PREPARED

FOR

LONDON BOROUGH OF HILLINGDON

JMP Consultants Ltd
Consulting Civil, Structural and Transportation Engineers
172 TOTTENHAM COURT ROAD
LONDON W1P 9LG Tel. 01-487 5331
Telex.261196 JMPCONG Fax. 01-3870078

TRAFFIC GENERATION STUDY

HIGH TECH ESTATES AND OFFICE BUILDINGS

1989

CONTENTS

1 INTRODUCTION

Background

1.1 This Study was undertaken for the London Borough of Hillingdon to determine the traffic generation rates from a sample of "High Tech" estates and office buildings within the Borough. The data will be used to assess the traffic impact of proposed developments, to assist in the updating of the Borough's car parking standards and to assess the impact of changes in use class, arising from the new class B1 Business Group, contained within the 1987 Use Classes Order.

1.2 Twelve sites were selected for study from a shortlist of twenty nine possible locations. The sites were chosen to obtain a sample of developments concentrating on those with a large number of staff. Sites were also selected to obtain a spread of sites across the Borough and to obtain a balance of sites within the town centres and those 'out-of-town'.

1.3 The twelve selected sites comprised of six 'High Tech' industrial developments and six office developments. The size of the developments ranged from a 'High Tech' site with a staff of 1000 on a floor space of 30,000 square metres to a small office building with a staff of 60 on 1000 square metres.

1.4 Different survey techniques were required for each type of site. For those 'High Tech' sites where all traffic (vehicular and pedestrian) passed through a single site entrance/exit, roadside interviews were carried out as people left the site while a count of all arrivals and departures was maintained throughout the day. In a similar vein, for those office buildings where all entrances and exits pass through a common area, 'foyer style' interviews were undertaken while again maintaining a count of all arrivals and departures. Where these methods were not applicable, questionnaires were distributed for staff to complete details of the trips made by them during the day and this was supplemented by an interview survey of all visitors.

1.5 Due to the nature of the surveys only a sample of users could be interviewed but assuming that a random, independent sample was surveyed, the results could then be scaled accordingly. In the event a 78% average sample was achieved for those sites where roadside and foyer interviews were undertaken and 54% for those sites where the staff questionnaire technique was employed.

Report Layout

1.6 Sections 2, 3 and 4 of the report outline the sample selection process, the survey techniques and the analysis procedures. This is followed by 12 Sections that outline the results for each of the 12 separate sites. Each section contains an Appendix which includes detailed tabulations.

1.7 Section 17 draws together their results of all sites and provides some overall comparison and analysis.

2 SITE SELECTION

2.1 Twelve sites were selected from an initial list of twenty-nine possible locations.

2.2 All twenty-nine sites were visited in order to determine a shortlist of suitable locations. Many of the initial sites were unsuitable for the survey due to security measures, incomplete buildings, or locations with too many entrances/exits to be adequately monitored. The sites to be used in the study were then selected to obtain a broad range of size and type of business, concentrating on those with larger staff numbers.

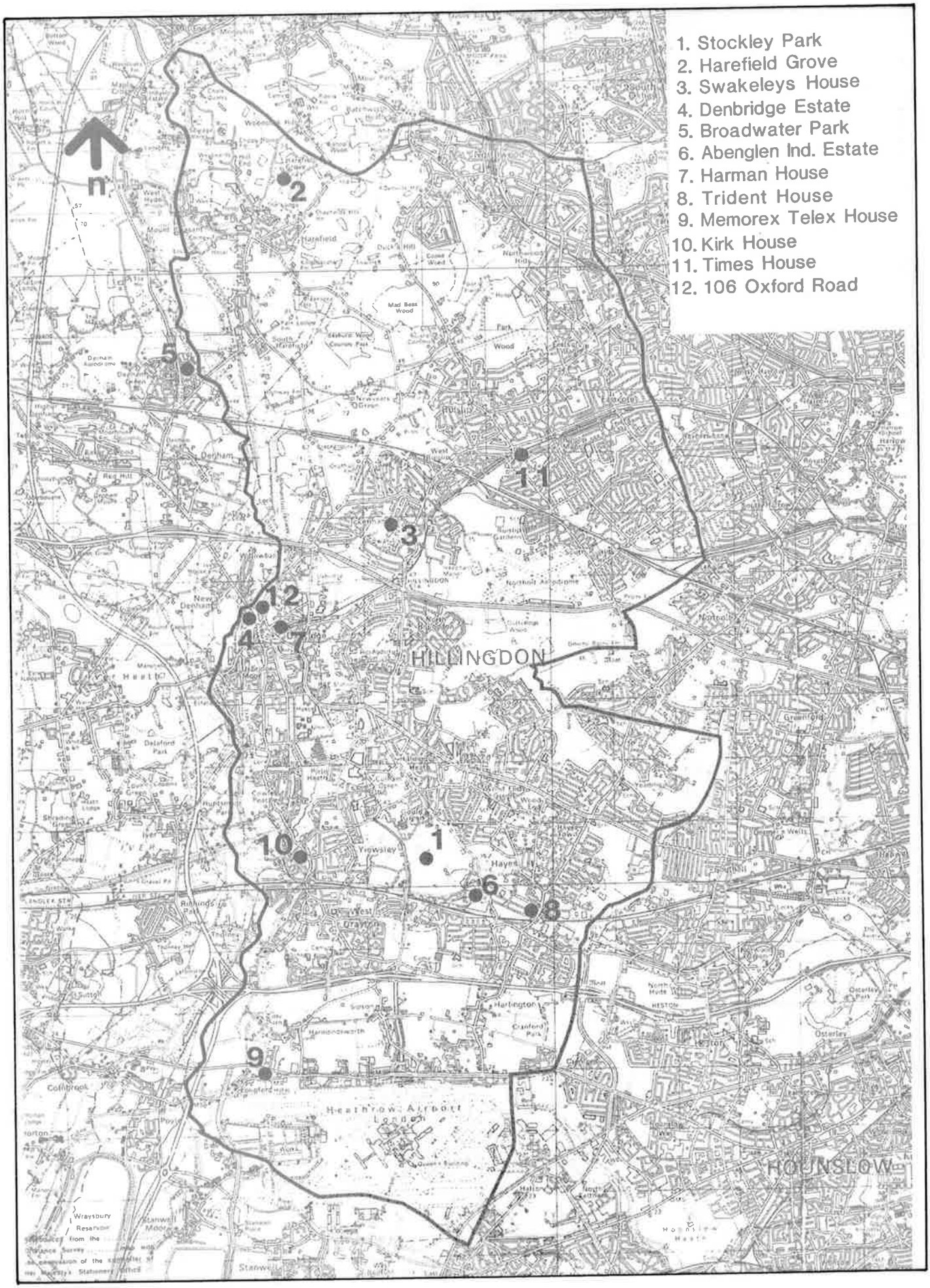
2.3 Sites were also selected to obtain a balance of town centre sites, where public transport and shopping facilities were readily available, and 'out-of-town' sites where the majority of employees must drive to work. The sites were also selected to obtain coverage of the entire Borough. The locations of the sites are set out at Figure 2.1.

2.4 The 'High Tech' developments were generally located 'out-of-town' where public transport was not so readily available and staff generally drove to work. The sites ranged in size from Stockley Park with a range of firms with a combined staff of 1000 on a floor space of 30,000 square metres to Harefield Grove with a staff of 100 on 4,200 square metres.

2.5 Businesses on these sites ranged from large multi-national companies, such as Roussel and Toshiba where scientific and research work was undertaken to smaller establishments such as Initial Services and Bristol Myers where they undertook managerial and administrative work, to small private companies with less than ten staff such as those on Abenglen Industrial Estate.

2.6 The office buildings were selected from both town centre and 'out-of-town' locations. They ranged in size from Harman House, in the centre of Uxbridge, with 580 staff on a floor space of 12,500 square metres to Memorex Telex House with 60 staff on 1000 square metres.

2.7 Businesses included large multi-national companies such as IBM through to large professional and retailing/marketing companies such as Cooper and Lybrand and the Rover Group to small consultancies and private companies.



LOCATION OF SURVEY SITES

Figure 2.1

3 SURVEY TECHNIQUES

3.1 The surveys were undertaken over a two week period from Monday 4 July to Friday 15 July 1988. The survey dates for each site were selected so that the survey was held on a normal working day and that no atypical events were being held which could influence the traffic generation, for instance, early finishing on Friday afternoons.

3.2 The businesses involved were approached by JMP, usually through the Personnel or Facilities Manager of each Company. Permission was obtained from them to undertake the survey on their premises after outlining to them the objectives and intention of the study. After initial permission had been received the participating businesses were then sent an outline of the survey technique including the appropriate interview sheet or questionnaire.

3.3 The number of staff employed on each development and the floor area of the building were also ascertained at this time.

3.4 The day prior to the survey the businesses were again contacted and the arrangements reconfirmed with them. Following the survey, letters of thanks were sent to all participating companies.

3.5 Four different survey techniques were used relevant to each particular site, namely:-

(i) Roadside interview
(ii) Classified vehicles counts
(iii) Foyer interviews
(iv) Staff questionnaire

Roadside Interviews

3.6 This technique was employed on those sites with a single entrance/exit through which all traffic, both vehicular and pedestrian, passed.

3.7 A row of cones was positioned to funnel all outbound traffic into a single file to allow surveyors to halt the traffic and undertake the interviews. Typically interviews took about thirty seconds and were made in batches of threes by the three surveyors. Interviewing took place in the outbound direction due to the increased safety aspect of warning drivers of the approaching interview. It was also considered that a better response would be achieved as, in most cases, drivers weren't so pressured for time as those racing to work or late for a meeting.

3.8 Information was recorded in half hour time intervals between 08.00 and 18.00. The vehicle type and number of occupants was determined and the driver then asked what purpose he had for visiting the site and from which firm he had come (for sites occupied by more than one company). Additional questions of where he lived and how long the journey took were also asked. Pedestrians were also asked a similar range of questions as they left the site. The questionnaire form is reproduced in an Appendix to this Report.

3.9 During off peak periods it was possible to achieve a 100% sample but during very busy peak periods this sample rate dropped to alleviate traffic congestion and to avoid unnecessary delays to the drivers. An average sample of 78% of the total outbound traffic was interviewed using this technique.

3.10 Counts at half hourly intervals were also maintained throughout the day of the number of vehicles and pedestrians arriving and departing from the site. From this data, parking accumulations on the site could be determined.

Classified Traffic Counts

3.11 For the estates where permission to conduct roadside interviews on the private estate road was not granted and those estates without a private road, classified traffic counts were undertaken. A complete count of all traffic including pedestrians, arriving and departing from the site was obtained at half hourly periods throughout the day (08.00 - 18.00).

Foyer Interviews

3.12 This form of survey was employed for those office buildings where all the entrances and exits passed through a common foyer. As people entered the building they were interviewed and asked the same questions as for the roadside interviews. Counts were also maintained of all arrivals and departures made throughout the day. An average sample of 76% of the total number of people entering the building were interviewed using this method. These surveys were concluded over the period 08.00-18.00.

Staff Questionnaire

3.13 This approach was adopted for those sites where neither of the interviews methods could be employed as there wasn't a single site entrance/exit

3.14 Questionnaires were delivered to the Personnel Managers to distribute to the staff. Collection boxes were then placed at the exits of the building and staff were asked to deposit their completed questionnaire in these boxes at the end of the day.

Each employee was asked:-

- where they lived
- how they travelled to work
- how long the journey took them
- where they parked their vehicle
- number of full days out of the office in the preceding week
- times of arrival and departure from work and details of other non-commuting trips made throughout the day.

The questionnaire is reproduced in an Appendix to this Report.

3.15 Although at these locations there may have been several entrances/exits they all had a main reception desk at which all visitors and deliveries reported. In order to obtain information regarding these trips a surveyor was located in the reception area.

3.16 An average of 54% of all employees responded to the questionnaire.

Survey Sites

3.17 The survey method, business classification and location of each site is set out in Table 3.1

Table 3.1 Survey Sites and Method Employed

SITE NAME	SURVEY METHOD EMPLOYED	HI-TECH/ OFFICE	IN TOWN/ OUT OF TOWN
Stockley Park	Roadside interview	High Tech	Out
Harefield Grove	Roadside interview	Office	Out
Swakeleys House	Roadside interview	High Tech	Out
Denbridge Estate	Roadside interview	High Tech	In
Broadwater Park	Classified traffic counts	High Tech	Out
Abenglen Industrial Estate	Classified traffic counts	Light Industry	Out
Harman House	Staff questionnaire	Office	In
Trident House	Staff questionnaire	Office	In
Memorex Telex House	Foyer interview	Office	Out
Kirk House	Staff questionnaire	Office	In
Times House	Foyer interview	Office	In
106 Oxford Road	Staff questionnaire	Office	In

4 ANALYSIS OF THE RESULTS

General

4.1 The method of analysis of the data recorded for each site is illustrated in the following paragraphs of this Section.

Traffic Flow and Purpose of Visit

4.2 For those sites where the roadside interview technique was employed, vehicle drivers were interviewed on exit from the site (for safety and sample size reasons) and hence tabulations of traffic flow by purpose of visit have been prepared for the outbound traffic from these sites.

4.3 For those sites where the questionnaire method was employed, all visitors and delivery staff were interviewed on entering the site and hence tabulations of traffic flow by purpose of visit have been prepared for the inbound traffic. Similarly where the foyer interview method has been employed; employees, visitors and delivery staff were interviewed on entering the building and hence tabulations are produced for the inbound direction.

4.4 The tables present hourly traffic counts (either inbound or outbound as explained above) by purpose of visit for a ten hour period (08.00-18.00) with three categories of 'purpose of visit' defined as:

(i) employees' vehicles
(ii) visitors' vehicles
(iii) delivery vehicles

The percentage of vehicle trips by purpose of visit summated over the whole day was also calculated. For the questionnaire survey data was obtained over a full day rather than a restriction of 0800 - 1800. For compatibility purposes trips arriving before 8.00 and leaving after 18.00 were deleted from the tabulations, but notes are made if the numbers are significant.

4.5 The vehicular traffic was further split into classes of vehicle type and the percentage of the total flow for each class calculated.

The vehicles classes included:-

(i) employees' cars
(ii) visitors' cars
(iii) HGV's
(iv) LGV's
(v) delivery cars
(vi) taxis
(vii) cycles
(viii) buses (applicable for Stockley Park only).

Trip Generation Rates

4.6 A trip has been defined as a one-way movement into or out of the site by any mode. Unless otherwise stated trips refer to vehicle trips and trip generation rates relate to inbound trips. In applying the results of this Study to other situations it should be assumed that all inbound trips are returned during the working day. In this Study the working day is taken as 08.00 - 18.00 and all tabulation (unless otherwise stated) refer to this time period.

4.7 Daily trip generation rates were calculated for each site on both a 'per area' and 'per employee' basis. The gross floor area and the current number of staff for each site were obtained from each of the participating companies. Trip generation rates were determined separately for each main purpose of visit, that is, for employees vehicles, for visitors vehicles and for delivery vehicles. All trip rates are related to the inbound flow. Where there are significant differences between the inbound and outbound flows due to vehicle movements outside the surveyed period the inbound movement is generally the larger.

4.8 Trip rates per area were obtained by calculating the traffic flow per 100 square metres of gross floor area. Trip rates per employee were obtained by calculating the traffic flow divided by the number of employees.

Peak to Daily Ratio

4.9 Peak to daily trip ratios were calculated for both the inbound and outbound peaks.

> The inbound peak to daily ratio is that percentage of the total daily inbound traffic, from a ten hour day (08.00 - 18.00), arriving within the hour of the greatest inbound traffic.
>
> Similarly, the outbound peak to daily ratio is that percentage of the total daily outbound traffic, from a ten hour day (08.00 - 18.00), departing within the hour of the greatest outbound traffic.

These figures do not necessarily relate to the conventional morning or evening peak hours.

Peak Hour Traffic

4.10 The highest traffic flows in the Borough occur at 8.00 - 9.00 and 17.00 - 18.00. These times were hence assumed to be peak hours.

4.11 The percentage of the daily flow of vehicles, by purpose of visit, that occurred in the peak hour (08.00-09.00 or 17.00-18.00) was determined. As diversion by purpose could only be obtained from the interview data, this analysis only be completed for either inbound or outbound traffic, dependent upon survey method.

4.12 The number of vehicles by purpose of visit, either arriving or departing from the site during the peak hour was determined as a percentage of the daily total of vehicles arriving or departing for that purpose.

Car Parking

4.13 Hourly figures of all inbound and all outbound traffic were recorded throughout the day. The number of vehicles parked on the site could be obtained for any hour by calculating the difference between the cumulative inbound and cumulative outbound traffic flows. In addition, a count of all vehicles already parked prior to the commencement of the survey time was made.

4.14 The number of available car park spaces was obtained from each site. The number of car park spaces per employee was calculated and by determining the maximum number of vehicles in the car park at any time, the maximum car park utilisation was obtained.

Vehicle Occupancy

4.15 Counts were undertaken of the number of occupants in each vehicle. An average daily value was calculated for each class of vehicle by purpose of visit.

Catchment Area

4.16 In order to determine catchment areas and appropriate drive times employees were asked where they lived and an estimate of the drive time was also obtained. The mean drive time for each location was then determined and appropriate drive time bands established. The percentage of trips from each catchment area and for each drive time band were then calculated.

4.17 The cumulative percentage of trips for each time band was established.

General

4.18 The following twelve sections contain the analysis of the data recorded from each of the twelve survey sites. Each section contains an Appendix setting out the detailed survey results relating to that site. The final Section sets out a comparison between sites.

5 STOCKLEY PARK

General

5.1 Stockley Park is a large, modern 'High Tech' estate situated on Stockley Road, a mile north of Junction 4 from the M4 motorway.

5.2 The development of Stockley Park has been divided into three phases with phase one nearing completion. At the time of the study there were a total of nine companies occupying Stockley Park, seven of these were computer and electrical related businesses such as Tandem Computers and Toshiba International.

5.3 The gross floor area occupied by these companies was over 31,000 square metres with a total of 1030 employees. Individual businesses ranged in size from Stockley Park Management with 6 employees on 4100 square metres to Marks and Spencers with 462 employees on 10,000 square metres.

5.4 The site has a car parking capacity for 960 vehicles. Vehicle spaces have been allocated to businesses at a rate of one car space per 350 square feet gross area.

Survey Details

5.5 The survey at Stockley Park was undertaken on Tuesday 17th July 1988 and the roadside interview technique was employed for this site. As Stockley Park is still in the process of being developed a number of contractors use the main entrance to the site where the interviews were held. On the survey date they accounted for 16% of the total outbound traffic which was removed from the calculations.

5.6 In parallel to the survey work the Local Authority installed automatic traffic counters on the inbound and outbound accesses for a period in excess of a week. This data was therefore used to give a more reliable 5 day coverage of traffic flow which was used as the basis for the calculations.

Traffic Flows

5.7 There was a total outbound flow for the day of 1348 vehicles, with 411 vehicles leaving during the peak hour between 17.00 - 18.00.

5.8 Employees vehicles accounted for 69% of the daily flow, visitors vehicles accounted for 16% and delivery vehicles for 11%. A bus route also enters Stockley Park and this accounted for 3% of the flow. Three people left the site on foot during the day.

Vehicles

5.9 Table 5.1 identifies the percentage of vehicles by type that visited the site. Some 90% of all vehicles were cars.

Table 5.1 Vehicle Types

VEHICLE TYPE	PERCENTAGE OF TOTAL
Employee's Car	69
Visitors Cars	16
Delivery Cars	5
LGV's	1
HGV's	3
Cycles	1
Taxis	2
Buses	3

Trip Generation

5.10 Table 5.2 shows the trip generation rates as calculated per gross area and also per employee. This table has been calculated using the ten hour count (8.00 - 18.00) from the average 5 day count (with contractors vehicles removed which accounted for 16% of the total traffic flow on survey day). As the average 5 day count data was used the analysis differs slightly from the observed result set out in the Appendix. Rates of 1.32 vehicle trips per employee or 4.35 vehicle trips per 100 sq m of gross floor area were observed. A considerable amount of traffic arrived at the site between 0700 and 0800, the inclusion of this traffic would increase the trip rate to 1.51 trips per employee or 4.97 trips per 100 sq m of gross floor area.

Table 5.2 Trip Generation Rates (Veh/10 hour day/Area or Employee)

	RATES PER	
	GROSS AREA	NO OF EMPLOYEES
	$31,322m^2/100$	1,031 Employees
Employees' Vehicles	3.00 (3.44)	0.91 (1.04)
Visitors' Vehicles	0.70 (0.79)	0.24 (0.24)
Deliveries	0.52 (0.59)	0.16 (0.18)
Buses	0.13 (0.15)	0.04 (0.05)
Total	4.35 (4.97)	1.32 (1.51)

NB The figures in brackets includes trips that arrived 07.00 - 08.00.

Peak to Daily Ratio

5.11 Table 5.3 shows the peak to daily traffic flow ratio for both inbound and outbound traffic. 33% of the total inbound traffic arrived between 8.00 and 9.00 and 28% of the total outbound traffic departed between 17.00 - 18.00.

Table 5.3 Peak to Daily Ratio (using average 5 day counts for ten hour day)

	NO. OF VEHICLES IN PEAK HOUR	% IN PEAK HOUR	TIME OCCURRING
Inbound	534	33%	8.00 - 9.00
Outbound	445	28%	17.00 - 18.00

Peak Hour Traffic

5.12 Table 5.4 shows the percentage of vehicles by purpose of visit departing during the outbound peak hour. 40% of all the employees vehicles departing from Stockley Park during the day left between 17.00 - 18.00 12% of all visitors vehicles, 8% of all delivery vehicles and 15% of all buses also left during the peak outbound hour.

Table 5.4 Peak Hour Traffic (17.00 - 18.00)

	% of the Daily Flow Occurring in Peak Hour
Employees' Vehicles	39
Visitors' Vehicles	12
Delivery Vehicles	9
Buses	15

Car Parking

5.13 Car park spaces are allocated to the companies on Stockley Park at a rate of one car park per 350 square feet gross area. Based on the number of employees at each establishment there was an average of 0.93 car spaces per employee for Stockley Park ranging from

0.70 for Marks and Spencers to 2.17 for Stockley Park Management. Marks and Spencers operates a shift work system. Therefore in practice a maximum of 2/3 of the staff would be on site at any time.

5.14 A total of 957 car spaces are provided on the site. A maximum demand of 810 vehicles requiring parking was observed which occurred at 11.00 am. This maximum demand equates to 0.79 spaces per employee on 2.51 per 100 sq m GFA.

Vehicle Occupancy

5.15 Table 5.5 shows the average vehicle occupancy for the three different types of vehicle by purpose of visit.

Table 5.5 Vehicle Occupancy

VEHICLE	AVERAGE DAILY VALUE
Employees' Vehicle	1.26
Visitors' Vehicle	1.22
Delivery Vehicle	1.09

Catchment Areas

5.16 Table 5.6 shows the cumulative percentage of drive times for employees' commuting trips to Stockley Park. 11.5% of employees' commuting trips are less than 10 minutes while 49% are less than 30 minutes.

Table 5.6 Cumulative Percentage of Employees' Commuting Trip Drive Times

DRIVE TIME BANDS	CUMULATIVE %
0 - 5 MINS	1.5
5 - 10	11.5
10 - 15	23.5
15 - 20	32.5
20 - 30	49.0
30 - 45	70.0
45 - 60	88.0
60 +	100.0

STOCKLEY PARK - APPENDIX

TABLE 5.7
OUTBOUND TRAFFIC BY MODE AND PURPOSE OF VISIT

HOUR BEGINNING	EMPLOYEES' VEHICLES	VISITORS' VEHICLES	DELIV.	BUSES	TOTAL	CONTRACTOR VEHICLES	GRAND TOTAL
08.00	39 (1)	4	20	4	67	18	85
09.00	21 (2)	20	29	3	65	23	88
10.00	30	22	16	4	72	30	102
11.00	32	29	26	4	91	24	115
12.00	151	26	14	3	194	44	238
13.00	92	17	8	5	122	20	142
14.00	45	22	7	4	78	12	90
15.00	51	29	17	3	100	14	114
16.00	99	30	16	3	148	33	181
17.00	364	26	15	6	411	34	445
Total	924	217	168	39	1348	252	1600
% Flow	69%	16%	12%	3%	100%		

*Note: Contractors vehicles have been removed from these results. On the survey day they account for 16% of the traffic flow.

Total Flow: 1348 Vehicles
Peak Hourly Flow: 411 vehicles (17.00 - 18.00)

Note 1: This figure includes 15 vehicles where spouse has dropped off employee.

Note 2: This figure includes 3 vehicles where spouse has dropped off employee.

STOCKLEY PARK - APPENDIX

TABLE 5.8
INBOUND AND OUTBOUND TRAFFIC AND VEHICLE ACCUMULATION

HOUR BEGINNING	INBOUND TRAFFIC	OUTBOUND TRAFFIC	VEHICLE ACCUMULATION AT BEGINNING OF HOUR
0800	534	85	204
0900	232	88	653
1000	115	102	797
1100	103	115	810
1200	106	238	798
1300	186	142	666
1400	113	90	710
1500	84	114	733
1600	78	181	703
1700	70	445	600
1800	-	-	225
Total	1621	1600	-
Total excluding Contractors (1)	1362	1340	-

Max. No. of Cars Parked	810 (11.00am)
No. of Car Spaces Provided	957
Max. % Parking Utilisation	85%
Morning Peak Hour Inbound (08.00-09.00)	534 (33%)
Evening Peak Hour Outbound (17.00-18.00)	445 (28%)

Footnote (1)

These figures are calculated using the average week day (5 day) count. The figures in this table also include contractors' vehicles which accounted for 16% of the surveyed outbound traffic. There was significant activity in the period 07.00 - 08.00 with 233 vehicles arriving and 40 leaving.

STOCKLEY PARK - APPENDIX

TABLE 5.9
CATCHMENT AREAS AND DRIVE TIMES

LOCATION	DRIVE TIME (MIN.)	% OF ALL TRIPS	
YIEWSLEY	0-5	1.5	(1.5)
HEATHROW	5-10	1.5	
HILLINGDON	5-10	4.5	
WEST DRAYTON	5-10	2.5	(10.0)
OTHERS	5-10	1.5	
HAYES	10-15	7	
UXBRIDGE	10-15	3	(12.0)
OTHERS	10-15	2	
HOUNSLOW	15-20	2	
SLOUGH	15-20	3	(9.0)
OTHERS	15-20	4	
RICHMOND	20-30	1.5	
EALING	20-30	1.5	
ICKENHAM	20-30	1	
NORTHOLT	20-30	1	(16.5)
RUISLIP	20-30	1.5	
OTHERS	20-30	10	
BRACKNELL	30-45	1	
CAMBERLY	30-45	1	
MAIDENHEAD	30-45	1	(21.0)
READING	30-45	3	
OTHERS	30-45	15	
BASINGSTOKE	45-60	1	
KINGSTON	45-60	1	
HAMPSTEAD	45-60	1	(18)
OTHERS	45-60	15	
CROYDON	60+	1	
MILTON KEYNES	60+	1	
OXFORD	60+	1	(12)
OTHERS	60+	9	

STOCKLEY PARK - APPENDIX

TABLE 5.10
FLOOR AREA AND CAR PARK SPACES PER EMPLOYEE

NAME	BUILDING	NET AREA (SQ M) NET	NET AREA (SQ M) GROSS	NO. OF EMPLOYEES	NO. OF CAR SPACES
TOSHIBA INTERNATIONAL	A1.1	1469	1803	66	55
HAYES MICRO COMPUTERS	A1.1	397	487	12	13
PST	A1.1	397	487	13	13
STOCKLEY PARK MANAGEMENT	A1.1	334	410	6	13
CONTROL DATA LTD	A1.2	3720	4282 }	176	133
	A2.1	1937	2160 }		68
QUOTRON	A2.1	2281	2544	38	72
FUJITSU EUROPE LTD	A1.3	4418	4906	162	152
MARKS AND SPENCER	A2.2	9206	10581	462	325
TANDON COMPUTERS	A2.3	3342	3662	94	113
		27,501	31,322	1,031	957

Car spaces have been allocated at 1 car park per 350 sq ft gross area.

For buildings A1.1 and A2.1 the gross areas per company have been determined by proportioning the % net area used per company.

STOCKLEY PARK - APPENDIX

TABLE 5.11
FLOOR AREA AND CAR PARK SPACES PER EMPLOYEE

NAME	AREA (SQ M) PER EMPLOYEE		NUMBER OF CAR PARK SPACES/ EMPLOYEE
	NET	GROSS	
TOSHIBA INTERNATIONAL	22	27	0.83
HAYES MICRO COMPUTERS	33	41	1.08
PST	31	37	1.00
STOCKLEY PARK MANAGEMENT	56	68	2.17
CONTROL DATA LTD	32	37	1.14
QUOTRON	60	67	1.89
FUJITSU EUROPE LTD	27	30	0.94
MARKS AND SPENCER	20	23	0.70
TANDON COMPUTERS	36	39	1.20
STOCKLEY PARK TOTAL	27	30	0.93

6 HAREFIELD GROVE

General

6.1 Harefield Grove is a small business development situated in the north west corner of the Borough on Rickmansworth Road.

6.2 Harefield Grove is an "out-of-town" location with little public transport or shopping facilities available within its immediate area, necessitating all employees to arrive at work by car. The buildings are located in large gardens with pleasant surroundings and a free restaurant is also provided for staff.

6.3 Harefield Grove's principal occupant is Initial Services which sub-leases part of the building to Strattwell Developments. The buildings on the site have a floor area of 4200 square metres with a total staff of 100 people. The site has a car park capacity for 126 vehicles.

Survey Details

6.4 The survey at Harefield Grove was undertaken on Friday 8th July 1988 and the roadside interview technique was employed as vehicles exited the site. 74% of all vehicles exiting from this site were stopped and their drivers were interviewed.

Traffic Flows

6.5 The total outbound traffic flow for the day was 143 vehicles with a maximum of 67 vehicles leaving in a single hour between 1700 - 1800.

6.6 Employees' vehicles accounted for 72% of the total flow, visitors' vehicles accounted for 12% and delivery vehicles for 16%. There were no pedestrian departures from the site.

Vehicle Type

6.7 Table 6.1 lists the percentage of vehicle types visiting Harefield Grove.

Table 6.1 Vehicle Types

VEHICLE TYPES	PERCENTAGE OF TOTAL
Employees' Cars	72
Visitors' Cars	12
Delivery Cars	9
HGV's	2
LGV's	5
Total	100

Trip Generation Rates

6.8 Table 6.2 shows the trip generation from Harefield Grove for both rates per area and per employee. Rates of 1.42 vehicle trips per employee and 3.35 vehicle trips per 100 sq m gross area were observed.

Table 6.2 Trip Generation Rates (Vehicles/Day/Area or Employee)

	RATES PER	
	GROSS AREA	NO. OF EMPLOYEES
	4199 sqm/100	99 Employees
Employees' Vehicles	2.42	1.03
Visitors' Vehicles	0.40	0.17
Delivery Vehicles	0.53	0.22
Total	3.35	1.42

Peak to Daily Ratio

6.9 The peak to daily ratio for both inbound and outbound traffic flows were relatively high. 38% of the total inbound traffic arrived between 08.00-09.00 and 47% of the total outbound traffic departed between 17.00-18.00.

Peak Hour Traffic

6.10 Table 6.3 shows the percentage of vehicles by purpose of visit departing during the outbound peak hour. 60% of all the employees departing from Harefield Grove during the day departed between 17.00-18.00.

Table 6.3 Peak Hour Traffic (17.00-18.00)

	% OF THE DAILY FLOW OCCURRING IN PEAK HOUR
Employees' Vehicles	60
Visitors' Vehicles	18
Delivery Vehicles	9

Car Park Capacity

6.11 Harefield Grove has a car park capacity of 126 vehicle spaces with a staff of 99 hence a rate of 1.27 car spaces per employee. A maximum of only 75 vehicles were parked at any one time. This equates to 0.75 per employee or 1.79 spaces per 100 sq m GFA.

Vehicle Occupancy

6.12 Table 6.4 presents the average daily occupancy for the three different types of vehicles by purpose of visit.

Table 6.4 Vehicle Occupancy

VEHICLES	AVERAGE DAILY VALUE
Employees' Vehicles	1.20
Visitors' Vehicles	1.18
Delivery Vehicles	1.09

Catchment Areas

6.13 Table 6.5 presents the cumulative percentage of drive times for employees' commuting trips to Harefield Grove. 20% of employees' commuting trips are less than 10 minutes while 60% are less than 30 minutes. All employees take an hour or less to drive to work.

Table 6.5 Cumulative Percentage of employees' commuting trip drive times

DRIVE TIME BANDS	CUMULATIVE %
0 - 5 MINS	11.5
5 - 10	20.5
10 - 15	26.5
15 - 20	38.0
20 - 30	60.0
30 - 45	79.0
45 - 60	96.5
60 +	100.0

HAREFIELD GROVE - APPENDIX

TABLE 6.6
OUTBOUND TRAFFIC BY PURPOSE OF VISIT

HOUR BEGINNING	EMPLOYEES' CARS	VISITORS' CARS	DELIVERIES	TOTAL
08.00	0	2	2	4
09.00	5	1	4	11
10.00	1	2	3	6
11.00	1	1	2	4
12.00	16	2	4	22
13.00	8	0	0	8
14.00	3	1	3	7
15.00	6	3	0	9
16.00	1	2	2	5
17.00	62	3	2	67
Total	103	17	22	143
% of Flow	72%	12%	16%	100%

There were no pedestrian exits.

Total Flow 143 vehicles
Peak Hourly Flow 67 vehicles (17.00 - 18.00)

HAREFIELD GROVE - APPENDIX

TABLE 6.7
INBOUND AND OUTBOUND TRAFFIC AND VEHICLE ACCUMULATION

HOUR BEGINNING	INBOUND TRAFFIC	OUTBOUND TRAFFIC	VEHICLE ACCUMULATION AT BEGINNING OF HOUR
0800	53	4	12
0900	21	11	61
1000	1	6	71
1100	13	4	66
1200	14	22	75
1300	13	8	67
1400	7	7	72
1500	9	9	72
1600	3	5	72
1700	7	67	70
1800	-	-	10
TOTAL	141	143	-

Max. No. of Vehicle Accumulations	75 (12.00)
No. of Car Spaces Provided	126
Max. % Utilisation	60
Morning Peak Hour Inbound (08.00-09.00)	53 (38%)
Evening Peak Hour Outbound (17.00-18.00)	67 (47%)

HAREFIELD GROVE - APPENDIX

TABLE 6.8
CATCHMENT AREAS AND DRIVE TIMES

LOCATION	DRIVE TIME (MIN.)	% OF ALL TRIPS	
Harefield	0-5	11.5	(11.5)
Rickmansworth	5-10	5	
Denham	5-10	2.5	(8.5)
Uxbridge	5-10	1	
Ickenham	10-15	4	
Others	10-15	2.5	(6.5)
Eastcote	15-20	5	
West Drayton	15-20	2.5	(11.5)
Others	15-20	4	
Watford	20-25	10	
Slough	20-25	2.5	(19)
Others	20-25	6.5	
High Wycombe	25-35	2.5	
Others	25-35	4	(6.5)
Hendon	35-40	4	(4)
Hemel Hempstead	40-50	4	
Potters Bar	40-50	2.5	(23.5)
Others	40-50	17	
Aylesbury	50-60	2.5	
Twickenham	50-60	2.5	(9)
Others	50-60	4	

7 SWAKELEYS HOUSE (MILTON PARK)

General

7.1 Swakeleys House is a small development situated in a largely residential area with access onto Milton Road in the northern part of the Borough. Swakeleys House is occupied by Bristol Myers Pharmaceuticals and its subsidiary companies. The buildings on the site have a gross area of 5050 square metres with a total staff of 180. The site has a car park capacity for 120 vehicles.

7.2 Swakeleys House is situated in a residential zone with a small shopping centre and limited public transport facilities available within a ten minute walk. The buildings are located in large gardens with pleasant surroundings. A staff restaurant is provided on site and also a hair dressing salon which is available to staff and also local residents for testing the company's products.

Survey Details

7.3 The survey at Swakeleys House was undertaken on Monday 4th July 1988 and the roadside interview technique was employed as vehicles and pedestrians exited from the site. An 87% sample was achieved for this site.

Traffic Flows

7.4 The total outbound vehicular traffic flow for the day was 201 vehicles with a maximum of 79 vehicles leaving in a single hour between 17.00 - 18.00. Employees' vehicles accounted for 68% of the vehicular flow, visitors' vehicles for 14% and delivery vehicles for 18%.

7.5 24 pedestrians also exited from the site during the day (11% of the total outbound flow). Four of these caught public transport while the remainder walked to their final destination.

Vehicle Type

7.6 Table 7.1 lists the percentage of vehicle types visiting Swakeleys House.

Table 7.1 Vehicle Types

VEHICLE TYPE	PERCENTAGE OF TOTAL
Employees' Cars	68
Visitors' Cars	14
Delivery Cars	11
HGV's	1
LGV's	6
Total	100

Trip Generation Rates

7.7 Table 7.2 shows trip generation from Swakeleys House for both rates per area and per employee. Rates of 1.27 vehicle trips per employee and 4.51 vehicle trips per every 100 sq m gross area were observed.

Table 7.2 Trip Generation (veh/day/area or employee)

	RATES PER GROSS AREA	RATES PER NO. OF EMPLOYEES
	5050sqm/100	180 Employees
Employees' vehicles	3.07	0.86
Visitors' Vehicles	0.65	0.18
Delivery Vehicles	0.79	0.22
TOTAL	4.51	1.27

Peak to Daily Ratio

7.8 The peak to daily ratio for inbound traffic was very high with 42% of the total daily inbound flow arriving between 8.00-9.00. 39% of the total daily outbound traffic departed between 17.00-18.00.

Peak Hour Traffic

7.9 Table 7.3 illustrates the percentage of vehicles by purpose of visit departing during the outbound peak hour. 49% of all the employees' vehicles departing from Swakeleys House during the day departed between 17.00-18.00.

Table 7.3 Outbound Peak Hour Traffic (17.00 - 18.00)

	% OF THE DAILY FLOW OCCURRING IN PEAK HOUR
Employees' Vehicles	49
Visitors' Vehicles	10
Delivery Vehicles	3

Parking Capacity

7.10 Swakeleys House has a car park capacity of 120 vehicle spaces. The car park is divided into three sections. 14 spaces are provided in the court yard which are available to management levels only. A visitors car park has capacity for thirty vehicles but staff also park here. The main staff car park has spaces for 75 vehicles.

7.11 A maximum of 138 vehicles were parked in the car parks at one time with only 120 vehicle spaces provided. When the car park has reached capacity, vehicles will park in unmarked spaces within the main staff car park. This equates to 0.77 spaces per employee or 2.73 spaces per 100 sq m GFA.

Vehicle Occupancy

7.12 Table 7.4 illustrates the average daily occupancy for the three different types of vehicles by purpose of visit.

Table 7.4 Vehicle Occupancy

VEHICLE	AVERAGE DAILY VALUE
Employees' Vehicles	1.17
Visitors' Vehicles	1.17
Delivery Vehicles	1.28

Catchment Areas

7.13 Table 7.5 illustrates the cumulative percentage of drive times for employees' commuting trips to Swakeleys House. 23% of employees commuting trips are less than 10 minutes while 62% are less than 30 minutes.

Table 7.5 Cumulative Percentage of Employees' Commuting Trip Drive Times

DRIVE TIME BAND	CUMULATIVE %
0- 5 min	0
5-10 min	23
10-15 min	32
15-20 min	43
20-30 min	63
30-45 min	85
45-60 min	94
60 +	100

7.14 In addition to vehicular commuting trips, a further 11 employees walk to work, two arrive by bus and 2 by train. Times for the walk trips vary between 2 minutes and 40 minutes while the 4 employees using public transport average about 45 minutes to commute to work.

SWAKELEYS HOUSE - APPENDIX

TABLE 7.6
OUTBOUND TRAFFIC BY MODE AND PURPOSE OF VISIT

HOUR BEGINNING	EMPLOYEES' CARS	VISITORS' CARS	DELIVERIES	TOTAL	PEDESTRIANS
08.00	9	1	3	13	0
09.00	0	1	2	3	1
10.00	6	2	5	13	2
11.00	1	6	1	8	0
12.00	11	1	7	19	2
13.00	16	1	1	18	2
14.00	3	5	4	12	0
15.00	5	7	3	15	2
16.00	5	2	8	21	2
17.00	67	3	1	79	13
Total	137	29	35	201	24
% of Flow	68	14	18	100	-

Total Flow 201 vehicles

Peak Hourly Flow 79 vehicles (17.00 - 18.00)

SWAKELEYS HOUSE - APPENDIX

TABLE 7.7
INBOUND AND OUTBOUND TRAFFIC AND VEHICLE ACCUMULATION

HOUR BEGINNING	INBOUND TRAFFIC	OUTBOUND TRAFFIC	VEHICLE ACCUMULATION AT BEGINNING OF HOUR
0800	95	13	25
0900	24	3	107
1000	19	13	128
1100	12	8	134
1200	12	19	138
1300	20	18	131
1400	6	12	133
1500	12	15	127
1600	17	21	124
1700	11	79	120
1800	-	-	52
TOTAL	228	201	-

Max. No. of Vehicle Accumulation	138 (12.00)
No. of Car Spaces Provided	120
Max. % Utilisation	115
Morning Peak Hour Inbound (08.00-9.00)	95 (42%)
Evening Peak Hour Outbound (17.00-18.00)	79 (39%)

SWAKELEYS HOUSE - APPENDIX

TABLE 7.8
CATCHMENT AREAS AND DRIVE TIMES

LOCATION	DRIVE TIME (MIN.)	% OF ALL TRIPS	
Ickenham	5-10	11.3	
Ruislip	5-10	6.5	
Hillingdon	5-10	3.6	(23.4)
Pinner	5-10	2	
Harefield	10-15	4.8	
Others	10-15	3.5	(8.3)
Eastcote	15-20	4	
Hayes	15-20	2	
Chalfont St Giles	15-20	1	(11)
Others	15-20	3	
Harrow	20-25	3.6	
Slough	20-25	3	
Gerrards Cross	20-25	2.4	(11)
Hounslow	20-25	1	
Others	20-25	2	
Ivor Heath	25-30	2.4	
High Wycombe	25-30	2	(8.4)
Others	25-30	4	
Langley	30-35	7.0	
Amersham	30-35	1	(9.0)
Others	30-35	1	
Twyford	35-40	2	
Others	35-40	5	(7)

SWAKELEYS HOUSE - APPENDIX

TABLE 7.8
CATCHMENT AREAS AND DRIVE TIMES (CONTD.)

LOCATION	DRIVE TIME (MIN.)	% OF ALL TRIPS	
St Albans	40-50	2	
Marlow	40-50	2	
Reading	40-50	2	
Weybridge	40-50	2	(13.5)
London W1	40-50	2	
Hemel Hempstead	40-50	1	
Others	40-50	2.3	
Maidenhead	50-60	0.8	
Goring on Thames	50-60	0.8	(3.0)
Milton Keynes	50-60	1.5	
Newbury	60-90	3.0	
Aylesbury	60-90	0.8	(4.6)
Kings Clere	60-90	0.8	
Others	90+	0.8	(0.8)

8 DENBRIDGE ESTATE

General

8.1 Denbridge Estate is a medium sized 'business' estate located in Oxford Road on the outskirts of Uxbridge's central business district.

8.2 The principal occupant of the site is Rank Xerox with two smaller companies, Roberts Removals and PTS Tool Specialists also occupying the site. The combined gross floor area on the site is 16,497 sqm with a total staff of 588. The site has a car park capacity for 360 vehicles.

Survey Details

8.3 The survey at Denbridge Estate was undertaken on Thursday 14th July 1988 and the roadside interview technique was employed as vehicles and pedestrians exited from the site. A 74% sample was achieved for this site.

Traffic Flows

8.4 The total outbound flow for the day was 590 vehicles with 186 vehicles leaving during the peak hour between 17.00-18.00. Employees' vehicles accounted for 68% of the vehicular flow, visitors vehicles for 9% and delivery vehicles for 23%.

8.5 588 people also left the building on foot, during the day. 270 of these exits were between 1200-1400 and were generally lunch hour trips. 103 pedestrians departed between 17.00-18.00. Of those commuting trips made by employees departing from the building on foot, 43% commuted by bus, 40% by train and 16% walked.

Vehicle Type

8.6 Table 8.1 lists the percentage of vehicle types visiting Denbridge Estate.

Table 8.1 Vehicle Types

VEHICLE TYPE	% OF TOTAL
Employees' Cars	68
Visitors' Cars	9
Delivery Cars	10
HGV's	6
LGV's	7
TOTAL	100

Trip Generation Rates

8.7 Table 8.2 shows the trip generation from Denbridge Estate for both rates per area and per employee. Rates of 1.18 vehicle trips per employee and 4.22 vehicle trips per every 100 sq m gross area were observed.

Table 8.2 Trip Generation Rates (Vehicles/day/area or employee)

	RATES PER	
	GROSS AREA	NO.OF EMPLOYEES
	16497sqm/100	588 Employees
Employees' Vehicles	2.86	0.80
Visitors' Vehicles	0.40	0.11
Delivery Vehicles	0.96	0.27
TOTAL	4.22	1.18

Peak to Daily Ratio

8.8 The peak to daily ratio for the inbound traffic was 36% of the total daily traffic arriving between 800-900. 32% of the total daily outbound traffic departed between 1700-1800.

Peak Hour Traffic

8.9 Table 8.3 shows the percentage of vehicles by purpose of visit departing during the outbound peak hour. 43% of all employee trips from Denbridge Estate departed between 1700-1800.

Table 8.3 Outbound Peak Hour Traffic (1700 - 1800)

	% OF THE DAILY FLOW OCCURRING IN PEAK HOUR
Employees' Vehicles	43
Visitors' Vehicles	9
Delivery Vehicles	7

Parking Capacity

8.10 Denbridge Estate has car parking space for 360 vehicles. Parking is controlled within the car park by an attendant. 10 spaces are reserved for management staff and a further 10 spaces are reserved for visitors' parking.

8.11 A maximum of 374 vehicles were parked on site at any one time with those vehicles arriving after the car park was at capacity parking in unmarked areas. This maximum parking demand equates to 0.63 per employee or 2.27 per 100 sq m GFA.

Vehicle Occupancy

8.12 Table 8.4 presents the average daily occupancy for the three different types of vehicle by purpose of visit.

Table 8.4 Vehicle Occupancy

VEHICLE	AVERAGE DAILY VALUE
Employees' Vehicles	1.16
Visitors' Vehicles	1.16
Delivery Vehicles	1.10

Catchment Areas

8.13 Table 8.5 shows the cumulative percentage of drive times for commuting trips to Denbridge Estate. 6% of employees' commuting trips are less than 10 minutes while 54% are less than 30 minutes. The length of travel to this site is one of the largest surveyed.

Table 8.5 Cumulative Percentage of Employees' Commuting Trip Drive Times

DRIVE TIME BAND	CUMULATIVE %
0- 5 min	0
5-10 min	6
10-15 min	15
15-20 min	29
20-30 min	54
30-45 min	69
45-60 min	84
60+	100

TABLE 8.6
OUTBOUND TRAFFIC BY MODE AND PURPOSE OF VISIT

Hour Beginning	Employees' Cars	Visitors' Cars	Deliveries	Total	Pedestrians
08.00	12*	6	19	37	15
09.00	12	5	20	37	210
10.00	16	7	3	26	27
11.00	21	8	12	41	41
12.00	50	10	17	77	138
13.00	39	4	21	64	128
14.00	17	5	14	36	46
15.00	18	4	10	32	24
16.00	42	2	10	54	45
17.00	172	5	9	186	103
TOTALS	399	56	135	590	588
% OF FLOW	68%	9%	23%	100%	-

Total Vehicle Flow 590 Vehicles

Peak Hourly Flow 186 Vehicles (17.00-18.00)

Total Pedestrian Flow 588 Pedestrians

* Includes 9 cars which had dropped employees at work.

Note: "Deliveries" includes vehicles making deliveries for companies on site.

DENBRIDGE ESTATE - APPENDIX

TABLE 8.7
HOURLY INBOUND AND OUTBOUND TRAFFIC AND VEHICLE ACCUMULATION

HOUR BEGINNING	INBOUND TRAFFIC	OUTBOUND TRAFFIC	VEHICLE ACCUMULATION AT BEGINNING OF HOUR
08.00	253	37	96
09.00	79	37	312
10.00	37	26	354
11.00	42	41	365
12.00	60	77	366
13.00	70	64	349
14.00	55	36	355
15.00	26	32	374
16.00	31	54	368
17.00	43	186	345
18.00	-	-	202
TOTAL	696	590	-

Max No. of Vehicle Accumulations	374 (15.00)
No. of Car Spaces Provided	360
Max. % Utilisation	104
Morning Peak Hour Inbound (08.00-09.00)	253 (36%)
Evening Peak Hour Outbound (17.00-18.00)	186 (32%)

DENBRIDGE ESTATE - APPENDIX

TABLE 8.8
CATCHMENT AREAS AND DRIVE TIMES

LOCATION	DRIVE TIME (MIN.)	% OF ALL TRIPS	
Cowley	5-10	2	
Uxbridge	5-10	4	(6)
Denham	10-15	2	
Harefield	10-15	2	
Hillingdon	10-15	4	(9)
Yiewsley	10-15	1	
Chalfont St Peter	15-20	2	
Gerards Cross	15-20	0.5	
Hayes	15-20	4	
Ickenham	15-20	2	(14)
Isleworth	15-20	0.5	
Slough	15-20	1	
West Drayton	15-20	2	
Others	15-20	2	
Beaconsfield	20-25	2	
Datchet	20-25	0.5	
Marlow	20-25	1	
Pinner	20-25	1	(8)
Stockenchurch	20-25	0.5	
Watford	20-25	2	
Others	20-25	1	
Chiswick	25-30	0.5	
Croxley Green	25-30	0.5	
Great Missendon	25-30	0.5	
High Wycombe	25-30	7	(17.5)
Maidenhead	25-30	1	
Ruislip	25-30	2	
Windsor	25-30	2	
Others	25-30	4	

DENBRIDGE ESTATE - APPENDIX

TABLE 8.8
CATCHMENT AREAS (Contd.)

LOCATION	DRIVE TIME (MIN.)	% OF ALL TRIPS	
Central London	30-35	1	
Ealing	30-35	2	
Harrow	30-35	0.5	(6)
Rickmansworth	30-35	0.5	
Others	30-35	2	
Brentford	35-	0.5	
Harrow	35-40	2	(2.5)
Barnet	40-50	0.5	
Bracknell	40-50	0.5	
Hazlemere	40-50	1	
Hounslow	40-50	0.5	
Oxford	40-50	2	(12)
Reading	40-50	2	
St Albans	40-50	0.5	
Thame	40-50	0.5	
Tring	40-50	0.5	
Others	40-50	4	
Camberley	50-60	2	
Enfield	50-60	1	
Leighton Buzzard	50-60	1	(9)
Wokingham	50-60	2	
Others	50-60	3	
Balham	60-90	1	
Bedford	60-90	1	
Essex	60-90	1	(10.5)
Maidstone	60-90	0.5	
Milton Keynes	60-90	1	
Others	60-90	6	
Croydon	90+	1	
Northampton	90+	1	(5.5)
Southampton	90+	0.5	
Others	90+	3	

9 BROADWATER PARK

General

9.1 Broadwater Park is a large, modern 'Hi-Tech' estate which is located just outside the boundary of the London Borough of Hillingdon on the North Orbital Road. Although located outside the boundary, much of the traffic generated by the site will be from within Hillingdon Borough.

9.2 Broadwater Park is occupied by four companies: Roussel, Bosch, Dunn and Bradstreet Limited and Barlow Limited which together employ a total of approximately 700 staff. The development has a gross area of 10,200 sqm of office space and 22,300 sqm of warehouse/light industrial space. The site has a car park capacity of 537 car spaces.

Survey Details

9.3 Permission could not be obtained from all companies on this site to undertake an on-site survey using either roadside interviews or staff questionnaires. Considering safety aspects and public relations it was determined prudent not to perform roadside interviews outside the property entrance without consent from the concerned companies occupying Broadwater Park. Therefore classified vehicle counts were undertaken on Tuesday 5th July. All inbound and outbound traffic was categorised into cars, cycles, LGV's, HGV's and pedestrians.

Traffic Flow

9.4 The total inbound flow for the day was 758 with 292 vehicles arriving between 08.00-09.00. The total outbound flow was 774 vehicles with 163 vehicles departing between 17.00-18.00. However, the outbound peak hour was between 16.00-17.00 when 194 vehicles departed. Also, a total of 119 pedestrians entered Broadwater Park during the day.

Vehicle Type

9.5 Table 9.1 presents the percentage of vehicle types visiting Broadwater Park.

Table 9.1 Vehicle types.

VEHICLE TYPE	PERCENTAGE OF TOTAL
CARS	85
LGV'S	7
HGV'S	5
M/C	3
TOTAL	100

Trip Generation Rates

9.6 Table 9.2 shows trip generation from Broadwater Park in terms of vehicle type trip rates per employee and per area. Rates of 1.07 vehicle trips per employee and 2.33 vehicle trips per every 100 sqm gross area were observed.

Table 9.2 Trip Generation Rates (Vehicles/Day/Area or Employee)

	RATES PER GROSS AREA	NO. OF EMPLOYEES
	32,500 sqm/100	705 Employees
CARS	1.98	0.91
LGV'S	0.17	0.03
HGV'S	0.11	0.08
M/C'S	0.07	0.05
TOTAL	2.33	1.07

Peak to Daily Ratio

9.7 The peak to daily ratio for the inbound traffic was 39% of the total daily inbound traffic arriving between 08.00-09.00. 21% of the total daily outbound traffic departed between 17.00-18.00 but the peak hour was between 16.00-17.00 when 25% of the daily outbound flow departed.

Parking Capacity

9.8 Broadwater Park has a car park capacity for 537 vehicles (or 0.76 car spaces per employee). Each company on site has been allotted car park spaces in proportion to staff levels.

9.9 The maximum number of vehicles parked in Broadwater Park occurred at 11.00am and was 321 vehicles, in addition to any vehicles parked before 8.00am. As permission was not obtained to enter the property of Broadwater Park the number of vehicles parked prior to 8.00am could not be established. This maximum demand equates to 0.45 spaces per employee or 0.99 spaces per 100 sq m GFA.

BROADWATER PARK - APPENDIX

TABLE 9.3
INBOUND TRAFFIC BY MODE AND VEHICLE TYPE

Hour Beginning	Cars	M/C	LGV's	HGV's	Total	Pedestrians
08.00	277	5	6	4	292	29
09.00	76	5	3	4	88	16
10.00	37	-	6	5	48	2
11.00	27	3	4	5	39	4
12.00	44	4	2	2	52	17
13.00	72	-	8	3	83	22
14.00	39	1	9	9	58	14
15.00	36	-	5	3	44	-
16.00	25	6	8	1	41	15
17.00	9	-	3	1	13	-
TOTALS	642	24	54	37	758	119
% OF FLOW	85%	3%	7%	5%	100%	-

Total Flow Vehicles	758
Peak Hourly Flow Vehicles	292 (08.00-09.00)
Total Pedestrian Flow	119

BROADWATER PARK - APPENDIX

TABLE 9.4
OUTBOUND TRAFFIC BY MODE AND VEHICLE TYPE

Hour Beginning	Cars	M/C	LGV's	HGV's	Total	Pedestrians
08.00	36	-	3	12	51	1
09.00	16	1	5	7	29	-
10.00	20	-	4	5	29	1
11.00	25	2	4	6	37	4
12.00	99	1	4	5	109	29
13.00	44	1	7	5	57	9
14.00	29	-	8	6	43	10
15.00	48	-	6	8	62	6
16.00	189	-	4	-	194	5
17.00	155	3	2	3	163	22
TOTALS	661	8	47	57	774	87

Total Flow Vehicles	774
Peak Hourly Vehicles	194 (16.00-17.00)
Total Pedestrian Flow	87

BROADWATER PARK - APPENDIX

TABLE 9.5
INBOUND AND OUTBOUND TRAFFIC AND VEHICLE ACCUMULATION

HOUR BEGINNING	INBOUND TRAFFIC	OUTBOUND TRAFFIC	VEHICLE ACCUMULATION AT BEGINNING OF HOUR
08.00	292	51	28
09.00	88	29	269
10.00	48	29	328
11.00	39	37	347
12.00	52	109	349
13.00	83	57	292
14.00	58	43	318
15.00	44	62	333
16.00	41	194	315
17.00	13	163	162
18.00	-	-	12
TOTALS	758	774	-

Max. No. of Vehicle Accumulations	349 (12.00)
Morning Peak Hour Inbound (08.00-09.00)	292 (39%)
Evening Peak Hour Outbound (17.00-18.00)	163 (21%)

10 ABENGLEN INDUSTRIAL ESTATE

General

10.1 Abenglen Industrial estate is located in Dawley Road, Hayes. The estate consists of 23 small units with gross areas ranging from 120 sqm to 223 sqm forming a combined gross area of 3,880 sqm.

10.2 Businesses on the site range from cargo handling, injection moulders to a small courier company. Staff sizes ranged from single self employed businesses to an establishment with 14 staff. There are a total of 135 staff employed on the site.

Survey Details

10.3 This site is situated at the end of a public road cul-de-sac without any private estate access road and therefore it was impractical to undertake roadside interviews as police presence would have been required. Staff sizes, floor areas and car park details were obtained from each of the twenty three businesses on site. Classified vehicle counts were undertaken on Thursday 7th July as vehicles arrived and departed from the site.

Traffic Flows

10.4 Both inbound and outbound traffic flows for this site are significantly more uniform throughout the day than for other sites in this study, with a much greater percentage of traffic arriving and departing from the site during the middle of the day. This is principally due to the type of business undertaken upon the site and the large percentage of delivery vehicles visiting the site.

10.5 A total of 288 vehicles arrived at the site during the day. 44 vehicles arrived between 08.00-09.00 but the maximum of 46 vehicles arrived between 11.00-12.00.

Vehicle Type

10.6 Table 10.1 presents the percentage of vehicle types visiting Abenglen Industrial Estate.

Table 10.1 Vehicle Types.

VEHICLE TYPE	PERCENTAGE OF TOTAL
CARS	63
LGV'S	25
HGV'S	12
	100

Trip Generation Rates

10.7 Table 10.2 presents trip generation for Abenglen Industrial Estate in terms of vehicle type trip rates per employee and per area. Very high trip generation rates were obtained for both per area and per employee values. Rates of 2.13 vehicle trips per employee and 7.41 trips per every 100 sqm gross area were observed.

Table 10.2 Trip Generation Rates (Vehicles/Day/Area or Employee)

	RATES PER GROSS AREA	RATES PER EMPLOYEE
	3,888 SQM/100	135 EMPLOYEES
CARS	4.66	1.34
LGV'S	1.85	0.53
HGV'S	0.90	0.26
TOTAL	7.41	2.13

Peak to Daily Ratio

10.8 15% of the total daily inbound flow arrived between 08.00-0900 and the peak of 16% arrived between 11.00-12.00. 9% of the total daily outbound flow departed between 17.00-18.00 and the peak of 14% departed between 11.00-12.00. These figures are very low due to the uniform traffic flows, both inbound and outbound during the day.

Parking Capacity

10.9 There are a total of 65 marked car spaces on Abenglen Industrial Estate. Each company has been allotted between 2 and 4 spaces dependent upon the size of the unit. There is further space on the site for vehicles to park when the site is at capacity. However, these vehicles and particularly those that must park on the public road outside, severely restrict access to the site, especially as many of these vehicles are light and heavy goods vehicles.

10.10 A maximum of 80 vehicles were parked on the site at any one time and therefore a maximum utilisation of over 100% was observed. This maximum demand equates to a rate of 0.59 spaces per employee or 2.05 spaces per 100 sq m GFA.

ABENGLEN INDUSTRIAL ESTATE - APPENDIX

TABLE 10.3
INBOUND TRAFFIC BY MODE AND VEHICLE TYPE

Hour Beginning	Cars	LGV's	HGV's	Total	Pedestrians
08.00	34	7	3	44	2
09.00	23	8	5	36	-
10.00	19	6	4	29	2
11.00	23	17	6	46	-
12.00	12	9	1	22	1
13.00	19	3	2	24	1
14.00	17	6	4	27	-
15.00	18	8	6	32	3
16.00	8	5	4	17	-
17.00	8	3	-	11	-
TOTALS	181	72	35	288	8
% OF FLOW	63%	25%	11%	100%	-

Total Vehicular Flow	288 Vehicles
Peak Hourly Flow	46 Vehicles (11.00-12.00)
Total Pedestrian Flow	86 Pedestrians

ABENGLEN INDUSTRIAL ESTATE - APPENDIX

TABLE 10.4
OUTBOUND TRAFFIC BY MODE AND VEHICLE TYPE

Hour Beginning	Cars	LGV's	HGV's	Total	Pedestrians
08.00	7	8	4	19	3
09.00	7	7	5	19	-
10.00	14	10	2	26	3
11.00	20	10	7	37	2
12.00	21	9	5	35	2
13.00	21	7	2	30	5
14.00	11	8	2	21	1
15.00	14	6	4	24	1
16.00	17	8	4	29	3
17.00	25	-	-	25	5
TOTALS	157	73	35	265	25

Total Flow 265 Vehicles

Peak Hourly Flow 37 Vehicles (11.00-12.00)

ABENGLEN INDUSTRIAL ESTATE - APPENDIX

TABLE 10.5
INBOUND AND OUTBOUND TRAFFIC AND VEHICLE ACCUMULATION

HOUR BEGINNING	INBOUND TRAFFIC	OUTBOUND TRAFFIC	VEHICLE ACCUMULATION AT BEGINNING OF HOUR
08.00	44	19	26
09.00	36	19	51
10.00	29	26	68
11.00	46	37	71
12.00	22	35	80
13.00	24	30	67
14.00	27	21	61
15.00	32	24	67
16.00	17	29	75
17.00	11	25	63
18.00			49
TOTAL	288	265	-

Max. No. of Vehicle Accumulations (12.00)	80
Morning Peak Hour Inbound (08.00-09.00)	44 (15%)
Evening Peak Hour Outbound (17.00-18.00)	25 (9%)

11. HARMAN HOUSE

General

11.1 Harman House is a large, modern office building situated on George Street in the centre of Uxbridge. The building's leaseholder is Hewlett Packard which sub-leases part of the building to Coopers and Lybrand Limited.

11.2 The building is well served by public transport with Uxbridge being a terminus of the Metropolitan Underground line and also numerous bus services.

11.3 Harman House was the largest office building included in the study with a gross floor area of 12,528 square metres and a total staff of 580 people.

11.4 The building has a car parking capacity for 372 vehicles. An underground car park for employees contains 300 car spaces for which employees gain entry through a card-entry barrier system. An additional surface car park has provision for a further 72 vehicles of which 36 are for customers and visitors use.

Survey Details

11.5 The survey at Harman House was undertaken on Wednesday 13 July and the staff questionnaire technique was employed for this site. Questionnaires were delivered to all staff by the building's General Services Supervisor and collected from boxes at the exits to the building. A sample of 35% of all employees responded to the questionnaire.

Traffic Flows

11.6 Estimates of traffic flows were obtained by expanding the questionnaires based on the number of employees. The total inbound traffic flow for the day (08.00-18.00) was 505 vehicles. 164 vehicles arrived between 8.00-9.00 but the maximum of 196 vehicles arrived between 9.00-10.00am. Employees' vehicles accounted for 76% of the traffic, visitors' vehicles for 19% and delivery vehicles for 5%.

Travel Modes

11.7 Table 11.1 presents the mode of travel for employees' commuting trips to Harman House. 86% of all employees drove a vehicle to work. Table 11.2 presents the travel mode of all visitors trips to Harman House. Figures relate to the period 08.00 and 18.00 only.

Table 11.1 Travel Mode for Employees' Commuting Trips.

TRAVEL MODE	PERCENTAGE OF EMPLOYEES
CAR DRIVER	86%
CAR PASSENGER	3%
BUS	5%
TRAIN	3%
WALK	3%
TOTAL	100%

Table 11.2 Travel Mode for all Visitors Trips.

TRAVEL MODE	PERCENTAGE OF VISITORS
CAR	80%
BUS	2%
TRAIN	13%
TAXI	4%
OTHER	1%
TOTAL	100%

Trip Generation Rates

11.8 Table 11.3 presents the trip generation from Harman House for both rates per area and rates per employee.

Table 11.3 Trip Generation Rates (Vehicles/Day/Area or Employee)

	RATES PER GROSS AREA	RATES PER NO. OF EMPLOYEES
	12,528 SQM/100	580 EMPLOYEES
EMPLOYEES VEHICLES	3.08	0.67
VISITORS VEHICLES	0.75	0.16
DELIVERY VEHICLES	0.20	0.04
TOTAL	4.03	0.87

Peak to Daily Ratio

11.9 39% of the total inbound traffic arrived between 08.00 - 09.0 while 43% of the outbound traffic departed between 17.00 - 18.00.

Car Parking Capacity

11.10 Harman House has parking space for nearly 400 vehicles with 300 spaces in the underground car park and 72 in the surface car park of which 36 spaces are reserved for customers and visitors. Hence there are 0.41 car spaces per employee.

11.11 A maximum of 363 vehicles were parked on the site at any one time with a maximum of 372 car spaces provided. All employees who drove to work parked in the staff car park. 33% of those visitors who drove to Harman House parked in the visitors' car park, 65% parked in a public car park while 2% found on-street parking. Employees also parked in the spaces provided for visitors only. The maximum demand for space equates to 0.63 per employee or 2.90 per 100 sq m GFA.

Vehicle Occupancy

11.12 The average occupancy of both employees' and visitors' vehicles was 1.03 employees per vehicle. Both of these values, in particular the employees' vehicle occupancy rate, are very low.

Catchment Areas

11.13 Table 11.4 presents the cumulative percentage of drive times for employees commuting trips to Harman House. 2.5% of all commuting trips to Harman House take less than 10 minutes while 44.5% take less than 30 minutes. These figures are both low, indicating a larger than average travel distance, probably due to the sites central 'intown' location and the nature of the employment.

Table 11.4 Cumulative Percentage of employees' Commuting trip drive times.

DRIVE TIME BANDS	CUMULATIVE %
0 - 5	0
5 - 10	2.5
10 - 15	18.0
15 - 20	36.0
20 - 30	44.5
30 - 45	71.5
45 - 60	92.5
+60	100.0

HARMAN HOUSE - APPENDIX

TABLE 11.5
INBOUND TRAFFIC BY PURPOSE OF VISIT

Hour Beginning	Employees' Cars	Visitors' Cars	Deliveries	Total
08.00	153	11	0	164
09.00	138	56	2	196
10.00	3	14	4	21
11.00	14	2	3	19
12.00	14	0	1	15
13.00	14	4	2	20
14.00	17	5	3	25
15.00	8	2	4	14
16.00	25	0	4	29
17.00	0	0	2	2
TOTALS	386	94	25	505
% OF FLOW	76%	19%	5%	100%

Total Flow 505 vehicles

Peak Hourly Flow 196 vehicles

Footnote

The interviews with staff identified 48 employee car arrivals prior to 08.00 and 117 employees that left between 18.00-19.00, and 46 that left after 19.00. These figures are excluded from the above table.

HARMAN HOUSE - APPENDIX

TABLE 11.6
INBOUND AND OUTBOUND TRAFFIC AND VEHICLE ACCUMULATION

HOUR BEGINNING	INBOUND TRAFFIC	OUTBOUND TRAFFIC	VEHICLE ACCUMULATION AT BEGINNING OF HOUR
08.00	164	16	48
09.00	196	29	196
10.00	21	25	363
11.00	19	23	359
12.00	15	31	355
13.00	20	23	339
14.00	25	19	336
15.00	14	20	342
16.00	29	43	336
17.00	2	171	322
18.00	-	-	153
TOTAL	505	400	-

Max No of vehicle Accumulation (10.00)	363
No. of Car Spaces Provided	372
Max. % Utilisation	98

Footnote

82 vehicles did not park in the adjacent car park as there was insufficient space. These vehicles were either parked in a public car park or in adjacent streets.

HARMAN HOUSE - APPENDIX

TABLE 11.7
CATCHMENT AREAS AND DRIVE TIMES

Location	Drive Time (Mins)	% of all Trips	
UXBRIDGE	5 - 10	2	(2.5)
OTHERS	5 - 10		
HILLINGDON	10 - 15	6	
RUISLIP	10 - 15	3	
IVER	10 - 15	2	(16.0)
CHALFONT ST. PETER	10 - 15	2	
EASTCOTE	10 - 15	1	
WEST DRAYTON	10 - 15	1	
OTHERS	10 - 15	1.0	
HAYES	15 - 20	3.5	
DENHAM	15 - 20	1.5	(8)
OTHERS	15 - 20	3	
SLOUGH	20 - 25	3.5	
BEACONSFIELD	20 - 25	1.5	(8.5)
OTHERS	20 - 25	3.5	
EALING	25 - 30	3	
HARROW	25 - 30	3	(10)
NORTHOLT	25 - 30	2	
OTHERS	25 - 30	2	
WATFORD	30 - 35	3	
WINDSOR	30 - 35	2	
RICKMANSWORTH	30 - 35	1.5	(9.0)
LONDON (NW6)	30 - 35	1.5	
OTHERS	30 - 35	1.0	
HIGH WYCOMBE	35 - 40	4	
MAIDENHEAD	35 - 40	4.0	(13)
STANMORE	35 - 40	1	
OTHERS	35 - 40	4	

HARMAN HOUSE - APPENDIX

TABLE 11.7
CATCHMENT AREAS AND DRIVE TIMES (CONTD)

Location	Drive Time (Mins)	% of all Trips	
CAMBERLEY	40 - 50	3	
ST. ALBANS	40 - 50	2	
HEMEL HEMPSTEAD	40 - 50	1.5	(13.5)
LONDON (N11)	40 - 50	1.5	
FULHAM	40 - 50	1.5	
OTHERS	40 - 50	4	
READING	50 - 60	6	
WOKINGHAM	50 - 60	4	(12)
OTHERS	50 - 60	2	
FARNHAM	60+	1.5	
OTHERS	60+	6	(7.5)

12 TRIDENT HOUSE

General

12.1 Trident House is a seven storey office building situated at the junction of Station Road and Clayton Road in Hayes. The site is easily accessible from the M4 motorway and Hayes & Harlington Rail Station is located adjacent to the site. A number of bus routes also service the site. The building is occupied by Avis Rent-A-Car Limited.

12.2 Trident House has a gross floor area of 3,250 sqm on seven floors and has a total of 230 staff. There are 53 car spaces provided in the car park which are available only to the management levels.

Survey Details

12.3 The staff questionnaire technique was employed for this site as there were a number of exits to the building. The survey was undertaken on Monday 11 July and a 70% response was achieved.

Traffic Flows

12.4 The total daily inbound flow was 156 vehicles with the peak flow of 56 vehicles arriving between 08.00-09.00. The lack of parking available to staff members is probably the most significant factor for this low traffic flow.

12.5 Employees' vehicles accounted for 58% of the traffic, visitors' vehicles for 14% and delivery vehicles for 20%.

Travel Modes

12.6 Table 12.1 presents the mode of travel for employees' commuting trips to Trident House. 54% of employees drove a vehicle to work while 21% arrived by bus. Table 12.2 shows the travel mode of trips by visitors to Trident House. 78% of visitors drove a vehicle while only 3% arrived by bus. Figures relate to the 08.00 - 18.00 period only.

Table 12.1 Travel Mode for Employees' Commuting Trips

TRAVEL MODE	PERCENTAGE OF EMPLOYEES
CAR DRIVER	54
CAR PASSENGER	12
BUS	21
WALK	12
TRAIN	1
TOTAL	100

Table 12.2 Travel Mode for All Visitors Trips

TRAVEL MODE	PERCENTAGE OF VISITORS
CAR DRIVER	78
CAR PASSENGER	15
BUS	3
TAXI	4
TOTAL	100

Trip Generation Rates

12.7 Table 12.3 presents the trip generation from Trident House for both rates per area and per employee. Rates of 0.68 vehicle trips per employee and 4.80 vehicle trips per every 100 sqm gross area were observed.

Table 12.3 Trip Generation Rates (Vehicles/Day/Area or Employee)

	RATES PER	
	GROSS AREA	NO. OF EMPLOYEES
	3,248 SQM/100	230 EMPLOYEES
EMPLOYEES' VEHICLES	2.77	0.39
VISITORS' VEHICLES	0.68	0.10
DELIVERY VEHICLES	1.35	0.19
TOTAL	4.80	0.68

Peak to Daily Ratio

12.8 The peak to daily ratio for the inbound traffic was 36% of the total daily inbound traffic arriving between 08.00-09.00. 43% of the total outbound traffic departed between 17.00-18.00.

Parking Capacity

12.9 Trident House has a staff car park for 53 vehicles which are only available to management staff. Three further spaces are available at the front of the building for visitors and delivery vehicles. Table 12.4 presents the percentage of vehicles by purpose of visit parking in different locations.

Table 12.4 Car Parking Location by Purpose of Visit

	PERCENTAGE OF VEHICLES USING PARKING LOCATION					
	STAFF CAR PARK	VISITOR CAR PARK	ON STREET	BLYTH RD CAR PARK	STATION CAR PARK	**TOTAL**
EMPLOYEES' VEHICLES	24	-	52	19	5	100
VISITORS' VEHICLES	-	33	67	-	-	100
DELIVERY VEHICLES	-	38	62	-	-	100

12.10 A maximum of 23 cars were parked in the staff car park at any one time with 53 car spaces provided. On survey day the number of available car spaces was reduced due to maintenance work being undertaken on the exterior of the building requiring erection of scaffolding. Typically the carpark is at, or near to, capacity for most of the day.

12.11 The maximum demand for parking space was recorded at 102. This equates to 0.44 spaces per employee or 3.14 spaces per 100 sq m GFA.

Vehicle Occupancy

12.12 The average daily occupancy of employees' vehicles was 1.22 persons per vehicle. The average daily occupancy of visitors' vehicles was 1.19 persons per vehicle.

Catchment Areas and Drive Times

12.13 Table 12.5 presents the cumulative percentage of drive times for employees' commuting trips to Trident House. 46% of all employees' commuting trips are less than 15 minutes while 72% of all commuting trips are less than 30 minutes.

Table 12.5 Cumulative Percentage of Employees' Commuting Trips Drive Time Bands

DRIVE TIME BANDS	CUMULATIVE %
0 - 5 MINS	0
5 - 10	0
10 - 15	46
15 - 20	63
20 - 30	72
30 - 45	92
45 - 60	96
60+	100%

TRIDENT HOUSE - APPENDIX

TABLE 12.6
INBOUND TRAFFIC BY PURPOSE OF VISIT

Hour Beginning	Employees Cars	Visitors Cars	Deliveries	Total
08.00	56	-	-	56
09.00	22	4	8	34
10.00	3	1	15	19
11.00	-	2	5	7
12.00	1	0	2	3
13.00	1	2	4	7
14.00	4	2	-	6
15.00	3	7	5	15
16.00	-	2	5	7
17.00	-	2	-	2
TOTALS	90	22	44	156
% OF DAILY FLOW	58%	14%	28%	100%

Total Flow	156 vehicles
Peak Hourly Flow	56 vehicles (08.00-09.00)

TRIDENT HOUSE - APPENDIX

TABLE 12.7
INBOUND AND OUTBOUND TRAFFIC AND VEHICLE ACCUMULATION

HOUR BEGINNING	INBOUND TRAFFIC	OUTBOUND TRAFFIC	VEHICLE ACCUMULATION AT BEGINNING OF HOUR
08.00	56	0	19
09.00	34	8	75
10.00	19	18	101
11.00	7	10	102
12.00	3	6	99
13.00	7	10	96
14.00	6	9	93
15.00	15	10	90
16.00	7	13	95
17.00	2	64	89
18.00	-	-	27
TOTALS	156	148	

Morning Peak Hour Inbound (08.00-09.00) 56 (36%)

Evening Peak Hour Outbound (17.00-18.00) 64 (43%)

Footnote

Nineteen employees' vehicles arrived prior to 08.00 and 27 departed after 18.00.

Max. No. of Vehicle Accumulations 102 (11.00)

No of Car Spaces provided 53

Max. % Utilisation 1.92

TRIDENT HOUSE - APPENDIX

TABLE 12.8
CATCHMENT AREAS AND DRIVE TIMES

Location	Drive Time (Mins)	% of All Trips	
HAYES	10 - 15	40.0	
HARLINGTON	10 - 15	4	(46.5)
OTHERS	10 - 15	2.5	
HILLINGDON	15 - 20	9	
UXBRIDGE	15 - 20	4	(17)
OTHERS	15 - 20	4	
RUISLIP	20 - 30	4	
WEST DRAYTON	20 - 30	2.5	(9)
OTHERS	20 - 30	2.5	
LANGLEY	30 - 35	2	
OTHERS	30 - 35	4	(6)
WOKINGHAM	35 - 40	2.5	
HANWORTH	35 - 40	2.5	(11.5)
SLOUGH	35 - 40	2.5	
OTHERS	35 - 40	4	
OTHERS	40 - 50	4	
OTHERS	50 - 60	2	(6)
OTHERS	60+	4	(4)

13 MEMOREX TELEX HOUSE

General

13.1 Memorex Telex House is a small office building situated on Bath Road in Longford. The building is occupied by Memorex Telex Limited.

13.2 The site has very good access being located near the junction of the M4 and M25 motorways. The site is not well served by public transport and there are no shopping facilities available within the immediate area.

13.3 Memorex Telex employ 60 staff on a gross area of 1,021 sqm. The car park has 40 marked vehicle spaces, and additional space for 6 more vehicles in unmarked areas. This was the smallest site included in the study.

Survey Details

13.4 The foyer interview technique was employed for this site as employees and visitors entered the building. The survey was undertaken on Monday 11 July and a 74% response was achieved.

Traffic Flow

13.5 The total daily inbound flow was 116 vehicles with 32 vehicles arriving between 08.00-09.00. 67% of the total flow was accounted for by employees' vehicles, 15% by visitors' vehicles and 18% by delivery vehicles.

Travel Modes

13.6 Table 13.1 shows the mode for travel for employees' commuting trips and visitors' trips to Memorex Telex House. 95% of the employees drove a vehicle to work while 85% of the visitors drove to Memorex Telex House.

Table 13.1 Travel Modes for Employees' Commuting Trips and Visitors Trips.

TRAVEL MODE	% OF EMPLOYEES' COMMUTING TRIPS	% OF VISITORS
CAR DRIVERS	95	85
CAR PASSENGERS	2	15
BUS	3	0
	100	100

Vehicle Types

13.7 Table 13.2 presents the percentage of vehicles visiting Memorex Telex House by vehicle type.

Table 13.2 Vehicle Types

VEHICLE TYPE	% OF TOTAL
EMPLOYEES' CARS	67
VISITORS' CARS	15
DELIVERY CARS	13
DELIVERY CYCLES	2
LGVS	3
	100

Trip Generation Rates

13.8 Table 13.3 presents the trip generation from Memorex Telex House for both rates per area and per employee. Rates were very high due to the high percentage of both employees and visitors driving to Memorex Telex House and the large lunch-time volumes. Rates of 1.93 vehicle trips per employee and 11.36 trips per every 100 sqm gross area were observed.

Table 13.3 Trip Generation Rates (Vehicles/Day/Area or Employee)

	RATES PER : GROSS AREA	NO. OF EMPLOYEES
	1,021 SQM/100	60 EMPLOYEES
EMPLOYEES' VEHICLES	7.64	1.30
VISITORS' VEHICLES	1.67	0.28
DELIVERY VEHICLES	2.06	0.35
TOTAL	11.36	1.93

Peak to Daily Ratio

13.9 The peak to daily ratio for the inbound traffic was 28% of the total daily inbound traffic arriving between 08.00-09.00. 15% of the total outbound traffic departed between 17.00-18.00 but the maximum outbound peak was 26% of the total outbound flow departing during the midday period from 12.00-13.00.

Parking Capacity

13.10 Memorex Telex House car park has 40 marked vehicle spaces but has additional non-marked areas when the car park space reaches capacity. Entrance to the car park is controlled by a car-entry system. A maximum of 46 vehicles were parked on site at any one time - hence a maximum utilisation of 115%. This maximum demand equates to 0.77 spaces per employee or 4.51 per 100 sq m GFA.

Vehicle Occupancy

13.11 The average daily occupancy of employees' vehicles was 1.05 persons per vehicle. The average daily occupancy of visitors' vehicles was 1.18 persons per vehicle.

Catchment Areas

13.12 Table 13.4 presents the cumulative percentage of drive times for employees' commuting trips to Memorex Telex House. 18% of all commuting trips are less than 10 minutes while 48% are less than 30 minutes.

Table 13.4 Cumulative Percentage of Employees' Commuting Trip Drive Time Bands

DRIVE TIME BANDS	CUMULATIVE %
0 - 5 MINS	0
5 - 10	18
10 - 15	28
15 - 20	35
20 - 30	48
30 - 45	79
45 - 60	95
60+	100

MEMOREX TELEX HOUSE - APPENDIX

TABLE 13.5
INBOUND TRAFFIC BY PURPOSE OF VISIT

Hour Beginning	Employees' Cars	Visitors' Cars	Deliveries	Total
08.00	28	3	1	32
09.00	12	2	6	20
10.00	3	2	1	6
11.00	-	2	-	2
12.00	6	-	3	9
13.00	17	3	-	20
14.00	12	4	2	18
15.00	-	-	-	-
16.00	-	1	6	7
17.00	-	-	2	2
TOTALS	78	17	21	116
% OF DAILY FLOW	67%	15%	18%	100%

Total Flow 116 vehicles
Peak Hourly Flow 32 Vehicles (08.00-09.00)

MEMOREX TELEX HOUSE - APPENDIX

TABLE 13.6
INBOUND AND OUTBOUND TRAFFIC AND VEHICLE ACCUMULATION

HOUR BEGINNING	INBOUND TRAFFIC	OUTBOUND TRAFFIC	VEHICLE ACCUMULATION AT BEGINNING OF HOUR
08.00	32	9	14
09.00	20	11	37
10.00	6	6	46
11.00	2	9	46
12.00	9	31	39
13.00	20	18	17
14.00	18	3	19
15.00	-	3	34
16.00	7	10	31
17.00	2	18	28
18.00	-	-	12
TOTAL	116	118	-

Morning Peak Hour Inbound (08.00 - 09.00)	32 (28%)
Evening Peak Hour Authorities (17.00 - 18.00)	18 (15%)
Max. No. of Vehicle Accumulations	46 (10.00-11.00)
No. of Car Spaces Provided	40
Max. % Utilisation	115

MEMOREX TELEX HOUSE - APPENDIX

TABLE 13.7
CATCHMENT AREAS AND DRIVE TIMES

Location	Drive Time (Mins)	% of All Trips	
BEDFONT	5 - 10	5	
LANGLEY	5 - 10	4	(18)
OTHERS	5 - 10	9	
STAINES	10 - 15	5	
OTHERS	10 - 15	5	(10)
SLOUGH	15 - 20	5	
OTHERS	15 - 20	2	(7)
CHERTSEY	25 - 35	5	
TEDDINGTON	25 - 35	5	(31)
OTHERS	25 - 35	21	
READING	35 - 40	5	
OTHERS	35 - 40	5	(10)
OTHERS	40 - 50	5	(5)
OXFORD	50 - 60	10	(14)
OTHERS	50 - 60	4	
OTHERS	60+	5	(5)

14 KIRK HOUSE

General

14.1 Kirk House is a small office building located on Cowley High Street. The building is occupied by British Telecom's Applied Technology Division. West Drayton Railway Station is conveniently located nearby and a number of bus routes service the site.

14.2 Kirk House has a gross floor area of 1,545 sqm and a staff of 120. The building has a car park with a capacity for 51 vehicles.

Survey Details

14.3 The staff questionnaire technique was employed for this site and the survey was undertaken on Friday 15 July. A response rate of 48% was achieved.

Traffic Flow

14.4 Based on expanding the interview data it is estimated that 106 vehicle trips were made to Kirk House during the day. 29 vehicles arrived between 08.00-09.00 but the peak hour flow was 40 vehicles arriving between 09.00-10.00. Employees' vehicles accounted for 82% of the total flow while visitors and deliveries accounted for 9% each.

Travel Modes

14.5 Table 14.1 presents the mode of travel for employees' commuting trips and visitors' trips to Kirk House. 83% of employees and all the visitors drove to Kirk House.

Table 14.1 Travel Modes for Employees' Commuting Trips and Visitors' Trips.

TRAVEL MODE	% OF EMPLOYEES' COMMUTING TRIPS	% OF VISITORS' TRIPS
CAR DRIVERS	83	100
CAR PASSENGERS	4	-
BUS	6	-
WALK	6	-
OTHER	1	-
TOTAL	100	100

Vehicle Types

14.6 Table 14.2 presents the percentage of each vehicle type visiting Kirk House. 84% of the vehicles visiting Kirk House were employee's vehicles.

Table 14.2 Vehicle Types

VEHICLE TYPE	% OF TOTAL
EMPLOYEES' CARS	82
VISITORS' CARS	9
DELIVERY CARS	4
LGV'S	3
HGV'S	2
	100

Trip Generation Rates

14.7 Table 14.3 presents the trip generation from Kirk House for both rates per area and per employee. Rates of 0.88 vehicle trips per employee and 6.86 trips per every 100 sqm gross area were observed based on the period 08.00-18.00.

Table 14.3 Trip Generation Rates (Vehicles/Day/Area or Employee)

	RATES PER	
	GROSS AREA	NO. OF EMPLOYEES
	1,545 SQM/100	120
EMPLOYEES' VEHICLES	5.64	0.72
VISITORS' VEHICLES	0.58	0.08
DELIVERY VEHICLES	0.64	0.08
TOTALS	6.86	0.88

Peak to Daily Ratio

14.8 27% of the daily inbound traffic arrived between 08.00-09.00 but the peak hour was between 09.00-10.00 when 38% of the total inbound traffic arrived. 27% of the daily outbound traffic departed between 17.00-18.00 but 31% of the total daily flow departed in the previous hour.

Parking Capacity

14.9 The car park at Kirk House has a capacity for 51 vehicles (0.52 vehicle spaces per employee). Access to the car park is controlled by a card entry system.

14.10 The car park reaches capacity between 09.00-10.00 and remains at, or near to, capacity for most of the day. Vehicles arriving after the car park is full are required to park elsewhere. Most of them park at Tesco's car park which is free, others at Fairfield Road public car park which is charged while others find on-street parking. Table 14.4 presents percentages of vehicles parking at different locations.

Table 14.4 Vehicle Parking Locations

	KIRK HOUSE CAR PARK	TESCO'S CAR PARK	FAIRFIELD RD CAR PARK	ON STREET	TOTAL
EMPLOYEES VEHICLES	77	16	4	3	100
VISITORS VEHICLES	78	13	9	0	100
DELIVERY VEHICLES	80	0	0	20	100

4.11 The maximum demand for parking space was recorded as 81. This equates to a demand of 0.67 per employee or 5.24 per 100 sq m GFA.

Vehicle Occupancy

14.12 The average daily occupancy of employees' vehicles was 1.05 persons per vehicle. The nine visitors to Kirk House were all vehicle drivers.

Catchment Areas

14.13 Table 14.5 presents the cumulative percentage of drive times for employees' commuting trips to Kirk House. All commuting trips are greater than 10 minutes but 54% were less than 30 minutes.

Table 14.5 Cumulative Percentage of Employees' Commuting Trip Drive Time Bands.

DRIVE TIME BANDS	CUMULATIVE %
0 - 10 MINS	0
10 - 15	32
15 - 20	41
20 - 30	54
30 - 45	72
45 - 60	100
60+	100

KIRK HOUSE - APPENDIX

TABLE 14.6
INBOUND TRAFFIC BY PURPOSE OF VISIT

Hour Beginnig	Employees' Cars	Visitors' Cars	Deliveries	Total
08.00	27	1	1	29
09.00	32	6	2	40
10.00	7	1	0	8
11.00	5	0	2	7
12.00	0	0	2	2
13.00	5	0	1	6
14.00	5	0	0	5
15.00	3	0	0	3
16.00	3	1	2	6
17.00	0	0	0	0
TOTALS	87	9	10	106
% OF DAILY FLOW	82%	9%	9%	100%

Total Flow 106 vehicles

Peak Hourly Flow 40 vehicles (09.00-10.00)

KIRK HOUSE - APPENDIX

TABLE 14.7
INBOUND AND OUTBOUND TRAFFIC AND VEHICLE ACCUMULATIONS

HOUR BEGINNING	INBOUND TRAFFIC	OUTBOUND TRAFFIC	VEHICLE ACCUMULATION
08.00	29	1	10
09.00	40	2	38
10.00	8	3	76
11.00	7	7	81
12.00	2	8	81
13.00	6	8	75
14.00	5	0	73
15.00	3	7	78
16.00	6	26	74
17.00	0	23	54
18.00	-	-	31
TOTALS	106	85	-

Morning Peak Hour Inbound (08.00-09.00) 29 (27%)

Evening Peak Hour Outbound (17.00-18.00) 23 (27%)

Footnote

Twelve employees' vehicles arrived prior to 08.00 am while thirty one vehicles departed after the end of the survey period at 18.00.

KIRK HOUSE - APPENDIX

TABLE 14.8
CATCHMENT AREAS AND DRIVE TIMES

Location	Drive Time (Mins)	% of All Trips	
WEST DRAYTON	10 - 15	7.5	
HAYES	10 - 15	7.5	(32.5)
LANGLEY	10 - 15	5.0	
OTHERS	10 - 15	12.5	
HOUNSLOW	15 - 25	5	
OTHERS	15 - 25	12.5	(17.5)
CHISWICK	25 - 35	7.5	
HAMPTON	25 - 35		(7.5)
OTHERS	25 - 35		
WOKING	35 - 40	5	(7.5)
OTHERS	35 - 40	2.5	
READING	40 - 50	10	(20)
OTHERS	40 - 50	10	
OTHERS	50+	15	(15)

15 TIMES HOUSE

General

15.1 Times House is a seven storey office building situated on Station Approach, Ruislip. The building is owned by Taylor Woodrow and is leased to five occupants.

15.2 The building is located adjacent to Ruislip Underground Station (Piccadilly and Metropolitan Lines), a number of bus routes pass the building and the A40 Western Avenue is within a few minutes drive.

15.3 At the time of the study only 2,653 sqm of the buildings available 4,900 sqm was occupied. Five companies lease the building ranging in size from Glenn Dimplex Limited with a staff of seven to Landis and Gyr with a staff of 39 forming a total of 135 staff on the site. Times House has a car park with a capacity for 101 vehicles.

Survey Details

15.4 The foyer interview technique was employed for this site as employees and visitors entered the building. The survey was undertaken on Wednesday 6th July and a 78% response was achieved.

Traffic Flow

15.5 189 vehicle trips were made to Times House, during the day. The peak hour flow was between 08.00-09.00 when 37 vehicles trips were made to the site. 73% of trips made to the site were by employees while 15% were made by visitors and 12% by deliveries.

Travel Modes

15.6 Table 15.1 presents the mode of travel for employees' commuting trips and visitors' trips to Times House. 72% of employees drove a car to work while all visitors drove to Times House.

Table 15.1 Travel Modes for Employees' Commuting trips and Visitors' Trips

TRAVEL MODE	% OF EMPLOYEES' COMMUTING TRIPS	% OF VISITORS' TRIPS
CAR DRIVERS	72	100
CAR PASSENGERS	7	-
BUS	7	-
WALK	6	-
TRAIN	8	-
TOTAL	100	100

Vehicle Types

15.7 Table 15.2 presents the percentages of vehicle types visiting Times House. 75% of the vehicles visiting Times House were employees' vehicles.

Table 15.2 Vehicle Types

VEHICLE TYPE	% OF TOTAL
EMPLOYEES' CARS	73
VISITORS' CARS	15
DELIVERY CARS	7
LGV'S	4
HGV'S	1
TOTAL	100

Trip Generation Rates

15.8 Table 15.3 presents trip generation from Times House for both rates per area and per employee. Rates of 1.46 vehicle trips per employee and 7.52 trips per every 100 sqm gross are were determined.

Table 15.3 Trip Generation Rates (Vehicle/Day/Area or Employee)

	RATES PER GROSS AREA	RATES PER NO. OF EMPLOYEES
	2,653 SQM/100	137 EMPLOYEES
EMPLOYEES' VEHICLES	5.20	1.01
VISITORS' VEHICLES	1.09	0.21
DELIVERY VEHICLES	0.83	0.16
TOTAL	7.12	1.38

Peak to Daily Ratio

15.9 20% of the total daily inbound traffic arrived between 08.00-09.00 while 19% of the total daily outbound traffic departed between 17.00-18.00.

Parking Capacity

15.10 The car park at Times House has a capacity for 101 vehicles. When the building is fully occupied parking is restricted to management levels but during the time of the study, was open to all staff and visitors to Times House. A maximum of 71 vehicles were parked at any one time hence a maximum utilisation of 70%. This maximum demand equates to 0.52 spaces per employee or 2.68 spaces per 100 sq m GFA.

Vehicle Occupancy

15.11 The average daily occupancy of employees' vehicles was 1.09 persons per vehicle while all visitors were car drivers.

Catchment Areas

15.12 Table 15.4 presents the cumulative percentage of drive times for employees' commuting trips to Times House. 24% of employees commuting trips are less than 10 minutes while 60% are less than 30 minutes.

Table 15.4 Cumulative Percentage of Employees' Commuting Trip Drive Time Bands

DRIVE TIME BANDS	CUMULATIVE %
0 - 5 MINS	0
5 - 10	24
10 - 15	44
15 - 20	50
20 - 30	60
30 - 45	81
45 - 60	88
60+	100

TIMES HOUSE - APPENDIX

TABLE 15.5
INBOUND TRAFFIC BY PURPOSE OF VISIT

Hour Beginning	Employees' Cars	Visitors' Cars	Deliveries	Total
08.00	35	1	1	37
09.00	17	7	5	29
10.00	8	4	3	15
11.00	5	8	5	18
12.00	4	4	1	9
13.00	31	-	-	31
14.00	16	1	3	20
15.00	12	2	1	15
16.00	8	1	2	11
17.00	2	1	1	4
TOTALS	138	29	22	189
% OF FLOW	73%	15%	12%	100%

Total Flow Vehicle	189
Peak Hourly Flow Vehicles	37 (08.00-09.00)

TIMES HOUSE - APPENDIX

TABLE 15.6
INBOUND AND OUTBOUND TRAFFIC VEHICLE ACCUMULATION

HOUR BEGINNING	INBOUND TRAFFIC	OUTBOUND TRAFFIC	VEHICLE ACCUMULATIONS AT BEGINNING OF HOUR
08.00	37	8	11
09.00	29	7	40
10.00	15	14	62
11.00	18	10	63
12.00	9	33	71
13.00	31	25	47
14.00	20	7	53
15.00	15	12	66
16.00	11	24	69
17.00	4	33	56
18.00	-	-	27
TOTAL	189	173	-

Morning Peak Hour Inbound (08.00-09.00) 37 (20%)

Evening Peak Hour Outbound (17.00-18.00) 33 (19%)

Footnote

Eleven vehicles arrived prior to 8.00am and 27 departed after the end of the survey period at 18.00.

Max. No. of Vehicle Accumulations 71

No. of Car Spaces Provided 101

Max. % Utilisation 70

TIMES HOUSE - APPENDIX

TABLE 15.7
CATCHMENT AREAS AND DRIVE TIMES

Location	Drive Time (Mins)	% of All Trips	
RUISLIP	5 - 10	18	
EASTCOTE	5 - 10	3	(24)
OTHERS	5 - 10	3	
HARROW	10 - 15	6	
ICKENHAM	10 - 15	6	(20)
OTHERS	10 - 15	8	
HAYES	15 - 20	3	(6)
OTHERS	15 - 20	3	
STANMORE	20 - 25	3	(5)
OTHERS	20 - 25	2	
ACTON	25 - 30	3	(5)
OTHERS	25 - 30	2	
MAIDENHEAD	30 - 40	5	
WATFORD	30 - 40	3	(16)
IVOR	30 - 40	3	
OTHERS	30 - 40	5	
OTHERS	40 - 50	9	(9)
OTHERS	50 - 60	3	(3)
OTHERS	60+	12	(12)

16 106 OXFORD ROAD

General

16.1 106 Oxford Road is located on the outskirts of the central business district of Uxbridge. This medium sized office block is occupied by two tenants, Grand Metropolitan Retailing and Rover Group.

16.2 Oxford Road runs directly from the Western Avenue providing good access to the building while Uxbridge Underground Station is within a ten minute walk.

16.3 The building has a gross area of 3,760 sqm with a total of 130 staff. The site has a car park with a capacity for 99 vehicles.

Survey Details

16.4 The questionnaire technique was employed for this site. The survey was undertaken on Wednesday 13 July and a 69% response was achieved.

Traffic Flow

16.5 133 vehicle trips were made to 106 Oxford Road during the day (8.00-18.00) of which 48 arrived between 08.00-09.00. 60 vehicles departed between 17.00-18.00. 48% of all trips were made by employees while 21% were made by visitors and 31% by deliveries.

Travel Modes

16.6 Table 16.1 presents the mode of travel for employees' commuting trips and visitors' trips to 106 Oxford Road. 80% of all employees drove to work while 73% of visitors drove.

Table 16.1 Travel Modes for Employees' Commuting Trips and Visitors' Trips

TRAVEL MODE	% OF EMPLOYEES' COMMUTING TRIPS	% OF VISITORS' TRIPS
CAR DRIVER	80	73
CAR PASSENGER	7	-
WALK	3	19
BUS	7	3
TRAIN	3	2
TAXI	-	3
TOTAL	100	100

Vehicle Types

16.7 Table 16.2 presents the percentages of vehicles types visiting the site. 57% of the vehicles visiting the site were employees' vehicles.

Table 16.2 Vehicle Types

VEHICLE TYPE	% OF TOTAL
EMPLOYEES' CARS	48
VISITORS' CARS	21
DELIVERY CARS	17
DELIVERY CYCLES	4
LGV'S	10
TOTAL	100

Trip Generation Rates

16.8 Table 16.3 presents trip generations from 106 Oxford Road for both rates per area and per employee. Rates of 1.02 vehicle trips per employee and 3.53 trips per every 100 sqm gross area were observed.

Table 16.3 Trip Generation Rates (Vehicles/Day/Area or Employee)

	RATES PER GROSS AREA	RATES PER NO. OF EMPLOYEES
	3,760 SQM/100	130 EMPLOYEES
EMPLOYEES' VEHICLES	1.70	0.49
VISITORS' VEHICLES	0.74	0.22
DELIVERY VEHICLES	1.09	0.31
TOTAL	3.53	1.02

Peak to Daily Ratio

16.9 The peak to daily ratio for the inbound flow was 36% of the daily inbound traffic arriving between 08.00-09.00. 42% of the total outbound flow departed between 17.00-18.00.

Parking Capacity

16.10 106 Oxford Road car park has a capacity for 99 vehicles (0.76 car spaces per employee). The maximum demand for vehicle parking space was 93, hence the maximum effective utilisation of 94%. This equates to a maximum demand of 0.71 spaces per employee or 2.47 spaces per 100 sq m GFA.

16.11 Access to the car park is restricted to managerial staff and visitors. Table 16.4 presents the percentages of vehicles by purpose of visit parking in each location.

Table 16.4 Percentage of trips by parking location

	COMPANY CAR PARK	CEDARS PUBLIC PARK	ON STREET
EMPLOYEES' VEHICLES	70	9	21
VISITORS' VEHICLES	41	4	55
DELIVERY VEHICLES	3	-	97

Vehicle Occupancy

16.12 The average daily occupancy of employees' vehicles was 1.05 persons per vehicle. All visitors to the building who came by car (73% of visitors) drove themselves.

Catchment Areas

16.13 Table 16.5 presents the cumulative percentage of drive times for employees' commuting trips to 106 Oxford Road. All commuting trips take longer than 10 minutes while 38% take less than 30 minutes.

Table 16.5 Cumulative Percentage of Employees' Commuting Trip Drive Time Bands

DRIVE TIME BANDS	CUMULATIVE %
0 - 10 MINS	0
10 - 15	14
15 - 20	28
20 - 30	38
30 - 45	73
45 - 60	91
60+	100

106 OXFORD ROAD - APPENDIX

TABLE 16.6
INBOUND TRAFFIC BY PURPOSE OF VISIT

HOUR BEGINNING	EMPLOYEES' CAR	VISITORS' CAR	DELIVERIES	TOTAL
08.00	46	-	2	48
09.00	11	4	8	23
10.00	2	4	5	11
11.00	-	3	4	7
12.00	-	2	3	5
13.00	5	-	4	9
14.00	-	5	7	12
15.00	-	5	5	10
16.00	-	4	2	6
17.00	-	1	1	2
TOTALS	64	28	41	133
% OF DAILY FLOW	48%	21%	31%	100%

Total Flow	133 Vehicles
Peak Hourly Flow	48 Vehicles

106 OXFORD ROAD - APPENDIX

TABLE 16.7
INBOUND AND OUTBOUND TRAFFIC AND VEHICLE ACCUMULATION

HOUR BEGINNING	INBOUND TRAFFIC	OUTBOUND TRAFFIC	VEHICLE ACCUMULATION AT BEGINNING OF HOUR
08.00	48	2	28
09.00	23	8	74
10.00	11	7	89
11.00	7	8	93
12.00	5	12	92
13.00	9	10	85
14.00	12	9	84
15.00	10	7	87
16.00	6	20	90
17.00	2	60	76
18.00	-	-	18
TOTAL	133	143	-

Morning Peak Hour Inbound (08.00-09.00) 48 (31%)

Evening Peak Hour Outbound (17.00-18.00) 60 (42%)

Footnote

Twenty-eight vehicles arrived before 08.00 while eighteen vehicles departed after the end of the survey at 18.00.

Max. No. of Vehicle Accumulations 93 (11.00-12.00)

No of Car Spaces Provided 99

Max. % Utilisation 94%

106 OXFORD ROAD - APPENDIX

TABLE 16.8
CATCHMENT AREAS AND DRIVE TIMES

LOCATION	DRIVE TIME (MINS)	% OF ALL TRIPS	
HILLINGDON	10 - 15	3.5	
HAYES	10 - 15	3.5	(14)
OTHERS	10 - 15	7	
NORTHWOOD	15 - 25	3.5	
SOUTHALL	15 - 25	3.5	(14)
OTHERS	15 - 25	7	
RUISLIP	25 - 30	7	(10.5)
OTHERS	25 - 30	3.5	
HARROW	30 - 35	3.5	
CHESHAM	30 - 35	3.5	(12)
OTHERS	30 - 35	5	
HIGH WYCOMBE	35 - 40	7	
WARGRAVE	35 - 40	3.5	(14)
OTHERS	35 - 40	3.5	
ST. ALBANS	40 - 50	3.5	(17.5)
OTHERS	40 - 50	14	
CAMBERLEY	50 - 60	3.5	
OTHERS	50 - 60	5.5	(9)
OTHERS	60+	9	(9)

17 COMPARATIVE ANALYSIS OF TRAFFIC GENERATION FACTORS

General

17.1 This Section draws together the results of the previous twelve Sections and summarises the data obtained. Comparisons are made with other sources of information. Tables listing each of the main facets of each of the study sites are given in an Appendix to this Section.

Daily Trip Generation Rate

17.2 The trip generation rate on a "per floor area" and "per employee" basis are illustrated in graphical form in Figures 17.1 and 17.2. While the graphs clearly show a positive trend (more space - more trips) there is clearly a lot of site by site variation.

17.3 Taking all sites together a regression analysis gives estimates of

TRIPS = 68 + 3.43 per 100 sq m (R^2 = 0.81)

TRIPS = -29 + 1.3 per employee (R^2 = 0.91)

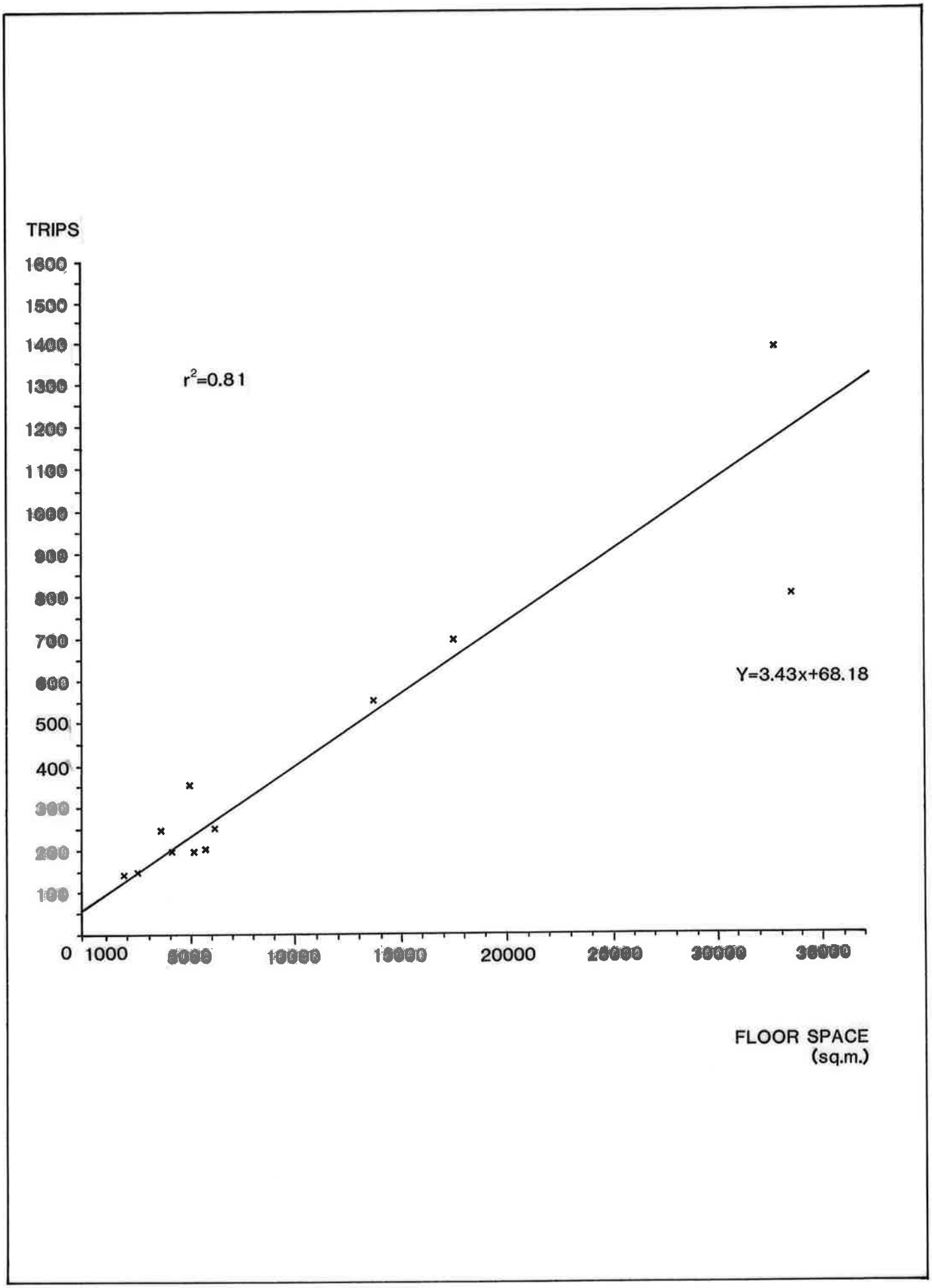
In common with previous work this analysis confirms that employees are a better determinant of trip generation than floor area. Unfortunately this provides little help to a Planning Authority in the assessment of a planning application as information on employment is not provided and is subject to change.

17.4 Over the range of sites surveyed the daily vehicle trip rate per 100 sq m varies between 2.33 (Broadwater Park) and 11.36 (Memorex House) while the rate per employee varies between 0.68 (Trident House) and 2.13 (Abenglen Industrial Estate). Many different issues contribute to this wide range including:-

employment density
type of industry/business
location of site
proximity to public transport.

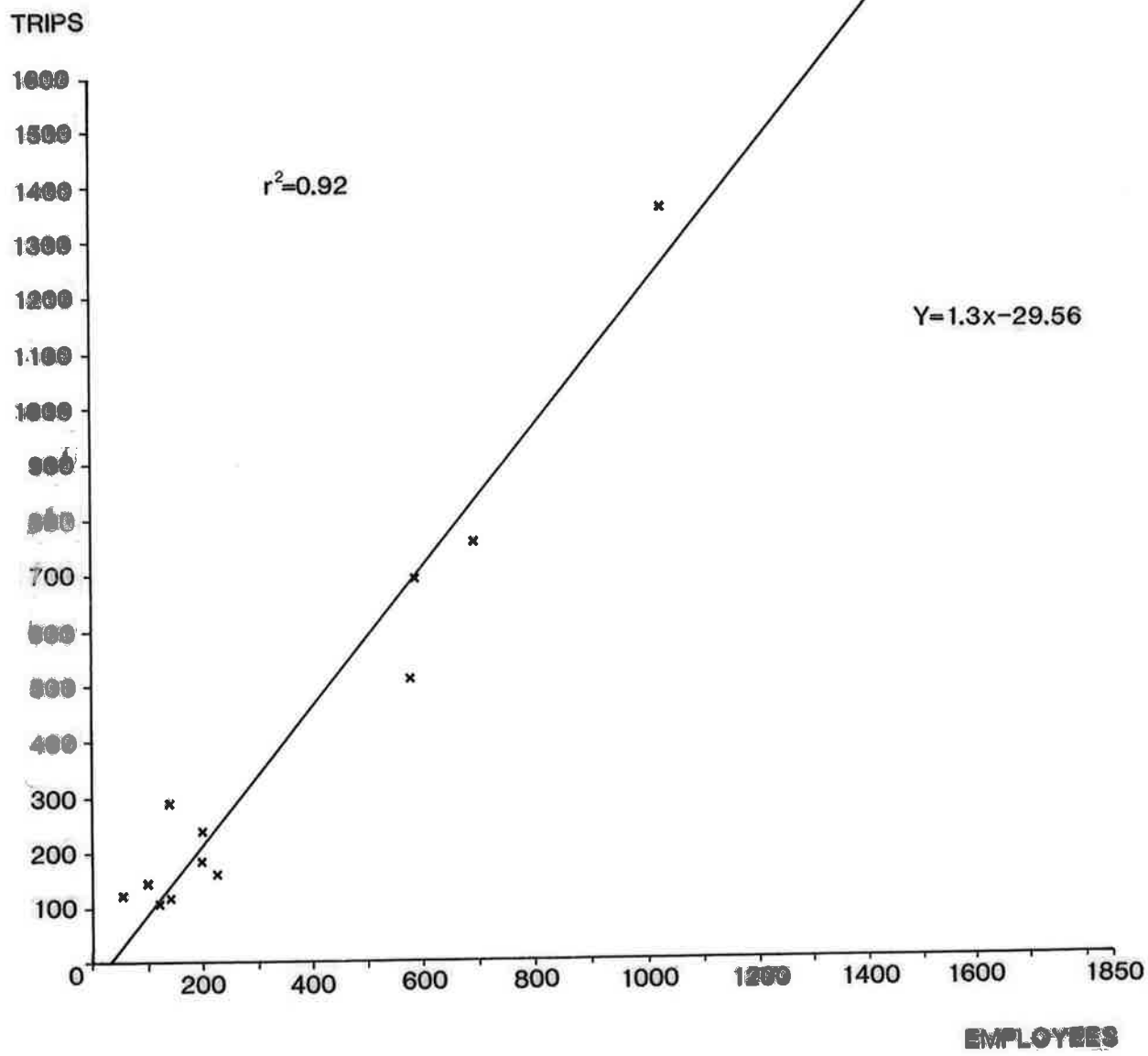
17.5 One of the biggest factors creating this variation is the effect of employment density, that is the space per employee within each establishment. This varies from 13 sq m per person in Kirk House to 46 sq m per person in Broadwater Park. A clear correlation between employment density and trip rates per sq metre can be seen from Table 17.1 which lists sites in descending order of trip rate.

17.6 Two major anomalies to the trend shown in Table 17.1 are the values recorded for Abenglen Industrial Estate and Memorex Telex House. Both sites have a greater trip rate than other sites of a similar employment to area density ratio. The explanations for this are probably that Abenglen comprises multiple light industrial units which generate a much larger percentage of commercial traffic than other sites classified as 'high tech' estates, while Memorex Telex House generates a large amount of off-peak traffic particularly during the lunch break period and a large number of non-commuting business trips.



TRIPS v FLOOR SPACE

Figure 17.1



TRIPS v EMPLOYMENT

Figure 17.2

Table 17.1 Trip Generation Rates By Employment Density

SITE NAME	TRIP RATE VEH/DAY/100 SQ M	EMPLOYEES PER 100 SQ M
Memorex Telex House	11.36	5.89
Abenglen Industrial Estate	7.41	3.47
Times House	7.12	5.16
Kirk House	6.86	7.79
Trident House	4.80	7.08
Swakeleys House	4.51	3.58
Stockley Park	4.35	3.29
Denbridge Estate	4.22	3.56
Harman House	4.03	4.63
106 Oxford Road	3.53	3.46
Harefield Grove	3.35	2.36
Broadwater Park	2.23	2.17

17.7 The sites within the Borough of Hillingdon were selected so as to provide a mix of 'High Tech' and 'Offices' and 'Town Centre' and 'Out of Town Centre'. Tables 17.2 and 17.3 set out the trip generation rates divided into these categories. Four additional sites obtained from surveys undertaken with Surrey County Council have been added to the mix, two of these are town centre offices and two are edge of town Business Parks.

Table 7.2 Trip Generation per Employee

SITE	TRIP RATE PER EMPLOYEE	USE	LOCATION IN/OUT OF TOWN CENTRE
Abenglen	2.13	Light Industrial	Out
Memorex Telex House	1.93	Office	Out
*SITE 1	1.45	High Tech	Out
Harefield Grove	1.42	Office	Out
*SITE 2	1.42	High Tech	Out
Times House	1.38	Office	In
Stockley Park	1.32	High Tech	Out
Swakeleys	1.27	High Tech	Out
Denbridge	1.18	High Tech	In
Broadwater Park	1.07	High Tech	Out
106 Oxford Road	1.02	Office	In
* SITE 3	0.93	Office	In
Kirk House	0.88	Office	In
Harmon House	0.87	Office	In
* SITE 4	0.82	Office	In
Trident House	0.68	Office	In

(*) Denotes site surveyed in Surrey.

Table 17.3 Trip Generation per 100 sq m Floor Area

SITE	TRIP RATE PER 100 SQ M	USE	LOCATION IN/OUT OF TOWN CENTRE
Memorex Telex House	11.36	Office	Out
Abenglen Ind. Estate	7.41	Light Industrial	Out
Times House	7.12	Office	In
Kirk House	6.86	Office	In
* SITE 3	6.49	Office	In
* SITE 4	5.21	Office	In
* SITE 2	4.86	High Tech	Out
Trident House	4.80	Office	In
Swakeleys	4.51	High Tech	Out
Stockley Park	4.35	High Tech	Out
Denbridge Estate	4.22	High Tech	In
* SITE 1	4.19	High Tech	Out
Harman House	4.03	Office	In
106 Oxford Road	3.53	Office	In
Harefield Grove	3.35	Office	Out
Broadwater Park	2.33	High Tech	Out

(*) denotes site surveyed in Surrey

17.8 The analysis by employee gives a reasonable general pattern that "high tech" sites and "out of town centre" sites tend to have higher trip rates than "office" and "in town centre" sites. There is clearly a cross relationship between these factors as high-tech sites tend to be out of town while offices tend to be in town centres. By ignoring the top two sites which have their own peculiarities and combining high-tech and office uses it can be seen that the sites in Hillingdon gives values of:-

trip rate in town centre = 1.00 trips per employee (Spread of 0.68 - 1.38)
trip rate out of town centre = 1.27 trips per employee (Spread of 1.07 - 1.42)

out of town centre is 27% higher.

There would therefore seem to be clear evidence that town centre sites attract significantly fewer trips per employee, presumably in part due to lack of parking, town centre congestion and availability of public transport.

17.9 The analysis by square metre is nowhere near so clear cut with "office" tending to be higher than "high-tech" caused in part by higher employment densities. By again ignoring the top two sites and combining high tech and office users it can be seen that:-

trip rate in town centre = 5.27 trip per 100 m^2 (Spread of 3.53 - 7.12)
trip rate out of town centre = 3.63 trip per 100 m^2 (Spread of 2.33 - 4.35)

out of town centre is 31% lower.

This reversal of pattern from that given in the proceeding paragraph is largely a reflection of the higher employment densities within office, and by association, town centre developments.

Peak Hour Traffic Generation

17.10 There is considerable variation in peak hour to daily traffic factors between sites with very low levels being recorded at Abenglen Industrial Estate (due to continuous all day activity) to very high rates at Harefield Grove where most trips are commuters who all leave within the same hour. Table 17.13 in the Annex to this Section sets out a list of all the rates.

17.11 Over all sites it was found that some 19% of all traffic movements (two-way) occurred during the morning peak period 08.00-09.00 (Spread 11% - 25%). The evening peak period accounted for some 16% of all traffic movements (Spread 7% - 26%). Considering directional movements it was found that 32% of all inbound trip occurred during the morning peak hour (Spread 15% - 39%) and 30% of the outbound trips occurred in the evening peak hour (Spread 9% - 47%).

17.2 Trip rates per 100 sq m for each of the peak hours are given in Table 17.4 for two directional movements and in Table 17.5 for the predominant direction (i.e. inbound in the morning, outbound in the morning).

Table 17.4 Peak Hour Trips Rates per 100 sq m GFA (Two Way Traffic)

SITE	TRIP RATE (TWO-WAY TRIPS PER 100 SQM)	
	AM PEAK 08.00-09.00	PM PEAK 17.00-18.00
Stockley Park	1.64	1.50
Harefield Grove	1.36	1.76
Swakeleys House	2.14	1.78
Denbridge Estate	1.76	1.39
Broadwater Park	1.06	0.54
Abenglen Industrial Est.	1.62	0.93
Harman House	1.44	1.38
Trident House	1.72	2.03
Memorex Telex House	4.02	1.96
Kirk House	1.94	1.49
Times House	1.70	1.39
106 Oxford Road	1.33	1.65
Average	1.81	1.48
Spread	1.06-4.02	0.54-2.03

Table 17.5 Peak Hour Trip Rates per 100 Sq M Floor Area

SITE	TRIP RATE (TRIPS PER 100 SQM)	
	INBOUND FLOWS MORNING (08.00-09.00)	OUTBOUND FLOWS EVENING (17.00-18.00)
Stockley Park	1.43	1.31
Harefield Grove	1.26	1.60
Swakeleys House	1.88	1.56
Denbridge Estate	1.53	1.13
Broadwater Park	0.90	0.50
Abenglen Industrial Est.	1.13	0.64
Harman House	1.31	1.36
Trident House	1.72	1.97
Memorex Telex House	3.13	1.76
Kirk House	1.89	1.89
Times House	1.39	1.24
106 Oxford Road	1.28	1.59
Average	1.57	1.35
Spread	0.90-3.13	0.50-1.97

17.13 These figures illustrate no strong pattern between offices and "high-tech" estates or between in town/out of town locations. If one was to ignore the specific outsiders such as Memorex Telex House, Broadwater Park (which has large warehousing areas) and Abenglen Industrial Estate one would arrive at a prudent range of trips rates of:-

morning peak hour 1.3 - 1.8 trips per 100 sq m
evening peak hour 1.3 - 1.7 trips per 100 sq m

17.14 If the extra sites that had been surveyed in Surrey are included in the analysis they significantly extend the range:-

Site 1	Business Park	Out of Town	1.29 (am)	1.00 (pm)
Site 2	Business Park	Out of Town	0.93 (am)	1.25 (pm)
Site 3	Office	in Town	3.81 (am)	3.17 (pm)
Site 4	Office	in Town	3.91 (am)	1.37 (pm)

(Trip rates in trips per 100 sqm of floor area)

17.15 The percentage of the total daily vehicle trips which are made by employees ranges from 57% to 84% with generally 70% of the total vehicle trips to each site being made by employees.

17.16 The percentage of the total vehicle trips by visitors ranges from 8% to 18% with a mean of 14% The percentage of delivery trips ranges from 8% to 25% with a mean of 16% (Harman House has been omitted from these figures as some deliveries are made to the rear of the building which were unrecorded). The greatest determining factor for

the number of visitors and deliveries is the type of business undertaken on the site. Those businesses where daily contact with the general public is an essential feature of their operation will have a significantly higher visitor trip rate.

17.17 The analysis of vehicle trips by purpose of visit for the sites in this study is presented in Table 17.6.

Table 17.6 Average Percentage of Daily Vehicle Trips by purpose of visit.

	% Employee Trips	% Visitors Trips	% Deliveries Trips	% Total
HI TECH ESTATES	70	13	17	100
OFFICE BUILDINGS	70	14	16	100

Vehicle Types

17.18 The average percentage of vehicle types visiting a site as determined from this study is presented in Table 17.7 for both Hi-Tech and office building sites.

17.19 Abenglen Industrial Estate received a considerably greater percentage of goods vehicles where 25% of all vehicles were LGV's and 12% were HGV's. This is due to the type of businesses on the development which include manufacturing, processing and cargo freighting companies. Denbridge Estate also has a high percentage of goods vehicles due to Roberts Removal Company which has premises on the site.

Table 17.7 Average Percentages of Trips by Vehicle Type

	Employees Car	Visitors Car	Delivery Car	LGV	HGV	Cycle	Taxi
Hi Tech Estate	68	12	8	6	3	1	2
Office Building	70	13	10	4	2	1	1

Vehicle Occupancy

17.20 Vehicle occupancy ranged between 1.03 to 1.26 persons per vehicle for employees' vehicles and from 1.00 to 1.22 for visitors' vehicles. Table 17.8 presents the average occupancy value for employees and visitors vehicles for both Hi-Tech estates and office buildings. Generally, vehicles visiting the Hi-Tech estates had greater occupancy levels than those visiting office buildings.

Table 17.8 Average Daily Occupancy Value

	Average Daily Occupancy of Employees Vehicles	Visitors Vehicles
Hi Tech Estates	1.20	1.18
Office Buildings	1.08	1.08

Drive Times

17.21 The location of the site was a major factor determining the percentage of employees' commuting trips of less than ten minutes. Few employees driving to work at 'in-town' locations had trips of less than ten minutes. An average of 15% of employees from the Hi-Tech Estates and 7% of employees from the office buildings take less than ten minutes to walk.

17.22 An average of slightly greater than 50% of all employees take less than 30 minutes to commute to work. 8% of employees from the 'Hi-Tech' estates and 6% of employees from the office buildings take more than an hour to drive to work. Table 17.9 presents the average cumulative percentages of vehicles arriving within the different time bands for the 'Hi-Tech' estates and the office buildings. More detailed analysis is given in Table 17.15.

Table 17.9 Average Cumulative Percentages of Employees Commuting Trip Drive Times

Time Band	Cumulative Percentage of Drive Times For :- Hi-Tech Estates	Office Buildings
00 - 05 mins	3	0
05 - 10	15	7
10 - 15	24	30
15 - 20	36	41
20 - 30	57	53
30 - 45	76	78
45 - 60	92	94
60+	100	100

Parking Capacity

17.23 Car parking provision ranged in values from 0.23 to 1.27 car spaces per employee. An average of 0.83 and 0.60 car spaces per employee for Hi-Tech estates and office buildings respectively were recorded for the sites in the study.

17.24 Car parks on six of the twelve sites reached capacity on the survey day. Three of these car parks had additional but unmarked car spaces which were also filled beyond capacity. A number of vehicles visiting five of the sites were required to find alternative off-site parking. Free supermarket car parks, charged public car parks and street parking were alternatives used dependent upon the location of the site.

17.25 Table 17.10 presents average values of the parking demand for the developments in the study. Full figures on a site by site basis are given in Table 17.16. The demand for spaces per 100 sq m GFA equate to:-

For high tech site	1 space per 47 sq m
For office site	1 space per 31 sq m

Table 17.10 Average Values for Parking Demand

	Average Values for:- Hi Tech Estates	Office Buildings
Car Park Spaces Per Employee	0.65	0.64
Car Park Spaces Per 100 m^2	2.11	3.25

Table 17.11 Vehicles Trips By Purpose of Visit

	NO. VEHICLES TRIPS	% BY PURPOSE		
		EMPLOYEES	VISITORS	DELIVERY
Stockley Park	1348	69	16	12(1)
Harefield Grove	143	72	12	16
Swakeleys House	201	68	14	18
Denbridge Estate	590	68	9	23
Broadwater Park	774	N/A	N/A	N/A
Abenglen Industrial Estate	288	N/A	N/A	N/A
Harman House	505	76	19	5
Trident House	156	58	14	28
Memorex Telex House	116	67	15	18
Kirk House	106	82	9	9
Times House	189	73	15	12
106 Oxford Road	133	48	21	31

(1) plus 3% Buses

Table 17.12 Percentage by Vehicle Types (08.00-18.00)

SITE	CARS			LGV's	HGV's	CYCLE	TAXI	BUS
	Employee	Visitor	Deliv.					
Stockley Park	69	16	5	1	3	1	2	3
Harefield Grove	72	12	9	5	2	-	-	-
Swakeleys House	68	11	11	6	1	-	3	-
Denbridge Estate	68	9	7	7	6	-	3	-
Broadwater Park	85 cars			7	5	3	-	-
Abenglen Industrial Estate	63 cars			25	12	-	-	-
Harman House	76	19	2	1	-	1	1	-
Trident House	58	14	18	4	5	-	1	-
Memorex Telex House	67	15	13	3	-	2	-	-
Kirk House	82	9	4	3	2	-	-	-
Times House	73	15	7	4	1	-	-	-
106 Oxford Road	48	20	17	10	-	4	1	-

Table 17.13 Vehicle Trip Generation Rates (Per 10 hour day 08.00-18.00)

SITE	PER 100 SQ M				PER EMPLOYEE			
	Emp.	Visitor	Deliv.	Total	Emp.	Visitor	Deliv.	Total
Stockley Park	3.00	0.70	0.65	4.35	0.91	0.21	0.20	1.32
Harefield Grove	2.42	0.40	0.53	3.35	1.03	0.17	0.22	1.42
Swakeleys House	3.07	0.65	0.79	4.51	0.86	0.18	0.22	1.27
Denbridge Estate	2.86	0.40	0.96	4.22	0.80	0.11	0.27	1.18
Broadwater Park	N/A	N/A	N/A	2.33	N/A	N/A	N/A	1.07
Abenglen Industrial Estate	N/A	N/A	N/A	7.41	N/A	N/A	N/A	2.13
Harman House	3.08	0.75	0.20	4.03	0.67	0.16	0.08	0.87
Trident House	2.77	0.68	1.35	4.80	0.39	0.10	0.19	0.68
Memorex Telex House	7.64	1.67	2.06	11.36	1.30	0.28	0.35	1.93
Kirk House	5.64	0.58	0.34	6.86	0.72	0.08	0.08	0.88
Times House	5.20	1.09	0.83	7.12	1.01	0.21	0.16	1.38
106 Oxford Road	1.70	0.74	1.09	3.53	0.49	0.22	0.31	1.02

Table 17.14 Percentage of Traffic in Peak Hours

SITE	TWO WAY		DIRECTIONAL	
	Morning Peak As % of all day	Evening Peak As % of all day	AM Inbound As % of Inbound	PM Outbound As % of Outbound
Stockley Park	19	17	33	28
Harefield Grove	20	26	38	47
Swakeleys House	25	21	42	39
Denbridge Estate	23	18	36	32
Broadwater Park	22	11	39	21
Abenglen Industrial Estate	11	7	15	9
Harman House	20	19	39	43
Trident House	18	22	36	43
Memorex Telex House	18	9	28	15
Kirk House	16	12	27	27
Times House	13	10	20	19
106 Oxford Road	18	23	36	42

Table 17.15 Cumulative Percentage of Employees' Drive Times

MINUTES	STOCKLEY PARK	HAREFIELD GROVE	SWAKELEYS HOUSE	DENBRIDGE ESTATE	HARMAN HOUSE	TRIDENT HOUSE	MEMOREX TELEX HOUSE	KIRK HOUSE	TIMES HOUSE	106 OXFORD ROAD
0 - 5	1	12	0	0	0	0	0	0	0	0
5 - 10	12	20	23	6	3	0	18	0	24	0
10 - 15	24	27	32	15	18	46	28	32	44	14
15 - 20	33	38	43	29	36	63	35	41	50	28
20 - 30	49	60	63	54	45	72	48	54	60	38
30 - 45	70	79	85	69	72	92	79	72	81	73
45 - 60	88	96	94	84	93	96	95	100	88	91
60 +	100	100	100	100	100	100	100	100	100	100

Table 17.16 Car Park Analysis

SITE	CURRENT PROVISION		MAXIMUM DEMAND	
	Spaces per Employee	Max % Utilisation	Spaces per Employee	Spaces per 100 sqm GFA
Stockley Park	0.93	85	0.79	2.51
Harefield Grove	1.27	60	0.76	1.79
Swakeleys House	0.67	115	0.77	2.73
Denbridge Estate	0.61	104	0.63	2.27
Broadwater Park	0.76	60 (2)	0.45 (2)	0.99
Abenglen Industrial Estate	0.48	123	0.59	2.05
Harman House	0.69	90	0.63	2.90
Trident House	0.23	193	0.44	3.14
Memorex Telex House	0.67	115	0.77	4.51
Kirk House	0.52	159	0.67	5.24
Times House	0.75	70	0.52	2.68
106 Oxford Road	0.76	94	0.71	2.47

(1) Includes vehicles that parked outside defined areas due to restrictions on space.

(2) Low estimate as it excludes vehicles parked prior to 8.00am.

(3) Restricted on day of survey by temporary construction work.

APPENDIX 1: INTERVIEW AND QUESTIONNAIRE SHEETS

LONDON BOROUGH OF HILLINGDON
TRANSPORT GENERATION STUDIES

ROADSIDE INTERVIEWS

DATE: ______________ DAY: ______________ SITE: ______________

HALF HOUR COMMENCING: ______________ INTERVIEWER: ______________

TRAVEL MODE WALK - 1 CAR - 2 CAR PASSENGER - 3 TRAIN - 4 BUS - 5 LGV - 6 HGV - 7 TAXI - 8 CYCLE - 9	NO OF PEOPLE IN VEHICLE	WHICH FIRM HAVE YOU COME FROM	PURPOSE EMPLOYEE - 1 BUSINESS - 2 DELIVERY/ SERVICE - 3 OTHER - 4 (EXPLAIN)	IF EMPLOYEE WHERE DO YOU LIVE HOW LONG DOES IT TAKE TO DRIVE

LONDON BOROUGH OF HILLINGDON
TRANSPORT GENERATION STUDIES

FOYER INTERVIEWS

DATE: ____________ DAY: ____________ SITE: ____________

HALF HOUR COMMENCING: ____________ INTERVIEWER: ____________

PURPOSE EMPLOYEE – 1 BUSINESS – 2 DELIVERY /SERVICE – 3 OTHER – 4	TRAVEL MODE WALK – 1 CAR – 2 CAR PASSENGER – 3 TRAIN – 4 BUS – 5 LGV – 6 HGV – 7 TAXI – 8 CYCLE – 9	IF EMPLOYEE WHERE DO YOU LIVE	IF EMPLOYEE'S CAR WHERE DO YOU PARK? OFFICE CARPARK – 1 COMPANY PAID PUBLIC PARK – PUBLIC PARK – 3 STREET – 4	TIME TO DRIVE IN

LONDON BOROUGH OF HILLINGDON TRANSPORT GENERATION STUDIES

OFFICE QUESTIONNAIRE

1. Where do you live (eg Uxbridge, Hayes)? .....

2. How do you normally travel to work (please tick)?

   Car Driver
   Car Passenger
   Bus
   Train
   Walk
   Other

3. How long does the journey normally take you? .....mins

4. If you normally drive a car to work,

   (i) Do you have a free parking space provided YES/NO
   (ii) Do you park in a charged car park YES/NO
   If so, where?
   (iii) Do you park on a street for free YES/NO
   (iv) Other (explain)

5. How many days in the last week have you been out of the office for the whole day (eg site visits, meetings, holidays, sick)?

6. Please list details of all trips you made to and from this office TODAY (exclude walk trips) but including your commuting trips.

ARRIVED		LEFT	
TIME	MODE (ie car driver, car passenger, bus, train)	TIME	MODE (ie car driver, car passenger, bus, train)

Thank you for your help.

LONDON BOROUGH OF HILLINGDON
TRANSPORT GENERATION STUDIES

OFFICE VISITORS SURVEY

TIME	PURPOSE BUSINESS - 1 DELIVERY/ SERVICE - 2 OTHER - 3	TRAVEL MODE WALK - 1 CAR - 2 CAR PASSENGER - 3 TRAIN - 4 BUS - 5 LGV - 6 HGV - 7 TAXI - 8 CYCLE - 9	WHERE DID YOU PARK ? VISITOR'S CARPARK STAFF CARPARK PUBLIC CARPARK STREET

LONDON BOROUGH OF HILLINGDON
TRANSPORT GENERATION STUDIES

VEHICLES
ARRIVALS AND DEPARTURES

Site Name :

Date :

TIME PERIOD	Number of vehicles arriving	Number of vehicles departing
before 8:00		
8:00 - 8:30		
8:30 - 9:00		
9:00 - 9:30		
9:30 - 10:00		
10:00 - 10:30		
10:30 - 11:00		
11:00 - 11:30		
11:30 - 12:00		
12:00 - 12:30		
12:30 - 1:00		
1:00 - 1:30		
1:30 - 2:00		
2:00 - 2:30		
2:30 - 3:00		
3:00 - 3:30		
3:30 - 4:00		
4:00 - 4:30		
4:30 - 5:00		
5:00 - 5:30		
5:30 - 6:00		
after 6:00		

LONDON BOROUGH OF HILLINGDON

This survey is being undertaken by JMP Consultants Limited for the London Borough of Hillingdon to improve their knowledge of the traffic generated by office and 'hi-tech' usages. The data will be used to assess the traffic impact of proposed developments and to assist in updating the Borough car parking standards.

Please complete the questionaire on the reverse side of this form and drop it into the box provided at reception or at other exits around the building on your way out this evening, or if more convenient, tomorrow.

Thank you for your help.

The data will be used for statistical analysis purposes only and anonymity and confidentiality of the answers will be strictly observed.

LONDON BOROUGH OF HILLINGDON
TRANSPORT GENERATION STUDIES

PEDESTRIAN
ARRIVALS AND DEPARTURES

Site Name :

Date :

TIME PERIOD	Number of people arriving	Number of people departing
8:00 – 8:30		
8:30 – 9:00		
9:00 – 9:30		
9:30 – 10:00		
10:00 – 10:30		
10:30 – 11:00		
11:00 – 11:30		
11:30 – 12:00		
12:00 – 12:30		
12:30 – 1:00		
1:00 – 1:30		
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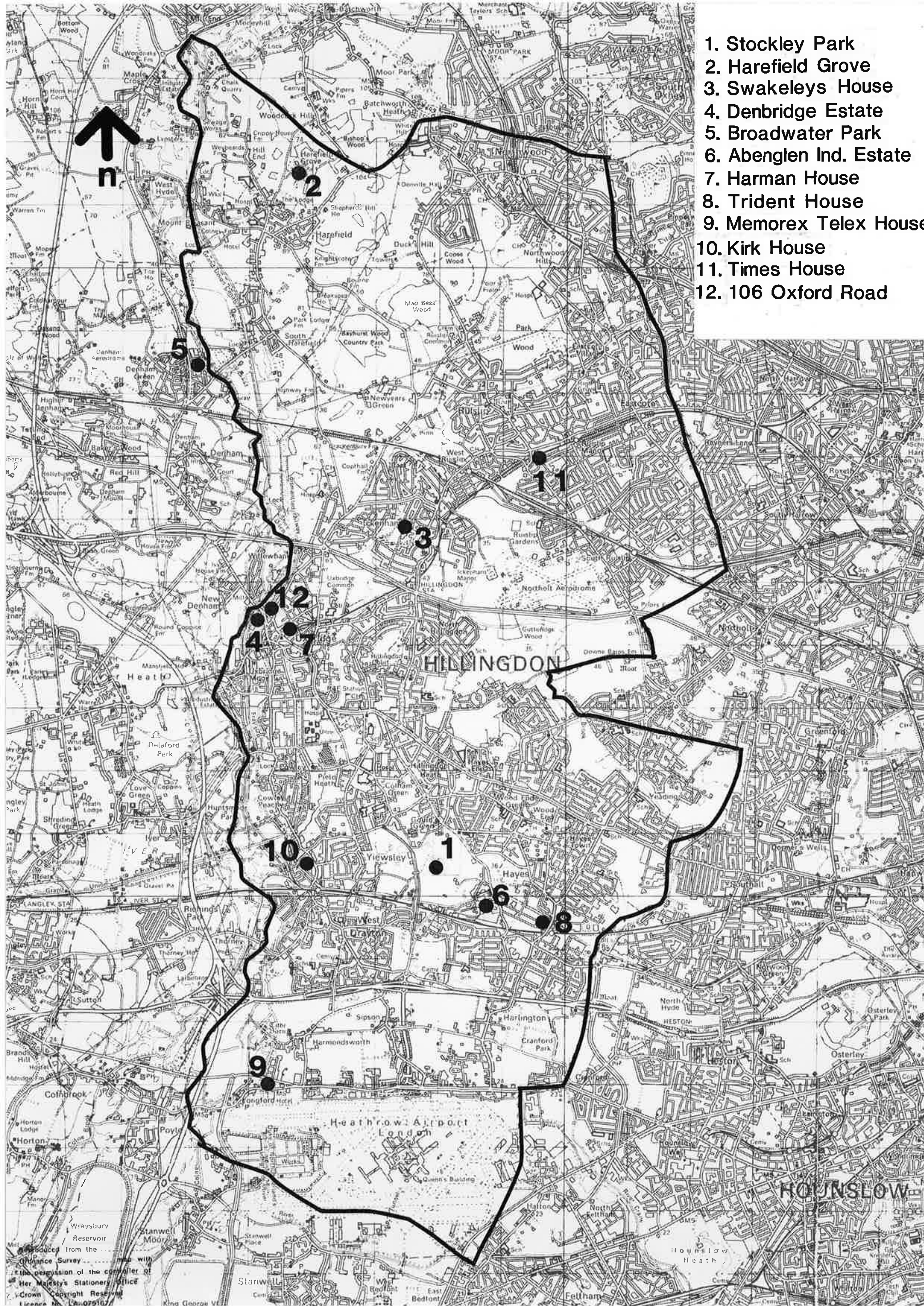
2:30 – 3:00		
3:00 – 3:30		
3:30 – 4:00		
4:00 – 4:30		
4:30 – 5:00		
5:00 – 5:30		
5:30 – 6:00		


1. Stockley Park
2. Harefield Grove
3. Swakeleys House
4. Denbridge Estate
5. Broadwater Park
6. Abenglen Ind. Estate
7. Harman House
8. Trident House
9. Memorex Telex House
10. Kirk House
11. Times House
12. 106 Oxford Road
n
HILLINGDON
HOUNSLOW
Heathrow Airport London