54	-166
3.00	470	537	-67	-233
4.00	391	410	-19	-252
5.00	620	504	116	-136
6.00	1625	1492	133	-3
7.00	3426	3244	182	179
8.00	9398	7560	1838	2017
9.00	13961	10307	3654	5671
10.00	11564	8805	2759	8430
11.00	9653	8682	971	9401
12.00	9372	9262	110	9511
13.00	9992	10100	-108	9403
14.00	10299	10566	-267	9136
15.00	9906	10599	-693	8443
16.00	10191	11265	-1074	7369
17.00	11153	12631	-1478	5891
18.00	11521	14152	-2631	3260
19.00	9407	10552	-1145	2115
20.00	7641	7887	-246	1869
21.00	5733	5984	-251	1618
22.00	4745	5283	-538	1080
23.00	3302	3790	-488	592
24.00	2262	2673	-411	181

5.3 Patterns of Travel

The figures in Table 6 show the number of vehicles travelling into the town centre and out of the town centre by each individual site on an average weekday. By examining these figures, it is possible to determine some patterns of behaviour in the traffic. For example, people may prefer to use one road to enter the town centre in the mornings and another to leave the town at night.

Table 6 Net Loss/Gain in Vehicles on an Average Weekday, by Site

Site	Location	1998 inbound	1998 outbound	Net	2000 inbound	2000 outbound	Net
WV01	Tettenhall Road	10085	10050	35	10085	9701	384
WV02	New Hampton Road West	8844	7395	1449	8064	6891	1173
WV03	Dunstall Road	3507	3671	-164	3747	3821	-74
WV04	Stafford Road	19147	18463	684	19557	18534	1023
WV05	Cannock Road	12961	12088	873	12594	11344	1250
WV06	Hilton Street	1325	1261	64	1463	1301	162
WV07	Wednesfield Road	13117	12782	335	15144	13082	2062
WV08	Willenhall Road	15163	15528	-365	15028	16121	-1093
WV09	Bilston Road	Replaced by	R213, R214	& R217	8278	10627	-2349
WV10	Steelhouse Lane	3143	2987	156	3623	3178	445
WV11	Vicarage Road	1749	1382	367	1582	1447	135
WV12	Birmingham Road	10651	11617	-966	11204	11260	-56
WV13	Dudley Road	11082	9205	1877	11043	9788	1255
WV14	Penn Road	15785	16363	-578	15886	16979	-1093
WV15	Gt. Brickkiln Street	3148	3479	-331	3058	3747	-689
WV16	Merridale Road	10927	11548	-621	9833	11822	-1989
WV17	Compton Road	8829	9394	-565	8085	8445	-360
R213	Dixon Street	3054	2948	86			
R214	Ettingshall Road	3322	2907	415			
R217	Bilston Road	9560	9912	-352			

5.4 Mode of Travel

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

Table 7 shows a summary of the data collected from the four manually surveyed sites. For the purpose of this table, light vehicles includes motorcycles, cars & taxis, and Goods Vehicles less than 1.5 tonnes. The heavy vehicle category includes all vehicles greater than 1.5 tonnes.

In Table 7 the percentage the vehicle category contributes to the total vehicles in that hour is given in brackets. In Tables 8 and 10 we have multiplied these percentages by the number of vehicles counted automatically, giving an indication of the number of each type of vehicle.

Table 7 Summary of inbound modal data from manual surveys

Time Starting	Total Vehs	Pedal Cycles	Bus & Coach	Total Light Vehicles	Total Heavy Vehicles
07:00	2377	29 (1.22%)	113 (4.75%)	2039 (85.78%)	196 (8.25%)
08:00	3106	25 (0.80%)	93 (2.99%)	2788 (89.76%)	200 (6.44%)
09:00	2759	9 (0.33%)	101 (3.66%)	2397 (86.88%)	252 (9.13%)
10:00	2569	8 (0.31%)	91 (3.54%)	2193 (85.36%)	277 (10.78%)
11:00	2430	10 (0.41%)	86 (3.54%)	2091 (86.05%)	243 (10.00%)
12:00	2540	15 (0.59%)	91 (3.58%)	2215 (87.20%)	219 (8.62%)
13:00	2659	11 (0.41%)	92 (3.46%)	2329 (87.59%)	227 (8.54%)
14:00	2417	5 (0.21%)	97 (4.01%)	2114 (87.46%)	201 (8.32%)
15:00	2467	15 (0.61%)	87 (3.53%)	2179 (88.33%)	186 (7.54%)
16:00	2710	20 (0.74%)	96 (3.54%)	2463 (90.89%)	131 (4.83%)
17:00	2645	25 (0.95%)	78 (2.95%)	2450 (92.63%)	92 (3.48%)
18:00	2236	11 (0.49%)	58 (2.59%)	2124 (94.99%)	43 (1.92%)
Total	30915	183 (0.59%)	1083 (3.50%)	27382 (88.57%)	2267 (7.33%)

Table 8 Estimated inbound mode of transport figures

Time Starting	No. Vehs counted automatically	estimated ped cyc	estimated bus	estimated light vehs	estimated heavy vehs
07:00	9398	115	447	8062	775
08:00	13961	112	418	12532	899
09:00	11564	38	423	10047	1056
10:00	9653	30	342	8240	1041
11:00	9372	39	332	8065	937
12:00	9992	59	358	8713	862
13:00	10299	43	356	9021	879
14:00	9906	20	398	8664	824
15:00	10191	62	359	9001	768
16:00	11153	82	395	10136	539
17:00	11521	109	340	10672	401
18:00	9407	46	244	8936	181
Total	126417	748	4429	111970	9270

Figure 9 Estimated inbound mode of transport figures

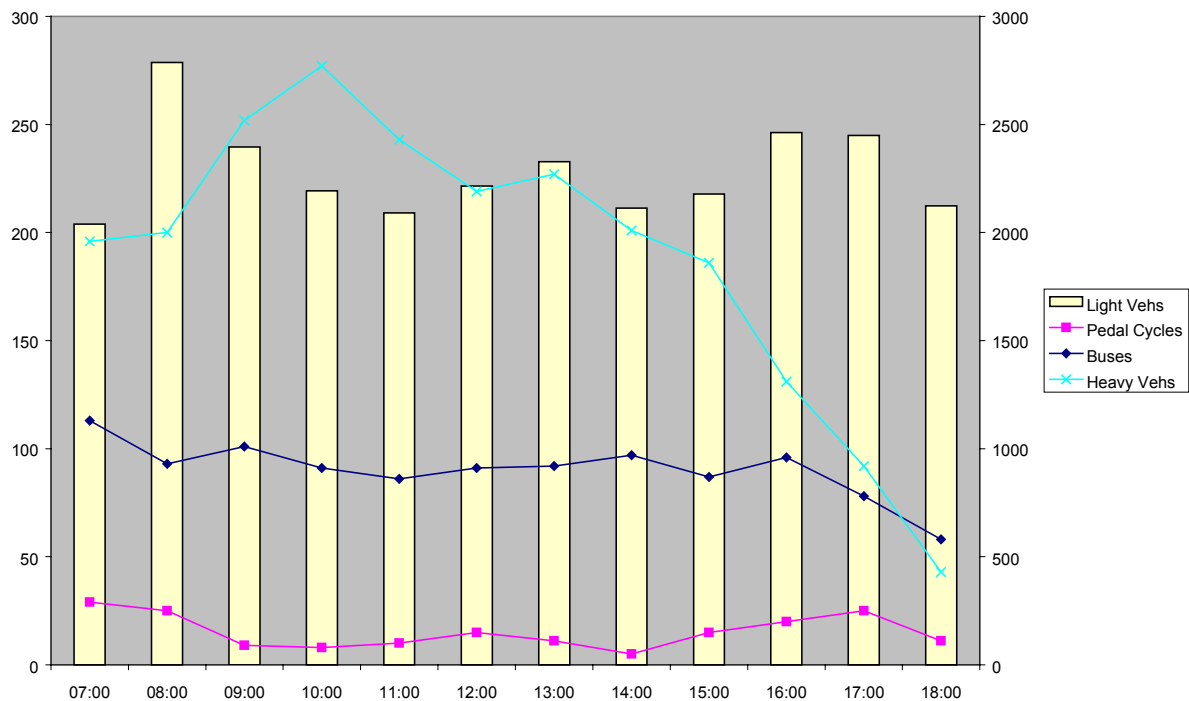


Figure 9 graphically illustrates the figures in Table 8. The lines in the graph are to be read from the left hand axis and the bar (light vehicles) from the right hand axis. The corresponding figures for manually counted outbound vehicles are given in Table 9, and estimated figures in Table 10 and Figure 10.

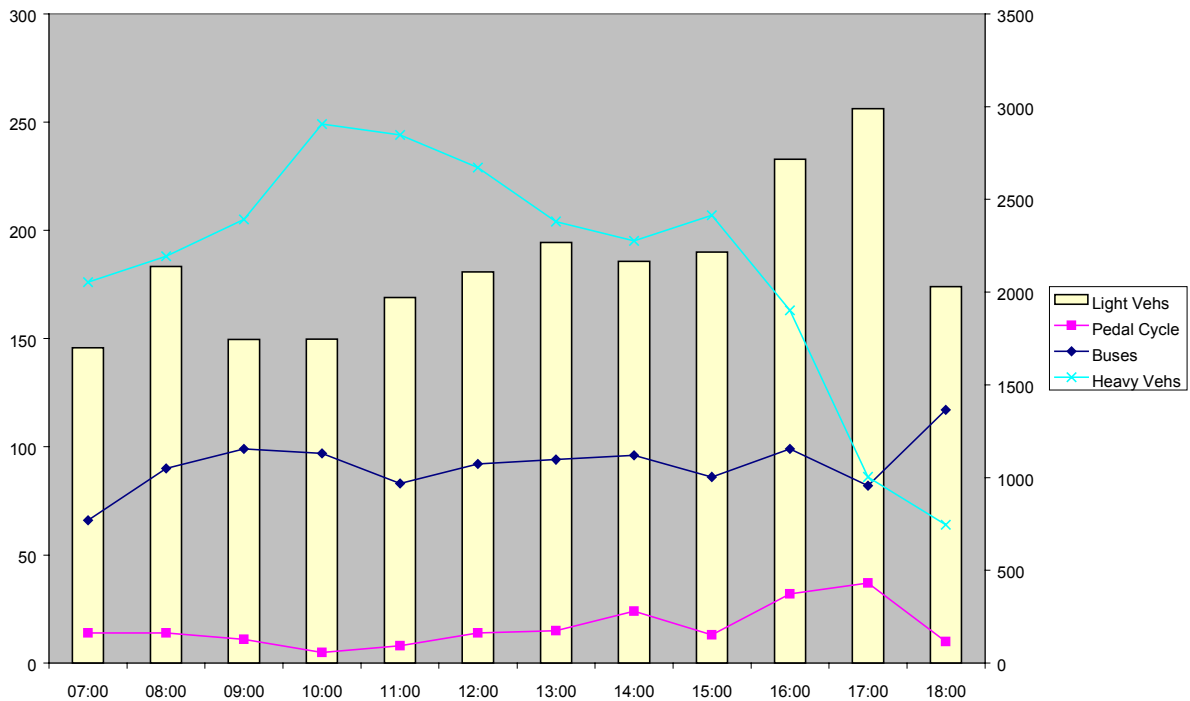
Table 9 Summary of outbound modal data from manual surveys

Time Starting	Total Vehs	Pedal Cycles	Bus & Coach	Total Light Vehicles	Total Heavy Vehicles
07:00	1956	14 (0.72%)	66 (3.37%)	1700 (86.91%)	176 (9.00%)
08:00	2430	14 (0.58%)	90 (3.70%)	2138 (87.98%)	188 (7.74%)
09:00	2059	11 (0.53%)	99 (4.81%)	1744 (84.70%)	205 (9.96%)
10:00	2097	5 (0.24%)	97 (4.63%)	1746 (83.26%)	249 (11.87%)
11:00	2306	8 (0.35%)	83 (3.60%)	1971 (85.47%)	244 (10.58%)
12:00	2438	14 (0.57%)	92 (3.77%)	2109 (86.51%)	229 (9.39%)
13:00	2580	15 (0.58%)	94 (3.64%)	2267 (87.87%)	204 (7.91%)
14:00	2480	24 (0.97%)	96 (3.87%)	2165 (87.30%)	195 (7.86%)
15:00	2523	13 (0.52%)	86 (3.41%)	2217 (87.87%)	207 (8.20%)
16:00	3010	32 (1.06%)	99 (3.29%)	2716 (90.23%)	163 (5.42%)
17:00	3193	37 (1.16%)	82 (2.57%)	2988 (93.58%)	86 (2.69%)
18:00	2220	10 (0.45%)	117 (5.27%)	2029 (91.40%)	64 (2.88%)
Total	29292	197 (0.67%)	1101 (3.76%)	25790 (88.04%)	2210 (7.54%)

Table 10 Estimated outbound mode of transport figures

Time Starting	No. Vehs counted automatically	estimated ped cyc	estimated bus	estimated light vehs	estimated heavy vehs
07:00	7560	54	255	6571	680
08:00	10307	59	382	9068	797
09:00	8805	47	423	7458	877
10:00	8682	21	402	7229	1031
11:00	9262	32	333	7916	980
12:00	10100	58	381	8737	949
13:00	10566	61	385	9284	835
14:00	10599	103	410	9253	833
15:00	11265	58	384	9899	924
16:00	12631	134	415	11397	684
17:00	14152	164	363	13243	381
18:00	10552	48	556	9644	304
Total	124481	837	4679	109599	9392

Figure 10 Estimated outbound mode of transport figures



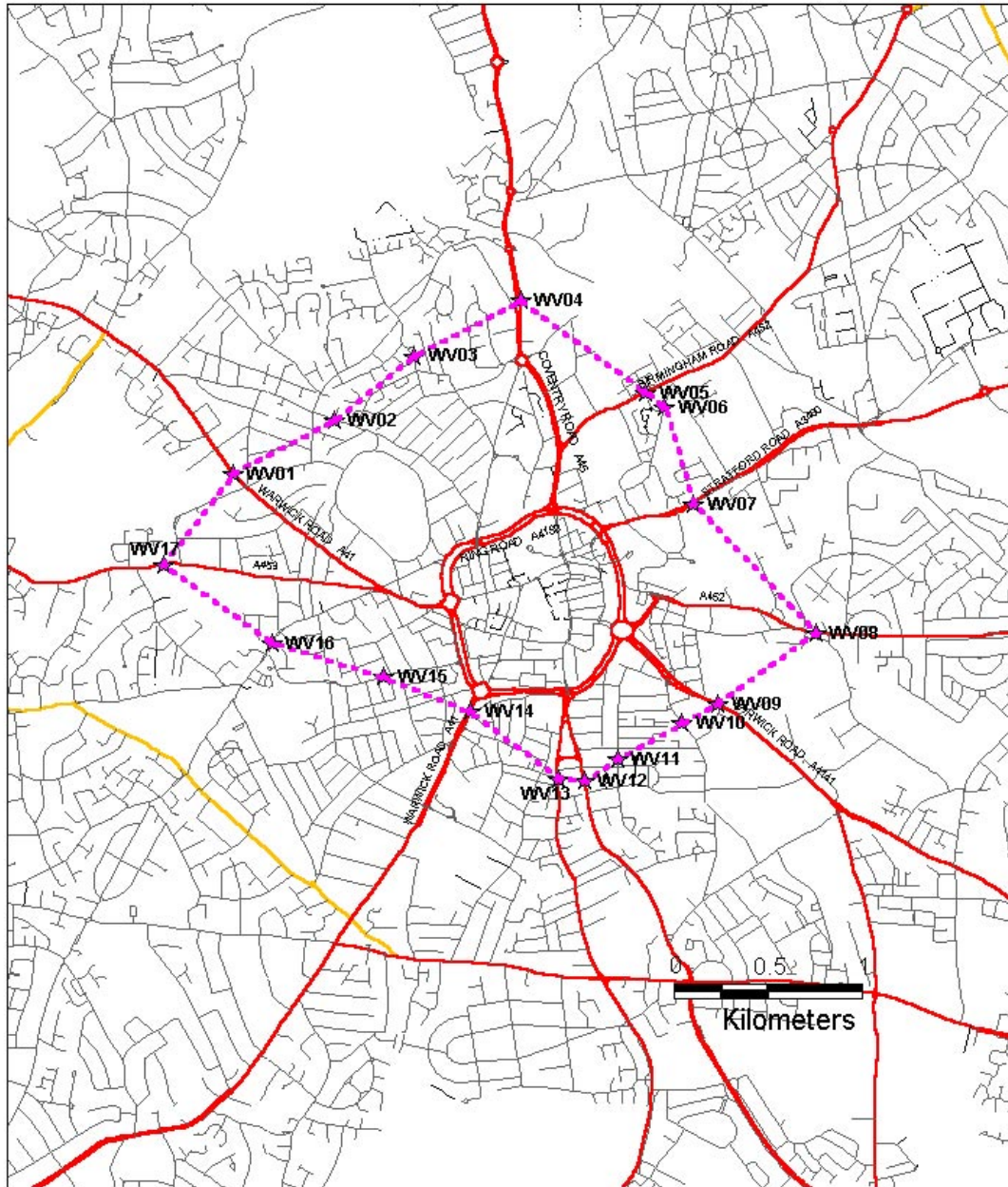
6 Appendix 1 Position Of Cordon Sites

The sites were chosen so as to create a closed cordon. The sites remain in the same position as those carried out manually in previous years. The map overleaf shows roughly where the sites were positioned, a description of the exact locations are given below.


Table A1. 1 Description of the Position of the Cordon Sites

Site	Name of Road	Exact Position
WV01	Tettenhall Road	Between Paget Road and St. Jude's Road West
WV02	New Hampton Rd West	Between Hunter St and Evans St.
WV03	Dunstall Road	Between Lowe Street and Evans Street
WV05	Cannock Road	Between Cambridge Street and Prole Street
WV04	Stafford Road	Between Gorsebrook Rd and Fiveways
WV06	Hilton Street	Between Springfield Rd and Yarwell Close
WV07	Wednesfield Road	Between Sun Street and Lincoln Street
WV08	Willenhall Road	Between Colliery Rd and Hickman Ave.
WV09	Bilston Road	Between Jenner Street and Steelhouse Lane
WV10	Steelhouse Lane	Between Gordon Street and Eagle Street
WV11	Vicarage Road	Between All Saints Rd and Bowdler Rd.
WV12	Birmingham Road	Between Derry St and Cartwright St
WV13	Dudley Road	Between Cartwright St and Drayton St.
WV14	Penn Road	Between Ablow St and Ring Road
WV15	Gt. Brickkiln St	Between Ashland St and Cherry St
WV16	Merridale Road	Between Merridale Ln and Aspen Way
WV17	Compton Road	Between Clark Rd and Richmond Rd

Figure 11 Location of Wolverhampton ATC Sites



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 Wbdc01\47995\monitoring\Wolverhampton cordon 2000\sites.wor

Title Location of Wolverhampton ATC Cordon sites					 Mott MacDonald Limited Canterbury House 85 Newhall Street, Birmingham, B3 1LZ Telephone 0121-237-4002 Fax 0121-237-4003	
Date	Drawn	Checked	Approved	Status	Drawing no.	Rev.
23/11/00	JS	JTB/DMK	BWS	Final	47995/BA15/02	A

7 Appendix 2 Comparison of Manual and Automatic Counts

Four of the automatic sites were manually surveyed for the 12 hour period (0700 - 1900)
The figures presented here compare the results of the manual surveys with the results of the automatic surveys for certain time periods. The surveys were not carried out at the same time, the ATC's were carried out in October and the manuals in November, so comparisons are not really accurate

Table A2. 1 WV05 Cannock Road

	INBOUND		OUTBOUND	
	Manual	Automatic	Manual	Automatic
Time Period				
07.30 - 09.30	1,682	1,814	1,086	1,279
16.30 - 18.30	1,537	1,572	1,652	1,829
07.00 - 19.00	9,579	9,807	7,871	8,777

Table A2. 2 WV06 Hilton Road

	INBOUND		OUTBOUND	
	Manual	Automatic	Manual	Automatic
Time Period				
07.30 - 09.30	211	156	117	240
16.30 - 18.30	152	259	199	177
07.00 - 19.00	941	1,222	905	1,115

Table A2.3 WV07 Wednesfield Road

	INBOUND		OUTBOUND	
	Manual	Automatic	Manual	Automatic
Time Period				
07.30 - 09.30	1,871	2,449	1,737	1,848
16.30 - 18.30	1,498	2,224	2,316	2,184
07.00 - 1900	9,135	11,929	10,673	10,388

Table A2.4 WV08 Willenhall Road

	INBOUND		OUTBOUND	
	Manual	Automatic	Manual	Automatic
Time Period				
07.30 - 09.30	2,220	2,099	1,621	2,137
16.30 - 18.30	2,010	2,060	1,755	2,186
07.00 - 1900	11,260	11,665	9,843	12,515

8 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	2377	29	113	2039	196	1.22%	4.75%	85.78%	8.25%	9398	115	447	8062	775
	08:00	3106	25	93	2788	200	0.80%	2.99%	89.76%	6.44%	13961	112	418	12532	899
	09:00	2759	9	101	2397	252	0.33%	3.66%	86.88%	9.13%	11564	38	423	10047	1056
	10:00	2569	8	91	2193	277	0.31%	3.54%	85.36%	10.78%	9653	30	342	8240	1041
	11:00	2430	10	86	2091	243	0.41%	3.54%	86.05%	10.00%	9372	39	332	8065	937
	12:00	2540	15	91	2215	219	0.59%	3.58%	87.20%	8.62%	9992	59	358	8713	862
	13:00	2659	11	92	2329	227	0.41%	3.46%	87.59%	8.54%	10299	43	356	9021	879
	14:00	2417	5	97	2114	201	0.21%	4.01%	87.46%	8.32%	9906	20	398	8664	824
	15:00	2467	15	87	2179	186	0.61%	3.53%	88.33%	7.54%	10191	62	359	9001	768
	16:00	2710	20	96	2463	131	0.74%	3.54%	90.89%	4.83%	11153	82	395	10136	539
	17:00	2645	25	78	2450	92	0.95%	2.95%	92.63%	3.48%	11521	109	340	10672	401
	18:00	2236	11	58	2124	43	0.49%	2.59%	94.99%	1.92%	9407	46	244	8936	181
	Total	30915	183	1083	27382	2267	0.59%	3.50%	88.57%	7.33%	126417	748	4429	111970	9270
	10-12 Total	4999	18	177	4284	520	0.98%	7.11%	82.84%	9.07%	19025	69	674	16305	1978
	07:00	408	4	29	338	37	0.98%	7.11%	82.84%	9.07%	1585	16	113	1313	144
	07:15	570	8	27	484	51	1.40%	4.74%	84.91%	8.95%	2057	29	97	1747	184
	07:30	615	7	33	529	46	1.14%	5.37%	86.02%	7.48%	2597	30	139	2234	194
	07:45	784	10	24	688	62	1.28%	3.06%	87.76%	7.91%	3159	40	97	2772	250
	08:00	770	7	24	679	60	0.91%	3.12%	88.18%	7.79%	3351	30	104	2955	261
	08:15	746	8	26	669	43	1.07%	3.49%	89.68%	5.76%	3531	38	123	3167	204
	08:30	781	7	22	705	47	0.90%	2.82%	90.27%	6.02%	3554	32	100	3208	214
	08:45	809	3	21	735	50	0.37%	2.60%	90.85%	6.18%	3525	13	92	3203	218
	09:00	793	3	31	701	58	0.38%	3.91%	88.40%	7.31%	3164	12	124	2797	231
	09:15	686	3	23	590	70	0.44%	3.35%	86.01%	10.20%	2926	13	98	2517	299
	Total	6962	60	260	6118	524	0.86%	3.73%	87.88%	7.53%	29449	254	1100	25879	2217
	16:30	704	6	28	640	30	0.85%	3.98%	90.91%	4.26%	2871	24	114	2610	122
	16:45	660	4	21	613	22	0.61%	3.18%	92.88%	3.33%	2828	17	90	2627	94
	17:00	716	10	19	656	31	1.40%	2.65%	91.62%	4.33%	3028	42	80	2774	131
	17:15	654	4	24	613	13	0.61%	3.67%	93.73%	1.99%	2865	18	105	2685	57
	17:30	658	3	17	617	21	0.46%	2.58%	93.77%	3.19%	2840	13	73	2663	91
	17:45	617	8	18	564	27	1.30%	2.92%	91.41%	4.38%	2788	36	81	2549	122
	18:00	608	3	15	579	11	0.49%	2.47%	95.23%	1.81%	2553	13	63	2431	46
	18:15	580	3	17	550	10	0.52%	2.93%	94.83%	1.72%	2411	12	71	2286	42
	Total	5197	41	159	4832	165	0.79%	3.06%	92.98%	3.17%	22184	175	679	20626	704

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. Coach	Est. Bus & Coach	Est. Light Vehs	Est. Heavy Vehs
07:00	1956	14	66	1700	176	0.72%	3.37%	86.91%	9.00%	7560	54	255	6571	6571	
08:00	2430	14	90	2138	188	0.58%	3.70%	87.98%	7.74%	10307	59	382	9068	9068	
09:00	2059	11	99	1744	205	0.53%	4.81%	84.70%	9.96%	8805	47	423	7458	7458	
10:00	2097	5	97	1746	249	0.24%	4.63%	83.26%	11.87%	8682	21	402	7229	7229	
11:00	2306	8	83	1971	244	0.35%	3.60%	85.47%	10.58%	9262	32	333	7916	7916	
12:00	2438	14	92	2109	229	0.57%	3.77%	86.51%	9.39%	10100	58	381	8737	8737	
13:00	2580	15	94	2267	204	0.58%	3.64%	87.87%	7.91%	10566	61	385	9284	9284	
14:00	2480	24	96	2165	195	0.97%	3.87%	87.30%	7.86%	10599	103	410	9253	9253	
15:00	2523	13	86	2217	207	0.52%	3.41%	87.87%	8.20%	11265	58	384	9899	9899	
16:00	3010	32	99	2716	163	1.06%	3.29%	90.23%	5.42%	12631	134	415	11397	11397	
17:00	3193	37	82	2988	86	1.16%	2.57%	93.58%	2.69%	14152	164	363	13243	13243	
18:00	2220	10	117	2029	64	0.45%	5.27%	91.40%	2.88%	10552	48	556	9644	9644	
Total	29292	197	1101	25790	2210	0.67%	3.76%	88.04%	7.54%	124481	837	4679	109599	109599	
10-12 Total	4403	13	180	3717	493					17944	53	735	15145	15145	
07:00	378	2	11	315	50	0.53%	2.91%	83.33%	13.23%	1314	7	38	1095	1095	
07:15	471	3	12	418	38	0.64%	2.55%	88.75%	8.07%	1683	11	43	1494	1494	
07:30	490	7	19	427	37	1.43%	3.88%	87.14%	7.55%	2059	29	80	1794	1794	
07:45	617	2	24	540	51	0.32%	3.89%	87.52%	8.27%	2504	8	97	2192	2192	
08:00	672	3	31	574	64	0.45%	4.61%	85.42%	9.52%	2525	11	116	2157	2157	
08:15	650	3	21	588	38	0.46%	3.23%	90.46%	5.85%	2678	12	87	2423	2423	
08:30	562	4	22	492	44	0.71%	3.91%	87.54%	7.83%	2562	18	100	2243	2243	
08:45	546	4	16	484	42	0.73%	2.93%	88.64%	7.69%	2542	19	74	2253	2253	
09:00	519	2	25	444	48	0.39%	4.82%	85.55%	9.25%	2245	9	108	1921	1921	
09:15	505	4	25	439	37	0.79%	4.95%	86.93%	7.33%	2219	18	110	1929	1929	
Total	5410	34	206	4721	449	0.63%	3.81%	87.26%	8.30%	22331	140	850	19487	19487	
16:30	733	13	30	653	37	1.77%	4.09%	89.09%	5.05%	3251	58	133	2896	2896	
16:45	793	14	18	730	31	1.77%	2.27%	92.06%	3.91%	3310	58	75	3047	3047	
17:00	884	18	24	817	25	2.04%	2.71%	92.42%	2.83%	3691	75	100	3411	3411	
17:15	817	12	17	758	30	1.47%	2.08%	92.78%	3.67%	3549	52	74	3293	3293	
17:30	729	3	20	690	16	0.41%	2.74%	94.65%	2.19%	3529	15	97	3340	3340	
17:45	763	4	21	723	15	0.52%	2.75%	94.76%	1.97%	3383	18	93	3206	3206	
18:00	643	3	29	589	22	0.47%	4.51%	91.60%	3.42%	3117	15	141	2855	2855	
18:15	560	5	27	506	22	0.89%	4.82%	90.36%	3.93%	2729	24	132	2466	2466	
Total	5922	72	186	5466	198	1.22%	3.14%	92.30%	3.34%	26559	323	834	24514	24514	

9 Appendix 4 Estimates of Persons From Occupancy Data

Start Time	Number of vehicles with Occupants						Total Ave Pass Occupancy	Automatically Counted Vehicles	B	C	D	E	F	G	H
	1	2	3	4	5	Total Veh									
	Vehicle Classes Surveyed														
	02 - Motor cycles etc														
	03 - Cars & taxis														
	05 - GV <30 cwt														
	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														
	Number of vehicles with Occupants														
07.00	269	25	4	1	0	299	335	1585	113	16	128	1313	1471	1487	144
07.15	464	84	4	1	1	554	653	2057	97	29	126	1747	2059	2088	184
07.30	489	120	4	1	0	614	745	2597	139	30	169	2234	2710	2740	194
07.45	559	115	15	3	0	692	846	3159	97	40	137	2772	3389	3429	250
08.00	598	114	16	1	0	729	878	3351	104	30	135	2955	3559	3589	261
08.15	559	116	12	1	2	690	841	3531	123	38	161	3167	3860	3897	204
08.30	523	117	12	3	0	655	805	3554	100	32	132	3208	3943	3975	214
08.45	533	129	10	2	0	674	829	3525	92	13	105	3203	3939	3952	218
09.00	584	95	13	0	0	692	813	3164	124	12	136	2797	3286	3298	231
09.15	494	124	15	2	0	635	795	2926	98	13	111	2517	3151	3163	299
07.30-09.30	4339	930	97	13	2	5381	6552	25807	877	208	22852	28044	1870	22	
09.30	457	117	10	2	0	586	729	25807	877	208	22852	28044	1870	22	
09.45	460	126	15	2	0	603	765	25807	877	208	22852	28044	1870	22	
10.00	460	127	14	2	0	603	764	25807	877	208	22852	28044	1870	22	
10.15	480	123	27	3	0	633	819	25807	877	208	22852	28044	1870	22	
10.30	498	129	18	1	0	646	814	25807	877	208	22852	28044	1870	22	
10.45	404	131	19	4	1	559	744	25807	877	208	22852	28044	1870	22	
11.00	451	165	19	5	0	640	858	25807	877	208	22852	28044	1870	22	
11.15	344	120	17	3	0	484	647	25807	877	208	22852	28044	1870	22	
11.30	427	134	12	2	0	575	739	25807	877	208	22852	28044	1870	22	
11.45	476	138	17	4	0	635	819	25807	877	208	22852	28044	1870	22	
10.00-12.00	3540	1067	143	24	1	4775	6204	13448	16855	4	13448	16855	1.25	1.25	
12.00	465	121	21	3	0	610	782	13448	16855	4	13448	16855	1.25	1.25	
12.15	476	135	27	2	0	640	835	13448	16855	4	13448	16855	1.25	1.25	
07.00-12.30	10470	2605	321	48	4	13448	16855	1.25	1.25	1.25	1.25	1.25	1.25	1.25	

Start Time	Number of vehicles with					Total Veh	Total Ave Pass Occupancy	A		B		C		D		E		F		G		
	1	2	3	4	5			Automatically Counted Vehicles	Estimated Number of Buses	Estimated Pedal Cycles	B+C	Est. Light Vehs.	ExAve Occ	F+C Est People Light Vehs + Ped Cyc	Estimated Heavy Vehs							
	Occupants																					
07.00	222	27	3	0	0	252	285	1.13	1314	38	7	45	1095	1238	1245	174	1					
07.15	360	41	3	0	0	404	451	1.12	1683	43	11	54	1494	1667	1678	136	1					
07.30	464	44	10	1	0	519	586	1.13	2059	80	29	109	1794	2026	2055	155	1					
07.45	541	77	13	1	0	632	738	1.17	2504	97	8	106	2192	2559	2567	207	2					
08.00	661	72	10	0	1	744	840	1.13	2525	116	11	128	2157	2435	2446	240	2					
08.15	631	76	14	2	0	723	833	1.15	2678	87	12	99	2423	2791	2803	157	1					
08.30	608	71	8	2	1	690	787	1.14	2562	100	18	119	2243	2558	2576	201	2					
08.45	578	73	13	1	0	665	767	1.15	2542	74	19	93	2253	2599	2618	196	2					
09.00	547	90	11	2	0	650	768	1.18	2245	108	9	117	1921	2269	2278	208	2					
09.15	469	68	6	2	0	545	631	1.16	2219	110	18	127	1929	2233	2251	163	1					
07.30-09.30	4499	571	85	11	2	5168	5950	1.15	19334	773	124	16911	1526	19595	17							
09.30	473	94	15	4	0	586	722	1.23														
09.45	390	101	15	1	1	508	646	1.27														
10.00	467	95	8	3	0	573	693	1.21														
10.15	440	95	12	0	0	547	666	1.22														
10.30	447	94	9	4	0	554	678	1.22														
10.45	392	108	16	5	0	521	676	1.30														
11.00	471	128	24	2	0	625	807	1.29														
11.15	456	101	23	5	0	585	747	1.28														
11.30	439	100	17	2	0	558	698	1.25														
11.45	435	110	25	6	3	579	769	1.33														
10.00-12.00	3547	831	134	27	3	4542	5734	1.26														
12.00	453	126	11	4	0	594	754	1.27														
12.15	494	120	19	8	2	643	833	1.30														
07.00-12.30	10438	1911	285	55	8	12697	15375	1.21														