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Data Input Table – Do Not Delete

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Report Title – third line	Pages i and ii	T3		
Report Title or Heading – first line	Left aligned in headers	HL1		Walsall Cordon Report 2001
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/BG13
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		April 2001
Initials of word processor	Footers	INI		JS

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Summary

Analysis of the 2001 Cordon Survey Has Shown That:

1. Around 13,704 vehicles travel into Walsall Town Centre during the morning peak period (07:30 – 09:30). Around 9,410 vehicles travel outbound during the same time period (Page 2, Table 1)
2. Off peak around 9,400 vehicles travel inbound, 8,823 outbound. (Page 2, Table 2)
3. On an average weekday, 19% of inbound vehicles travel into the town centre in the morning peak. Around 82% of an average weekday's traffic cross the cordon line in the main 12 hour day (07:00-19:00). (Page 2, Table 3)
4. By 12p.m. there is a net increase of some 6,446 vehicles within the cordon area over the overnight levels. (Page 5, Table 5 and Page 6, Figure 6)
5. The hour ending 9 a.m. shows the highest increase in vehicles in to the centre, with an excess of 2,522 entering the town centre over those leaving town. The hour ending 6p.m. shows the greatest loss in vehicles (2,871). (Page 5, Table 5) A breakdown of the peak periods by quarter hour is given in Figures 1 and 2 on Page 3.
6. The surveys have provided detailed data on the variations of traffic levels throughout the day, for inbound and outbound directions at individual sites and for the cordon as a whole.
7. Estimated occupancy figures based on the manual counts show some 15,432 people using private transport to travel into the town centre between 07:30 and 09:30. (Page 11, Figure 9)

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 Manual surveys have been undertaken by Walsall MBC while the Automatic surveys and analysis have been undertaken by the **jdt**.

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, with further sites on some of the minor roads so as to obtain a close 'closed' cordon. The idea is to capture all vehicles entering the town centre. The location of the sites is shown in Appendix 1.

Counters are used that record the vehicles automatically (ATC's). In this way, data for a full week is collected, enabling 24 hour average weekday data to be presented.

Four sites are also surveyed manually by Walsall 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.

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

Results of the 2001 Walsall Cordon Survey are presented on the following pages. Where appropriate, comparisons with 1999 and 1997 data have been made.

3 Background and Diary

Collection of the ATC data took place in the week beginning Sunday 18th March. It is important to avoid school holidays. Future similar exercises should be kept to the same week each time the surveys are repeated.

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

Collection of the manual data was spread over a wider time scale, due to staffing problems, with the first survey being carried out on the 15th March and the rest carried out between the 20th and 23rd of March.

Roadwork's on Wolverhampton Street (WL15) allowed for restricted categories of vehicles using this street in one direction only (outbound). The imbalance between in's and out's is greater than previous years while still being within the DETR recognised tolerance for ATC's of plus or minus 5%.

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. The figures show a slight increase in the number of vehicles counted inbound and outbound compared with this time period in 1999.

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

	1997	1999	2001
Inbound Total	13,865	13,627	13,704
Outbound Total	9,090	9,244	9,410

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 a slight increase 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)

	1997	1999	2001
Inbound Total	9,090	9,227	9,400
Outbound Total	8,815	8,744	8,823

The figures in Table 3 show that in 2001 around 19% 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 19.2%. The off-peak time period considered (1000-1200) shows 13% of the daily traffic travelling into the town centre. The outbound direction for this time period shows 11.8%. Around 82% of an average day's traffic is crossing 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

	07.30 - 09.30	10.00 - 12.00	16.00 - 18.00	07.00 – 19.00 (12 hour)	00.00 – 24.00 (24 hour)
1997					
Inbound	13,865	9,090	9,863	59,938	72,918
% of 24 hr	19.0%	12.5%	13.5%	82.2%	100%
Outbound	9,090	8,815	13,610	60,054	73,706
% of 24 hr	12.3%	12.0%	18.5%	81.5%	100%
NET	4,775	275	-3,747	-116	-788
1999					
Inbound	13,627	9,227	9,940	60,363	73,819
% of 24hr	18.5%	12.5%	13.5%	81.8%	100%
Outbound	9,244	8,744	13,649	60,124	74,137
% of 24hr	12.5%	11.8%	18.4%	81.1%	100%
NET	4,383	483	-3,709	116	-318
2001					
Inbound	13,704	9,400	9,424	59,212	72,190
% of 24hr	19.0	13.0	13.1	82.0	100
Outbound	9,410	8,823	14,383	61,319	75,068
% of 24hr	12.5	11.8	19.2	81.7	100
NET	4,294	577	-4,959	-2,107	-2,878

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

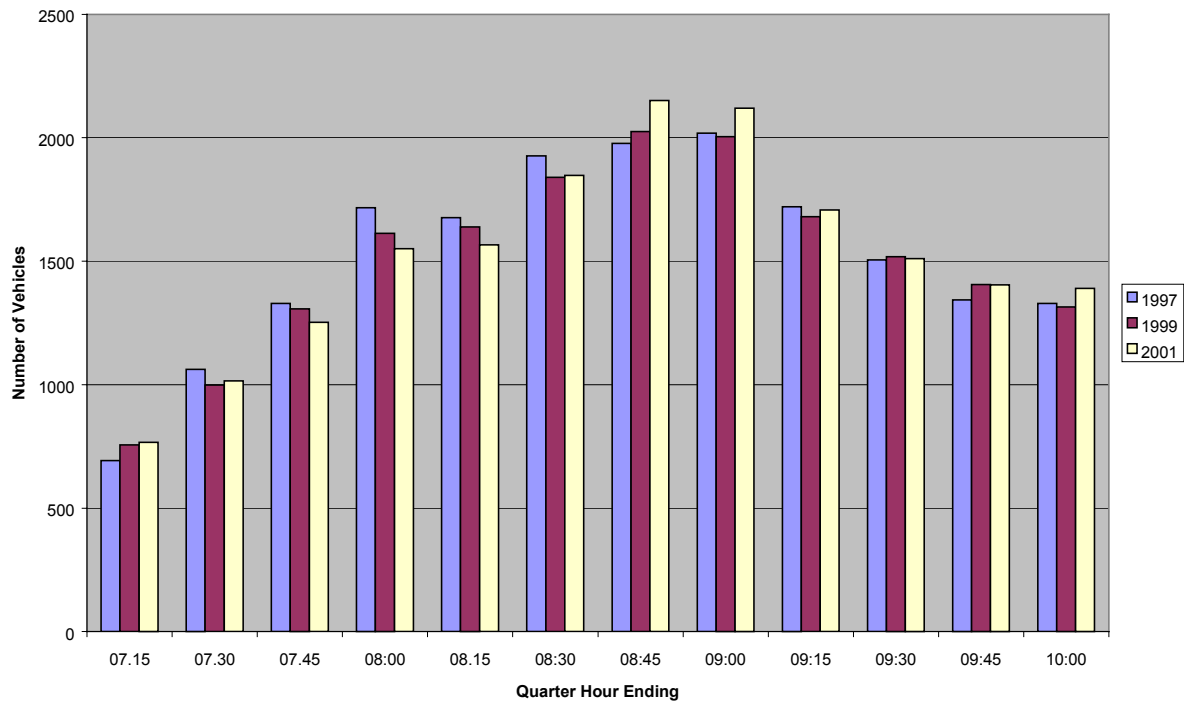


Figure 1 and Figure 2 show the two main peak periods by quarter hour. The morning figures are given from 7a.m. until 10a.m. and the evening from 4p.m. to 7p.m. These time periods are wider than those presented in previous tables. This allows a check on the traditional time periods as peak spreading may be seen on these graphs. Figure 1 shows fluctuating changes in traffic between 1997 and 1999. Similarly, in the outbound direction, (Figure 2) some time periods show increases compared with 1997 while others show decreases.

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

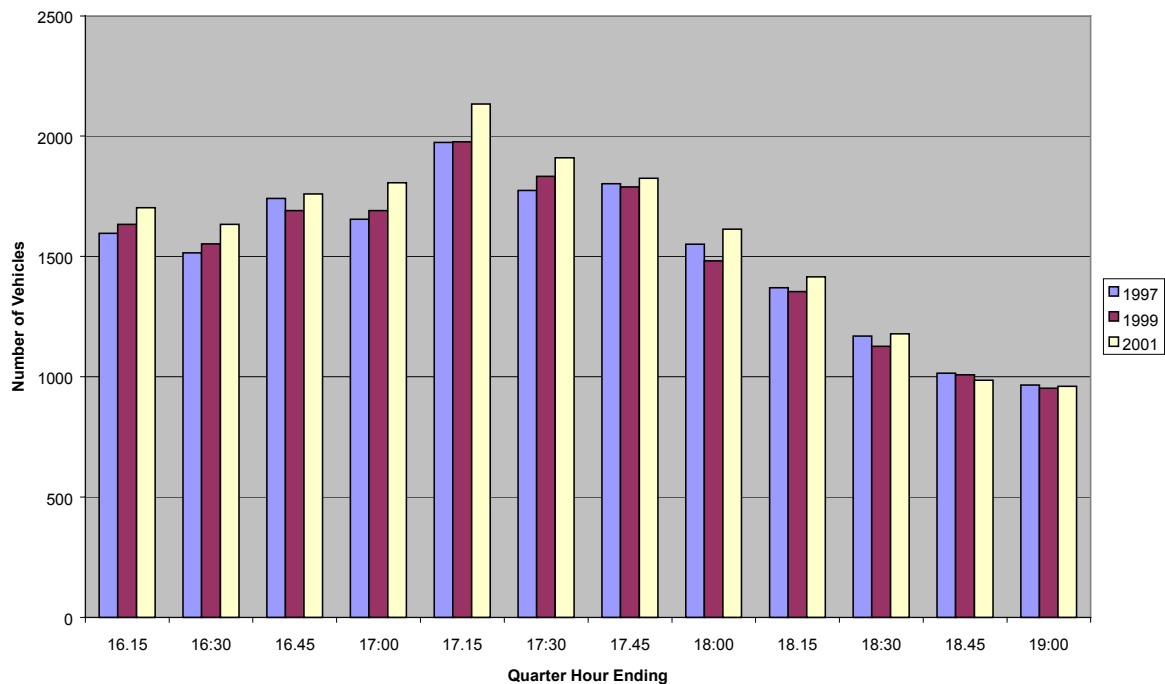


Figure 3 Inbound levels of vehicles, by hour

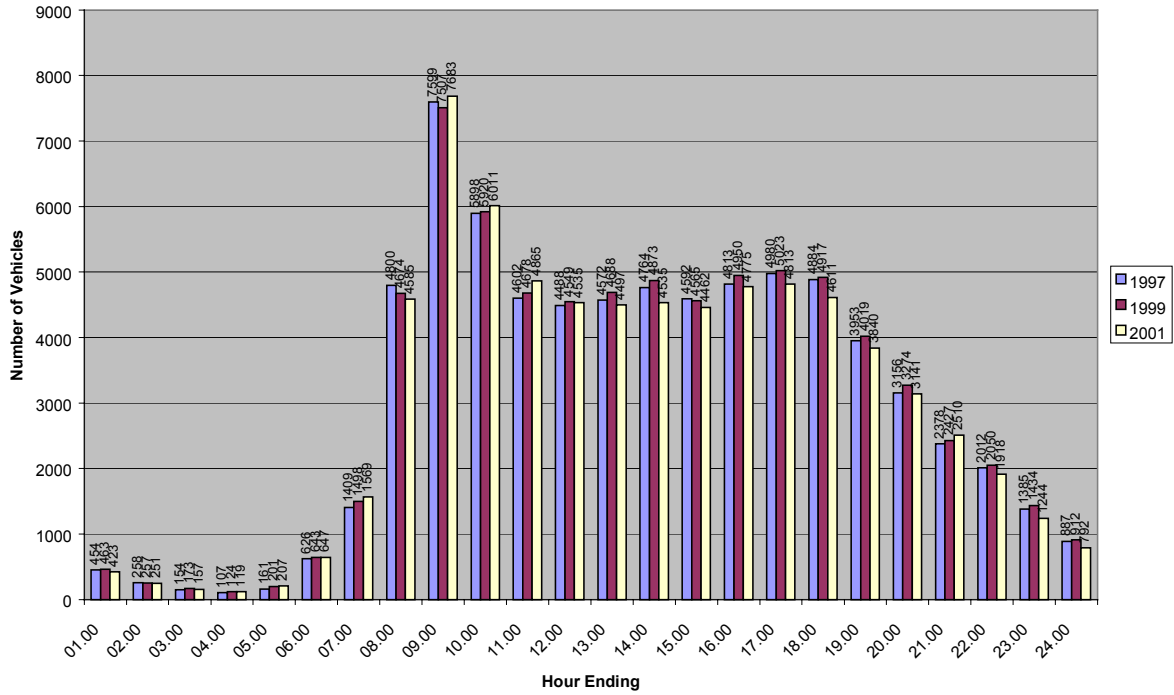
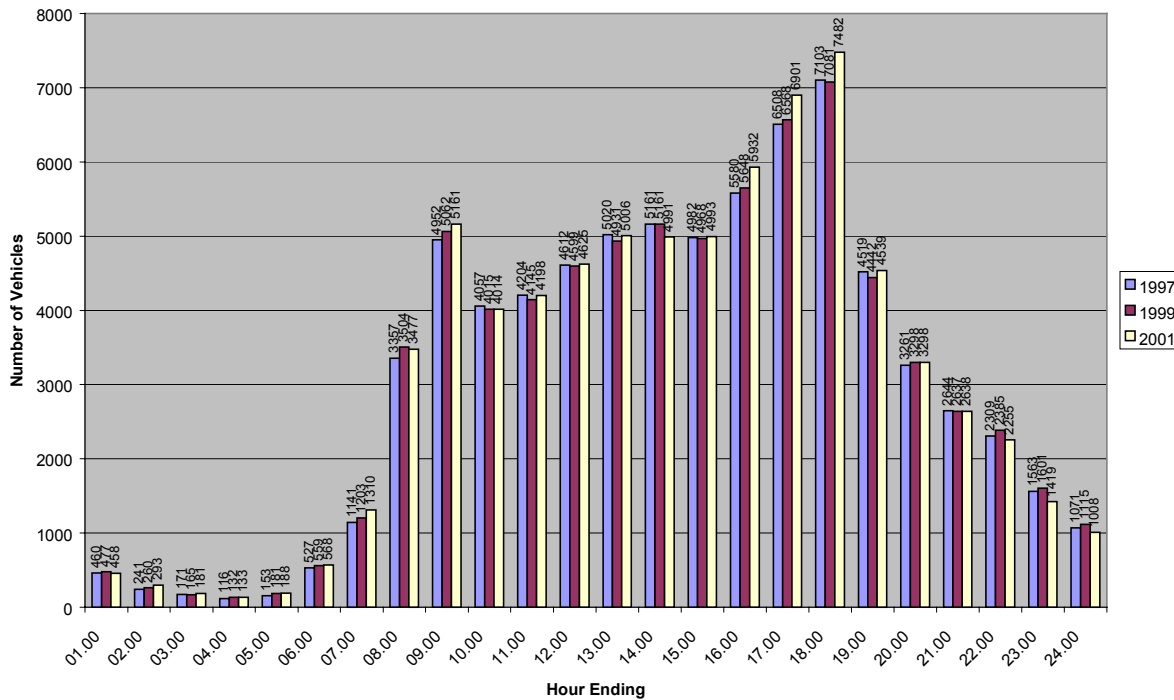


Figure 4 Outbound levels of vehicles, by hour



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 2001

	Mon.	Tues.	Wed.	Thur.	Fri.	Sat.	Sun.
Inbound							
07.30 - 09.30	0.989	1.024	1.040	0.985	0.964	0.460	0.099
10.00 - 12.00	0.997	1.014	0.943	1.019	1.027	1.116	0.633
16.00 - 18.00	1.034	1.042	0.961	0.989	0.975	0.693	0.485
07.00 - 19.00	0.999	1.033	0.973	1.001	0.995	0.838	0.464
00.00 - 24.00	0.994	1.025	0.973	1.001	1.008	0.860	0.525
Outbound							
07.30 - 09.30	0.976	1.052	1.033	0.990	0.951	0.468	0.151
10.00 - 12.00	0.987	1.033	0.861	1.017	1.103	1.202	0.705
16.00 - 18.00	1.019	1.037	0.949	0.981	1.015	0.782	0.355
07.00 - 19.00	0.986	1.024	0.933	1.008	1.049	0.929	0.491
00.00 - 24.00	0.975	1.009	0.935	1.013	1.068	0.969	0.559

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
01 00	423	458	-35	-35
02 00	251	293	-42	-77
03 00	157	181	-24	-101
04 00	119	133	-14	-115
05 00	207	188	19	-96
06 00	647	568	79	-17
07 00	1 569	1 310	259	242
08 00	4 585	3 477	1108	1 350
09 00	7 683	5 161	2522	3 872
10 00	6 011	4 014	1997	5 869
11 00	4 865	4 198	667	6 536
12 00	4 535	4 625	-90	6 446
13 00	4 497	5 006	-509	5 937
14 00	4 535	4 991	-456	5 481
15 00	4 462	4 992	-530	4 951
16 00	4 775	5 932	-1157	3 794
17 00	4 813	6 901	-2088	1 706
18 00	4 611	7 482	-2871	-1 165
19 00	3 840	4 539	-699	-1 864
20 00	3 141	3 298	-157	-2 021
21 00	2 510	2 638	-128	-2 149
22 00	1 918	2 255	-337	-2 486
23 00	1 244	1 419	-175	-2 661
24 00	792	1 008	-216	-2 877

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

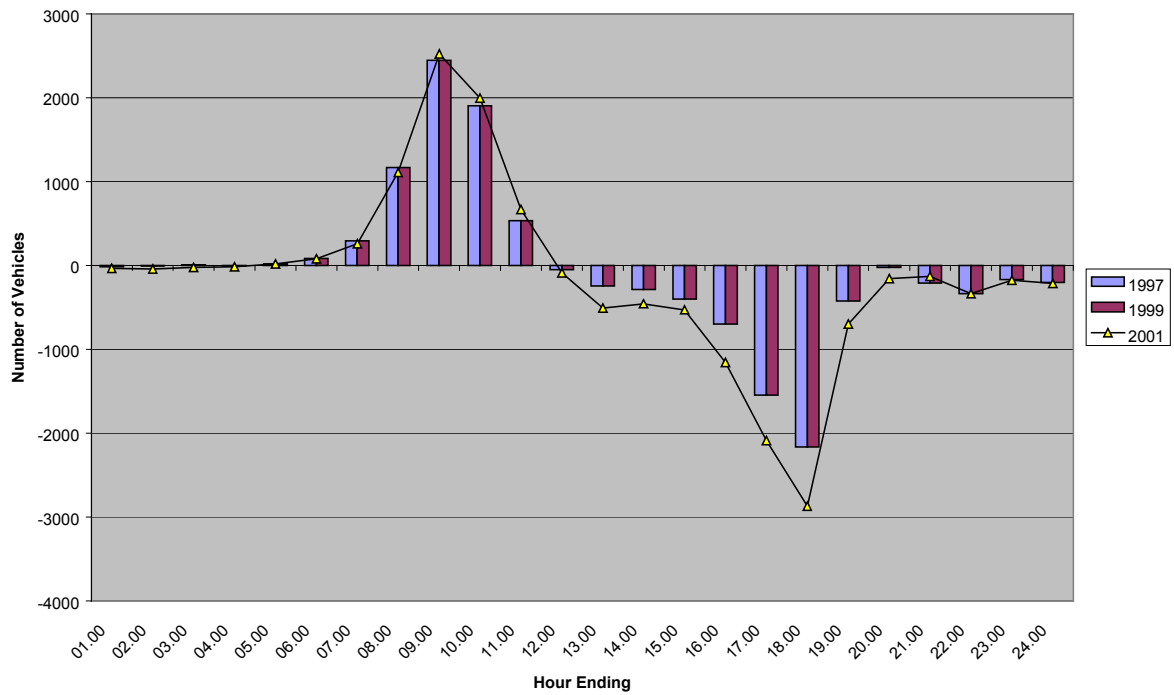
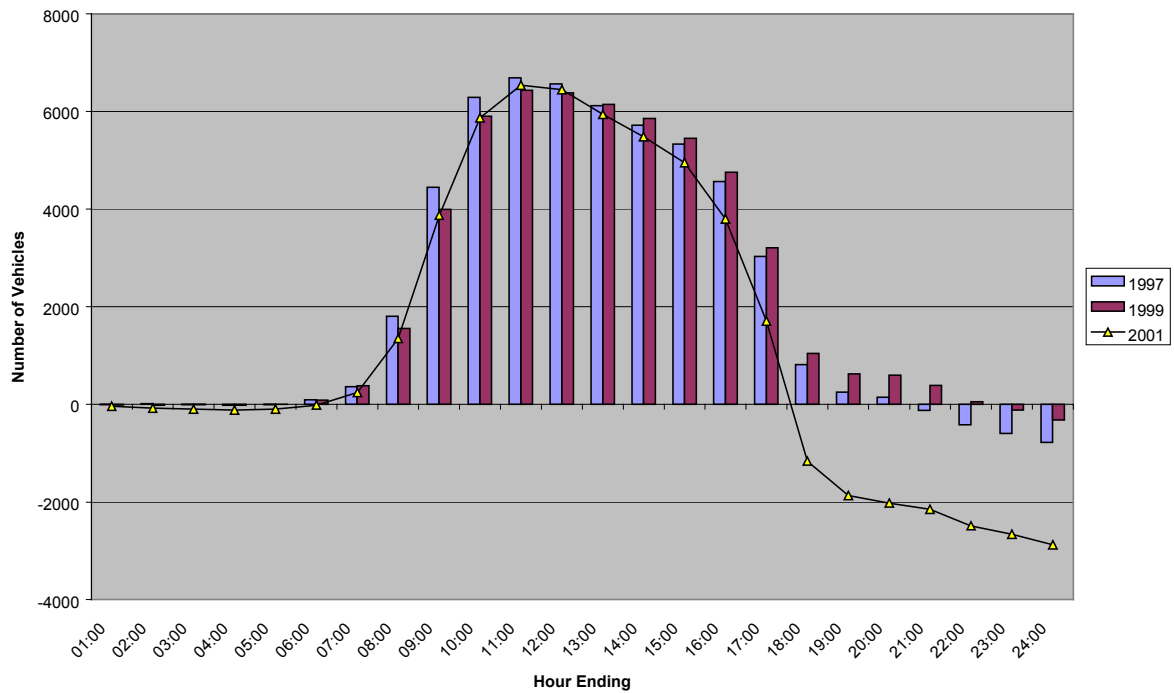


Figure 6 Net accumulation of vehicles, by hour



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

Site	Location	Inbound 2001	Outbound 2001	Net loss / gain 2001
WL01	Lichfield Street	2,650	3,539	-889
WL02	Lower Rushall Street	12,695	14,949	-2,254
WL03	Lincoln Road	607	301	306
WL04	The Crescent	1,411	1,436	-25
WL05	Sutton Road	3,538	4,590	-1,052
WL06	Birmingham Road	6,719	6,964	-245
WL07	Delves Road	1,902	1,764	138
WL08	West Bromwich St.	671	0	671
WL09	West Street	5,663	5,987	-324
WL10	Bescot Crescent	3,939	5,956	-2,017
WL12	Wednesbury Road	8,979	11,016	-2,037
WL13	Rollingmill Street	5,400	5,161	239
WL14	Bridgeman Street	8,053	6,273	1,780
WL15	Wolverhampton St.	0	1,361	-1,361
WL16	Green Lane	4,187	1,551	2,636
WL17	Stafford Street	4,107	2,241	1,866
WL18	Hatherton Street	1,668	1,980	-312

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

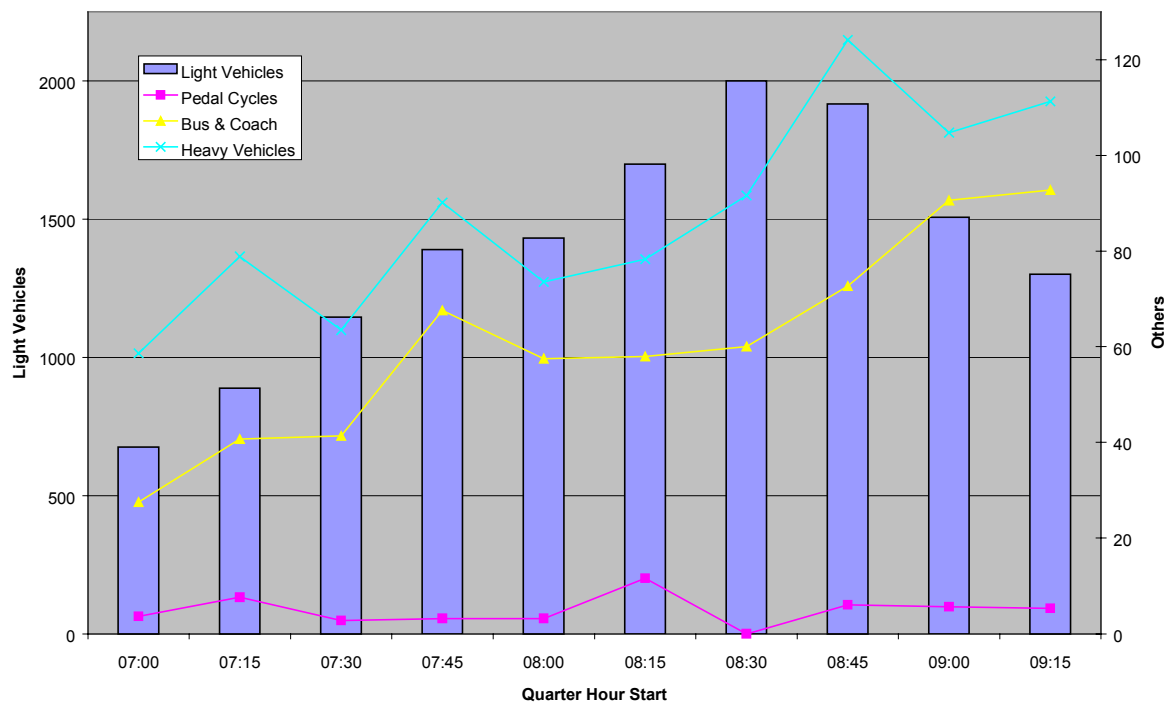
TIME STARTING	TOTAL VEH	PEDAL CYC	BUS & COACH	Light Vehs	Heavy Vehs	% pedal cycle	% bus	% light	% goods
07.00	418	2	15	369	32	0.48%	3.59%	88.28%	7.66%
07.15	399	3	16	349	31	0.75%	4.01%	87.47%	7.77%
07.30	454	1	15	415	23	0.22%	3.30%	91.41%	5.07%
07.45	482	1	21	432	28	0.21%	4.36%	89.63%	5.81%
08.00	490	1	18	448	23	0.20%	3.67%	91.43%	4.69%
08.15	637	4	20	586	27	0.63%	3.14%	91.99%	4.24%
08.30	681	0	19	633	29	0.00%	2.79%	92.95%	4.26%
08.45	700	2	24	633	41	0.29%	3.43%	90.43%	5.86%
09.00	603	2	32	532	37	0.33%	5.31%	88.23%	6.14%
09.15	570	2	35	491	42	0.35%	6.14%	86.14%	7.37%
Total	5434	18	215	4888	313	0.33%	3.96%	89.95%	5.76%

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	766	4	27	676	59
07.15	1015	8	41	888	79
07.30	1253	3	41	1145	63
07.45	1551	3	68	1390	90
08.00	1566	3	58	1432	74
08.15	1847	12	58	1699	78
08.30	2151	0	60	1999	92
08.45	2119	6	73	1916	124
09.00	1707	6	91	1506	105
09.15	1510	5	93	1301	111
Total	15485	51	613	13929	892

The figures in 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 left hand axis and all the other categories form the right-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 estimated figures in Figure 8. The figures collected in the manual surveys can be found in Appendix 2.

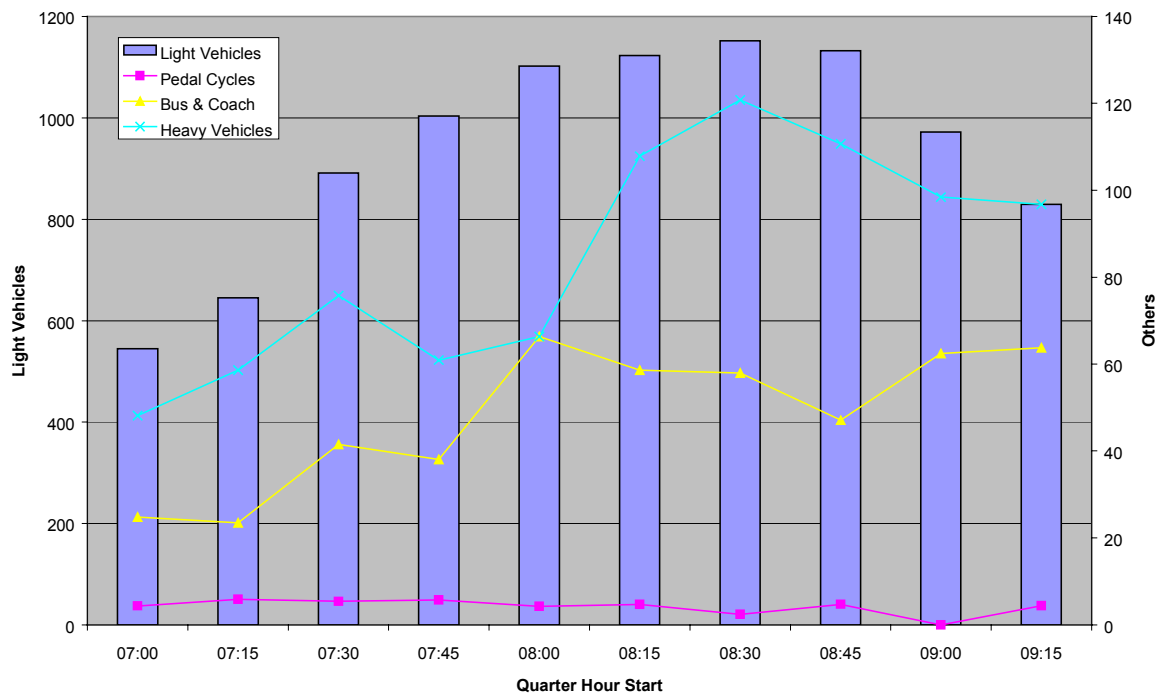
Table 9 Summary of Outbound mode of transport data from manual surveys

TIME STARTING	TOTAL VEH	PEDAL CYC	BUS & COACH	Light Vehs	Heavy Vehs	% pedal cycle	% bus	% light	% goods
07.00	426	3	17	373	33	0.70%	3.99%	87.56%	7.75%
07.15	500	4	16	440	40	0.80%	3.20%	88.00%	8.00%
07.30	562	3	23	494	42	0.53%	4.09%	87.90%	7.47%
07.45	582	3	20	527	32	0.52%	3.44%	90.55%	5.50%
08.00	579	2	31	515	31	0.35%	5.35%	88.95%	5.35%
08.15	552	2	25	479	46	0.36%	4.53%	86.78%	8.33%
08.30	552	1	24	477	50	0.18%	4.35%	86.41%	9.06%
08.45	550	2	20	481	47	0.36%	3.64%	87.45%	8.55%
09.00	472	0	26	405	41	0.00%	5.51%	85.81%	8.69%
09.15	452	2	29	377	44	0.44%	6.42%	83.41%	9.73%
Total	5227	22	231	4568	406	0.42%	4.42%	87.39%	7.77%

Table 10 Estimated Outbound mode of transport figures

TIME	No. auto	estimated	estimated	estimated	estimated
STARTING	vehs.	ped cyc	bus	light	goods
07.00	622	4	25	545	48
07.15	733	6	23	645	59
07.30	1014	5	41	891	76
07.45	1108	6	38	1003	61
08.00	1239	4	66	1102	66
08.15	1294	5	59	1123	108
08.30	1333	2	58	1152	121
08.45	1295	5	47	1133	111
09.00	1133	0	62	972	98
09.15	994	4	64	829	97
Total	10765	45	476	9408	836

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 four manual sites and the number of vehicles counted automatically per time period

Figure 9 Estimates of persons Inbound Morning Peak Period

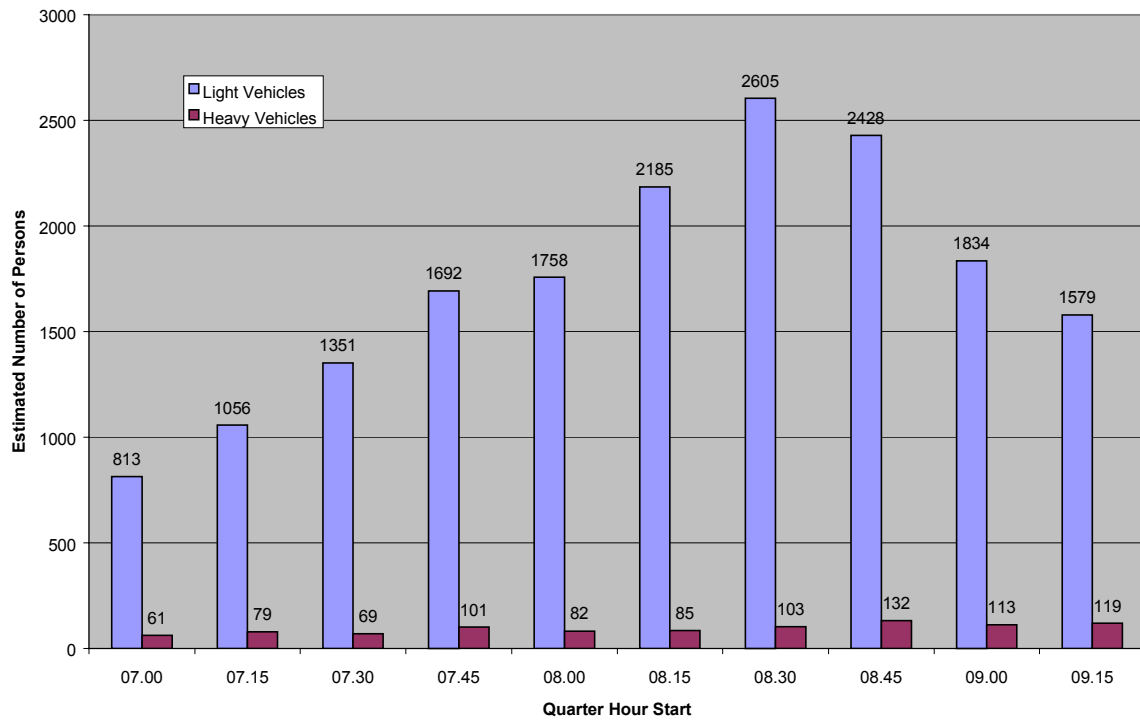
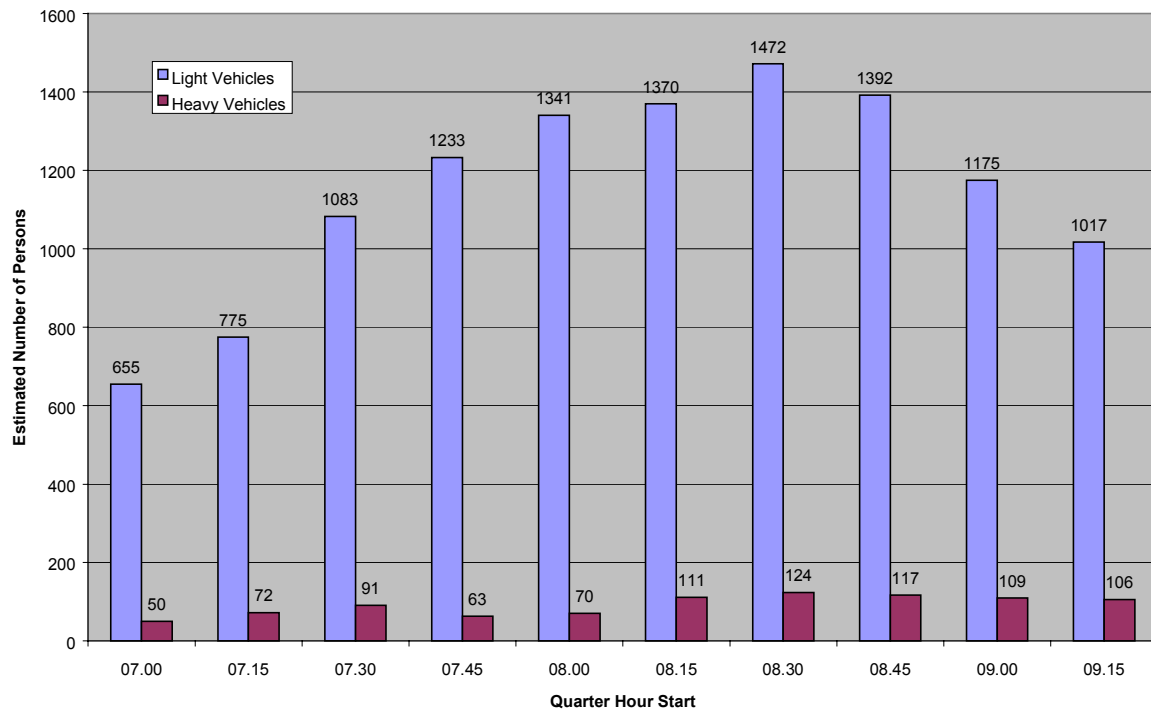


Figure 10 Estimates of persons Outbound Morning Peak Period



5 Appendix 1 Position of Cordon Sites

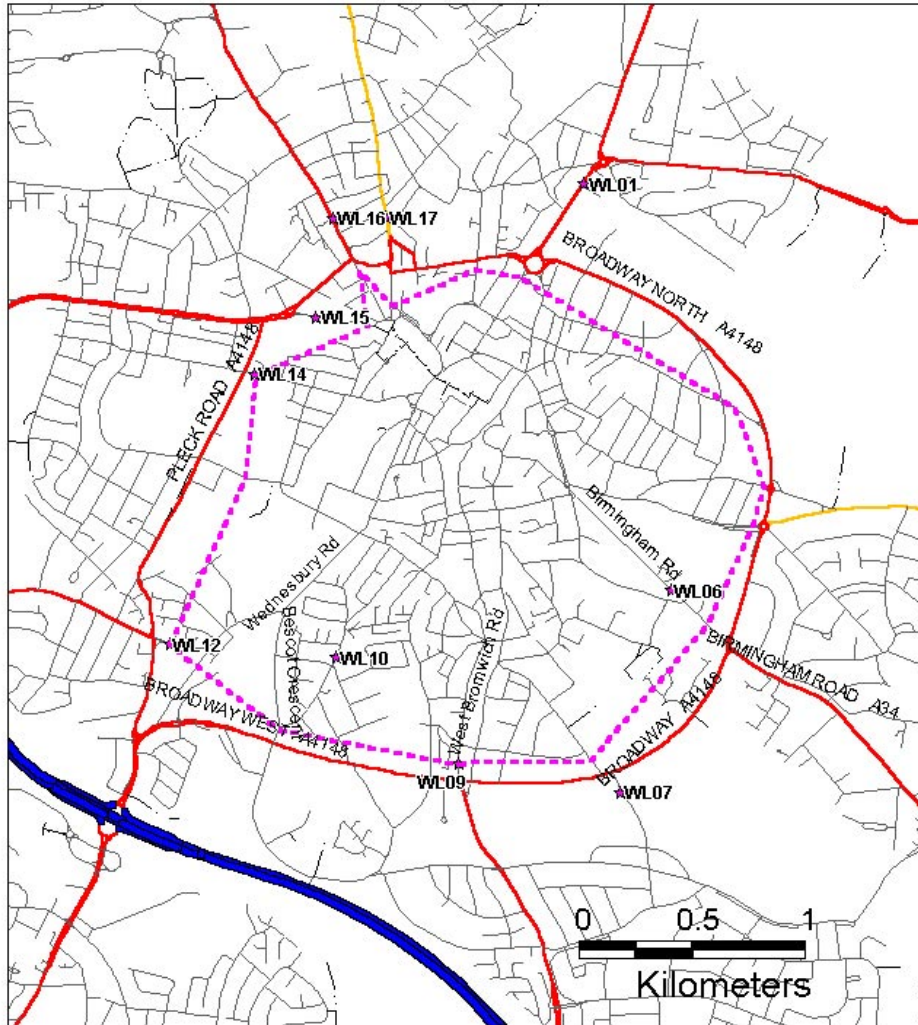
Table 11 Automatic count sites

Site	Location	Exact Position
WL01	Lichfield Street	Between Littleton Street and Hatherton St.
WL02	Lower Rushall Street	Between Broadway and Walhouse Road
WL03	Lincoln Road	Between Broadway and Princes Avenue
WL04	The Crescent	Between Broadway and Boscobel Road
WL05	Sutton Road	Between Broadway and Boscobel Road
WL06	Birmingham Road	Between Broadway and Jesson Close
WL07	Delves Road	Between Broadway and Tame Street East
WL08	West Bromwich Road	Between Broadway and Tame Street East
WL09	Weston Street	Between Broadway and Tame Street
WL10	Bescot Crescent	Between Broadway and Milton Street
WL12	Wednesbury Road	Between Bescot Rd and Caledon Street
WL13	Rollingmill Street	Between Brineton Street and Queen Street
WL14	Bridgeman Street	Between Pleck Road and Charles Street
WL15	Wolverhampton Street	Between Blue Lane and Townend
WL16	Green Lane	Between Court Way and Margaret Street
WL17	Stafford Street	Between Littleton Street and Townend
WL18	Hatherton Street	Between Littleton Street and Hatherton Road

Table 12 Manual Count sites

WL01(R491)	Lichfield Street	Near Butts Street
WL06(R1884)	Birmingham Road	Near Jesson Close
WL09(R5847)	Weston Street	Near Tame Street
WL12(N2050)	Wednesbury Road	Near Caledon Street

Figure 11 **Location of Walsall ATC Cordon Sites**



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Appendix 2 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	1763	7	67	1565	114	0.40%	3.82%	89.28%	6.50%	4585	18	175	4093	298
08:00	2508	7	81	2300	120	0.28%	3.23%	91.71%	4.78%	7683	21	248	7046	368
09:00	2232	6	110	1967	149	0.27%	4.93%	88.13%	6.68%	6011	16	296	5297	401
10:00	2246	1	107	1942	196	0.04%	4.78%	86.46%	8.73%	4865	2	232	4207	425
11:00	2029	0	97	1766	166	0.00%	4.78%	87.04%	8.18%	4535	0	217	3947	371
12:00	2073	0	87	1822	164	0.00%	4.20%	87.89%	7.91%	4497	0	189	3953	356
13:00	1742	2	89	1522	87	0.11%	5.11%	87.37%	4.99%	4535	5	232	3962	226
14:00	1759	4	86	1529	85	0.23%	4.89%	86.92%	4.83%	4462	10	218	3879	216
15:00	1954	4	96	1697	113	0.20%	4.91%	86.85%	5.78%	4775	10	235	4147	276
16:00	2588	12	92	2330	99	0.46%	3.55%	90.03%	3.83%	4813	22	171	4333	184
17:00	2719	14	86	2533	60	0.51%	3.16%	93.16%	2.21%	4611	24	146	4296	102
18:00	2328	2	69	2199	33	0.09%	2.96%	94.46%	1.42%	3840	3	114	3627	54
Total	25931	59	1067	23172	1386	0.23%	4.11%	89.36%	5.34%	59212	135	2436	52912	3165
10-12 Total	4275	1	204	3708	362	0.02%	4.77%	86.74%	8.47%	9400	2	449	8154	796
07:00	418	2	15	369	32	0.48%	3.59%	88.28%	7.66%	766	4	27	676	59
07:15	399	3	16	349	31	0.75%	4.01%	87.47%	7.77%	1015	8	41	888	79
07:30	454	1	15	415	23	0.22%	3.30%	91.41%	5.07%	1253	3	41	1145	63
07:45	482	1	21	432	28	0.21%	4.36%	89.63%	5.81%	1551	3	68	1390	90
08:00	490	1	18	448	23	0.20%	3.67%	91.43%	4.69%	1566	3	58	1432	74
08:15	637	4	20	586	27	0.63%	3.14%	91.99%	4.24%	1847	12	58	1699	78
08:30	681	0	19	633	29	0.00%	2.79%	92.95%	4.26%	2151	0	60	1999	92
08:45	700	2	24	633	41	0.29%	3.43%	90.43%	5.86%	2119	6	73	1916	124
09:00	603	2	32	532	37	0.33%	5.31%	88.23%	6.14%	1707	6	91	1506	105
09:15	570	2	35	491	42	0.35%	6.14%	86.14%	7.37%	1510	5	93	1301	111
7.30-9.30 Total	4617	13	184	4170	250	0.28%	3.99%	90.32%	5.41%	13704	39	546	12377	742
16:30	701	4	23	639	35	0.57%	3.28%	91.16%	4.99%	1210	7	40	1103	60
16:45	654	6	25	598	25	0.92%	3.82%	91.44%	3.82%	1191	11	46	1089	46
17:00	714	8	25	655	26	1.12%	3.50%	91.74%	3.64%	1197	13	42	1098	44
17:15	669	4	18	648	19	0.58%	2.61%	94.05%	2.76%	1167	7	30	1098	32
17:30	656	1	25	608	22	0.15%	3.81%	92.68%	3.35%	1185	2	45	1098	40
17:45	660	1	18	622	19	0.15%	2.73%	94.24%	2.88%	1062	2	29	1001	31
18:00	612	0	18	575	19	0.00%	2.94%	93.95%	3.10%	1044	0	31	981	32
18:15	571	1	19	537	14	0.18%	3.33%	94.05%	2.45%	923	2	31	868	23
Total	5257	25	171	4882	179	0.48%	3.25%	92.87%	3.40%	8979	43	292	8338	306

Outbound														
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	2070	13	76	1834	147	0.63%	3.67%	88.60%	7.10%	3477	22	128	3081	247
08:00	2233	7	100	1952	174	0.31%	4.48%	87.42%	7.79%	5161	16	231	4512	402
09:00	1770	3	101	1489	177	0.17%	5.71%	84.12%	10.00%	4014	7	229	3377	401
10:00	1933	0	90	1647	196	0.00%	4.66%	85.20%	10.14%	4198	0	195	3577	426
11:00	2016	2	98	1753	163	0.10%	4.86%	86.95%	8.09%	4625	5	225	4022	374
12:00	2143	2	88	1880	173	0.09%	4.11%	87.73%	8.07%	5006	5	206	4392	404
13:00	2346	3	98	2104	141	0.13%	4.18%	89.68%	6.01%	4991	6	208	4476	300
14:00	2395	6	98	2128	163	0.25%	4.09%	88.85%	6.81%	4993	13	204	4436	340
15:00	2628	4	109	2369	146	0.15%	4.15%	90.14%	5.56%	5932	9	246	5347	330
16:00	2908	11	112	2676	109	0.38%	3.85%	92.02%	3.75%	6901	26	266	6350	259
17:00	3256	9	92	3067	88	0.28%	2.83%	94.20%	2.70%	7482	21	211	7048	202
18:00	2503	5	49	2404	45	0.20%	1.96%	96.04%	1.80%	4539	9	89	4359	82
Total	28201	65	1111	25303	1722	0.23%	3.94%	89.72%	6.11%	61319	141	2416	55018	3744
10-12 Total	3949	2	188	3400	359	0.05%	4.76%	86.10%	9.09%	8823	5	420	7599	800
07:00	426	3	17	373	33	0.70%	3.99%	87.56%	7.75%	622	4	25	545	48
07:15	500	4	16	440	40	0.80%	3.20%	88.00%	8.00%	733	6	23	645	59
07:30	562	3	23	494	42	0.53%	4.09%	87.90%	7.47%	1014	5	41	891	76
07:45	582	3	20	527	32	0.52%	3.44%	90.55%	5.50%	1108	6	38	1003	61
08:00	579	2	31	515	31	0.35%	5.35%	88.95%	5.35%	1239	4	66	1102	66
08:15	552	2	25	479	46	0.36%	4.53%	86.78%	8.33%	1294	5	59	1123	108
08:30	552	1	24	477	50	0.18%	4.35%	86.41%	9.06%	1333	2	58	1152	121
08:45	550	2	20	481	47	0.36%	3.64%	87.45%	8.55%	1295	5	47	1133	111
09:00	472	0	26	405	41	0.00%	5.51%	85.81%	8.69%	1133	0	62	972	98
09:15	452	2	29	377	44	0.44%	6.42%	83.41%	9.73%	994	4	64	829	97
7.30-9.30 Total	4301	15	198	3755	333	0.35%	4.60%	87.31%	7.74%	9410	32	436	8205	737
16:30	759	0	29	708	22	0.00%	3.82%	93.28%	2.90%	1760	0	67	1642	51
16:45	703	5	23	653	22	0.71%	3.27%	92.89%	3.13%	1806	13	59	1678	57
17:00	866	2	18	825	21	0.23%	2.08%	95.27%	2.42%	2134	5	44	2033	52
17:15	822	0	29	764	29	0.00%	3.53%	92.94%	3.53%	1910	0	67	1775	67
17:30	839	2	19	797	21	0.24%	2.26%	94.99%	2.50%	1825	4	41	1734	46
17:45	729	5	26	681	17	0.69%	3.57%	93.42%	2.33%	1613	11	58	1507	38
18:00	769	3	15	738	13	0.39%	1.95%	95.97%	1.69%	1416	6	28	1359	24
18:15	643	1	13	616	13	0.16%	2.02%	95.80%	2.02%	1178	2	24	1129	24
Total	6130	18	172	5782	158	0.29%	2.81%	94.32%	2.58%	13642	40	383	12868	352

Appendix 4 Estimates of Persons from Occupancy Data

Total Inbound	Number of vehicles with					Total Veh	Total Pass	Ave Occupancy	Counted Vehicles	Automatically Estimated	B	C	D	E	F	G	H	Est People
	1	2	3	4	5													
Start Time																		
07.00	399	67	10	2	1	479	576	1.20	766	27	4	31	676	813	817	59	61	
07.15	397	65	11	1	0	474	564	1.19	1015	41	8	48	888	1056	1064	79	79	
07.30	507	91	6	2	0	606	715	1.18	1253	41	3	44	1145	1351	1354	63	69	
07.45	494	101	9	3	1	608	740	1.22	1551	68	3	71	1390	1692	1695	90	101	
08.00	500	113	7	1	3	624	766	1.23	1566	58	3	61	1432	1758	1761	74	82	
08.15	518	134	21	6	0	679	873	1.29	1847	58	12	70	1699	2185	2196	78	85	
08.30	575	119	34	11	1	740	964	1.30	2151	60	0	60	1999	2605	2605	92	103	
08.45	536	140	15	4	1	696	882	1.27	2119	73	6	79	1916	2428	2434	124	132	
09.00	469	110	6	2	0	587	715	1.22	1707	91	6	96	1506	1834	1840	105	113	
09.15	464	95	10	1	1	571	693	1.21	1510	93	5	98	1301	1579	1584	111	119	
07.30-09.30	4063	903	108	30	7	5111	6348	1.24			38		12389	15431	15469	875	943	
09.30	388	105	10	4	0	507	644	1.27										
09.45	415	108	10	7	0	540	689	1.28										
10.00	323	113	14	1	0	451	595	1.32										
10.15	307	113	14	1	1	436	584	1.34										
10.30	321	128	12	1	0	462	617	1.34										
10.45	333	130	10	3	0	476	635	1.33										
11.00	333	101	11	3	0	448	580	1.29										
11.15	326	114	7	0	0	447	575	1.29										
11.30	320	122	15	5	0	462	629	1.36										
11.45	298	112	7	4	0	421	559	1.33										
10.00-12.00	2561	933	90	18	1	3603	4774											
12.00	304	125	7	1	1	438	584	1.33										
12.15	272	120	10	6	3	411	581	1.41										
07.00-12.30	8799	2426	256	69	13	11563	14760											

Start Time	Number of vehicles with Occupants					Total Veh	Total Pass	Ave Occupancy	A		B+C	D	E	F		G	
	1	2	3	4	5				Automatically Counted Vehicles	Estimated Number of Buses				Estimated Pedal Cycles	Est. Light Vehs.	Est. Ave Occ	Est People Light Vehs + Ped Cyc
07.00	399	67	10	2	1	479	576	1.20	622	25	4	29	545	655	48	50	
07.15	353	57	9	2	1	422	507	1.20	733	23	6	29	645	775	59	72	
07.30	398	67	10	4	1	480	583	1.21	1014	41	5	47	891	1083	76	91	
07.45	425	96	10	2	0	533	655	1.23	1108	38	6	44	1003	1233	61	63	
08.00	427	74	10	6	0	517	629	1.22	1239	66	4	71	1102	1341	66	70	
08.15	397	66	14	4	0	481	587	1.22	1294	59	5	63	1123	1370	108	111	
08.30	402	84	18	6	1	511	653	1.28	1333	58	2	60	1152	1472	121	124	
08.45	344	71	12	1	0	428	526	1.23	1295	47	5	52	1133	1392	111	117	
09.00	339	65	6	3	0	413	499	1.21	1133	62	0	62	972	1175	98	109	
09.15	301	70	8	0	0	379	465	1.23	994	64	4	68	829	1017	97	106	
07.30-09.30	3033	593	88	26	2	3742	4597										
09.30	302	82	4	2	2	392	496	1.27									
09.45	286	78	10	3	2	379	494	1.30									
10.00	318	79	2	1	0	400	486	1.22									
10.15	283	90	11	4	1	389	517	1.33									
10.30	273	96	7	1	0	377	490	1.30									
10.45	296	113	14	3	0	426	576	1.35									
11.00	272	116	18	0	0	406	558	1.37									
11.15	326	123	12	5	2	468	638	1.36									
11.30	330	95	13	2	0	440	567	1.29									
11.45	343	101	19	2	0	465	610	1.31									
10.00-12.00	2441	813	96	18	3	3371	4442										
12.00	334	120	24	1	1	480	655	1.36									
12.15	314	153	17	4	1	489	692	1.42									
07.00-12.30	7462	1963	258	58	13	9754	12459										