TRICS

SURREY COUNTY COUNCIL

Extraction from:

TRICS REPORT 89/2

TRAFFIC GENERATION STUDIES

Non-Food Retail:

B & Q, Leatherhead

Texas, Reigate

1989

TRIP GENERATION SURVEYS

PREFACE

The following 8 sections set out in detail the results of trip generation surveys undertaken at 8 separate locations and for 4 different land uses. The Surveys were undertaken at:-

Food Retail	Sainsbury	Burpham
	Tesco	Hookwood
Non-Food Retail	B & Q	Leatherhead
	Texas	Reigate
'High Tech'	Mole Business Centre	Leatherhead
	Woking Business Centre	Woking
Offices	Petrofina	Epsom
	Costain	Woking

The surveys were undertaken during February 1987. Little information is currently known regarding seasonal variation of trip generation rates but very preliminary research mounted by the TRICS consortium since 1987 suggests that at retail sites the trip generation rates in February may be some 5% below the annual average. Surveys undertaken in December could be some 20% above the average.

The weather at the time of undertaking the surveys was good for the time of year and hence there is no reason to believe that the trip generation rates recorded at the High Tech and Offices areas are anything other than typical.

Survey Procedure

At the four retail outlets the surveys comprised

(i) traffic counts recorded by half hour periods into and out of the site. Vehicles were classified as

  (a) Customers

  (b) Deliveries

    - Light Goods under 30 cwts unladen
    - Heavy Goods over 30 cwts unladen
    - Articulated vehicles.

(ii) a sample interview of customers to determine catchment areas.

All surveys were conducted throughout the opening period of the store. At the Tesco site at Hookwood permission to interview customers was refused and hence the surveys were restricted to just the traffic counts undertaken off site. At each location all traffic entering the site was collected including delivery vehicles. The Tesco site in Hookwood included a petrol station and trips to this were included in the count.

At the 'High Tech' sites conventional roadside interview techniques were adopted to the outbound direction. The surveys were undertaken on the sites private road and hence no police presence was required. The survey determined which firm had been visited, the purpose of the visit and the catchment area of work trips.

At the office sites staff questionnaires were handed out through the personnel department. The questionnaire requested responses on arrival and departure time, mode of travel, home location and travel time and details of the type made that day. These surveys were supplement by surveys of visitors mounted at the main reception desks.

Details of all surveys forms are set out in an Appendix.

SURREY COUNTY COUNCIL

TRIP GENERATION STUDY

SURVEY RESULTS

B & Q LEATHERHEAD

JMP Consultants Ltd
Consulting Civil, Structural and Transportation Engineers
172 Tottenham Court Road
London
W1P 9LG

February 1987

1 SITE DESCRIPTION

1.1 The B & Q, DIY retail outlet is situated on Kingston Road, Leatherhead, immediately adjacent to Junction 9 (eastbound only) of the M25. The store has a gross area of 4000 sq m (43,000 sq ft) with a sales area of 3,250 sq m (35,000 sq ft). The store incorporates some 10,000 sq ft of garden centre retailing space which is included in the above figures.

1.2 The store has 156 parking spaces.

2 SURVEY TIMES AND DATES

2.1 Surveys were undertaken throughout shop opening hours in January 1987 as follows:-

Friday 30 January	09.00 to 20.00
Saturday 31 January	09.00 to 20.00
Sunday 1 February	09.00 to 18.00

2.2 It should be noted that during Sunday morning the car park was full and cars spilled over onto the adjacent road. Estimates of this additional traffic are included with the survey results.

3 TRAFFIC COUNTS

3.1 The results of the traffic counts are set out on Tables 1, 2 and 3. Equating these figures to rates per 100 sq ft gives the figures set out in the following tabulations.

TRIP GENERATION RATES (VEH/DAY/100m^2)

	Rates per 100 sq m (based on trip arrivals)	
	Gross Area	Sales Area
Area sqm	4000	3250
Friday	25.4	31.3
Saturday	47.4	58.3
Sunday	49.6	60.6

PEAK TO DAILY RATIO

	% in Peak Hours	Time Occurring
Friday	11%	14.00-15.00
Saturday	14%	15.00-16.00
Sunday	16%	11.00-12.00

PEAK PARKING DEMAND RATES (MAX VEH/100m^2)

	Rates per 100 sq m (sq m per space)	
	Gross Area	Sales Area
Friday	1.6 (62.5)	1.9 (52.6)
Saturday	3.7 (27.0)	4.6 (21.7)
Sunday	4.7 (21.3)	5.8 (17.2)

If the 10,000 sq ft of garden centre is excluded from the assumed gross and retail flow areas the trip rates and parking demand figures can be re-estimated as set out below.

TRIP GENERATION RATES (VEH/DAY/100 SQ M) Excl. Garden Centre

	Rates per 100 sq m (based on trip arrivals)	
	Gross Area	Sales Area
Area Sq m	3070	2320
Friday	33.1	43.8
Saturday	61.7	81.6
Sunday	64.6	85.5

PEAK PARKING DEMAND RATE (MAX VEH/100 sq m) Excl. Garden Centre

	Rates per 100 sq m (based on trip arrivals)	
	Gross Area	Sales Area
Friday	2.1 (47.6)	2.6 (37.4)
Saturday	4.9 (20.3)	6.5 (15.4)
Sunday	6.2 (16.1)	8.2 (12.2)

4 CATCHMENT AREA

4.1 In order to estimate catchment area customers were interviewed while leaving the store. The following amount of information was collected.

Friday	444 Interviews (representing 45%)
Saturday	591 Interviews (representing 31%)
Sunday	540 Interviews (representing 27%)

4.2 Estimates of drive times were obtained from the customers and these were checked against detailed local knowledge. Data was analysed in 5 minute drive time bands. Trip length distributions were established and set out below while Table 4 establishes current catchment areas.

B & Q LEATHERHEAD DRIVE TIMES

Drive Time Bands	Cumulative %		
	Friday	Saturday	Sunday
0- 5 mins	17	14	16
5-10	57	51	50
10-15	75	71	75
15-20	87	86	87
20-25	93	95	95
25-30	96	96	98
30+	100	100	100

TABLES

TABLE 1

SITE: B & Q Leatherhead

DAY AND DATE: Friday 30 January 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 - 09.00	16	-	16	26
09.00	63	46	109	43
10.00	103	84	187	62
11.00	97	102	199	57
12.00	107	111	218	53
13.00	89	92	181	50
14.00	114	111	225	53
15.00	103	113	216	43
16.00	110	97	207	56
17.00	88	94	182	50
18.00	73	76	149	47
19.00	54	90	124	31
TOTAL	1017	996	2013	NA

Number of Cars
in Car Park at 8.30 = 10

Total Flow In 1017 vehicles
Out 996 vehicles

Maximum Hour Flow Two-Way 225 vehicles (14.00 - 15.00)
Maximum Hour Flow In 114 vehicles (14.00-15.00)
Maximum Hour Flow Out 113 vehicles (15.00-16.00)

Peak Parking Usage 62 vehicles at 10.00

These figures include 16 delivery vehicles (6 light, 7 heavy, 3 articulated)

TABLE 2

SITE: B & Q Leatherhead

DAY AND DATE: Saturday 31 January 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 - 09.00	4	-	9	15
09.00	110	63	173	62
10.00	167	155	322	74
11.00	249	196	445	127
12.00	210	248	458	89
13.00	159	186	345	62
14.00	266	177	443	151
15.00	254	258	512	147
16.00	222	222	444	147
17.00	148	210	358	85
18.00	68	109	177	44
19.00	32	61	93	15
TOTAL	1894	1885	3779	NA

Number of Cars
in Car Park at 8.30 = 6

Total Flow In 1884 vehicles
Out 1885 vehicles

Maximum Hour Flow Two-Way 512 vehicles (15.00 - 16.00)
Maximum Hour Flow In 266 vehicles (14.00 - 15.00)
Maximum Hour Flow Out 258 vehicles (15.00 - 16.00)

Peak Parking Usage 151 (14.00)

No Delivery Vehicles were recorded on Saturday

TABLE 4

B & Q LEATHERHEAD CATCHMENT AREAS

LOCATION	APPROX DRIVE TIME (MINS)	% OF ALL TRIPS		
		FRI	SAT	SUN
Leatherhead	0- 5	17	14	16
Oxshott	5-10	3	2	2
Ashtead	5-10	14	10	13
Chessington	5-10	6	5	4
Fetcham	5-10	7	8	5
Bookham	5-10	9	12	10
Epsom	10-15	8	5	9
Cobham	10-15	4	2	5
Claygate	10-15	1	3	2
Ewell	10-15	1	3	2
Other Locations	10-15	6	7	7
Dorking	15-20	5	7	6
Horsley	15-20	1	2	3
Other Locations	15-20	6	6	3
Guildford	20-25	3	3	3
Reigate/Redhill	20-25	1	1	2
Other Locations	20-25	2	5	3
Other Locations	25-30	3	1	3
Other Locations	30+	4	4	2

SURREY COUNTY COUNCIL

TRAFFIC GENERATION STUDY

SURVEY RESULTS

TEXAS, REIGATE

JMP Consultants Ltd
Consulting Civil, Structural and Transportation Engineers
172 Tottenham Court Road
London
W1P 9LG

February 1987

1 SITE DESCRIPTION

1.1 The Texas DIY retail outlet is situated adjacent to the Reigate Railway Station, two miles south of M25 Junction 9. The store has a gross area 3160 sqm (34,000 sq ft) with a sales area of 2230 sqm (24,000 sq ft).

1.2 The store has 80 parking spaces, 30 adjacent to the forecourt and 50 alongside the development.

2 SURVEY TIMES AND DATES

2.1 Surveys were undertaken throughout shop opening hours as follows:-

Friday 13 February	09.00 to 20.00
Saturday 14 February	09.00 to 18.00
Sunday 15 February	09.00 to 18.00

3 TRAFFIC COUNTS

3.1 The results of the traffic counts are set out on Tables 1 to 3. Equating these figures to rates per 100 sqm gives the figures set out in the following tabulation.

TRIP GENERATES RATES (VEH/DAY/100m^2)

	Rates per 100 sq m	
	Gross Area	Sales Area
Area sq m	3160	2230
Friday	15.0	21.3
Saturday	33.4	47.4
Sunday	29.9	42.4

PEAK TO DAILY RATIO

	% in Peak Hours	Time Occurring
Friday	12%	14.00-15.00
Saturday	14%	15.00-16.00
Sunday	15%	12.00-13.00 Inbound

PEAK PARKING DEMAND RATES (MAX VEH/100m^2)

	Rates per 100 sq m (sq m per space)	
	Gross Area	Sales Area
Friday	1.9 (52.6)	2.7 (37.0)
Saturday	2.3 (43.4)	3.2 (31.2)
Sunday	2.0 (50.0)	2.9 (34.5)

4 CATCHMENT AREA

4.1 In order to estimate catchment area customers were interviewed while leaving the store. The following amount of information was collected.

Friday	268 Interviews	(representing 57%)
Saturday	490 Interviews	(representing 47%)
Sunday	416 Interviews	(representing 45%)

4.2 Estimates of drive times were obtained from the customers and these were checked against detailed local knowledge. Data was analysed in 5 minute drive bands. Trip length distributions were established and set out below while Table 4 establishes current catchment areas.

TEXAS, REIGATE DRIVE TIMES

Drive Time Bands	Cumulative %		
	Friday	Saturday	Sunday
0- 5 mins	25	25	26
5-10	51	52	60
10-15	81	76	79
15-20	92	92	95
20-25	96	95	97
25-30	97	97	99
30+	100	100	100

TABLES

TABLE 1

SITE: Texas, Reigate

DAY AND DATE: Friday 13 February 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 to 09.00	16	-	16	18
09.00	36	22	58	32
10.00	41	36	77	37
11.00	43	55	98	25
12.00	45	28	73	42
13.00	42	41	83	43
14.00	60	51	111	52
15.00	52	43	95	61
16.00	45	48	93	58
17.00	44	52	96	50
18.00	33	35	68	48
19.00	18	36	54	30
TOTAL	475	447	922	NA

Number of Cars
in Car Park at 8.30 = 2

Total Flow In 405
Out 402

Maximum Hour Flow Two-way 111 Vehicles (14.00 - 15.00)
Maximum Hour Flow In 60 Vehicles (14.00 - 15.00)
Maximum Hour Flow Out 55 Vehicles (11.00 - 12.00)

Peak Parking Usage 61 (15.00)

The figures include 45 Delivery Vehicles trips made throughout the day (29 light, 13 heavy, 3 articulated)

TABLE 2

SITE: TEXAS, REIGATE

DAY AND DATE: Saturday 14 February 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 - 09.00	15	-	15	21
09.00	60	52	112	29
10.00	123	88	211	64
11.00	130	135	265	59
12.00	131	125	256	65
13.00	117	114	231	68
14.00	155	151	306	72
15.00	142	157	299	57
16.00	126	154	280	29
17.00	57	85	142	1
TOTAL	1056	1061	2117	NA

Number of Cars
in Car Park at 8.30 = 6

Total Flow In 1056
Out 1061

Maximum Hour Flow Two-Way 306 Vehicles (14.00 - 15.00)
Maximum Hour Flow In 155 Vehicles (14.00 - 15.00)
Maximum Hour Flow Out 157 Vehicles (15.00 - 16.00)

Peak Parking Usage 72 (14.00)

No Delivery Vehicles were made on Saturday.

TABLE 3

SITE: Texas, Reigate

DAY AND DATE: Sunday 15 February 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 -09.00	3	-	3	4
09.00	35	20	55	19
10.00	111	79	190	51
11.00	144	131	275	64
12.00	138	144	282	58
13.00	106	111	217	53
14.00	126	123	249	56
15.00	133	127	260	62
16.00	104	134	238	32
17.00	46	74	120	4
TOTAL	946	943	1889	NA

Number of Cars
in Car Park at 8.30 = 1

Total Flow In 946
Out 943

Maximum Hour Flow Two-Way 282 Vehicles (12.00 - 13.00)
Maximum Hour Flow In 144 Vehicles (11.00 - 12.00)
Maximum Hour Flow Out 144 Vehicles (12.00 - 13.00)

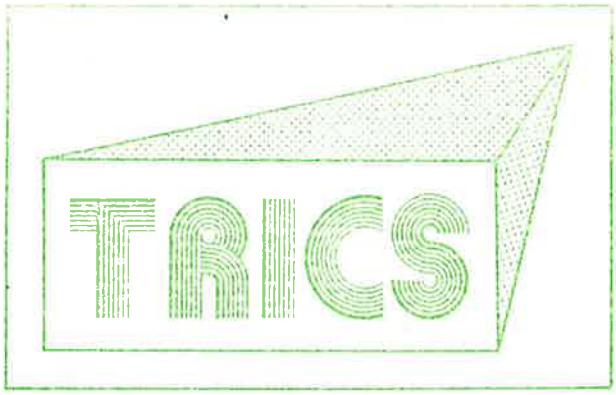
Peak Parking Usage 64 (11.00)

No Deliveries were made on Sunday

TABLE 4

TEXAS REIGATE CATCHMENT AREAS

LOCATION	APPROX DRIVE TIME (MINS)	% OF ALL TRIPS		
		FRI	SAT	SUN
Reigate	0- 5	25	26	26
Redhill	5-10	17	14	19
Merstham	5-10	6	6	7
Kingswood	5-10	2	2	2
Other Location	5-10	5	6	6
Horley	10-15	9	12	13
Dorking	10-15	6	3	1
Tedworth	10-15	1	1	1
Other Locations	10-15	10	8	4
Crawley	15-20	6	9	8
Godstone	15-20	1	1	2
Caterham	15-20	1	1	1
Other Locations	15-20	3	4	5
Oxted	20-25	2	1	1
East Grinstead	20-25	0	1	1
Other Locations	20-25	2	1	1
Horston	25-30	0	1	0
Other Locations	25-30	1	1	1
Other Locations	30+	3	2	1



SURREY COUNTY COUNCIL

TRICS REPORT 89/2
TRAFFIC GENERATION STUDIES

1989

B & Q LEATHERHEAD DRIVE TIMES

Drive Time Bands	Cumulative %		
	Friday	Saturday	Sunday
0- 5 mins	17	14	16
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10-15	75	71	75
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20-25	93	95	95
25-30	96	96	98
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TRIP GENERATION SURVEYS

PREFACE

The following 8 sections set out in detail the results of trip generation surveys undertaken at 8 separate locations and for 4 different land uses. The Surveys were undertaken at:-

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	Tesco	Hookwood
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	Texas	Reigate
'High Tech'	Mole Business Centre	Leatherhead
	Woking Business Centre	Woking
Offices	Petrofina	Epsom
	Costain	Woking

The surveys were undertaken during February 1987. Little information is currently known regarding seasonal variation of trip generation rates but very preliminary research mounted by the TRICS consortium since 1987 suggests that at retail sites the trip generation rates in February may be some 5% below the annual average. Surveys undertaken in December could be some 20% above the average.

The weather at the time of undertaking the surveys was good for the time of year and hence there is no reason to believe that the trip generation rates recorded at the High Tech and Offices areas are anything other than typical.

Survey Procedure

At the four retail outlets the surveys comprised

(i) traffic counts recorded by half hour periods into and out of the site. Vehicles were classified as

  (a) Customers

  (b) Deliveries

    - Light Goods under 30 cwts unladen
    - Heavy Goods over 30 cwts unladen
    - Articulated vehicles.

(ii) a sample interview of customers to determine catchment areas.

All surveys were conducted throughout the opening period of the store. At the Tesco site at Hookwood permission to interview customers was refused and hence the surveys were restricted to just the traffic counts undertaken off site. At each location all traffic entering the site was collected including delivery vehicles. The Tesco site in Hookwood included a petrol station and trips to this were included in the count.

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At the office sites staff questionnaires were handed out through the personnel department. The questionnaire requested responses on arrival and departure time, mode of travel, home location and travel time and details of the type made that day. These surveys were supplement by surveys of visitors mounted at the main reception desks.

Details of all surveys forms are set out in an Appendix.

SURREY COUNTY COUNCIL

TRIP GENERATION STUDY

SURVEY RESULTS

J SAINSBURY, BURPHAM

JMP Consultants Limited
Consulting Civil, Structural and Transportation Engineers
172 Tottenham Court Road
London
W1P 9LG

February 1987

1 SITE DESCRIPTION

1.1 The Sainsbury's Superstore at Burpham lies just off the A3 north of Guildford. With the A3 link to the M25 there are good transport connections in all directions. The store has a gross area of 5670 sq m (61,000 sq ft) with a retail area of 2980 sq m (32,000 sq ft). The store is predominantly food based, and there are no petrol sales.

1.2 The store has 620 car parking spaces.

2 SURVEYS TIMES AND DATES

2.1 Surveys were undertaken throughout shop opening hours in February of 1987 as follows:-

Thursday 5 February	09.00 to 20.00
Friday 6 February	09.00 to 21.00
Saturday 7 February	09.00 to 18.00

3 TRAFFIC COUNTS

3.1 The results of the traffic counts are set out on Tables 1, 2 and 3. Equating these figures to rates per 100 sqm gives the figures set out in the following tabulation.

TRIP GENERATION RATES (VEH/DAY/100 m^2)

	Rates per 100 sq m (based on trip arrivals)	
	Gross Area	Sales Area
Area sqm	5670	2980
Thursday	79.9	152.1
Friday	91.3	173.8
Saturday	81.4	154.9

MAXIMUM HOUR TO DAILY RATIO (2-WAY)

	% in Peak Hours	Time Occurring
Thursday	11%	18.00-19.00
Friday	10%	17.00-18.00
Saturday	13%	10.00-11.00

PEAK PARKING DEMAND RATES (MAX VEH/100m^2)

	Rates per 100 sq m (sq m per space)	
	Gross Area	Sales Area
Thursday	8.0 (12.5)	15.2 (6.6)
Friday	8.1 (12.3)	15.4 (6.5)
Saturday	8.7 (11.5)	16.9 (5.9)

3.2 Included in the above figures were 29 deliveries on the Thursday, 18 on the Friday and 5 on Saturday.

4 CATCHMENT AREA

4.1 In order to estimate catchment area customers were interviewed while leaving the store. The following amount of information was collected.

Thursday	590 Interviews	(representing 13%)
Friday	938 Interviews	(representing 18%)
Saturday	687 Interviews	(representing 15%)

4.2 Estimates of drive times were obtained from the customers and these were checked against detailed local knowledge. Data was analysed in 5 minute drive time bands. Trip length distributions were established and set out below while Table 4 establishes current catchment areas.

J SAINSBURY'S, BURPHAM DRIVE TIMES

Drive Time Bands	Cumulative %		
	Thursday	Friday	Saturday
0- 5 mins	13	12	10
5-10	61	61	59
10-15	82	80	76
15-20	96	91	92
20-25	98	94	95
25-30	99	97	98
30+	100	100	100

TABLES

TABLE 1

SITE: Sainsbury's, Burpham

DAY AND DATE: Thursday 5 February 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 - 09.00	89	6	95	136
09.00	450	180	630	406
10.00	396	350	746	452
11.00	427	441	868	438
12.00	336	382	718	392
13.00	352	373	725	371
14.00	413	359	772	425
15.00	387	411	798	401
16.00	445	491	936	355
17.00	513	486	999	382
18.00	470	550	1020	302
19.00	255	479	734	78
TOTAL	4533	4508	9041	NA

Car Park
Occcupancy at 08.30 = 53

Total Flow In 4533
Out 4508

Maximum Hour Flow Two-way 1020 (18.00 - 19.00)
Maximum Hour Flow In 513 (17.00 - 18.00)
Maximum Hour Flow Out 550 (18.00 - 19.00)

Peak Parking Usage 452 (10.00)

These figures include 29 Delivery Vehicles which arrived throughout the day (10 heavy and 19 articulated).

TABLE 2

SITE: Sainsbury's, Burpham

DAY AND DATE: Friday 6 February 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 - 09.00	95	6	101	134
09.00	474	163	637	445
10.00	400	385	785	460
11.00	348	431	779	377
12.00	405	410	815	372
13.00	425	421	846	376
14.00	467	481	948	362
15.00	412	399	811	375
16.00	497	493	990	379
17.00	549	472	1021	456
18.00	467	549	1016	374
19.00	443	507	950	310
20.00	197	396	593	111
TOTAL	5179	5113	10292	NA

Car Park
Occupancy at 8.30 = 45

Total Flow In 5179
Out 5113

Maximum Hour Flow In 549 (17.00 - 18.00)
Maximum Hour Flow Out 549 (18.00 - 19.00)

Peak Parking Usage 460 (10.00)

These figures include 18 Delivery Vehicles which arrived throughout the day (8 Heavy and 10 Articulated).

TABLE 3

SITE: Sainsbury's, Burpham

DAY AND DATE: Saturday 7 February 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 - 09.00	93	8	101	145
09.00	529	299	828	375
10.00	624	558	1182	441
11.00	570	517	1087	494
12.00	546	615	1161	425
13.00	451	528	979	348
14.00	557	506	1063	399
15.00	494	527	1021	366
16.00	474	577	1051	263
17.00	277	482	759	58
TOTAL	4615	4617	9232	NA

Car Park
Occupancy at 8.30 = 60

Total Flow In 4615
Out 4617

Maximum Hour Flow Two Way 1182 Vehicles (10.00 - 11.00)
Maximum Hour Flow In 624 Vehicles (10.00 - 11.00)
Maximum Hour Flow Out 615 Vehicles (12.00 - 13.00)

Peak Parking Usage 494 (11.00)

Number of Delivery Vehicles throughout Day 5 (1 Heavy, 4 Articulated)

These figures include 5 Delivery vehicles which arrived throughout the day (1 heavy, 4 articulate).

TABLE 4

SAINSBURY'S, BURPHAM CATCHMENT AREAS

LOCATION	APPROX DRIVE TIME (MINS)	% OF ALL TRIPS		
		THURS	FRI	SAT
Burpham	0- 5	12	10	9
Jacobs Wells	0- 5	1	2	1
Merrow	5-10	10	8	9
Bellfield	5-10	2	1	1
Clandon	5-10	2	1	1
Guildford	5-10	21	24	24
Worplesdon	5-10	3	4	4
Send	5-10	3	3	2
Stoughton	5-10	3	2	2
Others	5-10	4	6	6
Woking	10-15	7	9	8
Normandy	10-15	2	2	1
Others	10-15	12	8	8
Bramley	15-20	1	1	13
Peaslake	15-20	1	1	2
Godalming	15-20	3	3	3
Others	15-20	9	6	10
Cranleigh	20-25	1	1	1
Other	20-25	1	2	2
Other	25-30	1	3	3
Other	30+	1	3	2

1 SITE DESCRIPTION

1.1 The Tesco store is on the A217 at Hookwood, five miles south of Reigate. The store has a gross area of 7,350 sqm (81,602 sqft) with a retail area of 4,400 sqm (48,935 sqft). The store is predominantly food based, with a large non-food section. There is a small cafe and there are petrol sales.

1.2 The store has some 700 car parking spaces.

1.3 The store operates a scheduled free bus service from a wide catchment area. It is understood that this service attracts about 1,500 passengers per week.

2 DETAILS OF SURVEYS

2.1 The aim of this survey was to collect detailed information relating to the trip characteristics of the total number of vehicles arriving and leaving the store during the course of the day of the survey.

2.2 This survey differed from the other sites in that permission to interview customers to obtain information on catchment area was not granted by Tesco and hence only traffic count data could be obtained.

2.3 Volumetric counts on the store entrance/exit access roads provided a set of traffic flows for the survey period. These included access to the petrol station.

SURREY COUNTY COUNCIL

TRIP GENERATION STUDY

SURVEY RESULTS

TESCO, REIGATE

JMP Consultants Ltd
Consulting Civil, Structural and Transportation Engineers
172 Tottenham Court Road
London
W1P 9LG

March 1987

3 SURVEY TIMES AND DATES

3.1 Surveys were undertaken throughout shop opening hours as follows:-

Thursday 19 February	09.00 to 20.30
Friday 20 February	09.00 to 21.00
Saturday 21 February	08.00 to 19.30

4 TRAFFIC COUNTS

4.1 The results of the traffic counts are set out on Tables 1, 2 and 3. Equating these figures to rates per 100 sqm gives the figures set out in the following tabulation.

TRIP GENERATES RATES (VEH/DAY/100m^2)

	Rates per 100 sq m	
	Gross Area	Sales Area
Area sqm	7350	4400
Thursday	64.2	107.3
Friday	80.7	134.9
Saturday	88.3	147.5

PEAK TO DAILY RATIO

	% in Peak Hours	Time Occurring
Thursday	12%	17.00-18.00
Friday	11%	17.00-18.00
Saturday	11%	15.00-16.00

PEAK PARKING DEMAND RATES (MAX VEH/100m^2)

	Rates per 100 sq m (sq m per space)	
	Gross Area	Sales Area
Thursday	8.7 (11.5)	14.6 (6.8)
Friday	8.0 (12.5)	13.4 (7.5)
Saturday	10.0 (10.0)	16.7 (6.0)

TABLES

TABLE 1

SITE: Tesco Store, Reigate

DAY AND DATE: Thursday 19 February 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 - 09.00	160	10	170	190
09.00	375	133	508	432
10.00	481	323	804	590
11.00	443	391	834	642
12.00	387	499	886	530
13.00	362	441	803	451
14.00	399	427	826	423
15.00	362	408	770	377
16.00	476	508	984	345
17.00	629	469	1098	505
18.00	420	589	1009	336
19.00	228	364	592	200
TOTAL	4722	4562	9284	NA

Car Park Occupancy at 8.30 = 40

Maximum Hour Flow Two-Way 1098 Vehicles (17.00 - 18.00)
Maximum Hour Flow In 629 Vehicles (17.00 - 18.00)
Maximum Hour Flow Out 589 Vehicles (18.00 - 19.00)
Peak parking usage 642 (11.00)

These figures include 37 delivery vehicles which arrived throughout the day (28 heavy and 9 articulated).

TABLE 2

SITE: Tesco Store, Reigate

DAY AND DATE: Friday 20 February 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 - 09.00	210	12	222	248
09.00	452	217	669	483
10.00	446	343	789	586
11.00	436	434	870	588
12.00	465	537	1002	516
13.00	455	558	1013	413
14.00	485	521	1006	377
15.00	519	559	1078	337
16.00	626	563	1189	400
17.00	655	657	1312	398
18.00	573	578	1151	393
19.00	455	555	1010	293
20.00	158	251	409	200
TOTAL	5935	5785	11720	NA

Car Park
Occupancy at 8.30 = 50

Total Flow In 5935
Out 5785

Maximum Hour Flow Two-Way 1312 Vehicles (17.00 - 18.00)
Maximum Hour Flow In 655 Vehicles (17.00 - 18.00)
Maximum Hour Flow Out 657 Vehicles (17.00 - 18.00)
Peak parking usage 588 (11.00)

These figures include 44 delivery vehicles which arrived throughout the day (25 heavy and 9 articulated).

TABLE 3

SITE: Tesco Store, Reigate

DAY AND TIME: Saturday 21 February 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
07.30 - 08.00	78	20	98	98
08.00	349	149	498	298
09.00	459	350	809	407
10.00	684	469	1153	622
11.00	663	533	1216	732
12.00	687	726	1413	693
13.00	650	675	1325	668
14.00	715	650	1365	733
15.00	658	734	1392	657
16.00	583	675	1258	565
17.00	455	650	1105	370
18.00	310	410	720	270
19.00	200	297	497	173
TOTAL	6491	6358	12849	NA

Car Park
Occupancy at 07.30 = 40

Total Flow In 6491
Out 6358

Maximum Hour Flow Two Way 1413 Vehicles (12.00 - 13.00)
Maximum Hour Flow In 715 Vehicles (14.00 - 15.00)
Maximum Hour Flow Out 734 Vehicles (15.00 - 16.00)
Peak parking usage 733 (14.00)

These figures include 19 delivery vehicles which arrived throughout the day (3 heavy, 16 articulated).

SURREY COUNTY COUNCIL

TRIP GENERATION STUDY

SURVEY RESULTS

B & Q LEATHERHEAD

JMP Consultants Ltd
Consulting Civil, Structural and Transportation Engineers
172 Tottenham Court Road
London
W1P 9LG

February 1987

1 SITE DESCRIPTION

1.1 The B & Q, DIY retail outlet is situated on Kingston Road, Leatherhead, immediately adjacent to Junction 9 (eastbound only) of the M25. The store has a gross area of 4000 sq m (43,000 sq ft) with a sales area of 3,250 sq m (35,000 sq ft). The store incorporates some 10,000 sq ft of garden centre retailing space which is included in the above figures.

1.2 The store has 156 parking spaces.

2 SURVEY TIMES AND DATES

2.1 Surveys were undertaken throughout shop opening hours in January 1987 as follows:-

Friday 30 January	09.00 to 20.00
Saturday 31 January	09.00 to 20.00
Sunday 1 February	09.00 to 18.00

2.2 It should be noted that during Sunday morning the car park was full and cars spilled over onto the adjacent road. Estimates of this additional traffic are included with the survey results.

3 TRAFFIC COUNTS

3.1 The results of the traffic counts are set out on Tables 1, 2 and 3. Equating these figures to rates per 100 sq ft gives the figures set out in the following tabulations.

TRIP GENERATION RATES (VEH/DAY/100m^2)

	Rates per 100 sq m (based on trip arrivals)	
	Gross Area	Sales Area
Area sqm	4000	3250
Friday	25.4	31.3
Saturday	47.4	58.3
Sunday	49.6	60.6

PEAK TO DAILY RATIO

	% in Peak Hours	Time Occurring
Friday	11%	14.00-15.00
Saturday	14%	15.00-16.00
Sunday	16%	11.00-12.00

PEAK PARKING DEMAND RATES (MAX VEH/100m^2)

	Rates per 100 sq m (sq m per space)	
	Gross Area	Sales Area
Friday	1.6 (62.5)	1.9 (52.6)
Saturday	3.7 (27.0)	4.6 (21.7)
Sunday	4.7 (21.3)	5.8 (17.2)

If the 10,000 sq ft of garden centre is excluded from the assumed gross and retail flow areas the trip rates and parking demand figures can be re-estimated as set out below.

TRIP GENERATION RATES (VEH/DAY/100 SQ M) Excl. Garden Centre

	Rates per 100 sq m (based on trip arrivals)	
	Gross Area	Sales Area
Area Sq m	3070	2320
Friday	33.1	43.8
Saturday	61.7	81.6
Sunday	64.6	85.5

PEAK PARKING DEMAND RATE (MAX VEH/100 sq m) Excl. Garden Centre

	Rates per 100 sq m (based on trip arrivals)	
	Gross Area	Sales Area
Friday	2.1 (47.6)	2.6 (37.4)
Saturday	4.9 (20.3)	6.5 (15.4)
Sunday	6.2 (16.1)	8.2 (12.2)

4 CATCHMENT AREA

4.1 In order to estimate catchment area customers were interviewed while leaving the store. The following amount of information was collected.

Friday	444 Interviews (representing 45%)
Saturday	591 Interviews (representing 31%)
Sunday	540 Interviews (representing 27%)

4.2 Estimates of drive times were obtained from the customers and these were checked against detailed local knowledge. Data was analysed in 5 minute drive time bands. Trip length distributions were established and set out below while Table 4 establishes current catchment areas.

TABLE 1

SITE: B & Q Leatherhead

DAY AND DATE: Friday 30 January 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 - 09.00	16	-	16	26
09.00	63	46	109	43
10.00	103	84	187	62
11.00	97	102	199	57
12.00	107	111	218	53
13.00	89	92	181	50
14.00	114	111	225	53
15.00	103	113	216	43
16.00	110	97	207	56
17.00	88	94	182	50
18.00	73	76	149	47
19.00	54	90	124	31
TOTAL	1017	996	2013	NA

Number of Cars
in Car Park at 8.30 = 10

Total Flow In 1017 vehicles
Out 996 vehicles

Maximum Hour Flow Two-Way 225 vehicles (14.00 - 15.00)
Maximum Hour Flow In 114 vehicles (14.00-15.00)
Maximum Hour Flow Out 113 vehicles (15.00-16.00)

Peak Parking Usage 62 vehicles at 10.00

These figures include 16 delivery vehicles (6 light, 7 heavy, 3 articulated)

TABLE 2

SITE: B & Q Leatherhead

DAY AND DATE: Saturday 31 January 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 - 09.00	4	-	9	15
09.00	110	63	173	62
10.00	167	155	322	74
11.00	249	196	445	127
12.00	210	248	458	89
13.00	159	186	345	62
14.00	266	177	443	151
15.00	254	258	512	147
16.00	222	222	444	147
17.00	148	210	358	85
18.00	68	109	177	44
19.00	32	61	93	15
TOTAL	1894	1885	3779	NA

Number of Cars
in Car Park at 8.30 = 6

Total Flow In 1884 vehicles
Out 1885 vehicles

Maximum Hour Flow Two-Way 512 vehicles (15.00 - 16.00)
Maximum Hour Flow In 266 vehicles (14.00 - 15.00)
Maximum Hour Flow Out 258 vehicles (15.00 - 16.00)

Peak Parking Usage 151 (14.00)

No Delivery Vehicles were recorded on Saturday

TABLE 3

SITE: B & Q Leatherheaad

DAY AND DATE: Sunday 1 February 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 - 09.00	14	-	14	24
09.00	84	47	131	61
10.00	274	178	452	157
11.00	330	297	627	190
12.00	267	296	563	161
13.00	210	244	454	127
14.00	250	234	484	143
15.00	282	266	548	159
16.00	190	240	430	109
17.00	83	168	251	24
TOTAL	1984	1970	3954	NA

Number of Cars
in Car Park at 8.30 = 10

Total Flow In 1984 vehicles
Out 1970 vehicles

Maximum Hour Flow Two-Way 627 vehicles (11.00-12.00)
Maximum Hour Flow In 330 vehicles (11.00-12.00)
Maximum Hour Flow Out 297 vehicles (11.00-12.00)

Peak Parking Usage 190 (11.00)

No Delivery Vehicles were recorded on Sunday

TABLE 4

B & Q LEATHERHEAD CATCHMENT AREAS

LOCATION	APPROX DRIVE TIME (MINS)	% OF ALL TRIPS		
		FRI	SAT	SUN
Leatherhead	0- 5	17	14	16
Oxshott	5-10	3	2	2
Ashtead	5-10	14	10	13
Chessington	5-10	6	5	4
Fetcham	5-10	7	8	5
Bookham	5-10	9	12	10
Epsom	10-15	8	5	9
Cobham	10-15	4	2	5
Claygate	10-15	1	3	2
Ewell	10-15	1	3	2
Other Locations	10-15	6	7	7
Dorking	15-20	5	7	6
Horsley	15-20	1	2	3
Other Locations	15-20	6	6	3
Guildford	20-25	3	3	3
Reigate/Redhill	20-25	1	1	2
Other Locations	20-25	2	5	3
Other Locations	25-30	3	1	3
Other Locations	30+	4	4	2

SURREY COUNTY COUNCIL

TRAFFIC GENERATION STUDY

SURVEY RESULTS

TEXAS, REIGATE

JMP Consultants Ltd
Consulting Civil, Structural and Transportation Engineers
172 Tottenham Court Road
London
W1P 9LG

February 1987

1 **SITE DESCRIPTION**

1.1 The Texas DIY retail outlet is situated adjacent to the Reigate Railway Station, two miles south of M25 Junction 9. The store has a gross area 3160 sqm (34,000 sq ft) with a sales area of 2230 sqm (24,000 sq ft).

1.2 The store has 80 parking spaces, 30 adjacent to the forecourt and 50 alongside the development.

2 **SURVEY TIMES AND DATES**

2.1 Surveys were undertaken throughout shop opening hours as follows:-

Friday 13 February	09.00 to 20.00
Saturday 14 February	09.00 to 18.00
Sunday 15 February	09.00 to 18.00

3 **TRAFFIC COUNTS**

3.1 The results of the traffic counts are set out on Tables 1 to 3. Equating these figures to rates per 100 sqm gives the figures set out in the following tabulation.

TRIP GENERATES RATES (VEH/DAY/100m^2)

	Rates per 100 sq m	
	Gross Area	Sales Area
Area sq m	3160	2230
Friday	15.0	21.3
Saturday	33.4	47.4
Sunday	29.9	42.4

PEAK TO DAILY RATIO

	% in Peak Hours	Time Occurring
Friday	12%	14.00-15.00
Saturday	14%	15.00-16.00
Sunday	15%	12.00-13.00 Inbound

PEAK PARKING DEMAND RATES (MAX VEH/100m^2)

	Rates per 100 sq m (sq m per space)	
	Gross Area	Sales Area
Friday	1.9 (52.6)	2.7 (37.0)
Saturday	2.3 (43.4)	3.2 (31.2)
Sunday	2.0 (50.0)	2.9 (34.5)

4 CATCHMENT AREA

4.1 In order to estimate catchment area customers were interviewed while leaving the store. The following amount of information was collected.

Friday	268 Interviews	(representing 57%)
Saturday	490 Interviews	(representing 47%)
Sunday	416 Interviews	(representing 45%)

4.2 Estimates of drive times were obtained from the customers and these were checked against detailed local knowledge. Data was analysed in 5 minute drive bands. Trip length distributions were established and set out below while Table 4 establishes current catchment areas.

TEXAS, REIGATE DRIVE TIMES

Drive Time Bands	Cumulative %		
	Friday	Saturday	Sunday
0- 5 mins	25	25	26
5-10	51	52	60
10-15	81	76	79
15-20	92	92	95
20-25	96	95	97
25-30	97	97	99
30+	100	100	100

TABLES

TABLE 1

SITE: Texas, Reigate

DAY AND DATE: Friday 13 February 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 to 09.00	16	-	16	18
09.00	36	22	58	32
10.00	41	36	77	37
11.00	43	55	98	25
12.00	45	28	73	42
13.00	42	41	83	43
14.00	60	51	111	52
15.00	52	43	95	61
16.00	45	48	93	58
17.00	44	52	96	50
18.00	33	35	68	48
19.00	18	36	54	30
TOTAL	475	447	922	NA

Number of Cars
in Car Park at 8.30 = 2

Total Flow In 405
Out 402

Maximum Hour Flow Two-way 111 Vehicles (14.00 - 15.00)
Maximum Hour Flow In 60 Vehicles (14.00 - 15.00)
Maximum Hour Flow Out 55 Vehicles (11.00 - 12.00)

Peak Parking Usage 61 (15.00)

The figures include 45 Delivery Vehicles trips made throughout the day (29 light, 13 heavy, 3 articulated)

TABLE 2

SITE: TEXAS, REIGATE

DAY AND DATE: Saturday 14 February 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 - 09.00	15	-	15	21
09.00	60	52	112	29
10.00	123	88	211	64
11.00	130	135	265	59
12.00	131	125	256	65
13.00	117	114	231	68
14.00	155	151	306	72
15.00	142	157	299	57
16.00	126	154	280	29
17.00	57	85	142	1
TOTAL	1056	1061	2117	NA

Number of Cars
in Car Park at 8.30 = 6

Total Flow In 1056
Out 1061

Maximum Hour Flow Two-Way 306 Vehicles (14.00 - 15.00)
Maximum Hour Flow In 155 Vehicles (14.00 - 15.00)
Maximum Hour Flow Out 157 Vehicles (15.00 - 16.00)

Peak Parking Usage 72 (14.00)

No Delivery Vehicles were made on Saturday.

TABLE 3

SITE: Texas, Reigate

DAY AND DATE: Sunday 15 February 1987

TOTAL TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			CAR PARK OCCUPANCY AT END OF HOUR
	IN	OUT	TOTAL	
08.30 -09.00	3	-	3	4
09.00	35	20	55	19
10.00	111	79	190	51
11.00	144	131	275	64
12.00	138	144	282	58
13.00	106	111	217	53
14.00	126	123	249	56
15.00	133	127	260	62
16.00	104	134	238	32
17.00	46	74	120	4
TOTAL	946	943	1889	NA

Number of Cars
in Car Park at 8.30 = 1

Total Flow In 946
Out 943

Maximum Hour Flow Two-Way 282 Vehicles (12.00 - 13.00)
Maximum Hour Flow In 144 Vehicles (11.00 - 12.00)
Maximum Hour Flow Out 144 Vehicles (12.00 - 13.00)

Peak Parking Usage 64 (11.00)

No Deliveries were made on Sunday

TABLE 4

TEXAS REIGATE CATCHMENT AREAS

LOCATION	APPROX DRIVE TIME (MINS)	% OF ALL TRIPS		
		FRI	SAT	SUN
Reigate	0- 5	25	26	26
Redhill	5-10	17	14	19
Merstham	5-10	6	6	7
Kingswood	5-10	2	2	2
Other Location	5-10	5	6	6
Horley	10-15	9	12	13
Dorking	10-15	6	3	1
Tedworth	10-15	1	1	1
Other Locations	10-15	10	8	4
Crawley	15-20	6	9	8
Godstone	15-20	1	1	2
Caterham	15-20	1	1	1
Other Locations	15-20	3	4	5
Oxted	20-25	2	1	1
East Grinstead	20-25	0	1	1
Other Locations	20-25	2	1	1
Horston	25-30	0	1	0
Other Locations	25-30	1	1	1
Other Locations	30+	3	2	1

SURREY COUNTY COUNCIL

TRIP GENERATION STUDY

SURVEY RESULTS

MOLE BUSINESS PARK

JMP Consultants Ltd
Consulting Civil, Structural and Transportation Engineers
172 Tottenham Court Road
London
W1P 9LG

March 1987

1 SITE DESCRIPTION

1.1 The Mole Business Park is situated on the old Ronson factory site, close to Leatherhead Station. The site is a modern complex which lies about 3 miles to the south of M25 at Leatherhead.

1.2 There are two main production units, DIGITAL and DEAN & WOOD LTD and 16 other units on the site, with about one third being computer or electrical operations. The total area occupied by all units is about 16,000 square metres (180,000 sqft) with a total of 550 employees. The Table 2 illustrates the average floor space per employee by type of industrial activity. The average value for the whole site was 29.1 sqm per employee.

1.3 The site has a car parking capacity of about 700 cars which is not used to its full capacity.

2 SURVEY DETAILS, TIMES AND DATES

2.1 The aim of this survey was to collect detailed information relating to the trip characteristics of the total number of vehicles leaving the site during the course of the day of survey.

2.2 Interviewing took place at the two entrance/exit gates, on Tuesday 3 February 1987 from 0700 to 1800, using locally engaged staff under the supervision of the consultants staff. All survey team members were extensively briefed before starting their task. Where possible, a 100% sample rate was sought and achieved, although in the very busy peak periods, the sample rate dropped to alleviate traffic congestion. A classified count of both inbound and outbound traffic was recorded during the same survey period.

2.3 Interviewing took place in the outbound direction only. The outbound was preferred to the inbound direction due to the safety aspects of warning drivers of the approaching interview. Also, it was considered that travellers would give a better description of the place that they had just visited while, in most cases, being under no great pressure of time to reply.

2.4 Particular care was taken at both interview stations to ensure the safety of survey staff and avoid unnecessary delay to the drivers.

2.5 Before the survey commenced the Agent for the site was given details of the survey, the Security Company on the site was consulted and representatives of each unit were briefed of the survey and were requested to circulate details within their units.

2.6 In addition to collecting survey data relating to vehicular activity into and out of the site, data was collected on the activity of each unit on the site. This information was obtained from the representatives of each unit and is set out in Table 1.

2.7 The data collected for each unit included:-

(i) Employment on the site.

(ii) Gross floor area.

(iii) Details of main business undertaken.

(iv) Activity at site, as under:-

1 = Manufacturing	5 = Servicing
2 = Warehousing	6 = Research
3 = Wholesales	7 = Admin/Management
4 = Retail	8 = Other

2.8 Each unit had car parking spaces associated with it as well as a car parking space beneath DIGITAL. Thus the car parking spaces being scattered all around the site and due to a constant in/out flow of vehicles, it was not possible to achieve an accurate account of cars parked. The number of cars parked on the site was therefore not surveyed but was obtained from an analysis of net traffic flows at the site entrances.

2.9 It was not possible to obtain information concerning activities and the number of employees from the unit occupied by DUTCH DAIRY BUREAU, as there was no-one in this site on the day of survey. However, this infomation was later sought and obtained from DUTCH DAIRY BUREAU.

2.10 The vehicles belonging to ARMSTRONG EXPRESS SERVICE were not stopped and interviewed due to their possible urgent or important activities, however, the information concerning their activities, site area and number of employees was given to us by their supervisor. The drivers of this company were interviewed in their waiting room while they were waiting for their next task.

3 TRAFFIC COUNTS

3.1 The survey identified trips by 4 purposes (work, business, collection/delivery and others) and by various vehicle type (motorcycle, car, light goods and heavy goods). This gives a maximum combination of some 16 categories. For analysis purposes this was reduced to just 4 groups, namely:-

(i) Cars on work purpose

(ii) Cars on business purpose

(iii) Cars on other purposes

(iv) All goods vehicles, all purposes

3.2 The results of the traffic counts are set out on Tables 3, 4, 5 and parking analysis in Table 6. Equating these figures to rates per sqm and per employee gives the figures set out in the following tabulation.

TRIP GENERATION RATES (VEH/DAY/100m^2 OR EMPLOYEE)

	Rates per:-	
	Area (per 100m^2)	No of Employees
	16,000m^2	550 Employees
Cars on Work Purpose	2.81	0.82
Cars on Business Purpose	0.71	0.21
Cars on Other Purposes	0.34	0.10
All Goods Vehicles All Purposes	1.00	0.29
TOTAL	4.86	1.42

NB Figures based on Outbound traffic flows and interviews

PEAK TO DAILY RATIO

	% in Peak Hour	Time Occuring
Inbound	21%	0900-1000
Outbound	26%	1700-1800

PEAK HOUR TRIP RATES (all vehicles)

		INBOUND	OUTBOUND
(a)	Trips per 100 sq m		
	AM (08.00 - 09.00)	0.93	0.19
	PM (17.00 - 18.00)	0.16	1.25
(b)	Trips per employee		
	AM (08.00 - 09.00)	0.27	0.05
	PM (17.00 - 18.00)	0.05	0.36

PEAK PARKING DEMAND RATES (MAX/100m^2 OR EMPLOYEE)

	Rate per 100sqm Area	Rates per Employee	Time Occurring
Cars	1.83	0.53	1400-1500
Goods Vehicles	0.08	0.03	1400-1500
All Vehicles	1.91	0.56	1400-1500

4 CATCHMENT AREA

4.1 In order to estimate catchment area, drivers of the vehicles were interviewed while leaving the site. The following information was collected.

Cars 559 interviews (representing 91%)

All Goods Vehicles 139 interviews (representing 87%)

4.2 Estimates of drive times were obtained from the drivers and these were checked against detailed local knowledge. Data was analysed in 5 minute drive time bands. Trip length distributions were established and set out below while Table 7 establishes current catchment areas.

MOLE BUSINESS PARK DRIVE TIMES

Drive Time Bands	Cumulative %
0- 5 mins	0
5-10	11
10-15	22
15-20	41
20-25	53
25-30	61
30+	100

TABLES

TABLE 1

SITE: Mole Business Park

DAY AND DATE: Tuesday 3 February 1987

NAME, GROSS AREA OF UNITS AND ACTIVITIES OF THE FIRMS

NAME	AREA SQ M	NO OF EMPLOYEES	EMPLOYMENT ACTIVITY
Digital	4,500*	300	Mini-computer marketing & field service
Armstrong Security Express		13	Transportation (delivery & pick-up)
Dean and Wood	3,976	65	Whole sale refridgeration
Oriel Scientific Ltd	387	10	Import & retail sa equip
Dutch Diary Bureau	293	3	Printing, packaging and storage of promotional literature
Spong	1,201	30	Plastic injection moulding
SHED	298	5	Central heating
TIE Communications	1,269	35	Tele communications
Rediffusion	804	20	Marketing satelite receivers o R & D
Warrent Pearce Motors	690	12	Car modifications
Cable TV Supplies	358	6	Wharehousing (and small production)
Light Impressions	357	10	Hologram manufacture
Wassen International	649	17	Health food - cosmetics
Verbatim	554	10	Flexi disk marketing
Thermo Plastics	362	9	Petro-chemical production
Disposan - Rentokil	386	5	Sanitory exchange
TOTAL	16,084	550	

Vacant 376

*Excluding the car parking area beneath digital

TABLE 2

SITE: Mole Business Park

DAY AND DATE: Tuesday 3 February 1987

AVERAGE FLOOR AREA PER EMPLOYEE BY INDUSTRIAL ACTIVITY

	TYPE OF INDUSTRIAL ACTIVITY	FLOOR SPACE PER EMPLOYEE (SQM/EMPLOYEE)
1	The manufacture, processing and serving of food, drink and tobacco	-
2	The manufacture, processing and serving of chemicals and pharmaceuticals	45
3	The manufacture, processing and serving of metals , manufacturing and serving vehicles	57
4	The manufacture, processing and serving of instruments, household appliances, electrical and electronics	20
5	All activities associated with transport	15
6	All warehousing, wholesale and retail and distribution trades	58
7	All professional and administration, including management, marketing and research	50
8	Manufacture, process and serving of high tech art production	36
9	The manufacture, processing and serving of textiles and clothing	-
10	The manufacture, processing and serving of "other" manufacturing (which includes paper and printing, bricks and glass, timber and furniture and construction)	-

TABLE 3

SITE: Mole Business Park

DAY AND DATE: Tuesday 3 February 1987

INBOUND TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			
	CARS	LIGHT GOODS	HEAVY GOODS	TOTAL
07.00	20	5	-	25
08.00	144	6	-	150
09.00	144	15	1	160
10.00	37	12	3	52
11.00	31	19	2	52
12.00	32	8	2	42
13.00	61	11	1	73
14.00	53	18	2	73
15.00	31	16	2	49
16.00	29	9	-	38
17.00	17	9	-	26
18.00	10	3	-	13
TOTAL	609	131	13	753

Total Flow 753 vehicles

Peak Hour Flow 160 vehicles (09.00-10.00)

Number of Delivery Vehicles 144 (131 light & 13 heavy)

TABLE 4

SITE: Mole Business Park

DAY AND DATE: Tuesday 3 February 1987

OUTBOUND TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			
	CARS	LIGHT GOODS	HEAVY GOODS	TOTAL
07.00	3	5	-	8
08.00	21	8	1	30
09.00	24	11	2	37
10.00	32	19	3	54
11.00	33	18	3	54
12.00	48	13	1	62
13.00	66	11	1	78
14.00	28	13	1	42
15.00	49	16	2	67
16.00	42	12	1	55
17.00	193	6	1	200
18.00	78	11	1	90
TOTAL	617	143	17	777

Total Flow 777 vehicles

Peak Hour Flow 200 vehicles (17.00-18.00)

Number of Delivery Vehicles throughout Day 160 (143 light & 17 heavy)

TABLE 5

SITE: Mole Business Park

DAY AND TIME: Tuesday 3 February 1987

OUTBOUND TRAFFIC FLOW BY PURPOSE

TIME	EMPLOYEES CARS	BUSINESS CARS	OTHER CARS	GOODS VEHICLES	TOTAL
07.00-08.00	1	-	2	5	8
08.00-09.00	7	2	12	9	30
09.00-10.00	14	4	6	13	37
10.00-11.00	18	6	8	22	54
11.00-12.00	13	12	8	21	54
12.00-13.00	35	12	1	14	62
13.00-14.00	53	9	4	12	78
14.00-15.00	9	14	5	14	42
15.00-16.00	16	33	-	18	67
16.00-17.00	28	10	4	13	55
17.00-18.00	180	10	3	7	200
18.00-19.00	75	2	1	12	90
TOTAL	449	114	54	160	777

TABLE 6

SITE: Mole Business Park

DAY AND TIME: Tuesday 3 February 1987

NUMBER OF PARKED VEHICLES

HOUR BEGINNING	CARS	GOODS VEHICLES	TOTAL
Before 07.00	20	6	26
07.00	37	7	44
08.00	162	5	167
09.00	284	10	294
10.00	289	4	293
11.00	287	6	293
12.00	271	3	274
13.00	267	4	271
14.00	293	13	306
15.00	275	14	289
16.00	263	11	274
17.00	87	14	101
18.00	19	4	23

Peak parking on the site 306 vehicles (14.00-15.00)

Peak car parking 293 vehicles (14.00-15.00)

Peak goods vehicles parking 14 vehicles

Estimates of parking obtained from an analysis of net traffic flows at the site entrances.

TABLE 7

MOLE BUSINESS PARK CATCHMENT AREAS

LOCATION	APPROX DRIVE TIME (MINS)	% OF ALL TRIPS
Fetcham	5-10	4
Leatherhead	5-10	7
Ashtead	10-15	6
Bookham	10-15	5
Banstead	15-20	2
Chessington	15-20	1
Epsom	15-20	8
Ewell	15-20	2
Guildford	15-20	3
Surbiton	15-20	2
Others	15-20	1
Croydon	20-25	1
Dorking	20-25	3
Reigate	20-25	3
Walton-On-Thames	20-25	2
Weybridge	20-25	2
Others	20-25	1
Crawley	25-30	1
Sutton	25-30	2
Wallington	25-30	2
Others		3
Basingstoke	30+	2
Brighton	30+	1
Horsham	30+	2
Kent	30+	3
London	30+	7
Reading	30+	4
West Sussex	30+	5
Woking	30+	2
Others	30+	13

SURREY COUNTY COUNCIL

TRIP GENERATION STUDY

SURVEY RESULTS

WOKING BUSINESS PARK

JMP Consultants Ltd
Consulting Civil, Structural and Transportation Engineers
172 Tottenham Court Road
London
W1P 9LG

March 1987

1 SITE DESCRIPTION

1.1 The Woking Business Park is on the eastern outskirts of the town. The site is about 3 miles to the south west of the M25 (between Junction 10 and Junction 11) and is situated on the A245.

1.2 The site comprises of one large block and 22 other separate units. About 50% of the occupiers are in the electrical/computer business. The total area occupied by all units is about 23,000 square metres (254,000 sq ft) with a total of 665 employees. Table 2 sets out the average floor space per employee by type of industrial activity. The average value for the whole site was 34.6 sqare metres per employee.

1.3 There is only a single entrance to the estate which is gated and manned by Security Officers.

1.4 The site has a car parking capacity of about 600 cars.

2 SURVEY DETAILS, TIMES AND DATES

2.1 The aim of this survey was to collect detailed information relating to the trip characteristics of the total number of vehicles leaving the site during the course of the day of survey.

2.2 Interviewing took place at the exit gate, on Tuesday 10 February 1987 from 0700 to 1900, using locally engaged staff under the supervision of the consultants supervising staff. All survey team members were extensively briefed before starting their task. Where possible, a 100% sample rate was sought and achieved, although in the very busy peak periods, the sample rate dropped to alleviate traffic congestion. A classified count of both inbound and outbound traffic was recorded during the same survey period.

2.3 Interviewing took place in the outbound direction only. The outbound was preferred to the inbound direction due to the safety aspects of warning drivers of the approaching interview. Also, it was considered that travellers would give a better description of the place that they had just visited while, in most cases, being under no great pressure of time to reply.

2.4 Particular care was taken at the interview stations to ensure the safety of survey staff and avoid unnecessary delay to the drivers.

2.5 Before the survey commenced the Agent for the site was given details of the survey, the Security Company on the site was consulted and representatives of each unit were briefed of the survey and were requested to circulate details within their units.

2.6 In addition to collecting survey data relating to vehicular activity into and out of the site, data was collected on the activity of each unit on the site. This information was obtained from the representatives of each unit and is set out in Table 1.

2.7 The data collected for each unit included:-

(i) Employment on the site.

(ii) Gross floor area.

(iii) Details of main business undertaken.

(iv) Activity at site, as under:-

1 = Manufacturing	5 = Servicing
2 = Warehousing	6 = Research
3 = Wholesales	7 = Admin/Management
4 = Retail	8 = Other

2.8 Each unit had car parking spaces associated with it.

3 TRAFFIC COUNTS

3.1 The survey identified trips by 4 purposes (work, business, collection/delivery and others) and by various vehicle type (motorcycle, car, light goods and heavy goods). This gives a maximum combination of some 16 categories. For analysis purposes this was reduced to just 4 groups, namely:-

(i) Cars on work purpose

(ii) Cars on business purpose

(iii) Cars on other purposes

(iv) All goods vehicles, all purposes

3.2 The results of the traffic counts are set out on Tables 3, 4, 5 and parking analysis in Table 6. Equating these figures to rates per sqm and per employee gives the figures set out in the following tabulation.

TRIP GENERATION RATES (VEH/DAY/100m^2 OR EMPLOYEE)

	Rates per:-	
	Area (per 100m^2)	No of Employees
	23,133m^2	665 Employees
Cars on Work Purpose	2.85	0.99
Cars on Business Purpose	0.46	0.16
Cars on Other Purposes	0.35	0.12
All Goods Vehicles All Purposes	0.53	0.18
TOTAL	4.19	1.45

NB Figures based on outbound traffic and interviews

PEAK TO DAILY RATIO

	% in Peak Hour	Time Occuring
Inbound	29%	0900-1000
Outbound	24%	1700-1800

PEAK HOUR TRIPS RATES (all vehicles)

		INBOUND	OUTBOUND
(a)	Trips per 100 sq m		
	AM (08.00 - 09.00)	1.28	0.17
	PM (17.00 - 18.00)	0.16	1.00
(b)	Trips per employee		
	AM (08.00 - 09.00)	0.45	0.06
	PM (17.00 - 18.00)	0.54	10.35

PEAK PARKING DEMAND RATES (MAX/100m^2 OR EMPLOYEE)

	Rate per 100sqm Area	Rates per Employee	Time Occurring
Cars	2.0	0.71	0900-1000
Goods Vehicles	0.02	0.01	0900-1000
All Vehicles	2.02	0.72	0900-1000

4 CATCHMENT AREA

4.1 In order to estimate catchment area, drivers of the vehicles were interviewed while leaving the site. The following information was collected.

Cars	676 interviews (representing 80%)
All Goods Vehicles	86 interviews (representing 70%)

4.2 Estimates of drive times were obtained from the drivers and these were checked against detailed local knowledge. Data was analysed in 5 minute drive time bands. Trip length distributions were established and set out below while Table 7 establishes current catchment areas.

WOKING BUSINESS PARK DRIVE TIMES

Drive Time Bands	Cumulative %
0- 5 mins	0
5-10	5
10-15	30
15-20	40
20-25	55
25-30	63
30+	100

TABLES

TABLE 1

SITE: Woking Business Park

DAY AND DATE: Tuesday 10 February 1987

NAME, GROSS AREA OF UNITS AND ACTIVITIES OF THE FIRMS

NAME	AREA SQ M	NO OF EMPLOYEES	EMPLOYMENT ACTIVITY
EDS	2,167	80	Data processing unit
GVI Flex Creators	3,196	90	Thermo plastic eng. production
BMTV	495	25	Medical video production and distribution
Plus Wall	245	5	Manufacture and processing of curtain walling
L & C Electrical	251	7	Electrical distributors
Becker Paints	982	32	Paint manufacture
Riva Terminals	384	18	Computer and software retail
Special Machine Tools	175	10	Manufacture of special purpose machines (electronics hardware)
Air Serv	180	5	Operate airline services (sales and distribution)
Roboserve	494	20	Vending machine services (distribution)
Serone	2,179	130	Manufacture medical diagnostics
Plan File Systems	369	20	Office equipment
Grand Prix Engineering	528	3	Racing car restoration
LTX Europ Ltd	1,928	35	Automative testing
McLaren International	4,780	100	Design and building of racing cars
STO Storage Technology	4,780	85	Computer hardware
TOTAL	23,133	665	

TABLE 2

SITE: Woking Business Park

DAY AND DATE: Tuesday 10 February 1987

AVERAGE FLOOR AREA PER EMPLOYEE BY INDUSTRIAL ACTIVITY

	TYPE OF INDUSTRIAL ACTIVITY	FLOOR SPACE PER EMPLOYEE (SQM/EMPLOYEE)
1	The manufacture, processing and serving of food, drink and tobacco	-
2	The manufacture, processing and serving of chemicals and pharmaceuticals	24
3	The manufacture, processing and serving of metals , manufacturing and serving vehicles	60
4	The manufacture, processing and serving of instruments, household appliances, electrical and electronics	41
5	All activities associated with transport	-
6	All warehousing, wholesale and retail and distribution trades	24
7	All professional and administration, including management, marketing and research	35
8	Manufacture, process and serving of high tech art production	-
9	The manufacture, processing and serving of textiles and clothing	-
10	The manufacture, processing and serving of "other" manufacturing (which includes paper and printing, bricks and glass, timber and furniture and construction)	33

TABLE 3

SITE: Woking Business Park

DAY AND DATE: Tuesday 10 February 1987

INBOUND TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			
	CARS	LIGHT GOODS	HEAVY GOODS	TOTAL
07.00	73	1	-	74
08.00	284	8	5	297
09.00	96	16	7	119
10.00	40	6	2	48
11.00	34	8	2	44
12.00	45	7	2	54
13.00	136	17	2	155
14.00	70	7	1	78
15.00	46	6	1	53
16.00	34	12	4	50
17.00	25	10	1	36
18.00	10	3	0	13
TOTAL	893	101	27	1021

Total Flow 1021 Vehicles

Peak Hour Flow 297 Vehicles (08.00-09.00)

Number of Delivery Vehicles Throughout Day 129 (101 light & 27 heavy)

TABLE 4

SITE: Woking Business Park

DAY AND DATE: Tuesday 10 February 1987

OUTBOUND TRAFFIC

HOUR BEGINNING	TRAFFIC FLOW			
	CARS	LIGHT GOODS	HEAVY GOODS	TOTAL
07.00	5	1	0	6
08.00	28	9	2	39
09.00	35	15	6	56
10.00	33	10	4	47
11.00	37	5	2	44
12.00	121	11	2	134
13.00	85	13	2	100
14.00	50	8	2	60
15.00	44	9	2	55
16.00	59	4	4	67
17.00	224	7	1	232
18.00	126	2	1	129
TOTAL	847	94	28	969

Total Flow 969 vehicles

Peak Hour Flow 232 vehicles (17.00-18.00)

Number of Delivery Vehicles Throughout Day 122 (94 light & 28 heavy)

TABLE 5

SITE: Woking Business Park

DAY AND TIME: Tuesday 10 February 1987

OUTBOUND TRAFFIC FLOW BY 4 PURPOSES

TIME	EMPLOYEES CARS	BUSINESS CARS	OTHER CARS	GOODS VEHICLES	TOTAL
07.00-08.00	3	1	1	1	6
08.00-09.00	11	3	14	11	39
09.00-10.00	17	8	10	21	56
10.00-11.00	17	13	3	14	47
11.00-12.00	14	13	10	7	44
12.00-13.00	101	10	10	13	134
13.00-14.00	73	6	6	15	100
14.00-15.00	33	14	3	10	60
15.00-16.00	17	19	8	11	55
16.00-17.00	44	11	4	8	67
17.00-18.00	207	9	8	8	232
18.00-19.00	122	-	4	3	129
TOTAL	659	107	81	122	969

TABLE 6

SITE: Woking Business Park

DAY AND TIME: Tuesday 10 February 1987

NUMBER OF PARKED VEHICLES

HOUR BEGINNING	CARS	GOODS VEHICLES	TOTAL
Before 07.00	60	-	60
07.00	128	-	128
08.00	384	2	386
09.00	465	4	469
10.00	452	-	452
11.00	449	3	452
12.00	373	-	373
13.00	424	4	426
14.00	444	2	446
15.00	446	-	446
16.00	421	8	429
17.00	220	11	231
18.00	104	11	115

Peak parking on the site 469 vehicles (09.00-10.00)

Peak car parking 465 (09.00-10.00)

Peak goods vehicles parking 11 vehicles

Details of parking obtained from an analysis of net traffic flows at the site entrances.

TABLE 7

WOKING BUSINESS PARK CATCHMENT AREAS

LOCATION	APPROX DRIVE TIME (MINS)	% OF ALL TRIPS
Horsell	5-10	2
Sherewater	5-10	1
Woodham	5-10	1
Others	5-10	1
Byfleet	10-15	2
Goldsworth Park	10-15	1
Woking	10-15	16
Others	10-15	6
Knaphill	15-20	4
St Johns	15-20	1
Weybridge	15-20	2
Others	15-20	3
Chobam	20-25	2
Guildford	20-25	7
Others	20-25	6
Frimley Green	25-30	2
Others	25-30	6
Basingstoke	30+	2
Camberley	30+	3
Farnborough	30+	2
Farnham	30+	1
Reading	30+	2
Others	30+	27

SURREY COUNTY COUNCIL

TRIP GENERATION STUDY

SURVEY RESULTS

PETROFINA, EPSOM

JMP Consultants Ltd
Consulting Civil, Structural and Transportation Engineers
172 Tottenham Court Road
London
W1P 9LG

March 1987

1 SITE DESCRIPTION

1.1 The modern Petrofina office block forms part of the new Ashley Centre in Epsom. The site is served by A24, A240 and with the A24 link to M25 there are good transport connections in all directions. Epsom also has good rail connections to south and central London.

1.2 The company also has two subsidiary offices in the town centre. The main office block is of 5,400 sqm (60,000 sqft) and has 325 staff employed.

1.3 There is a publically available multi-storey car park within the complex but the company have sole use of 132 spaces.

2 SURVEY DETAILS, TIMES AND DATES

2.1 The principal objective of the study was to investigate the traffic generation from town centre office development. To achieve this objective, Petro-Fina office block in Epsom was one of the office developments selected to be surveyed.

2.2 The traffic and land-use surveys were carried out to quantify the various traffic patterns which gave rise to the present observed traffic flows. The study was designed so that the resulting data could provide basic information for assistance in the planning and development of future town centre offices, particularly with regards to the design of roads, associated junctions and car parking facilities.

2.3 The survey was carried out in three parts. The first involved obtaining the following information from the management of the company.

(a) Floor area

(b) Number of employees

(c) Policy for the allocation of parking spaces

2.4 The second involved issuing a simple questionnaire to all staff members with the assistance of the management. This questionnaire requested the following information:-

(a) Location of residence

(b) Normal mode of travel to work

(c) Travel time

(d) Allocation of free car parking spaces

(e) The number of days that employees were out of the office for the week of the survey

2.5 The third element was to use the visitors book at the reception desk of the company and with the assistance of the company receptionist to record more information on both business visitors and commercial deliveries by interviewing non-employees who came to Petrofina building during the survey day. The following information was recorded:-

(a) Time of visit

(b) Purpose of visit

(c) Mode of travel

2.6 The survey was undertaken throughout office opening hours on Wednesday 11 February 1987 from 0800 to 1800.

3 JOURNEY ANALYSIS

3.1 The results of the survey are set out on tables 1 and 2. There was 105 interview replies that were returned by the employees which represents 32% of the total number of staff. From these interviews it can be analysed that there was an average of 86% of staff present in the office during any day.

3.2 The average modal split of employees on their journey to work was determined as:-

(a)	Employees who drive to work	68%
(b)	Employees who travel as car passengers	5%
(c)	Employees who travel by public transport	14%
(d)	Employees who walk to work	13%

3.3 Of those employees who drove to work most parked in the company's free car park or had parking fees paid for them as can be seen from the following figures.

(a)	Employees who use free car parking facilities	81%
(b)	Employees who use charged parking area	3%
(c)	Employees who park on the street	16%

3.4 Equating the figures from Table 1 to rates per 100 square metre and per employee gives the figures set out in the following tabulation.

TRIP GENERATION RATES (VEH/DAY/100m^2 OR EMPLOYEE)

	Rates per 100 sqm	Rates per Employee
Area/Employee	5,400 m^2	325 Employees
Employees Cars	4.09	0.68
Non-Employees Cars - Business	0.46	0.08
Non-Employees Cars - Other	0.35	0.06
All Goods Vehicles All Purposes	0.31	0.05
TOTAL	5.21	0.82

PEAK TO DAILY RATIO

	% in Peak Hours	Time Occurring
Inbound	56	0800-0900
Outbound	28	1700-1800

PEAK HOUR TRIPS RATES (All Vehicles)

		INBOUND	OUTBOUND
(a)	Trips per 100 sqm		
	AM (08.00 - 09.00)	2.91	0.09
	PM (17.00 - 18.00)	0.09	1.48
(b)	Trips per Employee		
	AM (08.00 - 09.00)	0.48	0.12
	PM (17.00 - 18.00)	0.02	0.25

PEAK PARKING DEMAND RATES (MAX VEH/100m^2 OR EMPLOYEE)

	Rates per 100 sqm	Rates per Employee
Area/Employee	5,400	325
	4.22	0.70

It should be noted that these parking estimates have been obtained from travel data irrespective of where drivers currently park. They therefore reflect the total effect of the development or the car parking demand of the town as a whole. Non-employee trips were based on estimates. Assuming business visitors stayed an average of 3 hours and other visitors and goods vehicles stayed only 30 minutes then a maximum demand for 'visitors' space would have been 15 (included with the figures given in the Table).

4 CATCHMENT AREA

4.1 In order to estimate catchment area the employees who drove to work were asked what area they lived in and the time it took them to travel to work.

4.2 Estimates of drive times were obtained from the employees and these were checked against detailed local knowledge. Data was analysed in 5 minutes drive time bands. Trip length distributions were established and set out below while Table 2 establishes current catchment areas.

PETROFINA, EPSOM DRIVE TIMES

Drive Time Bands	Cumulative %
0- 5 mins	-
5-10	3
10-15	22
15-20	39
20-25	52
25-30	61
30+	100

5 FOOTNOTE

5.1 In comparison with other office sites it was found that this site exhibited very high trip rates during the morning period. These were twice those of the evening period. It was observed that in the morning the arrival time was very peaked within the single hour.

5.2 Emplyment density at 16.6 sqm per person is also higher than would generally be observed.

TABLES

TABLE 1

SITE: Petrofina Building, Epsom

DAY AND DATE: Wednesday 11 February 1987

TIME	ARRIVAL					DEPARTURE	CAR PARKING
	EMPLOYEE CARS	BUSINESS CARS	OTHER CARS	GOODS VEHICLES	TOTAL	EMPLOYEE CARS	
0600-0700	7	-	-	-	7	-	7
0700-0800	46	-	-	-	46	-	53
0800-0900	150	2	1	4	157	-	207
0900-1000	11	9	1	2	23	-	229
1000-1100	-	3	1	1	5	-	222
1100-1200	-	1	1	2	4	7	218
1200-1300	7	-	3	4	14	4	213
1300-1400	-	1	1	-	2	-	210
1400-1500	-	2	1	-	3	4	197
1500-1600	-	4	4	-	8	18	194
1600-1700	-	2	4	2	8	55	144
1700-1800	-	1	2	2	5	74	168
1800-1900	-	-	-	-	-	48	14
1900-2000	-	-	-	-	-	11	1
TOTAL	221	25	19	17	282	221	N/A

Peak total arrival 157 vehicles (0800-0900)
Peak employee arrival 150 vehicles peak car arrival
153 vehicles (0800-0900)
Peak goods arrival 4 vehicles (0800-0900)(1200-1300)

TABLE 2

SITE: Petrofina Building, Epsom

DAY AND DATE: Wednesday 11 February 1989

Time	Arrival	Departure(1)	Totals	Parking Demand (Calculated at end of hour)
0600-0700	7	-	7	7
0700-0800	46	-	46	53
0800-0900	157	5	162	205
0900-1000	23	3	28	225
1000-1100	5	2	7	228
1100-1200	4	12	16	220
1200-1300	14	20	34	214
1300-1400	2	4	6	212
1400-1500	3	6	9	209
1500-1600	8	22	30	195
1600-1700	8	62	70	141
1700-1800	5	80	85	66
1800-1900	-	52	52	14
1900-2000	-	14	14	0
TOTAL	282	282	564	NA

Peak departure - 85 vehicles (17.00 - 18.00)
Peak parking demand - 228 vehicles (11.00 - 12.00)

(1) Departure figures by hour have made some assumptions regarding the duration of visitor trips.

TABLE 3

PETROFINA BUILDING - EPSOM

LOCATION	APPROX TIME (MINS)	% OF ALL TRIPS
Leatherhead	5-10	3
Ashtead	10-15	1
Banstead	10-15	4
Epsom	10-15	6
Ewell	10-15	4
Others	10-15	4
Bookham	15-20	6
Fetcham	15-20	3
Surbiton	15-20	3
Others	15-20	5
Kingston	20-25	3
Sutton	20-25	1
Weybridge	20-25	4
Others		5
Dorking	25-30	1
Reigate	25-30	4
Walton-on-Thames	25-30	3
Others	25-30	1
Bromley	30+	4
Horsley	30+	4
Staple Cross	30+	1
Others	30+	30

SURREY COUNTY COUNCIL

TRIP GENERATION STUDY

SURVEY RESULTS

COSTAINS, WOKING

JMP Consultants Ltd
Consulting Civil, Structural and Transportation Engineers
172 Tottenham Court Road
London
W1P 9LG

March 1987

1 SITE DESCRIPTION

1.1 The Costain office building in Woking stands by itself within the main town centre area. The site is well served by A245, A324, B382 and A324 and with the A322 link to M25 at junction 3 there are good public transport connections in all directions and to Central London.

1.2 The office block is of 5,400 sqm (60,000 sqft) and has 380 staff employed.

1.3 There are 40 reserved car parking spaces but it is estimated that there is a demand for nearly 200. Most vehicles park in the adjacent multi-storey car park but have parking fees paid directly paid by the company.

2 SURVEY DETAILS, TIMES AND DATES

2.1 The principal objective of the study was to investigate the traffic generation from town centre office development. To achieve this objective, Costain building was one of the office developments selected to be surveyed.

2.2 The traffic and land-use surveys were carried out to quantify the various traffic patterns which gave rise to the present observed traffic flows. The study was designed so that the resulting data could provide basic information for assistance in the placing and development of future town centre offices, particularly with regards to the design of roads, associated junctions and car parking facilities.

2.3 The survey was undertaken in three parts. The first involved seeking the following information from the management of the company.

(a) Floor area

(b) Number of employees

(c) Policy for the allocation of parking spaces

2.4 The second involved issuing a simple questionnaire to all staff members with the assistance of the management. This questionnaire requested the following information:-

(a) Location of residence

(b) Normal mode of travel to work

(c) Travel time

(d) Allocation of free car parking spaces

(e) The number of days that employee was out of the office for the week of the survey

2.5 The third element was to use the visitors book at the reception desk of the company and with the assistance of the company receptionist to record more information on both business visitors and commercial deliveries by interviewing non-employees who came to Costains building during the survey day. The following information was recorded.

(a) Time of visit

(b) Purpose of visit

(c) Vehicle type or travel mode

2.6 The survey was undertaken throughout office opening hours on Tuesday 17 February 1987, from 0730 to 1730.

3 JOURNEY ANALYSIS

3.1 The results of survey are set out on Tables 1 and 2. There was 126 interview replies that were returned by the employees, which is a 33% return rate. From these interviews it can be analysed that there was on average 89% of employees present in the office during each day.

3.2 The avereage modal split of employees on their journeys to work was determined as:-

(i)	Employees who drive to work	74%
(ii)	Employees who travel as car passengers	6%
(iii)	Employees who travel by public tranport	12%
(iv)	Employees who walk to work	8%

3.3 Of those employees who drove to work it was found that virtually everyone received free car parking as shown in the figures below.

(i)	Employees who use free car parking facilities	99%
(ii)	Employees who use charged parking area	1%
(iii)	Employees who park on the street	0%

3.4 Equating the figures from Table 1 to rates per 100 square metre and per employee gives the figures set out in the following tabulation.

TRIP GENERATION RATES (VEH/DAY/100m^2 OR EMPLOYEE)

	Rates per 100 m^2	Rates per Employee
Area/Employee	5400m^2	380 Employees
Employees Cars	5.19	0.74
Non-Employees Cars - Business	0.78	0.11
Non-Employees Cars - Other	0.06	0.01
All goods vehicles all purposes	0.46	0.07
TOTAL	6.49	0.93

PEAK TO DAILY RATIO

	% in Peak Hours	Time Occurring
Inbound	59	0800-0900
Outbound	50	1700-1800

PEAK HOUR TRIPS RATES (All Vehicles)

	INBOUND	OUTBOUND
(a) Trips per 100 sq m		
AM (08.00 - 09.00)	3.81	0.02
PM (17.00 - 18.00)	0.02	3.24
(b) Trips per Employee		
AM (08.00 - 09.00)	0.54	0.00
PM (17.00 - 18.00)	0.00	0.46

PEAK PARKING DEMAND RATES (MAX VEH/100m^2 OR EMPLOYEE)

	Rates per 100sqm	Rates per employee
Area/Employee	5400 sqm	380 Employees
	5.06	0.72

It should be noted that these parking estimates have been obtained from travel data irrespective of where drivers currently park. They therefore reflect the total effect of the development on the car parking demand of the town as a whole. Non-employee trips were based on assumptions. Assuming business visits stayed an average 3 hours and other visitor and goods vehicles stayed only 30 minutes a maximum demand for 'visitors' space would have been 23 (included with the figures given in the Tables).

4 CATCHMENT AREA

4.1 In order to estimate catchment area, the employees who drove to work were requested to fill the section of the interview form in connection with area they live in and time it takes them to travel to work.

4.2 Estimates of drive times were obtained from the employees and these were checked against detailed local knowledge. Data was analysed in 5 minute drive time bands.

Trip length distributions were established and set out below while Table 3 establishes current catchment areas.

COSTAIN, WOKING DRIVE TIMES

Drive Time Bands	Cumulative %
0- 5 mins	1
5-10	5
10-15	26
15-20	30
20-25	42
25-30	47
30+	100

5 FOOTNOTE

5.1 In comparison with other office sites it was found that this site exhibited very high trip rates. A closer analysis of the details suggest two possible causes namely:-

(i) The site has a high density of use; 380 employees in 5400 sq m equates to 14.2 sqm per employee where more frequently figures of around 20 sq m per employee would be found.

(ii) The peak arrival and departures rates are very peaked occuring largely wihtin a single hour.

TABLES

TABLE 1

SITE: Costain House, Woking

DAY AND DATE: Tuesday 17 February 1987

TIME	ARRIVAL				
	EMPLOYEES CARS	BUSINESS CARS	OTHER CARS	GOODS VEH	TOTAL
0700-0800	38	2	-	-	40
0800-0900	200	4	-	2	206
0900-1000	14	7	-	1	21
1000-1100	3	6	1	5	15
1100-1200	-	7	-	7	14
1200-1300	-	3	-	2	5
1300-1400	19	1	-	-	20
1400-1500	-	4	2	5	13
1500-1600	3	6	-	2	11
1600-1700	3	2	-	-	5
1700-1800	-	-	-	1	1
1800-1900	-	-	-	-	-
1900-2000	-	-	-	-	-
TOTAL	280	42	3	25	351

Peak total arrival 206 vehicles (0800-0900)
Peak employee arrival 200 vehicles (0800-0900)
Peak goods arrival 7 vehicles (1100-1200)

TABLE 2

SITE: Costain House, Woking

DAY AND DATE: Tuesday 17 February 1987

Time	Arrival	Departure(1)	Totals	Parking Demand (Calculated at end of hour
0700-0800	40	-	40	40
0800-0900	206	1	207	245
0900-1000	21	2	23	264
1000-1100	15	7	22	272
1100-1200	14	13	27	273
1200-1300	5	23	28	255
1300-1400	20	9	29	266
1400-1500	13	12	25	267
1500-1600	11	13	24	265
1600-1700	5	49	54	221
1700-1800	1	175	176	47
1800-1900	-	35	35	12
1900-2000	-	12	12	0
TOTAL	351	351	702	-

Peak Depature 176 Vehicles (17.00 - 18.00)
Peak Parking Demand 273 Vehicles (11.00 - 12.00)

(1) Departure figures by hour have made some assumptions regarding the duration of visitor trips.

TABLE 3

COSTAIN, WOKING CATCHMENT AREAS

LOCATION	APPROX TIME (MINS)	% OF ALL TRIPS
Chobham	0- 5	1
Mayford	5-10	2
Westfield	5-10	1
Worplesdon Hill	5-10	1
Westend	10-15	1
Woking	10-15	20
Horsley	15-20	2
Lightwater	15-20	1
Oxshot	15-20	1
Camberley	20-25	3
Guildford	20-25	3
Ripley	20-25	2
Others	20-25	4
Ash	25-30	2
Bracknel	25-30	1
Crowthorne	25-30	1
Frimley		1
Epsom	30+	3
Croydon	30+	2
Maidenhead	30+	2
Twickenham	30+	2
Others	30+	44

APPENDIX 1 : INTERVIEW AND QUESTIONNAIRE SHEETS

SURREY COUNTY COUNCIL

FOOD SUPERSTORES

DATE..... DAY.....SITE.....

HALF HOUR COMMENCING.....INTERVIEWER.....

NO	WHERE DO YOU LIVE - Area or Town?	HOW LONG DOES IT TAKE YOU TO DRIVE HERE? - Min	HOW FREQUENTLY DO YOU SHOP HERE?	NO PEOPLE IN PARTY
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				

SURREY COUNTY COUNCIL

HIGH TECH SITES

DATE ..... DAY ..... SITE .....

HALF HOUR COMMENCING ..... INTERVIEWER .....

No	VEHICLE TYPE CAR =1 LGV =2 HGV =3 ARTIC=4	WHICH FIRM HAVE YOU COME FROM	PURPOSE EMPLOYEE = 1 BUSINESS = 1 DELIVERY = 3 OTHER = 4	IF EMPLOYEE	
				WHERE DO YOU LIVE	HOW LONG DOES IT TAKE TO DRIVE
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

SURREY COUNTY COUNCIL OFFICES

This survey is being undertaken by the County Council as part of a wider project of assessing future transport needs within the County. This survey is designed to assess the traffic flows associated with the Petro-Fina office.

Please complete the questions and return the form to:-

1 Where do you live (eg Ashtead, Banstead)?.....

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 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.

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