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Data Input Table – Do Not Delete

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Report Title – first line	Pages i and ii	T1		Coventry Cordon 1999
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Report Title or Heading – first line	Left aligned in headers	HL1		Coventry Cordon Report 1999
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		47995/025
Report Number	Footers	RPTNR		01
Revision Letter	Issue and Revision Record on page ii and footers	REV		B
Date of issue or report	Page i, Issue and Revision Record on page ii and footers	DATE		January 2000
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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	31033
estimated pedal cycles	124
estimated bus	1217
estimated light vehicles	28143
estimated goods vehicles	1550
estimated persons (light vehicles)	35792
estimated persons (heavy vehicles)	1961

0730-0930 outbound

total vehicles	20815
estimated pedal cycles	66
estimated bus	806
estimated light vehicles	18868
estimated goods vehicles	1075
estimated persons (light vehicles)	23707
estimated persons (heavy vehicles)	1322

1000-1200 inbound

total vehicles	18804
estimated pedal cycles	69
estimated bus	565
estimated light vehicles	17184
estimated goods vehicles	986

1000-1200 outbound

total vehicles	18087
estimated pedal cycles	90
estimated bus	545
estimated light vehicles	16493
estimated goods vehicles	959

1630-1830 inbound

total vehicles	23363
estimated pedal cycles	162
estimated bus	451
estimated light vehicles	22532
estimated goods vehicles	218

1630-1830 outbound

total vehicles	31421
estimated pedal cycles	232
estimated bus	581
estimated light vehicles	30300
estimated goods vehicles	308

0700-1230 inbound

total vehicles	63890
estimated pedal cycles	241
estimated bus	2150
estimated light vehicles	58234
estimated goods vehicles	3264

0700-1230 outbound

total vehicles	51370
estimated pedal cycles	208
estimated bus	1724
estimated light vehicles	46777
estimated goods vehicles	2661

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 Coventry City Centre are undertaken every two years using automatic Traffic Counts (ATCs) installed on all major and most minor roads crossing the cordon.

The counters record vehicles continuously, by direction, for a seven-day period. The location of the sites is shown in Figure 1.

Three sites are also surveyed manually by Coventry City Council 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.

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

Results of the 1999 Coventry Cordon Survey are presented on the following pages. Where appropriate, comparisons with 1997 data have been made.

3 Background

Collection of the data took place in the week beginning Monday 11th October. It is important to avoid school holidays and the Christmas shopping season. In future the intention will be to keep to the same week each year.

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

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 07.00-09.30. The figures show very similar levels recorded in 1999 compared with 1997.

Table 1 Number of vehicles crossing the cordon in the Morning Peak Period (07.00 - 09.30)

	1987	1989	1991	1993	1995	1997	1999
Inbound Total	33856	35239	35534	31861	34337	34764	34623
Outbound Total	19941	21451	21530	22385	23364	23880	23836

These figures have been collected in the same manner from 1993-1999. Pre1993 data was collected by the use of manual surveys and did not include buses and cyclists in the outbound direction.

Table 2 shows the number of vehicles crossing the cordon line in the traditional off-peak morning period (10.00-12.00). This time period shows decreases in both inbound and outbound when compared with the data collected two years ago.

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

	1987	1989	1991	1993	1995	1997	1999
Inbound Total	17109	17607	18807	19159	19711	19656	18804
Outbound Total	15911	16098	17307	18746	18257	18549	18087

These figures have been collected in the same manner from 1993-1999. Pre1993 data was collected by the use of manual surveys and did not include buses and cyclists in the outbound direction.

The figures in Table 3 show that in 1999 around 20% of traffic flowing into the town centre on a typical weekday is crossing the cordon line between the hours of 7.00a.m. and 9.30a.m. This corresponds to the figure outbound in the evening peak period (4p.m. to 6p.m.), which is 19.4% in both 1997 and 1999.

The off-peak time period considered (1000-1200) shows around 12% of the daily traffic travelling into the town centre. Around 80% of an average day's traffic crosses the cordon during the main 12hr day.

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

	07.00 - 09.30	10.00 - 12.00	16.00 - 18.00	07.00 – 19.00 (12 hour)	00.00 – 24.00 (24 hour)
1995					
Inbound	34337	19711	24040	135770	167112
% of 24hr	20.5	11.8	14.4	81.2	100
Outbound	23364	18257	30429	130096	162453
% of 24hr	14.4	11.2	18.7	80.1	100
NET	10973	1454	-6389	5674	4659
1997					
Inbound	34764	19656	24156	135789	165549
% of 24 hr	21.0	11.9	14.6	82.0	100
Outbound	23880	18549	32613	136129	168228
% of 24 hr	14.2	11.0	19.4	80.9	100
NET	10884	1107	-8457	-340	-2679
1999					
Inbound	34623	18804	24246	133643	162878
% of 24hr	21.3	11.5	14.9	82.1	100
Outbound	23836	18087	32135	134018	165811
% of 24hr	14.4	10.9	19.4	80.8	100
NET	10787	717	-7889	-375	-2933

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. Figure 1 shows fluctuating changes in traffic with perhaps an indication that the extremes of the graph are showing a downward trend in the number of vehicles counted, but the middle of the 0700-1000 time period showing a general increase in figures. This is contrary to the view of peak spreading.

Figure 2 shows a decrease in all quarter hour time segments when comparing 1999 figures with 1997.

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

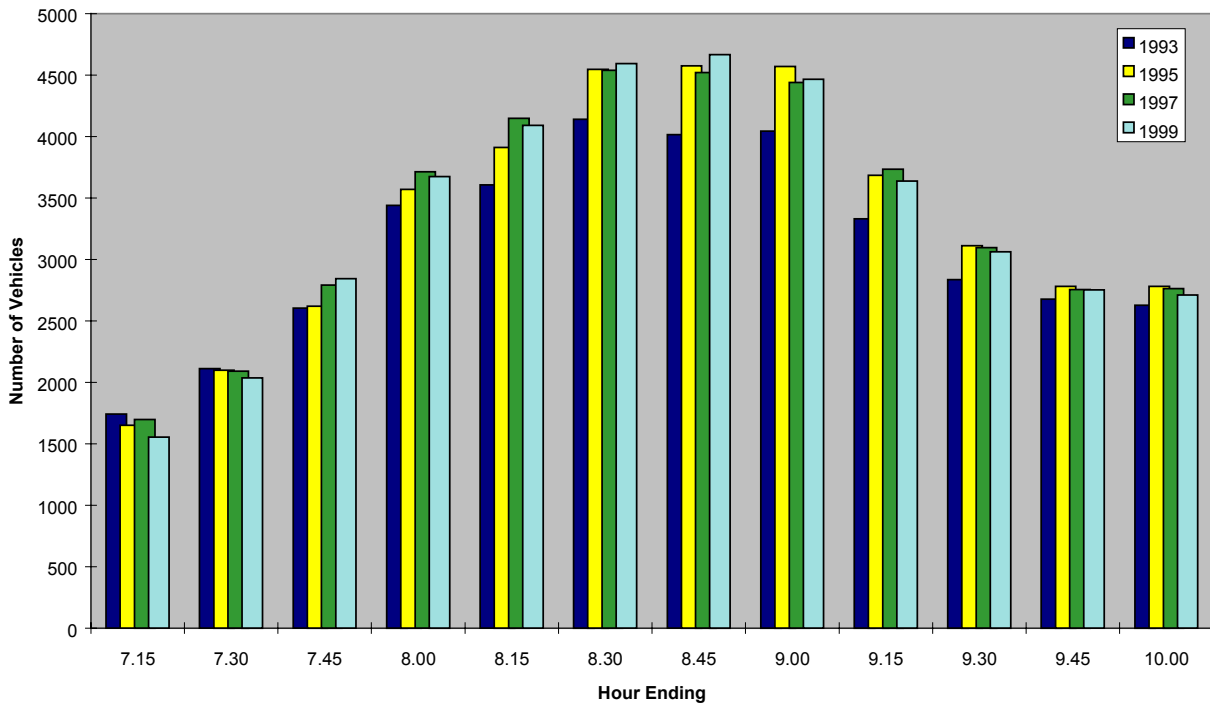


Figure 2 Outbound Evening Peak Period: Vehicle Volumes by Quarter Hour

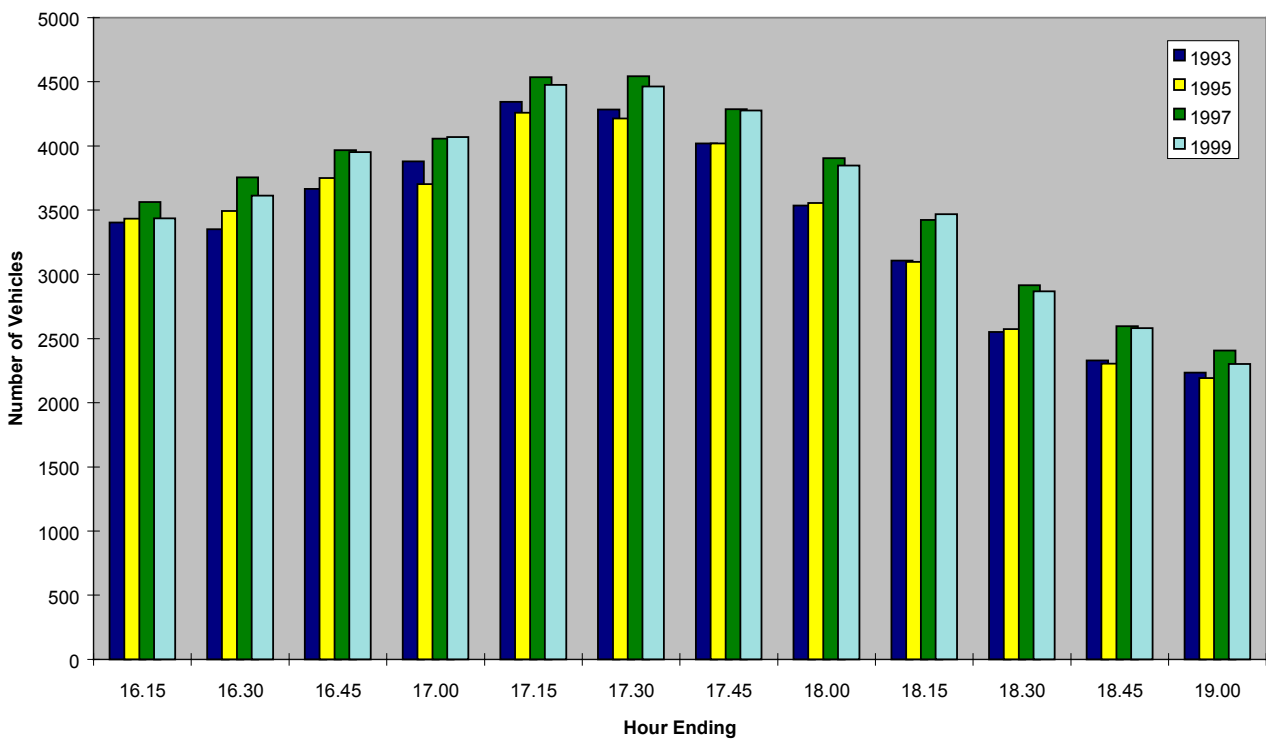


Figure 3 Inbound levels of vehicles, by hour

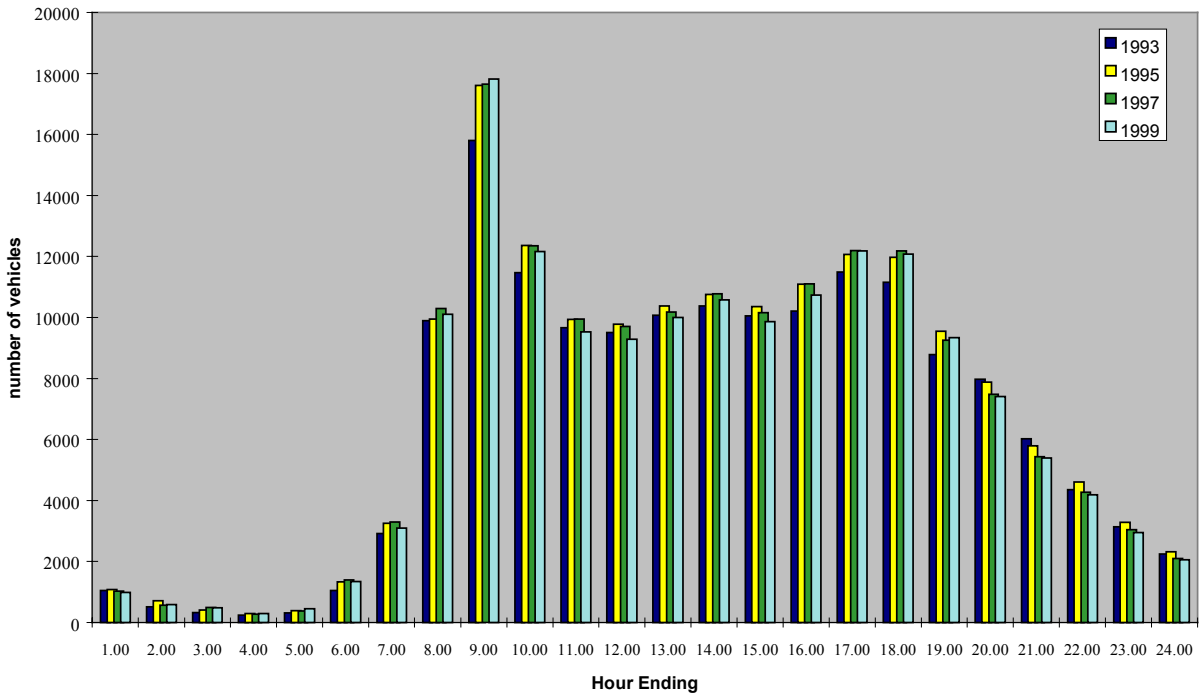
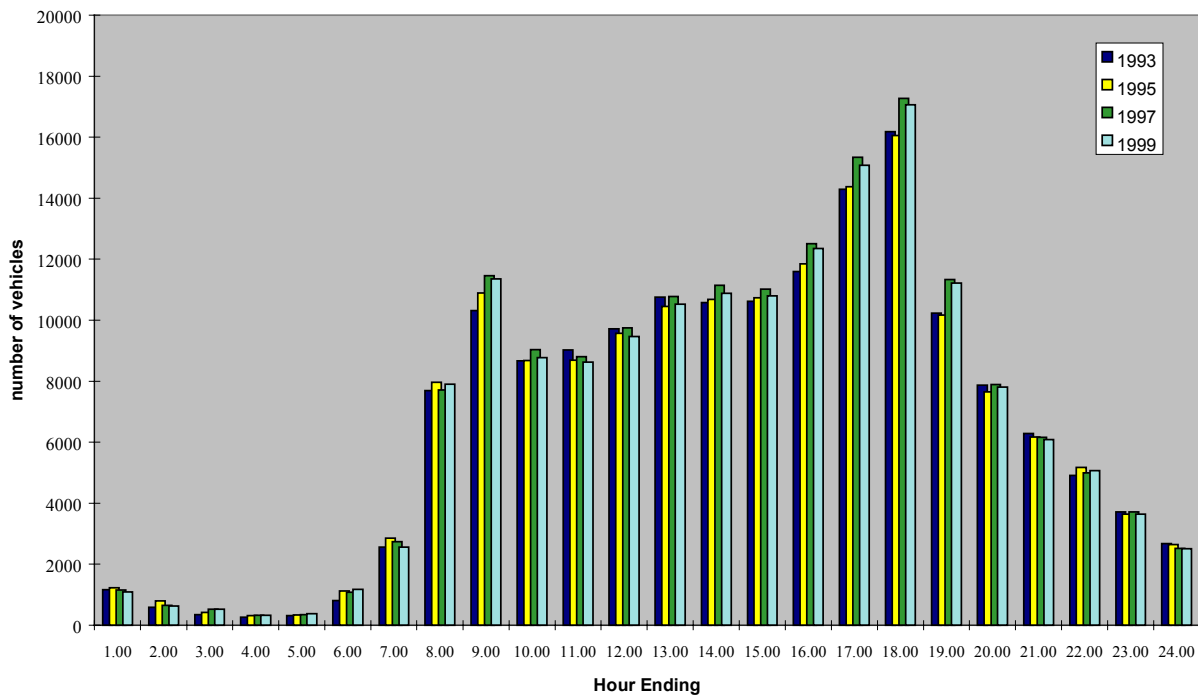


Figure 4 Outbound levels of vehicles, by hour



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 1998

	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
<u>Inbound</u>							
07.00 - 09.30	1.007	1.013	1.003	0.986	0.992	0.423	0.147
10.00 - 12.00	1.018	0.986	0.977	0.977	1.043	1.186	0.802
16.00 - 18.00	1.025	0.989	1.004	0.996	0.986	0.700	0.516
07.00 - 19.00	1.002	0.987	0.992	0.982	1.037	0.838	0.549
00.00 - 24.00	0.983	0.982	0.986	0.991	1.058	0.880	0.608
<u>Outbound</u>							
07.00 - 09.30	1.012	0.995	1.001	0.979	1.014	0.447	0.177
10.00 - 12.00	1.021	0.966	0.974	0.959	1.080	1.149	0.705
16.00 - 18.00	0.977	0.983	0.994	1.004	1.043	0.797	0.435
07.00 - 19.00	0.988	0.975	0.985	0.981	1.071	0.879	0.544
00.00 - 24.00	0.975	0.971	0.979	0.991	1.084	0.910	0.611

Figure 5 and Figure 6 show the net loss or gain in vehicles to the cordon by hour and the total accumulation of vehicles within 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 loss/gain	accumulation
1.00	990	1091	-101	-101
2.00	591	628	-37	-138
3.00	484	524	-40	-178
4.00	294	323	-29	-207
5.00	447	379	68	-139
6.00	1339	1171	168	29
7.00	3100	2567	533	562
8.00	10106	7906	2200	2762
9.00	17817	11346	6471	9233
10.00	12161	8768	3393	12626
11.00	9521	8625	896	13522
12.00	9283	9462	-179	13343
13.00	10003	10525	-522	12821
14.00	10575	10884	-309	12512
15.00	9866	10795	-929	11583
16.00	10728	12354	-1626	9957
17.00	12175	15072	-2897	7060
18.00	12071	17063	-4992	2068
19.00	9337	11218	-1881	187
20.00	7405	7808	-403	-216
21.00	5387	6085	-698	-914
22.00	4191	5067	-876	-1790
23.00	2949	3643	-694	-2484
24.00	2058	2507	-449	-2933

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

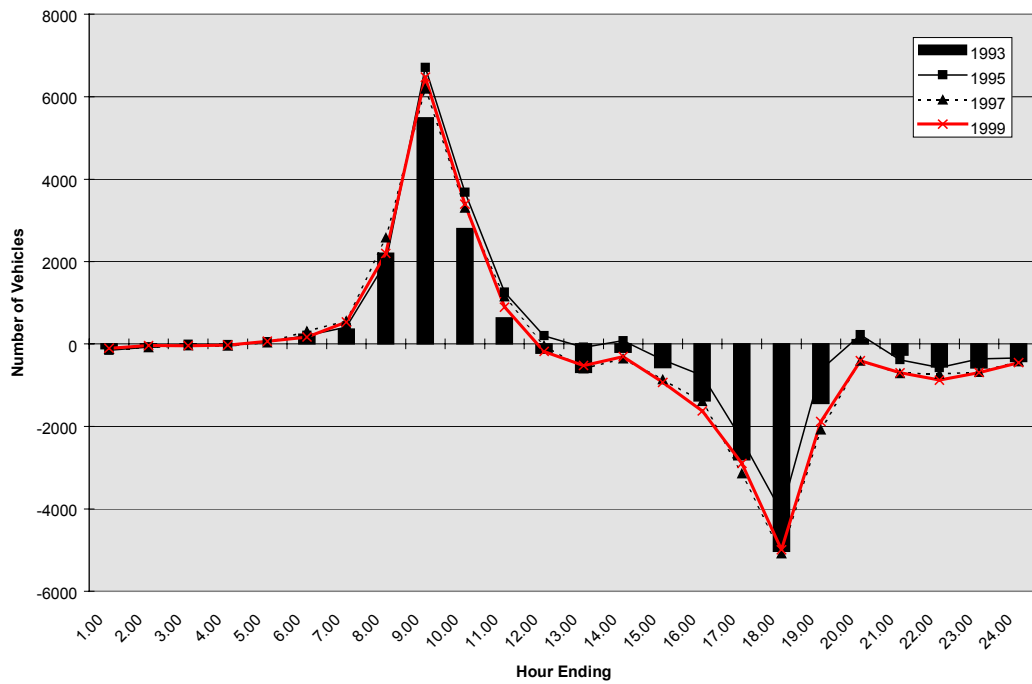
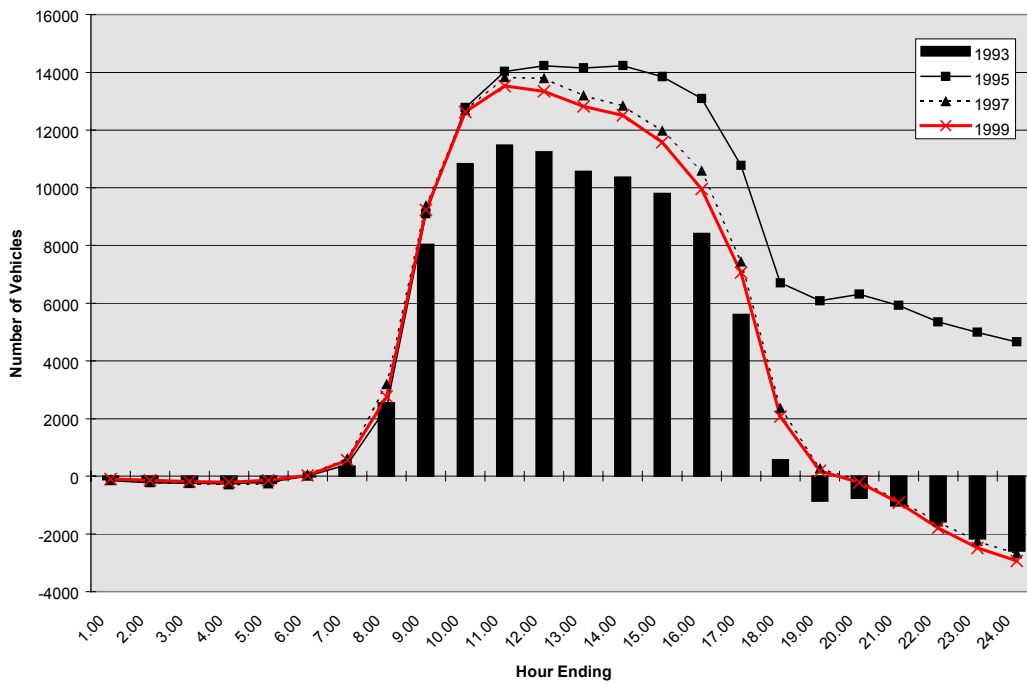


Figure 6 Net accumulation of vehicles, by hour



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.

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

		In dir	In Count	Out Dir	Out count
CC01	Foleshill Road	S	12999	N	14095
CC02	Stoney Stanton Road	S	9159	N	10130
CC03	Swan Lane	S	3982	N	4438
CC04	Heath Road	W	5091	E	5849
CC06	Walsgrave Road	W	13562	E	12825
CC07	Binley Road	W	19145	E	19156
CC08	Terry Road	W	2100	E	2245
CC09	London Road	N	17728	S	20352
CC10	Quarryfield Road	N	501	S	347
CC11	Mile Lane	N	2552	S	2925
CC12	Quinton Road	N	4706	S	2920
CC13	Stoney Road	N	2976	S	3581
CC14	Warwick Road	N	13539	S	11871
CC15	Albany Road	N	6729	S	6444
CC16	Spon End	E	16101	W	15689
CC17	Holyhead Road	E	11971	W	13893
CC18	Coundon Road	E	5394	W	5278
CC19	Radford Road	S	9743	N	9739
CC20	Sandy Lane	S	5100	N	4231

4.3 Mode of travel

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

Table 7 summarises the combined counts at the three 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

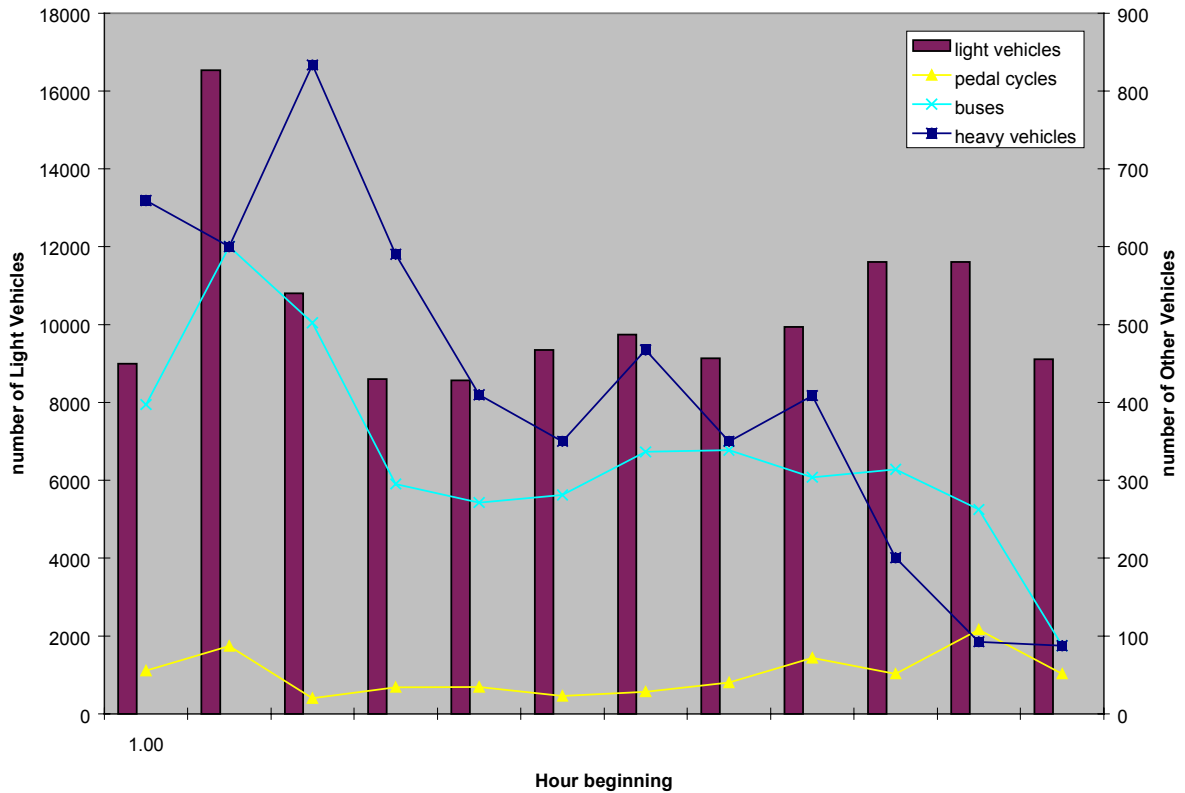
TIME STARTING	TOTAL VEH	PEDAL CYC	BUS & COACH	Light Vehs	Heavy Vehs	% pedal cycle	% bus	% light	% goods
7.00	1272	7	50	1132	83	0.0055	0.0393	0.8899	0.0653
8.00	1841	9	62	1708	62	0.0049	0.0337	0.9278	0.0337
9.00	1211	2	50	1076	83	0.0017	0.0413	0.8885	0.0685
10.00	1387	5	43	1253	86	0.0036	0.0310	0.9034	0.0620
11.00	1608	6	47	1484	71	0.0037	0.0292	0.9229	0.0442
12.00	1743	4	49	1629	61	0.0023	0.0281	0.9346	0.0350
13.00	1855	5	59	1709	82	0.0027	0.0318	0.9213	0.0442
14.00	1719	7	59	1592	61	0.0041	0.0343	0.9261	0.0355
15.00	1942	13	55	1800	74	0.0067	0.0283	0.9269	0.0381
16.00	2366	10	61	2256	39	0.0042	0.0258	0.9535	0.0165
17.00	2345	21	51	2255	18	0.0090	0.0217	0.9616	0.0077
18.00	1812	10	17	1768	17	0.0055	0.0094	0.9757	0.0094
0730-0930	3264	13	128	2960	163	0.0040	0.0392	0.9069	0.0499
1000-1200	2995	11	90	2737	157	0.0037	0.0301	0.9139	0.0524
1630-1830	4613	32	89	4449	43	0.0069	0.0193	0.9644	0.0093
0700-1230	8202	31	276	7476	419	0.0038	0.0337	0.9115	0.0511

Table 8 Estimated Inbound mode of transport figures

TIME STARTING	number of automatic vehs	estimated ped cyc	estimated bus	estimated light	estimated heavy
7.00	10106	56	397	8994	659
8.00	17817	87	600	16530	600
9.00	12161	20	502	10805	833
10.00	9521	34	295	8601	590
11.00	9283	35	271	8567	410
12.00	10003	23	281	9349	350
13.00	10575	29	336	9743	467
14.00	9866	40	339	9137	350
15.00	10728	72	304	9944	409
16.00	12175	51	314	11609	201
17.00	12071	108	263	11608	93
18.00	9337	52	88	9110	88
0730-0930	31033	124	1217	28143	1550
1000-1200	18804	69	565	17184	986
1630-1830	23363	162	451	22532	218
0700-1230	63890	241	2150	58234	3264

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



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.

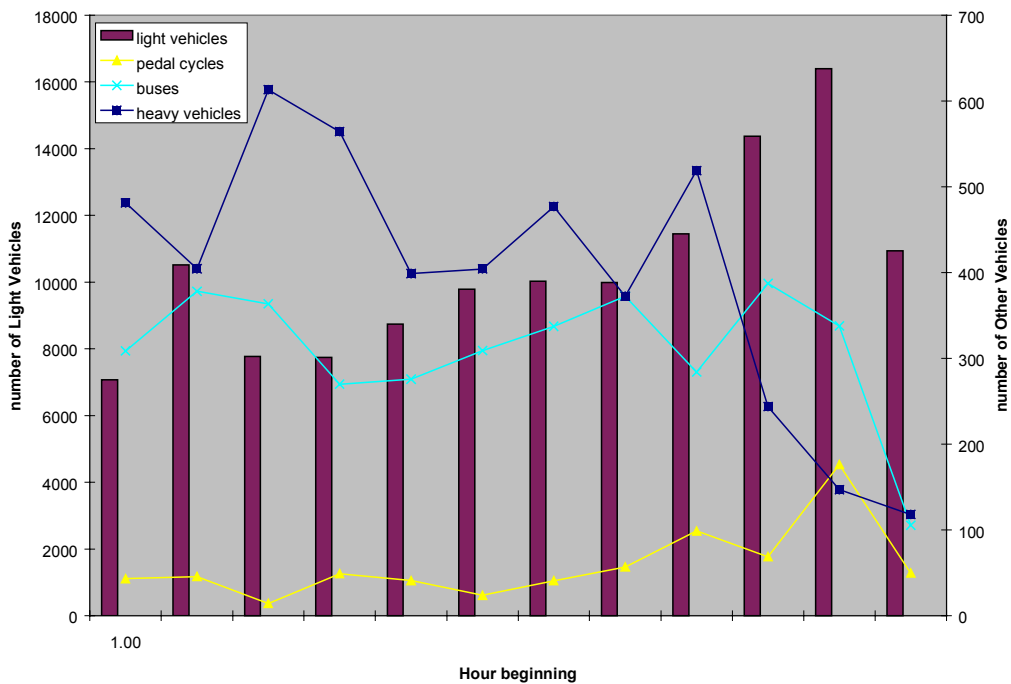
Table 9 Summary of Outbound mode of transport data from manual surveys

TIME STARTING	TOTAL VEH	PEDAL CYC	BUS & COACH	Light Vehs	Heavy Vehs	% pedal cycle	% bus	% light	% goods
7.00	1281	7	50	1146	78	0.0055	0.0390	0.8946	0.0609
8.00	1739	7	58	1612	62	0.0040	0.0334	0.9270	0.0357
9.00	1230	2	51	1091	86	0.0016	0.0415	0.8870	0.0699
10.00	1406	8	44	1262	92	0.0057	0.0313	0.8976	0.0654
11.00	1613	7	47	1491	68	0.0043	0.0291	0.9244	0.0422
12.00	1770	4	52	1646	68	0.0023	0.0294	0.9299	0.0384
13.00	1871	7	58	1724	82	0.0037	0.0310	0.9214	0.0438
14.00	1710	9	59	1583	59	0.0053	0.0345	0.9257	0.0345
15.00	2000	16	46	1854	84	0.0080	0.0230	0.9270	0.0420
16.00	2411	11	62	2299	39	0.0046	0.0257	0.9535	0.0162
17.00	2324	24	46	2234	20	0.0103	0.0198	0.9613	0.0086
18.00	1807	8	17	1763	19	0.0044	0.0094	0.9757	0.0105
0730-0930	3175	10	123	2878	164	0.0031	0.0387	0.9065	0.0517
1000-1200	3019	15	91	2753	160	0.0050	0.0301	0.9119	0.0530
1630-1830	4596	34	85	4432	45	0.0074	0.0185	0.9643	0.0098
0700-1230	8165	33	274	7435	423	0.0040	0.0336	0.9106	0.0518

Table 10 Estimated Outbound mode of transport figures

TIME STARTING	No. auto vehs.	estimated ped cyc	estimated bus	estimated light	estimated goods
7.00	7906	43	309	7073	481
8.00	11346	46	378	10517	405
9.00	8768	14	364	7777	613
10.00	8625	49	270	7742	564
11.00	9462	41	276	8746	399
12.00	10525	24	309	9788	404
13.00	10884	41	337	10029	477
14.00	10795	57	372	9993	372
15.00	12354	99	284	11452	519
16.00	15072	69	388	14372	244
17.00	17063	176	338	16402	147
18.00	11218	50	106	10945	118
0730-0930	20815	66	806	18868	1075
1000-1200	18087	90	545	16493	959
1630-1830	31421	232	581	30300	308
0700-1230	51370	208	1724	46777	2661

Figure 8 Estimated Outbound mode of transport figures



4.4 Occupancy Levels

Figures 9 and 10 show the estimated numbers of persons crossing the cordon calculated from the occupancy counts at the three manual sites and the number of vehicles counted automatically per time period.

Figure 9 Estimated persons in Light Vehicles Inbound Morning Peak Period

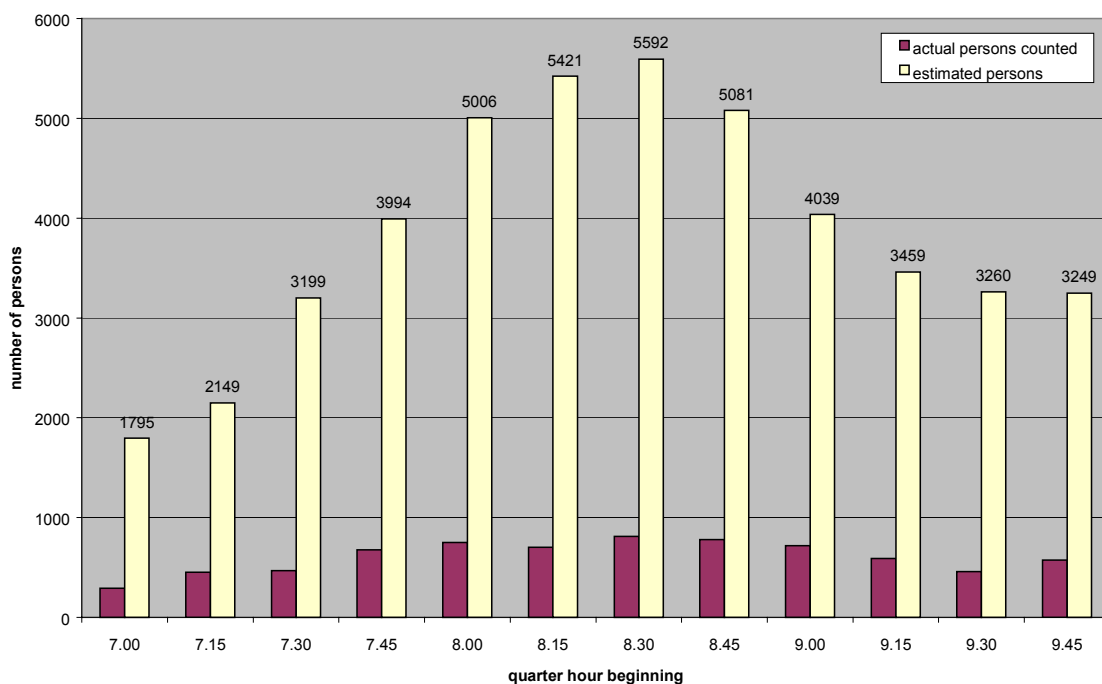


Figure 10 Estimated persons in Light Vehicles Outbound Morning Peak Period

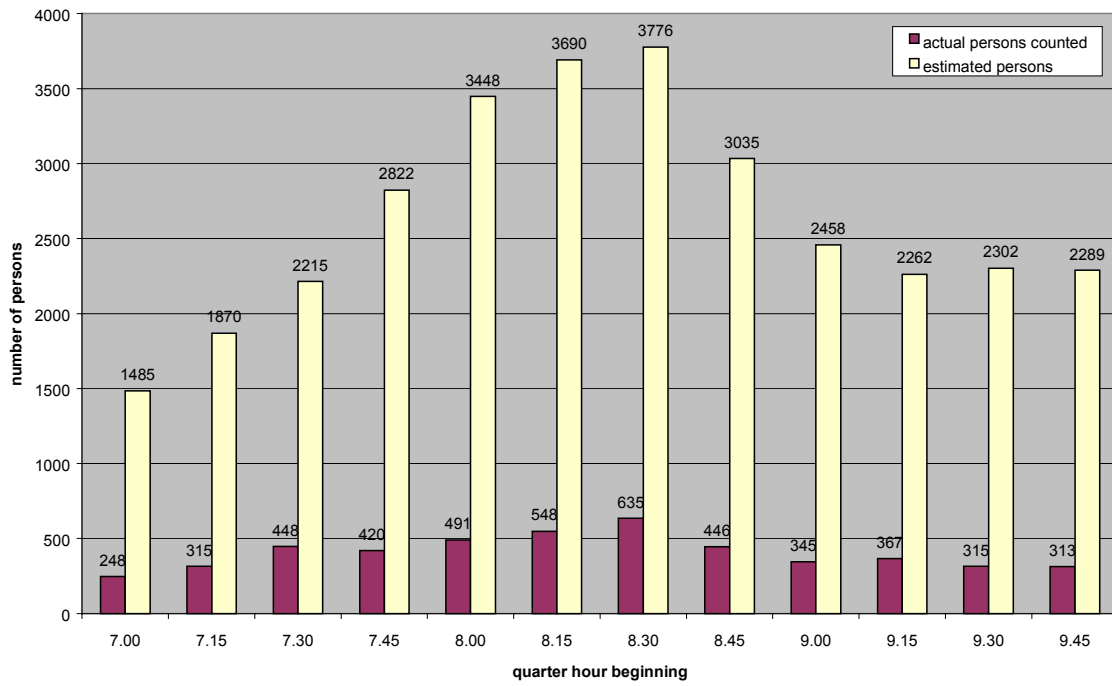


Figure 11 Estimated persons in Heavy vehicles – inbound morning peak

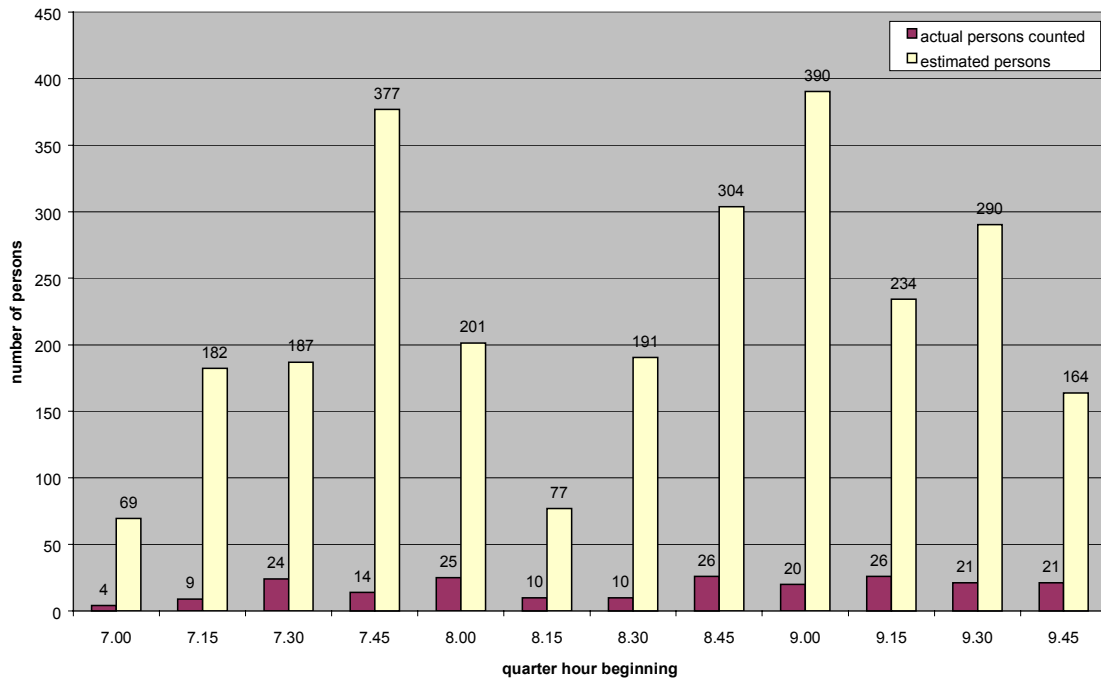
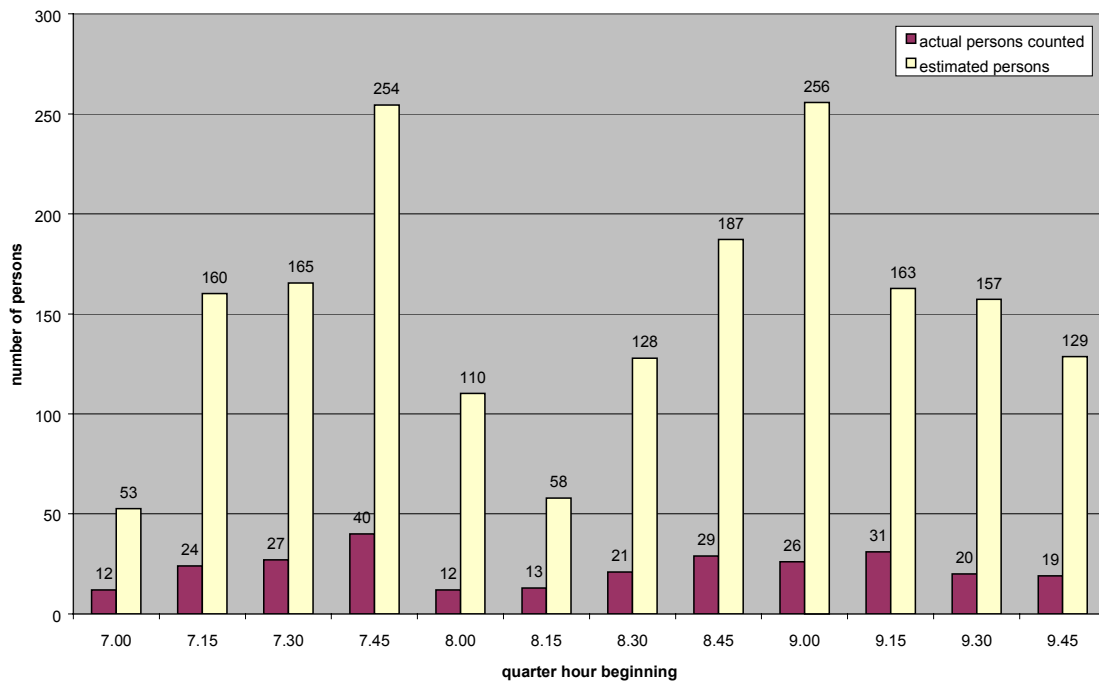


Figure 12 **Estimated persons in Heavy Vehicles – outbound morning peak**



5 Appendix 1 Position of Cordon Sites

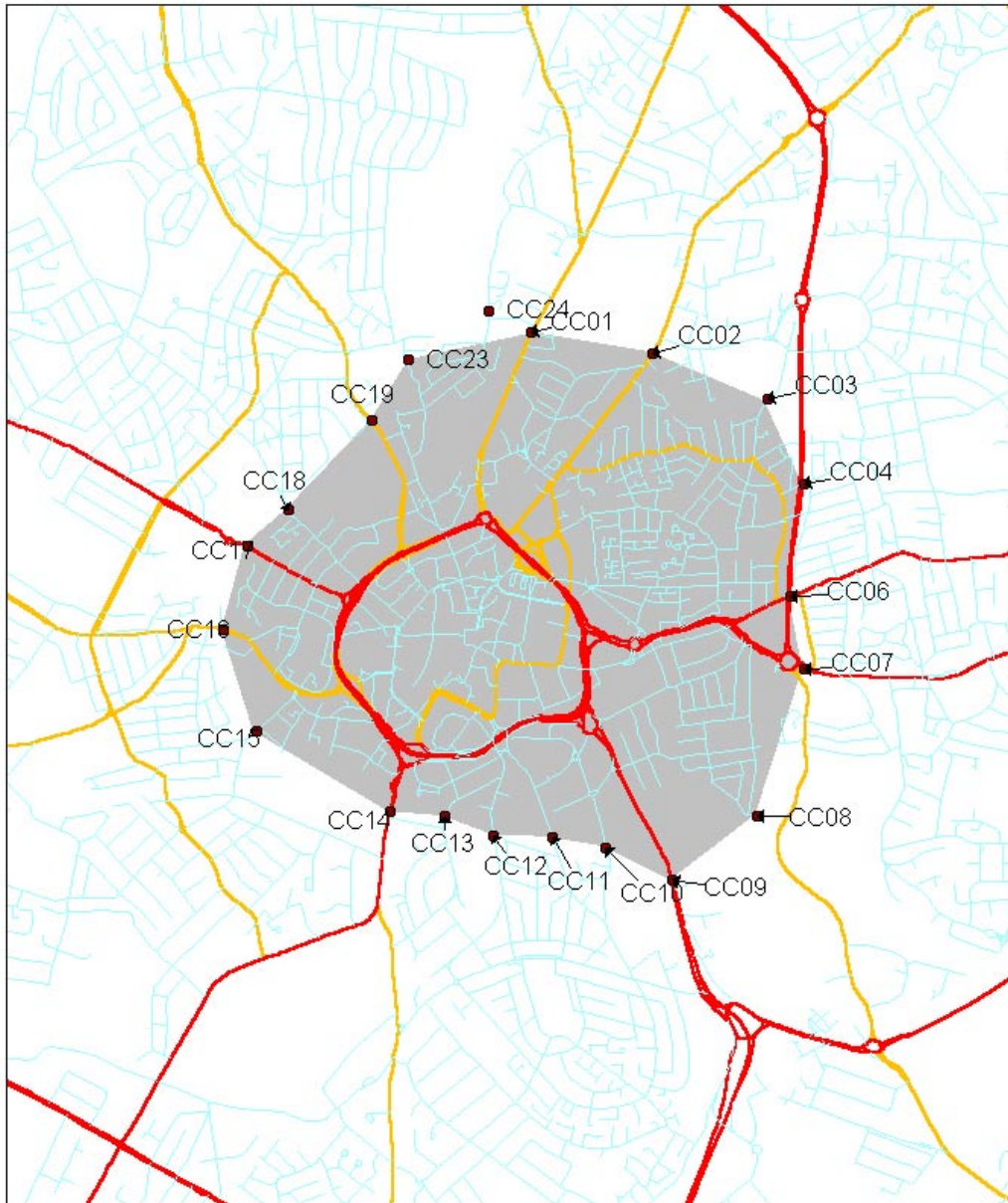
Table 11 Automatic count sites

CC01	Foleshill Road	between Honey Street and Edmund Street
CC02	Stoney Stanton Road	South of Red Lane
CC03	Swan Lane	North of Newham Road
CC04	Heath Road	West of Stepney Road
CC06	Walsgrave Road	between Kingsway and Swan Lane
CC07	Binley Road	west of Humber Road
CC08	Terry Road	near St. Georges Road
CC09	London Road	south of Acacia Avenue
CC10	Quarryfield Road	between Puma Road and St. Christians Croft
CC11	Mile Lane	Between Puma Road and Thomas Lansdail Street
CC12	Quinton Road	Between Hornchurch Close and Joan Ward Street
CC13	Stoney Road	north of Michaelmas Road
CC14	Warwick Road	just north of Michaelmas Road
CC15	Albany Road	between Broomfield Road and Bedford Street
CC16	Spon End	at railway bridge
CC17	Holyhead Road	at railway bridge
CC18	Coundon Road	between Butts Lane and Chester Street
CC19	Radford Road	south of Swillinton Road
CC20	Sandy Lane	between Wllys Road and St. Nicholas Street

Table 12 Manual Count sites

CC08 (R2303)	Terry Road	Between Georges Road and Humber Road
CC14 (R3931)	Warwick Road	North of Michealmas Road
CC17 (R8811)	Hiolyhead Road	At railway bridge

Figure 13 Location of Coventry ATC Cordon Sites



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 \pdc01\projects\47995\monitoring\Coventry_Cordon_1999\map.wor

Title Coventry Cordon 1999					 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.		page 16 of 22	Rev.
03/12/99	JTB	BWS	BWS	Final	47995/BA05/01			A

6 Appendix 2 Estimates of Vehicle Type from Passage Count Data

Table 13 INBOUND

TIME STARTING	Figures from passage counts				Proportions of total vehicles counted				number of automatic vehs	Estimated number of vehicles by type				
	TOTAL VEH	PEDAL CYC	BUS & COACH	Light VEHs	Heavy VEHs	pedal cycle	bus	light		heavy	ped cyc	bus	light	heavy
7.00	1272	7	50	1132	83	0.0055	0.0393	0.8899	0.0653	10106	56	397	8994	659
8.00	1841	9	62	1708	62	0.0049	0.0337	0.9278	0.0337	17817	87	600	16530	600
9.00	1211	2	50	1076	83	0.0017	0.0413	0.8885	0.0685	12161	20	502	10805	833
10.00	1387	5	43	1253	86	0.0036	0.0310	0.9034	0.0620	9521	34	295	8601	590
11.00	1608	6	47	1484	71	0.0037	0.0292	0.9229	0.0442	9283	35	271	8567	410
12.00	1743	4	49	1629	61	0.0023	0.0281	0.9346	0.0350	10003	23	281	9349	350
13.00	1855	5	59	1709	82	0.0027	0.0318	0.9213	0.0442	10575	29	336	9743	467
14.00	1719	7	59	1592	61	0.0041	0.0343	0.9261	0.0355	9866	40	339	9137	350
15.00	1942	13	55	1800	74	0.0067	0.0283	0.9269	0.0381	10728	72	304	9944	409
16.00	2366	10	61	2256	39	0.0042	0.0258	0.9535	0.0165	12175	51	314	11609	201
17.00	2345	21	51	2255	18	0.0090	0.0217	0.9616	0.0077	12071	108	263	11608	93
18.00	1812	10	17	1768	17	0.0055	0.0094	0.9757	0.0094	9337	52	88	9110	88
0730-0930	3264	13	128	2960	163	0.0040	0.0392	0.9069	0.0499	31033	124	1217	28143	1550
1000-1200	2995	11	90	2737	157	0.0037	0.0301	0.9139	0.0524	18804	69	565	17184	986
1630-1830	4613	32	89	4449	43	0.0069	0.0193	0.9644	0.0093	23363	162	451	22532	218
0700-1230	8202	31	276	7476	419	0.0038	0.0337	0.9115	0.0511	63890	241	2150	58234	3264

Table 14 Outbound

		Figures from passage counts				Proportions of total vehicles counted				number of automatic vehs	Estimated number of vehicles by type			
TIME STARTING	TOTAL VEH	PEDAL CYC	BUS COACH	Light VEHs	Heavy VEHs	pedal cycle	bus	light	heavy		ped cyc	bus	light	heavy
7.00	1281	7	50	1146	78	0.0055	0.0390	0.8946	0.0609	7906	43	309	7073	481
8.00	1739	7	58	1612	62	0.0040	0.0334	0.9270	0.0357	11346	46	378	10517	405
9.00	1230	2	51	1091	86	0.0016	0.0415	0.8870	0.0699	8768	14	364	7777	613
10.00	1406	8	44	1262	92	0.0057	0.0313	0.8976	0.0654	8625	49	270	7742	564
11.00	1613	7	47	1491	68	0.0043	0.0291	0.9244	0.0422	9462	41	276	8746	399
12.00	1770	4	52	1646	68	0.0023	0.0294	0.9299	0.0384	10525	24	309	9788	404
13.00	1871	7	58	1724	82	0.0037	0.0310	0.9214	0.0438	10884	41	337	10029	477
14.00	1710	9	59	1583	59	0.0053	0.0345	0.9257	0.0345	10795	57	372	9993	372
15.00	2000	16	46	1854	84	0.0080	0.0230	0.9270	0.0420	12354	99	284	11452	519
16.00	2411	11	62	2299	39	0.0046	0.0257	0.9535	0.0162	15072	69	388	14372	244
17.00	2324	24	46	2234	20	0.0103	0.0198	0.9613	0.0086	17063	176	338	16402	147
18.00	1807	8	17	1763	19	0.0044	0.0094	0.9757	0.0105	11218	50	106	10945	118
0730-0930	3175	10	123	2878	164	0.0031	0.0387	0.9065	0.0517	20815	66	806	18868	1075
1000-1200	3019	15	91	2753	160	0.0050	0.0301	0.9119	0.0530	18087	90	545	16493	959
1630-1830	4596	34	85	4432	45	0.0074	0.0185	0.9643	0.0098	31421	232	581	30300	308
0700-1230	8165	33	274	7435	423	0.0040	0.0336	0.9106	0.0518	51370	208	1724	46777	2661

7 Appendix 2 Estimates of Person trips from manual occupancy surveys

Table 15 Inbound Light Vehicle occupants

Start Time	Number of vehicles with Shown occupants					Total Veh	Total Ave Pass Occupancy	Est. Person trips							
	1	2	3	4	5			A Auto Vehs	B Est Buses	C Est Heavy	D Est P/c	E A-(B+C+D)	F E*(Ave Occ)	G F+C	
7.00	177	53	1	0	1	232	291	1.25	1554	51	69	13	1421	1783	1795
7.15	306	70	2	0	0	378	452	1.20	2036	55	182	8	1790	2141	2149
7.30	301	61	12	1	1	376	468	1.24	2843	123	148	8	2564	3191	3199
7.45	426	109	9	1	0	545	675	1.24	3673	174	269	26	3204	3968	3994
8.00	442	99	18	13	1	573	751	1.31	4091	149	121	9	3812	4996	5006
8.15	448	100	14	2	1	565	703	1.24	4593	164	62	51	4316	5370	5421
8.30	486	120	21	3	2	632	811	1.28	4667	135	172	9	4351	5583	5592
8.45	495	109	13	3	3	623	779	1.25	4466	153	245	20	4047	5060	5081
9.00	420	126	10	2	2	560	720	1.29	3639	166	332	0	3141	4039	4039
9.15	354	90	14	1	2	461	590	1.28	3061	151	207	0	2703	3459	3459
9.30	254	80	9	3	1	347	458	1.32	2752	86	194	11	2462	3249	3260
9.45	322	104	12	2	0	440	574	1.30	2709	99	117	9	2484	3240	3249
10.00	265	94	8	1	0	368	481	1.31							
10.15	293	101	3	1	0	398	508	1.28							
10.30	342	80	8	3	0	433	538	1.24					0730-0930	1.27	
10.45	244	80	6	1	1	332	431	1.30					light veh occ rate		
11.00	235	76	7	1	0	319	412	1.29					1000-1200	1.29	
11.15	275	78	8	1	0	362	459	1.27					0700-1230	1.28	
11.30	279	83	14	1	0	377	491	1.30							
11.45	255	77	8	2	2	344	451	1.31							
12.00	311	76	8	2	0	397	495	1.25							
12.15	314	104	12	1	1	432	567	1.31							

Table 16 Outbound Light Vehicle Occupants

Start Time	Number of vehicles with Shown occupants					Total Veh	Total Pass	Ave Occupancy	A	B	C	D	E	F	G
	1	2	3	4	5										
7.00	175	33	1	1	0	210	248	1.18	1350	43	48	11	1248	1474	1485
7.15	200	39	9	0	2	250	315	1.26	1671	51	133	13	1474	1857	1870
7.30	324	57	2	1	0	384	448	1.17	2108	92	116	6	1894	2209	2215
7.45	317	46	1	2	0	366	420	1.15	2777	125	191	13	2448	2809	2822
8.00	275	79	11	5	1	371	491	1.32	2804	105	92	7	2600	3442	3448
8.15	336	71	15	5	1	428	548	1.28	3044	105	49	35	2855	3655	3690
8.30	306	106	22	9	3	446	635	1.42	2843	85	103	6	2648	3770	3776
8.45	292	46	9	5	3	355	446	1.26	2655	84	155	0	2416	3035	3035
9.00	254	35	3	3	0	295	345	1.17	2430	102	226	0	2102	2458	2458
9.15	255	47	6	0	0	308	367	1.19	2154	109	147	0	1898	2262	2262
9.30	204	45	4	1	1	255	315	1.24	2090	83	142	8	1857	2294	2302
9.45	217	43	2	1	0	263	313	1.19	2094	68	102	7	1918	2282	2289
10.00	255	41	5	2	1	304	365	1.20							
10.15	235	55	4	2	0	296	365	1.23							
10.30	258	56	7	0	0	321	391	1.22							
10.45	281	77	8	3	0	369	471	1.28							
11.00	269	67	2	0	0	338	409	1.21	light veh occ rate	0730-0930			1.24		
11.15	312	63	6	0	1	382	461	1.21			1000-1200		1.24		
11.30	289	88	3	1	1	382	483	1.26			0700-1230		1.24		
11.45	296	98	9	3	0	406	531	1.31							
12.00	305	78	8	1	0	392	489	1.25							
12.15	304	109	15	1	0	429	571	1.33							

Table 17 Inbound Heavy Vehicle occupants

Start Time	Number of vehicles with Shown occupants					Total Veh	Total Pass	Ave Occupancy	A Auto Vehs	B Est Buses	C Est Light	D Est P/c	E A-E*(Ave Occ) (B+C+D)	Est person trips
	1	2	3	4	5									
7.00	4	0	0	0	0	4	4	1.00	1554	51	1421	13	69	69
7.15	9	0	0	0	0	9	9	1.00	2036	55	1790	8	182	182
7.30	15	3	1	0	0	19	24	1.26	2843	123	2564	8	148	187
7.45	7	2	1	0	0	10	14	1.40	3673	174	3204	26	269	377
8.00	6	8	1	0	0	15	25	1.67	4091	149	3812	9	121	201
8.15	6	2	0	0	0	8	10	1.25	4593	164	4316	51	62	77
8.30	8	1	0	0	0	9	10	1.11	4667	135	4351	9	172	191
8.45	16	5	0	0	0	21	26	1.24	4466	153	4047	20	245	304
9.00	14	3	0	0	0	17	20	1.18	3639	166	3141	0	332	390
9.15	20	3	0	0	0	23	26	1.13	3061	151	2703	0	207	234
9.30	9	3	2	0	0	14	21	1.50	2752	86	2462	11	194	290
9.45	10	4	1	0	0	15	21	1.40	2709	99	2484	9	117	164
10.00	14	3	2	0	0	19	26	1.37						
10.15	17	2	0	0	0	19	21	1.11						
10.30	16	1	1	0	0	18	21	1.17						
10.45	13	4	0	0	0	17	21	1.24						
11.00	17	2	0	0	0	19	21	1.11						
11.15	18	4	1	0	0	23	29	1.26						
11.30	18	3	0	0	0	21	24	1.14						
11.45	19	6	0	0	0	25	31	1.24						
12.00	34	7	1	0	0	42	51	1.21						
12.15	25	2	1	0	0	28	32	1.14						

Table 18 Outbound Heavy Vehicle occupants

Start Time	Number of vehicles with Shown occupants					Total Veh	Total Ave Pass Occupancy	Total					Est person trips		
	1	2	3	4	5			A Auto Vehs	B Est Buses	C Est Light	D Est P/c	E A-E*(Ave Occ) (B+C+D)		F	
7.00	10	1	0	0	0	11	1.09	12	43	1248	11	48	53		
7.15	17	2	1	0	0	20	1.20	24	51	1474	13	133	160		
7.30	13	4	2	0	0	19	1.42	27	92	1894	6	116	165		
7.45	22	6	2	0	0	30	1.33	40	125	2448	13	191	254		
8.00	8	2	0	0	0	10	1.20	12	105	2600	7	92	110		
8.15	9	2	0	0	0	11	1.18	13	105	2855	35	49	58		
8.30	13	4	0	0	0	17	1.24	21	85	2648	6	103	128		
8.45	20	3	1	0	0	24	1.21	29	84	2416	0	155	187		
9.00	20	3	0	0	0	23	1.13	26	102	2102	0	226	256		
9.15	25	3	0	0	0	28	1.11	31	109	1898	0	147	163		
9.30	16	2	0	0	0	18	1.11	20	83	1857	8	142	157		
9.45	11	4	0	0	0	15	1.27	19	68	1918	7	102	129		
10.00	19	2	1	0	0	22	1.18	26							
10.15	12	1	0	0	0	13	1.08	14							
10.30	20	4	0	0	0	24	1.17	28							
10.45	15	6	0	0	0	21	1.29	27							
11.00	24	1	0	0	0	25	1.04	26							
11.15	12	1	0	0	0	13	1.08	14							
11.30	19	3	0	0	0	22	1.14	25							
11.45	13	1	1	0	0	15	1.20	18							
12.00	19	3	0	0	0	22	1.14	25							
12.15	8	2	1	0	0	11	1.36	15							

8 Appendix 3: Modal Share

Table 19 Inbound Modal Share Figures (1997/1999)

	0730-0930		1000-1200		0700-1230	
	1997	1999	1997	1999	1997	1999
Bus Trips	9,505	9,367	8,719	7,676	24,394	22,649
Estimated Car Trips	30,881	31,727	20,968	19,623	69,845	65,996
Train Trips	968	1,089	578	771	1,979	2,290
Total Trips	41,354	42,183	30,265	28,070	96,218	90,935
Bus Modal Share	23.0%	22.2%	28.8%	27.3%	25.4%	24.9%
Car Modal Share	74.7%	75.2%	69.3%	69.9%	72.6%	72.6%
Train Modal Share	2.3%	2.6%	1.9%	2.7%	2.1%	2.5%

Source: CENTRO

Table 20 Outbound Modal Share Figures (1997/1999)

	0730-0930		1000-1200		0700-1230	
	1997	1999	1997	1999	1997	1999
Bus Trips	6,231	6,590	5,749	6,103	15,246	15,847
Estimated Car Trips	20,570	20,725	19,133	18,121	53,015	51,341
Train Trips	1,448	1,308	717	986	2,837	3,028
Total Trips	28,249	28,623	25,599	25,210	71,098	70,216
Bus Modal Share	22.1%	23.0%	22.5%	24.2%	21.4%	22.6%
Car Modal Share	72.8%	72.4%	74.7%	71.9%	74.6%	73.1%
Train Modal Share	5.1%	4.6%	2.8%	3.9%	4.0%	4.3%

Source: CENTRO