CRANFIELD INSTITUTE OF TECHNOLOGY

COLLEGE OF AERONAUTICS

APPLIED PSYCHOLOGY UNIT

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Academic Year 1990-91

DAVID MARK BOTTOMLEY BA MSc

OBSERVED & REPORTED DRIVER BEHAVIOUR AT JUNCTIONS: IMPLICATIONS FOR DRIVER TRAINING (VOLUME 2)

Supervisor: Dr. Andrew Guppy

September 1991

VOLUME 2

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APPENDIX A:

Initial Contact Letter to Councils

Applied Psychology Unit
College of Aeronautics
Cranfield Institute of Technology
Cranfield Bedford MK43 0AL England
Telephone Bedford (0234) 750111
Telex 825072 CITECH G
Fax 0234 750192

Cranfield

Richard White,
N.B.C.C.
County Hall,
BEDFORD.

15/1/88

Dear Richard,

Following our 'phone conversation this afternoon I am writing to you in the hope that you can provide some information relevant to the research which I am about to undertake. The aim of the research is mainly to further the work I did during last summer on the 101 roundabout. Basically, I am interested in obtaining a list of Bedfordshire road locations which have, primarily, a high accident record and I would be particularly interested in any sites which the council are proposing to alter in some way during the next six months. I would imagine that I will have time to look at 2 or 3 sites and, ideally, they would be of different types (eg. 1 roundabout, 1 t-junction & 1 crossroad) although I am prepared to consider any sites with poor accident records. Anyway, that appears to cover just about everything for the moment, and thanks very much in advance for the information.

Yours gratefully,

Dave Bottomley.

Figure A.1: Initial Contact Letter to Local Councils

APPENDIX B:

Location & Plans of the Sites used in the Observation Study

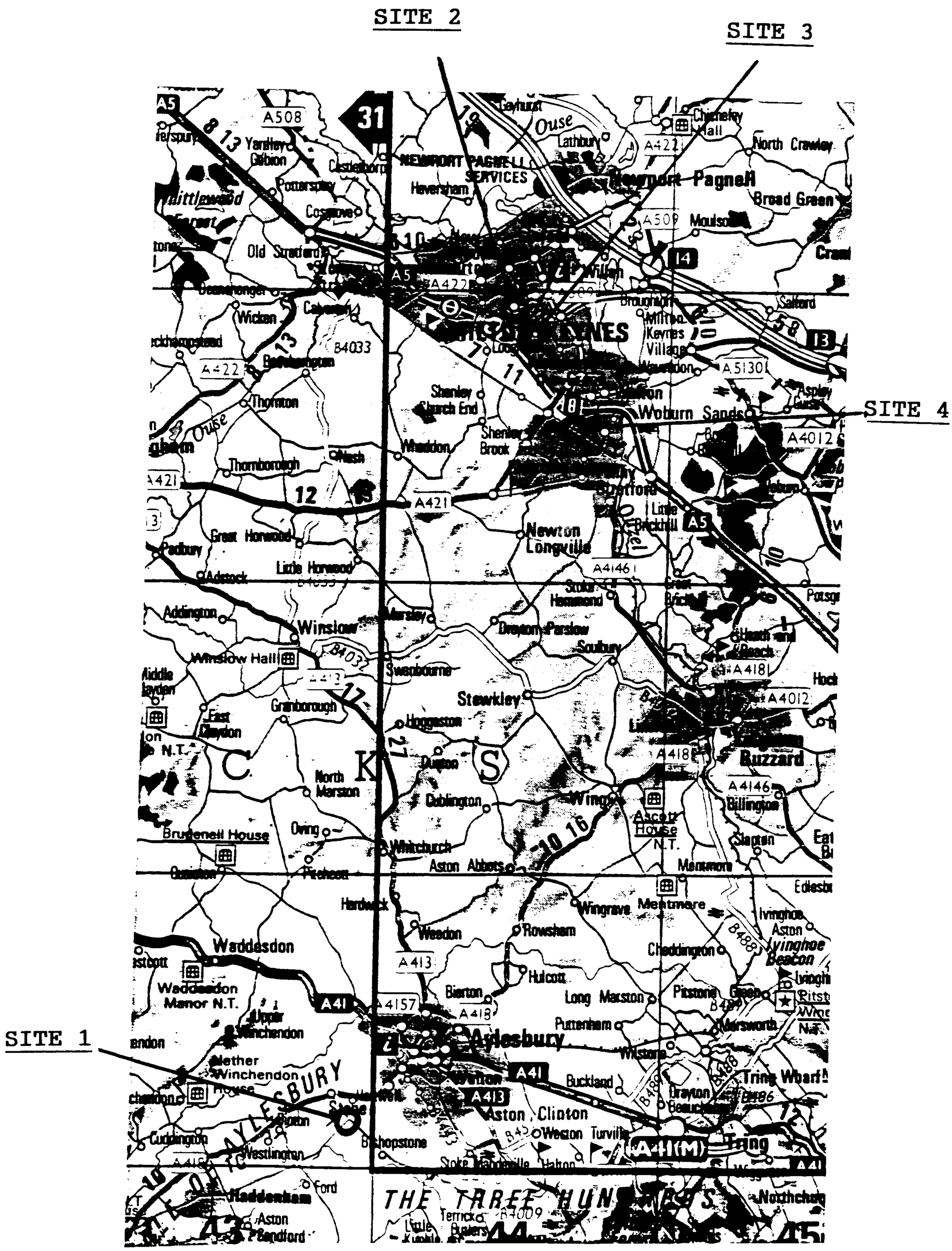

Figure B.1: Location of the Four Sites

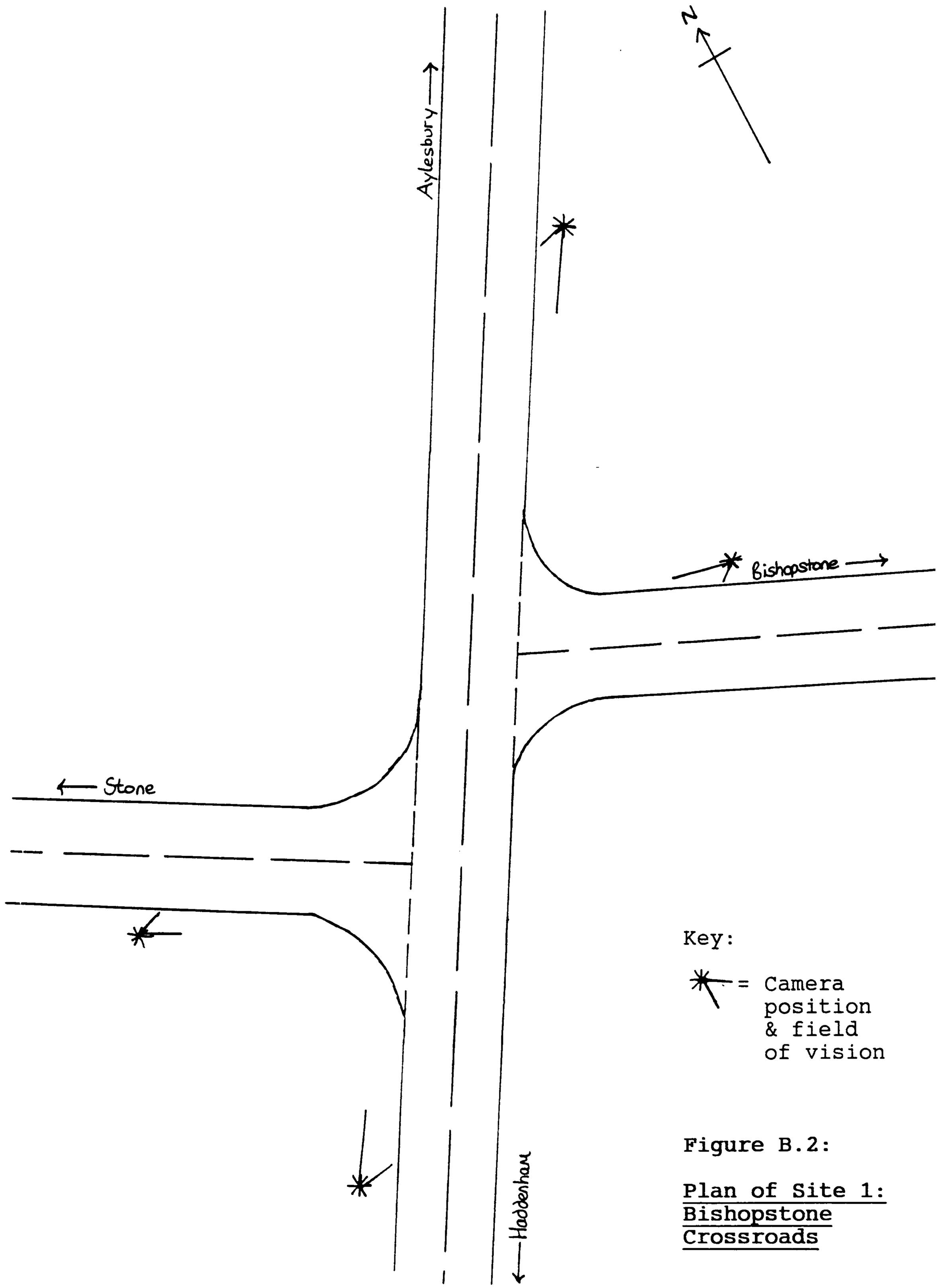

Figure B.2:

Plan of Site 1: Bishopstone Crossroads

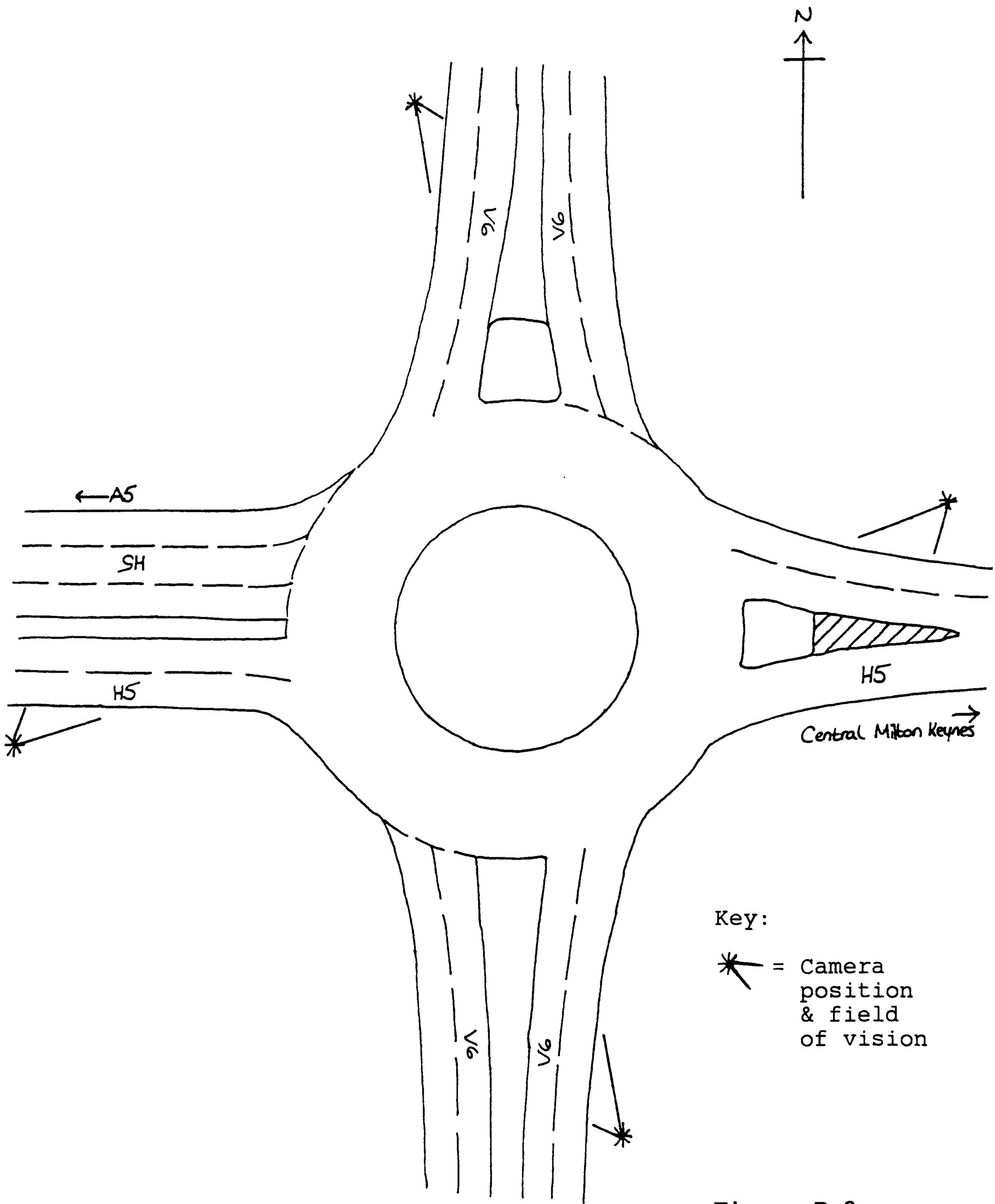

Figure B.3:

Plan of Site 2: V6/H5 Roundabout

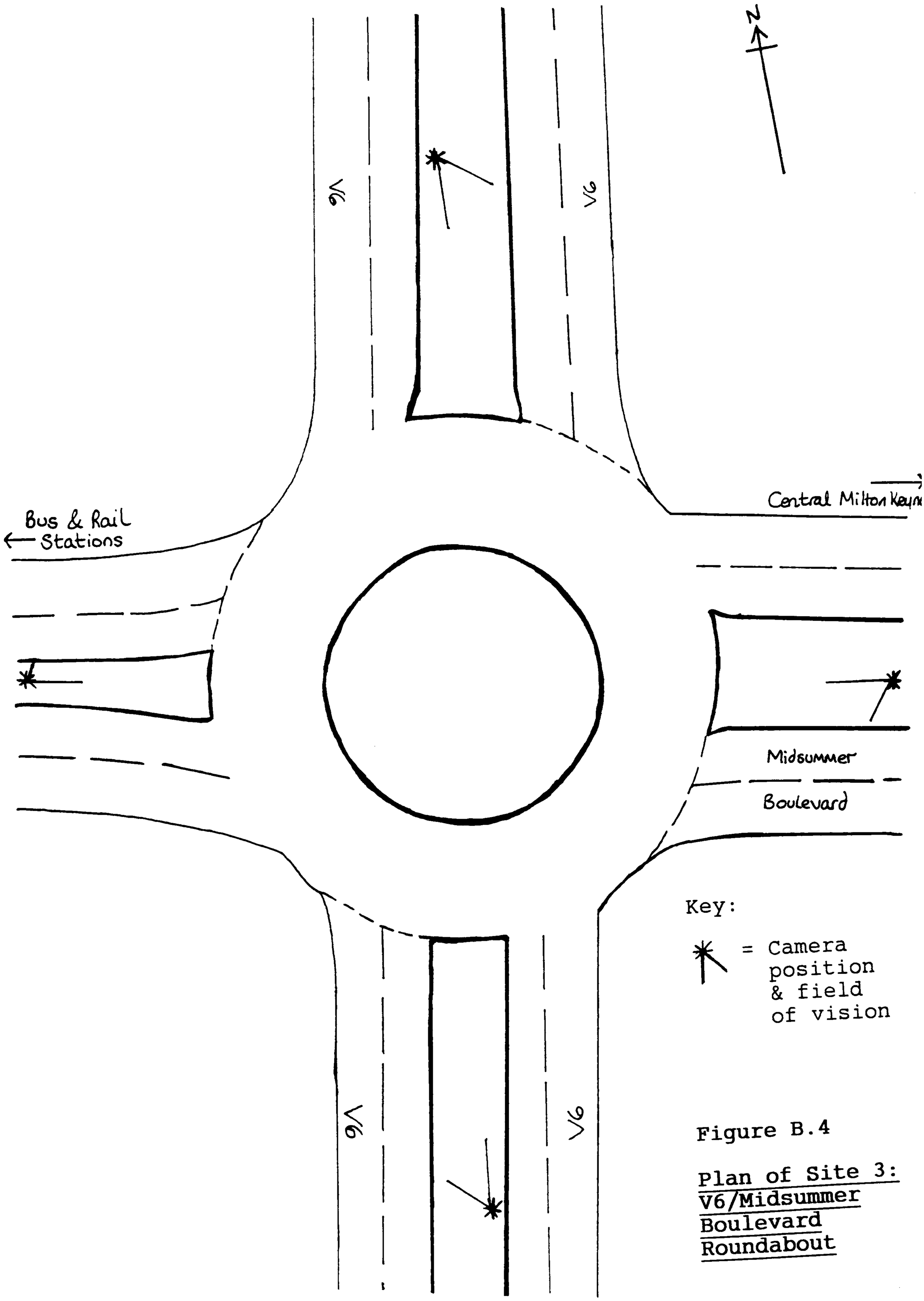

Figure B.4

Plan of Site 3:
V6/Midsummer
Boulevard
Roundabout

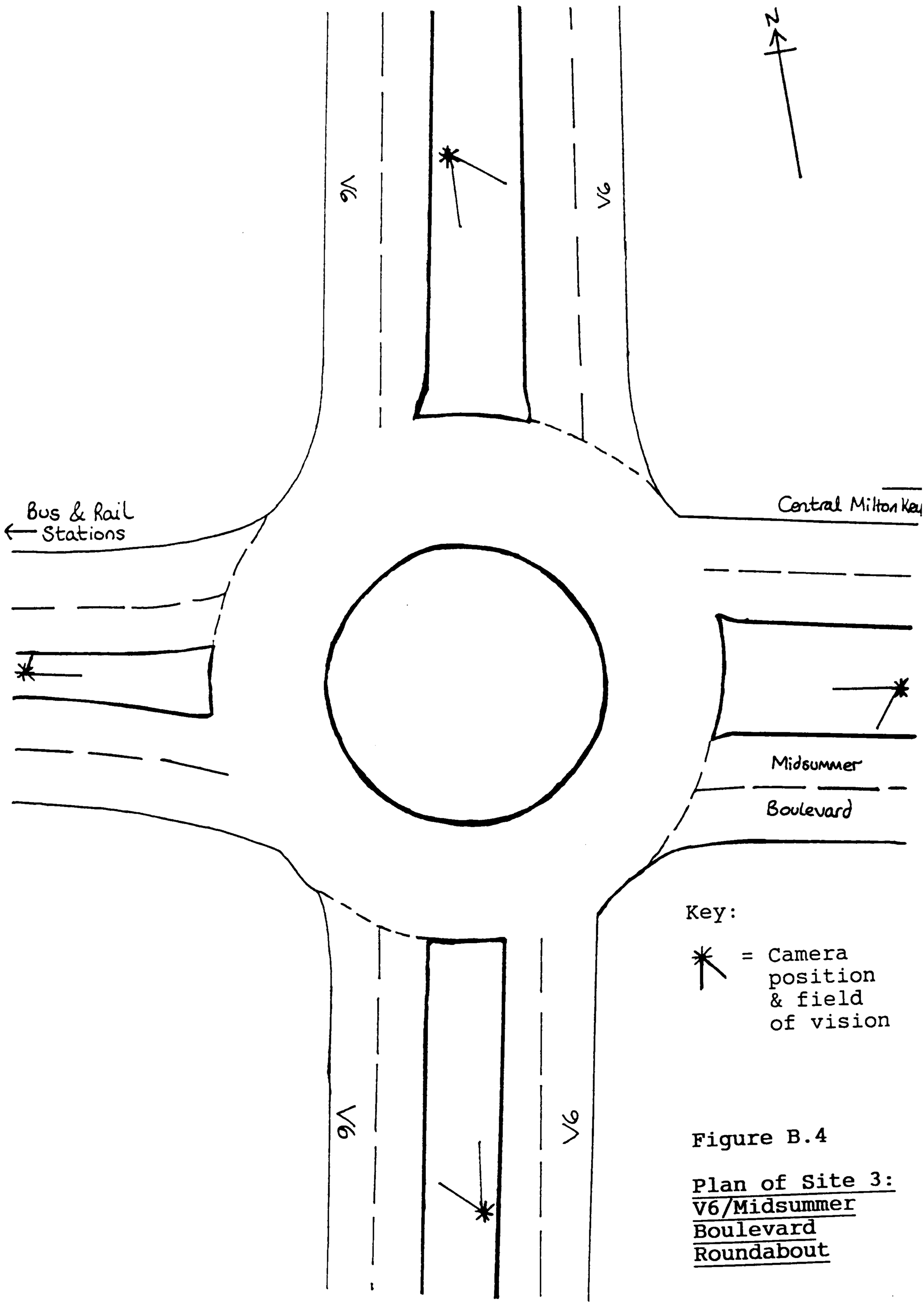

Figure B.4

Plan of Site 3:
V6/Midsummer
Boulevard
Roundabout

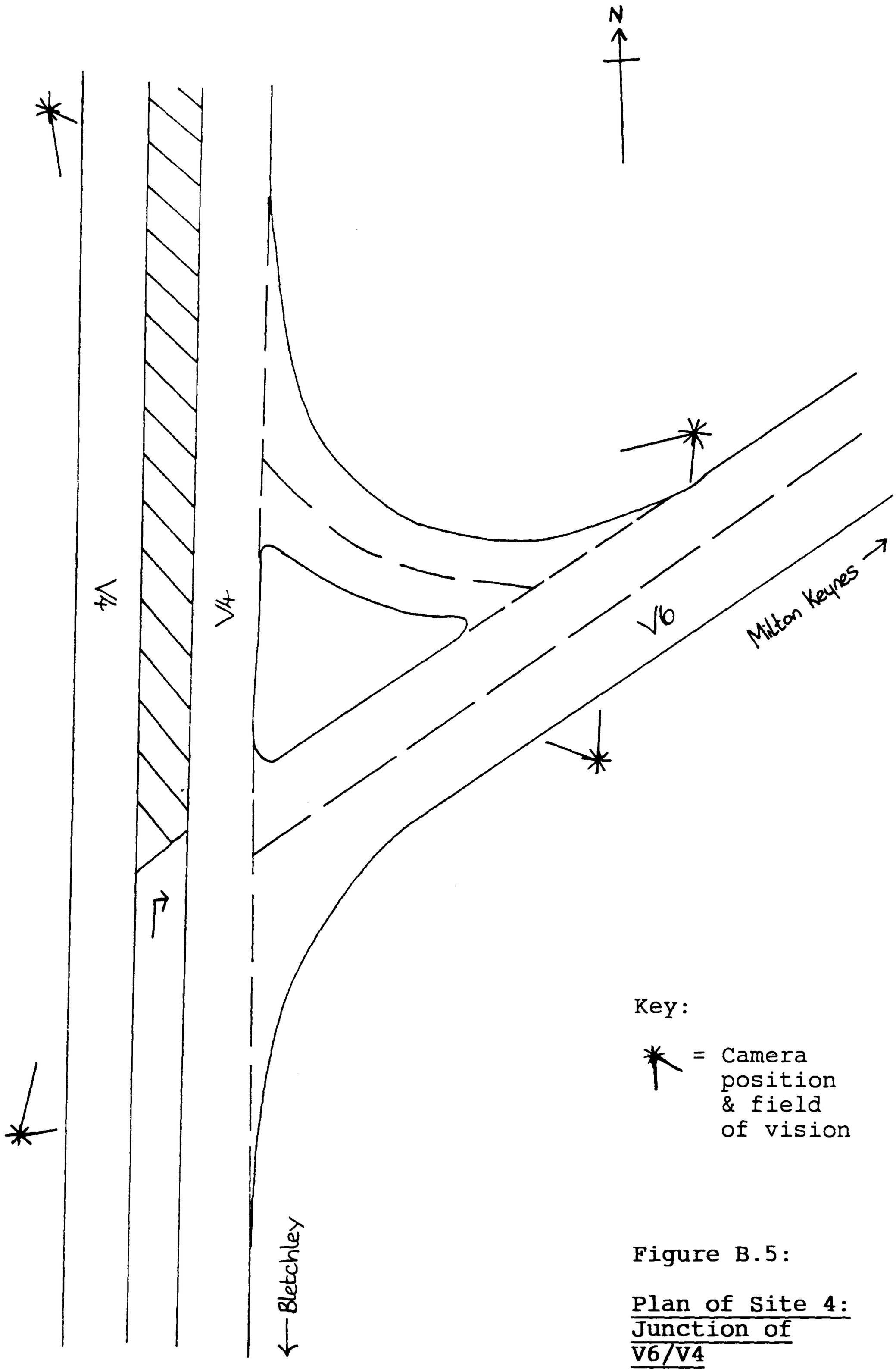

Figure B.5:

Plan of Site 4: Junction of V6/V4

APPENDIX C:

Initial Contact Letter to Thames Valley Police Requesting Permission to Gain Access to their Accident Records

Applied Psychology Unit
College of Aeronautics
Cranfield Institute of Technology
Cranfield Bedford MK43 0AL England
Telephone Bedford (0234) 750111
Telex 825072 CITECH G
Fax 0234 750192

Cranfield

Chief Inspector Bird,
Thames Valley Police - Divisional
Headquarters,
302, North Row,
Witan Gate East,
CENTRAL MILTON KEYNES,
MK9 2DS.

14/11/88

Dear Chief Inspector,

I am a PhD student at the Applied Psychology Unit at Cranfield Institute of Technology, investigating aspects of driving at junctions. Three of the four junctions I am looking at are in the Milton Keynes district:

1) The H5/V6 roundabout;

2) The V6/Midsummer Boulevard roundabout;

3) The V4/V6 junction near Bletchley.

Having obtained several hours worth of video recordings of driving at these junctions, I would like to supplement the information with details of the accidents that have occurred at them in recent years. Therefore, I am writing to you to request permission to access the accident records for these three junctions. I would be very grateful if you would contact me to let me know if this will be possible as soon as possible. If you have any further queries concerning my research, please do not hesitate to contact me at the address above. Thank you in anticipation,

Yours faithfully,

David Bottomley.

Figure C.1: Initial Contact Letter to Thames Valley Police

APPENDIX D:

Accident Histories of the 4 Junctions used in the Observation Study

ACCIDENT HISTORY OF THE SITES 1985-1988 (AUGUST)

Key to Tables (Based upon Police accident records classification system):

Weather Conditions:

1 - Fine without high winds
2 - Rain/hail without high winds
3 - Snow without high winds
4 - Fine with high winds
5 - Rain/hail with high winds
6 - Snow with high winds
7 - Fog/mist (if considered hazardous)
8 - Other
9 - Not known

Road Surface Conditions:

1 - Dry
2 - Wet/damp
3 - Snow
4 - Frost/ice
5 - Flooded (over 3cm. deep)
9 - Not known

Direction of Travel:

N/K - Not known

The remaining classifications refer to standard compass points - the one listed first being the direction travelled away from, the second being the intended destination of the vehicle given a successful negotiation of the junction.

Severity of Accident:

D/O - Damage to vehicle or road furniture only, no personal injuries

Slight - Slight injuries to person(s) involved

Serious - Serious injuries to person(s) involved

Fatal - Fatal injuries to person(s) involved

NB: ALL VEHICLES ARE DEFINED AS CARS UNLESS OTHERWISE INDICATED IN 'COMMENTS' SECTION.

The vehicle defined by the police as being at fault is always listed as vehicle 1 (unless otherwise indicated). Tables D.1, D.2, D.3 and D.4 (all over) detail the accidents records for each site in turn.

Table D.1: Accident History for Site 1 - Bishopstone Crossroads

Date	Day	Time	Weather	Road Surface	Vehicle 1 (V1) Direction of Travel	Vehicle 1 (V1) Comments	Vehicle 2 (V2) Direction of Travel	Vehicle 2 (V2) Comments	Severity of Accident	Overall Comments
14/01/85	Mon	14.55	9	9	N/K	-	N/K	-	Slight	-
20/01/85	Sun	15.20	9	9	N/K	-	N/K	-	Slight	-
20/05/85	Mon	18.05	9	9	N/K	-	N/K	-	D/O	-
16/08/85	Fri	07.30	9	9	N/K	-	N/K	-	Slight	-
23/10/85	Wed	20.30	9	9	N/K	-	N/K	-	Serious	-
08/05/86	Thu	16.45	1	1	SE-NW	Entering main road	SW-NE	Approaching crossroads on main road	Slight	V1 pulled out into main road into path of V2
22/05/86	Thu	14.30	1	1	SE-NW	Entering main road	SW-NE	Approaching crossroads on main road	Slight	V1 pulled out into main road into path of V2
03/10/86	Fri	15.40	1	1	SW-NE	Vehicle on main road, skidded at junction	NE-NW	On main road - waiting to turn right	Serious	V1 struck V2 & both left carriage-way - 3rd vehicle hit
01/01/87	Thu	01.00	1	1	N/K	Entering main road	N/K	Travelling along main road	D/O	V1 stalled as crossing main road - V2 collided with V1
15/04/87	Wed	16.15	1	1	SW-NE	On main road behind V2	SW-SE	On main road - stopped to turn right	Slight	Rear-end collision, V1 driver blamed hazy sunlight
09/09/87	Wed	13.55	1	1	SE-NW	Entering main road	NE-SW	Approaching crossroads on main road	Serious	V1 pulled out into main road into path of V2

(cont. over)

Table D.1: Accident History for Site 1 - Bishopstone Crossroads (cont.)

Date	Day	Time	Weather	Road Surface	Vehicle 1 (V1) Direction of Travel	Vehicle 1 (V1) Comments	Vehicle 2 (V2) Direction of Travel	Vehicle 2 (V2) Comments	Severity of Accident	Overall Comments
12/09/87	Sat	16.20	5	2	SW-NE	Vehicle on main road, skidded at junction	SW-SE	On main road - waiting to turn right	Slight	V1 collided with V2 - 3rd vehicle also hit
28/10/87	Wed	16.25	1	1	NE-NW	On main road waiting to turn right	SW-NE	On main road	Serious	V1 turned across path of V2 - bright sun low in sky blamed
02/12/87	Wed	19.00	9	9	NW-SE	Approaching junction	None	-	D/O	V1 failed to allow for 'Give Way' line- skidded & hit road sign on other side of road

Table D.2: Accident History of Site 2 - Roundabout at the Junction of Grafton Gate/Street (V6) and Portway (H5)

Date	Day	Time	Weather	Road Surface	Vehicle 1 (V1) Direction of Travel	Vehicle 1 (V1) Comments	Vehicle 2 (V2) Direction of Travel	Vehicle 2 (V2) Comments	Severity of Accident	Overall Comments
16/04/85	Tue	11.30	9	9	N/K	-	N/K	-	Slight	-
25/06/85	Tue	15.45	1	1	S-N	125 c.c. Motorcycle	None	-	Slight	Skidded on roundabout
28/08/85	Wed	08.50	9	9	N-S	Pulled up behind V2 at roundabout	N-S	Waiting at 'Give Way'	D/O	Rear-end collision
18/09/85	Wed	09.10	1	1	S-N	Pulled up behind V2 at roundabout	S-N	Waiting at 'Give Way'	Slight	Rear-end collision
25/11/85	Mon	18.40	9	9	N/K	-	N/K	-	Slight	-
25/03/86	Tue	19.00	9	9	N-S	-	None	Dog	D/O	Swerved to avoid dog
15/05/86	Thu	08.05	9	9	N/K	-	None	-	D/O	-
11/08/86	Mon	05.30	9	9	N/K	-	None	-	D/O	-
13/08/86	Wed	07.50	1	1	N-S	Motorcycle	N-S	Waiting at 'Give Way'	Slight	Rear-end collision
22/12/86	Mon	17.40	9	9	N/K	-	N/K	-	Slight	-
23/01/87	Fri	07.00	9	9	N/K	-	N/K	-	Slight	-
27/03/87	Fri	19.45	2	2	N/K	Approached too quickly	None	-	D/O	Vehicle hit barrier - excess alcohol
31/03/87	Tue	23.20	9	9	N/K	Skidded on approach	None	-	D/O	Vehicle hit barrier
15/04/87	Wed	08.25	1	1	N/K	Pulled up behind V2 at roundabout	N/K	Waiting at 'Give Way'	D/O	Rear-end collision
04/06/87	Thu	10.35	9	9	N/K	Pulled up behind V2 at roundabout	N/K	Waiting at 'Give Way'	D/O	Rear-end collision
09/06/87	Tue	17.40	9	9	N/K	Pulled up behind V2 at roundabout	N/K	Waiting at 'Give Way'	D/O	3rd vehicle on site caused V1 to swerve, V2 into rear

(cont. over)

Table D.2: Accident History of Site 2 - Roundabout at the Junction of Grafton Gate/Street (V6) and Portway (H5) (cont.)

Date	Day	Time	Weather	Road Surface	Vehicle 1 (V1) Direction of Travel	Vehicle 1 (V1) Comments	Vehicle 2 (V2) Direction of Travel	Vehicle 2 (V2) Comments	Severity of Accident	Overall Comments
06/07/87	Mon	09.45	9	9	N/K	-	N/K	Mini-bus	D/O	-
08/08/87	Sat	12.40	9	9	N/K	-	N/K	-	D/O	-
14/08/87	Fri	17.05	9	9	S-N	Entered roundabout	N-S	Moped	D/O	V1 pulled out too quickly causing rider of V2 to fall off
21/09/87	Mon	07.20	1	1	N-S	Pulled up behind V2 at roundabout	N-S	Waiting at 'Give Way'	Slight	Rear-end collision
13/10/87	Tue	08.05	1	1	W-E	Pulled up behind V2 at roundabout	W-E	Waiting at 'Give Way'	Slight	Rear-end collision
13/10/87	Tue	18.00	1	1	S-N	Entered roundabout	S-E	Vehicle on site	D/O	Rear-end collision on roundabout
26/10/87	Mon	21.05	2	2	W-E	Motorcycle	None	-	Slight	Skidded on roundabout
03/03/88	Thu	15.45	1	1	N/K	-	N/K	-	D/O	V1 touched V2 whilst overtaking on inside on site
30/03/88	Wed	14.55	1	1	N-S	Pulled up behind V2 at roundabout	N-S	Waiting at 'Give Way'	Slight	Rear-end collision
03/05/88	Tue	14.10	2	2	W-E	Left site	W-E	Left site	D/O	V1 overtook V2 then cut inside, hitting V2 on offside
13/05/88	Fri	07.55	1	1	N-S	Light goods vehicle	E-W	Entered roundabout	D/O	V1 mistimed entry & collided with rear of V2

(cont. over)

Table D.2: Accident History of Site 2 - Roundabout at the Junction of Grafton Gate/Street (V6) and Portway (H5) (cont.)

Date	Day	Time	Weather	Road Surface	Vehicle 1 (V1) Direction of Travel	Vehicle 1 (V1) Comments	Vehicle 2 (V2) Direction of Travel	Vehicle 2 (V2) Comments	Severity of Accident	Overall Comments
17/05/88	Tue	09.35	9	9	N/K	Pulled up behind V2 at roundabout	N/K	Waiting at 'Give Way'	D/O	Rear-end collision
27/05/88	Fri	09.50	1	1	S-N	Pulled up behind V2 at roundabout	S-W	Waiting at 'Give Way'	Slight	Rear-end collision
24/07/88	Sun	23.00	4	9	N/K	Failed to stop	E-W	On site	D/O	V1 pulled in front of V2 on site - latter rolled over

Table D.3: Accident History of Site 3 - Roundabout at Junction of Midsummer Boulevard & Grafton Street (V6)

					Vehicle 1 (V1)		Vehicle 2 (V2)			
Date	Day	Time	Weather	Road Surface	Direction of Travel	Comments	Direction of Travel	Comments	Severity of Accident	Overall Comments
20/02/85	Wed	14.45	9	9	N/K	-	N/K	-	D/O	-
22/02/85	Fri	N/K	9	9	N/K	-	N/K	-	D/O	-
18/03/86	Tue	16.34	1	1	S-N	Entered site at speed	W-E	Entered site at next arm	Serious	V1 hit side of V2
11/04/86	Fri	22.23	1	1	S-N	Motorcycle	None	-	Slight	Rider hit kerb & fell off
20/04/86	Sun	18.40	9	9	N/K	-	N/K	-	Serious	-
15/06/86	Sun	20.00	1	1	E-W	Entered roundabout	N/K	On site	Slight	V1 failed to give way
24/07/86	Thu	07.56	1	1	S-N	Moped	None	-	Slight	Brakes applied - puncture - rider fell off
10/08/86	Sun	20.40	2	2	N-S	-	W-E	-	Slight	V1 overshot 'Give Way' line - heavy rain
18/10/86	Sat	02.39	1	2	S-N	Pulled up behind V2 at roundabout	S-N	Waiting at 'Give Way'	D/O	Rear-end collision
27/10/86	Mon	23.50	1	9	S-N	Entered site	None	-	D/O	Collided with road signs on roundabout
10/11/86	Mon	21.55	1	1	S-N	Minibus	E-W	On site	Slight	V1 failed to give way - hit V2
01/12/86	Mon	08.20	9	9	N/K	-	N/K	-	D/O	-
12/12/86	Fri	08.00	1	2	N-S	-	E-W	Bicycle	Slight	V1 pulled out failing to see V2

(cont. over)

Table D.3: Accident History of Site 3 - Roundabout at Junction of Midsummer Boulevard & Grafton Street (V6)

Date	Day	Time	Weather	Road Surface	Vehicle 1 (V1) Direction of Travel	Vehicle 1 (V1) Comments	Vehicle 2 (V2) Direction of Travel	Vehicle 2 (V2) Comments	Severity of Accident	Overall Comments
04/08/87	Tue	19.15	8	2	W-E	Entered site	E-W	Bicycle	Slight	Driver hit cyclist - blamed sun-light & wet road
24/08/87	Mon	23.05	1	1	S-E	Entered site	None	-	Slight	V1 left road & hit road sign - excess alcohol
19/09/87	Sat	23.40	1	2	E-W	Entered site	N-S	Minibus	Slight	V1 hit V2 on site - blamed wet road
21/12/87	Mon	16.45	1	1	E-N	Entered site	N-S	Motorcycle	Slight	V1 hit V2 as entered site
04/03/88	Fri	19.10	9	9	N/K	-	None	-	D/O	Driver lost control - hit 2 road signs
07/07/88	Thu	14.00	1	1	S-N	-	E-W	-	D/O	V1 failed to give way & hit V2
29/07/88	Fri	14.25	9	9	N/K	-	Cat	-	D/O	Driver swerved to avoid cat & hit sign on site
27/08/88	Sat	12.45	9	9	N/K	Bus	N/K	Waiting at 'Give Way'	D/O	V1 cut across V2 & collided

Table D.4: Accident History of Site 4 - Junction of Grafton Street (V6) & Watling Street (V4)

Date	Day	Time	Weather	Road Surface	Vehicle 1 (V1) Direction of Travel	Vehicle 1 (V1) Comments	Vehicle 2 (V2) Direction of Travel	Vehicle 2 (V2) Comments	Severity of Accident	Overall Comments
08/02/85	Fri	11.20	9	9	N/K	-	N/K	-	D/O	-
16/02/85	Sat	20.00	1	3	S-NE	-	N-S	-	Slight	V1 moved into path of V2
03/07/85	Wed	06.40	9	9	N/K	-	N/K	-	D/O	-
25/08/85	Sun	00.10	9	9	N/K	-	None	-	D/O	-
24/10/85	Thu	18.40	9	9	NE-S	Pulled up behind V2	NE-S	Bus - Waiting at 'Give Way' line	D/O	-
02/12/85	Mon	17.10	1	1	S-NE	-	N-S	-	Slight	V1 moved into path of V2
04/12/85	Wed	21.36	9	9	N/K	Bus	N/K	-	D/O	-
12/12/85	Thu	18.10	1	1	S-NE	-	S-NE	-	Slight	Rear-end collision
06/01/86	Mon	17.35	1	9	S-NE	-	N-S	-	Slight	V1 moved into path of V2
14/01/86	Tue	13.30	4	2	NE-S	-	N-S	-	D/O	V1 did not stop at line
29/01/86	Wed	17.25	5	2	NE-S	Pulled up behind V2	NE-S	Waiting at 'Give Way' line	D/O	Rear-end collision
17/04/86	Thu	22.00	1	2	NE-N	Took wrong lane for turning right	N-S	-	Slight	V1 moved into path of V2 - 3rd vehicle hit as V1 pushed back into Grafton St. by impact with V2
04/06/86	Wed	14.00	9	9	N/K	-	N/K	-	D/O	-
21/07/86	Mon	11.40	9	9	N/K	-	N/K	-	D/O	-
01/09/86	Mon	07.40	2	2	NE-N	Stopped just over 'Give Way' line	N-S	Motorcycle	Slight	V2 hit V1 & skidded

(cont. over)

Table D.4: Accident History of Site 4 - Junction of Grafton Street (V6) & Watling Street (V4) (cont.)

Date	Day	Time	Weather	Road Surface	Vehicle 1 (V1) Direction of Travel	Vehicle 1 (V1) Comments	Vehicle 2 (V2) Direction of Travel	Vehicle 2 (V2) Comments	Severity of Accident	Overall Comments
16/09/86	Tue	16.05	2	2	NE-N	Took wrong lane for turning right	N-S	HGV	Slight	V1 moved into path of V2
29/10/86	Wed	17.20	1	1	S-NE	-	N-S	-	Slight	V1 moved into path of V2
17/12/86	Wed	08.05	1	2	S-NE	-	N-S	-	Serious	V1 moved into path of V2 - 3rd & 4th vehicles turning into Grafton St. hit
26/01/87	Mon	09.00	1	1	S-NE	-	N-S	-	Slight	V1 moved into path of V2
02/06/87	Tue	07.05	1	1	NE-N	HGV	N-S	Bicycle	Slight	V1 moved into path of V2
16/06/87	Tue	16.35	9	9	N/K	-	N/K	-	D/O	-
02/11/87	Mon	13.55	1	9	S-NE	-	S-NE	-	Slight	Rear-end collision - V2 skidded 3rd vehicle involved
27/11/87	Fri	12.15	9	9	N/K	-	N/K	-	D/O	-
01/12/87	Tue	17.10	1	2	S-NE	-	N-S	-	Serious	V1 moved into path of V2
13/02/88	Sat	14.50	1	1	NE-N	-	NE-N	Learner driver	Slight	Rear-end collision
09/03/88	Wed	16.35	1	9	NE-N	Took wrong lane for turning right	N-S	-	D/O	V1 moved into path of V2
23/03/88	Wed	20.40	1	1	NE-N	Light Goods - took wrong lane for turning right	S-NE	Light Goods	Slight	V1 moved into path of V2

(cont. over)

Table D.4: Accident History of Site 4 - Junction of Grafton Street (V6) & Watling Street (V4) (cont.)

Date	Day	Time	Weather	Road Surface	Vehicle 1 (V1) Direction of Travel	Vehicle 1 (V1) Comments	Vehicle 2 (V2) Direction of Travel	Vehicle 2 (V2) Comments	Severity of Accident	Overall Comments
23/05/88	Mon	08.10	1	1	NE-S	Pulled up behind V2	NE-S	Waiting to turn left into Watling St.	Slight	Rear-end collision at junction with Watling St.
15/07/88	Fri	11.00	9	9	N/K	-	N/K	-	Slight	-

APPENDIX E:

Graphs of Yearly, Monthly, Daily & Hourly Distribution of Accidents at each Junction

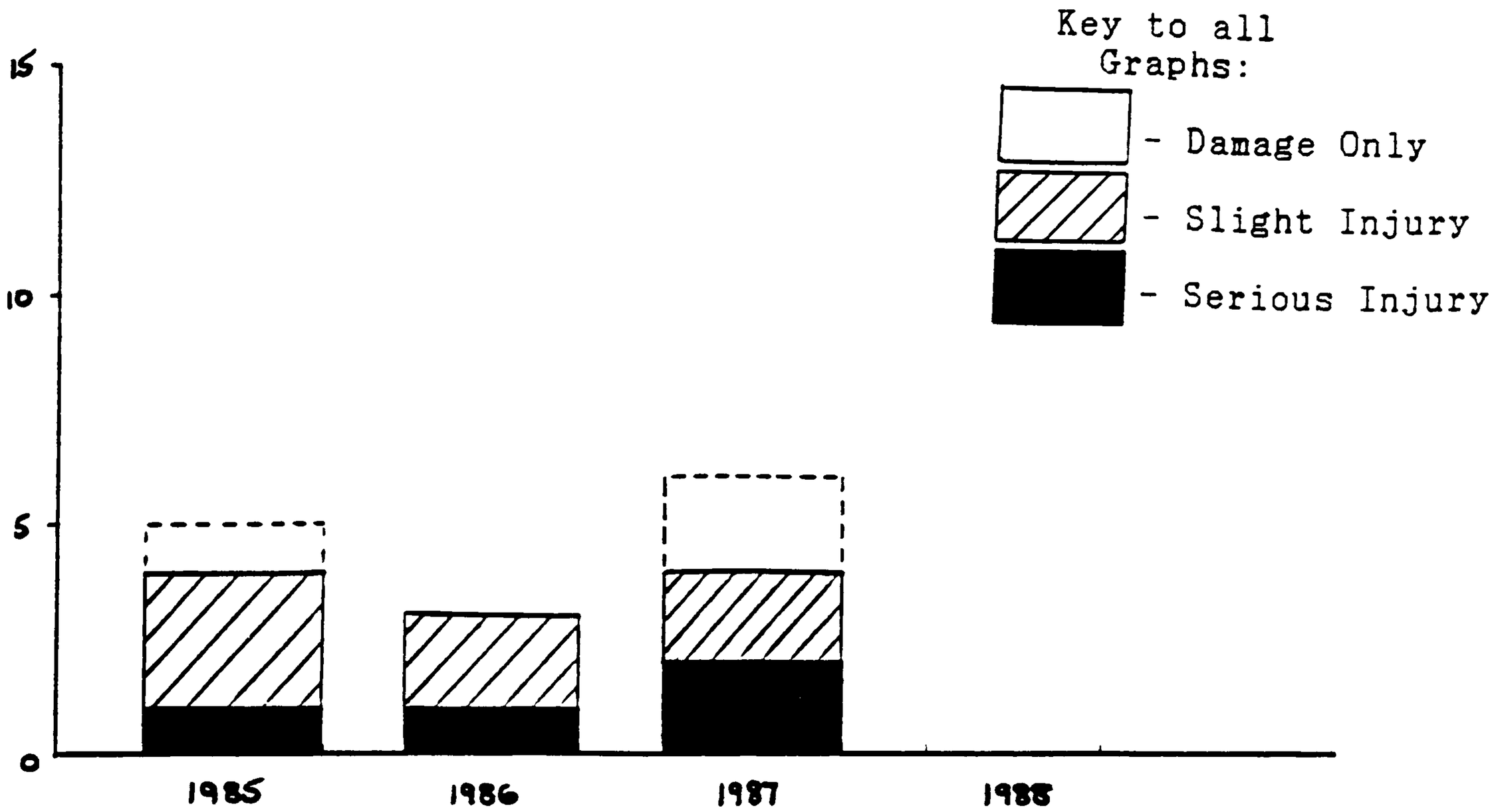

Figure E.1: Yearly Distribution of Accidents - Site 1

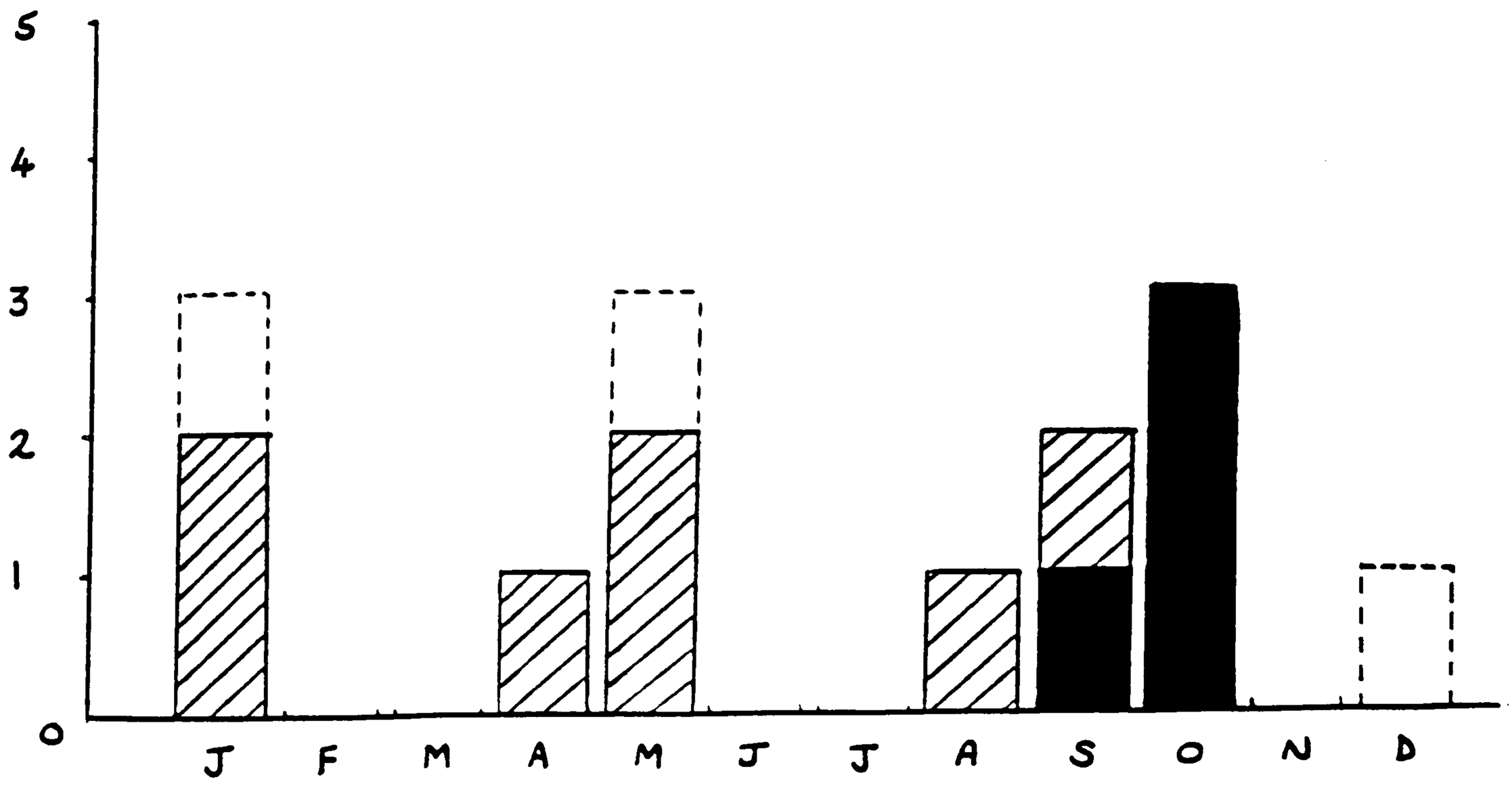

Figure E.2: Monthly Distribution of Accidents - Site 1

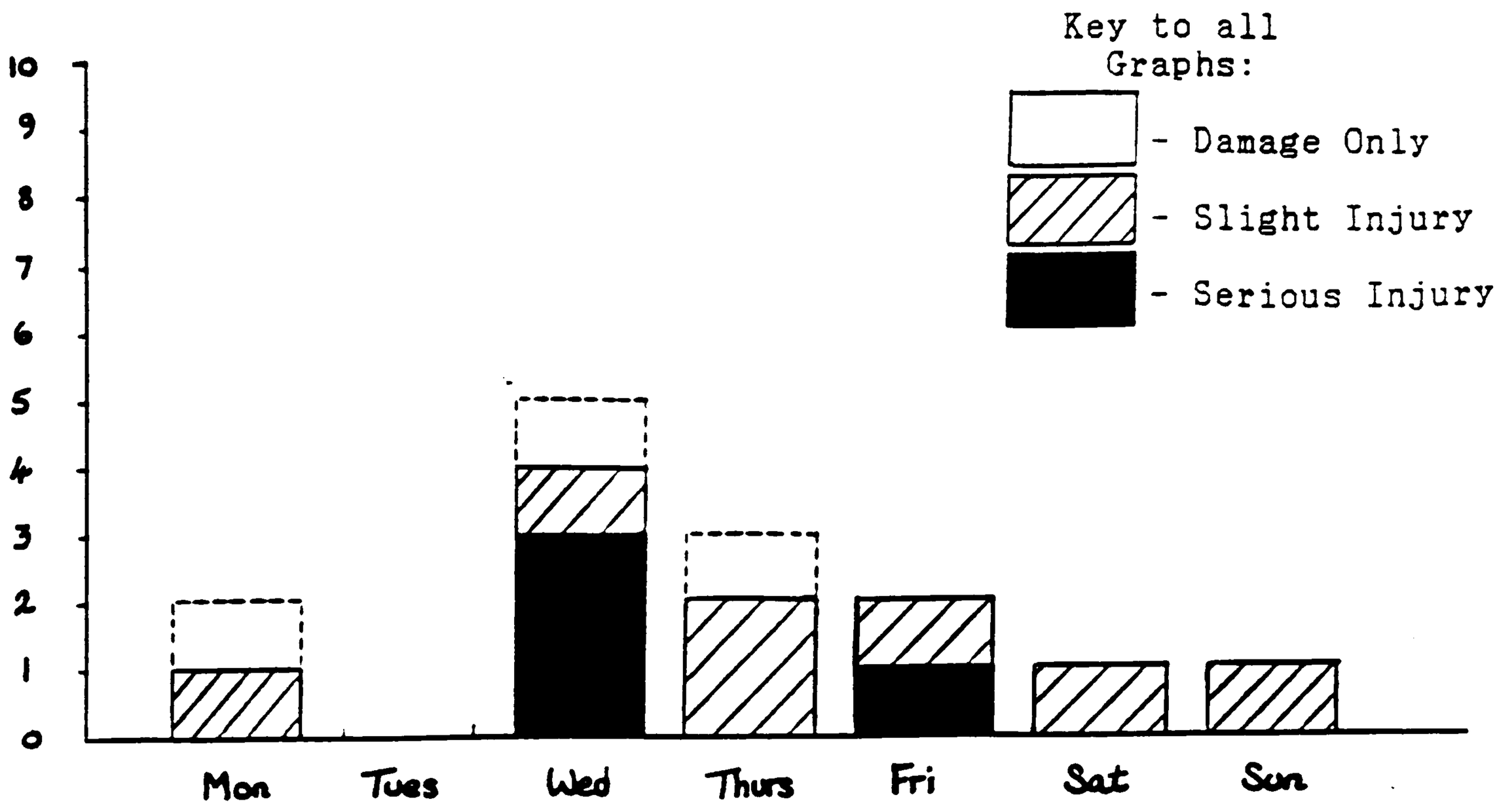

Figure E.3: Daily Distribution of Accidents - Site 1

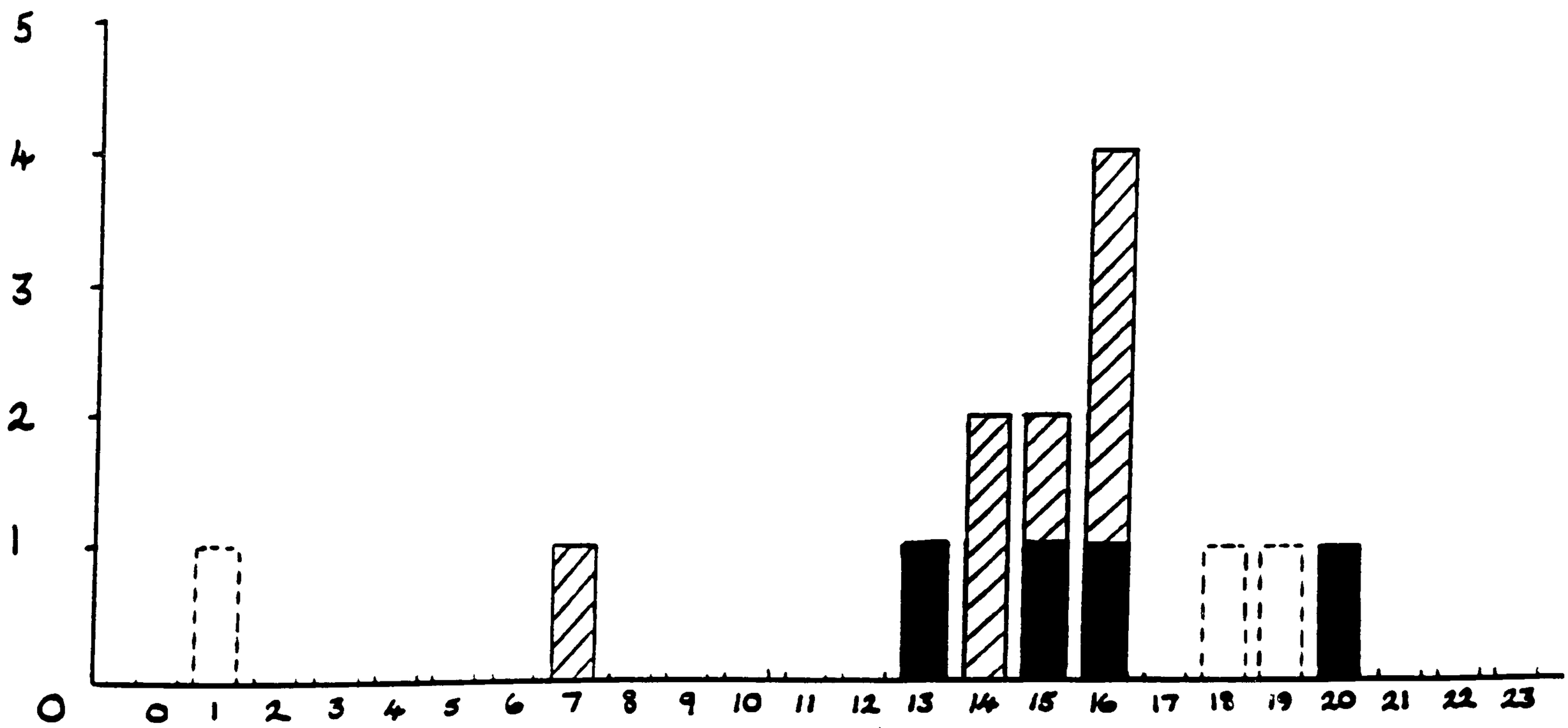

Figure E.4: Hourly Distribution of Accidents - Site 1

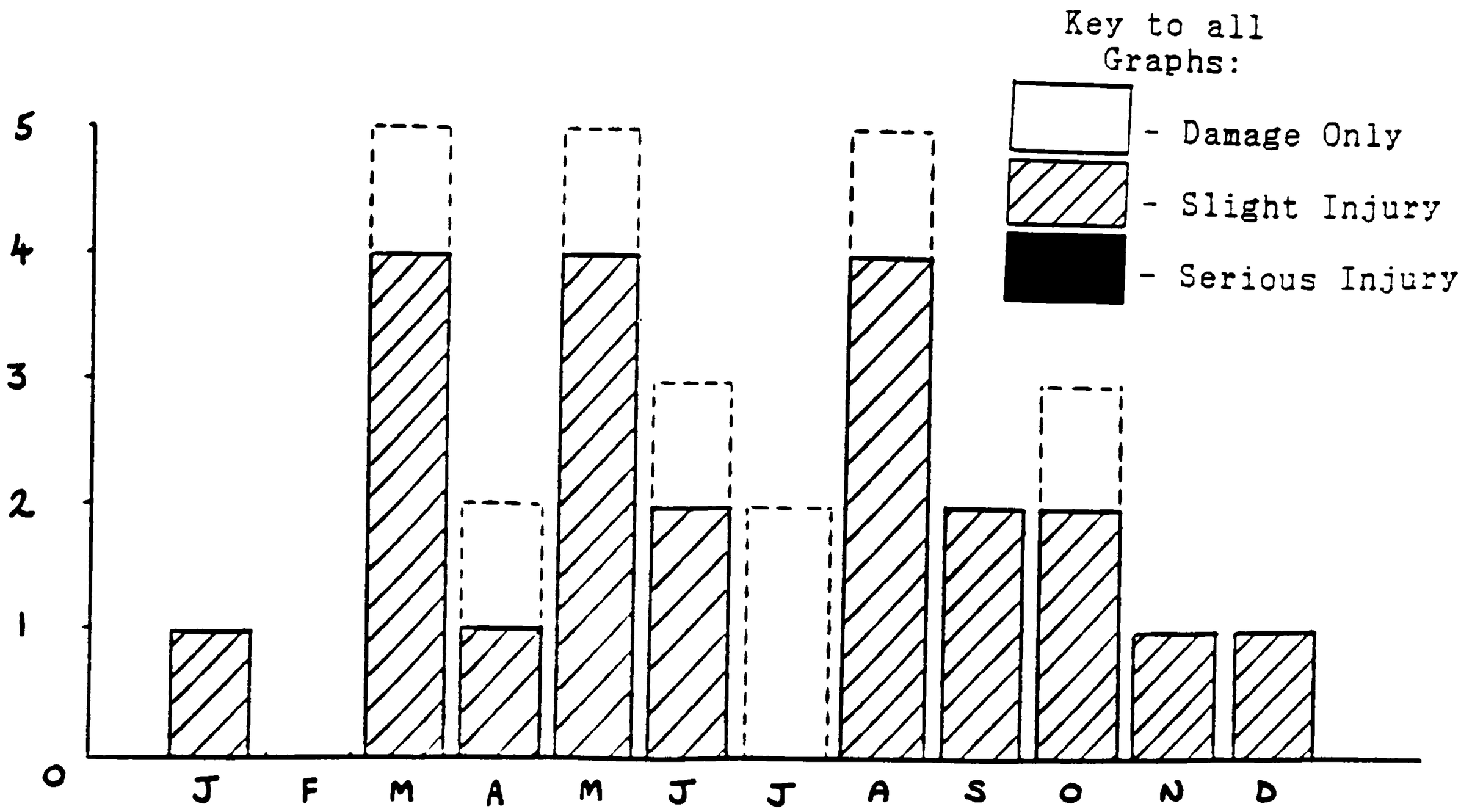

Figure E.5: Yearly Distribution of Accidents - Site 2

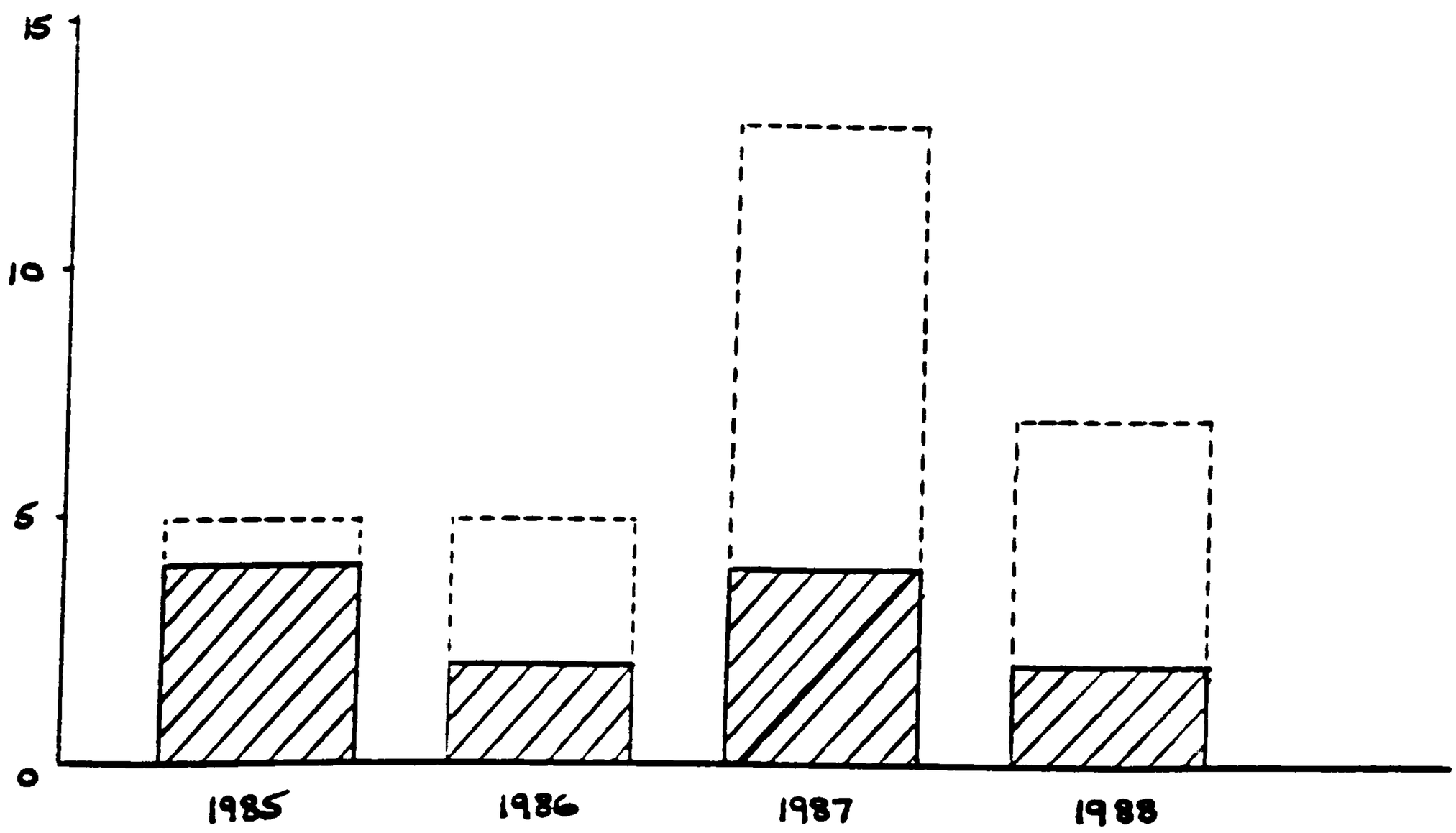

Figure E.6: Monthly Distribution of Accidents - Site 2

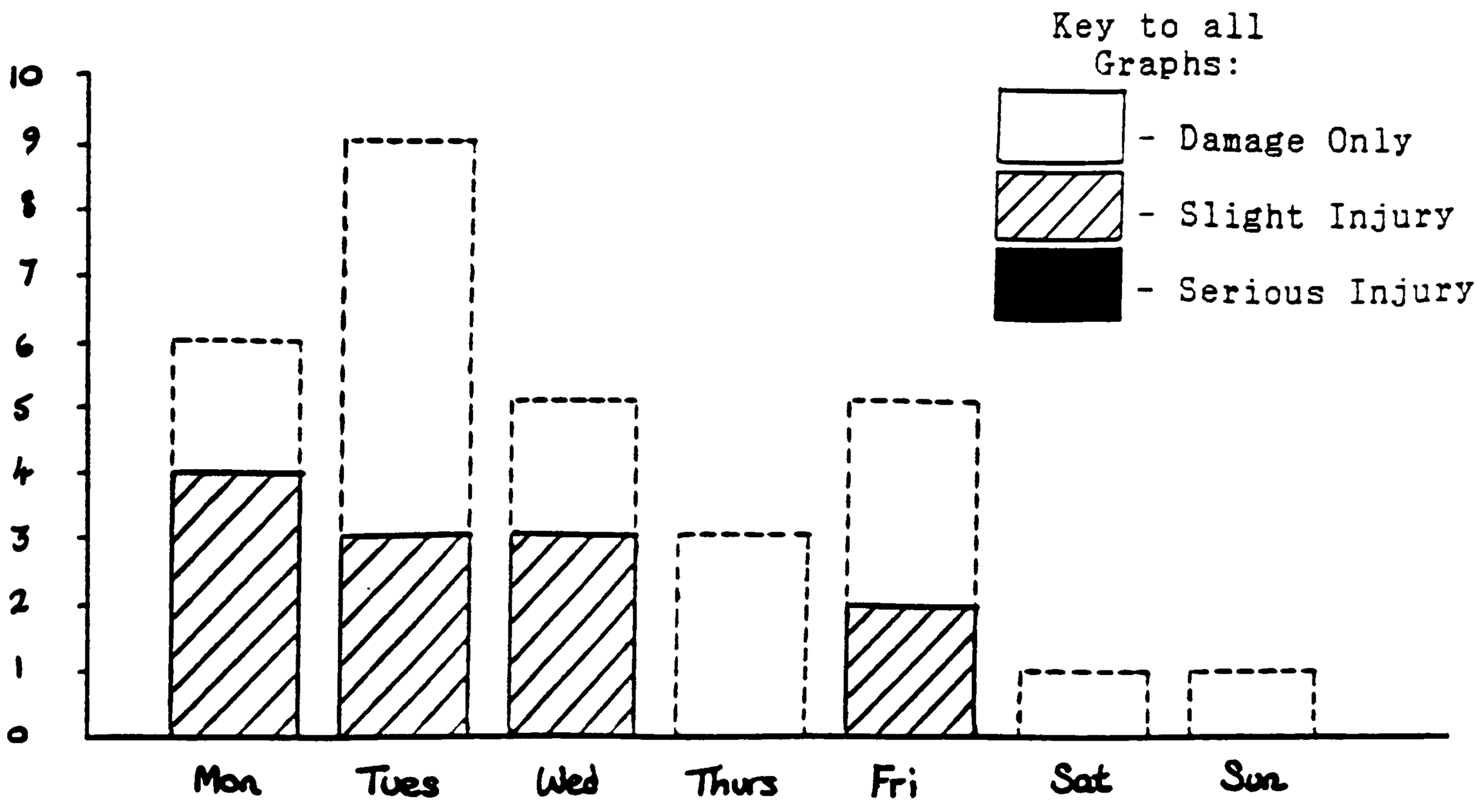

Figure E.7: Daily Distribution of Accidents - Site 2

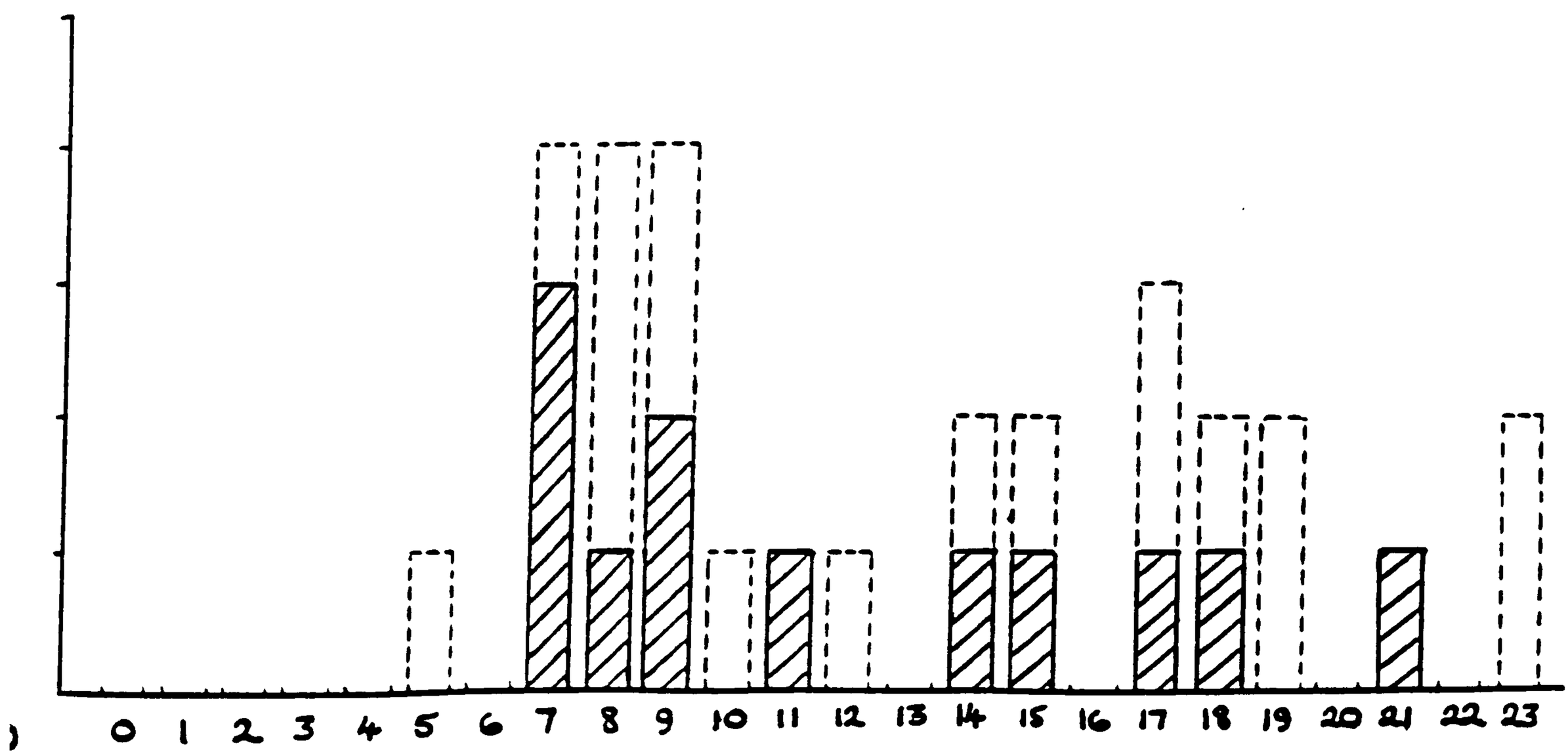

Figure E.8: Hourly Distribution of Accidents - Site 2

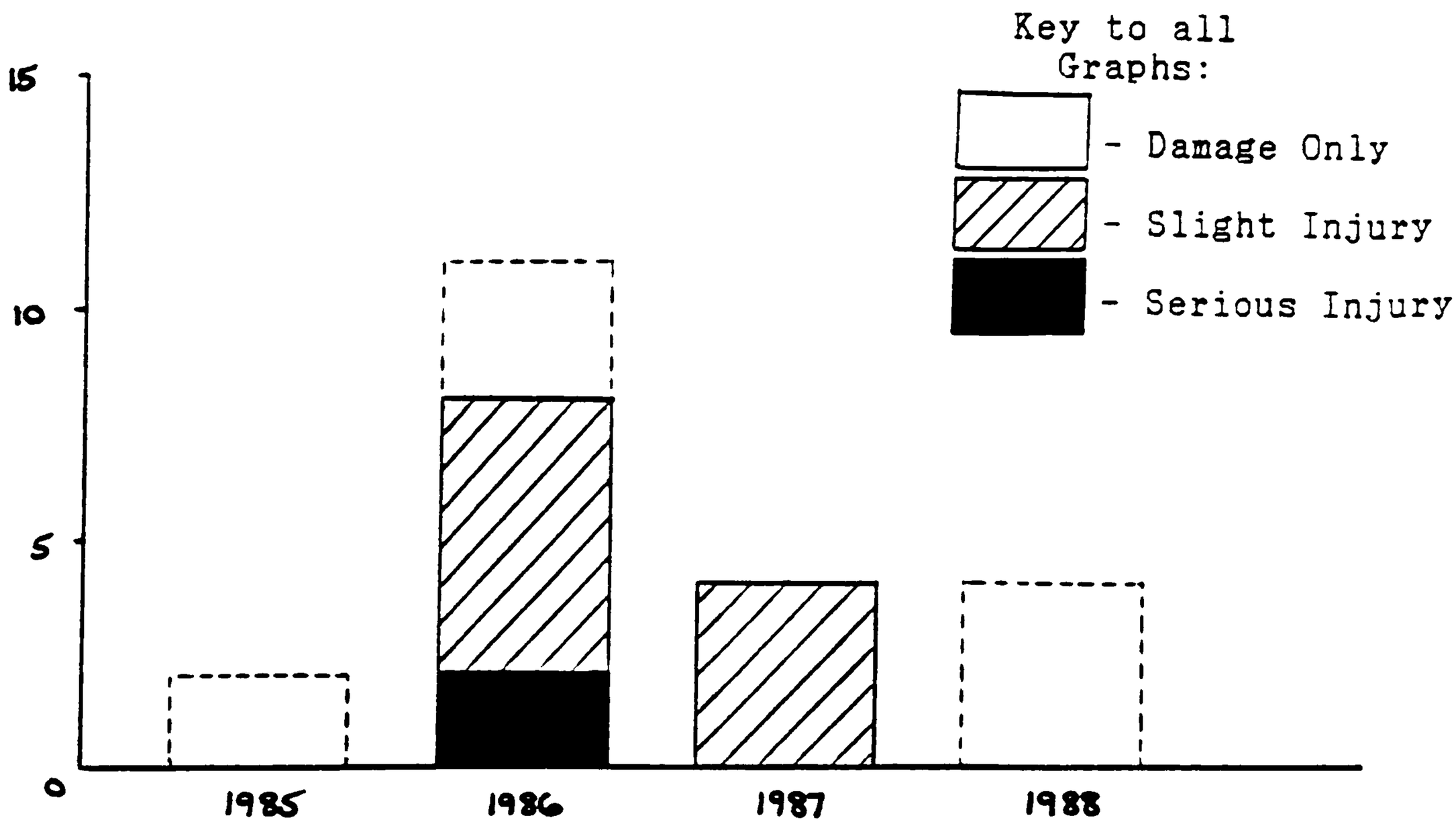

Figure E.9: Yearly Distribution of Accidents - Site 3

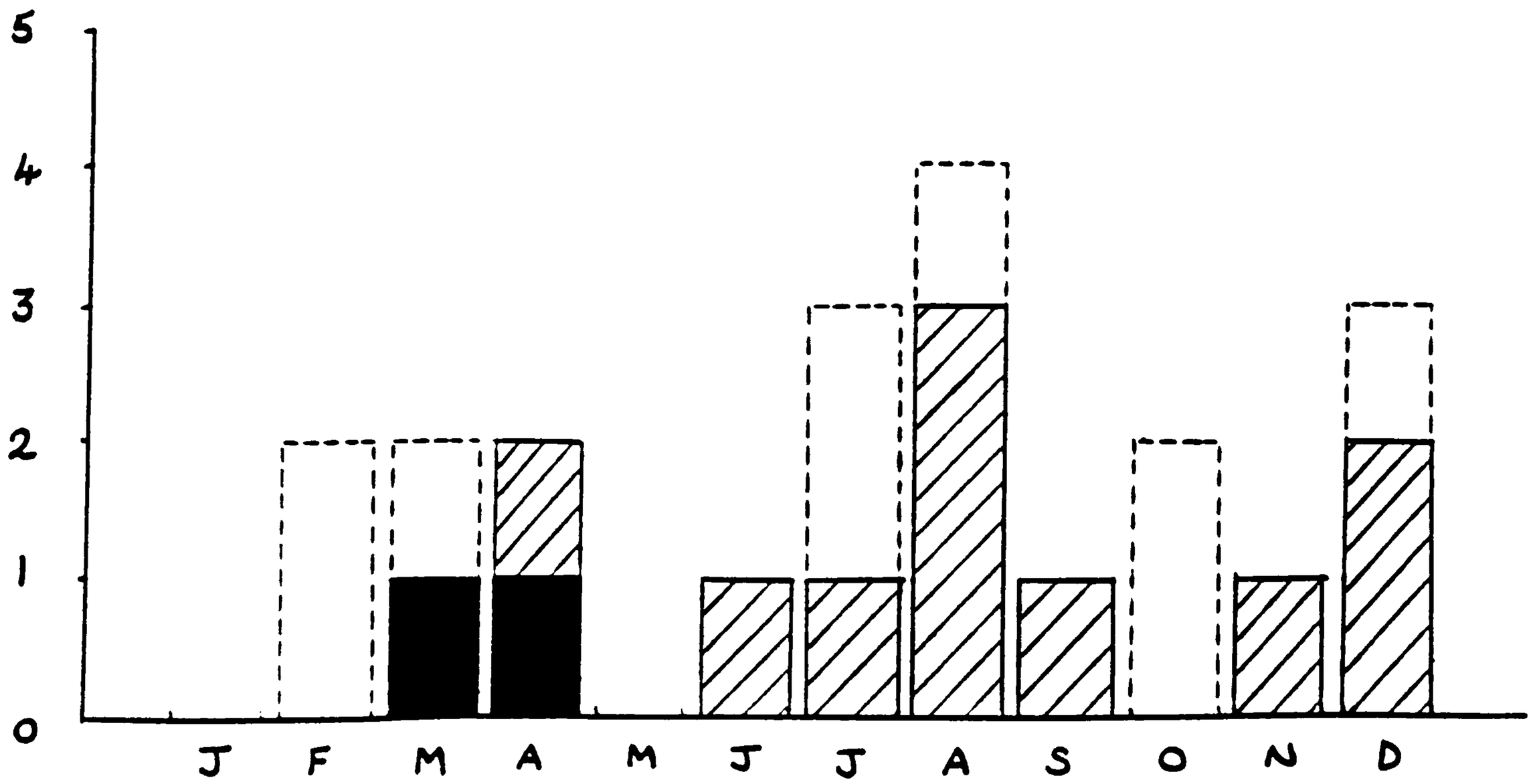

Figure E.10: Monthly Distribution of Accidents - Site 3

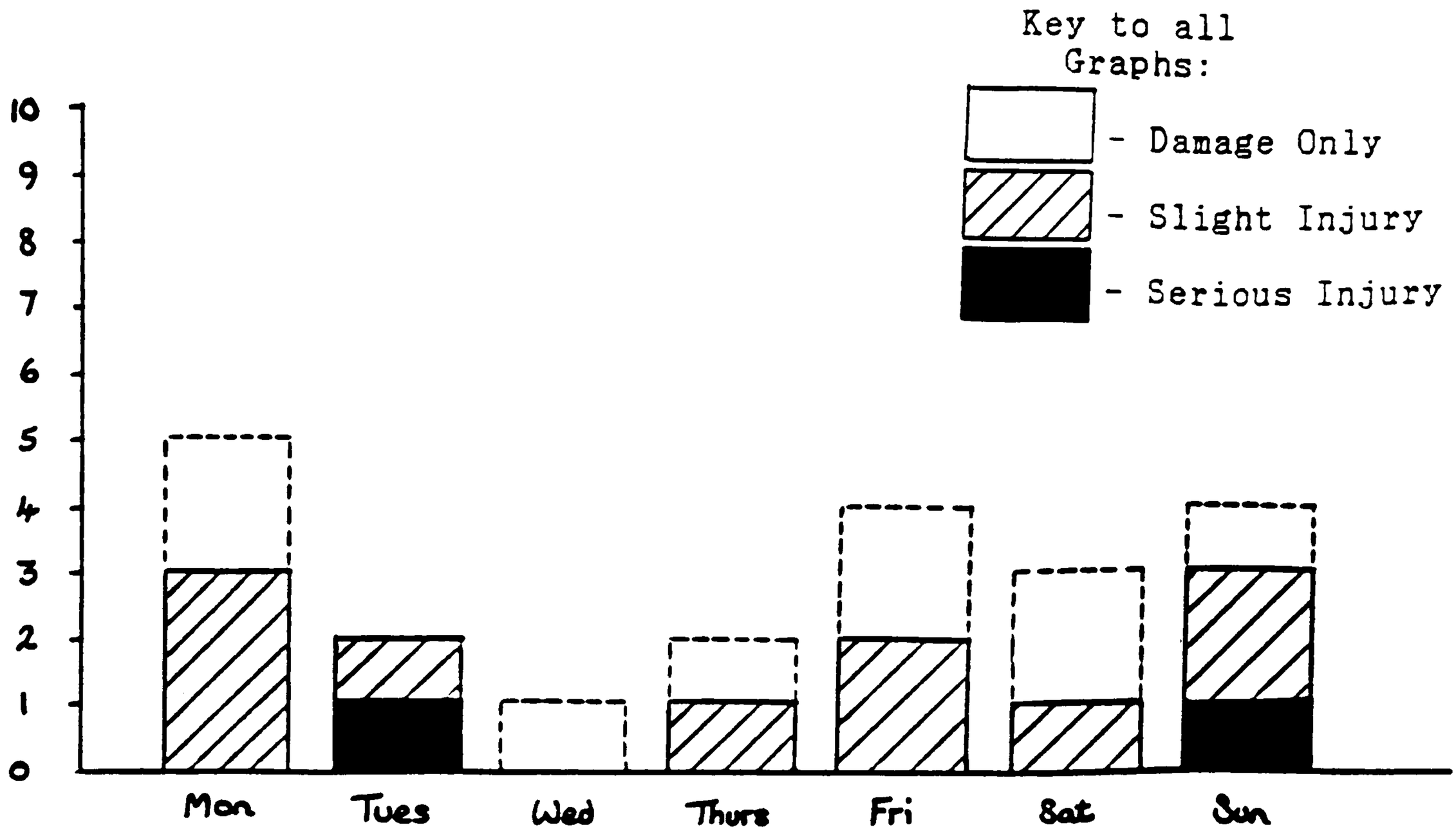

Figure E.11: Daily Distribution of Accidents - Site 3

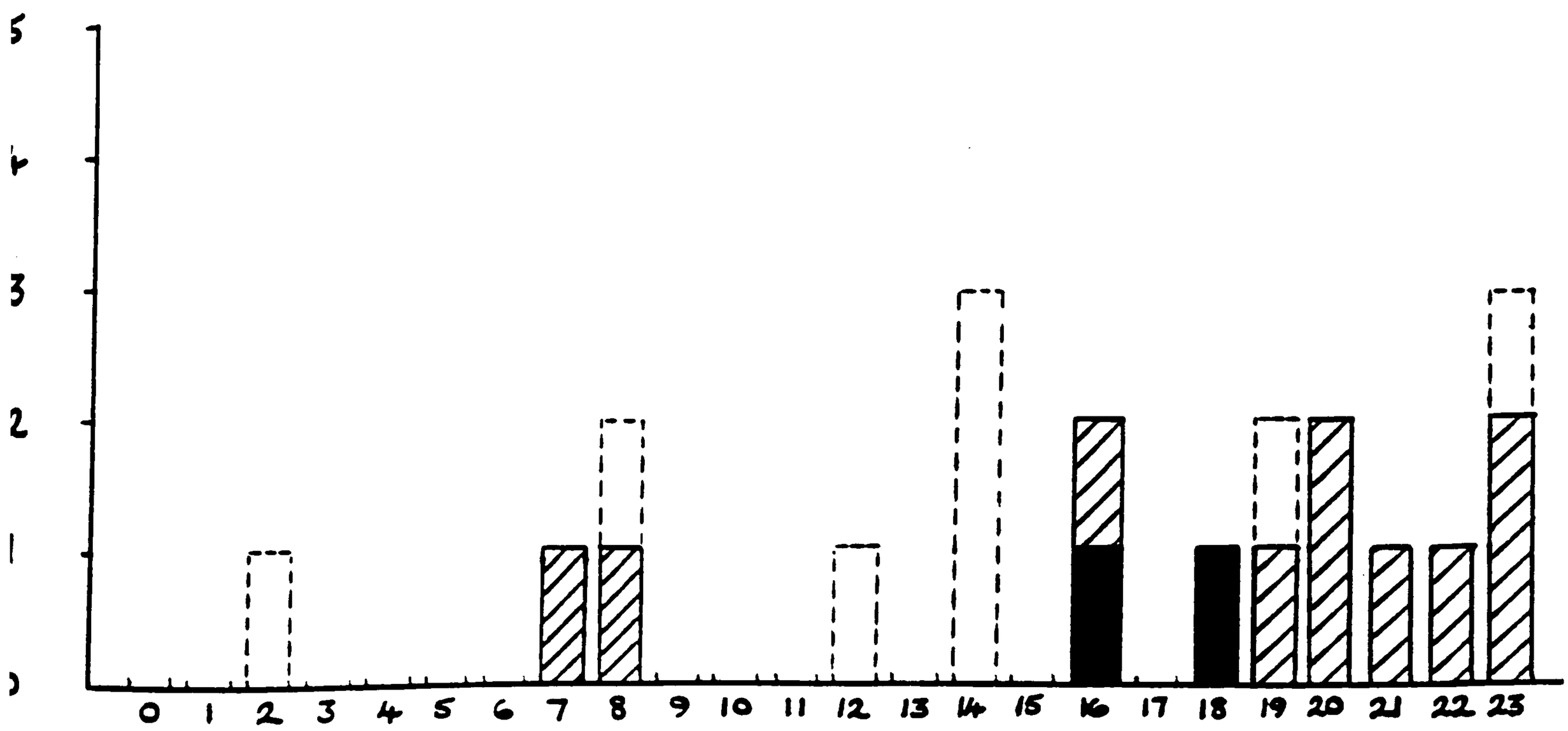

Figure E.12: Hourly Distribution of Accidents - Site 3

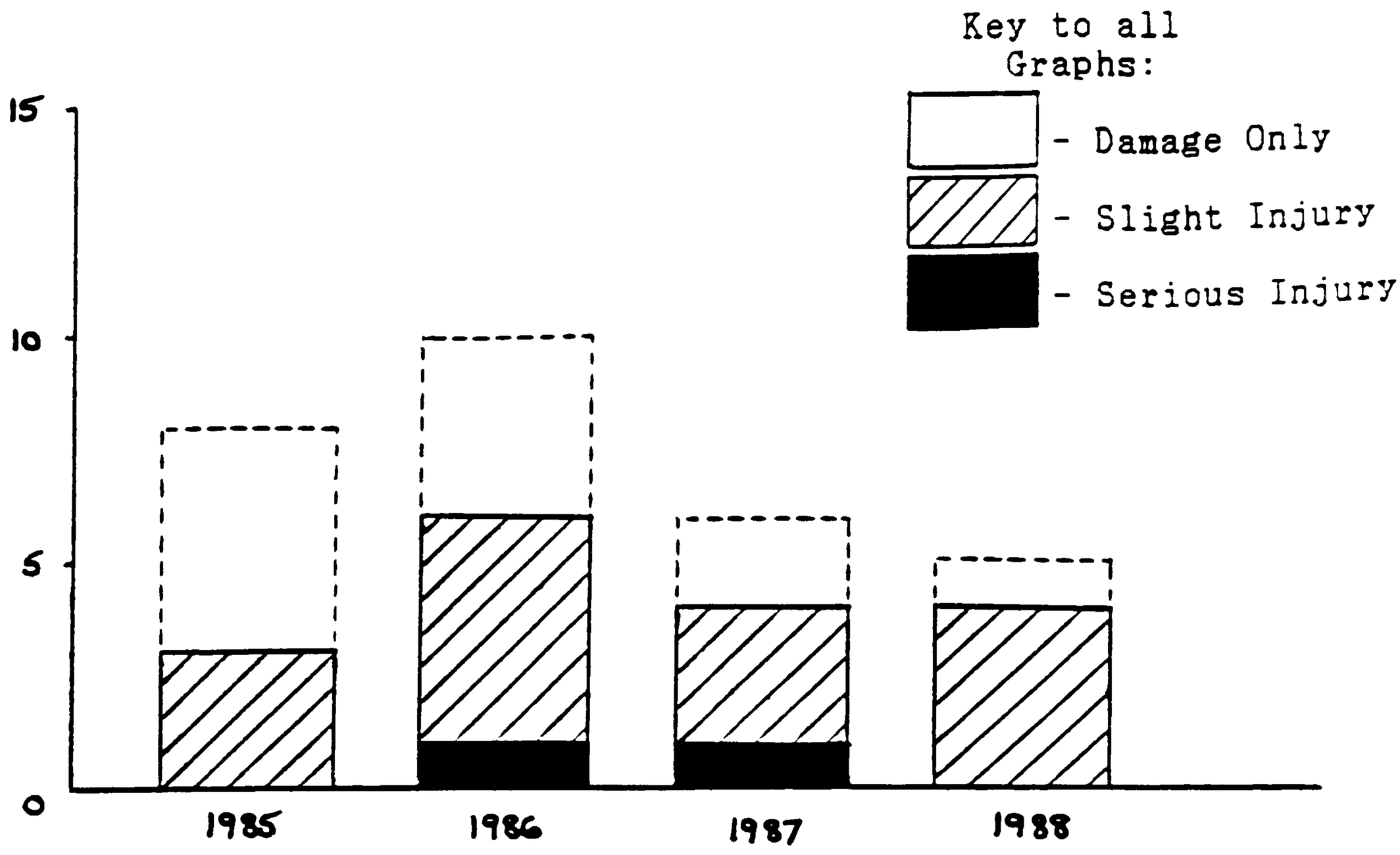

Figure E.13: Yearly Distribution of Accidents - Site 4

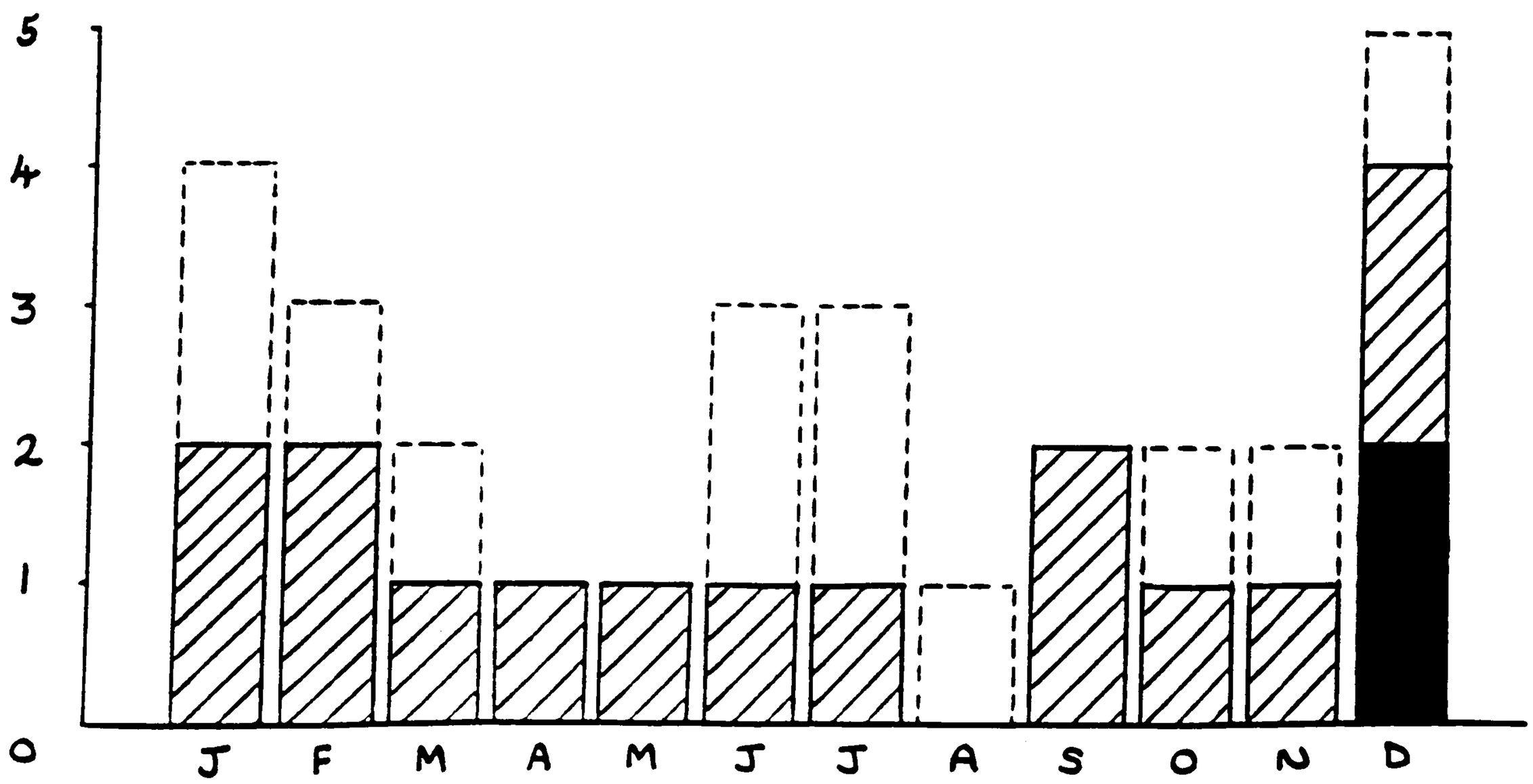

Figure E.14: Monthly Distribution of Accidents - Site 4

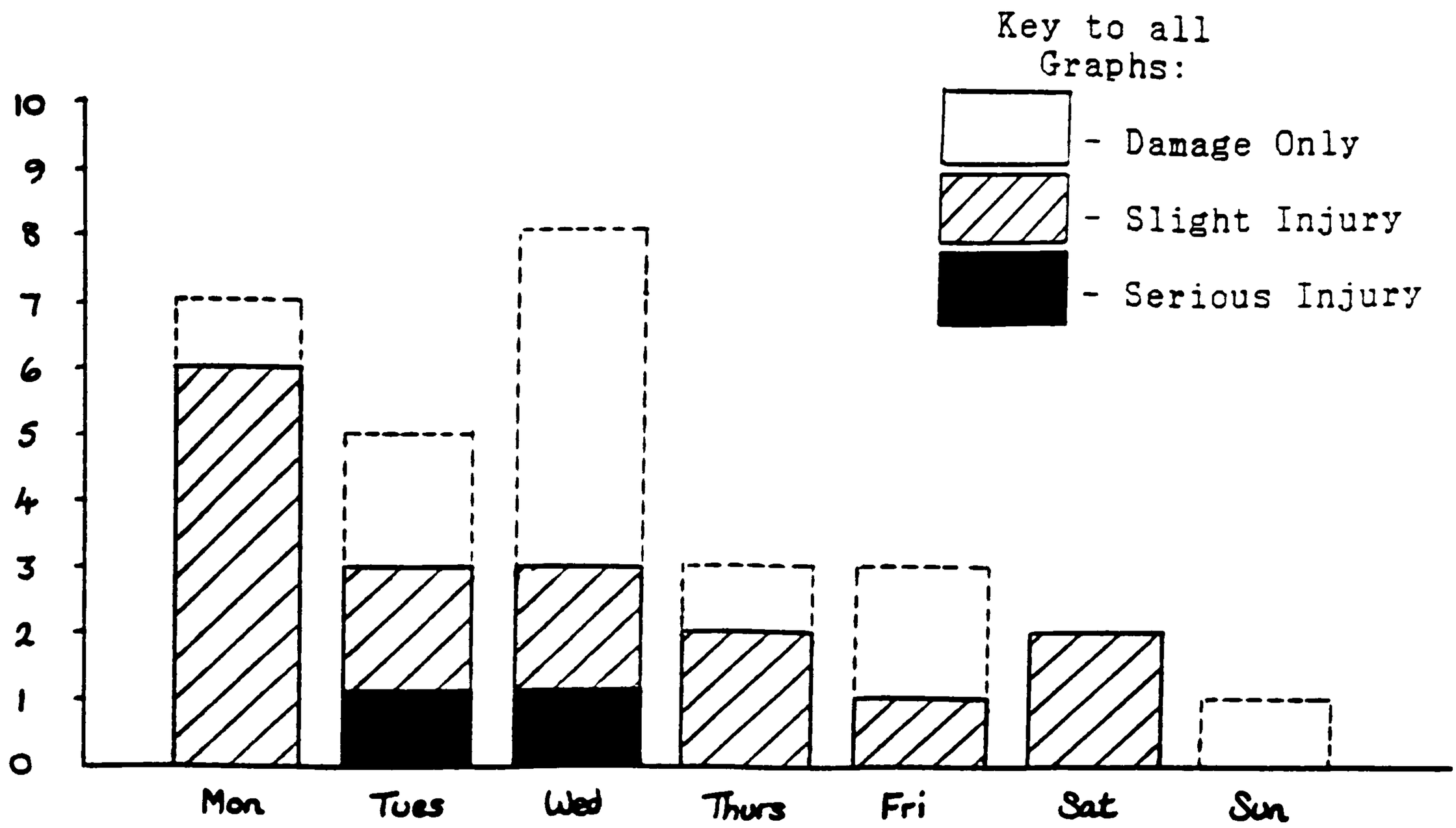

Figure E.15: Daily Distribution of Accidents - Site 4

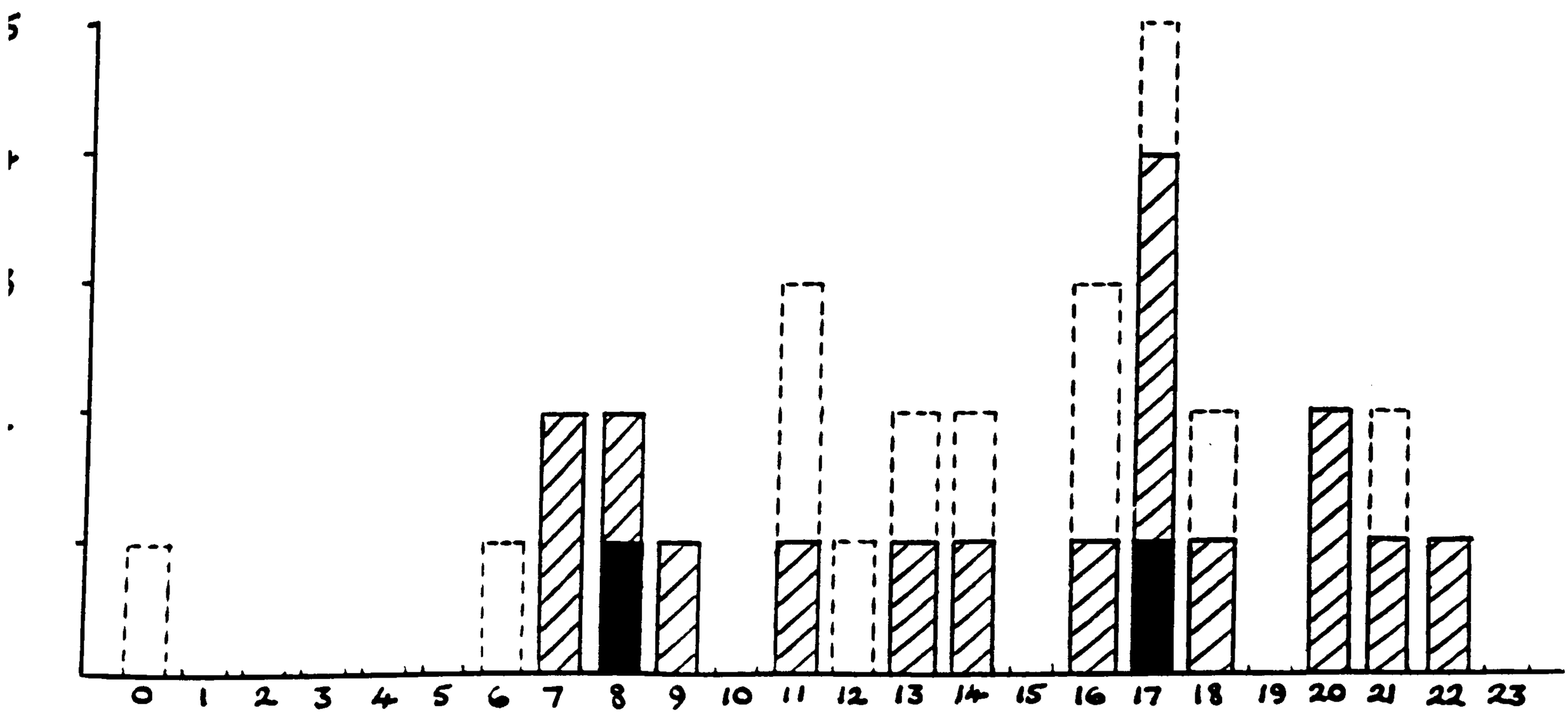

Figure E.16: Hourly Distribution of Accidents - Site 4

APPENDIX F:

Filming Sequence for the Observation Study

FILMING SEQUENCE FOR ALL SITES

Table F.1 (over) shows the order in which the entrance roads were filmed during each of the 5 time periods for all 4 sites. The numbers refer to the following entrance roads, denoted by the direction travelled from:

1 - North
2 - East
3 - South
4 - West

The exceptions to this concerns the Bishopstone and Bletchley sites (1 & 4).

For Site 1:

1 - North-East
2 - South-East
3 - South-West
4 - North-West

For Site 4:

1 - for vehicles coming from the North along V4 and turning left (via the slip road) to travel East along V6;

2 - for vehicles travelling along the V6, turning into the V4;

3 - for vehicles travelling North along the V4;

4 - for vehicles travelling from V6, turning right into V4 via the slip road.

Table F.1: Entrance Road Filming Sequences

Time Period:	Order:	Site No: 1	2	3	4
1	1	1	3	2	2
	2	3	1	1	1
	3	4	2	3	4
	4	2	4	4	3
2	5	2	2	3	2
	6	4	1	1	4
	7	3	3	4	1
	8	1	4	2	3
3	9	3	4	4	1
	10	1	3	3	3
	11	2	2	2	4
	12	4	1	1	2
4	13	4	1	1	3
	14	2	4	2	4
	15	1	3	4	2
	16	3	2	3	1
5	17	2	4	2	3
	18	1	2	4	2
	19	4	1	3	1
	20	3	3	1	4

APPENDIX G:

Tests of Inter & Intra-Rater Reliability for Observation Study Variables

TESTS OF INTER AND INTRA-RATER RELIABILITY FOR STUDY 1

As previously noted (in Section 2.6.1), observation studies should employ some method of assessing the reliability of the coding of the observations. For variables which have continuous data, straightforward regression tests may be used. Alternatively, a formula for calculating the reliability of two sets of ratings of categorical data was developed by Cohen (1960). Cohen's Kappa for a variable with *i* categories is given by:

$$K = \frac{N.\sum_i x_{ii} - \sum_i x_{i+}.x_{+i}}{N^2 - \sum_i x_{i+}.x_{+i}}$$

Where: N = the number of events/subjects observed;
x_{ii} = the number of agreements about category i;
x_{i+} = the number of times observer 1 used category i;
x_{+i} = the number of times observer 2 used category i.

A Kappa value of 1.00 indicates that there is perfect agreement between the two raters whilst a value of 0.00 indicates perfect disagreement. For the purposes of the current study it was felt that a Kappa value of 0.90 or greater represented an acceptable level of agreement.

Throughout this section the following abbreviations are used:

R1 - Rater 1;
R2 - Rater 2.

The figures in brackets refer to the rating session. For example, R1(2) refers to the second occasion on which the first observer rated the variables.

The first two tables in this section refer to the reliability tests carried out before the analysis of the videos. Additional tests were performed at a point roughly half-way through the analysis and again upon its completion and these are described towards the end of this section.

The only variables that were continuous in nature were those recording times - these 14 variables were subjected to regression tests and the results are shown in Table G.1 (over).

Table G.1: Values of r for Continuous Variables for Two Raters

Variable	Rater & Rating Session							
	R1(1) & R1(2)	R1 (2) & R1 (3)	R2(1) & R2(2)	R2(2) & R2(3)	R1(3) & R2(3)	R1(3) & R1(4)	R2(3) & R2(4)	R1(4) & R2(4)
9	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
10	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
11	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
12	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
13	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
14	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
15	0.750	0.912	0.548	0.903	0.486	0.998	0.903	0.955
17	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
18	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
20	0.803	0.907	0.907	1.000	0.803	0.907	1.000	0.907
21	0.906	0.905	0.527	0.898	0.906	0.906	0.904	1.000
22	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
23	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
30	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
31	0.887	1.000	0.771	0.915	0.915	1.000	0.902	0.960
32	0.649	1.000	0.259	0.467	0.332	0.986	0.944	0.903
35	0.713	1.000	0.887	1.000	0.713	0.998	1.000	1.000
36	0.659	0.893	0.756	0.677	0.659	0.722	0.793	0.885
37	1.000	1.000	0.500	1.000	1.000	1.000	1.000	1.000
38	0.857	0.774	0.401	1.000	0.857	0.957	1.000	1.000
39	0.668	0.835	0.722	0.614	0.668	1.000	0.988	0.922

From the above table it can be seen that, after the second rating session, there was satisfactory agreement for rater 1 on all bar three variables: 36 (DENSE2); 38 (DENSE4); and 39 (DENSE5). At the same stage, rater 2 had not achieved the required level of agreement on four variables: 21 (QUEUE2); 32 (TIMEOUT); 36 (DENSE2); and 39 (DENSE5). After an additional rating session, only variable 36 had not attained the required level of agreement, this being true for both raters.

Tests for inter-rater reliability were carried out after the third and fourth rating sessions. Only variables 15 (TEMPO6), 20 (QUEUE1), 32 (TIMEOUT), 35 (DENSE1), 36 (DENSE2), 38 (DENSE4) and 39 (DENSE5) had values less than 0.9 after the first inter-rater test (between the third set of ratings for each rater). However, the second comparison between the two raters revealed that all variables bar DENSE2 had passed the 0.9 criterion. However, it was decided that a value of 0.885 was acceptable as the original criterion of 0.9 was particularly high.

The remaining variables were all categorical and therefore were compared using Cohen's Kappa. Table G.2 (over) shows the values of Kappa obtained for these variables over four rating sessions, calculating the level of agreement for rater 1 and rater 2 as well as between the two raters.

Table G.2: Values of Kappa for Categorical Variables for Two Raters

Variable	Rater & Rating Session							
	R1(1) & R1(2)	R1 (2) & R1 (3)	R2(1) & R2(2)	R2(2) & R2(3)	R1(3) & R2(3)	R1(3) & R1(4)	R2(3) & R2(4)	R1(4) & R2(4)
7	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
16	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
19	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
24	1.000	1.000	0.906	1.000	1.000	1.000	1.000	1.000
25	1.000	1.000	0.906	1.000	1.000	1.000	1.000	1.000
26	1.000	1.000	0.906	1.000	1.000	1.000	1.000	1.000
27	1.000	1.000	0.906	1.000	1.000	1.000	1.000	1.000
28	1.000	1.000	0.906	1.000	1.000	1.000	1.000	1.000
29	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
33	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
34	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
41	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
42	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
43	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
44	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
45	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
47	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

From Table G.2 it can be seen that all comparisons produced perfect agreements for all variables, other than the inter-rater comparison after the third rating session in which five variables (24 to 28 inclusive) all obtained values of 0.906. However, these had been transformed to Kappa scores of 1.00 in the second inter-rater comparisons.

The following tables describe the reliability tests that were carried out during and after the main coding of the videos to enable the level of reliability to be maintained throughout the whole analysis. Table G.3 (over) gives the 'r' values for the continuous variables for both additional rating sessions.

From Table G.3 it can be seen that both raters maintained a high level of agreement throughout the sessions with only variable 36 (DENSE2) below the 0.9 criterion in the mid-analysis session. Once again, both values were very close to 0.9 and these were accepted. For the inter-rater test, an additional variable, 32 (DENSE5), also failed to make the level, but the value achieved also neared the criterion.

The situation for the post-analysis session showed an overall improvement with rater 2 achieving the criterion on all variables. Rater 1 only just failed to reach 0.9 for variable 31 (TIMEMOVE) and the inter-rater test showed an identical result. Overall, it can be said that the raters maintained a very high level of reliability on the continuous variables.

Table G.3: Values of r for Continuous Variables for Two Raters

	Rater & Rating Session					
	Mid-Analysis Rating Session			Post-Analysis Rating Session		
Variable	R1(4) & R1(5)	R2 (4) & R2 (5)	R1(5) & R2(5)	R1(5) & R1(6)	R2(5) & R2(6)	R1(6) & R2(6)
9	1.000	1.000	1.000	1.000	1.000	1.000
10	1.000	1.000	1.000	1.000	1.000	1.000
11	1.000	1.000	1.000	1.000	1.000	1.000
12	1.000	1.000	0.985	1.000	1.000	1.000
13	1.000	1.000	1.000	1.000	1.000	1.000
14	1.000	1.000	1.000	1.000	1.000	1.000
15	0.966	1.000	0.988	1.000	1.000	0.905
17	1.000	1.000	1.000	1.000	1.000	1.000
18	1.000	1.000	1.000	1.000	1.000	1.000
20	1.000	0.906	0.907	0.901	1.000	0.907
21	1.000	1.000	1.000	1.000	1.000	1.000
22	1.000	1.000	1.000	1.000	1.000	1.000
23	1.000	1.000	1.000	1.000	1.000	1.000
30	1.000	1.000	1.000	1.000	1.000	1.000
31	0.907	0.900	0.900	0.898	0.900	0.898
32	0.907	0.911	0.888	1.000	1.000	0.906
35	1.000	1.000	1.000	1.000	1.000	1.000
36	0.864	0.885	0.844	1.000	0.946	1.000
37	1.000	1.000	1.000	1.000	1.000	1.000
38	1.000	1.000	1.000	1.000	1.000	1.000
39	0.985	1.000	1.000	1.000	1.000	0.985

The situation for the categorical variables is outlined in Table G.4 (over).

The table reveals perfect agreement for both raters individually and when in comparison with one another. Therefore, an extremely high level of agreement was maintained throughout the analysis.

Table G.4: Values of Kappa for Categorical Variables for Two Raters

	Rater & Rating Session					
	Mid-Analysis Rating Session			Post-Analysis Rating Session		
Variable	R1(4) & R1(5)	R2 (4) & R2 (5)	R1(5) & R2(5)	R1(5) & R1(6)	R2(5) & R2(6)	R1(6) & R2(6)
7	1.000	1.000	1.000	1.000	1.000	1.000
16	1.000	1.000	1.000	1.000	1.000	1.000
19	1.000	1.000	1.000	1.000	1.000	1.000
24	1.000	1.000	1.000	1.000	1.000	1.000
25	1.000	1.000	1.000	1.000	1.000	1.000
26	1.000	1.000	1.000	1.000	1.000	1.000
27	1.000	1.000	1.000	1.000	1.000	1.000
28	1.000	1.000	1.000	1.000	1.000	1.000
29	1.000	1.000	1.000	1.000	1.000	1.000
33	1.000	1.000	1.000	1.000	1.000	1.000
34	1.000	1.000	1.000	1.000	1.000	1.000
41	1.000	1.000	1.000	1.000	1.000	1.000
42	1.000	1.000	1.000	1.000	1.000	1.000
43	1.000	1.000	1.000	1.000	1.000	1.000
44	1.000	1.000	1.000	1.000	1.000	1.000
45	1.000	1.000	1.000	1.000	1.000	1.000
47	1.000	1.000	1.000	1.000	1.000	1.000

APPENDIX H:

Coding Sheet used for Video Analysis

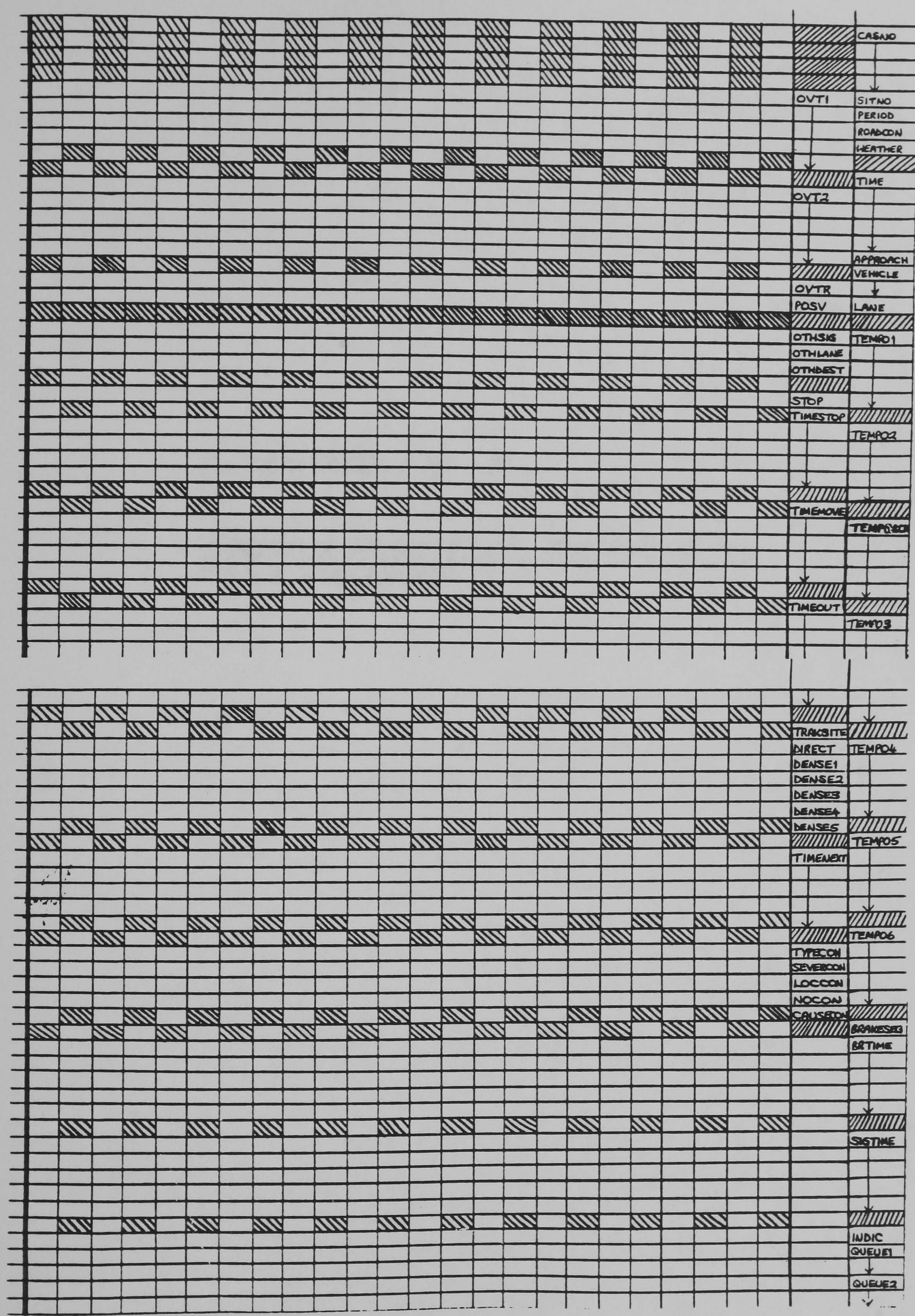

Figure H.1: Copy of Coding Sheet used to Analyse Video Recordings

APPENDIX I:

Complete Descriptive Statistics for all 4 Junctions

FULL DESCRIPTIVE STATISTICS FOR ALL SITES

I.1: DESCRIPTIVE STATISTICS - SITE 1

I.1.1: Number of Vehicles Per Entrance Lane/Road and Time Period - Site 1

Table I.1 (below) reveals the total number of vehicles that approached the junction from each direction in each time period. The figures in brackets are the row percentages which detail the proportion of vehicles using each entrance road per time period.

Table I.1: Distribution of Vehicles Using Each Entrance Road for all Time Periods - Site 1

	Approach Road				
Time Period	North-East	South-East	South-West	North-West	TOTAL
8.00-9.00	24 (23.5)	17 (16.6)	56 (54.9)	5 (4.9)	102
10.30-11.30	18 (35.3)	6 (11.8)	22 (43.1)	5 (9.8)	51
12.30-13.30	30 (44.8)	8 (11.9)	24 (35.8)	5 (7.5)	67
14.30-15.30	24 (35.8)	13 (19.4)	23 (34.3)	7 (10.4)	67
17.00-18.00	44 (43.6)	22 (21.8)	29 (28.7)	6 (5.9)	101
TOTAL	140 (36.1)	66 (17.0)	154 (39.7)	28 (7.2)	388

Clearly the two major road approaches account for the vast majority (over 75%) of examples. It is perhaps interesting to note that proportionally more drivers than might be expected travel from the South-West in the morning peak period, the situation being reversed to some extent for the evening peak period. The minor road entrance from the North-West accounted for a very small number of vehicles, only just over 7% overall, whilst the equivalent entrance road from the South-East was used more often, accounting for 17% of the total number of vehicles at the site.

I.1.2: Approach Speeds and Following Times for all Entrances and Time Periods - Site 1

As already noted in the previous section, the approach speeds of vehicles at each of the entrance roads may be able to explain many of the errors. Table I.2 (below) shows the all five mean approach speeds for each entrance road along with the proportion of following times that were below both the three and two second thresholds. It may be remembered that SPEED1 refers to the segment furthest away from the junction, SPEED5 the one closest to the junction for the minor road approaches (South-East and North-West), and on the exit from the site for the major road approaches. For each speed, the first figure in brackets is the standard deviation, the second the total number of observations. The approach speeds for each of the different types of vehicle classes (not including vehicles which had to queue to progress onto/through the junction) can be found in Appendix N.

Table I.2: Mean and Standard Deviation of the Five Approach Speeds and Proportion of Following Times Under Three Seconds for each Entrance of Site 1

	Approach Road			
MEAN SPEEDS:	North-East	South-East	South-West	North-West
SPEED1	31.06 (10.18) (139)	24.92 (7.49) (65)	27.59 (10.27) (153)	23.54 (5.93) (28)
SPEED2	37.19 (12.80) (139)	21.53 (10.74) (66)	33.00 (11.05) (152)	22.09 (6.06) (28)
SPEED3	40.52 (12.17) (124)	20.64 (7.65) (66)	34.93 (13.46) (140)	22.05 (10.16) (28)
SPEED4	40.63 (9.33) (119)	18.80 (10.08) (66)	37.89 (13.57) (118)	20.27 (8.32) (27)
SPEED5	41.85 (10.88) (118)	10.60 (4.42) (66)	40.21 (13.28) (118)	11.48 (5.30) (27)
% Following Times Below 3 Seconds	24.2 (132)	31.1 (61)	42.9 (147)	4.3 (23)
% Following Times Below 2 Seconds	19.7 (132)	23.0 (61)	29.9 (147)	0.0 (23)

The first thing that should be explained about this set of figures is the apparent erratic sequence of approach speeds of vehicles coming from the North-East and South-West. These figures are confounded by the inclusion of the figures for vehicles turning off the major road for which speeds beyond SPEED3 (and often SPEED2) could not be recorded (hence the reduced sample size for SPEED3 onwards). The approaches for the other two entrances both show a reasonably steady deceleration, graphic representations of which can be seen in Appendix N, which also contains full details of approach speeds in each time period. The proportion of following times under three seconds to those over three seconds are quite revealing in that vehicles travelling from the South-West close-followed more often (42.9%) than vehicles from other directions. In contrast, only just under 5% of those approaching from the North-West were involved in such incidents. For all entrances, 31.7% of following times were less than three seconds whilst 23.1% were less than two seconds.

When analysed by vehicle class (see Appendix N), the approach speeds for this site reveal that buses and motorcycles had the highest series of speeds, although it should be noted that there was only one example of each vehicle class that did not have to queue at the site. Cars and light goods vehicles showed the same approach speed pattern on their passage through the junction and, when the distorting factors outlined above are considered, had an mean passage speed of around 35 mph (almost exclusively made up of figures from vehicles travelling North-South and vice versa).

I.1.3: Incidence of Correct/Incorrect Signalling for all Entrances - Site 1

Possibly one of the most important aspects of a vehicle's negotiation of a junction is the message about the driver's intentions passed on to other drivers through the direction indicators. Table I.3 (over) shows the number of drivers using each approach road that gave each type of indication (left, right or none at all) on the approach to the junction. It has already been pointed out in the previous chapter that it was unfortunately not possible to record drivers' leaving signals in addition to these entrance signals. It should be noted that 'L&R' refers to drivers who gave a left signal immediately followed by a right signal - strictly the correct way to travel from one minor road to the other at this junction (a staggered crossroads). In addition, the first column shows the actual direction of the vehicle. The asterisks mark the categories in which the indication given correctly matches the destination of the vehicle.

Table I.3: Indicating Behaviour of Drivers at Site 1

Direction:	Indication:	Approach Road: North-East	South-East	South-West	North-West	TOTAL
Left	None	2	12	0	3	17
	Left	10*	16*	3*	1*	30
	Right	0	0	0	0	0
	L & R	0	0	0	0	0
Straight Ahead	None	119*	17	117*	12	265
	Left	0	4	3	4	11
	Right	1	0	0	2	3
	L & R	0	2*	0	2*	4
Right	None	3	3	2	1	9
	Left	0	0	1	0	1
	Right	5*	12*	28*	3*	48
	L & R	0	0	0	0	0
TOTAL		140	66	154	28	388
% Correct Signalling		(95.7)	(45.5)	(96.1)	(21.4)	(82.0)

The percentage of correct signalling overall is 82.0 (N=388), for vehicle turning left (regardless of the approach) the correct figure is 63.8% (N=47), for vehicles turning right 82.8%, and for vehicles travelling straight ahead the percentage correct figure is 84.8 (N=58). Clearly, the main problem lies with vehicles turning left. This is particularly true for vehicles turning from a minor into a major road, where only just over half of the drivers (53.1%) gave the correct signal, the remaining drivers failing to give any signal. Right turns were generally much better indicated, with the rather strange single case of a driver signalling left when turning from the major road into the minor road leading to the South-East.

The figures for vehicles travelling straight ahead require some explanation. For the North-East and South-West entrances, this is very straightforward as these vehicles are continuing along a main road and therefore no signal is necessary (although four drivers still managed to give one). For drivers wishing to travel from one minor road to the one (almost) opposite, the case is different as mentioned above. Only 4 out of 43 (9.3%) gave the correct sequence of signals, the vast majority (67.4%) gave no signal at all, while 18.6% (8) omitted the second signal.

I.1.4: Site Negotiation for all Entrances - Site 1

Another important aspect of junction negotiation is the actual path that vehicles use to cross the junction. For the purposes of this section, a vehicle's tracking was classed in one of two ways - correct or incorrect. In other words, whether the driver followed the accepted procedure, sticking to the lanes (where present) and not encroaching on any unnecessary territory. Table I.4 (below) shows the incidence of correct tracking for each entrance when all time periods were combined.

Table I.4: Incidence of Correct and Incorrect Junction Negotiation for Site 1

		Approach Road				
Direction	Tracking	North-East	South-East	South-West	North-West	TOTAL
Left	Correct	12	28	3	4	47
	Incorrect	0	0	0	0	0
Straight Across	Correct	120	22	120	11	273
	Incorrect	0	1	0	9	10
Right	Correct	3	15	24	4	46
	Incorrect	5	0	7	0	12
TOTAL	Correct	135	65	157	19	366
	Incorrect	5	1	7	9	22
Overall Total		140	66	154	28	388
% correct		(96.4)	(98.5)	(98.1)	(67.9)	(94.3)

The overall incidence of correct tracking was very high (94.3%) with all but the North-West entrance having over 95% correct tracking. All left turning manoeuvres were executed correctly, whilst a mere 10 (3.5%) drivers going across the junction did so incorrectly. Not surprisingly, these manoeuvres were all performed by drivers going from one minor road to the other (9 from North-West to South-East, 1 from South-East to North-West), cutting across the main road. Right turns were the least well executed with 79.3% of drivers using an incorrect tracking manoeuvre. In fact, over half (62.5%) of drivers travelling from the North-East, turning west, made this error. The remaining right turn errors were made by drivers turning South-East, having approached the junction from the South-West. In other words, this example of incorrect tracking was only performed by drivers leaving the main road by turning into a minor road. As far as time periods are concerned, the morning and evening peak periods had the highest proportion of correct manoeuvres (both around 97%), with only the afternoon off-peak period scoring less than 90% (88.1%).

I.1.5: Type and Distribution of Traffic Conflicts - Site 1

The table below (I.5) summarises the conflicts at Site 1 by combining the data from the five time periods (the full details can be found in Appendix M).

Table I.5: Traffic Conflicts at Site 1 - Summary Table

	Entrance				
Conflict Category	North-East	South-East	South-West	North-West	TOTAL
1	0	8	0	4	12
2	0	0	0	0	0
3	1	1	5	0	7
4	0	2	0	0	2
5	0	0	0	0	0
6	0	0	0	0	0
7	0	0	0	0	0
TOTAL	1	11	5	4	21

The previous table reveals that 12 of the 21 (57.1%) of conflicts were of the first category - left-turn conflicts. Not surprisingly, all of these conflicts happened to vehicles approaching from minor roads and hence turning into the major road. Of the second class of conflict, over half (55.6%) occurred on the approach from the South-West. The only minor road producing any of these conflicts was the South-East entrance, where 3 (33.3%) of these incidents occurred, 2 of which actually took place after the study vehicle had entered the junction.

The time period producing most conflicts per total number of vehicles was the lunchtime period, during which 9% of vehicles were involved in some form of conflict. The two morning periods were each responsible for the lowest conflict/non-conflict ratio (3.9% of passages resulting in a conflict), with the afternoon and evening periods falling somewhere in between (4.5% and 5.9% respectively).

I.2: DESCRIPTIVE STATISTICS - SITE 2

I.2.1 Number of Vehicles Per Entrance Lane/Road and Time Period - Site 2

Table I.6 (below) shows the total number of vehicles observed at Site 2 in each of the time periods for each entrance road and lane. In all cases, the lane numbered 1 refers to the inside lane. Lane 3 is the one next to the inside lane, in many cases this is also the outside lane. A value of 2 indicates that the vehicle in question was straddling the lane dividing line. The only exception to this was for the East approach where there was only strictly one entrance lane, although at peak times drivers often forced a dummy lane by approaching with half of their vehicle on the opposite carriageway. At the 'Give Way' line, there was just enough room to allow two vehicles to wait to enter the site adjacently and it was for these vehicles that a value of 2 was assigned. In the case of the West entrance, 5 refers to the outside of three lanes, 4 being used for occasions on which a vehicle straddled this and the middle lane. The row percentages in brackets are the proportion of the total number of vehicles during one time period using each entrance lane.

Table I.6: Distribution of Vehicles Entering Site 2

	Entrance													
	North			East		South			West					
	1	2	3	1	2	1	2	3	1	2	3	4	5	TOTAL
8.00-	35	0	14	50	18	32	0	7	55	1	83	1	59	355
9.00	(9.9)	(0)	(3.9)	(14.1)	(5.1)	(9.0)	(0)	(2.0)	(15.5)	(0.3)	(23.4)	(0.3)	(16.6)	
10.30-	34	0	11	26	0	29	0	6	20	0	23	1	12	162
11.30	(21.0)	(0)	(6.8)	(16.0)	(0)	(17.9)	(0)	(3.7)	(12.3)	(0)	(14.2)	(0.6)	(7.4)	
12.30-	47	0	26	52	0	44	0	10	44	0	27	2	11	263
13.30	(17.9)	(0)	(9.9)	(19.8)	(0)	(16.7)	(0)	(3.8)	(16.7)	(0)	(10.3)	(0.8)	(4.2)	
14.30-	31	0	11	31	0	19	0	8	21	0	12	0	13	146
15.30	(21.2)	(0)	(7.5)	(21.2)	(0)	(13.0)	(0)	(5.5)	(14.4)	(0)	(8.2)	(0)	(8.9)	
17.00-	66	0	26	60	0	54	0	11	37	0	24	0	10	288
18.00	(22.9)	(0)	(9.0)	(20.8)	(0)	(18.8)	(0)	(3.8)	(12.8)	(0)	(8.3)	(0)	(3.5)	
TOTAL	213	0	88	219	18	178	0	42	177	1	169	4	105	1214
	(17.5)	(0)	(7.2)	(18.0)	(1.5)	(14.7)	(0)	(3.5)	(14.6)	(0.1)	(13.9)	(0.3)	(8.6)	
Overall % for all lanes of entrance		24.7			19.5		18.2				37.5			

The type of approach favoured by 18 drivers at the East entrance was only observed during the morning peak period, when considerably more vehicles used the site overall than at any other time. The morning period also accounted for many more drivers approaching from the West in the outside lane. In fact, an extremely large number of vehicles were seen to use this entrance during this time period. Of all the vehicles observed during the morning peak period, 56.1% of them approached from the West. This had diminished to 24.6% for the evening peak, during which time the proportion of drivers using the North approach was 31.9% (from 13.8 during the morning).

I.2.2 Approach Speeds and Following Times for all Entrances and Time Periods - Site 2

Table I.7 (below and over) gives the mean approach speeds and proportion of following times under three and under two seconds for all vehicles using each entrance lane. The full breakdown of speeds for the various time periods and for each vehicle class (for non-queuing vehicles only) can be found by referring to Appendix M. The standard deviations and number of cases are given in brackets for each mean speed quoted.

Table I.7: Mean Approach Speeds and Proportion of Following Times Under Three & Two Seconds for Vehicles at Site 2

	Entrance												
	North			East		South			West				
MEAN SPEED:	1	2	3	1	2	1	2	3	1	2	3	4	5
SPEED1	30.33	-	36.33	24.69	18.45	30.84	-	36.70	25.97	43.28	28.55	31.59	33.85
	(5.38)		(5.29)	(9.32)	(9.32)	(6.89)		(6.30)	(9.39)	-	(11.46)	(3.94)	(12.35)
	(212)		(88)	(210)	(18)	(176)		(41)	(177)	(1)	(164)	(4)	(104)
SPEED2	26.68	-	33.58	24.13	20.45	30.27	-	32.39	24.42	30.40	26.55	28.97	28.36
	(5.91)		(7.21)	(13.17)	(10.62)	(6.90)		(7.05)	(4.39)	-	(4.72)	(2.34)	(4.22)
	(212)		(87)	(212)	(18)	(177)		(41)	(176)	(1)	(163)	(4)	(105)
SPEED3	23.85	-	31.07	22.84	20.62	27.07	-	32.11	22.98	29.14	24.86	24.90	25.91
	(4.60)		(6.56)	(12.03)	(6.18)	(5.77)		(5.31)	(5.67)	-	(6.48)	(6.33)	(5.05)
	(212)		(87)	(213)	(18)	(175)		(41)	(175)	(1)	(160)	(4)	(105)
SPEED4	23.76	-	28.83	20.30	17.86	21.35	-	28.94	21.61	23.27	20.28	25.22	24.65
	(5.71)		(6.36)	(11.42)	(6.74)	(4.58)		(5.57)	(6.71)	-	(5.75)	(5.17)	(6.27)
	(212)		(88)	(214)	(18)	(176)		(41)	(173)	(1)	(160)	(4)	(105)
SPEED5	20.86	-	22.73	16.54	9.50	15.50	-	21.61	17.69	23.42	18.64	21.50	24.28
	(19.26)		(15.78)	(12.93)	(6.46)	(12.05)		(9.78)	(15.12)	-	(11.93)	(4.90)	(8.59)
	(207)		(87)	(208)	(18)	(178)		(41)	(173)	(1)	(157)	(4)	(105)

(cont. over)

Table I.7: Mean Approach Speeds and Proportion of Following Times Under Three Seconds for Vehicles at Site 2 (cont.)

	Entrance												
	North			East		South			West				
	1	2	3	1	2	1	2	3	1	2	3	4	5
% Following Times Below 3 Secs	38.6 (207)	-	25.3 (83)	49.3 (209)	33.3 (18)	37.6 (170)	-	8.5 (35)	31.4 (172)	0.0 (1)	45.9 (159)	33.3 (3)	28.7 (101)
% Following Times Below 2 Secs	26.1 (207)	-	21.7 (83)	33.5 (209)	5.6 (18)	23.5 (170)	-	2.9 (35)	19.8 (172)	0.0 (1)	30.8 (159)	0.0 (3)	18.8 (101)

From the previous table, it can be seen that, in the vast majority of cases, the mean approach speeds gradually diminish as the vehicles near the junction. Also of note is the fact that in all cases the mean speed of vehicles approaching in the outside lane is always greater than the equivalent speeds for vehicles in nearside lanes. The only real exception to this occurs at the West entrance where the highest mean speed of vehicles was observed in lane 2 (ie. straddling the line between the inside and middle lanes). However, this is unlikely to be a representative result as there was only one example of a vehicle travelling in this lane. The following time figures reveal that the inside lanes of all entrance roads had a higher rate of close following (using times under three seconds as a criterion) than their respective outside lanes, although the middle lane of the West entrance had the highest rate of all. Overall, 37.5% of drivers followed the preceding vehicle with a gap of less than three seconds and 24.7% with a gap of under two seconds.

For cases in which the vehicles did not form a queue on approaching the junction, Table N.8 in Appendix N shows that the mean speeds for cars and light goods vehicles show a fairly uniform deceleration from around 30 to 20 miles per hour for the segment immediately prior to the 'Give Way' line. Heavy goods vehicles were generally slower than most other vehicle classes, and motorcycles and mopeds were the only vehicle types to show an increase in speed during the last approach segment.

I.2.3 Incidence of Correct/Incorrect Signalling for all Entrances - Site 2

One of the main problems with observing behaviour at a site as large as this roundabout was that some useful information was lost due to the limited range of the camera. In this case, the destination of many of the vehicles negotiating this site could not be determined.

The only exception to this was for vehicles turning left, this exit road always being in view. Table I.8 (below) shows the signalling displayed on the approach to the roundabout by drivers of vehicles turning left for all entrance roads. The asterisks indicate the correct combination of lane selection (assuming that drivers should approach in the inside lane if intending to turn left), signal given and exit taken. Following on, Table I.9 (below) shows the signals given by vehicles for which the destination was not known.

Table I.8: Indications of Drivers Turning Left at Site 2

		Entrance													
		North			East		South			West					
		1	2	3	1	2	1	2	3	1	2	3	4	5	TOTAL
Direction:	Indication:														
Left	None	12	0	1	28	0	42	0	0	38	0	0	0	0	121
	Left	13*	0	0	11*	0	16*	0	0	37*	0	1	0	1	79
	Right	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TOTAL		25	0	1	39	0	59	0	0	75	0	1	0	1	201
% Correct Signal & Position		(52.0)	(0)	(100)	(28.2)	(0)	(27.1)	(0)	(0)	(49.3)	(0)	(100)	(0)	(100)	(38.3)

Overall, 38.3% (N=201) of drivers gave the correct signal for turning left and only 3 such vehicles did not approach in the correct lane. The East and South entrances had the lowest proportion of correct signalling with over 70% of drivers failing to give any signal at all at both entrances. Drivers approaching from the North and West managed to give the appropriate signal on approximately 50% of occasions.

Table I.9: Indications of Drivers with Unknown Destination at Site 2

		Entrance													
		North			East		South			West					
Signal given	None	177	0	49	138	10	114	0	29	99	1	161	3	49	830
	Left	7	0	1	15	0	3	0	0	2	0	0	0	0	28
	Right	4	0	37	26	8	3	0	13	1	0	7	1	55	155
TOTAL		188	0	87	179	18	120	0	42	102	1	168	4	104	1013

Without having information about the destinations of these vehicles it is not possible to discuss the figures in the above table, and the information is presented merely to complete the details for Site 2.

I.2.4 Site Negotiation for all Entrances - Site 2

Table I.10 (below) shows the amount of correct junction tracking performed by drivers approaching from each direction at Site 2 over all five time periods. The figures for each entrance road are divided according to the exit taken by the vehicle. However, as has been explained previously (Section 4.4.3), much of this information was lost at this junction due to obscured vision. Therefore, the table below is divided into two halves, vehicles taking left hand turns (the only one that could be discerned) and those whose direction was unknown.

Table I.10: Incidence of Correct Tracking - Site 2

		Approach Road/Lane													
		North			East		South			West					TOTAL
		1	2	3	1	2	1	2	3	1	2	3	4	5	
Direction Tracking															
Left	Correct	25	0	1	39	0	57	0	0	73	0	1	0	1	197
	Incorrect	0	0	0	0	0	1	0	0	2	0	0	0	0	3
Unknown	Correct	169	0	86	172	16	112	0	41	90	1	158	2	98	945
	Incorrect	19	0	1	1	0	8	0	1	12	0	9	2	6	59
TOTAL	Correct	194	0	87	211	16	169	0	41	163	1	159	2	99	1142
	Incorrect	19	0	1	1	0	9	0	1	14	0	9	2	6	62
Overall Total		213	0	88	212	16	178	0	42	177	1	168	4	105	1204
% correct		(91.1)	(0)	(98.9)	(99.5)	(100)	(94.9)	(0)	(97.6)	(92.1)	(100)	(94.6)	(50)	(94.3)	(94.9)

The overall figure for correct negotiation at this site can be seen to be 94.9%, with drivers taking left turns scoring 98.5% correct, those whose direction was not known 94.1%. Only 3 (1.5%) of the left-turning drivers did not perform the manoeuvre correctly, two-thirds of these approaching the site from the Westerly direction (in the inside lane). For drivers whose destination was unknown, the two entrance lanes with the highest ratio of incorrect tracking were the inside lanes of the North and West entrances with 10.1% and 11.8% respectively.

Finally, the time period with the lowest rate of correct tracking was the morning off-peak period with 88.9% correct, all other periods produced at least 93% correct tracking. Unfortunately, little can be said about these figures without having information about the exit taken by these drivers.

I.2.5 Type and Distribution of Traffic Conflicts - Site 2

Table I.11 (below) summarises the traffic conflicts occurring at each lane of each entrance road at Site 2. The full details, when data for the five time periods are separated, can be found in Appendix M. The presentation is identical to the equivalent table for Site 1 earlier in this appendix.

Table I.11: Traffic Conflicts at Site 2 - Summary Table

	Entrance									
	North		East		South		West			TOTAL
Conflict Category:	1	3	1	2	1	3	1	3	5	
1	12	6	5	0	12	4	11	10	3	63
2	/	/	/	/	/	/	/	/	/	/
3	2	2	3	1	4	0	6	6	2	26
4	1	0	0	0	0	0	1	0	0	2
5	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0
7	0	1	0	0	0	0	0	0	0	1
TOTAL	15	9	8	1	16	4	18	16	5	92

For all entrances, 7.6% of all vehicles were involved in a conflict, over two-thirds (68.5%) of which were of the left-turn variety (categories 1 and 2). Over 60% of these left-turn conflicts occurred to vehicles approaching in inside lanes, but this is approximately in proportion to the total amount of vehicles approaching in these lanes. Of the other main category of traffic conflict, rear-end conflicts, the West entrance accounted for the highest number. Approximately 3.2% of vehicles entering the junction from the West were involved in this type of conflict, in contrast to approximately 1.8% for all other entrance roads. The two examples of this kind of conflict that occurred on the junction itself both involved vehicles approaching in the inside lanes.

When the time period is considered, the highest conflict to traffic density value was achieved during the morning peak (10.1% of vehicles involved in conflicts), the lowest during the afternoon period (2.7%). The equivalent figures for the mid-morning, lunchtime and evening peak periods are 6.8%, 8.0% and 6.9% respectively.

I.3: DESCRIPTIVE STATISTICS - SITE 3

I.3.1 Number of Vehicles Per Entrance Lane/Road and Time Period - Site 3

Table I.12 (below) shows the number of vehicles using each entrance lane during the five time periods. The row percentages (in brackets) show the proportion of vehicles using these entrance roads per time period.

Table I.12: Distribution of Vehicles at Site 3

	Entrance												
	North			East			South			West			
	1	2	3	1	2	3	1	2	3	1	2	3	TOTAL
8.00-9.00	100 (36.0)	1 (0.4)	27 (9.7)	9 (3.2)	0 (0)	5 (1.8)	67 (24.1)	0 (0)	44 (15.8)	16 (5.8)	0 (0)	9 (3.2)	278
10.30-11.30	55 (29.3)	1 (0.5)	9 (4.8)	24 (12.8)	1 (0.5)	12 (6.4)	59 (31.4)	2 (1.1)	16 (8.5)	7 (3.7)	0 (0)	2 (1.1)	188
12.30-13.30	49 (23.3)	1 (0.5)	10 (4.8)	32 (15.2)	0 (0)	13 (6.2)	56 (26.7)	0 (0)	34 (16.2)	13 (6.2)	0 (0)	2 (1.0)	210
14.30-15.30	68 (31.1)	0 (0)	13 (5.9)	26 (11.9)	2 (0.9)	16 (7.3)	60 (27.4)	0 (0)	20 (9.1)	7 (3.2)	0 (0)	7 (3.2)	219
17.00-18.00	66 (23.3)	1 (0.4)	15 (5.3)	41 (14.5)	3 (1.1)	27 (9.5)	60 (21.2)	24 (8.5)	26 (9.2)	12 (4.2)	0 (0)	8 (2.8)	283
TOTAL	338 (28.7)	4 (0.3)	74 (6.3)	132 (11.2)	6 (0.5)	73 (6.2)	302 (25.6)	26 (2.2)	140 (11.9)	55 (4.7)	0 (0)	28 (2.4)	1178

The North and South entrances were by far the most frequently used (35% and 39.7% respectively), with the West entrance proving the least popular (7.1%). The North entrance was by far the most common entrance during the morning peak period, whilst the East entrance accounted for far fewer vehicles proportionally during this period than it did during any other. The South entrance accounted for more vehicles during the evening peak period with 39.7%, with the North entrance producing 35.3% of

these cases. It is interesting to note that there was no small peak period observed at lunchtime as might be expected, although the afternoon period accounted for marginally more vehicles.

I.3.2 Approach Speeds and Following Times for all Entrances and Time Periods - Site 3

The table below (I.13) shows the mean, standard deviation and number of cases for each approach speed for each lane of each approach road, along with the proportion of drivers who followed the preceding vehicle with a gap of under three seconds and under two seconds. The full details of mean approach speeds for the different time periods and vehicle classes (for non-queuing vehicles only), along with as graphs of the approach speeds, can be found in Appendix M.

Table I.13: Mean and Standard Deviation of Approach Speeds and Proportion of Following Times Under 3 & 2 Seconds at Site 3

	Entrance											
	North			East			South			West		
	1	2	3	1	2	3	1	2	3	1	2	3
MEAN SPEED												
SPEED1	32.45	26.28	36.08	31.19	35.17	32.10	29.53	28.33	32.33	30.42	-	35.03
	(7.08)	(10.55)	(10.51)	(8.03)	(5.63)	(10.05)	(14.24)	(6.03)	(9.12)	(3.62)		(4.38)
	(335)	(4)	(77)	(131)	(6)	(74)	(293)	(26)	(142)	(55)		(28)
SPEED2	28.21	22.34	30.51	27.49	33.93	31.38	26.70	22.49	28.15	27.45	-	32.97
	(2.97)	(5.01)	(3.57)	(7.34)	(5.39)	(7.19)	(5.92)	(4.75)	(7.95)	(7.98)		(11.83)
	(335)	(4)	(77)	(131)	(6)	(74)	(297)	(26)	(142)	(55)		(28)
SPEED3	21.86	20.04	24.88	26.79	32.57	30.03	22.94	20.74	26.45	25.13	-	25.85
	(2.78)	(5.46)	(3.42)	(6.94)	(6.53)	(6.71)	(5.75)	(5.83)	(7.63)	(3.33)		(4.22)
	(335)	(4)	(77)	(131)	(6)	(74)	(296)	(26)	(142)	(55)		(28)
SPEED4	18.90	20.40	24.10	24.17	26.09	26.40	20.49	20.52	23.57	22.75	-	23.98
	(9.67)	(5.04)	(11.13)	(7.59)	(7.97)	(7.90)	(6.11)	(5.85)	(8.35)	(12.13)		(8.75)
	(334)	(4)	(77)	(131)	(6)	(74)	(297)	(26)	(142)	(55)		(28)
SPEED5	15.96	19.11	17.09	20.07	21.09	18.39	17.60	15.14	20.99	17.61	-	16.56
	(13.88)	(7.45)	(5.75)	(8.12)	(4.25)	(5.00)	(9.63)	(3.20)	(6.12)	(7.53)		(5.40)
	(334)	(4)	(77)	(130)	(6)	(74)	(297)	(26)	(141)	(55)		(28)
% Following Times Below 3 Seconds	30.0	25.0	12.5	15.9	16.7	18.8	36.5	36.0	21.2	4.0	-	4.3
	(330)	(4)	(72)	(126)	(6)	(69)	(293)	(25)	(137)	(50)		(23)
% Following Times Below 2 Seconds	19.4	0.0	4.2	7.9	0.0	11.6	20.8	24.0	11.7	0.0	-	4.3
	(330)	(4)	(72)	(126)	(6)	(69)	(293)	(25)	(137)	(50)		(23)

The previous table shows that the mean speeds for each entrance road gradually declined as the vehicles approached the junction as might be expected. As with Site 2, the speeds of vehicles approaching in the outside lanes were almost exclusively greater than their equivalent inside lane speeds. Also worth noting is the fact that the highest mean speeds (excluding SPEED4) were all recorded in lane 2 (ie. straddling the two lanes) of the East entrance. The amount of close-following was considerably more prevalent in vehicles from the North and South entrances (26.8% and 31.9% respectively for all lanes when times under three seconds were considered) than from the East and West entrances (16.9% and 4.1% respectively). No clear patterns related to differences between lanes emerged. For all entrances, 25.6% of following times were under three seconds and 14.9% for those under two seconds.

The table in Appendix N (N.9) showing the mean speeds for separate vehicle classes reveals a similar pattern as that for Site 2, especially in the last-segment acceleration behaviour of riders of motorcycles and mopeds. One difference, however, concerns the approach speeds of HGVs, which was higher in the first approach segment than any other vehicle type. The speeds in subsequent segments was roughly the same for HGVs as for other vehicles, indicating that HGVs drivers were braking earlier than other drivers.

I.3.3 Incidence of Correct/Incorrect Signalling for all Entrances - Site 3

Table I.14 (over) displays the frequency with which each type of indication was given by drivers approaching from each direction and heading for each possible destination. The asterisks indicate the correct signal for the particular manoeuvre. In this example, two extra categories of destination were included to account for vehicles which left the site via the same road by which they had entered, and others which turned left after completing a full circuit of the roundabout.

Overall, the incidence of appropriate signalling was 86.7%. 71.7% of left turns were preceded by the correct signal, the entrance with the lowest success rate for left turns was the East entrance (64.8%), the highest being the North and South entrances with over 75% each. Right turns produced roughly the same proportion of correct approach indications as left turns (71.6%) with the South entrance accounting for the highest proportion of correct signals (77.6%), the North entrance the least with 56.8%. Of the vast majority of vehicles travelling straight through the junction, only 12 (1.6%) gave an unnecessary signal.

Table I.14: Indications Given by Drivers at Site 3

		Entrance												
		North			East			South			West			
		1	2	3	1	2	3	1	2	3	1	2	3	TOTAL
Direction:	Indication:													
Left	None	15	0	1	20	2	0	2	0	0	1	0	0	41
	Left	59*	0	0	46*	1	1	7*	0	0	2*	0	0	116
	Right	1	0	0	1	0	0	0	0	0	0	0	0	2
Straight Ahead	None	251*	1	37*	61*	2	16*	274*	22	24*	44*	0	7*	739
	Left	0	0	0	0	0	0	0	1	0	7	0	0	8
	Right	0	0	0	1	0	0	1	1	1	0	0	0	4
Right	None	2	0	8	2	0	12	5	0	11	0	0	7	47
	Left	0	0	0	0	0	1	0	0	1	0	0	0	2
	Right	7	2	25*	0	1	43*	10	1	97*	1	0	14*	201
Back along entrance road	None	0	1	0	0	0	0	0	0	1	0	0	0	2
	Left	0	0	0	0	0	0	0	0	0	0	0	0	0
	Right	0	0	6*	0	0	0	1	1	7*	0	0	0	15
Left after full circuit	None	0	0	0	0	0	0	0	0	0	0	0	0	0
	Left	0	0	0	0	0	0	0	0	0	0	0	0	0
	Right	0	0	0	0	0	1*	0	0	0	0	0	0	1
TOTAL		335	4	77	131	6	74	300	26	142	55	0	28	1178
% Correct Signal & Position		(92.5)	-	(88.3)	(81.7)	-	(81.1)	(93.7)	-	(90.1)	(83.6)	-	(75.0)	(86.7)

I.3.4 Site Negotiation for all Entrances - Site 3

Table I.15 (over) reveals the amount of correct and incorrect junction negotiation by drivers passing through Site 3 during all time periods.

Table I.15: Incidence of Correct Tracking for Drivers at Site 3

		Approach Road/Lane												
		North			East			South			West			TOTAL
Direction	Tracking	1	2	3	1	2	3	1	2	3	1	2	3	
Left	Correct	75	0	0	67	1	0	9	0	0	3	0	0	155
	Incorrect	0	0	1	0	2	1	0	0	0	0	0	0	4
Straight Across	Correct	162	0	33	47	1	15	182	17	24	34	0	6	521
	Incorrect	89	1	4	12	1	1	92	7	1	17	0	1	226
Right	Correct	5	1	37	0	1	55	7	1	115	0	0	20	242
	Incorrect	4	2	2	2	0	2	9	1	2	1	0	1	26
TOTAL	Correct	242	1	70	114	3	70	198	18	139	37	0	26	918
	Incorrect	93	3	7	14	3	4	101	8	3	18	0	2	256
Overall Total		335	4	77	128	6	74	299	26	142	55	0	28	1174
% correct		(72.2)	(25)	(90.9)	(89.1)	(50)	(94.6)	(66.2)	(69.2)	(97.9)	(67.3)	(0)	(92.9)	(78.2)

For all entrances and time periods, 78.2% of all drivers were observed to complete their passage through the roundabout correctly. Left turns were generally the most successfully performed manoeuvres with over 97% them judged as being correct. Right turns were also well carried out with a rate of 90.3% correct. Drivers travelling straight ahead could only cross the site correctly 69.7% of the time. For all bar one entrance (the East), at least one-third of drivers failed to travel straight across the roundabout in a correct manner. Not surprisingly, many (61.5%) of the drivers who did not execute right turns correctly approached the site in the wrong lane (ie. the inside lane). The time period with the best tracking record proved to be the morning peak period (88.8%) with the other periods ranging from 71.8% (mid-morning) to 77.9% (evening peak).

I.3.5: Type and Distribution of Traffic Conflicts - Site 3

Table I.16 (over) summarises the incidence of traffic conflicts at Site 3. Entrance lanes which did not account for any conflicts are omitted from the table. Once again, a full breakdown of the conflicts at this site can be found in Appendix N.

Table I.16: Traffic Conflicts at Site 3 - Summary Table

Conflict Category:	Entrance North 1	North 3	East 1	East 2	East 3	South 1	South 2	South 3	West 1	West 3	TOTAL
1	19	6	12	1	5	12	1	8	9	2	75
2	/	/	/	/	/	/	/	/	/	/	/
3	3	1	1	0	0	4	0	1	0	0	10
4	1	0	0	0	0	1	0	0	0	0	2
5	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0
7	1	0	0	0	0	0	0	0	0	0	1
TOTAL	24	7	13	1	5	17	1	9	9	2	88

Of the 88 conflicts recorded at Site 3 (indicating that 7.5% of vehicles at this site were involved in a conflict), the vast majority (85.2%) were of the left-turn type, of which a third occurred on the North entrance. Three-quarters of the rear-end conflicts occurred in just two lanes, the inside lanes of the North and South entrances (33.3% and 41.7% respectively). Vehicles approaching in these lanes also accounted for the only type 4 (rear-end shunt on the junction) conflicts. Overall, the West entrance had the highest conflict to non-conflict ratio, with over 13% of all vehicles using this entrance being involved in some form of near-miss. The South approach accounted for least conflicts per total number of vehicles, with only 5.8% of them involved in a conflict. When the time periods are considered, it is interesting to note that the morning peak and lunchtime periods each accounted for almost twice as many conflicts per number of vehicles using the entrance than any other period, respectively 10.0% and 10.1% of vehicles being involved in conflicts during these periods.

I.4: DESCRIPTIVE STATISTICS - SITE 4

I.4.1 Number of Vehicles Per Entrance Lane/Road and Time Period - Site 4

Table I.17 (below) shows the distribution of vehicles entering Site 4 during the five time periods. The figures in brackets refer to the proportion of vehicles using each entrance in each time period.

Table I.17: Distribution of Vehicles for each Time Period - Site 4

	Entrance					
	North	East (1)		East (2)	South	
	1	1	2	1	1	TOTAL
8.00-9.00	6 (3.1)	72 (36.9)	19 (9.7)	20 (10.3)	78 (40.0)	195
10.30-11.30	6 (4.6)	60 (46.2)	4 (3.1)	6 (4.6)	54 (41.5)	130
12.30-13.30	18 (11.7)	55 (35.7)	12 (7.8)	13 (8.4)	56 (36.4)	154
14.30-15.30	5 (3.5)	67 (47.5)	5 (3.5)	3 (2.1)	61 (43.3)	141
17.00-18.00	26 (10.2)	89 (35.0)	4 (1.6)	3 (1.2)	132 (52.0)	254
TOTAL	61 (7.0)	343 (39.2)	44 (5.0)	45 (5.1)	381 (43.6)	874

The rather unusual nature of this junction is shown by the above table which reveals that almost 90% (87.8%) of vehicles approached the junction from the two most popular entrances. The situation is slightly distorted in that details of vehicles travelling from North to South on the main road (V4) were not recorded unless the vehicle in question turned off this road into the side road (V6) or featured as an 'other' vehicle for vehicles turning right from the V4 into V6. One of these entrances (the East) featured proportionally more vehicles during the off-peak period. The figures for the evening peak period are considerably affected by the large number of vehicles entering the site from the South during this period (over half of the total number of vehicles observed). Of the two lesser-used routes, many more vehicles were recorded turning from the V6 to travel along the V4, listed in the above table as East (2), during the

morning peak period (and to a lesser extent the lunchtime period) than at other times. The lunchtime and evening peak periods were considerably busier for the group of vehicles approaching from the North, turning left into the V6.

I.4.2 Approach Speeds and Following Times for all Entrances and Time Periods - Site 4

Table I.18 (below and over) shows the mean and standard deviation of all approach speeds for each entrance, along with the number of cases each figure is based on. The proportion of following times under three and two seconds are also included. It should be noted that for some entrances, the full compliment of five speeds could not be recorded. For example, the lack of any discernible markers combined with a distorting camera angle meant that only one overall speed could be measured for vehicles using the slip road to turn from the V6 to travel North along the V4. Similarly, the variety of different places that drivers used to turn right from the V4 into the V6 meant that a consistent number of speeds could not be recorded for each vehicle. Full details of these approach speeds for each time period and class of vehicle (strictly for vehicles not faced with a queue at the junction) can be found in Appendix M.

Table I.18: Mean and Standard Deviations of all Approach Speeds and the Proportion of Following Times Under 3 & 2 Seconds for all Entrances - Site 4

	Entrance				
	North	East (1)		East (2)	South
	1	1	2	1	1
MEAN SPEED:					
SPEED1	19.43	30.46	18.33	9.67	17.26
	(3.64)	(11.61)	(10.64)	(2.76)	(8.01)
	(61)	(326)	(44)	(45)	(379)
SPEED2	17.88	23.17	12.00	-	12.58
	(3.46)	(6.08)	(7.75)		(6.12)
	(61)	(328)	(44)		(326)
SPEED3	15.10	20.01	12.17	-	9.52
	(3.18)	(6.56)	(7.85)		(5.59)
	(61)	(330)	(44)		(211)
SPEED4	5.37	15.81	7.32	-	6.72
	(2.28)	(5.76)	(3.33)		(4.03)
	(60)	(332)	(3)		(47)
SPEED5	-	9.87	-	-	-
		(4.69)			
		(340)			

(cont. over)

Table I.18: Mean and Standard Deviations of all Approach Speeds and the Proportion of Following Times Under 3 & 2 Seconds for all Entrances - Site 4 (cont.)

	Entrance				
	North	East (1)		East (2)	South
	1	1	2	1	1
% Following Times Under 3 Seconds	7.1 (56)	43.8 (324)	12.8 (39)	5.0 (40)	49.2 (374)
% Following Times Under 2 Seconds	7.1 (56)	27.2 (324)	5.1 (39)	0.0 (40)	27.5 (374)

For vehicles travelling from the North to the East, it can be seen that significant deceleration does not really begin until the vehicles are in the last segment of the approach road, the decrease in speed being fairly small over successive segments until this point. The deceleration rates for vehicles coming from the East (turning South) and from the South are reasonably uniform, although these rates may be distorted by the queues that occasionally formed on these approaches. The two entrances with the highest percentage of following times under three seconds were the East (for vehicles turning left into the V4) and the South, both with over 40%. These entrances were also the ones which accounted for over 80% of the total vehicle flow between them. When the data for all entrances were combined, 40.5% of vehicles were found to be following the preceding vehicle with a gap of less than three seconds whilst 23.6% were found to have a gap of less than two seconds.

The most noticeable thing about the approach speeds for Site 4 is that they were generally lower at all stages of the approach than those recorded at other sites. This was particularly apparent during the final approach segment (measured by SPEED5), the mean speed of under 12 mph being considerably slower than the next lowest speed (just over 18mph at Site 3). The speeds of the various vehicle classes show no clear differences and all appear to show a fairly uniform deceleration.

I.4.3 Incidence of Correct/Incorrect Signalling for all Entrances - Site 4

Table I.19 (over) shows the incidence of correct approach signalling at this junction. Some of the spaces in the table are marked with dashes because the particular combination of approach, exit and signal could not be made. In addition, there are some incorrect combinations which could possibly have been made, but were not. These

are marked with zeros. Once again, the correct signal (or lack of signal) for each manoeuvre is labelled with an asterisk.

Table I.19: Indications of Drivers at Site 4

		Entrance					
		North	East (1)		East (2)	South	
		1	1	2	1	1	TOTAL
Direction:	Indication:						
Left	None	13	177	-	0	-	190
	Left	48*	156*	-	0	-	204*
	Right	0	6	-	0	-	6
Right	None	0	0	16	25	17	58
	Left	0	0	0	0	0	0
	Right	0	0	26*	20*	363*	409*
TOTAL		61	339	42	45	380	867
% Correct Signal & Position		(78.7)	(46.0)	(61.9)	(44.4)	(95.5)	(70.7)

Overall, 70.7% of drivers gave correct signals on the approach to this junction. Of all vehicles turning left the figure was 51.0%, the equivalent for vehicles turning right being 87.6%. When data from the three Eastern approaches are combined, 47.4% of drivers gave the required indication. Only 17 of the 380 (4.5%) drivers approaching from the South and turning into V6 failed to give a signal. However, the two lowest rates were achieved by drivers using the East approach (turning left) and those using the slip road to turn North, also having approached from the East (46.8% and 44.4% correct respectively).

Section I.4.4 Site Negotiation for all Entrances - Site 4

Table I.20 (over) shows the ratio of correct to incorrect site tracking for Site 4 for vehicles all combinations of entrances and exits. It should be noted that no category for vehicles travelling straight across is included as the layout of the junction meant that this manoeuvre was not possible for any of the entrance-exit combinations.

Table I.20: Incidence of Correct Tracking at Site 4

		Entrance					
		North	East (1)		East (2)	South	
		1	1	2	1	1	TOTAL
Direction	Tracking:						
Left	Correct	59	343	0	0	0	402
	Incorrect	2	0	0	0	0	2
Right	Correct	0	0	41	44	369	454
	Incorrect	0	0	3	1	12	16
TOTAL	Correct	59	343	41	44	369	856
	Incorrect	2	0	3	1	12	18
Overall Total		61	343	44	45	381	874
% correct		(96.7)	(100)	(93.2)	(97.8)	(96.9)	(97.9)

The table reveals that 97.9% of all manoeuvres at Site 4 were negotiated correctly, with 99.5% of all left turns and 96.6% of right turns contributing to this figure. It is perhaps surprising that none of the 343 drivers turning left from the V6 South onto the V4 made any tracking errors, but the figures for all manoeuvres are extremely low. Indeed, almost 97% of drivers turning right from the V4 into the V6, with considerable opportunity to take short cuts, performed the turn with no tracking problems. It should be noted that, although each entrance as included in the table had only one possible exit in theory, it can be seen that no drivers did not always follow the correct lane selection procedure. Finally, the proportion of drivers correctly negotiating the junction in each of the time periods was highest during the evening peak period, when no drivers at all were seen to make tracking errors. The afternoon period had the lowest success rate with 93.6% of manoeuvres being executed correctly.

Section I.4.5 Type and Distribution of Traffic Conflicts - Site 4

As with previous traffic conflict sections, the conflicts are split into three categories as shown in Table I.21 (over) which outlines the distribution of conflicts at each approach for all time periods. The full details for each time period in isolation can be found in Appendix N.

Table I.21: Traffic Conflicts for each Entrance Road - Site 4

Conflict Category:	Entrance: North 1	East (1) 1	East (1) 2	East (2) 1	South 1	TOTAL
1	3	20	/	/	/	23
2	/	6	2	3	0	11
3	1	5	1	1	9	17
4	0	1	0	1	0	2
5	0	0	0	0	0	0
6	0	0	0	0	0	0
7	0	0	0	0	0	0
TOTAL	4	32	3	5	9	53

For all entrances and time periods, 6.1% of vehicles entering this site were involved in some form of traffic conflict. Just under half (43.4%) of the conflicts were of the first category (left-turn) whilst the remainder were of either the cross-traffic or rear-end variety. Of the left-turn type, 87% involved vehicles turning left from the V6 (the 'side' road) into the V4 (the main road). A further 6 vehicles incorrectly using this approach to turn right into the V4 (instead of using the slip road) were involved in cross-traffic conflicts. This entrance also accounted for many (31.6%) of the rear-end conflicts. The main source of this type of conflict was the South entrance (for vehicles turning right into the V6) where just under half of these conflicts (47.4%) were recorded. Indeed, this was the only type of conflict observed at this entrance.

The mid-afternoon time period accounted for the highest proportion of conflicts (in relation to the total number of vehicles observed during that period) with 8.5% of vehicles being observed in a near-miss. The morning session saw conflicts for 7.2% of vehicles, whilst the equivalent figures for remaining periods were all around 5%.

APPENDIX J:

List of Variable Names used in the Observation Study

COMPLETE LIST & DEFINITIONS OF VARIABLES IN THE OBSERVATION STUDY

This section contains a list of all variables used in the analysis of the observation study, along with the definition for each of those variables. The first group of variables are those that were coded directly from the videos, the second group were all derived from these original variables.

Initial Variable Set

CASNO - Individual case reference number

SITNO - Code number for site

PERIOD - Code number for time period

ROADCON - Road conditions at the time of filming

WEATHER - Weather conditions at the time of filming

APPROACH - Study vehicle's approach road

VEHICLE - Vehicle type

LANE - Study vehicle's approach lane

TEMPO1 - Timebase reading at moment vehicle reaches first reference point

TEMPO2 - Timebase reading at moment vehicle reaches second reference point

TEMPBACK - Timebase reading at moment rear end of vehicle reaches second reference point

TEMPO3 - Timebase reading at moment vehicle reaches third reference point

TEMPO4 - Timebase reading at moment vehicle reaches fourth reference point

TEMPO5 - Timebase reading at moment vehicle reaches fifth reference point

TEMPO6 - Timebase reading at moment vehicle reaches sixth (ie. 'Give Way' line) reference point

BRAKE - Entrance road section in which evidence of braking activity, if any, appears

BRTIME - Timebase reading at moment braking activity appears

SIGTIME - Timebase reading at moment direction indicators utilised

INDIC - Direction of indication

QUEUE1 - Number of vehicles queuing to enter the site in front of the study vehicle in the same lane

QUEUE2 - Number of vehicles queuing to enter the site behind the study vehicle in the same lane before entering the site

OVT1 - Timebase reading at moment on-site vehicle reaches first on-site reference point

OVT2 - Timebase reading at moment on-site vehicle reaches second on-site reference point

OVTR - Direction of travel of on-site vehicle

POSV - Location of on-site vehicle as study vehicle enters fifth approach section

OTHSIG - Signalling activity of on-site vehicle

OTHLANE - On-site vehicle's lane position

OTHDEST - Destination of on-site vehicle

STOP - Study vehicle's stopping position, if relevant

TIMESTOP - Timebase reading at moment study vehicle stops

TIMEMOVE - Timebase reading at moment study vehicle pulls out onto site

SIDE - Presence of vehicle in adjacent lane at moment study vehicle enters site

TIMEOUT - Timebase reading at moment study vehicle pulls clear of potential path of on-site vehicles

TRAKSITE - Study vehicle's site-tracking

DIRECT - Location of study vehicle's exit from site

DENSITY - Total number of vehicles in view during the study vehicle's passage through the site

PREVTIME - Timebase reading at moment rear end of preceding vehicle reached second reference point

TIMENEXT - Timebase reading at moment subsequent vehicle reaches second reference point

SEVERCON - Severity of traffic conflict, if any

TYPECON - Conflict classification

LOCCON - Location of avoidance activity

NOCON - Number of vehicles involved in incident

CAUSECON - Vehicle causing conflict situation to arise

Additional Variables Calculated from Initial Set

FOLLOW - Time difference between study vehicle and the preceding vehicle

BEHIND - Time difference between study vehicle and the subsequent vehicle

FLOW - Number of vehicles passing along each entrance road during each time period

SPEED1 - Mean approach speed of study vehicle over first approach section

SPEED2 - Mean approach speed of study vehicle over second approach section

SPEED3 - Mean approach speed of study vehicle over third approach section

SPEED4 - Mean approach speed of study vehicle over fourth approach section

SPEED5 - Mean approach speed of study vehicle over final approach section

OTHSPEED - Mean speed of on-site vehicle

PULLOUT - Time lapse between moment study vehicle pulls clear of path of on-site vehicles and arrival of next on-site vehicle

APPENDIX K:

Derivation of Formula for Calculating Vehicle Approach Speeds

APPROACH SPEED CALCULATION

K.1 Calculation of Perceived Distances from Actual Distances for Approach Speed Calculations

Each of the five approach speeds for each approach lane for each approach road at each of the four sites were calculated using the same principle outlined in this section. Figure K.1 (below) illustrates the typical approach road, complete with reference points R1 and R2, and the points P1 and P2 at which the leading edge of each vehicle appears to cross R1 and R2 respectively on the monitor. The other key positions and distances are:

- C - camera;
- H1 - horizontal displacement of the reference points from the camera;
- H2 - horizontal displacement of the leading edge of the vehicles from the camera;
- X1 - actual gap between the two reference points;
- X2 - apparent distance travelled by each vehicle;
- V1 - vehicle as leading edge coincides with point R1;
- V2 - vehicle as leading edge coincides with point R2.

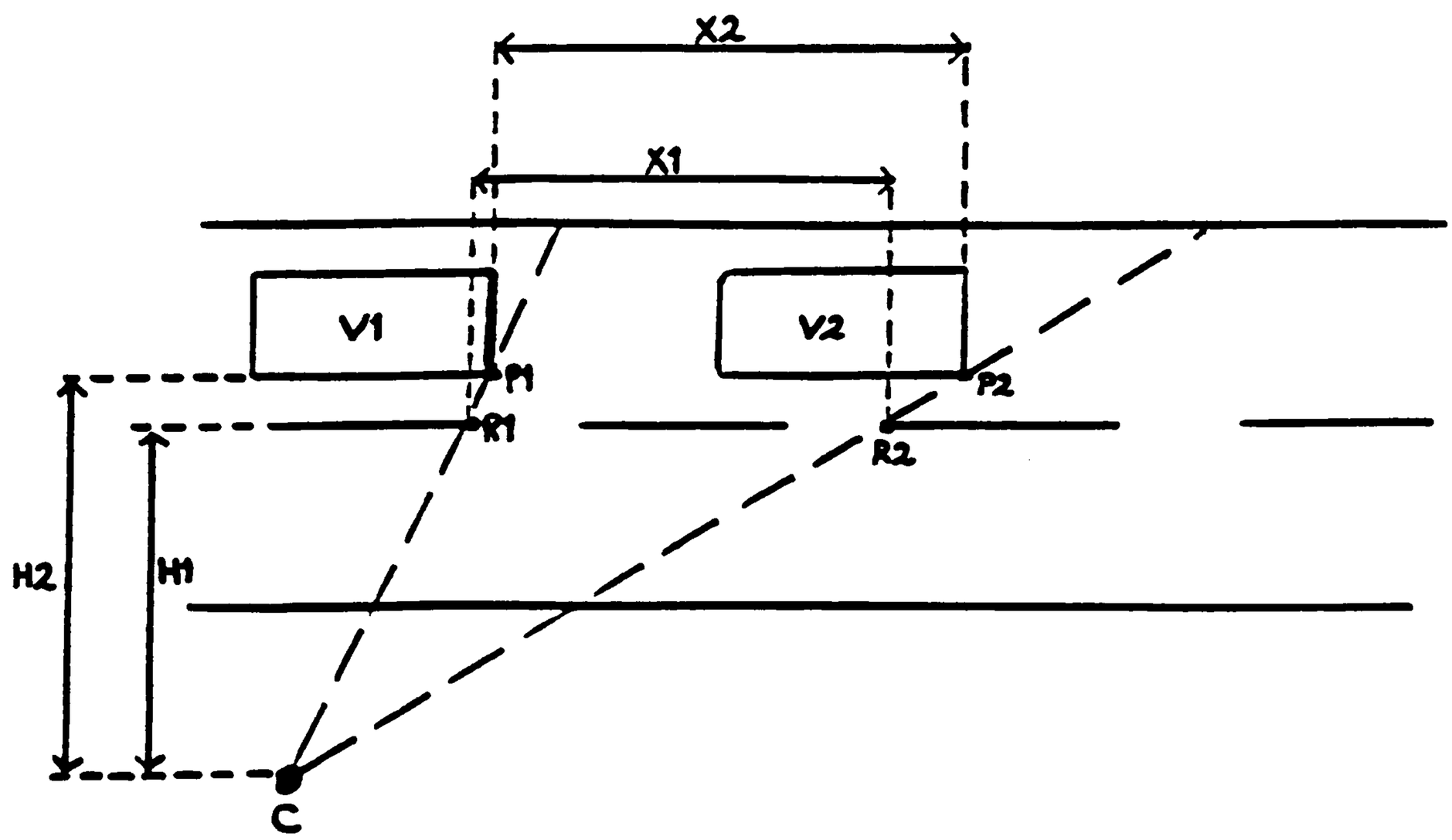

Figure K.1: Plan of Approach Road with Approach Speed Calculation Points

This can be represented geometrically by two right-angled triangles as shown in Figure K.2 (over). Angles alpha and beta, along with distances X and X', are additional parameters necessary for the calculation.

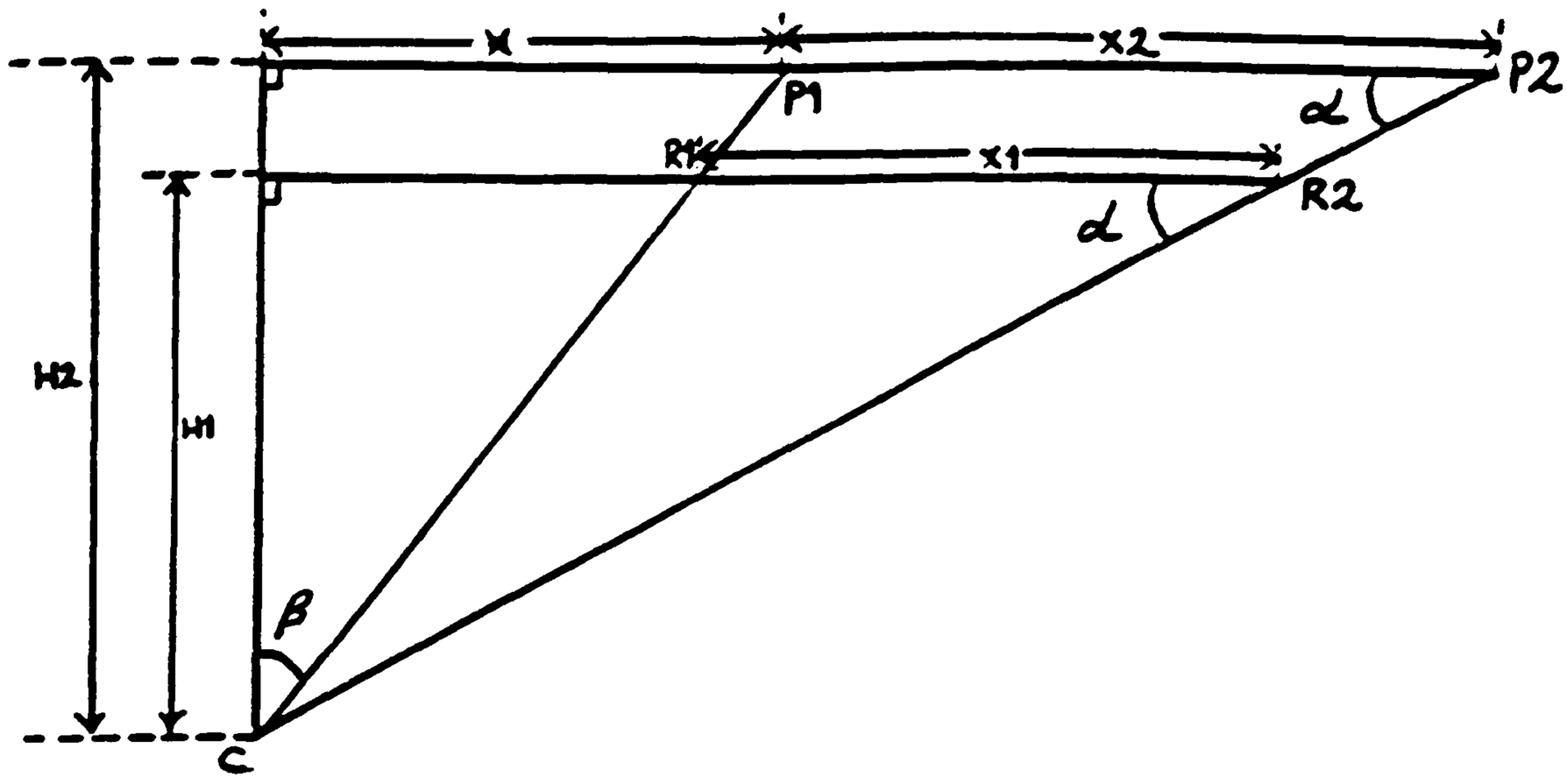

Figure K.2: Geometric Representation of Approach Road

The relationship between X1 and X2 is given by the following calculations.

$$\text{Tan } a = \frac{H1}{X1 + X'}, \quad \text{Tan } a = \frac{H2}{X + X2}$$

Therefore:

$$\frac{H1}{X1 + X'} = \frac{H2}{X + X2}$$

$$\text{or,} \quad X' = \frac{H1\ (X + X2)}{H2} - X1 \qquad \ldots(1)$$

$$\text{Tan } b = \frac{X}{H2}, \quad \text{Tan } b = \frac{X'}{H1}$$

Therefore:

$$\frac{X}{H2} = \frac{X'}{H1}$$

$$\text{or,} \quad X' = \frac{H1*X}{H2} \qquad \ldots(2)$$

From 1 & 2:

$$\frac{H1\ (X + X2)}{H2} - X1 = \frac{H1*X}{H2}$$

$$\text{or,} \quad X1 = \frac{H1\ (X + X2)}{H2} - \frac{H1*X}{H2}$$

$$X1 = \frac{H1*X + H1*X2 - H1*X}{H2}$$

Therefore: $X1 = \frac{H1*X2}{H2}$, or, $\frac{X1}{X2} = \frac{H1}{H2}$

In other words, the ratio between the perceived distance travelled and the actual distance travelled by a vehicle is equal to the ratio between the distance from

the camera of the plane of the reference points and the plane on which the leading edge of the vehicle is travelling.

Some additional information was required for the calculation of speeds. The width of vehicles had to be taken into account, along with the lane width, before the distance H2 (see Figure K.1) could be worked out. The mean value for a number of examples of each vehicle class (derived from a variety of sources such as motoring magazines) was calculated, and the appropriate values included in the section of the SPS file used to calculate the speeds of vehicles.

K.2 Calculation of the Percentage Error as a Result of Assumptions Made

By assuming that each vehicle is travelling exactly in the middle of the relevant entrance lane, the calculations for the speed of vehicles will be subject to a certain degree of error when this assumption does not hold true. The example shown below represents the maximum error obtained when the aforementioned assumptions are not met for one particular case (the lane with the greatest width). Assume the following values remain constant:

Lane width	=	155	in
Mean vehicle width	=	66	in
X1	=	309	in
H1	=	834	in

If:

v (velocity of vehicle) = 30 mph = 528"/sec

H2 = H1 + (Lane width - vehicle width)/2

= 834 + 89/2 = 878.5 in

From previous section:

$$X2 = \frac{X1*H2}{H1} = \frac{309*878.5}{834} = 325.5 \text{ in}$$

The time taken to cover this distance at a velocity of 30 mph, t, is given by:

t = 325.5/528 = 0.616 secs

If, however, the vehicle is actually travelling along the lane as far away from the middle as possible (without straddling the white lines), the distance H2 will now equal H1, and by definition X2 will equal X1 (309in), and the calculated speed, v', will be (with t remaining constant):

v' = 309/0.616 = 501.6"/sec or 28.5 mph.

This change in speed is exactly 5%, well within the realms of acceptability for a calculation of this nature.

APPENDIX L:

Distribution of Vehicle Classes for all 4 Junctions

PROPORTION OF VEHICLE TYPES AT EACH SITE

Table L.1 (below and over) shows the distribution of all original vehicle classifications (ie. prior to recoding) over the four sites.

Table L.1: Distributions Over the Four Sites for all Categories of Vehicle

Vehicle Type	Site: 1	2	3	4	TOTAL
Car - 1 Small	68 (17.5)	236 (19.4)	201 (17.1)	142 (16.2)	647 (17.7)
Car - 2 Medium	88 (22.7)	220 (18.1)	184 (15.6)	175 (20.0)	667 (18.3)
Car - 3 Large	166 (42.8)	594 (48.9)	523 (44.4)	380 (43.5)	1663 (45.5)
Car - 4 Special	8 (2.1)	10 (0.8)	9 (0.8)	4 (0.5)	31 (0.8)
Car + Trailer	0 (0)	1 (0.1)	1 (0.1)	2 (0.2)	4 (0.1)
Kit Car	1 (0.3)	0 (0)	0 (0)	0 (0)	1 (0.0)
Taxi	0 (0)	1 (0.1)	5 (0.4)	0 (0)	6 (0.2)
3-Wheel Cars	0 (0)	1 (0.1)	0 (0)	0 (0)	1 (0.0)
Motorcycle	1 (0.3)	12 (1.0)	5 (0.4)	10 (1.1)	28 (0.8)
Moped	3 (0.8)	3 (0.2)	5 (0.4)	4 (0.5)	15 (0.4)
Bicycle	5 (1.3)	0 (0)	6 (0.5)	3 (0.3)	14 (0.4)
Pick-up	0 (0)	0 (0)	0 (0)	1 (0.1)	1 (0.0)
Light Goods	34 (8.8)	52 (4.3)	63 (5.3)	77 (8.8)	226 (6.2)

(cont. over)

Table L.1: Distributions Over the Four Sites for all Categories of Vehicle (cont.)

Vehicle Type	Site: 1	2	3	4	TOTAL
LGV + Trailer	2 (0.5)	0 (0)	2 (0.2)	0 (0)	4 (0.1)
Landrover etc.	3 (0.8)	6 (0.5)	5 (0.4)	4 (0.5)	18 (0.5)
Microvan	2 (0.5)	2 (0.2)	6 (0.5)	12 (1.4)	22 (0.6)
Microvan + Trailer	0 (0)	0 (0)	0 (0)	1 (0.1)	1 (0.0)
Heavy Goods	4 (1.0)	30 (2.5)	27 (2.3)	40 (4.6)	101 (2.8)
Artic. HGV	0 (0)	9 (0.7)	4 (0.3)	12 (1.4)	25 (0.7)
Artic. Cab only	0 (0)	0 (0)	1 (0.1)	0 (0)	1 (0.0)
Minibus	1 (0.3)	24 (2.0)	99 (8.4)	0 (0)	124 (3.4)
Bus (Single Deck)	0 (0)	1 (0.1)	12 (1.0)	5 (0.6)	18 (0.5)
Bus (Double Deck)	0 (0)	0 (0)	4 (0.3)	0 (0)	4 (0.1)
Coach	0 (0)	1 (0.1)	5 (0.4)	0 (0)	6 (0.2)
Farm/ Building	0 (0)	2 (0.2)	1 (0.1)	0 (0)	3 (0.1)
Dustcart/ Cement	1 (0.3)	9 (0.7)	9 (0.8)	1 (0.1)	20 (0.5)
Emergency Service	1 (0.3)	0 (0)	0 (0)	0 (0)	1 (0.0)
Ice Cream Van	0 (0)	0 (0)	0 (0)	1 (0.1)	1 (0.0)
Milkfloat	0 (0)	0 (0)	1 (0.1)	0 (0)	1 (0.0)
TOTAL	388	1214	1178	874	3654

APPENDIX M:

Full Details of Involvement in Traffic Conflicts for Study 1

FULL DETAILS OF INVOLVEMENT IN TRAFFIC CONFLICTS FOR STUDY 1

M.1: Study Vehicles Involved in Traffic Conflicts at all Sites

Tables M.1 to M.4 (below and over) respectively show the types of vehicles under study that were involved in traffic conflicts at each of the four junctions respectively. It should be noted that, in the following tables, the seven conflict categories were re-coded into three as explained in Section 4.2.3.3, with the figures for cross-traffic conflicts combined with these for left-turn conflicts.

Table M.1: Study Vehicles Involved in Conflicts - Site 1

		Approach Road				
Vehicle Type	Conflict Type	North-East	South-East	South-West	North-West	TOTAL
Car	1		7		4	11
	2	1	3	5		9
	3					0
Light Goods etc.	1		1			1
	2					0
	3					0
TOTAL	1	0	8	0	4	12
	2	1	3	5	0	9
	3	0	0	0	0	0
Overall Total		1	11	5	4	21

Table M.2: Study Vehicles Involved in Conflicts - Site 2

		North			East		South			West					
		1	2	3	1	2	1	2	3	1	2	3	4	5	TOTAL
Vehicle Type	Conflict Type														
Car	1	11		6	4		10		3	10		10		2	56
	2	3		2	3		3			7		6		1	25
	3			1											1
Motorcycle	1	1													1
	2														0
	3														0
Light	1								1	1					2
Goods etc.	2					1	1								2
	3														0
Heavy	1						2								2
Goods etc.	2														0
	3														0
Bus/Coach	1				1									1	2
	2													1	1
	3														0
TOTAL	1	12	0	6	5	0	12	0	4	11	0	10	0	3	63
	2	3	0	2	3	1	4	0	0	7	0	6	0	2	28
	3	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Overall Total		15	0	9	8	1	16	0	4	18	0	16	0	5	92

Table M.3: Study Vehicles Involved in Conflicts - Site 3

		Approach Road/Lane												
		North			East			South			West			
		1	2	3	1	2	3	1	2	3	1	2	3	TOTAL
Vehicle Type	Conflict Type													
Car	1	16		5	10	1	5	7	1	7	8		2	62
	2	4		1	1			4		1				11
	3	1												1
Motorcycle	1							1						1
	2													0
	3													0
Light	1	2		1				1						4
Goods etc.	2							1						1
	3													0
Heavy	1							2						2
Goods etc.	2													0
	3													0
Bus/Coach	1	1			2			1		1	1			6
	2													0
	3													0
TOTAL	1	19	0	6	12	1	5	12	1	8	9	0	2	75
	2	4	0	1	1	0	0	5	0	1	0	0	0	12
	3	1	0	0	0	0	0	0	0	0	0	0	0	1
Overall Total		24	0	7	13	1	5	17	1	9	9	0	2	88

Table M.4: Study Vehicles Involved in Conflicts - Site 4

Vehicle Type	Conflict Type	North 1	East (1) 1	East (1) 2	East (2) 1	South 1	TOTAL
Car	1	1	18		2		21
	2	1	5		1	9	16
	3						0
Motorcycle	1		1				1
	2						0
	3						0
Light Goods etc.	1	1	7				8
	2		1		1		2
	3						0
Heavy Goods etc.	1	1		2	1		4
	2		1				1
	3						0
TOTAL	1	3	26	2	3	0	34
	2	1	7	0	2	9	19
	3	0	0	0	0	0	0
Overall Total		4	33	2	5	9	53

M2: Other Vehicles Involved in Traffic Conflicts at All Sites

Tables M.5 to M.8 (below and over) show the types of vehicles also involved in the traffic conflicts with the study vehicles (noted in Tables M.1 to M.4) at each of the four junctions respectively. The three conflict categories are identical to those previously noted in Chapter 5.

Table M.5: Other Vehicles Involved in Conflicts - Site 1

		Approach Road				
Vehicle Type	Conflict Type	North-East	South-East	South-West	North-West	TOTAL
Car	1		4		2	6
	2		3	5		8
	3					0
Bicycle	1					0
	2	1				1
	3					0
Heavy Goods etc.	1		1			1
	2					0
	3					0
Car & Bicycle	1		1			1
	2					0
	3					0
No Other Vehicle	1		2		2	4
	2					0
	3					0
TOTAL	1	0	8	0	4	12
	2	1	3	5	0	9
	3	0	0	0	0	0

Table M.6: Other Vehicles Involved in Conflicts - Site 2

		North			East		South			West					
		1	2	3	1	2	1	2	3	1	2	3	4	5	TOTAL
Vehicle Type	Conflict Type														
Car	1	9		6	4		10		3	10		8		3	53
	2	3		2	2	1	4			6		5		2	25
	3														0
Motorcycle	1														0
	2														0
	3			1											1
Moped	1	1													1
	2														0
	3														0
Light Goods etc.	1	1							1			2			4
	2														0
	3														0
Heavy Goods etc.	1						1			1					2
	2									1		1			2
	3														0
Bus/Coach	1														0
	2				1										1
	3														0
No Other Vehicle	1	1			1		1								3
	2														0
	3														0
TOTAL	1	12	0	6	5	0	12	0	4	11	0	10	0	3	63
	2	3	0	2	3	1	4	0	0	7	0	6	0	2	28
	3	0	0	1	0	0	0	0	0	0	0	0	0	0	1

Table M.7: Other Vehicles Involved in Conflicts - Site 3

		Approach Road/Lane												
		North			East			South			West			
		1	2	3	1	2	3	1	2	3	1	2	3	TOTAL
Vehicle Type	Conflict Type													
Car	1	10		4	10		5	9	1	5	6		2	52
	2	3						4		1				8
	3	1												1
Light	1	2			1			1		1				5
Goods etc.	2	1		1				1						3
	3													0
Heavy	1	1									2			3
Goods etc.	2					1								1
	3													0
Bus/Coach	1	6		2				2		1	1			12
	2				1									1
	3													0
Car &	1				1									1
HGV	2													0
	3													0
No Other	1									1				1
Vehicle	2													0
	3													0
TOTAL	1	19	0	6	12	0	5	12	1	8	9	0	2	74
	2	4	0	1	1	1	0	5	0	1	0	0	0	13
	3	1	0	0	0	0	0	0	0	0	0	0	0	1

Table M.8: Other Vehicles Involved in Conflicts - Site 4

Vehicle Type	Conflict Type	North 1	East (1) 1	East (1) 2	East (2) 1	South 1	TOTAL
Car	1	2	21	1	4		28
	2	1	4	1	1	8	15
	3						0
Moped	1			1			1
	2						0
	3						0
Light Goods etc.	1	1	2				3
	2		2			1	3
	3						0
Heavy Goods etc.	1		2				2
	2						0
	3						0
Slow Moving Vehicle	1		1				1
	2						0
	3						0
TOTAL	1	3	26	2	4	0	35
	2	1	6	1	1	9	18
	3	0	0	0	0	0	0

M.3: Conflict Vehicle Combinations

Table M.9 (below) combines the information from the previous two sets of tables by showing the vehicle combinations involved in each of the 254 conflicts noted during the observation study.

Table M.9: Combinations of Vehicles Involved in Conflicts

Study Vehicle Type:	Site No.	Other Vehicle Type: Car	Motor-cycle	Moped	Bicycle	Light Goods	Heavy Goods	Bus	Slow Moving Vehicles	Car & Bicycle	Car & HGV	No Other Vehicle	TOTAL
Car	1	13	-	-	1	-	1	-	-	1	-	4	20
	2	70	1	1	-	3	4	1	-	-	-	2	82
	3	53	-	-	-	6	3	11	-	-	-	1	74
	4	32	-	-	-	3	1	-	1	-	-	-	37
Motorcycle	1	-	-	-	-	-	-	-	-	-	-	-	0
	2	1	-	-	-	-	-	-	-	-	-	-	1
	3	-	-	-	-	1	-	-	-	-	-	-	1
	4	-	-	-	-	1	-	-	-	-	-	-	1
Light Goods etc.	1	1	-	-	-	-	-	-	-	-	-	-	1
	2	3	-	-	-	1	-	-	-	-	-	-	4
	3	4	-	-	-	-	-	1	-	-	-	-	5
	4	8	-	-	-	1	1	-	-	-	-	-	10
Heavy Goods etc.	1	-	-	-	-	-	-	-	-	-	-	-	0
	2	2	-	-	-	-	-	-	-	-	-	-	2
	3	1	-	-	-	-	-	1	-	-	-	-	2
	4	3	-	1	-	1	-	-	-	-	-	-	5
Bus etc.	1	-	-	-	-	-	-	-	-	-	-	-	0
	2	2	-	-	-	-	-	-	-	-	-	1	3
	3	3	-	-	-	2	-	-	-	-	1	-	6
	4	-	-	-	-	-	-	-	-	-	-	-	0
TOTAL	1	14	0	0	1	0	1	0	0	1	0	4	21
	2	78	1	1	0	4	4	1	0	0	0	3	92
	3	61	0	0	0	9	3	13	0	0	1	1	88
	4	43	0	1	0	6	2	0	1	0	0	0	53

M.4: Full Details of Traffic Conflicts for all Entrances and Time Periods for Each Junction

Tables M.10 to M.13 (below and over) detail the number of traffic conflicts that were seen to occur at each entrance road for each time period for all four junctions.

Table M.10: Full Traffic Conflict Details - Site 1

		Entrance				
	Conflict Type	North-East	South-East	South-West	North-West	TOTAL
8.00-9.00	1	0	1	0	1	2
	2	0	1	1	0	2
	3	0	0	0	0	0
10.30-11.30	1	0	0	0	0	0
	2	0	1	1	0	2
	3	0	0	0	0	0
12.30-13.30	1	0	3	0	1	4
	2	0	0	2	0	2
	3	0	0	0	0	0
14.30-15.30	1	0	1	0	1	2
	2	1	0	0	0	1
	3	0	0	0	0	0
17.00-18.00	1	0	3	0	1	4
	2	0	1	1	0	2
	3	0	0	0	0	0
TOTAL	1	0	8	0	4	12
	2	1	3	5	0	9
	3	0	0	0	0	0

Table M.11: Full Traffic Conflict Details - Site 2

		Entrance									
		North		East		South		West			TOTAL
		1	3	1	2	1	3	1	3	5	
	Conflict Type										
8.00-9.00	1	5	1	1	0	1	1	4	5	0	18
	2	0	1	2	1	2	0	4	6	2	18
	3	0	0	0	0	0	0	0	0	0	0
10.30-11.30	1	2	2	1	0	2	1	0	1	0	9
	2	1	0	0	0	0	0	1	0	0	2
	3	0	0	0	0	0	0	0	0	0	0
12.30-13.30	1	3	1	3	0	4	0	4	1	1	17
	2	2	0	0	0	1	0	0	0	0	3
	3	0	1	0	0	0	0	0	0	0	1
14.30-15.30	1	0	0	0	0	2	0	0	0	1	3
	2	0	1	0	0	0	0	0	0	0	1
	3	0	0	0	0	0	0	0	0	0	0
17.00-18.00	1	2	2	0	0	3	2	3	3	1	16
	2	0	0	1	0	1	0	2	0	0	4
	3	0	0	0	0	0	0	0	0	0	0
TOTAL	1	12	6	5	0	12	4	11	10	3	63
	2	3	2	3	1	4	0	7	6	2	28
	3	0	1	0	0	0	0	0	0	0	1

Table M.12: Full Traffic Conflict Details - Site 3

		Entrance										
		North		East			South			West		TOTAL
		1	3	1	2	3	1	2	3	1	3	
	Conflict Type											
8.00-9.00	1	8	2	0	0	2	4	0	3	1	1	21
	2	2	0	0	0	0	4	0	1	0	0	7
	3	0	0	0	0	0	0	0	0	0	0	0
10.30-11.30	1	2	1	1	0	0	3	0	0	2	1	10
	2	0	0	0	0	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0	0	0	0	0
12.30-13.30	1	3	0	5	0	1	4	0	3	3	0	19
	2	1	0	1	0	0	0	0	0	0	0	2
	3	0	0	0	0	0	0	0	0	0	0	0
14.30-15.30	1	3	1	1	0	1	1	0	1	2	0	10
	2	0	0	0	0	0	1	0	0	0	0	1
	3	0	0	0	0	0	0	0	0	0	0	0
17.00-18.00	1	3	2	5	1	1	0	1	1	1	0	15
	2	1	1	0	0	0	0	0	0	0	0	2
	3	1	0	0	0	0	0	0	0	0	0	1
TOTAL	1	19	6	12	1	5	12	1	8	9	2	75
	2	4	1	1	0	0	5	0	1	0	0	12
	3	1	0	0	0	0	0	0	0	0	0	1

Table M.13: Full Traffic Conflict Details - Site 4

		Entrance					
		North	East (1)		East (2)	South	
		1	1	2	1	1	TOTAL
	Conflict Type						
8.00-9.00	1	1	6	1	2	0	10
	2	0	2	0	1	1	4
	3	0	0	0	0	0	0
10.30-11.30	1	0	4	0	1	0	5
	2	0	1	0	1	0	2
	3	0	0	0	0	0	0
12.30-13.30	1	0	6	1	0	0	7
	2	0	0	1	0	0	1
	3	0	0	0	0	0	0
14.30-15.30	1	2	6	0	0	0	8
	2	0	1	0	0	3	4
	3	0	0	0	0	0	0
17.00-18.00	1	0	4	0	0	0	4
	2	1	2	0	0	5	8
	3	0	0	0	0	0	0
TOTAL	1	3	26	2	3	0	34
	2	1	6	1	2	9	19
	3	0	0	0	0	0	0

APPENDIX N:

Complete Approach Speed Details for all 4 Junctions for all Time Periods

FULL DETAILS OF APPROACH SPEEDS

Tables N.1 to N.4 give the full details of all mean approach speeds over all time periods for all four junctions. In Tables N.5 and N.6 the approach speeds are split by vehicle type, the former table featuring all vehicles from all four sites, the latter only including those vehicles which did not have to queue to enter the relevant junction, therefore also excluding 'through' traffic. This 'no-queue' information is also presented for each junction in turn in Tables N.7 to N.10, and the accompanying analysis of variance tests and post-hoc analyses are shown in Tables N.11 to N.30.

N.1: Approach Speeds for all Time Periods - Site 1

Table N.1 (below and over) shows the mean for each of the five approach speeds for each entrance road during each time period, followed by the mean times for all time periods. The figures in brackets refer to the relevant standard deviations and groups sizes.

Table N.1: Mean Approach Speeds for all Time Periods - Site 1

		Approach Road			
		North-East	South-East	South-West	North-West
8.00-9.00	SPEED1	26.49 (8.88) (24)	22.97 (4.56) (17)	26.05 (7.04) (56)	21.81 (9.41) (5)
	SPEED2	38.32 (9.81) (24)	21.44 (4.25) (17)	36.69 (8.93) (56)	21.21 (10.48) (5)
	SPEED3	42.07 (8.01) (22)	20.72 (4.26) (17)	39.25 (12.99) (55)	21.96 (7.90) (5)
	SPEED4	40.10 (6.57) (22)	18.81 (4.72) (17)	42.25 (14.74) (44)	21.87 (10.79) (5)
	SPEED5	44.32 (9.59) (21)	13.46 (3.09) (17)	42.16 (13.51) (44)	13.01 (6.27) (5)

(cont. over)

Table N.1: Mean Approach Speeds for all Time Periods - Site 1 (cont.)

		Approach Road			
		North-East	South-East	South-West	North-West
10.30-11.30	SPEED1	35.37 (10.70) (18)	27.24 (4.51) (6)	26.30 (10.00) (22)	25.00 (5.06) (5)
	SPEED2	41.98 (12.56) (18)	25.67 (8.45) (6)	29.51 (9.42) (22)	21.15 (4.65) (5)
	SPEED3	44.12 (12.74) (16)	24.04 (4.88) (6)	30.67 (10.67) (20)	20.78 (11.86) (5)
	SPEED4	43.60 (10.72) (15)	19.10 (6.35) (6)	35.20 (11.73) (20)	18.17 (12.18) (5)
	SPEED5	44.38 (12.46) (15)	11.25 (3.70) (6)	39.41 (12.16) (20)	10.76 (4.87) (5)
12.30-13.30	SPEED1	37.64 (10.54) (30)	26.95 (5.33) (8)	30.52 (15.20) (24)	21.94 (7.40) (5)
	SPEED2	40.74 (10.40) (30)	23.44 (12.23) (8)	33.35 (12.89) (23)	21.39 (6.34) (5)
	SPEED3	40.14 (5.31) (24)	22.89 (7.82) (8)	33.99 (14.08) (19)	20.88 (11.47) (5)
	SPEED4	46.05 (4.80) (24)	23.31 (9.75) (8)	35.24 (16.58) (19)	19.69 (8.30) (5)
	SPEED5	47.48 (5.74) (24)	11.57 (1.77) (8)	38.82 (16.44) (19)	9.74 (4.75) (5)

(cont. over)

Table N.1: Mean Approach Speeds for all Time Periods - Site 1 (cont.)

		Approach Road			
		North-East	South-East	South-West	North-West
14.30-15.30	SPEED1	31.94 (9.60) (24)	24.93 (2.79) (13)	30.23 (6.76) (23)	25.73 (2.93) (7)
	SPEED2	35.11 (12.63) (24)	26.15 (6.93) (13)	35.51 (12.48) (23)	24.65 (4.27) (7)
	SPEED3	41.15 (15.73) (22)	23.50 (3.22) (13)	36.15 (9.60) (20)	25.04 (7.09) (7)
	SPEED4	38.82 (11.25) (21)	18.56 (4.26) (13)	36.32 (7.95) (18)	24.10 (3.36) (6)
	SPEED5	38.26 (13.30) (21)	11.44 (2.73) (13)	40.35 (8.15) (18)	15.97 (3.21) (6)
17.00-18.00	SPEED1	26.70 (10.56) (43)	25.06 (8.23) (21)	27.00 (12.20) (28)	22.53 (5.37) (6)
	SPEED2	33.23 (14.29) (43)	17.05 (8.28) (22)	26.03 (11.53) (28)	21.20 (5.19) (6)
	SPEED3	38.12 (13.28) (40)	17.15 (6.11) (22)	28.79 (15.09) (26)	20.69 (8.57) (6)
	SPEED4	37.24 (9.32) (37)	17.20 (8.83) (22)	34.39 (14.32) (17)	17.35 (2.60) (6)
	SPEED5	37.83 (10.76) (37)	7.35 (5.10) (22)	37.49 (12.70) (17)	7.77 (4.58) (6)

(cont. over)

Table N.1: Mean Approach Speeds for all Time Periods - Site 1 (cont.)

		Approach Road			
		North-East	South-East	South-West	North-West
Mean for all Time Periods:	SPEED1	31.06 (10.18) (139)	24.92 (7.49) (65)	27.59 (10.27) (153)	23.54 (5.93) (28)
	SPEED2	37.19 (12.80) (139)	21.53 (10.74) (66)	33.00 (11.05) (152)	22.09 (6.06) (28)
	SPEED3	40.52 (12.17) (124)	20.64 (7.65) (66)	34.93 (13.46) (140)	22.05 (10.16) (28)
	SPEED4	40.63 (9.33) (119)	18.80 (10.08) (66)	37.89 (13.57) (118)	20.27 (8.32) (27)
	SPEED5	41.85 (10.88) (118)	10.60 (4.42) (66)	40.21 (13.28) (118)	11.48 (5.30) (27)

N.2: Approach Speeds for all Time Periods - Site 2

Table N.2 (below and over) shows the mean approach speed for each of the five approach speeds for each entrance during each time period, followed by the mean for all time periods. The figures in brackets refer to the relevant standard deviations and groups sizes.

Table N.2: Mean Approach Speeds for Each Time Period - Site 2

		Approach Road/Lane												
		North			East		South			West				
		1	2	3	1	2	1	2	3	1	2	3	4	5
8.00-9.00	SPEED1	30.02	-	37.81	9.57	18.45	32.51	-	38.03	30.11	43.28	31.72	37.16	33.87
		(5.22)		(6.09)	(6.47)	(9.32)	(4.92)		(6.23)	(8.71)	-	(10.92)	-	(10.42)
		(35)		(14)	(48)	(18)	(32)		(7)	(55)	(1)	(79)	(1)	(59)
	SPEED2	24.46	-	35.34	7.85	20.45	33.61	-	36.93	27.13	30.40	28.62	35.97	29.36
		(4.53)		(6.65)	(4.49)	(10.62)	(6.05)		(9.27)	(5.28)	-	(4.80)	-	(4.98)
		(35)		(14)	(48)	(18)	(32)		(7)	(55)	(1)	(79)	(1)	(59)
	SPEED3	24.75	-	36.27	8.91	20.62	28.78	-	35.65	24.53	29.14	25.42	32.99	27.92
		(4.14)		(8.23)	(5.15)	(6.18)	(4.60)		(3.39)	(5.10)	-	(5.56)	-	(5.33)
		(35)		(14)	(49)	(18)	(32)		(7)	(55)	(1)	(78)	(1)	(59)
	SPEED4	24.42	-	28.16	9.32	17.86	23.17	-	31.77	25.87	23.27	24.97	33.20	27.32
		(6.49)		(8.16)	(6.95)	(6.74)	(3.38)		(4.80)	(4.73)	-	(5.76)	-	(5.04)
		(35)		(14)	(50)	(18)	(32)		(7)	(54)	(1)	(79)	(1)	(59)
	SPEED5	18.82	-	21.24	6.98	9.50	17.43	-	21.53	19.75	23.42	18.05	25.00	25.32
		(18.09)		(17.70)	(5.01)	(6.46)	(11.40)		(9.70)	(11.98)	-	(9.51)	-	(8.41)
		(35)		(14)	(43)	(18)	(32)		(7)	(52)	(1)	(76)	(1)	(59)
10.30-11.30	SPEED1	29.83	-	35.53	29.28	-	31.34	-	37.73	26.23	-	27.28	33.45	35.02
		(5.16)		(6.29)	(2.88)		(5.35)		(3.61)	(3.94)		(3.84)	-	(2.70)
		(34)		(11)	(24)		(29)		(6)	(20)		(23)	(1)	(11)
	SPEED2	25.77	-	34.42	25.44	-	30.66	-	33.11	24.66	-	26.40	28.90	27.32
		(4.50)		(6.65)	(6.75)		(4.22)		(2.45)	(3.69)		(3.87)	-	(3.31)
		(34)		(11)	(24)		(29)		(6)	(19)		(22)	(1)	(12)
	SPEED3	25.54	-	34.93	27.78	-	28.37	-	34.33	22.87	-	26.63	25.67	22.97
		(5.27)		(5.62)	(4.66)		(3.92)		(2.51)	(4.33)		(5.70)	-	(4.38)
		(34)		(10)	(24)		(29)		(6)	(19)		(22)	(1)	(12)
	SPEED4	23.37	-	31.68	23.58	-	21.81	-	31.29	18.20	-	20.01	25.93	20.51
		(5.58)		(8.66)	(4.08)		(3.64)		(3.05)	(3.72)		(2.98)	-	(2.02)
		(34)		(10)	(25)		(29)		(6)	(19)		(22)		(12)
	SPEED5	20.14	-	21.15	18.61	-	15.26	-	26.39	17.49	-	22.12	28.47	15.32
		(17.34)		(9.72)	(5.71)		(9.93)		(4.71)	(11.16)		(7.19)	-	(4.18)
		(32)		(11)	(24)		(29)		(6)	(20)		(22)	(1)	(12)

(cont. over)

Table N.2: Mean Approach Speeds for Each Time Period - Site 2 (cont.)

		Approach Road/Lane												
		North			East		South			West				
		1	2	3	1	2	1	2	3	1	2	3	4	5
12.30- 13.30	SPEED1	29.19	-	34.64	29.19	-	32.00	-	39.13	23.28	-	25.30	27.87	29.92
		(6.35)		(5.76)	(4.98)		(5.34)		(5.97)	(4.23)		(4.64)	(0.00)	(3.27)
		(46)		(26)	(48)		(44)		(9)	(44)		(27)	(2)	(11)
	SPEED2	30.85	-	32.84	32.34	-	30.92	-	33.44	21.87	-	24.23	25.50	22.66
		(7.07)		(6.45)	(5.48)		(6.13)		(7.65)	(4.54)		(4.83)	(0.00)	(2.39)
		(46)		(26)	(49)		(44)		(9)	(44)		(27)	(2)	(11)
	SPEED3	24.21	-	28.30	33.21	-	27.29	-	32.78	22.46	-	24.80	20.47	20.06
		(4.58)		(5.24)	(6.16)		(4.28)		(6.00)	(6.20)		(4.70)	(1.11)	(3.56)
		(46)		(26)	(49)		(43)		(9)	(43)		(26)	(2)	(11)
	SPEED4	24.55	-	32.87	25.89	-	21.08	-	28.25	20.54	-	22.08	20.87	19.38
		(6.04)		(5.80)	(6.12)		(3.51)		(6.09)	(6.87)		(3.32)	(2.21)	(2.34)
		(46)		(26)	(48)		(43)		(10)	(42)		(25)	(2)	(11)
	SPEED5	22.10	-	27.15	18.91	-	15.00	-	22.39	17.20	-	19.02	16.26	20.36
		(20.95)		(17.76)	(9.73)		(9.91)		(10.64)	(12.06)		(13.79)	(8.36)	(10.37)
		(45)		(25)	(51)		(44)		(10)	(43)		(25)	(2)	(11)
14.30- 15.30	SPEED1	32.48	-	36.33	24.97	-	27.49	-	30.15	25.25	-	26.67	-	35.33
		(3.93)		(3.17)	(6.60)		(6.96)		(6.99)	(3.08)		(3.58)		(3.25)
		(31)		(11)	(31)		(18)		(8)	(21)		(12)		(13)
	SPEED2	30.61	-	29.51	27.29	-	28.24	-	25.94	25.36	-	24.44	-	28.38
		(4.01)		(7.01)	(6.23)		(6.52)		(5.72)	(3.13)		(3.31)		(2.90)
		(31)		(11)	(31)		(18)		(8)	(21)		(12)		(13)
	SPEED3	24.60	-	28.87	21.33	-	26.05	-	24.53	27.33	-	24.84	-	24.78
		(3.71)		(8.59)	(5.23)		(6.32)		(6.74)	(3.86)		(4.16)		(4.10)
		(31)		(11)	(31)		(18)		(8)	(21)		(12)		(13)
	SPEED4	24.40	-	30.91	21.86	-	21.14	-	23.59	25.08	-	24.48	-	24.15
		(4.18)		(4.00)	(5.35)		(4.38)		(6.51)	(5.52)		(4.07)		(4.05)
		(31)		(11)	(31)		(19)		(7)	(21)		(12)		(13)
	SPEED5	23.70	-	26.05	21.77	-	17.26	-	18.05	19.02	-	18.00	-	29.76
		(14.88)		(15.17)	(10.15)		(13.48)		(8.14)	(8.86)		(11.53)		(8.77)
		(30)		(11)	(30)		(19)		(7)	(21)		(12)		(13)

(cont. over)

Table N.2: Mean Approach Speeds for Each Time Period - Site 2 (cont.)

	Approach Road/Lane												
	North			East		South			West				
	1	2	3	1	2	1	2	3	1	2	3	4	5
17.00- SPEED1	30.55	-	37.54	31.31	-	29.71	-	38.05	23.27	-	23.73	-	34.80
18.00	(5.27)		(4.35)	(4.00)		(9.07)		(4.75)	(2.78)		(3.54)		(2.40)
	(66)		(26)	(59)		(53)		(11)	(37)		(23)		(10)
SPEED2	23.57	-	33.44	28.29	-	28.23	-	32.93	22.75	-	23.43	-	29.90
	(4.20)		(3.97)	(5.42)		(8.37)		(5.03)	(2.99)		(3.72)		(2.89)
	(66)		(26)	(60)		(54)		(11)	(37)		(23)		(10)
SPEED3	21.89	-	30.49	24.54	-	25.48	-	33.62	18.86	-	21.18	-	25.51
	(3.90)		(3.60)	(5.66)		(7.55)		(4.46)	(3.96)		(5.19)		(3.28)
	(66)		(26)	(60)		(53)		(11)	(37)		(22)		(10)
SPEED4	22.76	-	24.29	22.80	-	20.29	-	29.87	16.39	-	18.02	-	20.30
	(5.55)		(4.32)	(6.15)		(6.06)		(4.07)	(3.23)		(3.30)		(2.51)
	(66)		(26)	(60)		(53)		(11)	(37)		(22)		(10)
SPEED5	20.15	-	18.55	17.94	-	14.26	-	20.60	14.70	-	17.15	-	26.09
	(18.35)		(12.70)	(9.87)		(10.68)		(7.66)	(15.19)		(12.28)		(8.52)
	(65)		(26)	(60)		(54)		(11)	(37)		(22)		(10)
Mean for all Time Periods:													
SPEED1	30.33	-	36.33	24.69	18.45	30.84	-	36.70	25.97	43.28	28.55	31.59	33.85
	(5.38)		(5.29)	(9.32)	(9.32)	(6.89)		(6.30)	(9.39)	-	(11.46)	(3.94)	(12.35)
	(212)		(88)	(210)	(18)	(176)		(41)	(177)	(1)	(164)	(4)	(104)
SPEED2	26.68	-	33.58	24.13	20.45	30.27	-	32.39	24.42	30.40	26.55	28.97	28.36
	(5.91)		(7.21)	(13.17)	(10.62)	(6.90)		(7.05)	(4.39)	-	(4.72)	(2.34)	(4.22)
	(212)		(87)	(212)	(18)	(177)		(41)	(176)	(1)	(163)	(4)	(105)
SPEED3	23.85	-	31.07	22.84	20.62	27.07	-	32.11	22.98	29.14	24.86	24.90	25.91
	(4.60)		(6.56)	(12.03)	(6.18)	(5.77)		(5.31)	(5.67)	-	(6.48)	(6.33)	(5.05)
	(212)		(87)	(213)	(18)	(175)		(41)	(175)	(1)	(160)	(4)	(105)
SPEED4	23.76	-	28.83	20.30	17.86	21.35	-	28.94	21.61	23.27	20.28	25.22	24.65
	(5.71)		(6.36)	(11.42)	(6.74)	(4.58)		(5.57)	(6.71)	-	(5.75)	(5.17)	(6.27)
	(212)		(88)	(214)	(18)	(176)		(41)	(173)	(1)	(160)	(4)	(105)
SPEED5	20.86	-	22.73	16.54	9.50	15.50	-	21.61	17.69	23.42	18.64	21.50	24.28
	(19.26)		(15.78)	(12.93)	(6.46)	(12.05)		(9.78)	(15.12)	-	(11.93)	(4.90)	(8.59)
	(207)		(87)	(208)	(18)	(178)		(41)	(173)	(1)	(157)	(4)	(105)

N.3: Approach Speeds for all Time Periods - Site 3

Table N.3 (below and over) shows the mean approach speed for each of the five approach speeds for each entrance during each time period, followed by the mean for all time periods. The figures in brackets refer to the relevant standard deviations and groups sizes.

Table N.3: Mean Approach Speeds for Each Time Period - Site 3

		Approach Road/Lane											
		North			East			South			West		
		1	2	3	1	2	3	1	2	3	1	2	3
8.00-9.00	SPEED1	35.05	35.37	39.35	35.35	-	36.99	26.72	-	33.46	29.26	-	34.88
		(5.58)	-	(8.71)	(5.39)		(5.96)	(6.74)		(9.74)	(1.74)		(3.36)
		(99)	(1)	(28)	(9)		(5)	(66)		(44)	(16)		(9)
	SPEED2	29.15	30.80	31.62	29.02	-	31.59	26.40	-	27.63	27.51	-	34.80
		(2.03)	-	(2.67)	(9.79)		(9.54)	(5.93)		(7.49)	(8.43)		(13.94)
		(99)	(1)	(28)	(9)		(5)	(65)		(44)	(16)		(9)
	SPEED3	21.21	24.75	24.35	24.46	-	30.05	21.40	-	28.64	24.65	-	25.07
		(2.45)	-	(3.10)	(5.18)		(4.72)	(6.50)		(7.68)	(2.61)		(2.83)
		(99)	(1)	(28)	(9)		(5)	(64)		(44)	(16)		(9)
	SPEED4	18.65	25.78	23.59	20.02	-	26.88	17.30	-	26.29	23.65	-	25.00
		(13.31)	-	(15.35)	(4.23)		(6.16)	(5.76)		(8.27)	(12.32)		(9.01)
		(99)	(1)	(28)	(9)		(5)	(65)		(44)	(16)		(9)
	SPEED5	14.15	20.44	17.71	19.86	-	21.01	16.66	-	21.16	17.76	-	15.83
		(15.26)	-	(6.54)	(7.77)		(3.43)	(11.31)		(7.13)	(7.90)		(7.22)
		(99)	(1)	(28)	(9)		(5)	(65)		(44)	(16)		(9)
10.30-11.30	SPEED1	32.52	18.15	35.39	35.90	31.90	35.54	29.07	33.52	30.62	31.91	-	34.79
		(3.92)	-	(4.53)	(9.24)	-	(7.50)	(21.40)	(14.97)	(8.60)	(5.65)		(12.75)
		(54)	(1)	(10)	(24)	(1)	(12)	(54)	(2)	(16)	(7)		(2)
	SPEED2	26.69	11.34	25.27	27.36	29.20	30.19	26.41	32.33	27.56	31.84	-	31.32
		(3.06)	-	(3.54)	(6.26)	-	(4.75)	(7.60)	(6.83)	(12.26)	(6.79)		(11.07)
		(54)	(1)	(10)	(24)	(1)	(12)	(59)	(2)	(16)	(7)		(2)
	SPEED3	21.89	10.89	23.54	26.71	27.39	29.29	22.40	25.10	24.90	25.62	-	23.74
		(2.92)	-	(3.15)	(6.08)	-	(5.16)	(5.10)	(15.66)	(7.73)	(3.44)		(8.16)
		(54)	(1)	(10)	(24)	(1)	(12)	(59)	(2)	(16)	(7)		(2)
	SPEED4	19.85	13.90	23.78	27.23	27.70	23.91	22.74	19.61	22.87	22.45	-	21.21
		(4.43)	-	(5.63)	(6.84)	-	(7.44)	(6.24)	(19.54)	(8.87)	(7.22)		(0.00)
		(53)	(1)	(10)	(24)	(1)	(12)	(59)	(2)	(16)	(7)		(2)
	SPEED5	17.61	18.97	15.26	19.63	23.84	22.15	19.10	17.25	22.55	17.57	-	18.12
		(13.37)	-	(6.22)	(9.86)	-	(3.66)	(8.76)	(4.37)	(4.57)	(8.71)		(1.08)
		(53)	(1)	(10)	(24)	(1)	(12)	(59)	(2)	(16)	(7)		(2)

(cont. over)

Table N.3: Mean Approach Speeds for Each Time Period - Site 3 (cont.)

		Approach Road/Lane											
		North			East			South			West		
		1	2	3	1	2	3	1	2	3	1	2	3
12.30-	SPEED1	31.40	21.35	36.95	28.75	-	31.88	29.64	-	30.17	32.30	-	36.62
13.30		(3.89)	-	(5.95)	(7.44)		(18.81)	(7.34)		(7.23)	(4.90)		(4.18)
		(48)	(1)	(11)	(32)		(13)	(57)		(33)	(13)		(2)
	SPEED2	30.25	18.91	32.77	28.18	-	33.16	27.24	-	27.84	30.18	-	28.93
		(2.07)	-	(4.29)	(4.15)		(6.69)	(4.85)		(5.95)	(4.87)		(13.84)
		(48)	(1)	(11)	(32)		(13)	(57)		(33)	(13)		(2)
	SPEED3	22.90	16.37	25.42	27.86	-	30.95	24.55	-	26.87	26.88	-	26.68
		(2.79)	-	(2.51)	(4.38)		(6.80)	(6.11)		(5.94)	(4.52)		(1.22)
		(48)	(1)	(11)	(32)		(13)	(57)		(33)	(13)		(2)
	SPEED4	18.11	15.36	23.67	26.55	-	26.79	21.34	-	22.28	21.24	-	19.42
		(4.44)	-	(6.78)	(5.59)		(9.93)	(6.12)		(8.81)	(9.38)		(7.72)
		(48)	(1)	(11)	(32)		(13)	(57)		(33)	(13)		(2)
	SPEED5	15.99	13.10	17.05	23.60	-	18.16	16.25	-	21.83	18.83	-	14.56
		(14.32)	-	(3.36)	(6.83)		(5.28)	(9.28)		(5.41)	(6.92)		(0.85)
		(48)	(1)	(11)	(32)		(13)	(57)		(33)	(13)		(2)
14.30-	SPEED1	29.96	-	30.30	33.91	35.55	32.80	31.97	-	29.92	32.45	-	33.53
15.30		(5.13)		(8.40)	(5.46)	(5.16)	(6.76)	(5.21)		(6.65)	(2.00)		(5.23)
		(69)		(12)	(25)	(2)	(17)	(60)		(20)	(7)		(7)
	SPEED2	28.67	-	31.56	31.40	33.16	31.64	27.46	-	27.63	24.48	-	32.51
		(2.35)		(2.67)	(7.52)	(8.53)	(8.93)	(4.31)		(6.73)	(1.73)		(4.48)
		(69)		(12)	(25)	(2)	(17)	(60)		(20)	(7)		(7)
	SPEED3	21.74	-	25.50	31.77	31.27	30.75	23.82	-	27.24	25.77	-	24.75
		(3.37)		(4.44)	(7.46)	(10.90)	(8.81)	(4.87)		(6.47)	(2.36)		(5.56)
		(69)		(12)	(25)	(2)	(17)	(60)		(20)	(7)		(7)
	SPEED4	17.35	-	24.89	26.41	24.04	27.90	19.62	-	25.53	23.39	-	24.42
		(5.33)		(6.24)	(8.89)	(11.77)	(9.57)	(5.11)		(5.10)	(8.92)		(9.78)
		(69)		(12)	(25)	(2)	(17)	(60)		(20)	(7)		(7)
	SPEED5	15.98	-	15.02	22.90	21.66	19.38	17.07	-	21.77	15.55	-	17.42
		(13.09)		(5.47)	(5.84)	(8.63)	(4.55)	(8.55)		(5.71)	(6.52)		(2.86)
		(69)		(12)	(25)	(2)	(17)	(60)		(20)	(7)		(7)

(cont. over)

Table N.3: Mean Approach Speeds for Each Time Period - Site 3 (cont.)

		Approach Road/Lane											
		North			East			South			West		
		1	2	3	1	2	3	1	2	3	1	2	3
17.00-	SPEED1	31.83	30.25	34.53	27.78	36.01	29.34	30.56	27.90	35.70	27.86	-	36.18
18.00		(7.11)	-	(8.83)	(6.46)	(7.35)	(6.34)	(6.33)	(10.53)	(8.86)	(2.50)		(2.71)
		(65)	(1)	(16)	(41)	(3)	(27)	(56)	(24)	(29)	(12)		(8)
	SPEED2	26.05	28.32	29.49	24.30	36.01	30.84	25.98	21.67	29.97	23.58	-	32.75
		(1.17)	-	(3.49)	(6.11)	(6.13)	(5.54)	(5.30)	(7.15)	(6.16)	(3.85)		(3.30)
		(65)	(1)	(16)	(41)	(3)	(27)	(56)	(24)	(29)	(12)		(8)
	SPEED3	22.19	28.15	25.81	23.48	35.16	29.47	22.69	20.38	22.95	23.22	-	28.01
		(2.16)	-	(3.64)	(7.28)	(7.99)	(5.82)	(5.63)	(9.34)	(8.46)	(3.16)		(3.80)
		(65)	(1)	(16)	(41)	(3)	(27)	(56)	(24)	(29)	(12)		(8)
	SPEED4	20.73	26.54	24.91	20.08	26.91	26.28	21.89	20.60	19.93	22.98	-	24.28
		(3.37)	-	(4.87)	(8.25)	(10.01)	(5.50)	(4.21)	(8.23)	(5.05)	(7.54)		(7.11)
		(65)	(1)	(16)	(41)	(3)	(27)	(56)	(24)	(29)	(12)		(8)
	SPEED5	17.31	23.91	18.75	15.79	19.79	15.72	19.05	14.96	18.27	17.31	-	16.74
		(11.84)	-	(5.36)	(7.47)	(3.22)	(4.61)	(9.57)	(6.64)	(5.33)	(7.16)		(6.52)
		(65)	(1)	(16)	(40)	(3)	(27)	(56)	(24)	(28)	(12)		(8)
Mean for all Time Periods:													
	SPEED1	32.45	26.28	36.08	31.19	35.17	32.10	29.53	28.33	32.33	30.42	-	35.03
		(7.08)	(10.55)	(10.51)	(8.03)	(5.63)	(10.05)	(14.24)	(6.03)	(9.12)	(3.62)		(4.38)
		(335)	(4)	(77)	(131)	(6)	(74)	(293)	(26)	(142)	(55)		(28)
	SPEED2	28.21	22.34	30.51	27.49	33.93	31.38	26.70	22.49	28.15	27.45	-	32.97
		(2.97)	(5.01)	(3.57)	(7.34)	(5.39)	(7.19)	(5.92)	(4.75)	(7.95)	(7.98)		(11.83)
		(335)	(4)	(77)	(131)	(6)	(74)	(297)	(26)	(142)	(55)		(28)
	SPEED3	21.86	20.04	24.88	26.79	32.57	30.03	22.94	20.74	26.45	25.13	-	25.85
		(2.78)	(5.46)	(3.42)	(6.94)	(6.53)	(6.71)	(5.75)	(5.83)	(7.63)	(3.33)		(4.22)
		(335)	(4)	(77)	(131)	(6)	(74)	(296)	(26)	(142)	(55)		(28)
	SPEED4	18.90	20.40	24.10	24.17	26.09	26.40	20.49	20.52	23.57	22.75	-	23.98
		(9.67)	(5.04)	(11.13)	(7.59)	(7.97)	(7.90)	(6.11)	(5.85)	(8.35)	(12.13)		(8.75)
		(334)	(4)	(77)	(131)	(6)	(74)	(297)	(26)	(142)	(55)		(28)
	SPEED5	15.96	19.11	17.09	20.07	21.09	18.39	17.60	15.14	20.99	17.61	-	16.56
		(13.88)	(7.45)	(5.75)	(8.12)	(4.25)	(5.00)	(9.63)	(3.20)	(6.12)	(7.53)		(5.40)
		(334)	(4)	(77)	(130)	(6)	(74)	(297)	(26)	(141)	(55)		(28)

N.4: Approach Speeds for all Time Periods - Site 4

Table N.4 (below and over) shows the mean approach speed for each of the five approach speeds for each entrance during each time period, followed by the mean for all time periods. The figures in brackets refer to the relevant standard deviations and groups sizes.

Table N.4: Mean Approach Speeds for Each Time Period - Site 4

		Approach Road/Lane				
		North	East (1)		East (2)	South
		1	1	2	1	1
8.00-9.00	SPEED1	15.38	22.95	16.17	10.12	15.06
		(3.77)	(11.26)	(9.08)	(2.53)	(7.78)
		(6)	(69)	(19)	(20)	(77)
	SPEED2	14.66	17.89	13.63	-	10.47
		(5.25)	(9.04)	(9.02)		(5.91)
		(6)	(69)	(19)		(71)
	SPEED3	13.23	16.70	12.11	-	7.59
		(4.83)	(7.67)	(6.61)		(4.69)
		(6)	(68)	(19)		(49)
	SPEED4	5.45	14.11	11.07	-	4.27
		(0.96)	(6.88)	-		(2.46)
		(6)	(68)	(1)		(9)
	SPEED5	-	8.81	-	-	-
			(4.42)			
			(71)			
10.30-11.30	SPEED1	18.93	30.03	20.94	10.05	20.53
		(4.05)	(7.36)	(8.07)	(2.49)	(7.61)
		(6)	(56)	(4)	(6)	(54)
	SPEED2	18.84	21.34	12.50	-	15.08
		(2.75)	(4.24)	(7.62)		(6.12)
		(6)	(57)	(4)		(43)
	SPEED3	15.40	20.78	11.50	-	11.94
		(3.20)	(4.76)	(8.01)		(5.21)
		(6)	(58)	(4)		(25)
	SPEED4	5.20	17.34	-	-	6.03
		(2.34)	(5.12)			(4.52)
		(5)	(58)			(8)
	SPEED5	-	10.69	-	-	-
			(3.72)			
			(60)			

(cont. over)

Table N.4: Mean Approach Speeds for Each Time Period - Site 4 (cont.)

		Approach Road/Lane				
		North	East (1)		East (2)	South
		1	1	2	1	1
12.30-	SPEED1	19.06	35.93	20.25	8.02	22.56
13.30		(2.58)	(9.45)	(9.92)	(2.90)	(6.41)
		(18)	(52)	(12)	(13)	(56)
	SPEED2	17.61	28.61	9.57	-	16.11
		(3.25)	(5.06)	(6.64)		(5.01)
		(18)	(52)	(12)		(48)
	SPEED3	14.33	20.60	10.91	-	13.18
		(3.23)	(5.75)	(7.38)		(5.16)
		(18)	(53)	(12)		(29)
	SPEED4	5.28	18.64	-	-	11.07
		(2.22)	(4.70)			(4.51)
		(18)	(52)			(6)
	SPEED5	-	11.07	-	-	-
			(4.33)			
			(53)			
14.30-	SPEED1	22.85	38.05	26.14	11.17	20.90
15.30		(4.28)	(11.99)	(5.42)	(1.75)	(4.28)
		(5)	(65)	(5)	(3)	(60)
	SPEED2	17.70	27.42	15.33	-	17.81
		(0.99)	(5.70)	(4.25)		(4.67)
		(5)	(65)	(5)		(37)
	SPEED3	16.84	22.96	21.35	-	14.81
		(2.47)	(7.46)	(7.84)		(5.65)
		(5)	(66)	(5)		(26)
	SPEED4	5.52	13.00	5.44	-	9.26
		(2.54)	(4.76)	(4.76)		(4.33)
		(5)	(66)	(2)		(7)
	SPEED5	-	11.33	-	-	-
			(5.88)			
			(67)			

(cont. over)

Table N.4: Mean Approach Speeds for Each Time Period - Site 4 (cont.)

		Approach Road/Lane				
		North	East (1)		East (2)	South
		1	1	2	1	1
17.00-18.00	SPEED1	20.08	27.67	10.45	11.61	12.40
		(3.37)	(8.36)	(9.89)	(3.03)	(6.60)
		(26)	(84)	(4)	(3)	(132)
	SPEED2	18.61	22.10	6.88	-	10.04
		(3.33)	(4.13)	(5.83)		(5.04)
		(26)	(85)	(4)		(127)
	SPEED3	15.67	19.46	5.46	-	6.97
		(2.70)	(5.13)	(8.20)		(4.07)
		(26)	(85)	(4)		(82)
	SPEED4	5.43	16.54	-	-	5.76
		(2.62)	(5.23)			(2.61)
		(26)	(88)			(17)
	SPEED5	-	8.34	-	-	-
			(4.10)			
			(89)			
Mean for all Time Periods:						
	SPEED1	19.43	30.46	18.33	9.67	17.26
		(3.64)	(11.61)	(10.64)	(2.76)	(8.01)
		(61)	(326)	(44)	(45)	(379)
	SPEED2	17.88	23.17	12.00	-	12.58
		(3.46)	(6.08)	(7.75)		(6.12)
		(61)	(328)	(44)		(326)
	SPEED3	15.10	20.01	12.17	-	9.52
		(3.18)	(6.56)	(7.85)		(5.59)
		(61)	(330)	(44)		(211)
	SPEED4	5.37	15.81	7.32	-	6.72
		(2.28)	(5.76)	(3.33)		(4.03)
		(60)	(332)	(3)		(47)
	SPEED5	-	9.87	-	-	-
			(4.69)			
			(340)			

N.5: Approach Speeds for Different Vehicle Types

Table N.5 (below) gives the mean, standard deviation and number of cases for each of the five approach speed measures (all sites combined) for each reclassified vehicle type. Table N.6 features the same information as Table N.5 for vehicles which did not have to queue before entering (or leaving) the junction, whilst Tables N.7 to N.10 give this information for each of the four sites in isolation.

Table N.5: Mean Speeds Classified By Vehicle Type - All Sites

Vehicle Type	SPEED1	SPEED2	SPEED3	SPEED4	SPEED5
Cars	28.87 (11.52) (2984)	22.54 (11.26) (2905)	22.61 (11.05) (2778)	22.25 (11.77) (2584)	19.45 (17.05) (2496)
Light Goods	28.48 (10.43) (268)	21.06 (10.82) (256)	21.42 (10.99) (251)	20.03 (11.73) (230)	17.91 (18.22) (218)
Buses	27.28 (10.46) (152)	25.31 (9.81) (152)	25.37 (8.37) (151)	24.95 (10.56) (150)	13.76 (8.55) (148)
Heavy Goods	28.38 (12.73) (126)	20.82 (8.72) (120)	21.35 (8.66) (114)	19.89 (9.26) (104)	16.10 (14.39) (94)
Motorcycles	30.01 (13.22) (26)	22.31 (10.89) (24)	21.33 (9.82) (24)	20.51 (9.37) (21)	23.77 (18.93) (20)
Mopeds	27.41 (12.35) (15)	21.64 (9.94) (15)	20.37 (11.52) (14)	16.98 (15.78) (13)	21.57 (20.04) (12)
Bicycles	14.99 (5.44) (14)	14.67 (5.53) (14)	15.19 (6.95) (13)	15.33 (7.13) (12)	11.90 (7.84) (12)
Others	26.10 (11.14) (26)	19.28 (8.85) (26)	20.25 (8.41) (24)	20.19 (8.21) (24)	17.64 (12.72) (24)
MEAN	28.68 (10.23) (3611)	22.67 (9.74) (3512)	22.56 (8.74) (3369)	22.08 (9.72) (3138)	18.90 (14.96) (3024)

Table N.6: Mean Speeds Classified by Vehicle Type - All Sites (No Queue)

Mean Speed: / Vehicle Type:	SPEED1	SPEED2	SPEED3	SPEED4	SPEED5
Cars	29.96 (10.57) (2478)	27.37 (11.04) (2407)	25.40 (10.70) (2306)	23.47 (11.57) (2185)	21.44 (16.01) (2123)
Light Goods	29.09 (10.03) (226)	26.34 (10.77) (215)	24.95 (10.77) (212)	22.36 (11.41) (194)	22.00 (17.36) (185)
Buses/ Coaches	30.14 (10.14) (137)	30.24 (9.88) (137)	28.16 (8.29) (136)	24.66 (10.65) (135)	14.07 (7.76) (134)
Heavy Goods	28.34 (12.48) (115)	23.60 (8.54) (110)	22.52 (8.43) (104)	20.17 (8.45) (95)	16.47 (13.87) (85)
Motor-cycles	30.19 (11.93) (20)	24.80 (10.51) (19)	23.49 (9.81) (20)	21.64 (8.52) (17)	24.17 (16.33) (17)
Mopeds	25.85 (10.50) (10)	25.81 (8.01) (10)	26.55 (10.02) (9)	20.37 (11.46) (9)	26.29 (18.76) (9)
Bicycles	13.71 (5.54) (12)	12.18 (5.90) (12)	11.52 (7.23) (11)	11.25 (7.45) (11)	10.94 (8.21) (11)
Others	27.17 (10.93) (26)	22.74 (8.91) (26)	23.09 (8.70) (24)	20.71 (9.27) (24)	18.06 (12.91) (24)
Mean	29.75 (10.64) (3024)	27.45 (10.88) (2936)	25.32 (10.51) (2822)	23.25 (11.41) (2670)	20.90 (15.94) (2588)

Table N.7: Mean Speeds for each Vehicle Type - Site 1 (No Queue)

Mean Speed: / Vehicle Type:	SPEED1	SPEED2	SPEED3	SPEED4	SPEED5
Cars	29.64 (10.28) (303)	33.68 (12.96) (301)	35.35 (14.67) (281)	35.78 (13.27) (256)	35.12 (19.98) (256)
Light Goods	29.04 (8.22) (38)	34.15 (11.73) (37)	35.09 (12.36) (36)	34.94 (12.04) (35)	34.86 (18.46) (35)
Buses/ Coaches	29.51 (-) (1)	31.08 (-) (1)	38.11 (-) (1)	41.86 (-) (1)	41.62 (-) (1)
Heavy Goods	26.39 (1.71) (3)	27.20 (0.94) (3)	34.48 (2.54) (3)	30.99 (12.68) (3)	16.85 (19.25) (3)
Motor-cycles	39.35 (-) (1)	36.83 (-) (1)	40.63 (-) (1)	40.98 (-) (1)	41.62 (-) (1)
Mopeds	26.76 (12.63) (3)	26.91 (11.01) (3)	37.77 (13.69) (2)	32.00 (13.91) (2)	37.74 (16.16) (2)
Bicycles	8.00 (2.31) (5)	8.94 (2.61) (5)	9.98 (4.17) (4)	9.72 (2.35) (4)	10.86 (1.72) (4)
Others	21.76 (8.97) (2)	20.27 (12.88) (2)	33.88 (-) (1)	38.62 (-) (1)	37.77 (-) (1)
Mean	29.20 (10.30) (356)	33.19 (13.00) (353)	35.04 (14.48) (329)	35.32 (13.39) (303)	34.66 (19.88) (303)

Table N.8: Mean Speeds for each Vehicle Type - Site 2 (No Queue)

Mean Speed: / Vehicle Type:	SPEED1	SPEED2	SPEED3	SPEED4	SPEED5
Cars	30.78 (8.56) (848)	28.62 (7.73) (847)	26.47 (6.34) (841)	23.83 (7.37) (842)	21.25 (14.85) (848)
Light Goods	29.99 (7.56) (49)	28.55 (7.45) (50)	27.27 (6.19) (50)	22.90 (5.81) (50)	22.34 (15.53) (50)
Buses/ Coaches	27.26 (8.97) (23)	31.58 (7.71) (23)	29.05 (6.42) (23)	25.27 (7.57) (23)	16.72 (7.24) (23)
Heavy Goods	25.91 (6.33) (38)	27.33 (7.62) (38)	24.76 (5.85) (38)	23.18 (7.02) (38)	19.09 (14.03) (38)
Motor-cycles	33.83 (10.02) (11)	27.21 (8.54) (11)	26.46 (5.26) (11)	21.42 (5.73) (11)	23.99 (14.07) (11)
Mopeds	25.89 (5.71) (3)	28.43 (5.60) (3)	24.88 (6.10) (3)	19.54 (9.43) (3)	25.71 (26.03) (3)
Others	23.98 (5.13) (11)	25.07 (7.49) (11)	24.31 (5.60) (11)	19.84 (7.58) (11)	17.53 (13.17) (11)
Mean	30.42 (8.52) (983)	28.58 (7.72) (983)	26.47 (6.31) (977)	23.71 (7.29) (978)	21.12 (14.80) (984)

Table N.9: Mean Speeds for each Vehicle Type - Site 3 (No Queue)

Mean Speed: / Vehicle Type:	SPEED1	SPEED2	SPEED3	SPEED4	SPEED5
Cars	32.56 (11.30) (853)	27.45 (10.12) (853)	24.25 (8.60) (852)	21.98 (10.62) (852)	19.38 (12.21) (851)
Light Goods	31.52 (9.86) (68)	25.25 (8.70) (68)	23.14 (7.77) (68)	19.41 (8.27) (68)	20.00 (12.92) (68)
Buses/ Coaches	30.97 (10.39) (109)	30.05 (9.84) (109)	28.18 (7.99) (109)	24.55 (11.02) (109)	13.28 (6.35) (109)
Heavy Goods	37.19 (18.18) (28)	24.04 (6.85) (28)	23.61 (7.80) (28)	19.23 (7.05) (28)	16.11 (7.29) (28)
Motor-cycles	28.69 (8.19) (4)	21.05 (9.15) (4)	18.95 (6.71) (4)	15.99 (8.90) (3)	23.31 (22.74) (3)
Mopeds	20.96 (0.03) (2)	25.14 (3.85) (2)	22.47 (4.26) (2)	16.61 (7.83) (2)	20.66 (1.01) (2)
Bicycles	17.53 (4.74) (5)	15.74 (5.82) (5)	12.77 (8.13) (5)	12.53 (8.82) (5)	10.93 (8.85) (5)
Others	30.50 (15.15) (11)	21.05 (7.69) (11)	20.63 (9.06) (11)	20.26 (9.41) (11)	17.72 (11.39) (11)
Mean	32.33 (11.41) (1080)	28.13 (10.06) (1080)	24.49 (8.52) (1079)	21.95 (10.49) (1078)	18.69 (12.06) (1077)

Table N.10: Mean Speeds for each Vehicle Type - Site 4 (No Queue)

Mean Speed: / Vehicle Type:	SPEED1	SPEED2	SPEED3	SPEED4	SPEED5
Cars	24.03 (11.37) (474)	19.92 (5.52) (406)	17.21 (6.88) (332)	14.14 (6.70) (235)	11.98 (3.91) (168)
Light Goods	26.16 (12.18) (71)	20.92 (5.47) (60)	18.76 (6.79) (58)	15.87 (6.20) (41)	11.64 (3.82) (32)
Buses/ Coaches	24.28 (13.15) (4)	27.57 (7.00) (4)	17.14 (4.11) (3)	15.27 (10.41) (2)	12.05 - (1)
Heavy Goods	25.08 (12.20) (46)	19.58 (6.54) (41)	18.20 (8.22) (35)	15.53 (6.81) (26)	10.80 (3.41) (16)
Motor-cycle	19.41 (14.92) (4)	16.96 (6.86) (3)	15.56 (9.64) (4)	21.69 (0.32) (2)	17.76 (0.44) (2)
Mopeds	29.32 (1.62) (2)	20.89 (1.08) (2)	21.93 (1.63) (2)	13.73 (3.59) (2)	21.33 (16.00) (2)
Bicycles	18.41 (0.36) (2)	11.37 (0.00) (2)	11.49 (0.00) (2)	11.12 (1.00) (2)	11.17 (2.55) (2)
Others	31.79 (13.13) (2)	21.72 (1.93) (2)	25.97 - (1)	17.35 - (1)	8.03 - (1)
Mean	24.39 (11.57) (605)	20.03 (5.60) (520)	17.49 (6.98) (437)	14.53 (6.62) (311)	11.96 (4.09) (224)

N.6: ANOVA and Newman-Keuls Summary Tables

Tables N.11 to N.30 present the main details of the analysis of variance (see Section 4.7.1) tests performed on the approach speeds of different vehicle classes, at all junctions combined and at each site individually. For each of the Significant tests, Newman-Keuls post-hoc comparisons were carried out between all pairs of means to determine which vehicles differed from which others. For ease of presentation in these tables, the vehicle classes are labelled as follows:

1	-	Cars;	5	-	Motorcycles;
2	-	Light Goods;	6	-	Mopeds;
3	-	Buses/Coaches;	7	-	Bicycles;
4	-	Heavy Goods;	8	-	All other classes.

Table N.11: ANOVA Summary Table for SPEED1 - All Sites

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	p.
Between Groups	7	2529.61	361.37	2.43	0.028
Within Groups	70	10417.83	148.83		
Total	77	12947.45			

Table N.12: Newman-Keuls Post Hoc Tests on Ordered Pairs of Means - SPEED1 for All Sites

Vehicle Class:	7	6	8	4	2	1	3	5
7	-	*	*	*	*	*		
6		-						
8			-					
4				-				
2					-			
1						-		
3							-	
5								-

* - Significant at the 5% level;
** - Significant at the 1% level.

Table N.13: ANOVA Summary Table for SPEED2 - All Sites

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	p.
Between Groups	7	1652.51	236.07	2.83	0.013
Within Groups	60	5003.38	83.39		
Total	67	6655.89			

Table N.14: Newman-Keuls Post Hoc Tests on Ordered Pairs of Means - SPEED2 for All Sites

Vehicle Class:	7	8	4	5	6	2	1	3
7	-	*	*	*	*	*	*	*
8		-						
4			-					
5				-				
6					-			
2						-		
1							-	
3								-

* - Significant at the 5% level;
** - Significant at the 1% level.

Table N.15: ANOVA Summary Table for SPEED3 - All Sites

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	p.
Between Groups	7	1391.06	198.72	2.51	0.022
Within Groups	85	6738.63	79.28		
Total	92	8129.69			

Table N.16: Newman-Keuls Post Hoc Tests on Ordered Pairs of Means - SPEED3 for All Sites

Vehicle Class:	7	4	8	5	2	1	6	3
7	-	**	**	*	**	**	**	**
4		-						
8			-					
5				-				
2					-			
1						-		
6							-	
3								-

* - Significant at the 5% level;
** - Significant at the 1% level.

Table N.17: ANOVA Summary Table for SPEED4 - All Sites

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	p.
Between Groups	7	1781.53	254.50	3.44	0.004
Within Groups	63	4656.01	73.90		
Total	70	6437.54			

Table N.18: Newman-Keuls Post Hoc Tests on Ordered Pairs of Means - SPEED4 for All Sites

Vehicle Class:	7	4	6	8	5	2	1	3
7	-	*						
4		-						
6			-					
8				-				
5					-			
2						-		
1							-	
3								-

* - Significant at the 5% level;
** - Significant at the 1% level.

Table N.19: ANOVA Summary Table for SPEED5 - All Sites

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	p.
Between Groups	7	4273.54	610.51	2.46	0.026
Within Groups	68	16900.47	248.54		
Total	75	21174.01			

Table N.20: Newman-Keuls Post Hoc Tests on Ordered Pairs of Means - SPEED5 for All Sites

Vehicle Class:	7	3	4	8	1	2	5	6
7	-							
3		-						
4			-					
8				-				
1					-			
2						-		
5							-	
6								-

* - Significant at the 5% level;
** - Significant at the 1% level.

Table N.21: ANOVA Summary Table for SPEED1 - Site 1

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	p.
Between Groups	1	171.30	171.30	2.18	0.143
Within Groups	82	6434.01	78.46		
Total	83	6605.32			

Table N.22: ANOVA Summary Table for SPEED1 - Site 2

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	p.
Between Groups	5	1042.51	208.50	3.86	0.005
Within Groups	55	2969.07	53.98		
Total	60	4011.58			

Table N.23: Newman-Keuls Post Hoc Tests on Ordered Pairs of Means - SPEED1 for Site 2

Vehicle Class:	8	4	3	2	1	5
8	-					*
4		-				
3			-			
2				-		
1					-	
5						-

* - Significant at the 5% level;
** - Significant at the 1% level.

It should be noted that no bicycles (category 7) were included in this analysis.

Table N.24: ANOVA Summary Table for SPEED1 - Site 3

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	p.
Between Groups	4	335.77	83.94	0.36	0.835
Within Groups	40	9317.30	232.93		
Total	44	9653.07			

Table N.25: ANOVA Summary Table for SPEED1 - Site 4

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	p.
Between Groups	2	38.17	19.09	0.13	0.875
Within Groups	132	18777.45	142.25		
Total	134	18815.62			

Table N.26: ANOVA Summary Table for SPEED5 - Site 1

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	p.
Between Groups	1	47.05	47.05	0.12	0.732
Within Groups	64	25463.17	397.86		
Total	65	25510.22			

Table N.27: ANOVA Summary Table for SPEED5 - Site 2

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	p.
Between Groups	5	2313.57	462.71	2.13	0.080
Within Groups	43	9346.09	217.35		
Total	48	11659.66			

Table N.28: ANOVA Summary Table for SPEED5 - Site 3

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	p.
Between Groups	4	908.66	227.17	2.78	0.038
Within Groups	44	3597.51	81.76		
Total	48	4506.17			

Table N.29: Newman-Keuls Post Hoc Tests on Ordered Pairs of Means - SPEED5 for Site 3

Vehicle Class:	3	4	8	1	2
3	-				
4		-			
8			-		
1				-	
2					-

* - Significant at the 5% level;
** - Significant at the 1% level.

Table N.30: ANOVA Summary Table for SPEED5 - Site 4

Source	D.F.	Sum of Squares	Mean Squares	F-Ratio	p.
Between Groups	2	8.02	4.01	0.24	0.791
Within Groups	42	715.18	17.03		
Total	44	723.20			

APPENDIX O:

Correlation Matrices & Statistics for Multiple Regression Analyses for Study 1

CORRELATION MATRICES AND STATISTICS FOR MULTIPLE REGRESSION ANALYSES

The following tables (O.1 to O.39) contain further details of the multiple regression analyses contained in Section 4.4.2. Each section contains details of one analysis, beginning with the correlation matrix, followed by the summary statistics for each of the variables used in each solution (including the B and Beta weights and the squared semipartial correlation coefficients). The stars in these tables show variables which reached the criterion values on the beta weights (0.3) or the squared semipartial correlation coefficients (0.05). Finally, the statistics for the solution, including the adjusted value of R^2, the univariate F-test statistic and the significance of the solution, are shown.

O.1: Multiple Regression with SPEED1 as DV - All Sites

Table O.1: Correlation Matrix for SPEED1 - All Sites

	SPEED1	FOLLOW	BEHIND	DENSITY	OTHPRES
SPEED1	1.000				
FOLLOW	-0.089	1.000			
BEHIND	0.027	0.100	1.000		
DENSITY	-0.002	0.119	0.192	1.000	
OTHPRES	-0.031	0.063	0.007	-0.226	1.000

Table O.2: Relative Importance of Variables - MR with SPEED1 as DV - All Sites

Variable	B	Beta	sr^2
OTHPRES	-0.5214	-0.0268	0.0007
BEHIND	0.7508	0.0369	0.0013
FOLLOW	-1.8863	-0.0900	0.0079
DENSITY	-0.0137	-0.0049	0.0000
(Constant)	30.6938		

Table O.3: Summary Statistics for MR with SPEED1 as DV - All Sites

Multiple R = 0.0990 $F_{(4,1720)}$ = 4.26

R^2 = 0.0098 p = 0.002

Adjusted R^2 = 0.0075 N = 1725

O.2: Multiple Regression with SPEED1 as DV - Site 1

Table O.4: Correlation Matrix for SPEED1 - Site 1

	SPEED1				
SPEED1	1.000	FOLLOW			
FOLLOW	-0.167	1.000	BEHIND		
BEHIND	-0.101	0.089	1.000	DENSITY	
DENSITY	-0.221	0.059	0.220	1.000	OTHPRES
OTHPRES	0.022	-0.092	0.207	-0.161	1.000

Table O.5: Relative Importance of Variables - MR with SPEED1 as DV - Site 1

Variable	B	Beta	sr^2
OTHPRES	-0.2067	-0.0174	0.0003
FOLLOW	-1.9019	-0.1526	0.0244
BEHIND	-0.4096	-0.2064	0.0414
DENSITY	-0.3732	-0.0383	0.0014
(Constant)	26.5441		

Table O.6: Summary Statistics for MR with SPEED1 as DV - Site 1

Multiple R = 0.2731 $F_{(4,56)}$ = 1.128

R^2 = 0.0746 p = 0.353

Adjusted R^2 = 0.0085 N = 61

O.3: Multiple Regression with SPEED1 as DV - Site 2

Table O.7: Correlation Matrix for SPEED1 - Site 2

	SPEED1	FOLLOW	BEHIND	DENSITY	OTHPRES
SPEED1	1.000				
FOLLOW	-0.071	1.000			
BEHIND	-0.001	0.120	1.000		
DENSITY	0.064	0.152	0.188	1.000	
OTHPRES	0.056	0.074	0.063	-0.169	1.000

Table O.8: Relative Importance of Variables - MR with SPEED1 as DV - Site 2

Variable	B	Beta	sr^2
OTHPRES	1.3812	0.0787	0.0059
FOLLOW	-1.6375	-0.0892	0.0002
BEHIND	-0.2410	-0.0132	0.0077
DENSITY	0.2288	0.0931	0.0079
(Constant)	30.0331		

Table O.9: Summary Statistics for MR with SPEED1 as DV - Site 2

Multiple R = 0.1290 $F_{(4,660)} = 2.79$

R^2 = 0.0166 $p = 0.026$

Adjusted R^2 = 0.0107 $N = 665$

O.4: Multiple Regression with SPEED1 as DV - Site 3

Table O.10: Correlation Matrix for SPEED1 - Site 3

	SPEED1	FOLLOW	BEHIND	DENSITY	OTHPRES
SPEED1	1.000				
FOLLOW	-0.123	1.000			
BEHIND	-0.009	0.072	1.000		
DENSITY	-0.087	0.105	0.192	1.000	
OTHPRES	-0.008	0.100	-0.005	-0.264	1.000

Table O.11: Relative Importance of Variables - MR with SPEED1 as DV - Site 3

Variable	B	Beta	sr^2
OTHPRES	-0.3576	-0.0180	0.0003
BEHIND	0.3006	0.0146	0.0002
FOLLOW	-2.4312	-0.1138	0.0126
DENSITY	-0.2518	-0.0823	0.0060
(Constant)	29.8772		

Table O.12: Summary Statistics for MR with SPEED1 as DV - Site 3

Multiple R = 0.1454 $F_{(4,804)}$ = 4.343

R^2 = 0.0212 p = 0.002

Adjusted R^2 = 0.0163 N = 809

O.5: Multiple Regression with SPEED1 as DV - Site 4

Table O.13: Correlation Matrix for SPEED1 - Site 4

	SPEED1	FOLLOW	BEHIND	DENSITY	OTHPRES
SPEED1	1.000				
FOLLOW	-0.391	1.000			
BEHIND	-0.127	0.023	1.000		
DENSITY	-0.232	0.035	0.190	1.000	
OTHPRES	-0.061	0.201	-0.025	-0.343	1.000

Table O.14: Relative Importance of Variables - MR with SPEED1 as DV - Sites 4

Variable	B	Beta	sr^2
OTHPRES	-1.2513	-0.0671	0.0038
BEHIND	-1.3692	-0.0769	0.0058
FOLLOW	*-7.0604*	*-0.3682 **	*0.1313 **
DENSITY	-0.5174	-0.2277	0.0445
(Constant)	45.6557		

Table O.15: Summary Statistics for MR with SPEED1 as DV - Site 4

Multiple R = 0.4591 $F_{(4,177)}$ = 11.817

R^2 = 0.2108 p = 0.000

Adjusted R^2 = 0.1929 N = 182

O.6: Multiple Regressions with SPEED2 as DV - All Sites

Table O.16: Correlation Matrix for SPEED2 - All Sites

	SPEED2	FOLLOW	BEHIND	DENSITY	OTHPRES
SPEED2	1.000				
FOLLOW	-0.104	1.000			
BEHIND	-0.045	0.100	1.000		
DENSITY	-0.166	0.119	0.192	1.000	
OTHPRES	-0.191	0.063	0.007	-0.226	1.000

Table O.17: Relative Importance of Variables - MR with SPEED2 as DV - All Sites

Variable	B	Beta	sr^2
OTHPRES	*-4.6989*	*-0.2344*	*0.0517 **
BEHIND	0.0694	0.0033	0.0000
FOLLOW	-1.3850	-0.0642	0.0040
DENSITY	-0.6094	-0.2117	0.0404
(Constant)	30.5358		

Table O.18: Summary Statistics for MR with SPEED2 as DV - All Sites

Multiple R = 0.2937 $F_{(4,1720)}$ = 40.601

R^2 = 0.0863 p = 0.000

Adjusted R^2 = 0.0842 N = 1725

O.7: Multiple Regressions with SPEED3 as DV - All Sites

Table O.19: Correlation Matrix for SPEED3 - All Sites

	SPEED3	FOLLOW	BEHIND	DENSITY	OTHPRES
SPEED3	1.000				
FOLLOW	-0.117	1.000			
BEHIND	-0.036	0.100	1.000		
DENSITY	-0.185	0.119	0.192	1.000	
OTHPRES	-0.148	0.063	0.007	-0.226	1.000

Table O.20: Relative Importance of Variables - MR with SPEED3 as DV - All Sites

Variable	B	Beta	sr^2
OTHPRES	-3.2640	-0.1934	0.0352
BEHIND	0.2796	0.0158	0.0002
FOLLOW	-1.4559	-0.0801	0.0062
DENSITY	*-0.5391*	*-0.2224*	*0.0445*
(Constant)	30.3929		

Table O.21: Summary Statistics for MR with SPEED3 as DV - All Sites

Multiple R = 0.2804 $F_{(4,1720)}$ = 36.683

R^2 = 0.0786 p = 0.000

Adjusted R^2 = 0.0765 N = 1725

O.8: Multiple Regressions with SPEED4 as DV - All Sites

Table O.22: Correlation Matrix for SPEED4 - All Sites

	SPEED4	FOLLOW	BEHIND	DENSITY	OTHPRES
SPEED4	1.000				
FOLLOW	-0.129	1.000			
BEHIND	-0.099	0.100	1.000		
DENSITY	-0.132	0.119	0.192	1.000	
OTHPRES	-0.119	0.063	0.007	-0.226	1.000

Table O.23: Relative Importance of Variables - MR with SPEED4 as DV - All Sites

Variable	B	Beta	sr^2
OTHPRES	-2.5761	-0.1444	0.0196
BEHIND	-1.1499	-0.0617	0.0036
FOLLOW	-1.8631	-0.0970	0.0092
DENSITY	-0.3609	-0.1409	0.0179
(Constant)	28.6103		

Table O.24: Summary Statistics for MR with SPEED4 as DV - All Sites

Multiple R = 0.2332 $F_{(4,1720)} = 24.723$

R^2 = 0.0544 p = 0.000

Adjusted R^2 = 0.0522 N = 1725

O.9: Multiple Regressions with SPEED5 as DV - All Sites

Table O.25: Correlation Matrix for SPEED5 - All Sites

	SPEED5	FOLLOW	BEHIND	DENSITY	OTHPRES
SPEED5	1.000				
FOLLOW	0.030	1.000			
BEHIND	0.001	0.100	1.000		
DENSITY	-0.362	0.119	0.192	1.000	
OTHPRES	0.144	0.063	0.007	-0.226	1.000

Table O.26: Relative Importance of Variables - MR with SPEED5 as DV - All Sites

Variable	B	Beta	sr^2
OTHPRES	1.2832	0.0565	0.0030
BEHIND	1.5462	0.0651	0.0041
FOLLOW	1.5624	0.0638	0.0040
DENSITY	*-1.2046*	*-0.3690 **	*0.1226 **
(Constant)	33.1722		

Table O.27: Summary Statistics for MR with SPEED5 as DV - All Sites

Multiple R = 0.3790 $F_{(4,1720)}$ = 72.106

R^2 = 0.1436 p = 0.000

Adjusted R^2 = 0.1416 N = 1725

O.10: Multiple Regressions with SPEED5 as DV - Site 1

Table O.28: Correlation Matrix for SPEED5 - Site 1

	SPEED5	FOLLOW	BEHIND	DENSITY	OTHPRES
SPEED5	1.000				
FOLLOW	0.321	1.000			
BEHIND	0.001	0.089	1.000		
DENSITY	-0.212	0.059	0.220	1.000	
OTHPRES	0.147	-0.092	0.207	-0.161	1.000

Table O.29: Relative Importance of Variables - MR with SPEED5 as DV - Site 1

Variable	B	Beta	sr^2
OTHPRES	3.3005	0.1492	0.0215
FOLLOW	*8.0897*	*0.3479 **	*0.1270 **
BEHIND	-0.3084	-0.2048	0.0407
DENSITY	-0.6908	-0.0155	0.0002
(Constant)	12.6159		

Table O.30: Summary Statistics for MR with SPEED5 as DV - Site 1

Multiple R = 0.4204 $F_{(4,56)}$ = 3.006

R^2 = 0.1767 p = 0.026

Adjusted R^2 = 0.1179 N = 61

O.11: Multiple Regressions with SPEED5 as DV - Site 2

Table O.31: Correlation Matrix for SPEED5 - Site 2

	SPEED5	FOLLOW	BEHIND	DENSITY	OTHPRES
SPEED5	1.000				
FOLLOW	-0.064	1.000			
BEHIND	0.016	0.120	1.000		
DENSITY	-0.525	0.152	0.188	1.000	
OTHPRES	0.261	0.074	0.063	-0.169	1.000

Table O.32: Relative Importance of Variables - MR with SPEED5 as DV - Site 2

Variable	B	Beta	sr^2
OTHPRES	3.1385	0.1685	0.0272
FOLLOW	-0.2144	-0.0110	0.0001
BEHIND	2.0035	0.1031	0.0101
DENSITY	*-1.3403*	*-0.5140 **	*0.2423 **
(Constant)	38.5269		

Table O.33: Summary Statistics for MR with SPEED5 as DV - Site 2

Multiple R = 0.5622 $F_{(4,660)}$ = 76.23

R^2 = 0.3160 p = 0.000

Adjusted R^2 = 0.3119 N = 665

O.12: Multiple Regressions with SPEED5 as DV - Site 3

Table O.34: Correlation Matrix for SPEED5 - Site 3

	SPEED5	FOLLOW	BEHIND	DENSITY	OTHPRES
SPEED5	1.000				
FOLLOW	0.043	1.000			
BEHIND	0.050	0.072	1.000		
DENSITY	-0.435	0.105	0.192	1.000	
OTHPRES	0.294	0.100	-0.005	-0.264	1.000

Table O.35: Relative Importance of Variables - MR with SPEED5 as DV - Site 3

Variable	B	Beta	sr^2
OTHPRES	3.8017	0.1785	0.0292
BEHIND	2.7942	0.1263	0.0154
FOLLOW	1.3766	0.0600	0.0035
DENSITY	*-1.3726*	*-0.4180 **	*0.1545 **
(Constant)	32.8581		

Table O.36: Summary Statistics for MR with SPEED5 as DV - Site 3

Multiple R = 0.4930 $F_{(4,804)}$ = 64.521

R^2 = 0.2430 p = 0.000

Adjusted R^2 = 0.2392 N = 809

O.13: Multiple Regressions with SPEED5 as DV - Site 4

Table O.37: Correlation Matrix for SPEED5 - Site 4

	SPEED5	FOLLOW	BEHIND	DENSITY	OTHPRES
SPEED5	1.000				
FOLLOW	-0.030	1.000			
BEHIND	-0.119	0.023	1.000		
DENSITY	-0.549	0.035	0.190	1.000	
OTHPRES	0.391	0.201	-0.025	-0.343	1.000

Table O.38: Relative Importance of Variables - MR with SPEED5 as DV - Sites 4

Variable	B	Beta	sr^2
OTHPRES	*2.1353*	*0.2462*	*0.0518 **
BEHIND	-0.1978	-0.0239	0.0006
FOLLOW	-0.5623	-0.0631	0.0039
DENSITY	*-0.4831*	*-0.4574 **	*0.1796 **
(Constant)	14.4228		

Table O.39: Summary Statistics for MR with SPEED5 as DV - Site 4

Multiple R = 0.5933 $F_{(4,177)}$ = 24.034

R^2 = 0.3520 p = 0.000

Adjusted R^2 = 0.3373 N = 182

APPENDIX P:

Full Details of Discriminant Function Analyses for Study 1

DISCRIMINANT FUNCTION ANALYSES FOR STUDY 1 - FULL DETAILS

The following tables contain the details of the discriminant function analyses performed upon the data derived from the first study. Each section contains five tables: the group means and standard deviations; the univariate F-tests; the canonical discriminant function; the standardised canonical discriminant function, coefficients and pooled within-groups correlations; and finally the classification matrix. It should be noted that the presence of stars against any variable name in the fourth table in each series denoted variables which achieved the relevant criterion value for the pooled within-groups correlations (0.3).

P.1: DFA Using CORRSIG as DV - All Sites

Table P.1: DFA Using CORRSIG as DV - All Sites: Group Means & Standard Deviations

	Group			
	Correct Signalling		Incorrect Signalling	
Predictor Variables	Mean	Standard Deviation	Mean	Standard Deviation
FOLLOW	0.302	0.459	0.407	0.492
BEHIND	0.296	0.457	0.356	0.479
QUEUE1	0.141	0.348	0.299	0.458
TOTTIME	8.089	16.489	13.592	14.503
OTHPRES	0.698	0.459	0.683	0.466
SPEED1	29.365	11.901	27.275	11.668
SPEED5	20.687	15.222	13.288	14.454
DENSITY	7.344	3.993	8.696	5.480
TRAKSITE	1.188	0.392	1.059	0.236
QUEUE2	0.138	0.346	0.245	0.431
STOP	0.118	0.323	0.137	0.344

Table P.2: DFA Using CORRSIG as DV - All Sites: Univariate F-Tests

Predictor Variables	Wilks' Lambda	F-value	Significance
FOLLOW	0.988	9.70	0.002
BEHIND	0.996	3.14	0.077
QUEUE1	0.963	29.81	0.000
TOTTIME	0.970	24.64	0.000
OTHPRES	1.000	0.22	0.639
SPEED1	0.992	6.18	0.013
SPEED5	0.941	48.79	0.000
DENSITY	0.980	15.68	0.000
TRAKSITE	0.962	31.15	0.000
QUEUE2	0.982	14.71	0.000
STOP	0.999	0.61	0.437

Table P.3: DFA Using CORRSIG as DV - All Sites: Canonical Discriminant Function

Eigenvalue	0.113
Canonical Correlation	0.319
% Variance Accounted For	10.147
Wilks' Lambda	0.899
Chi-Squared	83.295
Degrees of Freedom	11
Significance	0.000

Table P.4: DFA Using CORRSIG as DV - All Sites: Standardised Canonical Discriminant Function Coefficients & Pooled Within-Groups Correlations

Variable	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
FOLLOW	*-0.160*	*-0.331 **
BEHIND	-0.217	-0.188
QUEUE1	*-0.223*	*-0.580 **
TOTTIME	*-0.373*	*-0.528 **
OTHPRES	0.072	0.050
SPEED1	0.175	0.264
SPEED5	*0.607*	*0.742 **
DENSITY	*0.294*	*-0.421 **
TRAKSITE	*0.442*	*0.593 **
QUEUE2	*0.114*	*-0.408 **
STOP	0.152	-0.050

Table P.5: DFA Using CORRSIG as DV - All Sites: Classification Matrix

		Predicted Group	
		Correct Signalling	Incorrect Signalling
Actual Group	N		
Correct Signalling	388	263 (67.8%)	125 (32.2%)
Incorrect Signalling	398	159 (39.9%)	239 (60.1%)

Percent of cases correctly classified = 63.87%

P.2: DFA Using CORRSIG as DV - Site 1

Table P.6: DFA Using CORRSIG as DV - Site 1: Group Means & Standard Deviations

	Group			
	Correct Signalling		Incorrect Signalling	
Predictor Variables	Mean	Standard Deviation	Mean	Standard Deviation
FOLLOW	0.222	0.424	0.182	0.395
BEHIND	0.222	0.424	0.227	0.429
QUEUE1	0.222	0.424	0.227	0.429
TOTTIME	19.538	14.065	18.452	17.655
OTHPRES	0.852	0.362	0.727	0.456
SPEED1	26.915	9.397	27.122	6.701
SPEED5	29.053	4.613	29.500	5.175
DENSITY	5.815	4.788	4.136	4.549
TRAKSITE	1.074	0.267	1.091	0.294
QUEUE2	0.296	0.465	0.136	0.351
STOP	0.519	0.509	0.364	0.492

Table P.7: DFA Using CORRSIG as DV - Site 1: Univariate F-Tests

Predictor Variables	Wilks' Lambda	F-value	Significance
FOLLOW	0.998	0.12	0.734
BEHIND	1.000	0.00	0.967
QUEUE1	1.000	0.00	0.967
TOTTIME	0.999	0.06	0.812
OTHPRES	0.976	1.14	0.292
SPEED1	1.000	0.01	0.931
SPEED5	0.998	0.10	0.751
DENSITY	0.968	1.56	0.218
TRAKSITE	0.999	0.04	0.835
QUEUE2	0.964	1.77	0.190
STOP	0.976	1.16	0.288

Table P.8: DFA Using CORRSIG as DV - Site 1: Canonical Discriminant Function

Eigenvalue	0.231
Canonical Correlation	0.433
% Variance Accounted For	18.741
Wilks' Lambda	0.813
Chi-Squared	8.613
Degrees of Freedom	11
Significance	0.658

Table P.9: DFA Using CORRSIG as DV - Site 1: Standardised Canonical Discriminant Function Coefficients & Pooled Within-Groups Correlations

Variable	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
FOLLOW	0.199	0.104
BEHIND	-0.446	-0.013
QUEUE1	-0.547	-0.013
TOTTIME	-1.251	-0.073
OTHPRES	*0.288*	*0.324 **
SPEED1	-0.057	-0.026
SPEED5	0.106	-0.097
DENSITY	*1.311*	*0.379 **
TRAKSITE	0.091	-0.064
QUEUE2	*0.882*	*-0.404 **
STOP	*0.385*	*0.326 **

Table P.10: DFA Using CORRSIG as DV - Site 1: Classification Matrix

		Predicted Group	
		Correct Signalling	Incorrect Signalling
Actual Group	N		
Correct Signalling	22	15 (68.2%)	7 (31.8%)
Incorrect Signalling	22	13 (59.1%)	9 (40.9%)

Percent of cases correctly classified = 54.55%

P.3: Analyses Using CORRSIG as DV - Site 2

Table P.11: DFA Using CORRSIG as DV - Site 2: Group Means & Standard Deviations

	Group			
	Correct Signalling		Incorrect Signalling	
Predictor Variables	Mean	Standard Deviation	Mean	Standard Deviation
FOLLOW	0.433	0.499	0.344	0.479
BEHIND	0.343	0.478	0.475	0.504
QUEUE1	0.269	0.447	0.361	0.484
TOTTIME	11.281	13.150	18.340	21.559
OTHPRES	0.657	0.478	0.656	0.479
SPEED1	30.139	10.738	27.085	12.004
SPEED5	22.556	17.745	17.535	19.314
DENSITY	7.269	5.221	9.918	7.744
TRAKSITE	1.030	0.171	1.016	0.128
QUEUE2	0.194	0.398	0.311	0.467
STOP	0.060	0.239	0.148	0.358

able P.12: DFA Using CORRSIG as DV - Site 2: Univariate F-Tests

Predictor Variables	Wilks' Lambda	F-value	Significance
FOLLOW	0.992	1.04	0.309
BEHIND	0.982	2.32	0.131
QUEUE1	0.990	1.25	0.266
TOTTIME	0.961	5.10	0.026
OTHPRES	1.000	0.00	0.991
SPEED1	0.982	2.31	0.131
SPEED5	0.982	2.35	0.128
DENSITY	0.960	5.23	0.024
TRAKSITE	0.998	0.25	0.619
QUEUE2	0.982	2.36	0.127
STOP	0.979	2.72	0.102

Table P.13: DFA Using CORRSIG as DV - Site 2: Canonical Discriminant Function

Eigenvalue	0.093
Canonical Correlation	0.292
% Variance Accounted For	8.545
Wilks' Lambda	0.915
Chi-Squared	10.763
Degrees of Freedom	11
Significance	0.463

Table P.14: DFA Using CORRSIG as DV - Site 2: Standardised Canonical Discriminant Function Coefficients & Pooled Within-Groups Correlations

Variable	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
FOLLOW	-0.338	-0.298
BEHIND	*0.630*	*0.444 **
QUEUE1	*-0.237*	*0.326 **
TOTTIME	*0.367*	*0.658 **
OTHPRES	0.080	-0.003
SPEED1	*-0.234*	*-0.443 **
SPEED5	*-0.139*	*-0.447 **
DENSITY	*0.567*	*0.667 **
TRAKSITE	-0.107	-0.145
QUEUE2	*-0.511*	*0.447 **
STOP	*0.260*	*0.480 **

Table P.15: DFA Using CORRSIG as DV - Site 2: Classification Matrix

		Predicted Group	
		Correct Signalling	Incorrect Signalling
Actual Group	N		
Correct Signalling	68	34 (50.0%)	34 (50.0%)
Incorrect Signalling	67	20 (29.9%)	47 (70.1%)

Percent of cases correctly classified = 60.00%

P.4: Analyses Using CORRSIG as DV - Site 3

Table P.16: Analyses Using CORRSIG as DV - Site 3 Group Means & Standard Deviations

	Group			
	Correct Signalling		Incorrect Signalling	
Predictor Variables	Mean	Standard Deviation	Mean	Standard Deviation
FOLLOW	0.227	0.421	0.282	0.452
BEHIND	0.252	0.436	0.245	0.432
QUEUE1	0.084	0.279	0.109	0.313
TOTTIME	6.883	3.703	7.682	3.292
OTHPRES	0.672	0.471	0.718	0.452
SPEED1	33.339	12.737	30.450	8.864
SPEED5	20.029	13.454	14.349	9.885
DENSITY	6.403	3.450	7.400	3.197
TRAKSITE	1.252	0.436	1.182	0.387
QUEUE2	0.067	0.251	0.036	0.188
STOP	0.059	0.236	0.073	0.261

Table P.17: Analyses Using CORRSIG as DV - Site 3 Univariate F-Tests

Predictor Variables	Wilks' Lambda	F-value	Significance
FOLLOW	0.996	0.91	0.342
BEHIND	1.000	0.01	0.908
QUEUE1	0.998	0.41	0.522
TOTTIME	0.987	2.96	0.087
OTHPRES	0.998	0.56	0.453
SPEED1	0.983	3.91	0.049
SPEED5	0.946	13.08	0.000
DENSITY	0.978	5.12	0.025
TRAKSITE	0.993	1.65	0.200
QUEUE2	0.995	1.09	0.297
STOP	0.999	0.18	0.673

Table P.18: Analyses Using CORRSIG as DV - Site 3 Canonical Discriminant Function

Eigenvalue	0.138
Canonical Correlation	0.348
% Variance Accounted For	12.125
Wilks' Lambda	0.879
Chi-Squared	28.629
Degrees of Freedom	11
Significance	0.003

Table P.19: Analyses Using CORRSIG as DV - Site 3 Standardised Canonical Discriminant Function Coefficients & Pooled Within-Groups Correlations

Variable	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
FOLLOW	-0.079	-0.170
BEHIND	0.019	0.021
QUEUE1	0.086	-0.114
TOTTIME	*0.384*	*-0.308* *
OTHPRES	-0.373	-0.134
SPEED1	*0.461*	*0.353* *
SPEED5	*0.922*	*0.646* *
DENSITY	*-0.381*	*-0.404* *
TRAKSITE	0.095	0.230
QUEUE2	0.547	0.187
STOP	-0.362	-0.076

Table P.20: Analyses Using CORRSIG as DV - Site 3: Classification Matrix

		Predicted Group	
		Correct Signalling	Incorrect Signalling
Actual Group	N		
Correct Signalling	110	80 (72.7%)	30 (27.3%)
Incorrect Signalling	99	43 (43.4%)	56 (56.6%)

Percent of cases correctly classified = 65.07%

P.5: Analyses Using CORRSIG as DV - Site 4

Table P.21: Analyses Using CORRSIG as DV - Site 4: Group Means & Standard Deviations

	Group			
	Correct Signalling		Incorrect Signalling	
Predictor Variables	Mean	Standard Deviation	Mean	Standard Deviation
FOLLOW	0.389	0.489	0.535	0.501
BEHIND	0.443	0.499	0.426	0.496
QUEUE1	0.328	0.471	0.411	0.494
TOTTIME	11.997	5.841	13.363	7.084
OTHPRES	0.702	0.459	0.698	0.461
SPEED1	29.683	9.117	23.239	12.610
SPEED5	9.983	4.690	9.600	4.793
DENSITY	9.115	4.734	9.589	4.696
TRAKSITE	1.000	0.000	1.000	0.000
QUEUE2	0.344	0.477	0.388	0.489
STOP	0.160	0.368	0.163	0.371

Table P.22: Analyses Using CORRSIG as DV - Site 4: Univariate F-Tests

Predictor Variables	Wilks' Lambda	F-value	Significance
FOLLOW	0.979	5.62	0.019
BEHIND	1.000	0.07	0.791
QUEUE1	0.993	1.90	0.169
TOTTIME	0.989	2.88	0.091
OTHPRES	1.000	0.01	0.936
SPEED1	0.920	22.35	0.000
SPEED5	0.998	0.42	0.516
DENSITY	0.997	0.66	0.418
TRAKSITE	(Constant)		
QUEUE2	0.998	0.54	0.462
STOP	1.000	0.00	0.957

Table P.23: Analyses Using CORRSIG as DV - Site 4: Canonical Discriminant Function

Eigenvalue	0.105
Canonical Correlation	0.308
% Variance Accounted For	9.475
Wilks' Lambda	0.905
Chi-Squared	25.185
Degrees of Freedom	10
Significance	0.005

Table P.24: Analyses Using CORRSIG as DV - Site 4: Standardised Canonical Discriminant Function Coefficients & Pooled Within-Groups Correlations

Variable	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
FOLLOW	*-0.227*	*-0.456 **
BEHIND	0.260	0.051
QUEUE1	0.059	-0.266
TOTTIME	*-0.273*	*-0.327 **
OTHPRES	0.056	0.016
SPEED1	*0.951*	*0.910 **
SPEED5	-0.187	0.125
DENSITY	0.316	-0.156
TRAKSITE	(Constant)	
QUEUE2	-0.107	-0.142
STOP	-0.066	-0.010

Table P.25: Analyses Using CORRSIG as DV - Site 4: Classification Matrix

		Predicted Group	
		Correct Signalling	Incorrect Signalling
Actual Group	N		
Correct Signalling	126	63 (50.0%)	63 (50.0%)
Incorrect Signalling	131	41 (31.3%)	90 (68.7%)

Percent of cases correctly classified = 59.53%

P.6: Analysis Using TRAKSITE as DV - All Sites

Table P.26: Analysis Using TRAKSITE as DV - All Sites: Group Means & Standard Deviations

	Group			
	Correct Tracking		Incorrect Tracking	
Predictor Variables	Mean	Standard Deviation	Mean	Standard Deviation
FOLLOW	0.376	0.485	0.225	0.419
BEHIND	0.365	0.482	0.229	0.421
QUEUE1	0.179	0.384	0.025	0.155
TOTTIME	10.191	10.357	5.610	2.714
OTHPRES	0.613	0.488	0.750	0.434
SPEED1	29.090	9.977	29.792	11.252
SPEED5	12.416	16.161	22.548	12.550
DENSITY	7.197	4.538	5.246	2.571
CORRSIG	0.482	0.501	0.785	0.411
QUEUE2	0.150	0.357	0.018	0.132
STOP	0.120	0.326	0.049	0.217

Table P.27: Analysis Using TRAKSITE as DV - All Sites: Univariate F-Tests

Predictor Variables	Wilks' Lambda	F-value	Significance
FOLLOW	0.973	15.44	0.000
BEHIND	0.978	12.64	0.000
QUEUE1	0.934	39.16	0.000
TOTTIME	0.915	51.87	0.000
OTHPRES	0.978	12.28	0.001
SPEED1	0.999	0.61	0.437
SPEED5	0.890	68.68	0.000
DENSITY	0.934	39.38	0.000
CORRSIG	0.901	61.39	0.000
QUEUE2	0.942	33.98	0.000
STOP	0.984	9.27	0.002

Table P.28: Analysis Using TRAKSITE as DV - All Sites: Canonical Discriminant Function

Eigenvalue	0.310
Canonical Correlation	0.486
% Variance Accounted For	23.667
Wilks' Lambda	0.763
Chi-Squared	148.67
Degrees of Freedom	11
Significance	0.000

Table P.29: Analysis Using TRAKSITE as DV - All Sites: Standardised Canonical Discriminant Function Coefficients & Pooled Within-Groups Correlations

Variable	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
FOLLOW	-0.193	-0.299
BEHIND	-0.201	-0.271
QUEUE1	*-0.105*	*-0.477 **
TOTTIME	*-0.258*	*-0.548 **
OTHPRES	0.080	0.267
SPEED1	-0.051	0.059
SPEED5	*0.512*	*0.631 **
DENSITY	*0.066*	*-0.478 **
CORRSIG	*0.609*	*0.597 **
QUEUE2	*-0.082*	*-0.444 **
STOP	0.057	-0.232

Table P.30: Analysis Using TRAKSITE as DV - All Sites: Classification Matrix

		Predicted Group	
		Correct Tracking	Incorrect Tracking
Actual Group	N		
Correct Tracking	274	174 (63.5%)	100 (36.5%)
Incorrect Tracking	284	67 (23.6%)	217 (76.4%)

Percent of cases correctly classified = 70.07%

P.7: Analysis using TRAKSITE as DV - Site 2

Table P.31: Analysis using TRAKSITE as DV - Site 2: Group Means & Standard Deviations

	Group			
	Correct Tracking		Incorrect Tracking	
Predictor Variables	Mean	Standard Deviation	Mean	Standard Deviation
FOLLOW	0.324	0.475	0.313	0.468
BEHIND	0.297	0.463	0.271	0.449
QUEUE1	0.162	0.374	0.000	0.000
TOTTIME	10.789	14.712	6.029	2.225
OTHPRES	0.568	0.502	0.625	0.489
SPEED1	30.935	11.963	29.658	6.349
SPEED5	16.234	7.553	19.569	4.121
DENSITY	6.676	5.011	4.188	2.294
CORRSIG	0.270	0.450	0.188	0.394
QUEUE2	0.162	0.374	0.000	0.000
STOP	0.135	0.347	0.083	0.279

Table P.32: Analysis using TRAKSITE as DV - Site 2: Univariate F-Tests

Predictor Variables	Wilks' Lambda	F-value	Significance
FOLLOW	1.000	0.01	0.909
BEHIND	0.999	0.07	0.791
QUEUE1	0.901	9.07	0.003
TOTTIME	0.944	4.90	0.030
OTHPRES	0.997	0.28	0.597
SPEED1	0.995	0.40	0.528
SPEED5	0.894	9.86	0.002
DENSITY	0.899	9.33	0.003
CORRSIG	0.990	0.81	0.370
QUEUE2	0.901	9.07	0.003
STOP	0.993	0.58	0.448

Table P.33: Analysis using TRAKSITE as DV - Site 2: Canonical Discriminant Function

Eigenvalue	0.247
Canonical Correlation	0.445
% Variance Accounted For	19.787
Wilks' Lambda	0.802
Chi-Squared	17.088
Degrees of Freedom	11
Significance	0.105

Table P.34: Analysis using TRAKSITE as DV - Site 2: Standardised Canonical Discriminant Function Coefficients & Pooled Within-Groups Correlations

Variable	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
FOLLOW	-0.036	0.025
BEHIND	-0.071	0.059
QUEUE1	*0.274*	*0.666 **
TOTTIME	*-0.013*	*0.489 **
OTHPRES	-0.121	-0.117
SPEED1	0.372	0.140
SPEED5	*-0.257*	*-0.694 **
DENSITY	*0.379*	*0.675 **
CORRSIG	0.246	0.199
QUEUE2	*0.516*	*0.666 **
STOP	-0.383	0.169

Table P.35: Analysis using TRAKSITE as DV - Site 2: Classification Matrix

		Predicted Group	
		Correct Tracking	Incorrect Tracking
Actual Group	N		
Correct Tracking	44	19 (43.2%)	25 (56.8%)
Incorrect Tracking	48	11 (22.9%)	37 (77.1%)

Percent of cases correctly classified = 60.87%

P.8: Analysis using TRAKSITE as DV - Site 3

Table P.36: Analysis using TRAKSITE as DV - Site 3 Group Means & Standard Deviations

	Group			
	Correct Tracking		Incorrect Tracking	
Predictor Variables	Mean	Standard Deviation	Mean	Standard Deviation
FOLLOW	0.322	0.468	0.211	0.409
BEHIND	0.295	0.457	0.224	0.418
QUEUE1	0.093	0.290	0.030	0.171
TOTTIME	7.485	3.593	5.380	2.458
OTHPRES	0.674	0.470	0.772	0.421
SPEED1	29.761	10.080	32.230	12.012
SPEED5	12.976	12.777	21.461	11.688
DENSITY	7.273	3.354	5.522	2.536
CORRSIG	0.881	0.324	0.914	0.281
QUEUE2	0.093	0.290	0.022	0.146
STOP	0.115	0.319	0.039	0.194

Table P.37: Analysis using TRAKSITE as DV - Site 3 Univariate F-Tests

Predictor Variables	Wilks' Lambda	F-value	Significance
FOLLOW	0.984	7.25	0.007
BEHIND	0.993	3.02	0.083
QUEUE1	0.983	7.88	0.005
TOTTIME	0.895	53.87	0.000
OTHPRES	0.988	5.50	0.020
SPEED1	0.988	5.68	0.018
SPEED5	0.892	55.14	0.000
DENSITY	0.920	39.93	0.000
CORRSIG	0.997	1.34	0.248
QUEUE2	0.976	11.02	0.001
STOP	0.980	9.50	0.002

Table P.38: Analysis using TRAKSITE as DV - Site 3 Canonical Discriminant Function

Eigenvalue	0.172
Canonical Correlation	0.383
% Variance Accounted For	14.656
Wilks' Lambda	0.853
Chi-Squared	71.554
Degrees of Freedom	11
Significance	0.000

Table P.39: Analysis using TRAKSITE as DV - Site 3 Standardised Canonical Discriminant Function Coefficients & Pooled Within-Groups Correlations

Variable	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
FOLLOW	*0.159*	*0.304 **
BEHIND	0.135	0.196
QUEUE1	*-0.320*	*0.317 **
TOTTIME	*0.815*	*0.828 **
OTHPRES	-0.043	-0.265
SPEED1	-0.058	-0.269
SPEED5	*-0.339*	*-0.838 **
DENSITY	*0.260*	*0.713 **
CORRSIG	0.055	-0.130
QUEUE2	*-0.103*	*0.375 **
STOP	*-0.286*	*0.348 **

Table P.40: Analysis using TRAKSITE as DV - Site 3 Classification Matrix

		Predicted Group	
		Correct Tracking	Incorrect Tracking
Actual Group	N		
Correct Tracking	246	163 (66.3%)	83 (33.7%)
Incorrect Tracking	232	70 (30.2%)	162 (69.8%)

Percent of cases correctly classified = 67.99%

P.9: Analyses Using TYPECON as DV: Three Group DFA - Conflict Categories 1 & 2 - All Sites

Table P.41: Analyses Using TYPECON as DV - All Sites: Group Means & Standard Deviations

	Group					
	Type 1 Conflict		Type 2 Conflict		No Conflict	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Predictor Variables	(N=46)		(N=44)		(N=46)	
FOLLOW	0.130	0.341	0.750	0.438	0.370	0.488
BEHIND	0.391	0.493	0.341	0.479	0.370	0.488
QUEUE1	0.022	0.147	0.795	0.408	0.174	0.383
TOTTIME	11.026	5.345	10.301	29.403	11.280	13.109
OTHPRES	0.065	0.250	0.705	0.462	0.739	0.444
SPEED1	30.028	9.037	28.168	12.577	30.442	12.239
SPEED5	26.795	12.166	16.721	7.609	25.984	14.226
DENSITY	7.283	2.971	11.477	5.329	7.739	4.474
TRAKSITE	0.130	0.341	1.045	0.211	0.174	0.383
QUEUE2	0.217	0.417	0.409	0.497	0.239	0.431
STOP	0.348	0.482	0.023	0.151	0.196	0.401
CORRSIG	0.413	0.498	0.341	0.479	0.543	0.504
NEWPULL	0.587	0.498	0.182	0.390	0.043	0.206
SIDE	0.196	0.401	0.295	0.462	0.152	0.363
DECEL	-24.048	74.844	-39.248	85.197	-32.746	45.998

Table P.42: Analyses Using TYPECON as DV - All Sites: Univariate F-Tests

Predictor Variables	Wilks' Lambda	F-value	Significance
FOLLOW	0.734	24.08	0.000
BEHIND	0.998	0.12	0.886
QUEUE1	0.495	67.73	0.000
TOTTIME	1.000	0.03	0.967
OTHPRES	0.613	42.03	0.000
SPEED1	0.998	0.15	0.864
SPEED5	0.862	10.69	0.000
DENSITY	0.842	12.49	0.000
TRAKSITE	0.973	1.85	0.161
QUEUE2	0.965	2.44	0.091
STOP	0.887	8.48	0.000
CORRSIG	0.971	1.95	0.146
NEWPULL	0.626	39.79	0.000
SIDE	0.979	1.44	0.241
DECEL	0.992	0.53	0.591

Table P.43: Analyses Using TYPECON as DV - All Sites: Canonical Discriminant Function

	Function 1	Function 2
Eigenvalue	2.262	0.459
Canonical Correlation	0.833	0.561
% Variance Accounted For	69.347	31.439
Wilks' Lambda	0.210	0.686
Chi-Squared	196.55	47.559
Degrees of Freedom	30	14
Significance	0.000	0.000

Table P.44: Analyses Using TYPECON as DV - All Sites: Standardised Canonical Discriminant Function Coefficients and Pooled Within-Groups Correlations

Variable:	Standardised Canonical Discriminant Function Coefficients		Pooled Within-Groups Correlations	
	Function 1	Function 2	Function 1	Function 2
FOLLOW	*0.338*	*-0.037*	*0.395 **	*-0.136*
BEHIND	-0.077	-0.102	-0.028	0.006
QUEUE1	*0.794*	*-0.536*	*0.627 **	*-0.528 **
TOTTIME	-0.153	0.231	-0.010	0.024
OTHPRES	*0.279*	*0.558*	*0.451 **	*0.611 **
SPEED1	0.000	-0.032	-0.020	0.053
SPEED5	*0.229*	*0.085*	*-0.236*	*0.275*
DENSITY	0.228	-0.267	0.259	-0.279
TRAKSITE	-0.139	0.093	-0.069	0.192
QUEUE2	-0.197	0.318	0.115	-0.122
STOP	*-0.077*	*0.031*	*-0.237*	*0.031*
CORRSIG	0.176	0.242	-0.036	0.240
NEWPULL	*-0.493*	*-0.408*	*-0.450 **	*-0.553 **
SIDE	*0.075*	*-0.046*	*0.064*	*-0.164*
DECEL	-0.156	0.115	-0.059	-0.008

Table P.45: Analyses Using TYPECON as DV - All Sites: Group Centroids

Group:	Function 1	Function 2
Conflict 1	-1.824	-0.451
Conflict 2	1.832	-0.508
No Conflict	0.072	0.936

Table P.46: Analyses Using TYPECON as DV - All Sites: Classification Matrix

Actual Group	N	Predicted Group: Type 1 Conflict	Type 2 Conflict	No Conflict
Type 1 Conflict	46	39 (84.8%)	1 (2.2%)	6 (13.0%)
Type 2 Conflict	44	1 (2.3%)	36 (81.8%)	7 (15.9%)
No Conflict	46	6 (13.0%)	7 (15.2%)	33 (71.7%)

Percent of cases correctly classified = 79.41%

P.10: Analyses Using TYPECON as DV: Two Group DFA - Conflict Category 1 - All Sites

Table P.47: Analyses Using TYPECON as DV: Two Group DFA - Conflict Category 1 - All Sites: Group Means & Standard Deviations

Predictor Variables	Group: Type 1 Conflict (N=119) Mean	Standard Deviation	No Conflict (N=116) Mean	Standard Deviation
FOLLOW	0.185	0.390	0.362	0.483
BEHIND	0.353	0.480	0.336	0.474
QUEUE1	0.050	0.220	0.233	0.424
TOTTIME	11.864	6.431	9.376	6.463
OTHPRES	0.118	0.324	0.647	0.480
SPEED1	31.294	9.837	30.328	11.629
SPEED5	23.647	12.693	27.127	16.903
DENSITY	7.605	3.535	7.810	4.277
TRAKSITE	0.118	0.324	0.129	0.337
QUEUE2	0.261	0.441	0.164	0.372
STOP	0.370	0.485	0.060	0.239
CORRSIG	0.429	0.497	0.517	0.502
NEWPULL	0.487	0.502	0.138	0.346
SIDE	0.218	0.415	0.155	0.364
DECEL	-36.263	97.821	-29.151	96.470

Table P.48: Analyses Using TYPECON as DV: Two Group DFA - Conflict Category 1 - All Sites: Univariate F-Tests

Predictor Variables	Wilks' Lambda	F-value	Significance
FOLLOW	0.960	9.61	0.002
BEHIND	1.000	0.07	0.788
QUEUE1	0.931	17.23	0.000
TOTTIME	0.964	8.75	0.003
OTHPRES	0.703	98.52	0.000
SPEED1	0.998	0.47	0.492
SPEED5	0.986	3.20	0.075
DENSITY	0.999	0.16	0.688
TRAKSITE	1.000	0.07	0.787
QUEUE2	0.986	3.30	0.071
STOP	0.859	38.19	0.000
CORRSIG	0.992	1.85	0.175
NEWPULL	0.859	38.40	0.000
SIDE	0.993	1.54	0.215
DECEL	0.999	0.31	0.575

Table P.49: Analyses Using TYPECON as DV: Two Group DFA - Conflict Category 1 - All Sites: Canonical Discriminant Function

Eigenvalue	0.893
Canonical Correlation	0.687
% Variance Accounted For	47.160
Wilks' Lambda	0.528
Chi-Squared	143.85
Degrees of Freedom	15
Significance	0.000

Table P.50: Analyses Using TYPECON as DV: Two Group DFA - Conflict Category 1 - All Sites: Standardised Canonical Discriminant Function Coefficients & Pooled Within-Groups Correlations

Variable	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
FOLLOW	0.064	0.215
BEHIND	0.086	-0.019
QUEUE1	0.570	0.288
TOTTIME	-0.339	-0.205
OTHPRES	*0.620*	*0.688* *
SPEED1	-0.018	-0.048
SPEED5	0.182	0.124
DENSITY	0.222	0.028
TRAKSITE	0.020	0.019
QUEUE2	-0.258	-0.126
STOP	*-0.271*	*-0.429* *
CORRSIG	0.106	0.094
NEWPULL	*-0.278*	*-0.430* *
SIDE	-0.210	-0.086
DECEL	0.038	0.039

Table P.51: Analyses Using TYPECON as DV: Two Group DFA - Conflict Category 1 - All Sites: Group Centroids

Group:	Centroid:
Type 1 Conflict	-0.929
No Conflict	0.953

Table P.52: Analyses Using TYPECON as DV: Two Group DFA - Conflict Category 1 - All Sites: Classification Matrix

		Predicted Group	
Actual Group	N	Type 1 Conflict	No Conflict
Type 1 Conflict	119	107 (89.9%)	12 (10.0%)
No Conflict	116	28 (24.1%)	88 (75.9%)

Percent of cases correctly classified = 82.98%

P.11: Analyses Using TYPECON as DV: Two Group DFA - Conflict Category 2 - All Sites

Table P.53: Analyses Using TYPECON as DV: Two Group DFA - Conflict Category 2 - All Sites: Group Means & Standard Deviations

	Group			
	Conflict Type 2		No Conflict	
Predictor Variables	Mean	Standard Deviation	Mean	Standard Deviation
FOLLOW	0.745	0.440	0.268	0.447
BEHIND	0.314	0.469	0.411	0.496
QUEUE1	0.843	0.464	0.286	0.563
OTHPRES	0.725	0.451	0.714	0.456
SPEED1	28.538	12.198	29.565	12.530
DENSITY	10.333	5.771	7.107	4.280
DECEL	-33.823	80.247	-25.616	103.395

Table P.54: Analyses Using TYPECON as DV: Two Group DFA - Conflict Category 2 - All Sites: Univariate F-Tests

Predictor Variables	Wilks' Lambda	F-value	Significance
FOLLOW	0.773	30.88	0.000
BEHIND	0.990	1.08	0.302
QUEUE1	0.773	30.91	0.000
OTHPRES	1.000	0.01	0.899
SPEED1	0.998	0.18	0.669
DENSITY	0.906	10.91	0.001
DECEL	0.998	0.21	0.650

Table P.55: Analyses Using TYPECON as DV: Two Group DFA - Conflict Category 2 - All Sites: Canonical Discriminant Function

Eigenvalue	0.594
Canonical Correlation	0.610
% Variance Accounted For	37.259
Wilks' Lambda	0.627
Chi-Squared	47.315
Degrees of Freedom	7
Significance	0.000

Table P.56: **Analyses Using TYPECON as DV: Two Group DFA - Conflict Category 2 - All Sites: Standardised Canonical Discriminant Function Coefficients & Pooled Within-Groups Correlations**

Variable	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
FOLLOW	*0.581*	*0.704 **
BEHIND	-0.254	-0.131
QUEUE1	*0.602*	*0.704 **
OTHPRES	-0.039	0.016
SPEED1	0.319	-0.054
DENSITY	*0.362*	*0.418 **
DECEL	-0.011	-0.058

Table P.57: **Analyses Using TYPECON as DV: Two Group DFA - Conflict Category 2 - All Sites: Classification Matrix**

		Predicted Group	
		Type 2 Conflict	No Conflict
Actual Group	N		
Type 2 Conflict	51	43 (84.3%)	8 (15.7%)
No Conflict	56	12 (21.4%)	44 (78.6%)

Percent of cases correctly classified = 81.31%

APPENDIX Q:

Additional Statistics Reported in Chapter 5

ADDITIONAL STATISTICAL ANALYSES REPORTED IN CHAPTER 5

Q.1: T-Test of SPEED1 Measures Between Type-2-Conflict-Involved Vehicles and Non-Conflict-Involved Vehicles at Site 1

Table Q.1 (below) shows the statistics from the t-test analysis, reported in Section 5.1.1.

Table Q.1: T-Test of SPEED1 for Type-2-Conflict-Involved Vehicles and Non-Conflict-Involved Vehicles at Site 1

Variable:	N	Mean	Std. Dev.	Pooled Variance Estimate:			
				t	Deg. Free.	2-tail prob.	Est. w^2
Type 2-Conflict	5	20.28	4.07	-1.82	151	0.70	0.01
Non-conflict	148	28.73	10.31				

If a 5% criterion level is accepted, this result is not significant and the mean first segment approach speeds for the two groups of vehicles can not be said to be significantly different at the 5% level.

Q.2: T-Test of SPEED4 Measures Between Type-1-Conflict-Involved Vehicles and Non-Conflict-Involved Vehicles at Site 2

Table Q.2 (below) shows the statistics from the t-test analysis, reported in Section 5.1.2.

Table Q.2: T-Test of SPEED4 for Type-1-Conflict-Involved Vehicles and Non-Conflict-Involved Vehicles at Site 2

Variable:	N	Mean	Std. Dev.	Pooled Variance Estimate:			
				t	Deg. Free.	2-tail prob.	Est. w^2
Type 1-Conflict	61	23.13	7.23	0.49	1154	0.63	0.00
Non-conflict	1095	22.66	8.02				

Again, this result is not significant and the mean fourth segment approach speeds for the two groups of vehicles can not be said to be significantly different at the 5% level.

Q.3: T-Test of SPEED5 Measures Between Correct and Incorrect Site Trackers at Site 3

Table Q.3 (below) shows the statistics from the t-test analysis, reported in section 5.1.3.

Table Q.3: T-Test of SPEED5 Measures Between Correct and Incorrect Site Trackers at Site 3

Variable:	N	Mean	Std. Dev.	Pooled Variance Estimate: t	Deg. Free.	2-tail prob.	Est. w^2
Incorrect Trackers	516	17.76	12.87	-8.37	739	0.00	0.09
Correct Trackers	225	23.12	12.36				

This result is significant at the accepted 5% level and it can be said that the mean final approach for the correct site trackers is significantly higher than those of incorrect trackers (at the 5% level). However, the level of omega squared (w^2) is very low, suggesting that there is little predictive association between the two variables.

Q.4: T-Test of PULLOUT Times Between Queuers and Non-Queuers at all Sites

Table Q.4 (below) shows the statistics from the t-test analysis, reported in Section 5.3.1. It should be noted that only PULLOUT times of less than 16 seconds were used so to eliminate extraneous values at the high end which would have confounded the issue.

Table Q.4: T-Test of PULLOUT Times Between Queuers and Non-Queuers at all Sites

Variable:	N	Mean	Std. Dev.	Pooled Variance Estimate: t	Deg. Free.	2-tail prob.	Est. w^2
Non-Queuers	884	5.10	3.91	-3.62	1064	0.00	0.01
Queuers	182	6.32	5.08				

This result is significant at the 5% level and it can be said that the accepted gap times adopted by drivers who queued at the 'Give Way' line is significantly larger than those adopted by drivers who did not have to queue. Despite this, the level of predictive association is extremely low.

Q.5: Pearson's Correlation Between Gap Acceptance Times and Time Waited at the 'Give Way' Line

Table Q.5 (below) shows the statistics from the correlation analysis reported in Section 5.3.1. Again, only PULLOUT times of less than 16 seconds were used.

Table Q.5: Pearson's Correlation Between Gap Acceptance Times and Time Waited at the 'Give Way' Line

Pearson's Correlation Coefficient:

	TIMELINE
PULLOUT	0.1893 (N=278) (p.=.001)

This result is significant at the accepted 5% level (and beyond) and it can be said that the accepted gap times adopted by drivers (PULLOUT) are significantly positively correlated to the length of time they have to wait at the 'Give Way' line before pulling out (TIMELINE). However, the percent of variance accounted for one variable when predicting values on the other is only 3.6%.

Q.6: T-Test of PULLOUT Times Between Drivers With Another Vehicle Alongside and Those Without

Table Q.6 (below) shows the statistics from the t-test analysis, reported in Section 5.3.1.

Table Q.6: T-Test of PULLOUT Times Between Drivers With Another Vehicle Alongside and Those Without

Variable:	N	Mean	Std. Dev.	Pooled Variance Estimate: t	Deg. Free.	2-tail prob.	Est. w^2
Nothing to Side	938	6.18	9.22	5.76	1149	0.00	0.03
Vehicle by Side	213	10.52	12.55				

This result is significant at the 5% level and it can be said that the accepted gap times adopted by drivers with an accompanying vehicle to the side is significantly larger than those adopted by drivers who did not have such an accompanying vehicle.

APPENDIX R:

Advertisement to Recruit Volunteers for Social Information Generating Groups

Earn £5

Volunteers are required to participate in discussion groups concerned with aspects of driving. Each group will consist of 4 people and it is anticipated that the sessions will last approximately 30 minutes.

Both experienced and novice drivers who are interested in taking part should contact:

DAVID BOTTOMLEY at the Applied Psychology Unit

on extension 2228 or 2229.

Thank You...

Figure R.1: Advertisement Placed to Recruit Participants for the Social Information Generating Groups

APPENDIX S:

Points Raised in Social Information Generating Groups

POINTS RAISED IN SOCIAL INFORMATION GENERATING GROUPS

The Social Information Generating Groups (SIGGs) were employed as an additional item generation method for the questionnaire study. Each of the three groups were asked to begin the discussion by talking about the factors which influence their driving behaviour when approaching junctions. Additional prompts were used throughout the discussions to follow up promising issues or to keep the discussion going after a silent period. Tables S.1 to S.3 (below and over) list the points raised during these sessions for each of the groups respectively. The numbers in the tables are references for the individual comments.

Table S.1: Points Raised by SIGG 1 (29/8/89)

1 - Thinking about which exit to take.
2 - Driving process more automatic if driver knows site.
3 - Lane selection more automatic if driver knows site.
4 - Adequacy of signposting is important.
5 - Drivers behind self in queue of traffic leading up to junction cause problems by overtaking and cutting in, generally restricting own manoeuvrability.
6 - Make conscious effort to note behaviour of drivers on same approach road first.
7 - Drivers on site indicating too early.
8 - Drivers tend to assume driver in front will respond in same way they would themselves.
9 - Anticipation of other drivers is essential to make suitable progress.
10 - Motorcycle riders treat junctions with a greater degree of caution.
11 - Get used to certain behaviours happening at familiar site over period of time.
12 - Temptation exists to enter roundabout if on-site vehicle is going slowly enough.
13 - When approaching roundabout is difficult to judge speed of other vehicles accurately.
14 - Some vehicles go too quickly on site.
15 - Instinctively distrust drivers of certain types of vehicles (eg. XR3i's).
16 - Sex of driver doesn't make any difference to driving at junctions.
17 - Slip roads tend to work better than roundabouts.
18 - People are ignorant of roundabouts.
19 - Direction arrows on road surface are useful.
20 - Direction arrows on signs above road surface would be useful.
21 - Some drivers cut across all three lanes on roundabouts.
22 - Young drivers often like to show off.
23 - Young drivers don't know their own capabilities.
24 - Young drivers don't know their cars' capabilities.
25 - Driving test is inadequate.

(cont. over)

Table S.1: Points Raised by SIGG 1 (29/8/89) (cont.)

26 - Is too much emphasis on etiquette in training programme.
27 - Drivers of high powered vehicles are often competitive and feel they have to overtake smaller vehicles.
28 - Vehicles which have insufficient power annoy other drivers.
29 - Very few drivers stick to the speed limit.
30 - Heavy goods vehicles cause problems at junctions due to their size.
31 - Drivers often don't realise large vehicles such as HGVs and coaches have difficulty negotiating small junctions and fail to compensate appropriately.
32 - HGV drivers often follow other vehicles too closely and place drivers under pressure.
33 - Drivers approach junction too quickly.
34 - Drivers sometimes cause problems by jumping long queues of vehicles waiting to enter junction.

Table S.2: Points Raised by SIGG 2 (31/8/89)

35 - Think about direction are travelling in.
36 - Incorrect lane selection can cause problems.
37 - Note speeds of vehicles in front and on site when approaching.
38 - Visibility to the right is important.
39 - Drivers often tend to cut straight across the roundabout.
40 - Cyclists cause problems due to their high vulnerability, tending to stick to inside lane on site rather than middle lane (when travelling straight across).
41 - Signposts often too close to junctions.
42 - Some drivers use middle lane when turning right.
43 - Confusion amongst drivers as to which lane is correct when travelling straight over a roundabout.
44 - Problems often arise because drivers anticipate other drivers in particular lanes to go in particular directions.
45 - Trees/bushes can obstruct view of vehicles coming from the right.
46 - Trees/bushes obstructing view make drivers more cautious because they can't see.
47 - Some drivers not so good at anticipating actions of other drivers.
48 - Lane markings often too close to the site.
49 - Have to anticipate the behaviour of drivers immediately in front in queue.
50 - Often pressurised by drivers in queue behind into pulling onto site before would do in normal circumstances.

(cont. over)

Table S.2: Points Raised by SIGG 2 (31/8/89) (cont.)

51 - Seeing someone else make a stupid manoeuvre makes oneself more cautious in the short term.
52 - Drivers often bad at judging speed of other vehicles tend to concentrate on vehicles some way in front rather than one immediately in front.
53 - Tend to concentrate more when police around.
54 - People who do a great deal of driving get worse by becoming more lazy.
55 - Experience increases ability to predict actions of other drivers.
56 - Personality has a reasonable amount to do with the way you drive.
57 - Drivers who have accidents are often trying to prove something.
58 - Drivers can get egged on by passengers.
59 - Drive more cautiously when have father in car.
60 - People follow closely because they don't know how long it takes to stop.

Table S.3: Points Raised by SIGG 3 (1/9/89)

61 - Environmental influences affect visibility to great extent.
62 - Difficult to judge speed of vehicles negotiating junctions because are travelling in different plane.
63 - Curvature of roundabout makes speed judgement difficult.
64 - Judging safe gaps is a problem.
65 - Get pressurised by other vehicles when waiting to enter junctions.
66 - React differently when under pressure - safety margins lessened.
67 - Drivers of newer, faster cars tend to put drivers under pressure more often.
68 - Younger male drivers more responsible for putting others under pressure.
69 - Unfamiliar sites more difficult to negotiate.
70 - Direction signposts too close to junctions.
71 - Roads so congested that lane markings often obscured by vehicles.
72 - People tend to be pre-programmed to see certain types of vehicles (eg. cars, HGVs) and not others (eg. bicycles).
73 - Relative movement of cyclists may make drivers pull out into their paths.
74 - Drivers entering site concentrate on fitting into a gap and tend not to notice other factors such as cyclists, especially if obscured by other vehicles.
75 - People tend to assume other vehicles will slow down when approaching a junction.

(cont. over)

Table S.3: Points Raised by SIGG 3 (1/9/89) (cont.)

76 - Experience tells you never to rely on assumptions of other drivers' behaviour.
77 - Have to allow for other drivers doing unpredictable things.
78 - Are computing possibilities of movements and weighing up risks.
79 - If drive often enough, the assessment of relative vehicle positions and speeds becomes a subconscious process.
80 - Get blasé about driving through regularly used sites.
81 - Don't have time to check extensively at each site as traffic flow is interrupted.
82 - Motorcycles cornering at high speed on roundabout can cause problems.
83 - If traffic is light, do not usually need to stop at junction.
84 - Some drivers religiously stop at junctions regardless of circumstances, holding traffic up.
85 - Pressure to get from 'A' to 'B' in least amount of time possible means have to drive as quickly as possible.
86 - Have an obligation not to drive in way that holds up other people.
87 - Often have to force way out into traffic on site.
88 - Roundabouts not suitable for density of traffic have to cope with.
89 - Can be considerate in some circumstances but not in others depending on amount of time available.
90 - Drivers are more considerate to cyclists or motorcyclists if have experience of those vehicle types themselves.
91 - Easy for motorists who are not cyclists to misjudge speed range of bicycle.
92 - Harder to judge accurately vehicles' speeds at night.
93 - Whilst concentrating on vehicles from right on site tend to assume car in front is going to behave in certain manner.
94 - Beginners tend to concentrate more on vehicle immediately in front rather than on vehicles ahead of that.
95 - Experienced drivers have wider field of view.
96 - Drivers tend to be unaware of rights of 'give way' at some types of junctions (eg. staggered T-junctions).
97 - Novice drivers tend to be over cautious at staggered T-junctions.
98 - Sometimes vision to right and left obscured.
99 - Three-quarter vision of many vehicles very poor - particularly bad at junctions.
100 - Can be distracting if can see vehicles at other side of roundabout - large centre island helps.
101 - Visibility to right at 'give way' line often not clear enough.
102 - Some roundabouts tend to be too big allowing vehicles on site to build quite a speed.
103 - Design of roundabouts encourage straight-lining.

APPENDIX T:

Letter to Thames Valley Police Requesting Permission to Obtain Names & Addresses of Accident-Involved Drivers from their Accident Records

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CENTRAL MILTON KEYNES,
MK9 2DS.

28/9/89

Dear Chief Superintendant,

I am a PhD student at the Applied Psychology Unit at Cranfield, specialising in road safety issues. The specific aim of the research is to develop a method by which the errors of drivers approaching and negotiating junctions can be better understood. I wrote to Chief Inspector Bird at D-Division towards the end of last year asking permission to look at the accident records of three sites in the Milton Keynes area: the H5/V6 roundabout; the V6/Midsummer Boulevard roundabout and the V4/V6 junction near Bletchley.

Permission to access the relevant files was very kindly granted, and I am currently writing to you in the hope that you may be able to assist me in my research once again. The second part of my PhD consists of a questionnaire designed to investigate various errors and attitudes of drivers, mainly concentrating on the differences (if any) between accident-involved and non-accident-involved drivers. In order that I obtain a large enough sample of drivers who have been involved in accidents at junctions, I need to have access to some form of database of such drivers' names and addresses and I was wondering if it would be possible for me to obtain this information from your accident records.

My research supervisor, Dr. Andrew Guppy, informs me that a former PhD student from the Unit, Peter Brookes, was given permission by Thames Valley D-Division to access similar information in 1986 and that the procedure adopted worked extremely well. I intend to utilise the same technique and would be very grateful if you could confirm whether or not this would be acceptable to you. I look forward to hearing from you shortly,

Yours sincerely,

David M Bottomley

David M. Bottomley.

Figure T.1: Letter to Thames Valley Police Requesting Permission to Obtain Names & Addresses of Accident-Involved Drivers from their Accident Records

APPENDIX U:

Questionnaire used in the Main Survey

Section 1:

1) How old are you? .....years

2) Are you:

Female [ ] Male [ ]

3) Which of the following best describes your marital status?

Single [ ] Separated/Divorced [ ]

Married/Co-habiting [ ] Widowed [ ]

4) What is your occupation? .....

5) Does your job involve driving (other than getting to and from work)?

Yes [ ] No [ ]

6) For which of the following classes of vehicle have you passed the test to hold a full licence?

Car [ ] Public service vehicle [ ]

Motorcycle [ ] None [ ]

Heavy goods vehicle [ ]

If you have not passed the test for cars, please go straight to question 10.

7a) How many years ago did you pass the driving test for cars?

.....

7b) How many times did you take the test?

.....

8a) When you were learning to drive a car, did you receive most of your tuition from:

Qualified driving instructor [ ]

Friend/relative [ ]

About 50/50 of each of the above [ ]

8b) Approximately how many lessons did you have from a qualified driving instructor?

.....

<PTO>

9) Have you received any additional training (such as the Advanced Driving Test)?

Yes [ ] No [ ]

If YES, please specify .....

10) How many years have you been driving on a regular basis?

.....

11a) What type of vehicle do you mostly drive?

Car [ ] Heavy goods [ ]

Motorcycle [ ] Bus/Coach [ ]

Light goods [ ] Other (please specify) [ ]

.....

11b) Please indicate the make and model of this vehicle:

.....

11c) Who does this vehicle belong to?

You [ ] Friend/member of family [ ]

Your employers [ ] Other (please specify) [ ]

.....

12) Do you drive another type of vehicle on a regular basis?

Yes [ ] No [ ]

If NO, go to question 14.

13a) What other type of vehicle do you drive on a regular basis?

Car [ ] Heavy goods [ ]

Motorcycle [ ] Bus/Coach [ ]

Light goods [ ] Other (please specify) [ ]

.....

<PTO>

13b) Who does this vehicle belong to?

You [ ] Friend/member of family [ ]

Your employers [ ] Other (please specify) [ ]

.....

14) How many miles do you drive in an average year? (If you are not sure, please estimate your annual mileage)

.....

15) What percentage of your driving would you say is done on unfamiliar roads?

..... %

16) What percentage of your last 12 month's mileage was done on each of the following types of roads? (Please estimate if uncertain)

Rural ..... % Urban ..... %

Motorways ..... %

Section 2:

17) Have you ever been involved in any road accidents whilst driving which resulted in injury or damage to property in excess of £100?

Yes [ ] No [ ]

If NO, go to Section 3 on page 7.

18) How many such accidents have you been involved in?

.....

19a) How many of these accidents occurred at, or on the approaches to, junctions?

.....

19b) For how many of these accidents were you the responsible party?

.....

In this section, you are asked to answer the following questions with respect to your most recent accident at a junction whilst the driver of a vehicle. If you have never been involved in such an accident, please answer the questions with respect to your most recent accident when driving, regardless of the location.

<PTO>

20) How long ago did this accident occur?

.....

21a) What type of vehicle were you driving?

Car	[ ]	Heavy goods	[ ]
Motorcycle	[ ]	Bus/Coach	[ ]
Light goods	[ ]	Other (please specify)	[ ]

.....

21b) What type of vehicle(s), if any, were also involved in this accident? (Please write the number of each type of vehicle involved in the appropriate box)

Car	[ ]	Heavy goods	[ ]
Motorcycle	[ ]	Bus/Coach	[ ]
Light goods	[ ]	Other (please specify)	[ ]

.....

22a) Which of the following best describes the type of location at which this accident occurred?

Not at/near junction	[ ]	Motorway slip-road	[ ]
Roundabout	[ ]	Mini-roundabout	[ ]
T-junction	[ ]	Other (please specify)	[ ]
Crossroads	[ ]		

.....

22b) Is this location:

Urban	[ ]	Rural	[ ]
Motorway	[ ]		

22c) Would you say that this accident occurred on a familiar or an unfamiliar route?

Familiar	[ ]	Unfamiliar	[ ]

<PTO>

22d) At what time of day did this accident occur?

Day [ ] Evening [ ] Night [ ]

22e) Was the purpose of this trip for business or pleasure?

Business [ ] Pleasure [ ] Other [ ]

23a) Please provide a very brief description of this accident, including details of the type of manoeuvre it resulted from?

.....

.....

.....

.....

23b) Which, if any, procedures did you adopt in an attempt to avoid the collision?

.....

.....

23c) Why did you choose this/these *particular* procedure(s)?

.....

.....

24) Were you deemed by either the police or an insurance company to be the responsible party?

Yes	[ ]	Yes, but only partly	[ ]
No	[ ]	No, neither police nor insurance company involved	[ ]

25) Do you feel that you could have done anything to prevent this accident from happening?

Yes [ ] No [ ]

If YES, please specify .....

.....

.....

<PTO>

26) Do you feel that anyone else could have done anything to prevent this accident from happening?

Yes [ ] No [ ]

If YES, please state WHO, and what you think they could have done:

.....

.....

27) To what extent would you say each of the following factors contributed to this accident?

	TOTALLY	CONSIDERABLY	MODERATELY	MINIMALLY	NOT AT ALL
Your own driving					
Another's driving					
Another (non-driving) road user (eg. a pedestrian)					
Road/weather conditions					
Poor visibility due to trees etc.					
Excessive speed on your part					
Impatience on your part					
Lack of concentration					
Poor road design					

<PTO>

27 (cont.):

	TOTALLY	CONSIDERABLY	MODERATELY	MINIMALLY	NOT AT ALL
Poor judgement of other vehicles' movements					
Mechanical failure					
Fatigue					
Other (please specify)					

Section 3:

In this section you are asked to judge the likelihood of a number of behaviours resulting in an accident at a junction on a scale ranging from highly likely to highly unlikely. For each one, please make your judgement by ticking the box that most closely represents your likelihood estimate for each behaviour.

28: What do you think is the likelihood of each of the following resulting in an accident AT A JUNCTION?

	Highly Likely						Highly Unlikely
Drivers not indicating correctly:							
Mechanical failure of a vehicle:							
Close following a vehicle whilst approaching the junction:							
Failure to observe the correct 'Give Way' procedure:							
Overtaking whilst on the junction:							

<PTO>

28 (cont.):

	Highly Likely						Highly Unlikely
Motorcyclists going quickly through junctions:							
Lack of anticipation of other drivers' intentions:							
Pedal cyclists straight-lining roundabouts (ie. with no reference to lanes):							
Inconsideration to other drivers:							
Approaching the junction too quickly:							
Poor use of lanes on approaching the junction:							
Poor road design and signposting:							
Drivers not concentrating on their driving:							
Drivers behaving aggressively:							
Driving whilst under the influence of alcohol:							
Drivers 'straightlining' roundabouts:							
Drivers cutting-up others on the approach road:							
Trees etc. obscuring visibility:							

<PTO>

Section 4

29: For each of the scales below, please tick the box which represents the point on the scale which you feel best describes YOUR OWN DRIVING AT JUNCTIONS.

AGGRESSIVE	[ ]	[ ]	[ ]	[ ]	[ ]	**DEFENSIVE**
ANTICIPATING	[ ]	[ ]	[ ]	[ ]	[ ]	**NON-ANTICIPATING**
ATTENTIVE	[ ]	[ ]	[ ]	[ ]	[ ]	**INATTENTIVE**
CAREFUL	[ ]	[ ]	[ ]	[ ]	[ ]	**CARELESS**
COURTEOUS	[ ]	[ ]	[ ]	[ ]	[ ]	**IMPOLITE**
DECISIVE	[ ]	[ ]	[ ]	[ ]	[ ]	**INDECISIVE**
EXPERIENCED	[ ]	[ ]	[ ]	[ ]	[ ]	**INEXPERIENCED**
INSISTENT	[ ]	[ ]	[ ]	[ ]	[ ]	**YIELDING**
IRRITABLE	[ ]	[ ]	[ ]	[ ]	[ ]	**PLACID**
LAX	[ ]	[ ]	[ ]	[ ]	[ ]	**PRECISE**
NERVOUS	[ ]	[ ]	[ ]	[ ]	[ ]	**CONFIDENT**
PATIENT	[ ]	[ ]	[ ]	[ ]	[ ]	**IMPATIENT**
RECKLESS	[ ]	[ ]	[ ]	[ ]	[ ]	**CAUTIOUS**
RESPONSIBLE	[ ]	[ ]	[ ]	[ ]	[ ]	**IRRESPONSIBLE**
SAFE	[ ]	[ ]	[ ]	[ ]	[ ]	**RISKY**
SELFISH	[ ]	[ ]	[ ]	[ ]	[ ]	**CONSIDERATE**
SLOW	[ ]	[ ]	[ ]	[ ]	[ ]	**FAST**
TOLERANT	[ ]	[ ]	[ ]	[ ]	[ ]	**INTOLERANT**

<PTO>

Section 5:

30: Please indicate the extent to which you agree, or disagree, with each of the following statements about aspects of driving at junctions by placing a tick in the appropriate box. Please remember that there are no right or wrong answers and that it is your honest answers that are required.

	STRONGLY AGREE	AGREE	UNCERTAIN	DISAGREE	STRONGLY DISAGREE
It's necessary to make a special point of looking out for motor-cyclists when approaching a junction.					
I regard my own driving as superior to that of most other drivers.					
I think you have to drive aggressively at junctions if you want to get anywhere.					
I sometimes don't see motorcyclists until it's almost too late.					
It's important for me to drive in a way which makes it clear to other drivers what I am going to do.					
I feel that my safety is mainly in the hands of other road users.					
I feel an obligation to drive in a way that doesn't hold up other drivers.					
It's important to try to fit in with what other road users are doing.					

<PTO>

30 (cont.):

	STRONGLY AGREE	AGREE	UNCERTAIN	DISAGREE	STRONGLY DISAGREE
Motorcyclists tend to treat junctions with more caution than other road users.					
Young drivers tend to take more risks and are therefore more dangerous than older drivers.					
I find some roundabouts very confusing.					
I often find myself being distracted by things inside the vehicle (eg. by a passenger or the radio)					
I tend to assume that other drivers will always drive in the same way that I do.					
I am usually less considerate to other road users if I am trying to get somewhere quickly.					
I usually get annoyed by people driving too close behind me when approaching a junction.					
I consciously try to anticipate other drivers' actions.					
It's necessary to make a special point of looking out for cyclists at junctions.					

<PTO>

30 (cont.):

	STRONGLY AGREE	AGREE	UNCERTAIN	DISAGREE	STRONGLY DISAGREE
If traffic is light, I pay less attention to other vehicles when entering a junction than I would during peak times.					
I think that's it's important to assert my right of way at junctions, rather than let other drivers take advantage of me and push in.					
I often find it difficult to judge the speeds of vehicles negotiating a junction which I am approaching.					
I distrust drivers of certain types of vehicles (eg. Xr3i's).					
When approaching a junction I am often too busy thinking about which direction I want to go in to pay much attention to other vehicles.					
In most situations, it's safe to assume what other drivers are going to do.					
I find some T-junctions very confusing.					
It's safer to drive in a way that allows for other drivers doing stupid things.					

<PTO>

Section 6:

31: The section that follows contains more statements about driving at junctions. As with the previous section, please indicate the extent to which each one reflects the way you drive at junctions. Once again, please remember that there are no right or wrong answers.

NB: Throughout this section and the one that follows, the term NEAR-MISS refers to an incident in which a collision is avoided by one or more drivers taking some evasive action.

	STRONGLY AGREE	AGREE	UNCERTAIN	DISAGREE	STRONGLY DISAGREE
I tend to stop at the 'Give Way' line even when not absolutely necessary.					
No matter what the gap between my vehicle and the one in front, I know that I will be able to pull up in time.					
The longer I wait at the 'Give Way' line to enter a junction, the more likely I am to take a risk when pulling out onto that junction.					
I rarely approach junctions too quickly.					
I tend to be more cautious about pulling out onto junctions if my visibility is obscured.					
I often find myself driving very close to the vehicle in front because I am concentrating on the traffic on the junction.					

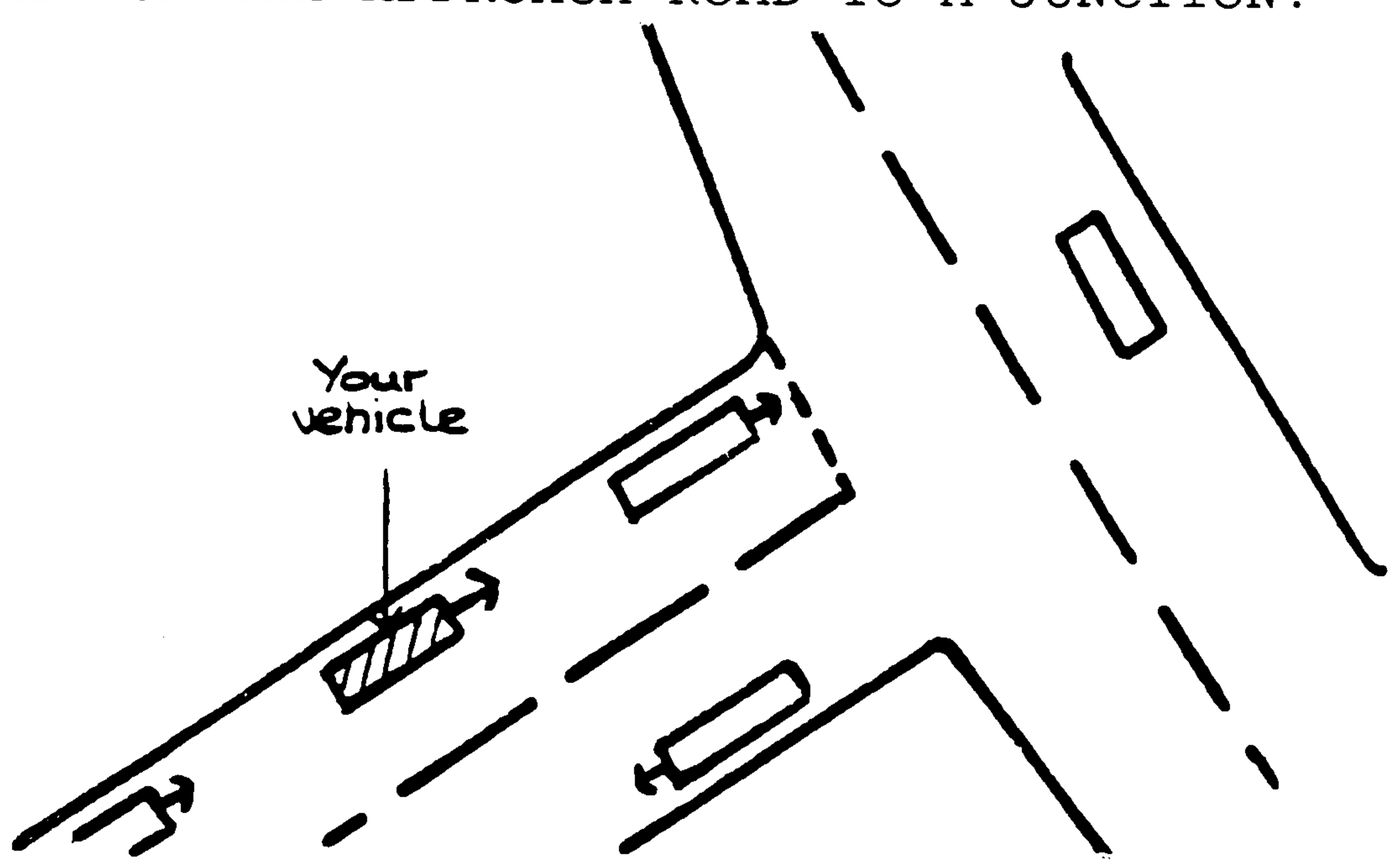
31 (cont.):

	STRONGLY AGREE	AGREE	UNCERTAIN	DISAGREE	STRONGLY DISAGREE
I'm rarely confused by the 'right of way' rule at junctions.					
When approaching a junction I tend to brake early rather than leaving it until the last possible moment.					
I sometimes find that I have been involved in a near-miss with another vehicle as I pull out onto the junction because I have under-estimated the speed of that vehicle on the junction.					
When queuing to enter a junction, I usually focus upon vehicles nearer the junction rather than the one immediately in front.					
The presence of a vehicle behind me when I am at the 'Give Way' line sometimes makes me feel pressured into entering the junction when I would normally prefer to wait.					
When queuing up to enter a junction, I often find myself almost colliding with the vehicle in front because I had expected it to have moved.					

Section 7:

In the following section, some situations that you will frequently encounter on the road are presented. For each one you are asked to estimate the number of occasions that you have been involved in a near-miss with at least one other vehicle in the previous year.

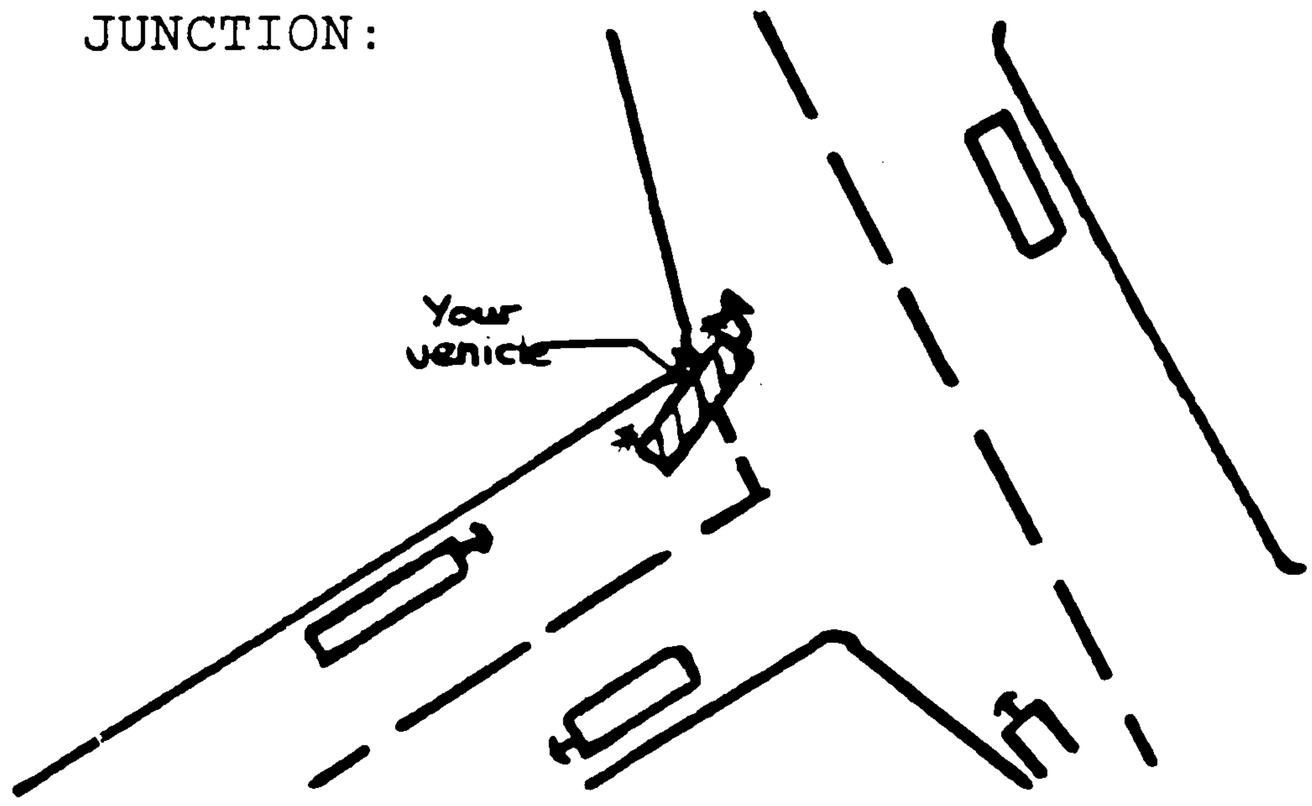
32: WHEN ON THE APPROACH ROAD TO A JUNCTION:



Please estimate the number of occasions on which you have been involved in a near-miss when approaching a junction as shown above.

None	Between 1 & 5	Between 6 & 10	Between 11 & 20	More Than 20
[ ]	[ ]	[ ]	[ ]	[ ]

33: WHEN PULLING OUT AT THE 'GIVE WAY' LINE ONTO A JUNCTION:

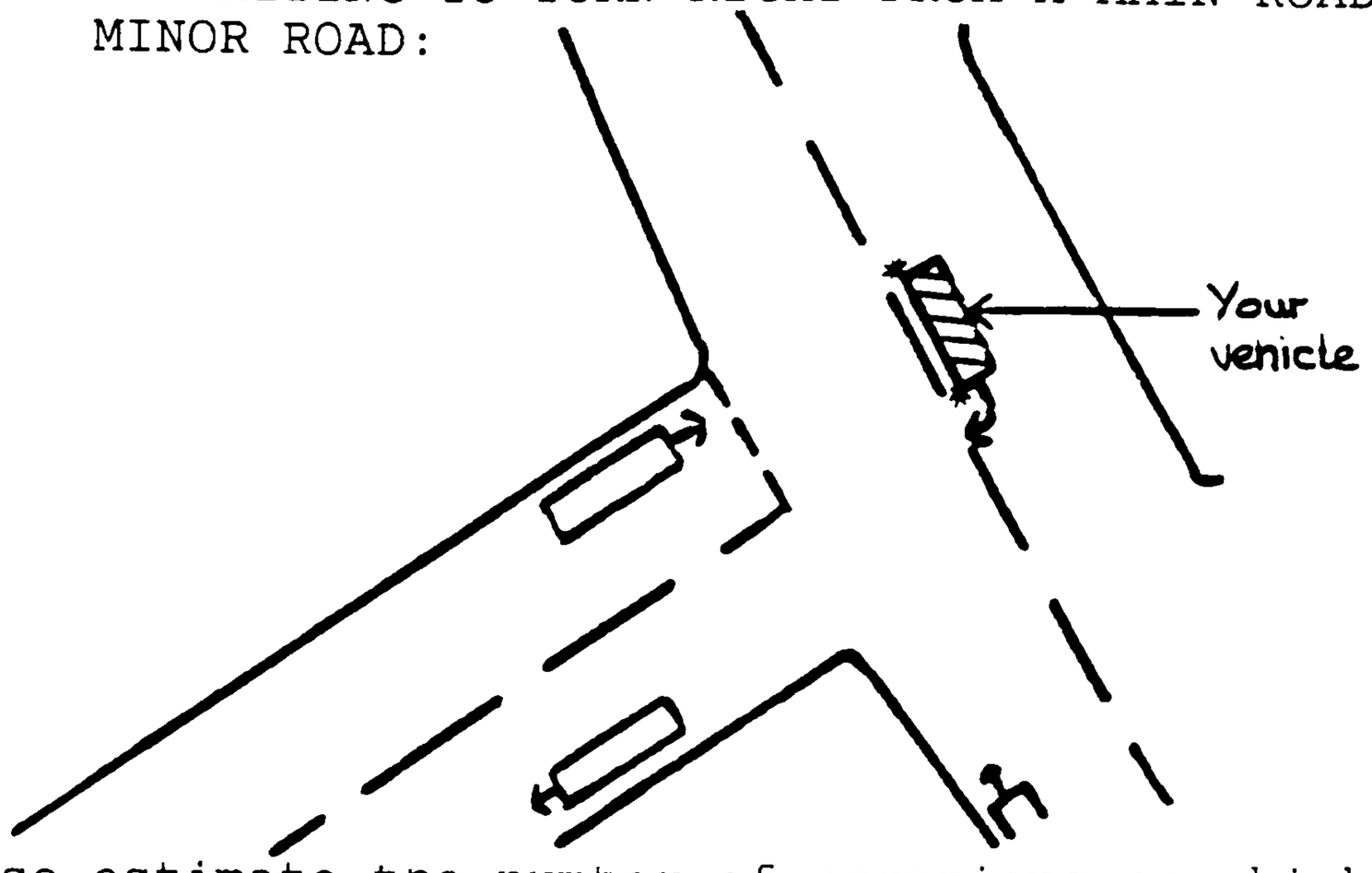


Please estimate the number of occasions on which you have been involved in a near-miss when entering a junction as shown above.

None	Between 1 & 5	Between 6 & 10	Between 11 & 20	More Than 20
[ ]	[ ]	[ ]	[ ]	[ ]

<PTO>

34: WHEN WAITING TO TURN RIGHT FROM A MAIN ROAD ONTO A MINOR ROAD:



Please estimate tne number of occasions on which you have been involved in a near-miss when leaving a junction from a major road to a minor road as shown above.

None	Between 1 & 5	Between 6 & 10	Between 11 & 20	More Than 20
[ ]	[ ]	[ ]	[ ]	[ ]

35: There now follows a list of circumstances under which some drivers feel that they are more likely to be involved in an accident at a JUNCTION. For each one, please indicate on the scale the extent to which you agree or disagree with each statement.

"I AM MORE LIKELY TO BECOME INVOLVED IN AN ACCIDENT AT A JUNCTION IF...

	STRONGLY AGREE	AGREE	UNCERTAIN	DISAGREE	STRONGLY DISAGREE
...weather conditions are poor."					
...traffic is dense."					
...I have other things on my mind."					
...my visibility is obscured."					
...road conditions are poor."					

<PTO>

35 (cont.): "I AM MORE LIKELY TO BECOME INVOLVED IN AN ACCIDENT AT A JUNCTION IF...

	STRONGLY AGREE	AGREE	UNCERTAIN	DISAGREE	STRONGLY DISAGREE
...I am tired."					
...another road user makes a mistake."					
...the layout of the junction is poor."					
...I am in a hurry."					

Please note any other circumstance under which you feel you would be more likely to become involved in an accident, and also indicate your strength of agreement or disagreement as with the previous items.

	STRONGLY AGREE	AGREE	UNCERTAIN	DISAGREE	STRONGLY DISAGREE
.....					
.....					

36: Finally, two very brief questions requiring likelihood estimates as in previous sections.

a) What is the likelihood that you will be involved in a road accident whilst driving during the next 12 months?

Highly Likely						Highly Unlikely

b) What is the likelihood that an average driver will be involved in a road accident whilst driving during the next 12 months?

Highly Likely						Highly Unlikely

THAT IS THE END OF THE QUESTIONNAIRE, THANK YOU FOR YOUR CO-OPERATION. IF THERE ANY COMMENTS YOU WOULD LIKE TO MAKE, PLEASE NOTE THEM OVER THE PAGE.

APPENDIX V:

Letter to Thames Valley Police Requesting a Covering Letter for the Questionnaire

Applied Psychology Unit
College of Aeronautics
Cranfield Institute of Technology
Cranfield Bedford MK43 0AL England
Telephone Bedford (0234) 750111
Telex 825072 CITECH G
Fax 0234 750192

Cranfield

Chief Inspector Thompson,
Thames Valley Police - Divisional
Headquarters,
302, North Row,
Witan Gate East,
CENTRAL MILTON KEYNES,
MK9 2DS.

9/12/89

Dear Chief Inspector,

I am a PhD student at the Applied Psychology Unit at Cranfield, specialising in road safety issues. The specific aim of the research is to develop a method by which the errors of drivers approaching and negotiating junctions can be better understood. This involves sending out a questionnaire to a large number of accident-involved drivers along with drivers from the general population.

Several months ago, I wrote to Chief Inspector Bird requesting permission to take names and addresses of accident-involved drivers from the accident records at D-Division. Permission was very kindly granted, and I spent some time over the last couple of weeks doing just this. However, one condition imposed on this use of data from the files was that I followed exactly the same procedure adopted by a former student from the APU several years ago. This involved including a covering letter from the police with every questionnaire sent out to the accident-involved drivers. The main points to be included in such a letter are:

The fact that the research is concerned with accidents at junctions, and that each person has been selected because of their involvement in such an accident;

The information contained within returned questionnaires will be completely anonymous and confidential;

Although the police have assisted with the research in allowing me access to the accident records, any queries should be directed to me at the APU.

For further guidance, I enclose a copy of the covering letter used in the aforementioned study and the latest copy of my questionnaire. Although some changes may be made to the questionnaire before the final survey, I assure you that these will be minor and more concerned with the layout than question content. If you could provide me with such a covering letter in the near future, I would be most grateful. Should you have any queries about my research, please do not hesitate to contact me at the above address. I look forward to hearing from you shortly,

Yours sincerely,

David M. Bottomley.

Figure V.1: Letter Requesting a Covering Letter for the Questionnaire

APPENDIX W:

Covering Letters for Questionnaire

Thames Valley Police

Police Station
302 North Row
Witan Gate East
Central Milton Keynes MK9 2DS
Telephone: 0908-678787

My ref

Your ref

Date: 13 December 1989

Dear Sir/Madam,

Mr. Bottomley of Cranfield Institute of Technology is currently conducting detailed research into road accidents at junctions. The area of research involves several counties and is spread over a three year period.

Accidents are a matter of concern to us all, and as you were involved in an accident at a junction during the study period, I am writing to you to seek your assistance in the research programme.

Mr. Bottomley has prepared a questionnaire which you are asked to complete. I should, however, point out that you are, of course, under no obligation to do so, but if you are willing to assist in the study, anonymity is guaranteed as the questionnaire contains no identifying marks on it.

The questionnaire should take only a few minutes to complete as the main areas of interest to the researchers are:-

(a) the extent to which you were exposed to risk at the time of the accident in terms of your usage of the road,

(b) the nature of your means of transport, including the kind of vehicle(s) you have used and are now using.

There is one further point I should emphasise. If you complete the questionnaire, the information contained in it is solely for the use of the researchers, and should be sent direct to Mr. Bottomley at Cranfield, who will treat it as totally confidential. Whatever you say, therefore in the questionnaire cannot influence our decision about any possible Court action arising from the accident, or affect the information that we normally supply to interested parties in respect of possible civil claims.

If you decide to complete the questionnaire, and thereby assist in this extremely worthwhile accident research project, please use the enclosed stamped addressed envelope and forward it direct to Mr. Bottomley.

Yours faithfully,

D.S.McCRONE
Chief Superintendent

Figure W.1: Police Covering Letter for the Questionnaire

Applied Psychology Unit
College of Aeronautics
Cranfield Institute of Technology
Cranfield Bedford MK43 0AL England
Telephone Bedford (0234) 750111
Telex 825072 CITECH G
Fax 0234 750192

Cranfield

Dear Sir/Madam,

Please find enclosed a questionnaire that has been designed to answer questions concerning the ways in which people drive at junctions. The questionnaire itself forms part of a larger study which aims to develop a clearer understanding of driving practices at junctions and suggest ways in which accidents can be reduced. The questions concern aspects of your driving behaviour at junctions, your attitudes to various aspects of driving, as well as some details about your driving experience.

Although the questionnaire appears to be quite bulky, you will find that many of the pages contain a small number of questions, and the whole thing should only take about 15 to 20 minutes to complete. If you could spare some time to fill in the questionnaire, and return it in the 'Freepost' envelope provided, I would be very grateful and you can be assured that you will be contributing to this attempt to understand accidents at junctions. Please note that it is very important that you remember these questions have no right or wrong answers and that it is your honest opinions and reported behaviours that are of interest. I would also like to assure you that all information that you may choose to give on this questionnaire will be completely anonymous and confidential.

The size of this survey means that it is not possible to thank personally all participants. However, there will be a free draw with a total of £120 worth of prizes open to all who return their questionnaire and complete the entry form on the following page. Entry into the draw will not implicate your anonymity as these forms will be detached from the rest of the questionnaire as soon as they are received. The prizes will be tokens of your choice (either book, record or Halfords) and the distribution will be as follows:

2 - 1st prizes of £20,

4 - 2nd prizes of £10,

8 - 3rd prizes of £5.

<PTO>

Figure W.2: Covering Letter for the Questionnaire

The draw will be made during September, but interested parties should return their questionnaires as soon as possible to ensure inclusion in the draw. Please note that draw entry forms returned without an accompanying questionnaire can not be entered into the draw. A list of winners will be available from me at the above address from the end of September.

Many thanks in advance for your participation.

Yours faithfully,

David Bottomley, B.A., M.Sc.

DRAW ENTRY FORM
****

If you wish to be included in the free prize draw, please fill in your name and address, along with your choice of prize, in the spaces below and return this sheet along with the questionnaire in the FREEPOST envelope provided.

NAME: (Mr/Ms/Mrs/Miss) .....

ADDRESS: .....

.....

.....

.....

MY PREFERRED PRIZE IS: (please tick one box only)

Book Token [ ]

Record Token [ ]

Halfords Voucher [ ]

Figure W.2: Covering Letter for the Questionnaire (cont.)

APPENDIX X:

Reminder Letter for Questionnaire Returns

Applied Psychology Unit
College of Aeronautics
Cranfield Institute of Technology
Cranfield Bedford MK43 0AL England
Telephone Bedford (0234) 750111 x 2227
Telex 825072 CITECH G
Fax 0234 750192

Cranfield

5th September 1990

Dear Sir/Madam,

I am writing to you concerning the questionnaire about driving at junctions that I sent you several weeks ago. If you have already completed and returned the questionnaire, then I apologise for troubling you again and would be grateful if you disregard this letter. If you have not yet returned the questionnaire, I would like to remind you that it is still not too late. The prize draw has been delayed for a couple of weeks until mid-October, therefore allowing those who still wish to participate a chance to be included in the draw. Once again, I would like to stress the importance of the information which you are in a position to supply me with. We would all like to see a significant reduction in the number of road accidents and, although it is likely that we will never prevent all accidents from occurring, I believe that a large number of accidents may be avoided. It is anticipated that this research will point to some of the ways in which such a reduction may be brought about.

If you would still like to participate, please complete and return the questionnaire as soon as possible to guarantee inclusion in the free draw. Those people who would like to participate, but have mislaid their questionnaire, can obtain another copy from me by writing or telephoning me at the above address.

Thank you in antipation.

Yours faithfully,

David Bottomley
(Research Assistant).

Figure X.1: Reminder Letter for Questionnaire Returns

APPENDIX Y:

Complete List & Definition of Variables used in the Questionnaire Study

COMPLETE LIST & DEFINITIONS OF VARIABLES IN THE QUESTIONNAIRE STUDY

This section contains a list of all variables used in the analysis of the questionnaire study, along with the definition for each of those variables. The first group of variables are those which were coded directly from the questionnaires. The second group were all derived from these original variables.

Y.1: Initial Variable Set

Section 1 - Demographic Details:

RESPNO - Respondent's identification number.

SAMPLE - Sample identification code.

AGE - Age of respondent.

SEX - Sex of respondent.

STATUS - Marital status of respondent.

OCCU - Occupation of respondent.

DRWORK - Whether driving forms part of respondent's work or not.

CAR - Whether respondent has passed driving test for cars or not.

MOTORCYC - Whether respondent has passed test to ride a motorcycle or not.

HGV - Whether respondent has passed driving test for heavy goods vehicles or not.

PSV - Whether respondent has passed driving test for public service vehicles or not.

TESTYRS - How long ago test for cars was passed.

TESTTIM - How many times test for cars was taken.

TUITION - Source of majority of driving tuition.

LESSONS - How many lessons, if any, received from a qualified instructor.

ADTRAIN - What type of additional training, if any, has been undertaken by the respondent.

YEARSDR - How many years the respondent has been driving on a regular basis.

VEHICLE - What type of vehicle the respondent usually drives.

VEHCLASS - Based on the respondent's stated vehicle make and model, the class of car (as defined in the observation study) was coded.

VEHSPEC - Whether the car can be said to be 'special' (ie. sports) or not.

VEHBEL - Who the vehicle most driven belongs to.

OVEHICLE - Which other type of vehicle, if any, the respondent drives.

OVEHBEL - Who this other vehicle belongs to.

MILES - An approximation of the number of miles driven per year by the respondent.

UNFAMIL - What proportion of the respondent's total mileage is done on unfamiliar roads.

RURAL - What proportion of the respondent's total mileage is done on rural roads.

MOTORWAY - What proportion of the respondent's total mileage is done on motorways.

URBAN - What proportion of the respondent's total mileage is done on urban roads.

Section 2 - Accident Details:

ACCS - How many accidents with total damage over £100 or with personal injury the respondent has been involved in.

JUNCACCS - How many of these accidents occurred at junctions.

ACCSRESP - How many of these junction accidents the respondent felt responsible for.

ACCAGO - How long ago the most recent accident occurred.

ACCVEH - What vehicle the respondent was driving at the time.

OVACCC - How many cars were also involved.

OVACCM - How many motorcycles were also involved.

OVACCLG - How many light goods vehicles were also involved.

OVACCHG - How many heavy goods vehicles were also involved.

OVACCBC - How many buses or coaches were also involved.

OVACCO- What other type of vehicle , if any, was also involved.

OVACCON - How many of these other vehicles were involved.

TYPELOC - What type of road location the accident occurred at.

LOCATION - Whether the location was rural, urban or motorway.

FAMILIAR - Whether the location was familiar or unfamiliar to the respondent.

TIMEDAY - Whether the accident occurred during the day, evening or night.

PURPOSE - The purpose of the journey during which the accident occurred.

ACCDESC - A brief description of the accident.

ACCAV1 - What accident avoidance technique, if any, was adopted.

ACCAV2 - What other accident avoidance technique was adopted.

ACCAVY1 - Reason why the particular avoidance technique(s) was/were chosen.

ACCAVY2 - Another reason, if any, why the avoidance technique(s) was/were adopted.

RESP - Who the police or insurance company felt was responsible for the accident.

YPREV1 - What the respondent felt they could have done to prevent the accident.

YPREV2 - What other thing the respondent felt they could have done to prevent the accident.

OPREV1 - What the respondent felt someone else could have done to prevent the accident.

OPREV2 - What other thing the respondent felt someone else could have done to prevent the accident.

OWNDRIVE - The extent to which the respondent felt that their own driving contributed to the accident.

ANDRIVE - The extent to which the respondent felt that another's driving contributed to the accident.

ANNODR - The extent to which the respondent felt that another non-driving person contributed to the accident.

WEATHER - The extent to which the respondent felt that the road or weather conditions contributed to the accident.

VISIBIL - The extent to which the respondent felt that poor visibility due to obstructions contributed to the accident.

EXCESSP - The extent to which the respondent felt that excess speed on their part contributed to the accident.

IMPAT - The extent to which the respondent felt that impatience on their part contributed to the accident.

CONCEN - The extent to which the respondent felt that lack of concentration on their part contributed to the accident.

DESIGN - The extent to which the respondent felt that poor road design contributed to the accident.

JUDGE - The extent to which the respondent felt that poor judgement of other vehicles' movements on their part contributed to the accident.

MECHFAIL - The extent to which the respondent felt that mechanical failure contributed to the accident.

FATIGUE - The extent to which the respondent felt that fatigue on their part contributed to the accident.

OTHFACT - What other factor, if any, also contributed to the accident in their opinion.

OTHFACTX - The extent to which the respondent felt that this other factor contributed to the accident.

Section 3 - Likelihood of Undesirable Driving Practices Resulting in an Accident at a Junction

Q28A - Drivers not indicating correctly.

Q28B - Mechanical failure of a vehicle.

Q28C - Close following a vehicle whilst approaching the junction.

Q28D - Failure to observe the correct 'Give Way' procedure.

Q28E - Overtaking whilst on the junction.

Q28F - Motorcyclists going quickly through junctions.

Q28G - Lack of anticipation of other drivers' intentions.

Q28H - Pedal cyclists 'straight-lining' roundabouts (ie. with no reference to lanes).

Q28I - Inconsideration to other drivers.

Q28J - Approaching the junction too quickly.

Q28K - Poor use of lanes on approaching the junction.

Q28L - Poor road design and signposting.

Q28M - Drivers not concentrating on their driving.

Q28N - Drivers behaving aggressively.

Q28O - Driving whilst under the influence of alcohol.

Q28P - Drivers 'straight-lining' roundabouts.

Q28Q - Drivers cutting-up others on the approach road.

Q28R - Trees etc. obscuring visibility.

Section 4 - Self Descriptors of Driving Style

The following pairs of adjectives constitute the poles of each item in this section.

AGGRESS - Aggressive/Defensive.

ANTIC - Anticipating/Non-Anticipating.

ATTEN - Attentive/Inattentive.

CAREFUL - Careful/Careless.

COURT - Courteous/Impolite.

DECIS - Decisive/Indecisive.

EXPER - Experienced/Inexperienced.

INSIST - Insistent/Yielding.

IRRIT - Irritable/Placid.

LAX - Lax/Precise.

NERVOUS - Nervous/Confident.

PATIENT - Patient/Impatient.

RECKLESS - Reckless/Cautious.

RESPONSE - Responsible/Irresponsible.

SAFE - Safe/Risky.

SELFISH - Selfish/Considerate.

SLOW - Slow/Fast.

TOLERANT - Tolerant/Intolerant.

Section 5 - Statements About Driving at Junctions

Q30A - It's necessary to make a special point of looking out for motorcyclists when approaching a junction.

Q30B - I regard my own driving as superior to that of most other drivers.

Q30C - I think you have to drive aggressively at junctions if you want to get anywhere.

Q30D - I sometimes don't see motorcyclists until it's almost too late.

Q30E - It's important for me to drive in a way which makes it clear to other drivers what I'm going to do.

Q30F - I feel that my safety is mainly in the hands of other road users.

Q30G - I feel an obligation to drive in a way that doesn't hold up other drivers.

Q30H - It's important to try to fit in with what other road users are doing.

Q30I - Motorcyclists tend to treat junctions with more caution than other road users.

Q30J - Young drivers tend to take more risks and are therefore more dangerous than older drivers.

Q30K - I find some roundabouts very confusing.

Q30L - I often find myself being distracted by things inside the vehicle (eg. by a passenger or the radio).

Q30M - I tend to assume that other drivers will always drive in the same way that I do.

Q30N - I am usually less considerate to other road users if I am trying to get somewhere quickly.

Q30O - I usually get annoyed by people driving too closely behind me when approaching a junction.

Q30P - I consciously try to anticipate other drivers' actions.

Q30Q - It's necessary to make a special point of looking out for cyclists at junctions.

Q30R - If traffic is light, I pay less attention to other vehicles when entering a junction than I would during peak times.

Q30S - I think that it's important to assert my right of way at junctions, rather than let other drivers take advantage of me and push in.

Q30T - I often find it difficult to judge the speeds of vehicles negotiating a junction which I am approaching.

Q30U - I distrust drivers of certain types of vehicles (eg. Xr3i's).

Q30V - When approaching a junction I am often too busy thinking about which direction I want to go in to pay much attention to other vehicles.

Q30W - In most situations, it's safe to assume what other drivers are going to do.

Q30X - I find some T-junctions very confusing.

Q30Y - It's safer to drive in a way that allows for other drivers doing stupid things.

Section 6 - Reported Behaviours of Driving at Junctions

Q31A - I tend to stop at the 'Give Way' line even when not absolutely necessary.

Q31B - No matter what the gap between my vehicle and the one in front, I know that I will be able to pull up in time.

Q31C - The longer I wait at the 'Give Way' line to enter a junction, the more likely I am to take a risk when pulling out onto that junction.

Q31D - I rarely approach junctions too quickly.

Q31E - I tend to be more cautious about pulling out onto junctions if my visibility is obscured.

Q31F - I often find myself driving very close to the vehicle in front because I am concentrating on the traffic on the junction.

Q31G - I'm rarely confused by the 'right of way' rule at junctions.

Q31H - When approaching a junction, I tend to brake early rather than leaving it until the last possible moment.

Q31I - I sometimes find that I have been involved in a near-miss with another vehicle as I pull out onto the junction because I have under-estimated the speed of a vehicle on the junction.

Q31J - When queuing to enter a junction, I usually focus upon vehicles nearer the junction rather than the one immediately in front.

Q31K - The presence of a vehicle behind me when I am at the 'Give Way' line sometimes makes me feel pressured into entering the junction when I would normally prefer to wait.

Q31L - When queuing up to enter a junction, I often find myself almost colliding with the vehicle front because I had expected it to have moved.

Section 7 - Reported Near-Misses and Increased Accident-Likelihood Factors

CLOSEFOL - The estimated number of occasions on which the respondent has been involved in a rear-end shunt type near miss whilst approaching a junction during the previous 12 months.

PULLOUT - The estimated number of occasions on which the respondent has been involved in a left-turn type near miss whilst entering a junction during the previous 12 months.

TURNIN - The estimated number of occasions on which the respondent has been involved in a cross-traffic type near miss whilst entering minor road from a major road during the previous 12 months.

WEATHPR - The extent to which the respondent feels that poor weather conditions are likely to increase their chances of becoming involved in an accident.

DENSE - The extent to which the respondent feels that heavy traffic conditions is likely to increase their chances of becoming involved in an accident.

OTHINGS - The extent to which the respondent feels that having other things on their mind is likely to increase their chances of becoming involved in an accident.

VISOBSC - The extent to which the respondent feels that having their visibility obscured is likely to increase their chances of becoming involved in an accident.

POORCOND - The extent to which the respondent feels that poor road conditions are likely to increase their chances of becoming involved in an accident.

TIRED - The extent to which the respondent feels that tiredness is likely to increase their chances of becoming involved in an accident.

MISTAKE - The extent to which the respondent feels that another road user's mistake is likely to increase their chances of becoming involved in an accident.

LAYOUT - The extent to which the respondent feels that poor junction layout is likely to increase their chances of becoming involved in an accident.

HURRY - The extent to which the respondent feels that being in a hurry is likely to increase their chances of becoming involved in an accident.

OTHTYPE - What other factor, if any, is likely increase the likelihood of their becoming involved in an accident.

OTYPEQ - The extent to which the respondent feels that this additional factor increases the likelihood of accident involvement.

PROBACC - The respondent's estimate of the probability of their being involved in a road accident during the next 12 months.

OPROBACC - The respondent's estimate of the probability of the average driver being involved in a road accident during the next 12 months.

Y.2: Additional Variables Derived from Initial Set

PACC - The respondent's relative assessment of their accident probability during the following 12 month period in comparison with the 'average' driver.

TESTAGE - The respondent's age at the time of taking their driving test.

AGEACC - The respondent's age at the time of their described accident.

ACCEXP - The respondent's driving experience at the time of their described accident.

CULP - Independent raters' assessments of accident culpability

GUILTY - Derived from ACCDESC to distinguish those respondents who could be said to be responsible for the described accident from those who were not.

UDPFAC1 - First Section 3 metavariable

UDPFAC2 - Second Section 3 metavariable

UDPFAC3 - Third Section 3 metavariable

UDPFAC4 - Fourth Section 3 metavariable

DESCFAC1 - First Section 4 metavariable

DESCFAC2 - Second Section 4 metavariable

DESCFAC3 - Third Section 4 metavariable

OPINFAC1 - First Section 5 metavariable

OPINFAC2 - Second Section 5 metavariable

OPINFAC3 - Third Section 5 metavariable

OPINFAC4 - Fourth Section 5 metavariable

OPINFAC5 - Fifth Section 5 metavariable

OPINFAC6 - Sixth Section 5 metavariable

OPINFAC7 - Seventh Section 5 metavariable

OPINFAC8 - Eighth Section 5 metavariable

REPOFAC1 - First Section 6 metavariable

REPOFAC2 - Second Section 6 metavariable

REPOFAC3 - Third Section 6 metavariable

INCPFAC1 - First Section 7 metavariable

INCPFAC2 - Second Section 7 metavariable

APPENDIX Z:

Descriptive Statistics for Questionnaire Items

DESCRIPTIVE STATISTICS FOR QUESTIONNAIRE ITEMS

Z.1: Basic Descriptive Statistics for Variables used in the Questionnaire Study

Table Z.1 (below and over) lists the mean, standard deviation, minimum value, maximum value and number of valid cases for each of the non-categorical variables used in the questionnaire study.

Table Z.1: Descriptive Statistics for all Non-Categorical Variables from the Questionnaire Study

Variable Name:	Mean	Standard Deviation	Minimum Value	Maximum Value	Number of Cases
AGE	40.37	15.03	18	83	734
SEX	0.59	0.49	0	1	738
TESTYRS	17.48	11.97	1	55	707
TESTTIM	1.60	0.87	1	8	708
VEHICLE	0.92	0.27	0	1	740
VEHBEL	0.81	0.39	0	1	739
VEHSPEC	0.07	0.26	0	1	679
LESSONS	15.86	12.71	0	98	690
DRSCHOOL	0.86	0.38	0	1	712
FRIEND	0.37	0.48	0	1	712
ADTRAIN	0.08	0.27	0	1	716
YEARSDR	17.79	12.79	1	64	730
MILES	13.76	14.51	0	98	725
UNFAMIL	21.40	17.67	0	90	726
RURAL	32.95	23.43	0	98	720
MOTORWAY	23.80	20.10	0	90	717
URBAN	43.45	23.92	0	98	715
MOTORCYC	0.18	0.39	0	1	736
HGV	0.06	0.23	0	1	736
PSV	0.02	0.15	0	1	736
ACCS	0.93	1.28	0	10	740
JUNCACCS	1.07	0.94	0	8	381
ACCSRESP	0.55	0.61	0	3	285
ACCAGO	5.42	6.69	0	37	377
ACCEXP	13.11	11.51	0	63	371
OWNDRIVE	3.58	1.38	1	5	375
ANDRIVE	2.51	1.53	1	5	364
ANNDDR	4.79	0.81	1	5	330
WEATHER	4.06	1.33	1	5	355
VISIBIL	4.23	1.32	1	5	346
EXCESSP	4.62	0.81	1	5	350
IMPAT	4.53	0.92	1	5	350
CONCEN	3.87	1.41	1	5	362
DESIGN	3.88	1.39	1	5	352
JUDGE	3.74	1.47	1	5	359
MECHFAIL	4.87	0.62	1	5	348
FATIGUE	4.69	0.83	1	5	346

(cont. over)

Table Z.1: Descriptive Statistics for all Non-Categorical Variables from the Questionnaire Study (cont.)

Variable Name:	Mean	Standard Deviation	Minimum Value	Maximum Value	Number of Cases
Q28A	2.39	1.37	1	7	738
Q28B	4.92	1.79	1	7	733
Q28C	2.17	1.28	1	7	737
Q28D	2.02	1.36	1	7	736
Q28E	1.91	1.52	1	7	735
Q28F	2.77	1.56	1	7	733
Q28G	2.58	1.34	1	7	738
Q28H	2.94	1.71	1	7	732
Q28I	2.62	1.44	1	7	733
Q28J	2.50	1.38	1	7	732
Q28K	2.65	1.40	1	7	730
Q28L	3.41	1.78	1	7	732
Q28M	2.14	1.26	1	7	732
Q28N	2.21	1.36	1	7	733
Q28O	1.73	1.40	1	7	731
Q28P	2.54	1.36	1	7	737
Q28Q	2.25	1.26	1	7	730
Q28R	3.49	1.83	1	7	732
AGGRESS	3.59	0.96	1	5	719
ANTIC	1.76	0.86	1	5	729
ATTEN	1.67	0.72	1	5	722
CAREFUL	1.68	0.75	1	4	734
COURT	2.01	0.88	1	5	730
DECIS	1.80	0.85	1	5	724
EXPER	1.68	0.83	1	5	734
INSIST	3.27	0.96	1	5	721
IRRIT	3.65	0.96	1	5	725
LAX	4.07	0.80	1	5	722
NERVOUS	4.30	0.87	1	5	728
PATIENT	2.23	1.09	1	5	728
RECKLESS	4.21	0.75	1	5	728
RESPONSE	1.56	0.69	1	4	731
SAFE	1.64	0.77	1	5	730
SELFISH	4.05	0.89	1	5	729
SLOW	3.00	0.96	1	5	729
TOLERANT	2.18	0.97	1	5	733
Q30A	1.66	0.72	1	5	738
Q30B	2.97	1.00	1	5	733
Q30C	4.02	0.90	1	5	736
Q30D	3.42	1.11	1	5	736
Q30E	1.40	0.59	1	5	737
Q30F	3.24	1.20	1	5	736
Q30G	2.58	1.06	1	5	738
Q30H	2.66	1.03	1	5	735
Q30I	3.27	1.01	1	5	736
Q30J	2.34	1.14	1	5	737
Q30K	2.87	1.20	1	5	736
Q30L	3.96	0.89	1	5	736
Q30M	3.81	0.96	1	5	736

(cont. over)

Table Z.1: Descriptive Statistics for all Non-Categorical Variables from the Questionnaire Study (cont.)

Variable Name:	Mean	Standard Deviation	Minimum Value	Maximum Value	Number of Cases
Q30N	3.13	1.14	1	5	737
Q30O	2.06	1.05	1	5	737
Q30P	1.79	0.68	1	5	735
Q30Q	1.74	0.75	1	5	737
Q30R	3.40	1.08	1	5	734
Q30S	2.89	1.05	1	5	735
Q30T	3.65	0.92	1	5	733
Q30U	3.11	1.23	1	5	733
Q30V	4.01	0.80	1	5	732
Q30W	3.81	1.00	1	5	734
Q30X	3.58	0.97	1	5	734
Q30Y	2.09	1.06	1	5	733
Q31A	2.67	1.14	1	5	736
Q31B	2.90	1.12	1	5	733
Q31C	3.37	1.08	1	5	735
Q31D	2.31	0.87	1	5	736
Q31E	1.48	0.54	1	4	736
Q31F	3.81	0.92	1	5	737
Q31G	2.16	0.95	1	5	736
Q31H	2.04	0.80	1	5	735
Q31I	3.68	0.99	1	5	736
Q31J	3.33	1.02	1	5	735
Q31K	3.61	1.12	1	5	735
Q31L	3.77	0.98	1	5	736
CLOSEFOL	1.51	0.62	1	5	732
PULLOUT	1.58	0.64	1	5	733
TURNIN	1.51	0.68	1	5	731
WEATHPR	2.44	0.98	1	5	733
DENSE	2.78	1.05	1	5	731
OTHINGS	2.73	1.14	1	5	734
VISOBSC	2.10	0.87	1	5	733
POORCOND	2.48	0.96	1	5	733
TIRED	2.32	0.93	1	5	735
MISTAKE	2.12	0.77	1	5	735
LAYOUT	2.35	0.93	1	5	737
HURRY	2.80	1.10	1	5	735
PROBACC	5.06	1.50	1	7	720
OPROBACC	3.96	1.33	1	7	725
PACC	8.08	1.51	3	13	717
TESTAGE	22.35	7.19	17	68	703
AGEDRIVE	22.66	7.30	16	59	724
AGEACC	35.16	13.90	17	81	372
DRIVEEX	294.08	311.43	0	2156	711

(cont. over)

Table Z.1: Descriptive Statistics for all Non-Categorical Variables from the Questionnaire Study (cont.)

Variable Name:	Mean	Standard Deviation	Minimum Value	Maximum Value	Number of Cases
UDPFAC1	12.52	4.79	5	27	725
UDPFAC2	10.53	4.31	4	24	720
UDPFAC3	7.79	4.05	4	22	726
UDPFAC4	14.75	4.99	4	24	726
DESCFAC1	23.93	6.51	11	36	703
DESCFAC2	8.33	2.75	5	13	715
DESCFAC3	7.11	2.50	4	12	716
OPINFAC1	17.57	3.17	7	18	725
OPINFAC2	3.40	1.28	2	8	736
REPOFAC1	21.56	3.76	6	24	732
INCPFAC1	14.28	3.66	6	22	724
INCPFAC2	7.85	2.57	3	12	731

Z.2: Other Demographic and General Driving Details

Table Z.2 (below and over) shows the number, and, in brackets, the percentage of respondents falling into each of several demographic categories in each of the three samples distributed. Following on, Table Z.3 (over) shows the mean, standard deviation and number of cases for several of the demographic variables about which data of a continuous nature was recorded for each sample.

Table Z.2: Responses to Categorical Demographic Items in each Sample

	Sample:			
	General	Milton Keynes	Police Accident Records	TOTAL
Number of respondents who drive as part of work	166 (41.5)	63 (40.1)	83 (58.0)	312 (47.8)
Number of car licence holders	398 (98.8)	172 (97.7)	151 (96.2)	721 (98.0)
Number of motor-cycle licence holders	77 (19.1)	28 (15.9)	29 (18.5)	134 (18.2)

(cont. over)

Table Z.2: Responses to Categorical Demographic Items in each Sample (cont.)

	Sample:			
	General	Milton Keynes	Police Accident Records	TOTAL
Number of HGV licence holders	21 (5.2)	8 (4.5)	13 (8.3)	42 (5.7)
Number of PSV licence holders	9 (2.2)	2 (1.1)	5 (3.2)	16 (2.2)
Main vehicle driven - car	378 (93.3)	168 (95.5)	138 (86.8)	684 (92.4)

Table Z.3: Means, Standard Deviations and Number of Case for Continuous Demographic Items for each Sample

	Sample:			
	General	Milton Keynes	Police Accident Records	TOTAL
Mean number of driving lessons	14.98 (11.08) (381)	16.51 (14.96) (164)	17.43 (13.79) (145)	15.86 (12.71) (690)
Mean number of years driving on regular basis	18.45 (13.11) (400)	17.65 (12.24) (176)	16.25 (12.50) (154)	17.79 (12.79) (730)
Mean number of times car driving test taken	1.56 (0.80) (391)	1.58 (0.97) (170)	1.74 (0.95) (147)	1.60 (0.87) (708)
Mean number of miles driven per year (x 1000)	11.67 (11.08) (398)	12.53 (13.39) (174)	20.58 (20.45) (153)	13.76 (14.51) (725)
% driving done on unfamiliar roads	20.71 (17.14) (398)	20.53 (16.75) (176)	24.22 (19.80) (152)	21.40 (17.67) (726)

(cont. over)

Table Z.3: Means, Standard Deviations and Number of Case for Continuous Demographic Items for each Sample (cont.)

	Sample:			
	General	Milton Keynes	Police Accident Records	TOTAL
% driving done on rural roads	31.61 (23.28) (394)	35.51 (23.20) (172)	33.55 (23.97) (154)	32.95 (23.43) (720)
% driving done on urban roads	44.52 (23.50) (390)	43.13 (25.17) (172)	41.11 (23.48) (153)	43.45 (23.92) (715)
% driving done on motorways	23.93 (19.28) (392)	21.86 (21.21) (172)	25.67 (20.81) (153)	23.80 (20.10) (717)

APPENDIX AA:

Complete Details for all Reported Accidents

FULL DETAILS FROM SECTION 2 OF THE QUESTIONNAIRE

AA.1: ACCIDENT DESCRIPTIONS REPORTED BY RESPONDENTS TO QUESTIONNAIRE

Listed below are the responses provided by respondents when asked to provide a brief description of their most recent junction accident (or any other accident if they had never been involved in an accident at a junction). Several of the categories were combined for the purposes of several of the analyses, and the summarized accident descriptions are given in Section 8.2.2. It should be noted that, whilst the descriptions given are as close to the original statements as possible, some degree of clarification was necessary in some cases, due to inadequate descriptions. It is felt, however, that the small degree of inference required in these instances is justified by the increase in overall clarity of the descriptions. The figures in the end column are the number of such cases reported by the respondents.

Accident Description:

1	Turning right from major to minor road - other vehicle ran into side as crossing other carriageway	14
2	Ran into vehicle in front whilst queuing to enter junction	47
3	Leaving T-junction	3
4	Other vehicle cut across path as it turned right from major to minor road	1
5	Hit by other vehicle on junction whilst turning left at 'Give Way' at junction	21
6	Braked hard to avoid obstruction - vehicle behind ran into rear	1
7	Hit obstruction on road	3
8	Whilst turning right at signalized T-junction was hit by vehicle coming from left	1
9	Cut up by other vehicle	4
10	Hit animal that ran out in front of vehicle	2
11	Hit other vehicle crossing path after it jumped red light	5

(cont. over)

12	Ran into rear of vehicle in front whilst queuing to turn off from major road to minor	8
13	Turning right from major road to minor when hit by vehicle overtaking	4
14	Turning right at 'Give Way' line - hit by vehicle coming from right	23
15	Turning at 'Give Way' line (direction of turn unspecified) - hit by other vehicle	33
16	Leaving roundabout	2
17	Hit by other vehicle straying from course whilst waiting at 'Give Way'	6
18	Hit by other vehicle cutting across path whilst both vehicle entering junction	4
19	Vehicle rolled over	3
20	Hit patch of ice and skidded - no other vehicle involved	1
21	Overtaking vehicle at junction when hit by other vehicle pulling out of minor road	2
22	Hit by vehicle from behind as moving over to outside lane	2
23	Other vehicle pulled out of minor road directly into path	39
24	Collided with other vehicle pulling out of minor road whilst in process of turning from major road to same minor road	1
25	Hit by other vehicle crossing path after traffic lights failed	1
26	Hit by vehicle turning into same side road waiting at 'Give Way' line to pull out of	2
27	Ran into rear of vehicle in front on main road	15
28	Ran into rear of vehicle in front on junction	2
29	Reversed into other vehicle as pulling out of parking space	2
30	Other vehicle cut across path as turning right to leave major road	7

(cont. over)

31	Hit other vehicle whilst negotiating sharp bend	2
32	Hit by other vehicle straying onto wrong carriageway	9
33	Other vehicle ran into rear on main road	21
34	Other vehicle ran into rear whilst waiting at 'Give Way'	30
35	Turning from major road into minor - hit vehicle coming along minor road in opposite direction	1
36	Hit parked vehicle whilst turning right at junction	2
37	Skidded	12
38	Head-on collision	7
39	Trailer jack-knifed	1
40	Ran into side of other vehicle performing U-turn in path	3
41	Strayed onto other carriageway and hit other vehicle	1
42	Cut-up by other vehicle as leaving roundabout	2
43	Hit road sign (no other vehicle involved)	1
44	Pulled into path of other vehicle as changing lanes in queue of traffic	1
45	Fell asleep and hit road furniture (no other vehicle involved)	1
46	Took corner too quickly and hit side of road (wall/verge etc.)	1
47	Hit side of road (wall/verge etc)	4
48	Hit by vehicle from behind attempting to overtake whilst both entering junction	1
49	Hit pedestrian	2
50	Hit by other vehicle which skidded on path of ice	1
51	Hit by other vehicle reversing out of parking space	1

(cont. over)

52	Ran into parked vehicle	4
53	Hit by vehicle behind as queuing to turn into minor road from major road	1
54	Pulled out of parking space and hit by other vehicle	1
55	Collided with other vehicle as both competing for same parking space	1
56	Hit by vehicle coming in opposite direction and overtaking third vehicle	1
57	Hit by other vehicle as its' driver attempted to overtake	1
58	Ran into stationary vehicle on junction as pulling out from minor road	1
59	Hit by other vehicle on junction	1
60	Other vehicle hit side after driver had aborted attempts to turn	1
61	Drove straight through red light and into side of other vehicle	1
62	Hit vehicle coming in opposite direction as nosing way through traffic queue slowly approaching junction	1
63	Details not specified	6

AA.2: FULL DETAILS OF ACCIDENT LOCATIONS

Table AA.1 (below and over) presents the complete details of accident locations as reported by respondents for each of the major accident categories summarized in Section 8.2.3.

Table AA.1: Full Details of Accident Locations for each Major Accident Classification

	Accident Type:				
Location:	Left-turn Accident	Rear-end Accident	Cross-Traffic Accident	Other Accident Category	TOTAL
Not at or near junction	0 (0)	15 (20.8)	5 (35.7)	61 (27.9)	82 (21.4)
Roundabout	14 (17.9)	31 (43.1)	0 (0)	34 (15.5)	79 (20.6)
T-junction	47 (60.3)	20 (27.8)	5 (35.7)	63 (28.8)	134 (35.0)
Crossroads	13 (16.7)	2 (2.8)	1 (7.1)	27 (12.3)	43 (11.2)
Motorway slip-road	0 (0)	0 (0)	0 (0)	5 (2.3)	5 (1.3)
Mini-roundabout	2 (2.6)	2 (2.8)	0 (0)	2 (0.9)	6 (1.6)
Zebra-crossing	0 (0)	1 (1.4)	0 (0)	3 (1.4)	4 (1.0)
Other slip road	0 (0)	1 (1.4)	1 (7.1)	0 (0)	2 (0.5)
Dual-carriageway centre section	0 (0)	0 (0)	1 (7.1)	0 (0)	1 (0.3)
Staggered cross-roads	0 (0)	0 (0)	1 (7.1)	0 (0)	1 (0.3)
Double mini-roundabout	1 (1.3)	0 (0)	0 (0)	1 (0.5)	2 (0.5)
Private drive	0 (0)	0 (0)	0 (0)	1 (0.5)	1 (0.3)

(cont. over)

Table AA.1: Full Details of Accident Locations for each Major Accident Classification (cont.)

Location:	Accident Type: Left-turn Accident	Rear-end Accident	Cross-Traffic Accident	Other Accident Category	TOTAL
Traffic lights	0 (0)	0 (0)	0 (0)	7 (3.2)	7 (1.8)
Sharp bend	0 (0)	0 (0)	0 (0)	6 (2.7)	6 (1.6)
Roadworks	0 (0)	0 (0)	0 (0)	1 (0.5)	1 (0.3)
Motorway central reservation	0 (0)	0 (0)	0 (0)	1 (0.5)	1 (0.3)
Car park	0 (0)	0 (0)	0 (0)	3 (1.4)	3 (0.8)
Country track	0 (0)	0 (0)	0 (0)	1 (0.5)	1 (0.3)
Unknown	1 (1.3)	0 (0)	0 (0)	3 (1.4)	4 (1.0)
TOTAL	78	72	14	219	383

AA.3: DETAILS OF OTHER ROAD USERS INVOLVED IN ACCIDENTS

Table AA.2 (below) shows the number and proportion of other road users involved in the described accidents. In the case of cars, several of the accidents were reported as involving more than one other vehicle, and Table AA.2 also lists the number of accidents involving multiple numbers of other cars.

Table AA.2: Road Users Also Involved in Accidents with Respondent's Vehicle

Road User Class:	Number involved	Number of Reported Accidents	Percentage of Total
Car	1	238	62.1
	2	22	5.7
	3	6	1.6
	4	1	0.3
	Ttl cars	267	69.7
Motorcycle	1	23	6.0
Light goods vehicle	1	28	7.3
Heavy goods vehicle	1	23	6.0
Bus/coach	1	7	1.8
Bicycle	1	12	3.1
Horse	1	1	0.3
Pedestrian	1	1	0.3
TOTAL		383	100.0

AA.4: ACCIDENT AVOIDANCE TECHNIQUES ADOPTED BY RESPONDENTS

Listed below are the procedures adopted by respondents in attempts to avoid a collision. Once again, the items are presented in a form as close to the original statement as possible. Edited details are presented in Section 8.2.4. The figures in the final column refer to the number of examples of each avoidance procedure cited by respondents.

1	Turning further right	1
2	Stopping	26
3	Braking	135
4	Swerving	72
5	Applying hand brake	2
6	Accelerating	7
7	Changing down through gears	2
8	Turning into skid	5
9	Unable to remember	1
10	Moving forward	2
11	Taking foot off accelerator	1

AA.5: SUGGESTED REASONS FOR ADOPTION OF ACCIDENT AVOIDANCE TECHNIQUES

This section lists the reasons for the adoption of the particular accident avoidance techniques reported by respondents.

1	To give other vehicle room	5
2	Had Anti-Lock Braking system	1
3	Was the correct procedure	8
4	The only thing possible to do	56
5	Automatic reaction	20
6	Panic	2
7	To avoid a collision	23

(cont. over)

8	Because of other vehicle's expected movements	1
9	Result of training	2
10	Limited space in which to manoeuvre	4
11	Instinct	23
12	No time to do anything else	11
13	Did not see anything	1
14	To avoid hitting other vehicles	8
15	Emergency situation	1
16	To avoid injuring person	5
17	To slow down	2
18	To stop	4
19	Nowhere else to go	4
20	Obvious thing to do	4
21	Was travelling slowly	2
22	Had no control	1
23	Because other vehicle was not going to stop	2
24	Had seen other vehicle	2
25	Unable to swerve (due to on-coming traffic/ parked cars)	6
26	Passenger told driver to do so	1
27	To straighten vehicle	1
28	Anything else would have made situation worse	1
29	To avoid hitting side of road	1
30	Unable to think of any others	1
31	Did not know what else to do	1
32	Saw other driver's brake lights	1
33	Inexperience	1
34	To save own life	1

(cont. over)

35	Previous experience	1
36	To minimise impact	1
37	Other driver was travelling too quickly	1
38	Details not specified (despite indicating that another factor was implicated)	13

AA.6: ACCIDENT PREVENTION TECHNIQUES SUGGESTED BY RESPONDENTS

The first part of this section lists the prevention methods suggested by the respondent they believed they should have adopted to avoid the collision. Also included are the prevention techniques these respondents felt another driver, or someone else involved in the incident, should have adopted. The figures in the two columns indicate the number of respondents who suggested each prevention method for, respectively, themselves and the other entity involved. The categories are, once again, as close to the originals as possible and the information is summarized in Section 8.2.5.

		Self	Other
1	Not pulled out onto junction	4	8
2	Driven below speed limit	0	3
3	Checked intentions of other driver more thoroughly	1	2
4	Been more decisive	0	6
5	Parking should be altered at junction	0	5
6	Not miscalculated movements of other vehicle	1	3
7	Stopped at 'Give Way' line	4	7
8	Driven less quickly	20	49
9	Maintained vehicle with more care	0	1
10	Debris from road should have been cleared up	0	2
11	Stopped	4	4
12	Been more attentive	16	18
13	Not cut across path of vehicle	0	3

(cont. over)

		Self	Other
14	Signalled intentions more clearly	0	7
15	Attended to traffic signals/signposts	1	5
16	Concentrated	5	4
17	Allowed other vehicle more space	2	2
18	Junction should have turning lane	0	1
19	Waited	11	9
20	Parked vehicle obscuring visibility should have been left elsewhere	0	8
21	Should have paused to make decision	0	1
22	Priorities at junction should be changed	0	1
23	Not been over alcohol limit	2	2
24	Been more cautious	2	8
25	Had headlights switched on	1	3
26	Should not have braked when did	0	2
27	Concentrated more upon vehicle immediately in front	14	5
28	Pulled out onto junction	3	6
29	Visibility improved at junction	0	3
30	Should not have been talking to passenger	1	1
31	Passenger should have warned of danger	1	2
32	Checked situation more thoroughly	22	31
33	Non-slip road surface should be introduced	0	1
34	Not assumed other driver's movements	3	1
35	Ignored loose animal that cause pile-up and concentrated on road	1	0
36	Owner kept dog on leash	0	1
37	Driven more quickly	0	1

(cont. over)

		Self	Other
38	Become more familiar with vehicle	0	1
39	Checked that other vehicle had stopped	2	0
40	Realised visibility was impaired	2	0
41	Visibility at junction should be improved	0	3
42	Followed vehicle in front less closely	5	6
43	Repaired brakes	0	1
44	Better lighting introduced to area	0	2
45	Been more patient	0	1
46	Not been distracted	1	0
47	Speed humps should be introduced	0	2
48	Not stopped	1	4
49	Not left vehicle in gear	0	2
50	Worn appropriate footwear	0	1
51	Wait until eyes had dark-adapted	1	0
52	Concentrated on road ahead	1	0
53	Not heeded bad advice in magazine	0	1
54	Other driver should have made self more visible	0	2
55	Mounted pavement to avoid parked cars	1	0
56	Waited until road was clear	2	2
57	Other driver should have braked	0	3
58	Used hand brake	1	0
59	Anticipated events more accurately	2	3
60	Not been distracted by passenger	1	1
61	Been more restrained	1	0
62	Not overtaken whilst passing junction	0	2
63	Used dipped headlights	0	1

(cont. over)

		Self	Other
64	Not overtaken on bend	1	3
65	Reacted more quickly	2	0
66	Pulled out onto junction more slowly	1	0
67	Adopted alternative route	3	1
68	Taken more care when changing gears	0	1
69	'Stop' sign moved further away from junction	0	1
70	Improved ventilation in car	1	0
71	Had music on in car	1	0
72	Adopted correct position at junction	3	4
73	Driven according to road conditions	2	1
74	Run animal over	1	0
75	Not allowed self to be distracted by separate accident	1	0
76	Gained more practice of skid-avoidance techniques	2	0
77	Irrelevant response	0	1
78	Refused to drive unsafe vehicle	1	0
79	Ignored other driver's signal to proceed	1	1
80	Swerved	1	1
81	Braked sooner	3	3
82	Used a pedestrian crossing	0	1
83	Signposting been improved	0	4
84	Not cut across bend quite as sharply	0	1
85	Junction layout altered	0	4
86	Not over-reacted	3	0
87	Pulled over to side of road	0	1
88	Not changed lanes	0	1

(cont. over)

		Self	Other
89	Made sure could see through windscreen	2	0
90	Installed servo-assisted brakes	0	1
91	Braked rather than swerved	1	1
92	Roads gritted	0	1
93	Fitted high-intensity brakes lights to rear of vehicle	1	1
94	Maintained correct course for vehicle	1	3
95	Driver physically unfit to drive	0	4
96	Nothing	219	115
97	Details not specified	16	16

AA.7: ADDITIONAL ACCIDENT CONTRIBUTORY FACTORS SUGGESTED BY RESPONDENTS

In addition to rating the extent to which each of twelve factors contributed to the described accident, respondents were also asked to suggest one other factor that they felt contributed to the accident. The following list shows the 38 suggested additional contributory factors, along with the frequency with which each was cited.

1	Poor maintenance	1
2	Foreign driver	1
3	Poor condition of tyres	1
4	Excess alcohol	6
5	Type/design of junction	2
6	Contents of vehicle incorrectly loaded	1
7	Signposts obscured visibility	1
8	Sun blinding	2
9	Other driver speeding	5
10	Other driver's lack of attention	2
11	Inexperience	1

(cont. over)

12	Poor lighting	1
13	Inappropriate footwear	1
14	Poor parking	2
15	Dangerous bend in road	1
16	Newly-qualified driver's lack of experience	2
17	Other driver's impatience	1
18	Other driver's lack of concentration	3
19	Agitation	1
20	Inadequate signposting	3
21	Other driver being distracted	1
22	Other driver's poor skill	1
23	Morning sickness	1
24	Other driver's carelessness	1
25	Low blood sugar (diabetic) - led to driver misjudging junction	1
26	Hot weather	1
27	Bad luck	1
28	Other driver's assumption of own vehicle's movements	1
29	Other driver's poor headlights	1
30	Other driver's poor judgement	1
31	Family problems	1
32	Other driver in a hurry	1
33	Poor road markings	1
34	Concerned that was holding up other vehicles	1
35	Poor road surface	1
36	Other driver's unfamiliarity with new vehicle	1
37	Other driver's lack of experience	1
38	Details not specified	2

APPENDIX BB:

Tests of Reliability for Assessments of Accident Culpability

TESTS OF RELIABILITY FOR ASSESSMENTS OF ACCIDENT CULPABILITY

The following section describes the reliability tests performed on the ratings of three independent assessors of accident culpability from the accident descriptions provided by respondents. Table BB.1 (below and over) lists the values attributed by each rater (including three separate ratings by Rater 1) to each accident category. Culpability was coded as follows:

1 Respondent mainly or totally culpable;

2 Other driver/person/animal etc. culpable;

3 Roughly equal culpability between respondent and other;

4 Insufficient information available to form opinion.

Table BB.1: Culpability Ratings for each Rater

Accident Category:	Rater 1 (1st)	Rater 2	Rater 3	Rater 1 (2nd)	Rater 1 (3rd)
1	1	1	1	1	1
2	1	1	2	1	1
3	4	4	1	4	4
4	2	2	2	2	2
5	1	1	1	1	1
6	2	3	1	2	2
7	4	4	1	4	4
8	1	2	1	1	1
9	2	2	2	2	2
10	2	4	2	2	2
11	2	2	2	2	2
12	1	1	1	1	1
13	3	2	2	2	2
14	1	1	1	1	1

(cont. over)

Table BB.1: Culpability Ratings for each Rater (cont.)

Accident Category:	Rater 1 (1st)	Rater 2	Rater 3	Rater 1 (2nd)	Rater 1 (3rd)
15	1	1	1	1	1
16	4	4	4	4	4
17	2	2	2	2	2
18	2	2	2	2	2
19	4	1	4	1	1
20	1	4	1	1	1
21	3	1	3	3	3
22	1	1	3	1	1
23	2	2	2	2	2
24	2	3	3	2	2
25	4	1	3	4	4
26	2	2	2	2	2
27	1	1	1	1	1
28	1	1	1	1	1
29	1	1	1	1	1
30	2	2	2	2	2
31	1	1	1	4	4
32	2	2	2	2	2
33	2	2	2	2	2
34	2	2	2	2	2
35	3	1	1	1	1
36	1	1	1	1	1
37	1	1	4	1	1
38	4	4	4	4	4

(cont. over)

Table BB.1: Culpability Ratings for each Rater (cont.)

Accident Category:	Rater 1 (1st)	Rater 2	Rater 3	Rater 1 (2nd)	Rater 1 (3rd)
39	4	4	4	4	4
40	3	3	2	1	1
41	1	1	1	1	1
42	2	3	2	2	2
43	1	1	1	1	1
44	1	1	1	1	1
45	1	1	1	1	1
46	1	1	1	1	1
47	1	1	1	1	1
48	2	2	2	2	2
49	4	1	1	4	4
50	2	4	2	2	2
51	2	2	2	2	2
52	1	1	1	1	1
53	2	2	2	2	2
54	1	3	2	1	1
55	1	1	1	1	1
56	3	3	3	3	3
57	2	2	2	2	2
58	1	1	1	1	1
59	4	4	2	4	4
60	4	4	2	4	4
61	1	1	1	1	1
62	1	1	1	1	1

The ratings were then analysed using Cohen's Kappa, previously described in Appendix G. Table BB.2 (below) shows the values of Kappa obtained for all combinations of two raters. It may be remembered that a Kappa value of 0.00 indicates perfect disagreement between the two raters, a value of 1.00 indicating perfect agreement. As previously, a value of 0.8 was deemed to be sufficient for the purposes of this study.

Table BB.2: Values of Cohen's Kappa for Raters of Accident Culpability

Rater:	Rater 1 (1st)				
Rater 1 (1st)	1.00	Rater 2			
Rater 2	0.66	1.00	Rater 3		
Rater 3	0.61	0.56	1.00	Rater 1 (2nd)	
Rater 1 (2nd)	0.88	0.63	0.62	1.00	Rater 1 (3rd)
Rater 1 (3rd)	0.88	0.63	0.62	1.00	1.00

APPENDIX CC:

Principal Components Analyses & Reliability Measures for 5 Groups of Questionnaire Variables

PRINCIPAL COMPONENTS ANALYSES & RELIABILITY MEASURES FOR FIVE DIFFERENT SETS OF QUESTIONNAIRE VARIABLES

CC.0: Overview

The five sections contained within this appendix all follow an identical format. The items contained in each of five main sections of the questionnaire (excluding those dealing with descriptive and accident details) were subjected to a principal components analysis, and each section begins with a description of the relevant PCA. In order to assess the reliability of each scale constructed from the high loading variables, a Cronbach's Alpha reliability coefficient was calculated. The details of the reliability analysis directly follows the PCA in each section. The analyses described in this appendix are briefly summarized in Section 8.3. However, before any description of a PCA, it is felt that a brief introduction to the main points of principal components analysis is warranted.

CC.1: Background to Principal Components Analysis

Principal components analysis is a statistical technique in which a number of distinct variables may be combined to produce a smaller number of main components that are reasonably independent of each other. The correlations between this larger set of variables may be able to reveal a great deal about:

"...hypothetical structures or processes that may have generated the combination of outcomes that were measured by the observed variables." (Tabachnick and Fidell, 1983, p. 372).

At this stage, the distinction between factor analysis (FA) and principal components analysis (PCA) should be made. The major difference between the two techniques concerns the structure of the correlation matrix, with PCA retaining unities along the main diagonal, whilst FA inserts communalities (ie. the squared multiple correlation coefficients between a variable and all other variables) into the main diagonal. If the goal of the analysis is to reduce the data by using the initial variables to construct factors, these being linear transformations of the original variables. For these reasons, PCA is the method that will be adopted in each of the analyses described in this chapter.

The first principal component produced by the solution is the linear combination of variables which is able to account for a higher proportion of the total variance than any other linear combination. The second component is that which is able to account for the largest proportion of the remaining variance, and so on for all subsequent factors. The solution produces as many factors as there are initial variables entered into the solution,

although many of those positioned lower in the hierarchy will be of limited use in the overall solution given their ability to account for small, and diminishing, amounts of variance. SPSS adopts the technique of only retaining factors that are able to account for more variance than a single variable, selected on the basis of having eigenvalues (the proportion of the total amount of variance accounted for by each factor - the variables in the solution contributing equal amount of variance) greater than unity.

The independent (or orthogonal) factors produced by a PCA need not necessarily be meaningful and a technique known as rotation may be adopted to increase the interpretability of those factors. This involves 'rotating' the factors through multi-dimensional space (the number of dimensions dictated by the number of factors), maximising the factor loadings (the amount of 'weight' assigned to each factor) of high contributing variables, and minimising the loadings of low contributing variables. The most common form of rotation, and the one that will be employed in these analyses, is 'varimax' rotation, which is generally the preferred form as it retains the orthogonality of the factors.

Interpretation of the factors is generally aided by only considering a subset of the variables contributing to that factor, rejecting those variables with lower factor loading scores. The criterion level that should be adopted for inclusion of variables in a factor is open to debate, although it should be clear that adoption of a higher criteria will mean that the higher scoring variables will be more of a pure measure of the factor. Tabachnick and Fidell (op. cit.) suggest that the 9% variance overlap achieved with a loading of 0.3 or above is sufficient, although Comrey (1973) felt that this level was 'poor', describing a criterion of 0.45 (20% variance explained) as 'fair'. For the purposes of this study, this cut-off point of 0.45 will be adopted throughout.

CC.2: PCA and Cronbach's Alpha for Undesirable Driving Practice Items

CC.2.1: PCA for Section 3 Items

This section of Appendix CC contains the full details of the principal components analysis using the likelihood of undesirable driving practices resulting in an accident items from Section 3 of the questionnaire. Table CC.1 (over) gives the pre- and post-rotation statistics for the solution whilst Table CC.2 (over) shows the factor loading scores, communalities and measures of sampling adequacy for each variable. The main contributing variables, factor label and explanation for each metavariable then follows.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.874
Bartlett Test of Sphericity = 3566.094 (Sig. = 0.000)

Table CC.1: PCA Using Section 3 Factors: Initial & Final Statistics

Factor:	Initial Statistics		Final Statistics	
	Eigenvalue	% Variance	Eigenvalue	% Variance
1	5.441	30.2	2.763	15.3
2	1.693	9.4	2.475	13.8
3	1.208	6.7	2.261	12.6
4	1.075	6.0	1.918	10.7
TOTAL	9.417	52.3	9.417	52.4

Table CC.2: PCA Using Section 3 Factors: Factor Loading Scores After Rotation, Communalities & MSA Values

Variable:	MSA	Communality	Factor 1	Factor 2	Factor 3	Factor 4
Q28A	0.905	0.246	0.436	-0.083	0.122	0.184
Q28B	0.847	0.508	-0.030	-0.033	0.126	0.700 *
Q28C	0.899	0.482	0.562 *	-0.088	0.398	0.015
Q28D	0.891	0.512	0.382	0.045	0.534 *	0.281
Q28E	0.836	0.654	0.053	0.199	0.765 *	0.159
Q28F	0.892	0.351	0.034	0.467 *	0.132	0.338
Q28G	0.852	0.436	0.618 *	0.151	0.011	0.178
Q28H	0.884	0.543	0.135	0.559 *	0.095	0.451 *
Q28I	0.885	0.558	0.602 *	0.439	0.041	0.027
Q28J	0.868	0.581	0.674 *	0.295	0.172	-0.103
Q28K	0.849	0.583	0.683 *	0.340	-0.025	0.016
Q28L	0.852	0.535	0.273	0.158	0.093	0.654 *
Q28M	0.887	0.443	0.397	0.138	0.505 *	0.104
Q28N	0.913	0.473	0.344	0.432	0.408	0.038
Q28O	0.855	0.653	-0.041	0.257	0.748 *	0.160
Q28P	0.856	0.650	0.198	0.770 *	0.135	0.021
Q28Q	0.897	0.639	0.173	0.706 *	0.305	0.133
Q28R	0.857	0.571	0.054	0.285	0.200	0.668 *

Factor 1 - UDPFAC1

Variable:	Factor Loading:	Variable Description:
Q28K	0.683	'Poor use of lanes on approaching the junction'
Q28J	0.674	'Approaching the junction too quickly'
Q28G	0.618	'Lack of anticipation of other drivers' intentions'
Q28I	0.602	'Inconsideration to other drivers'
Q28C	0.562	'Close-following a vehicle whilst approaching the junction'

Factor label: 'Carelessness/Egocentricity on approaching junction'

This first factor appears to have two elements, grouping poor junction approaching styles with items relating to behaviour towards other drivers. A high score on this factor indicates a driver who feels that poor junction approach behaviours and an egocentric approach to driving at junctions are unlikely to result in an accident at a junction.

Factor 2 - UDPFAC2

Variable:	Factor Loading:	Variable Description:
Q28P	0.770	'Drivers straightlining roundabouts'
Q28Q	0.706	'Drivers cutting up others on the approach road'
Q28H	0.559	'Pedal-cyclists straight-lining roundabouts'
Q28F	0.467	'Motorcyclists going quickly through junctions'

Factor label: 'Careless junction negotiation'

This factor relates to actual junction negotiation, with two of the items referring to the practice of 'straightlining'. A high score on this factor indicates a driver who believes that careless junction negotiation behaviours are more unlikely to result in an accident.

Factor 3 - UDPFAC3

Variable:	Factor Loading:	Variable Description:
Q28E	0.765	'Overtaking whilst on junction'
Q28O	0.748	'Driving under the influence of alcohol'
Q28D	0.543	'Failure to observe the correct 'Give Way' procedure'
Q28M	0.505	'Drivers not concentrating on their driving'

Factor label: 'Reckless driving'

The variables with high loading scores on the third factor do not appear to have a central theme, other than all behaviours display a general recklessness. A high score indicates a belief that participation in any of these reckless driving practices will be unlikely to result in an accident.

Factor 4 - UDPFAC4

Variable:	Factor Loading:	Variable Description:
Q28B	0.700	'Mechanical failure of a vehicle'
Q28R	0.668	'Trees obscuring visibility'
Q28L	0.654	'Poor road design and signposting'
Q28H	0.451	'Pedal-cyclists straightlining roundabouts'

Factor label: 'External factors'

In contrast, this final factor has a very distinct central theme, that of events outside the control of the driver, with only the variable with the lowest loading score (Q28H - only having a marginal score) being an exception. A high score on this factor suggests a belief that such external or environmental factors are unlikely to result in a collision.

CC.2.2: Cronbach's Alpha for Section 3 Metavariables

Table CC.3 (over) summarises the reliability tests performed on the Section 3 metavariables.

Table CC.3: Cronbach's Alpha for Section 3 Metavariables

Factor Name:	N	Alpha	Variables	Scale Mean if Item Deleted	Alpha if Item Deleted
UDPFAC1:	725	0.741	Q28K	9.86	0.680
			Q28J	10.02	0.663
			Q28G	9.95	0.719
			Q28I	9.90	0.675
			Q29C	10.35	0.733
UDPFAC2:	720	0.702	Q28P	7.98	0.622
			Q28Q	8.27	0.609
			Q28H	7.58	0.634
			Q28F	7.75	0.689
UDPFAC3:	726	0.715	Q28E	5.89	0.607
			Q28O	6.06	0.627
			Q28D	5.77	0.660
			Q28M	5.66	0.706
UDPFAC4:	726	0.657	Q28B	9.85	0.653
			Q28R	11.27	0.521
			Q28L	11.34	0.561
			Q28H	11.80	0.610

CC.3: PCA and Cronbach's Alpha on Section 4 Items - Self Descriptors

CC.3.1: PCA on Section 4 Items

This section shows the tables (CC.4 and CC.5) containing the full details of the PCA performed on the self-descriptor variables contained in Section 4 of the questionnaire.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.906
Bartlett Test of Sphericity = 4712.423 (Sig. = 0.000)

Table CC.4: PCA Using Section 4 Items: Initial & Final Statistics

	Initial Statistics		Final Statistics	
Factor:	Eigenvalue	% Variance	Eigenvalue	% Variance
1	6.107	33.9	4.545	25.2
2	2.488	13.8	2.749	15.3
3	1.147	6.4	2.449	13.6
TOTAL	9.742	54.1	9.743	54.1

Table CC.5: PCA Using Section 4 Items: Factor Loading Scores After Rotation, Communalities & MSA Values

Variable:	MSA	Communality	Factor 1	Factor 2	Factor 3
AGGRESS	0.912	0.481	-0.656 *	-0.159	0.160
ANTIC	0.870	0.495	-0.070	0.664 *	0.222
ATTEN	0.877	0.612	0.143	0.753 *	0.157
CAREFUL	0.919	0.646	0.435	0.671 *	0.086
COURT	0.939	0.487	0.611 *	0.305	0.143
DECIS	0.846	0.610	0.007	0.229	0.747 *
EXPER	0.831	0.590	-0.003	0.268	0.720 *
INSIST	0.886	0.309	-0.511 *	0.023	0.219
IRRIT	0.892	0.562	-0.765 *	0.060	-0.220
LAX	0.901	0.393	-0.261	-0.345	-0.454 *
NERVOUS	0.782	0.669	-0.035	-0.034	-0.817 *
PATIENT	0.897	0.634	0.765 *	0.074	0.208
RECKLESS	0.930	0.506	-0.598 *	-0.386	0.023
RESPONSE	0.929	0.581	0.465 *	0.557 *	0.233
SAFE	0.927	0.518	0.450 *	0.518 *	0.217
SELFISH	0.940	0.569	-0.692 *	-0.285	-0.096
SLOW	0.921	0.472	0.541 *	0.277	-0.320
TOLERANT	0.927	0.606	0.744 *	0.182	0.137

Factor 1 - DESCFAC1

Variable:	Factor Loading:	Variable Description:
PATIENT	0.765	'Patient/Impatient'
TOLERANT	0.744	'Tolerant/Intolerant'
IRRIT	-0.714	'Irritable/Placid'
SELFISH	-0.692	'Selfish/Considerate'
AGGRESS	-0.656	'Aggressive/Defensive'
COURT	0.611	'Courteous/Impolite'
RECKLESS	-0.598	'Reckless/Cautious'
SLOW	0.541	'Slow/Fast'
INSIST	-0.511	'Insistent/Yielding'
RESPONSE	0.465	'Responsible/Irresponsible'
SAFE	0.450	'Safe/Risky'

Factor label: 'Self-Centred/Ill-mannered'

Eleven of the eighteen variables were found to load highly on the first factor. In all cases, the first-named variable was assigned the lower value, and therefore the theme of this factor is one of aggression, arrogance and egocentricity. A high score on this factor indicates a self-centred and aggressive driver.

Factor 2 - DESCFAC2

Variable:	Factor Loading:	Variable Description:
ATTEN	0.753	'Attentive/Inattentive'
CAREFUL	0.671	'Careful/Careless'
ANTIC	0.664	'Anticipating/Non-Anticipating'
RESPONSE	0.557	'Responsible/Irresponsible'
SAFE	0.518	'Safe/Risky'

Factor label: 'Negligence'

The second factor is concerned with negligence, reflected in inattentiveness, lack of anticipation and carelessness. A high score on this factor would be obtained by a highly negligent driver.

Factor 3 - DESCFAC3

Variable:	Factor Loading:	Variable Description:
NERVOUS	-0.817	'Nervous/Confident'
DECIS	0.747	'Decisive/Indecisive'
EXPER	0.720	'Experienced/Inexperienced'
LAX	-0.454	'Lax/Precise'

Factor label: 'Timidity'

The lack of confidence, indecision and lack of experience associated with this final factor suggest general timidity in driving style. Therefore, a high score points to a timid driver.

CC.3.2: Cronbach's Alpha for Section 4 Metavariables

In order to aid interpretability, and due to the direction of the original coding, the variables with negative factor loading scores retained their names, whilst those with positive scores were reflexed and re-named, adopting the adjective at the opposite pole of the original name. Table CC.6 (below) shows the values of Alpha for each of the three scales, in addition to the contribution of the individual variables to those scales.

Table CC.6: Cronbach's Alpha for Section 4 Metavariables

Factor Name:	N	Alpha	Variables	Scale Mean if Item Deleted	Alpha if Item Deleted
DESCFAC1:	703	0.869	AGGRESS	21.51	0.858
			IMPOLITE	21.91	0.856
			INSIST	21.19	0.873
			IRRIT	21.57	0.859
			IMPAT	21.69	0.851
			RECKLESS	22.13	0.856
			IRRESP	22.36	0.859
			RISKY	22.27	0.861
			INCONSID	21.97	0.851
			FAST	20.92	0.865
			INTOLNT	21.74	0.848
DESCFAC2:	715	0.776	NONANTIC	6.58	0.794
			INATTENT	6.66	0.726
			CARELESS	6.64	0.710
			IRRESP	6.77	0.716
			RISKY	6.68	0.728
DESCFAC3:	716	0.740	INDECIS	5.31	0.648
			INEXPER	5.42	0.661
			LAX	5.18	0.757
			NERVOUS	5.41	0.644

CC.4: PCA and Cronbach's Alpha for Section 5 Items - Opinion Statements

CC.4.1: PCA for Section 5 Items

As in the previous sections, the tables relating to the PCA analysis performed on the Section 5 opinion statements are given first (Tables CC.7 and CC.8), followed by the metavariable descriptions and contributing variables.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.708
Bartlett Test of Sphericity = 2107.579 (Sig. = 0.000)

Table CC.7: PCA Using Section 5 Items: Initial & Final Statistics

Factor:	Initial Statistics		Final Statistics	
	Eigenvalue	% Variance	Eigenvalue	% Variance
1	2.970	11.9	2.602	10.4
2	2.237	8.9	1.887	7.5
3	1.775	7.1	1.812	7.2
4	1.434	5.7	1.534	6.1
5	1.300	5.2	1.503	6.0
6	1.169	4.7	1.350	5.4
7	1.080	4.3	1.183	4.7
8	1.026	4.1	1.120	4.5
TOTAL	12.991	51.9	12.991	51.8

Table CC.8: PCA Using Section 5 Items: Factor Loading Scores After Rotation, Communalities & MSA Values

Variable:	MSA	Communality	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Q30A	0.594	0.681	0.074	0.806 *	-0.017	0.092	-0.077	0.002	0.019	0.106
Q30B	0.613	0.617	-0.282	0.118	0.281	-0.063	0.491*	-0.352	-0.198	0.191
Q30C	0.642	0.577	-0.036	-0.030	0.730 *	0.108	-0.006	0.040	0.047	0.161
Q30D	0.792	0.445	0.513 *	0.110	0.125	-0.026	0.180	-0.048	-0.016	-0.344
Q30E	0.724	0.363	-0.096	0.404	-0.159	-0.017	0.364	0.108	0.058	-0.134
Q30F	0.608	0.756	0.041	0.052	0.078	0.101	0.000	-0.100	0.851 *	-0.033
Q30G	0.604	0.654	-0.090	0.117	0.216	0.704 *	0.077	0.144	0.210	-0.135
Q30H	0.604	0.573	0.028	0.101	-0.090	0.710 *	0.134	0.136	-0.113	0.027
Q30I	0.609	0.646	-0.027	0.070	0.067	-0.008	-0.002	0.065	-0.015	0.795 *
Q30J	0.698	0.431	0.055	-0.127	-0.073	0.121	0.572 *	0.168	0.189	-0.024
Q30K	0.749	0.527	0.574 *	-0.129	-0.163	0.066	0.148	0.240	0.209	0.164
Q30L	0.792	0.303	0.440	0.064	0.245	-0.004	-0.160	-0.111	-0.064	0.049
Q30M	0.792	0.419	0.340	-0.134	0.111	0.398	-0.039	-0.265	0.111	0.175
Q30N	0.697	0.563	0.214	-0.168	0.571 *	-0.051	0.080	0.301	-0.197	-0.157
Q30O	0.696	0.450	0.255	0.146	0.076	-0.273	0.302	0.134	0.408	0.087
Q30P	0.760	0.421	-0.270	0.279	-0.075	0.136	0.384	0.309	-0.001	0.061
Q30Q	0.626	0.703	-0.020	0.832 *	-0.019	0.000	0.041	0.072	0.049	0.001
Q30R	0.796	0.422	0.394	-0.228	0.379	0.049	0.123	0.135	-0.032	-0.186
Q30S	0.637	0.541	-0.011	0.028	0.678 *	-0.018	0.109	-0.189	0.180	-0.015
Q30T	0.776	0.478	0.650 *	0.117	-0.049	0.011	-0.110	-0.104	0.078	-0.103
Q30U	0.748	0.448	0.214	0.019	0.153	0.111	0.598 *	-0.066	-0.059	-0.037
Q30V	0.835	0.457	0.602 *	-0.188	0.107	0.096	0.041	-0.060	-0.042	-0.177
Q30W	0.731	0.476	0.285	-0.180	-0.041	0.419	0.116	-0.405	-0.016	0.089
Q30X	0.755	0.427	0.580 *	0.020	-0.087	-0.043	0.131	0.032	0.062	0.242
Q30Y	0.634	0.612	-0.034	0.083	0.042	0.156	0.127	0.736 *	-0.061	0.131

Factor 1 - OPINFAC1

Variable:	Factor Loading:	Variable Description:
Q30T	0.650	'Find it difficult to judge speeds of vehicles on junction whilst approaching'
Q30V	0.602	'Too busy thinking about direction to attend to other vehicles'
Q30K	0.574	'Find some roundabouts confusing'
Q30X	0.580	'Find some T-junctions confusing'
Q30D	0.513	'Don't see motorcyclists until almost too late'

Factor label: 'Inattention to vehicles on junction/ junction layout confusing'

This first factor appears to have two major aspects, one concerned with paying adequate attention to other vehicles, the other concerned with confusing junction layouts. A low score on OPINFAC1 would be obtained by a driver who did not pay sufficient attention to other vehicles and found junction layouts confusing.

Factor 2 - OPINFAC2

Variable:	Factor Loading:	Variable Description:
Q30Q	0.832	'Make special point of looking out for cyclists'
Q30A	0.806	'Make special point of looking out for motorcyclists'

Factor label: 'Looking out for vulnerable road users'

This rather straightforward factor concerns paying special attention to so-called 'vulnerable' road users. A low OPINFAC2 score identifies a driver who claims to pay this special attention to cyclists and motorcyclists.

Factor 3 - OPINFAC3

Variable:	Factor Loading:	Variable Description:
Q30C	0.730	'Have to drive aggressively at junctions to get anywhere'
Q30S	0.678	'Important to assert right of way at junctions'
Q30N	0.571	'Less considerate to other road users if trying to get somewhere quickly'

Factor label: 'Assertiveness at junctions'

OPINFAC3 concerns assertiveness at junctions, and a low score on this factor would characterise a driver who believes that assertive driving at junctions is necessary.

Factor 4 - OPINFAC4

Variable:	Factor Loading:	Variable Description:
Q30H	0.710	'Important to fit in with other road users'
Q30G	0.704	'Feel obliged to drive in way that doesn't hold up others'

Factor label: 'Conformity to others' driving style'

This fourth factor concerns conformity of driving styles, and a low score would be associated with a driver who believes in conforming.

Factor 5 - OPINFAC5

Variable:	Factor Loading:	Variable Description:
Q30U	0.598	'Distrust drivers of some vehicles'
Q30J	0.572	'Safety consciousness is most important thing when driving at junctions'
Q30B	0.491	'Own driving superior to others'

Factor label: 'Others' driving inferior'

This factor is not as clear-cut as some of the previous ones in this section. Two of the items indicate a superior attitude to other drivers, although the analysis suggests that attention to safety is associated with this. A low OPINFAC5 score would be obtained by a driver who feels superior to other drivers and believes her/himself to be more safety-conscious at junctions.

Factor 6 - OPINFAC6

Variable:	Factor Loading:	Variable Description:
Q30Y	0.734	'Safer to allow for other drivers doing stupid things'

Factor label: 'Safer to allow for other drivers' errors'

A low score on this single-variable factor would be achieved by a driver who believes that it is safer to drive in a fashion that allows for others' stupidity.

Factor 7 - OPINFAC7

Variable:	Factor Loading:	Variable Description:
Q30F	0.851	'Safety mainly in hands of others'

Factor label: 'Safety mainly in hands of others'

Another single-variable factor, a low OPINFAC7 score highlights a driver who feels that their safety is mainly in the hands of other drivers.

Factor 8 - OPINFAC8

Variable:	Factor Loading:	Variable Description:
Q30I	0.795	'Motorcyclists treat junctions with more caution than others'

Factor label: 'Motorcyclists treat junctions with more caution than others'

A low factor score on OPINFAC8 would be obtained by a respondent who agrees that motorcyclists treat junctions with more caution than other road users.

CC.4.2: Assessment of Adequacy of Driver Opinion Scales

The reliability tests carried out on the eight metavariables derived from the PCA are then summarized in Table 8.9. Due to their only featuring a single variable that achieved a factor loading score greater than 0.45, the final three scales could not be subjected to analysis. In addition, the two-variable scales (OPINFAC2 and OPINFAC4) do not have figures in the final 'alpha if item deleted' column as these scales would be reduced to single-variable scales (and therefore be completely reliable) if either item was removed.

Table CC.9: Cronbach's Alpha for Section 5 Metavariables

Factor Name:	N	Alpha	Variables	Scale Mean if Item Deleted	Alpha if Item Deleted
OPINFAC1:	725	0.621	Q30D	14.15	0.582
			Q30K	14.70	0.570
			Q30T	13.91	0.565
			Q30V	13.56	0.570
			Q30X	13.98	0.550
OPINFAC2:	736	0.708	Q30A	1.74	-
			Q30Q	1.66	-
OPINFAC3:	730	0.488	Q30C	6.02	0.299
			Q30N	6.91	0.512
			Q30S	7.16	0.365
OPINFAC4:	735	0.500	Q30G	2.66	-
			Q30H	2.58	-
OPINFAC5:	727	0.308	Q30B	5.47	0.316
			Q30J	6.09	0.226
			Q30U	5.32	0.112

CC.5: PCA and Cronbach's Alpha on Section 6 Items - Reported Behaviour Questions

CC.5.1: PCA on Section 6 Items

The PCA was performed on the twelve reported behaviour items contained in section 6 of the questionnaire is described in Tables CC.10 and CC.11. Although the questions were split into two halves, half concerned with behaviours at 'Give Way' lines, the other half with behaviour upon approaching junctions, it was felt that it would be more appropriate to include all items in a single analysis rather than assuming the two groups of items are independent.

Kaiser-Meyer-Olkin measure of sampling adequacy = 0.762;
Bartlett Test of Sphericity = 988.938 (p.=0.000);

Table CC.10: PCA Using Section 6 Items: Initial & Final Statistics

Factor:	Initial Statistics		Final Statistics	
	Eigenvalue	% Variance	Eigenvalue	% Variance
1	2.710	22.6	2.313	19.3
2	1.528	12.7	1.706	14.2
3	1.170	9.7	1.390	11.6
TOTAL	5.408	45.0	5.409	45.1

Table CC.11: PCA Using Section 6 Items: Factor Loading Scores After Rotation, Communalities & MSA Values

Variable:	MSA	Communality	Factor 1	Factor 2	Factor 3
Q31A	0.642	0.527	0.056	0.712 *	-0.131
Q31B	0.709	0.173	-0.072	0.403	-0.076
Q31C	0.797	0.324	0.523 *	-0.223	-0.020
Q31D	0.737	0.430	-0.133	0.571 *	0.294
Q31E	0.763	0.434	-0.104	0.326	0.563 *
Q31F	0.825	0.464	0.633 *	-0.175	-0.182
Q31G	0.726	0.583	-0.095	-0.091	0.752 *
Q31H	0.702	0.537	-0.113	0.633 *	0.350
Q31I	0.752	0.547	0.702 *	0.167	-0.161
Q31J	0.805	0.445	0.536 *	-0.241	0.315
Q31K	0.785	0.448	0.557 *	0.150	-0.340
Q31L	0.782	0.496	0.699 *	-0.085	0.003

Factor 1 - REPOFAC1

Variable:	Factor Loading:	Variable Description:
Q31I	0.702	'Under-estimate speed of vehicle on junction'
Q31L	0.699	'Almost collide with vehicle in front having expected it to have moved'
Q31F	0.633	'Drive close to vehicle in front due to concentration on traffic on junction'
Q31K	0.557	'Vehicle behind pressurises into entering junction'
Q31J	0.536	'Focus upon vehicles nearer junction rather than one immediately in front'
Q31C	0.523	'Longer wait at 'Give Way', more likely to take risk'

Factor label: 'Not attending to vehicle in front/ Impatience'

This factor appears to consist of two elements - one concerned with drivers not concentrating on the vehicle immediately in front due to other factors, the other concerned with inappropriate behaviours due to pressure of time constraints. A low score on this factor would be obtained by a driver who is relatively poor at attending to the vehicle in front and are prone to impatience when faced with time pressures.

Factor 2 - REPOFAC2

Variable:	Factor Loading:	Variable Description:
Q31A	0.712	'Stop at 'Give Way' even when not necessary'
Q31H	0.633	'Brake early'
Q31D	0.571	'Rarely approach junctions too quickly'

Factor label: 'Caution when approaching junction'

This factor is far more straightforward, a low score on this factor indicates a driver who approaches junctions with caution.

Factor 3 - REPOFAC3

Variable:	Factor Loading:	Variable Description:
Q31G	0.752	'Rarely confused by right of way at junctions'
Q31E	0.563	'More cautious about pulling out if visibility obscured'

Factor label: 'Confidence/Caution when pulling out at 'Give Way' line'

The final factor in this section deals with behaviours performed whilst pulling out at the 'Give Way' line. A low score suggests someone who is more confident and cautious about entering junctions.

CC.5.2: Cronbach's Alpha on Section 6 Items

Table CC.12 (below) details the reliability tests for the metavariables derived from the reported behaviour items, including the alpha coefficients for each scale and the altered value upon removal of each variable in turn.

Table CC.12: Cronbach's Alpha for Section 6 Scales

Factor Name:	N	Alpha	Variables	Scale Mean if Item Deleted	Alpha if Item Deleted
REPOFAC1:	732	0.671	Q31C	18.19	0.646
			Q31F	17.75	0.612
			Q31I	17.88	0.608
			Q31J	18.24	0.667
			Q31K	17.95	0.637
			Q31L	17.79	0.608
REPOFAC2:	732	0.486	Q31A	4.35	0.529
			Q31D	4.71	0.346
			Q31H	4.97	0.314
REPOFAC3:	735	0.267	Q31E	2.16	-
			Q31G	1.48	-

CC.6: PCA and Cronbach's Alpha on Section 7 Items - Increased Accident Likelihood

CC.6.1: PCA on Section 7 Items

Tables CC.13 and CC.14 outline the principal components analysis performed on the variables contained within Section 7 of the questionnaire. The metavariables are then named and explained.

Kaiser-Meyer-Olkin measure of sampling adequacy = 0.826;
Bartlett Test of Sphericity = 1497.724 (p.=0.000);

Table CC.13: PCA Using Section 7 Items: Initial & Final Statistics

Factor:	Initial Statistics		Final Statistics	
	Eigenvalue	% Variance	Eigenvalue	% Variance
1	3.344	37.2	2.508	27.9
2	1.289	14.3	2.125	23.6
TOTAL	4.633	51.5	4.633	51.5

Table CC.14: PCA Using Section 7 Items: Factor Loading Scores After Rotation, Communalities & MSA Values

Variable:	MSA	Communalities	Factor 1	Factor 2
WEATHPR	0.806	0.539	0.730 *	0.080
DENSE	0.909	0.342	0.516 *	0.274
OTHINGS	0.772	0.704	0.103	0.833 *
VISOBSC	0.878	0.484	0.636 *	0.282
POORCOND	0.793	0.628	0.781 *	0.132
TIRED	0.849	0.587	0.213	0.736 *
MISTAKE	0.822	0.234	0.484 *	0.005
LAYOUT	0.857	0.435	0.614 *	0.241
HURRY	0.791	0.681	0.165	0.808 *

Factor 1 - INCPFAC1

Variable:	Factor Loading:	Variable Description:
POORCOND	0.781	'Poor road conditions'
WEATHPR	0.730	'Poor weather conditions'
VISOBSC	0.636	'Visibility obscured'
LAYOUT	0.614	'Poor junction layout'
DENSE	0.516	'Dense traffic'
MISTAKE	0.484	'Mistake by other road user'

Factor label: 'Environmental factor'

The theme behind this factor is very clear, being concerned with environmental matters, in principal beyond the control of the driver. A low score on this factor would be obtained by a driver who believed that their chances of being involved in an accident is more likely to be increased by these environmental elements.

Factor 2 - INCPFAC2

Variable:	Factor Loading:	Variable Description:
OTHINGS	0.833	'Have other things on mind'
HURRY	0.808	'In a hurry'
TIRED	0.736	'Tired'

Factor label: 'Driver factor'

This factor also has a clear theme, the items all being things over which the driver, ultimately, has control. A low score on this factor indicates a person who believes that their chances of being involved in an accident is more likely to be governed by internal aspects of their driving.

CC.6.2: Assessment of Adequacy of Increased Likelihood of an Accident Scales

Table CC.15 (over) shows the reliability coefficient obtained by the two scales derived from the PCA described above.

Table CC.15: Cronbach's Alpha for Section 7 Items

Factor Name:	N	Alpha	Variables	Scale Mean if Item Deleted	Alpha if Item Deleted
INCPFAC1:	724	0.733	WEATHPR	11.83	0.681
			DENSE	11.49	0.715
			VISOBSC	12.18	0.682
			POORCOND	11.80	0.654
			MISTAKE	12.16	0.739
			LAYOUT	11.93	0.691
INCPFAC2:	731	0.744	OTHINGS	5.12	0.620
			TIRED	5.52	0.707
			HURRY	5.05	0.640

APPENDIX DD:

Complete Details of all Multivariate Analyses Summarized in Sections 8.4 to 8.9

COMPLETE DETAILS OF ANALYSES SUMMARIZED IN SECTIONS 8.4 to 8.7

The sections in this appendix present the full statistics from the analyses summarized in Sections 8.4 to 8.7.

DD.1: Multiple Regression Predicting Accident Liability

Tables DD.1 to DD.3 describe the analysis performed to predict involvement in all forms of accidents. The analysis is described in further detail in Section 8.4.1 which also contains a summary of the main points from the analysis.

Table DD.1: Multiple Regression Predicting Accident Liability: Correlation Matrix

	ACCS	AGE	SEX	DRWORK	TESTAGE	LESSONS	DRSCHOOL	FRIEND	ADTRAIN	VEHICLE	VEHBEL
ACCS	1.000										
AGE	0.169	1.000									
SEX	0.252	0.129	1.000								
DRWORK	0.212	0.056	0.323	1.000							
TESTAGE	-0.069	0.428	-0.189	-0.153	1.000						
LESSONS	-0.043	-0.330	-0.303	-0.144	0.110	1.000					
DRSCHOOL	-0.026	-0.253	-0.054	-0.077	0.064	0.422	1.000				
FRIEND	-0.051	0.162	0.049	0.017	-0.028	-0.448	-0.482	1.000			
ADTRAIN	0.054	0.036	0.105	0.150	-0.026	-0.109	-0.033	-0.005	1.000		
VEHICLE	-0.061	-0.023	-0.198	-0.239	0.041	0.114	0.042	0.020	-0.113	1.000	
VEHBEL	-0.227	-0.083	-0.239	-0.382	0.111	0.127	0.049	0.020	-0.049	0.328	1.000
MILES	0.220	0.039	0.317	0.440	-0.131	-0.165	-0.055	-0.046	0.190	-0.323	-0.406
YEARSDR	0.216	0.890	0.245	0.143	0.005	-0.423	-0.301	0.199	0.067	-0.043	-0.127
TESTTIM	-0.011	-0.080	-0.090	-0.099	0.110	0.379	0.066	-0.041	-0.034	0.009	0.058
PACC	-0.174	-0.005	-0.007	-0.100	0.060	-0.037	0.033	-0.052	-0.022	0.021	0.053
MOTORCYC	0.089	0.188	0.281	0.118	-0.075	-0.233	-0.080	0.033	0.089	-0.144	-0.097
HGV	0.032	0.116	0.184	0.176	-0.059	-0.059	0.000	-0.082	0.163	-0.312	-0.214
PSV	0.040	0.062	0.065	0.152	-0.004	-0.087	0.007	0.042	0.168	-0.068	0.003
UNFAMIL	-0.006	-0.187	0.061	0.131	-0.070	0.054	0.051	-0.107	0.063	-0.087	-0.168
MOTORWAY	0.107	0.034	0.208	0.206	-0.055	-0.051	-0.061	-0.019	0.026	-0.057	-0.230
RURAL	-0.046	0.099	-0.058	-0.030	-0.018	-0.060	-0.020	0.050	0.012	-0.009	0.060
URBAN	-0.046	-0.137	-0.111	-0.140	0.062	0.111	0.097	-0.043	-0.037	0.056	0.157
UDPFAC1	-0.012	-0.162	-0.011	-0.116	-0.109	0.051	0.004	-0.074	-0.025	0.068	0.065
UDPFAC2	0.054	0.011	0.076	-0.063	-0.033	-0.053	-0.063	-0.011	0.093	0.003	0.032
UDPFAC3	0.095	0.008	0.118	0.057	-0.040	-0.030	-0.050	0.031	0.034	0.016	-0.042
UDPFAC4	0.059	0.083	0.177	0.035	-0.054	-0.137	-0.074	-0.013	0.021	0.020	-0.044
DESCFAC1	0.167	-0.286	0.123	0.105	-0.207	0.034	0.012	-0.003	-0.078	0.029	-0.064
DESCFAC2	0.080	-0.257	0.019	0.021	-0.215	0.049	0.023	0.023	-0.142	-0.036	-0.055
DESCFAC3	-0.115	-0.210	-0.285	-0.179	0.043	0.207	0.072	-0.058	-0.093	0.061	0.092
OPINFAC1	0.054	0.002	0.181	0.071	-0.118	-0.148	-0.041	0.065	0.114	-0.030	-0.063
OPINFAC2	0.077	-0.029	-0.010	-0.033	-0.055	0.029	0.025	0.003	-0.108	0.063	-0.052
REPOFAC1	-0.033	0.123	0.021	-0.009	-0.001	-0.124	-0.095	0.095	0.134	0.079	0.005
INCPFAC1	0.017	-0.027	0.015	-0.016	-0.030	-0.071	-0.002	-0.001	0.008	-0.042	-0.062
INCPFAC2	-0.005	0.054	-0.043	-0.030	-0.019	-0.123	-0.089	0.078	-0.009	0.049	-0.036

Table DD.1: Multiple Regression Predicting Accident Liability: Correlation Matrix (cont.)

	MILES	YEARSDR	TESTTIM	PACC	MOTORCYC	HGV	PSV	UNFAMIL	MOTORWAY	RURAL	URBAN
MILES	1.000										
YEARSDR	0.102	1.000									
TESTTIM	0.009	-0.146	1.000								
PACC	-0.071	-0.037	0.001	1.000							
MOTORCYC	0.105	0.274	-0.136	0.033	1.000						
HGV	0.365	0.155	-0.054	-0.026	0.116	1.000					
PSV	0.167	0.062	-0.048	0.001	0.131	0.095	1.000				
UNFAMIL	0.233	-0.155	-0.039	0.013	0.027	0.132	-0.033	1.000			
MOTORWAY	0.302	0.066	-0.049	-0.057	0.117	0.205	0.002	0.254	1.000		
RURAL	-0.082	0.119	0.056	0.060	0.027	-0.026	-0.024	-0.042	-0.415	1.000	
URBAN	-0.176	-0.171	-0.034	-0.033	-0.131	-0.142	0.024	-0.167	-0.448	-0.597	1.000
UDPFAC1	-0.054	-0.146	0.029	-0.059	-0.068	-0.023	-0.064	-0.059	0.026	0.043	-0.047
UDPFAC2	-0.005	-0.001	-0.049	-0.033	0.082	0.004	-0.001	-0.026	0.022	0.015	-0.027
UDPFAC3	0.052	0.012	0.005	-0.062	-0.063	-0.013	-0.011	-0.007	0.083	-0.001	-0.055
UDPFAC4	0.085	0.100	-0.128	0.082	0.085	0.002	0.044	0.006	-0.003	0.012	-0.004
DESCFAC1	0.025	-0.211	0.069	-0.150	-0.017	-0.040	-0.108	-0.038	0.088	-0.123	0.039
DESCFAC2	-0.055	-0.180	0.091	-0.148	-0.074	-0.041	-0.088	-0.019	0.042	-0.074	0.027
DESCFAC3	-0.199	-0.260	0.117	-0.098	-0.159	-0.115	-0.091	0.034	-0.048	0.008	0.021
OPINFAC1	0.127	0.061	-0.112	0.092	0.144	0.024	0.065	-0.054	-0.002	0.089	-0.067
OPINFAC2	0.001	-0.027	0.025	-0.103	-0.166	-0.093	-0.031	-0.132	-0.011	0.067	-0.053
REPOFAC1	-0.003	0.131	-0.129	0.095	0.082	-0.005	0.073	-0.003	-0.055	0.051	0.003
INCPFAC1	0.020	-0.022	-0.140	0.135	0.000	0.023	-0.023	0.016	0.011	-0.017	0.006
INCPFAC2	0.037	0.058	-0.100	0.080	-0.014	0.037	0.041	-0.008	-0.025	0.006	0.010

Table DD.1: Multiple Regression Predicting Accident Liability: Correlation Matrix (cont.)

	UDPFAC1	UDPFAC2	UDPFAC3	UDPFAC4	DESCFAC1	DESCFAC2	DESCFAC3	OPINFAC1	OPINFAC2	REPOFAC1	INCPFAC1
UDPFAC1	1.000										
UDPFAC2	0.505	1.000									
UDPFAC3	0.454	0.514	1.000								
UDPFAC4	0.365	0.633	0.522	1.000							
DESCFAC1	0.139	0.080	0.125	0.028	1.000						
DESCFAC2	0.166	0.058	0.142	0.012	0.659	1.000					
DESCFAC3	0.132	0.032	0.039	-0.097	0.196	0.472	1.000				
OPINFAC1	0.016	0.035	-0.050	0.129	-0.015	-0.228	-0.437	1.000			
OPINFAC2	0.175	0.207	0.199	0.172	0.143	0.195	0.129	-0.038	1.000		
REPOFAC1	-0.061	0.017	-0.172	0.050	-0.323	-0.364	-0.325	0.512	-0.106	1.000	
INCPFAC1	0.167	0.102	0.042	0.234	0.047	-0.007	-0.135	0.198	0.018	0.201	1.000
INCPFAC2	0.060	0.064	0.063	0.175	-0.103	-0.148	-0.177	0.262	-0.048	0.326	0.409

Table DD.1: Multiple Regression Predicting Accident Liability: Correlation Matrix (cont.)

	INCPFAC2
INCPFAC2	1.000

Table DD.2: Multiple Regression Predicting Accident Liability: Summary Statistics

Step	Variable	Multiple R	R^2	Adjusted R^2	Beta In
1	SEX	0.252	0.064	0.062	0.252
2	PACC	0.305	0.093	0.090	-0.173
3	VEHBEL	0.346	0.120	0.114	0.168
4	YEARSDR	0.374	0.140	0.133	0.146
5	DESCFAC1	0.403	0.162	0.154	-0.158
6	LESSONS	0.416	0.173	0.162	0.117
7	MILES	0.427	0.182	0.170	0.110
8	HGV	0.437	0.191	0.178	-0.102

$F_{(8,487)} = 14.36$
$p = 0.000$
$N = 496$

Table DD.3: Multiple Regression Predicting Accident Liability: Relative Importance of Predictors Remaining in Equation

Variable	B Weight	Beta Weight	Partial Correlation Coefficients
SEX	0.398	0.154	0.150
PACC	-0.102	-0.121	-0.131
VEHBEL	-0.382	-0.122	-0.121
YEARSDR	0.031	0.249	0.231
DESCFAC1	0.032	0.162	0.168
LESSONS	0.015	0.132	0.127
MILES	0.012	0.143	0.133
HGV	-0.582	-0.102	-0.103
(Constant)	0.176		

DD.2: Multiple Regression Predicting Junction Accident Liability

Tables DD.4 to DD.6 describe the analysis performed to predict involvement in accidents occurring at junctions only. The analysis is described in further detail in Section 8.4.2 which also contains a summary of the main points from the analysis.

Table DD.4: Multiple Regression Predicting Junction Accident Liability: Correlation Matrix

	JUNCACCS	AGE	SEX	DRWORK	TESTAGE	LESSONS	DRSCHOOL	FRIEND	ADTRAIN	VEHICLE	VEHBEL
JUNCACCS	1.000										
AGE	0.161	1.000									
SEX	0.233	0.104	1.000								
DRWORK	0.259	0.045	0.302	1.000							
TESTAGE	-0.033	0.446	-0.178	-0.131	1.000						
LESSONS	-0.031	-0.310	-0.281	-0.136	0.120	1.000					
DRSCHOOL	-0.029	-0.226	-0.012	-0.059	0.049	0.398	1.000				
FRIEND	-0.034	0.158	0.049	0.035	-0.053	-0.448	-0.452	1.000			
ADTRAIN	0.077	0.038	0.081	0.147	-0.021	-0.096	-0.036	0.005	1.000		
VEHICLE	-0.063	-0.019	-0.198	-0.238	0.021	0.091	0.025	0.016	-0.126	1.000	
VEHBEL	-0.230	-0.065	-0.257	-0.377	0.114	0.141	0.059	-0.017	-0.075	0.340	1.000
MILES	0.229	0.016	0.301	0.430	-0.130	-0.152	-0.067	-0.021	0.182	-0.300	-0.409
YEARSDR	0.194	0.884	0.214	0.124	0.008	-0.409	-0.268	0.209	0.064	-0.025	-0.115
TESTTIM	-0.028	-0.076	-0.094	-0.111	0.127	0.398	0.097	-0.057	-0.048	-0.016	0.044
PACC	-0.143	-0.007	-0.005	-0.104	0.047	-0.011	0.033	-0.065	0.003	0.026	0.057
MOTORCYC	0.056	0.165	0.263	0.101	-0.075	-0.238	-0.054	0.035	0.060	-0.161	-0.111
HGV	0.048	0.130	0.177	0.161	-0.056	-0.036	0.010	-0.086	0.173	-0.283	-0.218
PSV	0.031	0.072	0.072	0.169	-0.010	-0.096	0.004	0.041	0.183	-0.081	-0.002
UNFAMIL	0.032	-0.179	0.076	0.128	-0.078	0.065	0.035	-0.100	0.089	-0.100	-0.158
MOTORWAY	0.128	0.082	0.237	0.248	-0.056	-0.058	-0.077	-0.048	0.054	-0.080	-0.250
RURAL	-0.062	0.055	-0.051	-0.030	-0.045	-0.040	0.014	0.050	0.019	-0.001	0.069
URBAN	-0.051	-0.138	-0.139	-0.172	0.088	0.098	0.082	-0.020	-0.070	0.067	0.166
UDPFAC1	-0.036	-0.165	-0.037	-0.128	-0.106	0.055	0.001	-0.083	-0.043	0.082	0.073
UDPFAC2	0.032	-0.006	0.046	-0.059	-0.011	-0.051	-0.073	0.007	0.074	0.024	0.038
UDPFAC3	0.064	-0.014	0.103	0.046	-0.013	-0.009	-0.026	0.043	0.047	0.001	-0.001
UDPFAC4	0.043	0.060	0.131	0.010	-0.022	-0.142	-0.082	0.018	0.025	0.048	-0.003
DESCFAC1	0.170	-0.297	0.124	0.107	-0.213	0.034	0.024	0.009	-0.072	0.039	-0.085
DESCFAC2	0.043	-0.265	0.022	0.025	-0.212	0.049	0.024	0.038	-0.132	-0.025	-0.053
DESCFAC3	-0.139	-0.216	-0.266	-0.163	0.035	0.192	0.087	-0.056	-0.083	0.042	0.082
OPINFAC1	0.075	0.009	0.190	0.056	-0.100	-0.185	-0.066	0.100	0.122	-0.037	-0.071
OPINFAC2	0.025	-0.058	-0.024	-0.033	-0.021	0.059	0.062	-0.019	-0.106	0.076	-0.038
REPOFAC1	0.033	0.119	0.030	-0.013	-0.015	-0.154	-0.113	0.091	0.153	0.055	-0.025
INCPFAC1	-0.019	0.016	0.037	-0.002	-0.009	-0.082	-0.020	-0.002	0.017	-0.069	-0.082
INCPFAC2	0.024	0.094	-0.046	-0.028	-0.004	-0.165	-0.112	0.095	0.008	0.053	-0.055

Table DD.4: Multiple Regression Predicting Junction Accident Liability: Correlation Matrix (cont.)

	MILES	YEARSDR	TESTTIM	PACC	MOTORCYC	HGV	PSV	UNFAMIL	MOTORWAY	RURAL	URBAN
MILES	1.000										
YEARSDR	0.081	1.000									
TESTTIM	0.032	-0.151	1.000								
PACC	-0.068	-0.040	0.020	1.000							
MOTORCYC	0.113	0.248	-0.166	0.084	1.000						
HGV	0.341	0.168	-0.040	-0.019	0.107	1.000					
PSV	0.185	0.075	-0.052	0.003	0.144	0.108	1.000				
UNFAMIL	0.232	-0.143	-0.022	0.012	0.041	0.141	-0.036	1.000			
MOTORWAY	0.317	0.117	-0.053	-0.062	0.140	0.218	0.001	0.222	1.000		
RURAL	-0.077	0.087	0.059	0.066	0.029	-0.033	-0.021	-0.019	-0.404	1.000	
URBAN	-0.190	-0.183	-0.036	-0.039	-0.153	-0.144	0.022	-0.159	-0.447	-0.602	1.000
UDPFAC1	-0.074	-0.141	0.013	-0.027	-0.097	-0.058	-0.075	-0.068	-0.001	0.089	-0.063
UDPFAC2	-0.037	-0.018	-0.066	-0.028	0.068	-0.013	-0.001	-0.013	0.020	0.024	-0.033
UDPFAC3	0.020	-0.008	-0.001	-0.061	-0.073	-0.033	-0.009	-0.022	0.072	-0.002	-0.039
UDPFAC4	0.045	0.068	-0.146	0.100	0.046	-0.037	0.050	-0.014	-0.005	0.036	-0.024
DESCFAC1	0.015	-0.221	0.058	-0.152	-0.005	-0.053	-0.117	-0.018	0.089	-0.123	0.037
DESCFAC2	-0.063	-0.190	0.104	-0.146	-0.057	-0.079	-0.091	-0.027	0.016	-0.064	0.037
DESCFAC3	-0.201	-0.266	0.113	-0.048	-0.179	-0.118	-0.099	0.021	-0.086	0.011	0.047
OPINFAC1	0.156	0.065	-0.130	0.105	0.156	0.014	0.068	-0.037	0.031	0.102	-0.105
OPINFAC2	-0.036	-0.065	0.053	-0.137	-0.194	-0.103	-0.027	-0.175	-0.081	0.104	-0.030
REPOFAC1	0.051	0.133	-0.146	0.102	0.065	0.010	0.075	0.030	-0.016	0.052	-0.032
INCPFAC1	0.056	0.012	-0.129	0.156	0.006	0.051	-0.029	-0.010	0.018	-0.007	-0.010
INCPFAC2	0.073	0.095	-0.117	0.078	-0.026	0.054	0.044	0.008	-0.015	0.029	-0.021

Table DD.4: Multiple Regression Predicting Junction Accident Liability: Correlation Matrix (cont.)

	UDPFAC1	UDPFAC2	UDPFAC3	UDPFAC4	DESCFAC1	DESCFAC2	DESCFAC3	OPINFAC1	OPINFAC2	REPOFAC1	INCPFAC1
UDPFAC1	1.000										
UDPFAC2	0.467	1.000									
UDPFAC3	0.436	0.492	1.000								
UDPFAC4	0.330	0.611	0.503	1.000							
DESCFAC1	0.115	0.075	0.128	0.023	1.000						
DESCFAC2	0.172	0.053	0.145	0.009	0.690	1.000					
DESCFAC3	0.129	0.020	0.041	-0.106	0.205	0.484	1.000				
OPINFAC1	-0.003	0.012	-0.080	0.091	0.003	-0.239	-0.463	1.000			
OPINFAC2	0.172	0.160	0.140	0.136	0.206	0.219	0.172	-0.062	1.000		
REPOFAC1	-0.060	0.032	-0.160	0.058	-0.313	-0.377	-0.355	0.517	-0.100	1.000	
INCPFAC1	0.159	0.088	0.046	0.237	0.029	-0.023	-0.155	0.200	0.030	0.198	1.000
INCPFAC2	0.036	0.055	0.058	0.148	-0.152	-0.168	-0.189	0.251	-0.043	0.339	0.399

Table DD.4: Multiple Regression Predicting Junction Accident Liability: Correlation Matrix (cont.)

	INCPFAC2
INCPFAC2	1.000

Table DD.5: Multiple Regression Predicting Junction Accident Liability: Summary Statistics

Step	Variable	Multiple R	R^2	Adjusted R^2	Beta In
1	DRWORK	0.259	0.067	0.065	0.259
2	YEARSDR	0.307	0.094	0.090	0.165
3	DESCFAC1	0.359	0.129	0.123	0.193
4	MILES	0.382	0.146	0.138	0.145
5	LESSONS	0.395	0.156	0.146	0.110
6	SEX	0.408	0.166	0.154	0.114

$F_{(6,416)} = 13.813$
$p = 0.000$
$N = 423$

Table DD.6: Multiple Regression Predicting Junction Accident Liability: Relative Importance of Predictors Remaining in Equation

Variable	B Weight	Beta Weight	Partial Correlation Coefficients
DRWORK	0.241	0.135	0.129
YEARSDR	0.021	0.237	0.221
DESCFAC1	0.026	0.187	0.191
MILES	0.008	0.135	0.129
LESSONS	0.010	0.130	0.125
SEX	0.204	0.114	0.111
(Constant)	-0.843		

DD.3: DFA Predicting Junction Accident Culpability

Tables DD.7 to DD.11 details the stepwise two-group discriminant function analysis performed to predict accident culpability for junction accident-involved drivers as detailed in Section 8.5.1.

Table DD.7: DFA Predicting Culpability: Group Means, Standard Deviations and Univariate Significance Tests

	Group:						
	Not Culpable for Accident (N=46)		Culpable for Accident (N=46)				
Predictor Variables:	Mean	Standard Deviation	Mean	Standard Deviation	Wilks' Lambda	Univariate F- Ratio	Significance
SEX	0.63	0.49	0.67	0.47	0.998	0.188	0.666
AGEACC	33.13	9.86	31.07	11.23	0.990	0.879	0.351
DRWORK	0.65	0.48	0.59	0.50	0.995	0.408	0.525
LESSONS	15.54	13.90	16.65	9.11	0.998	0.205	0.652
ADTRAIN	0.09	0.28	0.15	0.36	0.990	0.918	0.341
ACCEXP	10.30	8.39	11.09	10.01	0.998	0.165	0.686
MILES	18.54	15.71	14.24	10.74	0.974	2.352	0.129
PACC	8.30	1.35	7.61	1.34	0.936	6.157	0.015
VEHBEL	0.65	0.48	0.70	0.47	0.998	0.194	0.661
UDPFAC1	11.96	4.26	14.61	4.96	0.922	7.572	0.007
UDPFAC2	10.41	3.91	11.43	4.77	0.986	1.262	0.264
UDPFAC3	7.91	4.01	8.37	4.19	0.997	0.285	0.595
UDPFAC4	14.98	4.97	15.59	5.66	0.997	0.301	0.585
DESCFAC1	25.35	6.87	28.98	7.12	0.936	6.190	0.015
DESCFAC2	8.11	2.76	9.59	2.93	0.935	6.217	0.015
DESCFAC3	6.52	2.06	7.26	2.43	0.973	2.478	0.119
OPINFAC1	18.11	3.02	18.26	3.06	0.999	0.058	0.811
OPINFAC2	3.20	1.29	3.54	1.66	0.986	1.261	0.265
REPOFAC1	22.43	3.05	20.30	4.08	0.918	8.037	0.006
INCPFAC1	13.80	3.89	14.67	2.93	0.984	1.466	0.229
INCPFAC2	8.54	2.69	7.61	2.83	0.972	2.635	0.108

Table DD.8: DFA Predicting Culpability: Canonical Discriminant Function

Eigenvalue	0.538
Canonical Correlation	0.591
% Variance Accounted For	34.975
Wilks' Lambda	0.650
Chi-Squared	36.803
Deg. Free.	9
Significance	0.000

Table DD.9: DFA Predicting Culpability: Summary Statistics

Step of Entry	Variable In	Wilks' Lambda Upon Entry	Significance	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
1	REPOFAC1	0.918	0.006	-0.671	-0.407
2	UDPFAC1	0.842	0.001	0.494	0.395
3	PACC	0.804	0.000	-0.345	-0.357
4	OPINFAC1	0.777	0.000	0.489	0.035
5	MILES	0.758	0.000	-0.378	-0.220
6	ADTRAIN	0.735	0.000	0.241	0.138
7	ACCEXP	0.719	0.000	1.191	0.058
8	AGEACC	0.667	0.000	-0.979	-0.135
9	DESCFAC3	0.650	0.000	0.325	0.226

Table DD.10: DFA Predicting Culpability: Group Centroids

Group:	Group Centroids:
Non-Culpable	-0.725
Culpable	0.725

Table DD.11: DFA Predicting Culpability: Classification Matrix

		Predicted Group:	
Actual Group:	N	Non-Culpable	Culpable
Non-Culpable	56	37 (66.1%)	19 (33.9%)
Culpable	61	21 (34.4%)	40 (65.6%)

Percent of cases correctly classified = 65.81

DD.4: DFA Predicting Admission/Denial of Accident Culpability

Tables DD.12 to DD.16 describe the analysis performed to discriminate between those respondents who admitted to being mainly responsible for causing the described accident and those who denied such culpability. The analysis is described and the results summarized in Section 8.5.2.

Table DD.12: DFA Predicting Admission/Denial of Culpability: Group Means, Standard Deviations and Univariate Significance Tests

	Group:						
	Deniers (N=38)		Admitters (N=39)				
Predictor Variables:	Mean	Standard Deviation	Mean	Standard Deviation	Wilks' Lambda	Univariate F-Ratio	Significance
SEX	0.58	0.50	0.69	0.47	0.986	1.056	0.308
AGEACC	35.74	12.83	33.21	15.21	0.992	0.622	0.433
ACCEXP	11.87	11.24	12.26	13.24	1.000	0.019	0.890
UDPFAC1	12.82	4.51	13.87	4.73	0.987	1.004	0.320
UDPFAC2	10.11	3.90	10.72	4.71	0.995	0.386	0.536
UDPFAC3	7.89	4.20	8.31	3.71	0.997	0.209	0.649
UDPFAC4	14.18	4.32	15.36	5.61	0.986	1.056	0.308
DESCFAC1	24.24	5.05	28.79	7.20	0.879	10.287	0.002
DESCFAC2	8.39	2.62	9.67	2.59	0.942	4.599	0.035
DESCFAC3	6.95	2.19	7.41	2.21	0.989	0.851	0.359
OPINFAC1	17.89	2.88	17.90	2.98	1.000	0.000	0.997
OPINFAC2	3.50	1.29	3.69	1.61	0.996	0.334	0.565
REPOFAC1	22.00	3.02	20.28	3.59	0.936	5.146	0.026
INCPFAC1	14.42	3.63	14.87	3.07	0.995	0.347	0.558
INCPFAC2	8.39	2.47	7.85	2.66	0.988	0.879	0.352

Table DD.13: DFA Predicting Admission/Denial of Culpability: Canonical Discriminant Function

Eigenvalue	0.279
Canonical Correlation	0.467
% Variance Accounted For	21.837
Wilks' Lambda	0.782
Chi-Squared	17.862
Deg. Free.	5
Significance	0.003

Table DD.14: DFA Predicting Admission/Denial of Culpability: Summary Statistics

Step of Entry	Variable In	Wilks' Lambda Upon Entry	Significance	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
1	DESCFAC1	0.879	0.002	0.633	0.701
2	REPOFAC1	0.837	0.001	-0.504	-0.496
3	ACCEXP	0.826	0.003	1.325	0.030
4	AGEACC	0.795	0.002	-1.176	-0.172
5	UDPFAC4	0.782	0.003	0.284	0.224

Table DD.15: DFA Predicting Admission/Denial of Culpability: Group Centroids

Group:	Group Centroids:
Deniers	-0.528
Admitters	0.515

Table DD.16: DFA Predicting Admission/Denial of Culpability: Classification Matrix

		Predicted Group:	
Actual Group:	N	Deniers	Admitters
Deniers	41	28 (68.3%)	13 (31.7%)
Admitters	43	13 (30.2%)	30 (69.8%)

Percent of cases correctly classified = 69.05

DD.5: DFA Predicting Use of Accident Avoidance Measures

The following tables (DD.17 to DD.21) provide the full details of the two-group stepwise DFA performed to discriminate between those respondents who used some form of accident prevention measure and those who did not. This analysis is presented in the main body of the text in Section 8.6.1.

Table DD.17: DFA Predicting Use of Accident Avoidance Measures: Group Means, Standard Deviations and Univariate Significance Tests

	Group: No Accident Avoidance Measure (N=101)		Group: Some Accident Avoidance Measure (N=101)				
Predictor Variables:	Mean	Standard Deviation	Mean	Standard Deviation	Wilks' Lambda	Univariate F-Ratio	Significance
SEX	0.65	0.48	0.69	0.46	0.998	0.357	0.551
AGEACC	32.50	11.08	33.16	11.26	0.999	0.178	0.674
ACCEXP	11.10	9.25	12.14	10.46	0.997	0.560	0.455
MILES	14.25	13.25	19.33	16.09	0.971	5.995	0.015
ADTRAIN	0.07	0.26	0.09	0.29	0.999	0.269	0.605
DRSCHOOL	0.94	0.24	0.80	0.40	0.957	8.950	0.003
FRIEND	0.27	0.44	0.39	0.49	0.984	3.261	0.073
LESSONS	16.94	11.56	13.84	10.38	0.980	4.020	0.046
DRWORK	0.49	0.50	0.65	0.48	0.971	5.949	0.016
PACC	8.00	1.85	7.88	1.44	0.999	0.258	0.612
TESTTIM	1.58	0.82	1.51	0.66	0.998	0.442	0.507
TESTAGE	21.02	5.07	20.59	5.02	0.998	0.359	0.550
VEHBEL	0.75	0.43	0.66	0.47	0.990	1.939	0.165
VEHICLE	0.90	0.30	0.89	0.31	1.000	0.053	0.819
MOTORCYC	0.21	0.41	0.22	0.41	1.000	0.029	0.864
HGV	0.05	0.22	0.06	0.24	1.000	0.095	0.758
PSV	0.02	0.14	0.03	0.17	0.999	0.203	0.653
ACCS	1.85	1.13	1.86	1.33	1.000	0.003	0.955
UDPFAC1	12.07	4.71	12.63	5.06	0.997	0.673	0.413
UDPFAC2	10.26	4.51	11.19	4.64	0.990	2.092	0.150
UDPFAC3	7.70	4.29	8.47	4.21	0.992	1.625	0.204
UDPFAC4	14.30	4.94	15.38	5.57	0.990	2.120	0.147
DESCFAC1	24.98	6.75	25.54	6.64	0.998	0.358	0.550
DESCFAC2	8.52	2.73	8.67	2.81	0.999	0.145	0.704
DESCFAC3	6.95	2.29	6.88	2.38	1.000	0.045	0.833
OPINFAC1	17.65	2.90	18.21	3.20	0.992	1.663	0.199
OPINFAC2	3.33	1.29	3.70	1.53	0.982	3.580	0.060
REPOFAC1	21.91	3.48	21.50	3.65	0.997	0.654	0.420
INCPFAC1	14.29	3.68	14.17	3.98	1.000	0.049	0.826
INCPFAC2	7.63	2.52	8.00	2.72	0.995	0.987	0.322

Table DD.18: DFA Predicting Use of Accident Avoidance Measures: Canonical Discriminant Function

Eigenvalue	0.109
Canonical Correlation	0.313
% Variance Accounted For	9.803
Wilks' Lambda	0.902
Chi-Squared	20.376
Deg. Free.	5
Significance	0.001

Table DD.19: DFA Predicting Use of Accident Avoidance Measures: Summary Statistics

Step of Entry	Variable In	Wilks' Lambda Upon Entry	Significance	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
1	DRSCHOOL	0.957	0.003	-0.597	-0.642
2	MILES	0.931	0.001	0.407	0.525
3	OPINFAC2	0.915	0.001	0.387	0.406
4	DRWORK	0.907	0.001	0.332	0.523
5	UDPFAC2	0.902	0.001	0.234	0.310

Table DD.20: DFA Predicting Use of Accident Avoidance Measures: Group Centroids

Group:	Group Centroids:
No Accident Avoidance Measure	-0.328
Some Accident Avoidance Measure	0.328

Table DD.21: DFA Predicting Use of Accident Avoidance Measures: Classification Matrix

		Predicted Group:	
Actual Group:	N	No Accident Avoidance Measure	Some Accident Avoidance Measure
No Accident Avoidance Measure	133	91 (68.4%)	42 (31.6%)
Some Accident Avoidance Measure	120	52 (43.3%)	68 (56.7%)

Percent of cases correctly classified = 62.85

DD.6: DFA Predicting Accident Preventability

The following tables (DD.22 to DD.26) provide the full details of the two-group stepwise DFA performed to discriminate those respondents who felt that they could have done something to prevent the described accident from those who felt they were powerless to do this. This analysis is presented in the main body of the text in Section 8.6.2.

Table DD.22: DFA Predicting Accident Preventability: Group Means, Standard Deviations and Univariate Significance Tests

	Group: Helpless (N=72)		Not Helpless (N=72)				
Predictor Variables:	Mean	Standard Deviation	Mean	Standard Deviation	Wilks' Lambda	Univariate F-Ratio	Significance
SEX	0.67	0.47	0.71	0.46	0.998	0.287	0.593
AGEACC	32.42	10.15	32.44	10.98	1.000	0.000	0.987
ACCEXP	10.68	8.45	12.24	10.04	0.993	1.001	0.316
MILES	18.38	14.29	16.89	15.26	0.997	0.364	0.547
LESSONS	18.04	13.25	15.54	9.96	0.989	1.638	0.203
ADTRAIN	0.06	0.23	0.15	0.36	0.975	3.689	0.057
PACC	8.03	1.57	7.58	1.50	0.979	3.010	0.085
VEHBEL	0.74	0.44	0.75	0.44	1.000	0.036	0.850
DRWORK	0.65	0.48	0.57	0.50	0.993	1.045	0.308
UDPFAC1	12.68	5.12	14.22	4.89	0.977	3.411	0.067
UDPFAC2	10.47	4.34	11.84	4.98	0.979	3.116	0.080
UDPFAC3	7.85	4.37	8.43	4.23	0.995	0.663	0.417
UDPFAC4	14.89	5.30	15.08	5.24	1.000	0.049	0.825
DESCFAC1	25.03	6.96	28.06	6.64	0.952	7.142	0.008
DESCFAC2	8.21	2.77	9.61	2.88	0.941	8.879	0.003
DESCFAC3	6.79	2.26	7.11	2.54	0.996	0.634	0.427
OPINFAC1	18.22	3.14	17.67	2.84	0.991	1.238	0.268
OPINFAC2	3.33	1.42	3.47	1.35	0.997	0.360	0.550
REPOFAC1	22.15	3.18	21.10	3.89	0.978	3.183	0.077
INCPFAC1	14.03	3.70	14.65	3.39	0.992	1.117	0.292
INCPFAC2	8.10	2.47	7.35	2.39	0.976	3.421	0.067

Table DD.23: DFA Predicting Accident Preventability: Canonical Discriminant Function

Eigenvalue	0.265
Canonical Correlation	0.458
% Variance Accounted For	20.940
Wilks' Lambda	0.791
Chi-Squared	32.079
Deg. Free.	11
Significance	0.001

Table DD.24: DFA Predicting Accident Preventability: Summary Statistics

Step of Entry or Removal	Variable In	Variable Removed	Wilks' Lambda Upon Entry/ Removal	Significance	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
1	DESCFAC2		0.941	0.003	0.374	0.486
2	ADTRAIN		0.906	0.001	0.431	0.313
3	UDPFAC1		0.885	0.001	-	0.194
4	ACCEXP		0.866	0.001	1.093	0.164
5	DRWORK		0.853	0.001	-0.408	-0.167
6	AGEACC		0.840	0.001	-0.792	0.003
7	INCPFAC2		0.824	0.000	-0.282	-0.302
8	PACC		0.817	0.001	-0.268	-0.283
9	REPOFAC1		0.809	0.001	-0.263	-0.291
10	UDPFAC2		0.803	0.001	0.569	0.288
11		UDPFAC1	0.807	0.001	-	-
12	INCPFAC1		0.798	0.001	0.283	0.172
13	UDPFAC4		0.791	0.001	-0.318	0.036

Table DD.25: DFA Predicting Accident Preventability: Group Centroids

Group:	Group Centroids:
Not Preventable	-0.511
Preventable	0.511

Table DD.26: DFA Predicting Accident Preventability: Classification Matrix

		Predicted Group:	
Actual Group:	N	Not Preventable	Preventable
Not Preventable	81	60 (74.1%)	21 (25.9%)
Preventable	78	24 (30.8%)	54 (69.2%)

Percent of cases correctly classified = 71.70

DD.7: DFA Predicting Involvement in the Main Accident Types

This section of Appendix DD describes the discriminant function analysis designed to discriminate between respondents involved in the two major forms of accident (so-called 'cross-traffic/left-turn' and 'rear-end shunt' accidents) and those involved in no accidents at all. Two separate two-group analyses were performed, that dealing with rear-end shunt accidents in Section DD.7.1 (Tables DD.27 to DD.31, below and over) and that with cross-traffic and left-turn accidents in Section DD.7.2 (Tables DD.32 to DD.36, over). These analyses are described and summarized in Section 8.7.3.

DD.7.1 DFA Predicting Involvement in Rear-End Shunt Accidents

Table DD.27: DFA Predicting Involvement in Rear-End Shunt Accidents: Group Means, Standard Deviations and Univariate Significance Tests

	Group:						
	Non-Accident Involved (N=59)		Rear-End Accident-Involved (N=60)				
Predictor Variables:	Mean	Standard Deviation	Mean	Standard Deviation	Wilks' Lambda	Univariate F-Ratio	Significance
SEX	0.39	0.49	0.62	0.49	0.949	6.347	0.013
AGE	38.10	15.23	37.30	14.57	0.999	0.086	0.770
YEARSDR	15.03	12.47	16.13	12.37	0.998	0.233	0.630
UDPFAC1	13.49	4.04	13.07	4.64	0.998	0.284	0.595
UDPFAC2	11.02	4.41	11.17	4.57	1.000	0.033	0.856
UDPFAC3	8.15	3.62	8.22	4.32	1.000	0.008	0.930
UDPFAC4	15.41	4.91	15.20	5.16	1.000	0.050	0.823
DESCFAC1	24.75	6.06	25.43	6.67	0.997	0.346	0.558
DESCFAC2	8.61	2.79	8.77	2.57	0.999	0.101	0.751
DESCFAC3	7.29	2.16	6.75	2.47	0.987	1.062	0.208
OPINFAC1	17.53	2.71	17.93	3.28	0.995	0.547	0.461
OPINFAC2	3.49	1.10	3.62	1.53	0.998	0.261	0.611
REPOFAC1	21.71	3.76	21.53	3.82	0.999	0.066	0.798
INCPFAC1	14.56	2.97	14.82	4.07	0.999	0.155	0.695
INCPFAC2	8.29	2.33	7.67	2.41	0.983	2.038	0.156

Table DD.28: DFA Predicting Involvement in Rear-End Shunt Accidents: Canonical Discriminant Function

Eigenvalue	0.093
Canonical Correlation	0.292
% Variance Accounted For	8.509
Wilks' Lambda	0.915
Chi-Squared	10.225
Deg. Free.	4
Significance	0.037

Table DD.29: DFA Predicting Involvement in Rear-End Shunt Accidents: Summary Statistics

Step of Entry	Variable In	Wilks' Lambda Upon Entry	Significance	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
1	SEX	0.949	0.013	0.781	0.764
2	INCPFAC2	0.935	0.020	-0.670	-0.433
3	INCPFAC1	0.923	0.027	0.498	0.119
4	UDPFAC1	0.915	0.037	-0.334	-0.162

Table DD.30: DFA Predicting Involvement in Rear-End Shunt Accidents: Group Centroids

Group:	Group Centroids:
Non-Accident Involved	-0.305
Rear-End Accident-Involved	0.300

Table DD.31: DFA Predicting Involvement in Rear-End Shunt Accidents: Classification Matrix

		Predicted Group:	
		Non-Accident Involved	Rear-End Accident-Involved
Actual Group:	N		
Non-Accident Involved	61	41 (67.2%)	20 (32.8%)
Rear-End Accident-Involved	70	25 (35.7%)	45 (64.3%)

Percent of cases correctly classified = 65.65

DD.7.2 DFA Predicting Involvement in Cross-Traffic/ Left-Turn Accidents

Table DD.32: DFA Predicting Involvement in Cross-Traffic/ Left-Turn Accidents: Group Means, Standard Deviations and Univariate Significance Tests

	Group:						
	Non-Accident Involved (N=53)		Cross-Traffic/ Left-Turn Accident-Involved (N=53)				
Predictor Variables:	Mean	Standard Deviation	Mean	Standard Deviation	Wilks' Lambda	Univariate F-Ratio	Significance
SEX	0.38	0.49	0.62	0.49	0.940	6.658	0.011
AGE	37.43	15.03	41.87	13.95	0.977	2.479	0.118
YEARSDR	14.53	12.35	18.92	11.41	0.966	3.622	0.060
UDPFAC1	13.66	4.06	11.21	3.84	0.911	10.206	0.002
UDPFAC2	11.17	4.51	9.25	3.91	0.950	5.502	0.021
UDPFAC3	8.15	3.69	7.34	3.58	0.987	1.320	0.253
UDPFAC4	15.53	4.96	13.96	5.26	0.977	2.484	0.118
DESCFAC1	24.77	5.96	24.60	5.76	1.000	0.022	0.882
DESCFAC2	8.62	2.86	8.57	2.60	1.000	0.011	0.915
DESCFAC3	7.32	2.13	7.11	2.10	0.998	0.255	0.614
OPINFAC1	17.47	2.66	17.47	2.70	1.000	0.000	1.000
OPINFAC2	3.51	1.10	3.57	1.46	1.000	0.051	0.822
REPOFAC1	21.66	3.85	21.06	3.73	0.994	0.673	0.414
INCPFAC1	14.57	3.05	13.66	2.71	0.976	2.608	0.109
INCPFAC2	8.21	2.40	7.64	2.75	0.988	1.271	0.262

Table DD.33: DFA Predicting Involvement in Cross-Traffic/ Left-Turn Accidents: Canonical Discriminant Function

Eigenvalue	0.177
Canonical Correlation	0.388
% Variance Accounted For	15.062
Wilks' Lambda	0.849
Chi-Squared	16.731
Deg. Free.	3
Significance	0.001

Table DD.34: DFA Predicting Involvement in Cross-Traffic/ Left-Turn Accidents: Summary Statistics

Step of Entry	Variable In	Wilks' Lambda Upon Entry	Significance	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
1	UDPFAC1	0.911	0.002	0.782	0.744
2	SEX	0.859	0.000	-0.607	-0.601
3	REPOFAC1	0.849	0.001	0.279	0.191

Table DD.35: DFA Predicting Involvement in Cross-Traffic/ Left-Turn Accidents: Group Centroids

Group:	Group Centroids:
Non-Accident Involved	0.417
Cross-Traffic/Left-Turn Accident-Involved	-0.417

Table DD.36: DFA Predicting Involvement in Cross-Traffic/ Left-Turn Accidents: Classification Matrix

		Predicted Group:	
		Non-Accident Involved	Cross-Traffic/ Left-Turn Accident-Involved
Actual Group:	N		
Non-Accident Involved	56	40 (71.4%)	16 (28.6%)
Cross-Traffic/ Left-Turn Accident-Involved	61	21 (34.4%)	40 (65.6%)

Percent of cases correctly classified = 68.38

DD.8: Multiple Regression Predicting Values of Self-Descriptor Metavariable - DESCFAC1

A stepwise multiple regression analysis was performed using descriptive variables to predict values on the self-descriptor metavariable DESCFAC1. Tables DD.37 to DD.39 describe the analysis which is summarized in Section 8.8 of the main text. It should be noted that a high score on DESCFAC1 was obtained by drivers who described themselves as being more self-centred and ill-mannered.

Table DD.37: Multiple Regression Predicting Scores on DESCFAC1: Correlation Matrix

	DESCFAC1	AGE	SEX	DRWORK	TESTAGE	LESSONS	DRSCHOOL	FRIEND	ADTRAIN	VEHICLE	VEHBEL
DESCFAC1	1.000										
AGE	-0.285	1.000									
SEX	0.132	0.111	1.000								
DRWORK	0.111	0.043	0.344	1.000							
TESTAGE	-0.198	0.434	-0.177	-0.164	1.000						
LESSONS	0.035	-0.341	-0.302	-0.149	0.089	1.000					
DRSCHOOL	0.034	-0.256	-0.073	-0.085	0.065	0.428	1.000				
FRIEND	-0.001	0.181	0.065	0.041	-0.015	-0.454	-0.477	1.000			
ADTRAIN	-0.055	0.042	0.098	0.168	-0.024	-0.113	-0.055	0.031	1.000		
VEHICLE	0.027	0.011	-0.213	-0.239	0.039	0.086	0.019	0.014	-0.109	1.000	
VEHBEL	-0.071	-0.063	-0.254	-0.387	0.116	0.120	0.034	0.004	-0.040	0.350	1.000
MILES	0.042	0.011	0.326	0.440	-0.130	-0.157	-0.050	-0.012	0.188	-0.353	-0.419
YEARSDR	-0.215	0.891	0.221	0.134	0.012	-0.426	-0.307	0.215	0.075	-0.009	-0.106
TESTTIM	0.068	-0.095	-0.075	-0.088	0.077	0.387	0.060	-0.041	-0.047	-0.022	0.044
PACC	-0.148	0.018	-0.007	-0.098	0.061	-0.044	0.016	-0.038	-0.025	0.029	0.052
MOTORCYC	-0.012	0.149	0.267	0.125	-0.080	-0.218	-0.072	0.027	0.104	-0.131	-0.081
HGV	-0.030	0.117	0.185	0.178	-0.022	-0.064	-0.017	-0.059	0.171	-0.301	-0.206
PSV	-0.100	0.053	0.063	0.144	-0.005	-0.082	0.008	0.036	0.157	-0.061	0.004
UNFAMIL	-0.024	-0.158	0.079	0.155	-0.063	0.033	0.047	-0.069	0.091	-0.099	-0.183
MOTORWAY	0.098	0.018	0.198	0.203	-0.062	-0.052	-0.060	0.006	0.038	-0.057	-0.235
RURAL	-0.114	0.088	-0.037	-0.025	-0.011	-0.060	-0.016	0.033	0.011	-0.020	0.055
URBAN	0.023	-0.133	-0.120	-0.140	0.061	0.110	0.091	-0.047	-0.046	0.066	0.162
ACCS	0.172	0.142	0.243	0.222	-0.069	-0.043	-0.022	-0.046	0.074	-0.081	-0.227

Table DD.37: Multiple Regression Predicting Scores on DESCFAC1: Correlation Matrix (cont.)

	MILES	YEARSDR	TESTTIM	PACC	MOTORCYC	HGV	PSV	UNFAMIL	MOTORWAY	RURAL	URBAN
MILES	1.000										
YEARSDR	0.070	1.000									
TESTTIM	0.031	-0.147	1.000								
PACC	-0.088	-0.011	-0.021	1.000							
MOTORCYC	0.096	0.236	-0.142	0.024	1.000						
HGV	0.361	0.139	-0.051	-0.029	0.101	1.000					
PSV	0.157	0.053	-0.046	0.002	0.126	0.092	1.000				
UNFAMIL	0.258	-0.131	-0.036	0.008	0.018	0.137	-0.034	1.000			
MOTORWAY	0.316	0.049	-0.049	-0.048	0.117	0.201	0.002	0.252	1.000		
RURAL	-0.079	0.108	0.055	0.055	0.031	-0.022	-0.023	-0.043	-0.408	1.000	
URBAN	-0.188	-0.146	-0.033	-0.034	-0.133	-0.143	0.022	-0.162	-0.450	-0.603	1.000
ACCS	0.235	0.186	-0.008	-0.185	0.103	0.061	0.037	0.024	0.105	-0.043	-0.045

Table DD.37: Multiple Regression Predicting Scores on DESCFAC1: Correlation Matrix (cont.)

	ACCS
ACCS	1.000

Table DD.38: Multiple Regression Predicting Scores on DESCFAC1: Summary Statistics

Step	Variable	Multiple R	R^2	Adjusted R^2	Beta In
1	AGE	0.285	0.081	0.080	-0.285
2	ACCS	0.357	0.127	0.124	0.217
3	SEX	0.376	0.141	0.136	0.122
4	PACC	0.391	0.153	0.147	-0.110
5	PSV	0.403	0.163	0.155	-0.098
6	UNFAMIL	0.414	0.171	0.162	-0.094
7	MOTORWAY	0.421	0.178	0.167	0.086

$F_{(6,488)} = 16.32$
$p = 0.000$
$N = 537$

Table DD.39: Multiple Regression Predicting Scores on DESCFAC1: Relative Importance of Predictors Remaining in Equation

Variable	B Weight	Beta Weight	Partial Correlation Coefficients
AGE	-0.184	-0.335	-0.338
ACCS	0.836	0.167	0.171
SEX	1.625	0.127	0.120
PACC	-0.441	-0.105	-0.112
PSV	-4.715	-0.100	-0.110
UNFAMIL	-0.041	-0.115	-0.120
MOTORWAY	0.027	0.085	0.089
(Constant)	33.763		

DD.9: DFA Analyses Concerned with Training Issues

The following tables provide the full details of the discriminant function analyses reported in Section 8.9, in which metavariables were used to predict the types of training received.

DD.9.1: DFA Predicting Type of Pre-Test Training Received

Tables DD.40 to DD.44 (over) describe the analysis performed to discriminate between respondents who reported receiving each of the three (from a qualified driving instructor, a friend or relative or a roughly equal mixture of the two) types of pre-test training (question 8a).

Table DD.40: DFA Predicting Type of Pre-Test Training Received: Group Means, Standard Deviations and Univariate Significance Tests

Predictor Variables:	Group: Qualified Driving Instructor (N=57) Mean	Standard Deviation	Friend or Relative (N=57) Mean	Standard Deviation	50% of Each (N=57) Mean	Standard Deviation	Wilks' Lambda	F-Ratio	Significance
AGE	35.30	10.72	44.67	13.56	35.05	10.79	0.872	12.372	0.000
SEX	0.63	0.49	0.67	0.48	0.53	0.50	0.985	1.273	0.283
YEARSDR	14.14	9.44	23.98	12.83	14.16	9.90	0.843	15.674	0.000
TESTYRS	14.82	9.63	24.40	12.81	14.33	9.87	0.844	15.556	0.000
MOTORCYC	0.19	0.40	0.25	0.43	0.14	0.35	0.988	1.008	0.367
TESTTIM	1.58	0.80	1.46	0.89	1.53	0.76	0.996	0.324	0.724
DRWORK	0.47	0.50	0.53	0.50	0.37	0.49	0.983	1.485	0.230
VEHSPEC	0.07	0.26	0.05	0.23	0.11	0.31	0.993	0.577	0.563
ADTRAIN	0.04	0.19	0.11	0.31	0.11	0.31	0.985	1.241	0.292
ACCS	0.98	1.22	1.04	1.41	0.82	1.10	0.995	0.437	0.647
HGV	0.07	0.26	0.04	0.19	0.02	0.13	0.988	1.037	0.357
PACC	8.32	1.58	7.93	1.29	7.70	0.98	0.963	3.204	0.043
MILES	14.98	14.50	15.39	13.09	12.51	12.50	0.991	0.771	0.464
VEHBEL	0.75	0.43	0.79	0.41	0.93	0.26	0.960	3.474	0.033
TESTAGE	20.47	4.76	20.26	4.41	20.72	6.47	0.999	0.106	0.899
PSV	0.02	0.13	0.04	0.19	0.53	0.23	0.994	0.512	0.600
UDPFAC1	13.18	4.94	12.75	5.62	12.28	3.92	0.994	0.480	0.619
UDPFAC2	10.63	4.19	11.33	5.09	10.04	4.13	0.986	1.194	0.306
UDPFAC3	7.88	4.41	8.39	5.13	7.42	3.64	0.992	0.675	0.510
UDPFAC4	15.46	4.83	15.82	4.94	14.30	5.00	0.983	1.492	0.228
DESCFAC1	26.35	7.24	25.04	7.36	24.18	5.96	0.983	1.443	0.239
DESCFAC2	8.51	2.83	8.23	2.75	8.65	2.47	0.996	0.363	0.696
DESCFAC3	7.16	2.39	6.68	2.35	6.79	1.96	0.992	0.702	0.497
OPINFAC1	18.68	3.07	18.23	3.29	18.12	2.99	0.994	0.522	0.594
OPINFAC2	3.47	1.44	3.39	1.25	3.56	1.41	0.997	0.233	0.792
REPOFAC1	21.54	3.41	22.39	3.92	22.04	3.66	0.991	0.758	0.470
INCPFAC1	14.46	4.23	14.30	3.02	14.56	3.53	0.999	0.076	0.927
INCPFAC2	7.98	2.82	8.32	2.59	8.33	2.56	0.996	0.315	0.730

Table DD.41: DFA Predicting Type of Pre-Test Training Received: Canonical Discriminant Function

	Function 1	Function 2
Eigenvalue	0.260	0.150
% Variance Accounted For	63.415	36.585
Canonical Correlation	0.454	0.361
Total % Variance Accounted For	20.630	13.039
Wilks' Lambda	0.690	0.870
Chi-Squared	66.819	22.919
Deg. Free.	18	8
Significance	0.000	0.003

Table DD.42: DFA Predicting Type of Pre-Test Training Received: Summary Statistics

Step of Entry	Variable In	Wilks' Lambda Upon Entry	Significance	Standardised Canonical Discriminant Function Coefficients		Pooled Within-Groups Correlations	
				Function 1	Function 2	Function 1	Function 2
1	YEARSDR	0.843	0.000	0.973	-0.396	0.770	-0.463
2	VEHBEL	0.812	0.000	-0.241	-0.341	-0.275	-0.380
3	PACC	0.785	0.000	0.247	0.554	0.106	0.484
4	UDPFAC1	0.768	0.000	0.301	0.121	0.066	0.175
5	VEHSPEC	0.753	0.000	-0.328	-0.059	-0.156	-0.060
6	DESCFAC1	0.740	0.000	0.523	0.628	0.078	0.323
7	DESCFAC2	0.719	0.000	-0.481	-0.706	-0.128	0.016
8	DESCFAC3	0.703	0.000	0.175	0.442	-0.054	0.225
9	HGV	0.690	0.000	-0.111	0.369	0.052	0.279

Table DD.43: DFA Predicting Type of Pre-Test Training Received: Group Centroids

Group:	Group Centroids:	
	Function 1	Function 2
Qualified Driving Instructor	-0.068	0.540
Friend or Relative	0.650	-0.226
50% of each	-0.582	-0.315

Table DD.44: DFA Predicting Type of Pre-Test Training Received: Classification Matrix

		Predicted Group		
Actual Group	N	Qualified Driving Instructor	Friend or Relative	50% of each
Qualified Driving Instructor	62	33 (53.2%)	18 (29.0%)	11 (17.7%)
Friend or Relative	81	14 (17.3%)	52 (64.2%)	15 (18.5%)
50% of each	72	16 (22.2%)	21 (29.2%)	35 (48.6%)

Percent of cases correctly classified = 55.81

DD.9.2: DFA Predicting Receipt of Advanced Training

Tables DD.45 to DD.49 detail the discriminant function analysis performed to predict receipt of advanced, post-test driver training.

Table DD.45: DFA Predicting Receipt of Advanced Training: Group Means, Standard Deviations and Univariate Significance Tests

	Group: No Advanced Training (N=43)		Group: Advanced Training Taken (N=42)				
Predictor Variables:	Mean	Standard Deviation	Mean	Standard Deviation	Wilks' Lambda	F-Ratio	Significance
AGE	33.91	11.40	37.26	10.74	0.977	1.949	0.166
SEX	0.56	0.50	0.76	0.43	0.954	4.018	0.048
YEARSDR	14.40	10.94	17.17	9.86	0.982	1.503	0.224
ACCS	1.09	1.57	1.17	1.34	0.999	0.054	0.817
DRWORK	0.47	0.50	0.74	0.45	0.922	6.984	0.010
TESTAGE	19.40	3.67	20.24	3.79	0.987	1.087	0.300
LESSONS	15.93	11.42	11.90	8.60	0.961	3.360	0.070
UDPFAC1	13.09	4.12	12.62	5.12	0.997	0.221	0.639
UDPFAC2	10.12	3.19	12.17	5.77	0.952	4.141	0.045
UDPFAC3	8.09	4.73	8.50	4.55	0.998	0.163	0.687
UDPFAC4	13.91	4.71	15.21	4.84	0.981	1.591	0.211
DESCFAC1	25.35	6.84	23.71	6.07	0.984	1.355	0.248
DESCFAC2	8.77	2.76	7.40	2.58	0.938	5.533	0.021
DESCFAC3	7.07	2.15	6.43	1.88	0.975	2.138	0.147
OPINFAC1	17.91	3.19	19.12	3.05	0.963	3.206	0.077
OPINFAC2	3.74	1.47	3.00	0.88	0.912	7.993	0.006
REPOFAC1	20.81	3.63	23.12	3.47	0.903	8.950	0.004
INCPFAC1	14.37	3.86	14.43	3.90	1.000	0.005	0.947
INCPFAC2	7.72	2.63	7.71	2.61	1.000	0.000	0.991

Table DD.46: DFA Predicting Receipt of Advanced Training: Canonical Discriminant Function

Eigenvalue	0.542
Canonical Correlation	0.593
% Variance Accounted For	35.141
Wilks' Lambda	0.649
Chi-Squared	34.846
Deg. Free.	5
Significance	0.000

Table DD.47: DFA Predicting Receipt of Advanced Training: Summary Statistics

Step of Entry	Variable In	Wilks' Lambda Upon Entry	Significance	Standardised Canonical Discriminant Function Coefficients	Pooled Within-Groups Correlations
1	REPOFAC1	0.903	0.004	0.545	0.446
2	DRWORK	0.828	0.000	0.527	0.394
3	UDPFAC2	0.765	0.000	0.995	0.304
4	UDPFAC1	0.701	0.000	-0.676	-0.070
5	OPINFAC2	0.649	0.000	-0.473	-0.422

Table DD.48: DFA Predicting Receipt of Advanced Training: Group Centroids

Group:	Group Centroids:
No Additional Training	-0.719
Additional Training	0.736

Table DD.49: DFA Predicting Receipt of Advanced Training: Classification Matrix

		Predicted Group	
Actual Group	N	No Advanced Training	Advanced Training Taken
No Advanced Training	50	36 (72.0%)	14 (28.0%)
Advanced Training Taken	50	12 (24.0%)	38 (76.0%)

Percent of cases correctly classified = 74.00