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AGES OF DRIVERS INVOLVED IN SOME JUNCTION ACCIDENTS

by

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ABSTRACT

An analysis is given of the ages of drivers and riders involved in accidents at junctions. The junctions studied include samples of those controlled by traffic signals in outer London, urban major/minor junctions with different speed limits, and rural major/minor junctions. In particular, ages of drivers approaching on the major and minor roads have been examined.

In general, accident involvement at junctions related to the amount of car travel was above average for the under 25 age group and for those of 65 years and over. At major/minor junctions there was a marked trend for accident involvement to increase with age on the minor road approaches in rural areas. Older drivers were also more at risk though to a lesser extent on the minor road approaches in urban areas subject to speed limits of 30 or 40 mile/hour. The age factor was most marked for dual carriageways and the difficulties older drivers experience seem to be associated with "re-starting".

1. INTRODUCTION

Accident statistics have contained evidence over many years¹ that drivers' experience and age influence accident involvement. Garwood¹ analysed the frequency with which various driving faults were reported. Young drivers were more often associated with reports of inexperience, skidding, excessive speed, fatigue and being dazzled. Older drivers were more particularly associated with illness or physical defects, and errors in junction movements. Overall, Munden² found that drivers in the older age groups seem to be safer than had been thought. This report gives the results of recent research on accidents at samples of junctions, one objective of which is to determine whether particular groups of road users have above-average risk of accident involvement.

2. COMPOSITION OF THE SAMPLE OF JUNCTIONS

The circumstances of junction accidents described in original Police reports have been studied for about 1500 accidents involving 2,737 drivers (including riders of motorcycles); their ages were recorded as if accurate to one year. The drivers have been grouped as follows according to the type of junction:

- (1) 554 drivers involved in accidents at 12 junctions controlled by traffic signals, located in outer divisions of the London Metropolitan Police District, on roads with speed limit 50-70 mile/hour;
- (2) 1,470 drivers involved in accidents at a sample of urban major/minor junctions, comprising -

- (a) approximately 20 junctions in the same outer London areas as (1), and also on roads with speed limit 50-70 mile/hour. At these; 371 drivers approached the junction along a major road, and 124 drivers approached the junction along a minor road;
- (b) 78 junctions in Cheltenham, Gloucester, Oxford, Portsmouth, Southampton and Swindon, on roads subject to speed limit 30-40 mile/hour.

At these:

685 drivers approached the junction along a major road, and
290 drivers approached the junction along a minor road;

(3) 713 drivers involved in accidents at a sample of more than 50 rural major/minor junctions in the Counties of Berkshire, Hampshire, Surrey, Wiltshire, Somerset, Oxford, Buckingham, Huntingdon, Warwick, Fife and York, on roads with speed limit 50-70 mile/hour.

At these:

365 drivers approached the junction along a major road, and
348 drivers approached the junction along a minor road.

The overall distribution of ages is given in Table 1. Two main features stand out. Firstly, whereas only 12 per cent of all the drivers and riders involved in all the groups were age 55 or over, in the case of the minor road approaches to the rural junctions 42 per cent were age 55 or over, and for urban junctions with the lower speed limits, 17 per cent on the minor roads were age 55 or over. The other main feature of the distribution of ages was a peak number of younger drivers and riders (under age 25) on the major road approaches to urban major/minor junctions, whatever the speed limit.

3. DIFFERENCES OF ACCIDENT INVOLVEMENT WITHIN THE SAMPLE

3.1 *Driver age*

In Table 2 the data from Table 1 have been grouped to enable comparison to be made with available data on the amount of car travel³. The numbers of motorcyclists involved are shown separately, because they formed a large proportion of involved drivers in Southern urban accidents in particular, and most of them were under 25 years of age. This breakdown indicates that the peaks in the number of under 25's on the major road approaches to urban junctions were largely accounted for by motor cycle riders.

Comparison of the involvement of vehicle drivers in accidents, with the estimated total car travel, indicates in total above-average involvement for the group of drivers under 25 years (x2.0) and for the group of drivers of 65 years and over (x1.3). The distribution of ages for minor road approaches to rural junctions differs greatly from that for all the other groups, showing that accident involvement increases with driver age, over age 45, to twice the expected involvement in the range 55-64 years, and to nearly five times that expected for drivers of 65 and over. (All these comparisons were statistically significant).

3.2 *Time of day and driver age*

To examine the difference in accident involvement at different times of day, the data are regrouped in Table 3 for drivers under 25, in the range 25-59, and 60 years and over. For all groups the frequency of accident involvement was greatest between 3 pm and 6 pm, corresponding to late afternoon and the main evening traffic peak; but it is notable that for drivers under 25 or over 60 nearly as many accidents occurred between noon and 3 pm. This is the period including travel at lunchtime and immediately afterwards, when traffic flows are generally much lower than during the evening peak.

The time of the accident was between 6 pm and midnight for 36 per cent of the drivers under 25 years, but for 24 per cent of drivers aged 25-59, and only 19 per cent of drivers aged 60 and over. At traffic signals more than half the drivers under 25 years were involved during the hours of mainly social travelling, in the evening and after midnight.

3.3 *Accidents at junctions on dual carriageways*

For the accidents at rural junctions (sample 3) further breakdown indicates that the concentration of involvement of older drivers at the minor road approaches is intensified when results for junctions on rural dual carriageways are compared with those for rural single carriageway roads. About 60 per cent of all minor road drivers involved in accidents at the dual carriageway junctions were 55 years or over, and as shown in Figure 1, more than 90 per cent of drivers aged 60 or over were on the minor road approaches to the dual carriageways. Table 4 has been compiled to set this observation in perspective on a national scale. It covers all injury accidents reported at junctions on dual carriageways in Great Britain between 1.1.70 and 31.12.71. Information is contained in each accident report as to whether or not each involved driver was reported to have disobeyed a junction control, and an estimate of his age is also given.

The total number of drivers involved was 30,146, including drivers on major roads. The records for the national accident data do not specify whether vehicles involved were on the major or minor road, but some indication is given by the reporting of whether a driver disobeyed the junction control. Of the 30,146 drivers concerned, 2,540 were so reported. At roundabouts, the proportion of drivers so reported was small, and there was no noticeable effect related to driver age. At T junctions, staggered junctions, Y junctions and crossroads taken together, the proportion of drivers reported to have disobeyed a junction control was higher in the higher age groups, and this effect was greater in non-built-up areas than in built-up areas.

Considering all the drivers involved in accidents at the non-roundabout junctions on dual carriageways, 3 per cent in built-up areas and 5 per cent in non-built-up areas were reported to be over 64 years. Considering all drivers reported to have disobeyed junction control, and so by inference known to have approached on minor roads, 6 per cent in built-up areas and 16 per cent in non-built-up areas were reported to be over 64 years.

There is no reason to suppose that older drivers prefer to drive on minor roads, and so would be more likely to be on the minor road approaches to junctions. Where attempts have been made to estimate the ages of drivers by direct observation, no such bias has been found⁴.

For comparison, approximately 4 per cent of all car travel is estimated to be attributable to drivers over 64 years.

4. DISCUSSION

Young drivers were most frequently involved in the junction accidents when travelling on the major roads, particularly at night, in urban areas, and when riding motorcycles. The present work supports the conclusion that their frequency of accidents depends markedly on their having greater exposure to accident risks than older drivers, because of their use of motorcycles, and driving at night³.

The risk of an accident at the junction of a minor road with a rural major road increases considerably with age of driver, and is greatest at junctions with dual carriageways. The Police reports suggest that the particular situation preceding these accidents is the approach of a driver along a minor road, who usually stops at the junction, but then misjudges or fails to perceive a vehicle on the major road, and restarts into its path. Some evidence on this has been reported earlier⁵.

Although the problem has been defined by statistical analysis of driver ages, it is not yet known whether there are underlying factors which happen to be correlated with driver age. Only a small percentage of all accidents is currently of this type, but the problem is of significance for junction improvements and future design, since large capital expenditure will be made on the network of trunk and primary roads. The national statistics suggest that the relative accident risks for older drivers are lower at conventional roundabouts than at other types of junction in non-built-up areas, indicating the benefit to the older driver of the priority-to-the-right rule.

Further research is desirable into the apparent relation between the errors made by drivers on the minor roads (particularly at T-junctions and crossroads in non-built-up areas), and age-dependent deficiencies of human performance.

5. ACKNOWLEDGEMENTS

The work described in this report was carried out in the Accident Investigation Division of the Safety Department of the TRRL. Access to accident descriptions in original Police reports was given by the Chief Constables of the Thames Valley, Hampshire, Surrey, Wiltshire, Somerset and Bath, Mid-Anglia, Fife and West Yorkshire constabularies, and the Metropolitan Police.

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TABLE 1

Reported ages of 2737 drivers involved in junction accidents

Age Range	Traffic Signals	Major/minor junctions					
	Outer London (50-70 mph roads)	Outer London (50-70 mph roads)		Other Southern Towns (30-40 mph roads)		Rural Junctions	
		Major road Approach	Minor road Approach	Major road Approach	Minor road Approach	Major road Approach	Minor road Approach
	(numbers of drivers)						
under 20	44	39	8	132	23	31	16
20-24	84	58	15	128	48	63	35
25-29	74	41	18	87	33	50	21
30-34	60	37	16	68	32	42	24
35-39	64	46	15	62	17	46	16
40-44	53	37	14	44	31	39	22
45-49	43	36	12	53	26	34	33
50-54	63	42	14	35	29	19	36
55-59	33	17	6	31	17	21	41
60-64	19	12	3	25	16	13	44
65-69	13	3	1	13	15	5	29
70-74	4	2	1	5	1	2	17
75-79		1	1	1	1		10
80-84				1	1		3
85-89							1
Total	554	371	124	685	290	365	348

(percentages)

under 20	8) 23	10) 26	6) 18	19) 38	8) 25	8) 25	5) 15
20-24	15) 23	16) 26	12) 18	19) 38	17) 25	17) 25	10) 15
25-29	13) 24	11) 21	15) 28	13) 23	11) 22	14) 25	6) 13
30-34	11) 24	10) 21	13) 28	10) 23	11) 22	11) 25	7) 13
35-39	12) 22	12) 22	12) 23	9) 15	6) 17	13) 24	5) 11
40-44	10) 22	10) 22	11) 23	6) 15	11) 17	11) 24	6) 11
45-49	8) 19	10) 21	10) 21	8) 13	9) 19	9) 14	9) 19
50-54	11) 19	11) 21	11) 21	5) 13	10) 19	5) 14	10) 19
55-59	6) 9	5) 8	5) 7	5) 8	6) 11	6) 10	12) 25
60-64	3) 9	3) 8	2) 7	3) 8	5) 11	4) 10	13) 25
65-69	) 3	) 1	) 2	2) 3	) 5	) 2	8) 13
70-74	) 3	) 1	) 2	1) 3	) 5	) 2	5) 13
75-79	-))))	-)
80-84	-	) <1	) <1	) <1	) 1	-	) 4
85-89	-))))	-)
Total	100%	100%	100%	100%	100%	100%	100%

TABLE 2

Distribution of drivers and riders involved in junction accidents, and estimated car travel, by age groups

Age Group	Outer London Traffic Signals		Outer London (50-70 mph roads)				Other Southern Towns (30-40 mph roads)				Rural Junctions				Total (excluding motor cyclists)	Percent- age of all car travel (Est from Ref.3)
	Motor Cy- clist	Other driver	Major		Minor		Major		Minor		Major		Minor			
			Motor Cy- clist	Other driver	Motor Cy- clist	Other driver	Motor Cy- clist	Other driver	Motor Cy- clist	Other driver	Motor Cy- clist	Other driver	Motor Cy- clist	Other driver		
NUMBERS																
under 25	19	109	33	64	3	20	100	160	9	62	19	75	3	48	538	
25 - 34	4	130	6	72	1	33	12	143	3	62	3	89	0	45	574	
35 - 44	2	115	3	80	1	28	15	91	2	46	3	82	0	38	480	
45 - 54	3	103	6	72	0	26	16	72	1	54	3	50	0	69	446	
55 - 64	1	51	3	26	0	9	8	48	1	32	1	33	0	85	284	
65 - 74	0	17	0	5	0	2	6	12	0	16	0	7	0	46	105	
75 and over	0	0	0	1	0	1	0	2	0	2	0	0	0	14	20	
TOTAL	29	525	51	320	5	119	157	528	16	274	29	336	3	345	2447	
PERCENTAGES																
under 25	67	20.8	65	20.0	(60)	16.8	64	30.3	56	22.6	67	22.3	(100)	13.9	22.0	11.0
25 - 34		24.8		22.5		27.7		27.1		22.6		26.5		13.1	23.5	23.7
35 - 44		21.9		25.0		23.6		17.2		16.8		24.4		11.0	19.6	27.0
45 - 54		19.6		22.5		21.8		13.6		19.7		14.9		20.0	18.2	22.1
55 - 64		9.7		8.1		7.6		9.1		11.7		9.8		24.6	11.6	12.4
65 and over		3.2		1.9		2.5		2.7		6.6		2.1		17.4	5.1	3.8
TOTAL		100		100		100		100		100		100		100	100	100

TABLE 3

Time of day and driver age
(numbers of drivers)

Hours com	Outer London Traffic Signals	Outer London (50-70 mph roads)		Other southern towns (30-40 mph roads)		Rural Junctions		Total
		Major road Approach	Minor road Approach	Major road Approach	Minor road Approach	Major road Approach	Minor road Approach	
<u>Drivers under 25</u>								
00 - 02)	) 18	) 14	) 2	) 9	) 0	) 4	) 5	) 52
03 - 05)))))))))
06 - 08	15	12	0	26	9	5	5	72
09 - 11	7	12	3	32	5	6	4	69
12 - 14	19	15	7	47	12	23	8	131
15 - 17	15	18	4	48	20	25	11	141
18 - 20	32	13	2	45	10	24	12	138
21 - 23	22	13	5	53	15	7	6	121
Total	128	97	23	260	71	94	51	724
<u>Drivers 25 - 59</u>								
00 - 02)	) 30	) 10	) 4	) 6	) 4	) 1	) 1	) 56
03 - 05)))))))))
06 - 08	54	40	11	43	21	22	16	207
09 - 11	84	45	14	62	24	39	31	299
12 - 14	62	45	16	74	44	44	38	323
15 - 17	63	70	25	95	41	88	63	445
18 - 19	47	24	13	55	30	47	33	249
21 - 23	50	22	12	46	21	10	11	172
Total	390	256	95	381	185	251	193	1751
<u>Drivers 60 & over</u>								
00 - 02)	) 0	) 0	) 0	) 0	) 0	) 0	) 0	) 0
03 - 05)))))))))
06 - 08	2	1	0	9	4	3	9	28
09 - 11	10	2	1	6	9	4	13	25
12 - 14	10	5	1	13	8	7	25	69
15 - 17	8	3	3	9	6	5	37	71
18 - 20	4	6	0	4	0	0	20	34
21 - 23	2	1	1	3	7	1	0	15
Total	36	18	6	44	34	20	104	262
TOTAL	554	371	124	685	290	365	348	2737

TABLE 4

Reported action of all drivers involved in accidents at T junctions, Y junctions, staggered junctions, crossroads and roundabouts, on dual carriageways, 1970-1971

DRIVER AGE GROUP	T junctions, Y junctions Staggered junctions and crossroads			Roundabouts			
	Total number of drivers involved	Reported action "disobeyed junction control"		Total number of drivers involved	Reported action "disobeyed junction control"		
		Number	Per cent		Number	Per cent	
Under 25	5821	442	7.6	939	42	4.5	BUILT UP AREAS
25-34	5070	348	6.9	700	38	5.4	
35-54	6328	500	7.9	839	38	4.5	
55-64	1682	170	10.1	212	17	) 7.8
65 and over	601	94	15.6	57	4		
not known	372	29		61	3		
Total	19874	1583		2808	142		
Under 25	1381	147	10.6	367	15	4	NON BUILT UP AREAS
25-34	1551	128	8.2	410	10	2.5	
35-54	2076	228	11.0	399	22	2.5	
55-64	680	123	18.1	118	3	) 5
65 and over	338	121	35.8	44	5		
not known	70	11		30	2		
Total	6096	758		1368	57		

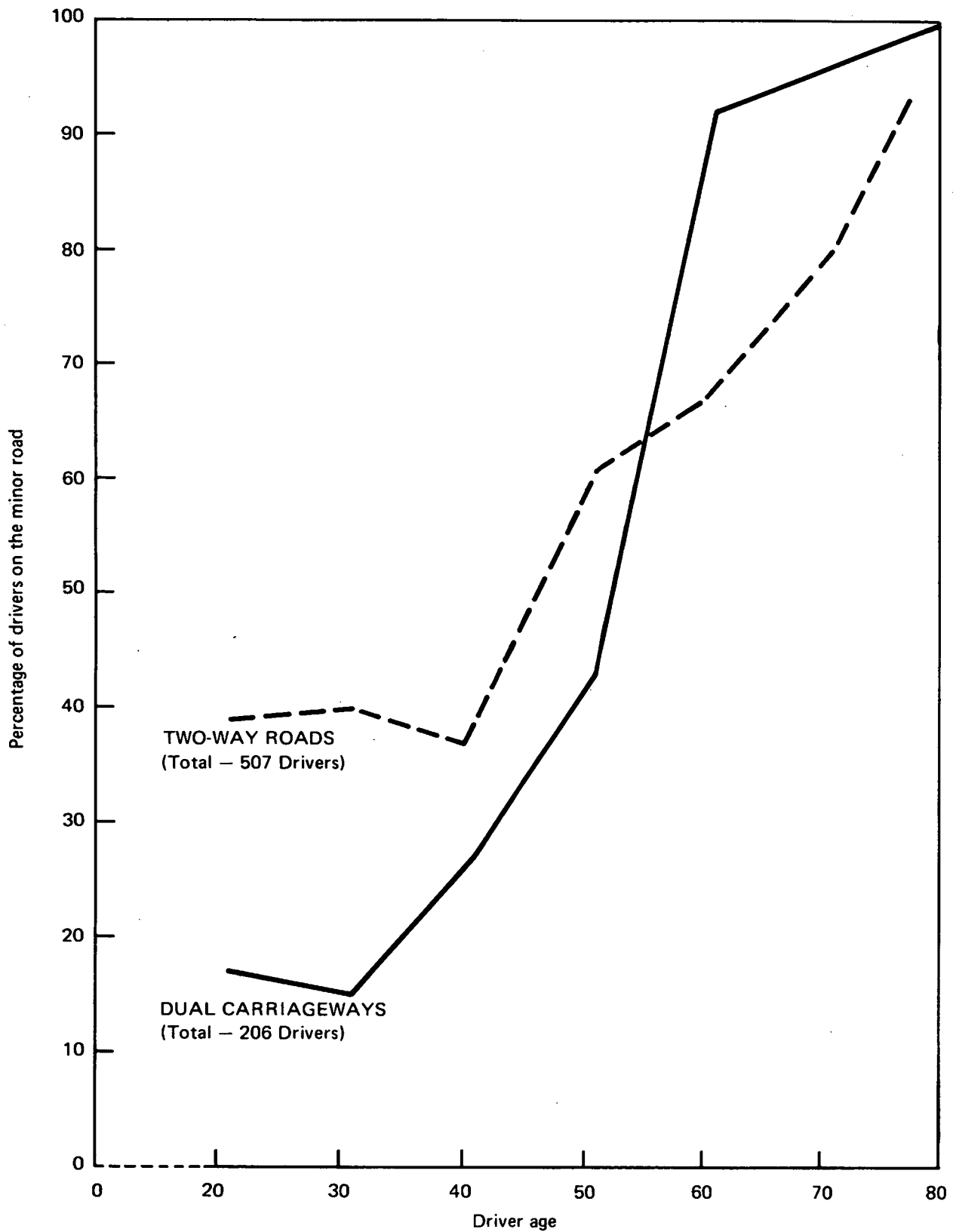


Fig. 1 DRIVERS INVOLVED IN ACCIDENTS AT RURAL JUNCTIONS

Showing the increase with driver age of the percentage of involved drivers who approached on the minor road

ABSTRACT

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In general, accident involvement at junctions related to the amount of car travel was above average for the under 25 age group and for those of 65 years and over. At major/minor junctions there was a marked trend for accident involvement to increase with age on the minor road approaches in rural areas. Older drivers were also more at risk though to a lesser extent on the minor road approaches in urban areas subject to speed limits of 30 or 40 mile/hour. The age factor was most marked for dual carriageways and the difficulties older drivers experience seem to be associated with "re-starting".

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