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BICYCLE RESEARCH REPORT NO. 37

June 1993

SAFETY FOR CYCLISTS AT URBAN ROAD JUNCTIONS

by Robert Schnüll, Dankmar Alrutz and others

A new study has shown that cycleways are particularly hazardous at junctions

The Key Facts

At junctions, cyclists are considerably safer on the road or - except at roundabouts - on cycle lanes than on a cycleway. This is the conclusion of a study commissioned by the German Federal Highways Institute on the behaviour of cyclists continuing straight ahead on major urban roads.

Contents

A study carried out for the German Federal Roads Institute (BASt) by Hanover University and Planning Office (PGV) contains important findings on „the behaviour of and reaction to cyclists continuing straight ahead while proceeding along major urban roads in built-up areas“. Model calculations were made on the safety of cyclists and ease of movement for motor traffic, analyses from Germany and other countries were evaluated, and empirical studies made of 44 different stretches of road in 7 German cities (Bonn, Brunswick, Bremen, Darmstadt, Hanover, Münster and Rosenheim).

The accident risk for cyclists at junctions is considerably lower when they ride on the road or - except at roundabouts - on cycle lanes (ie. special lanes for cyclists marked off from the road by a continuous stripe) than on cycleways with marked-off crossings. Police records show that in general 50% to 60% of all accidents to cyclists occur at junctions, but the proportions of junction accidents is significantly higher on roads with cycleways than on those without - see Table 3.1.

On roads with cycleways almost all cyclists involved in accidents were riding straight ahead; this also includes those later intending to turn left. Cyclists using the left-hand side of the road, whether legally or illegaly, are particularly at risk - see Table 3.3. On roads with cycleways, the proportion of cyclists wholly or partly to blame for accidents was significantly lower than on roads without cycleways. Lorries are almost twice as often involved in cycle accidents at junctions with cycleways as at junctions without them - see Table 3.4.

At junctions without signal control, the risk to cyclists continuing straight

ahead is considerably lower on the road or on cycle lanes than on cycleways - see Fig 5.13. Cycleway crossings can be made a great deal safer if they are differently surfaced at the junction area rather than simply being marked off by lines.

Source

„Sicherung von Radfahrern an städtischen Knotenpunkten“ von Robert Schnüll, Johannes Lange, Ingo Fabian, Matthias Kölle und Fabian Schütte, Institut für Verkehrswirtschaft, Straßenwesen und Städtebau der Universität Hannover sowie Dankmar Alrutz, Hans W. Fechtel, Jörg Stellmacher-Hein, Thomas Bruckner und Helga Meyhöfer, Planungsgemeinschaft Verkehr, Hannover. Bericht zum Forschungsvorhaben 8925 der Bundesanstalt für Straßenwesen. Forschungsberichte der Bundesanstalt für Straßenwesen Bd. 262, Bergisch- Gladbach 1992. ISSN 0173-7066

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Institut für Verkehrswirtschaft, Straßenwesen und Städtebau, Universität Hannover, Prof. Dr.-Ing. R. Schnüll, Appelstr. 9a, Tel. 0511/762-2802; Planungsgemeinschaft Verkehr, Hannover, Dipl.-Ing. D. Alrutz, Große Barlinge 72a, W-3000 Hannover 1; Bundesanstalt für Straßenwesen (Projektbetreuung S. Metz-Dörner, W. Kockelke), Brüderstr. 53, W-5060 Bergisch-Gladbach 1, Telefon 02204/43-0; Telefax 02204/43-832

All illustrations from

BASt (Hg.) Forschungsbericht 262 / -Research Report No. 262 of the German Federal Highways Institute

Table 3.1: Accidents at junctions as a proportion of all cycle accidents on roads with and without cycleways.

		Proportion of junction accidents on:		
City	Population as on 1.1.1986	Roads with cycle-ways (%)	Roads without cycle-ways (%)	Year(s) in question
West Berlin	1 860 084	63.4	52.7	1986
Hanover	508 298	62.0	47.0	1985
Brunswick	248 001	59.0	38.2	1981-86
Darmstadt	134 181	61.5	53.2	1987

Source: Berlin (38); Hanover and Brunswick - own research. Darmstadt: police report 1987

Table 3.3: Cycle accidents recorded by police at junctions with and without cycleways, classified according to major accidents type. (Figures in %; cyclists riding on left given in brackets).

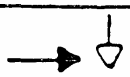
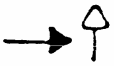
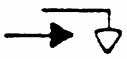
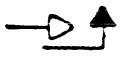
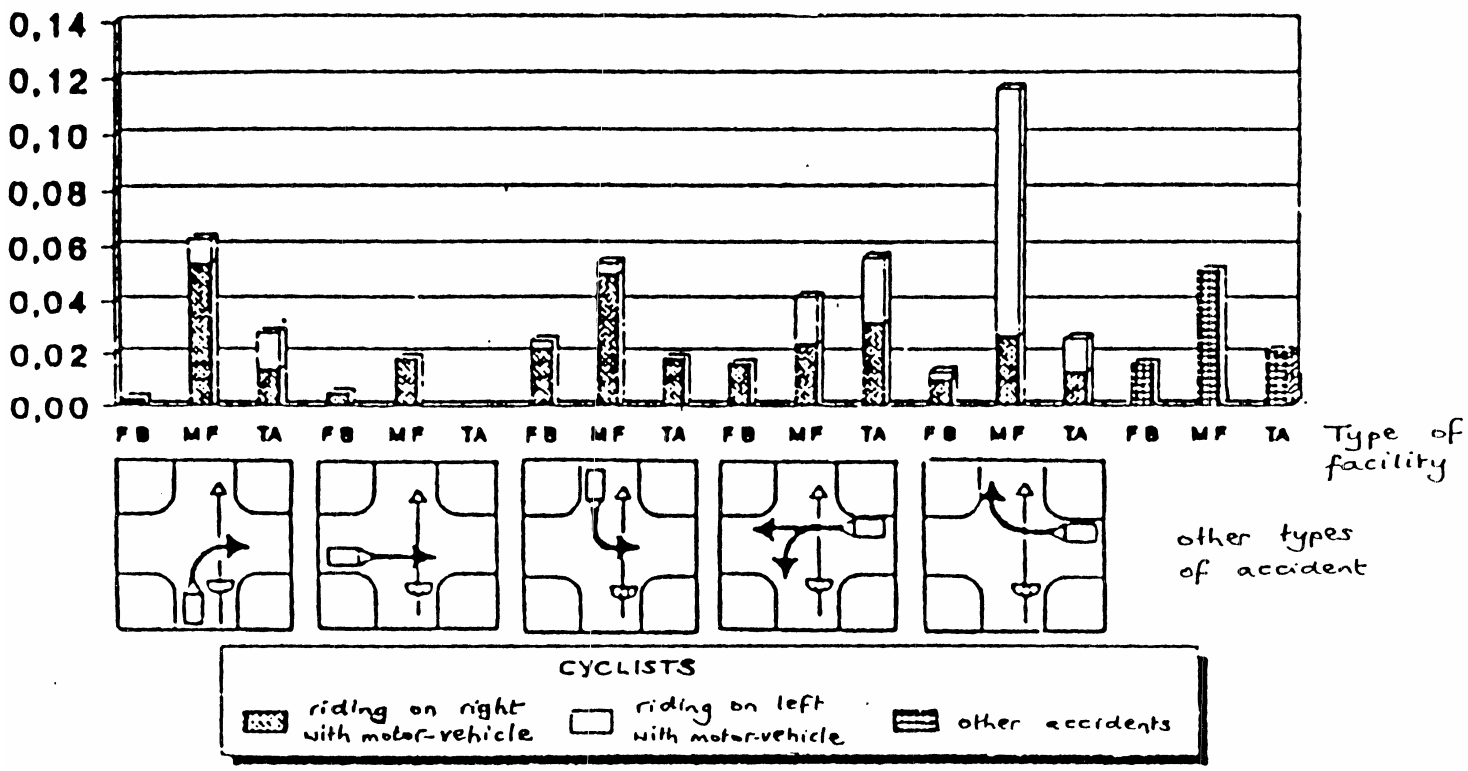
Source: / Accident type	with cycleway		without cycleway	
	ALRUTZ/ MEEWES [5] %	KELLER/ LANG [30] %	ALRUTZ/ MEEWES [5] %	KELLER/ LANG [30] %
Cyclists riding straight ahead				
	43 (35)	38 (28)	18	21
	17 (4)	16 (2)	21	27
	23 (6)	29 (5)	9	8
	6 (3)	17 (-)	14	24
	2 (-)	-	8	-
Cyclists turning left				
	2 (-)	-	5	12
	1 (-)	-	10	8
Other accidents	5 (2)	-	15	-
No. of accidents	n=261 100%	n=221 100%	n=468 100%	n=169 100%

Table 3.4: Accidents at junctions involving cyclists, classified according to other party involved in accident. Source: (38)

Other party involved in accident	Junctions with cycleway %	Junctions without cycleway
Saloon or hatchback	73.5	79.0
heavy goods vehicle	7.1	3.9
cyclist	3.7	2.4
moped, motor-assisted bicycle, motorcycle	2.6	2.2
pedestrian	7.4	4.4
no other party	5.7	7.8
others	0.1	0.3
total	100.0% n=1057	100,0% n=955

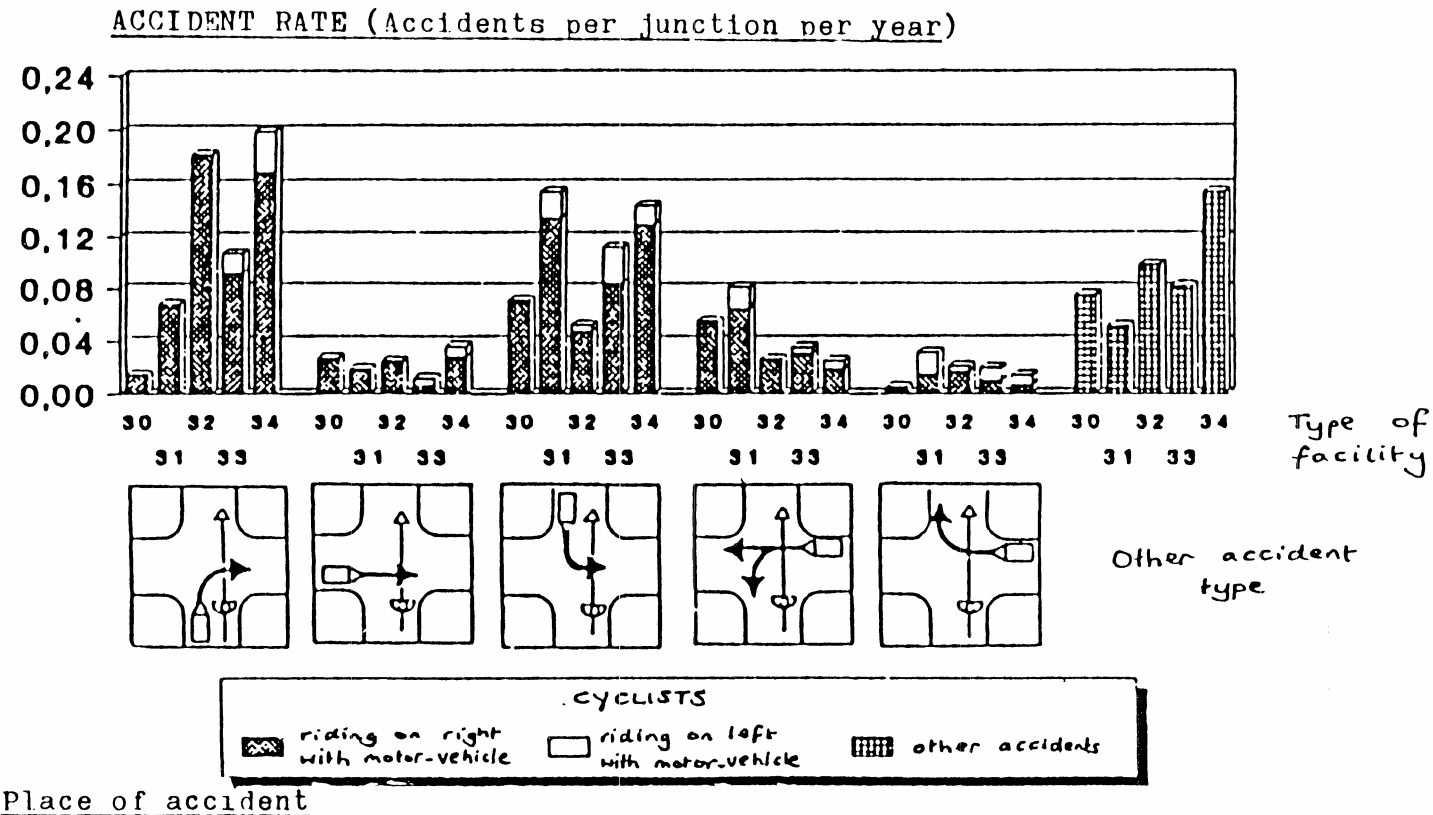
Fig 5.13: Accident rates at junctions without signal control, according to place and type of accident



Place of accident

FB	road or cycle lane	148	junctions, 28 accidents
MF	cycleway with crossing	350	junctions, 326 accidents
TA	cycleway with different surface	75	junctions, 21 accidents

Fig 5.23: Accident rates at signal controlled junctions according to clearance and to accident type.



Place of accident

30	road	72 junctions, 51 accidents
31	cycle lane	26 junctions, 24 accidents
32	cycleway with crossing, small clearance	79 junctions, 93 accidents
33	cycleway with crossing, medium clearance	69 junctions, 77 accidents
34	cycleway with crossing, large clearance	46 junctions, 89 accidents

Fig 5.28: Accident rates on roads permitting right turn, classified according to type of facility.

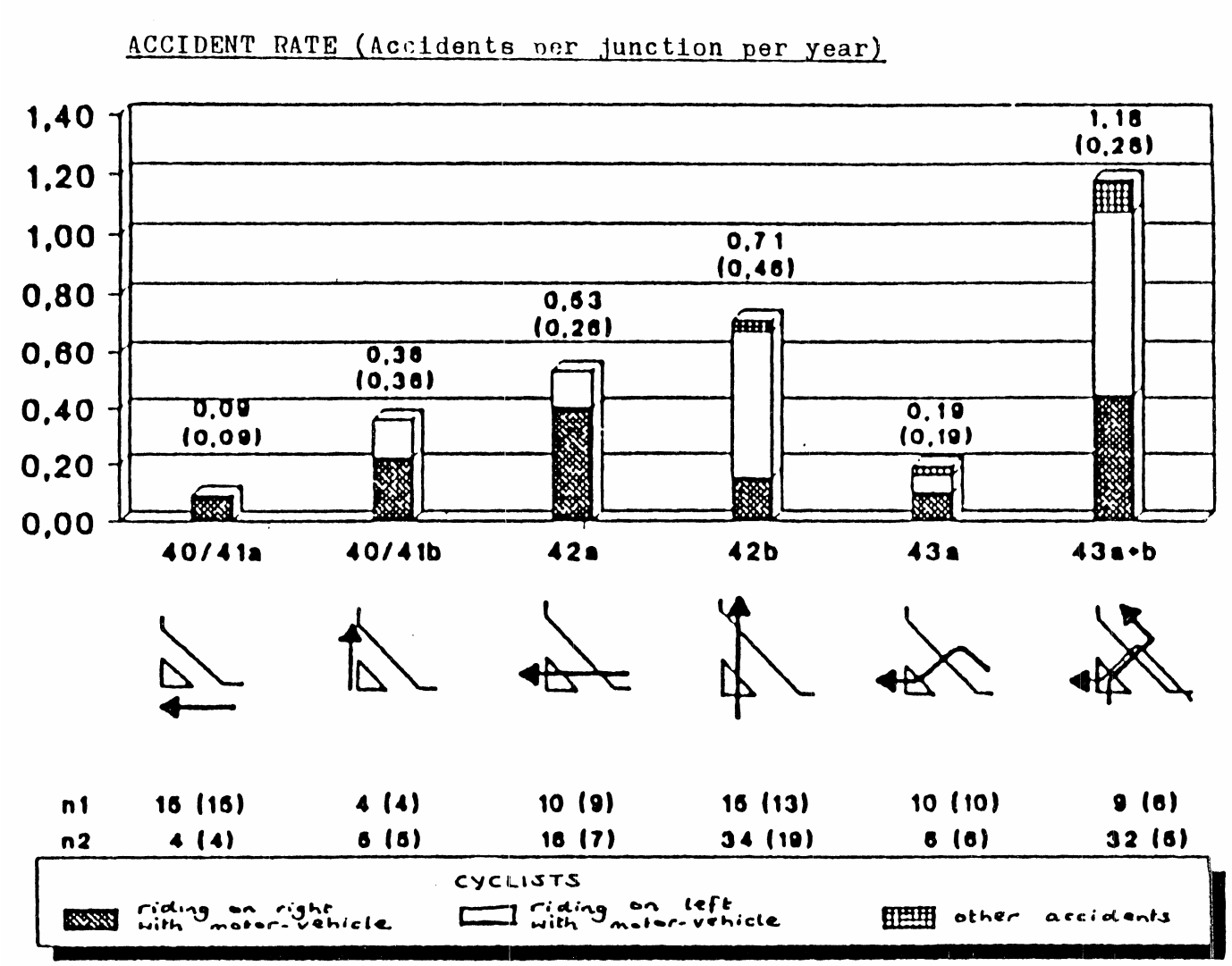
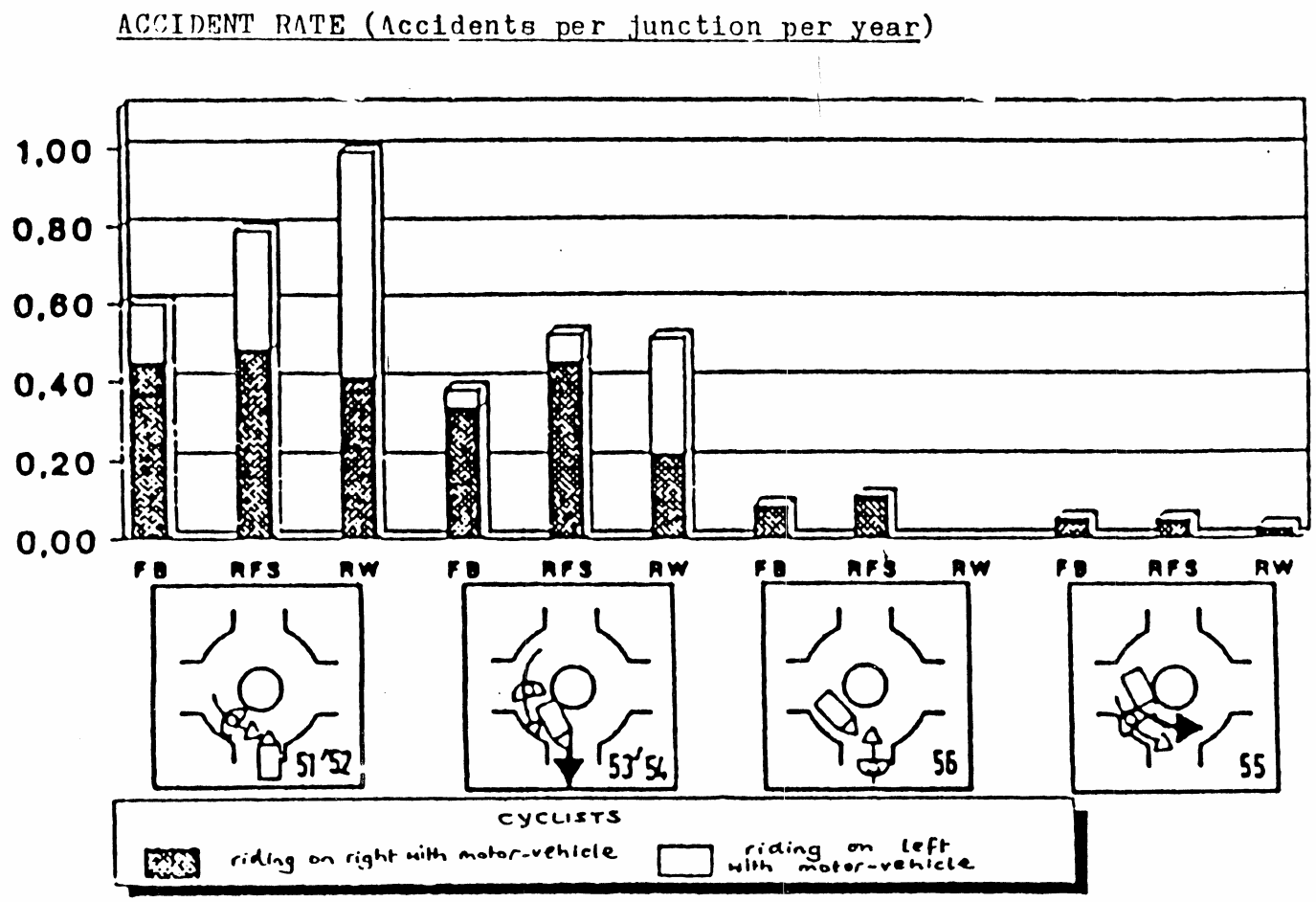


Fig 5.35: Accidents for major types of accident at roundabouts with various cycle facilities (all accidents)



Place of accident:

FB:	no cycle facility, type 50:	29 junctions, 108 accidents
RFS	cycle lane, type 51:	24 junctions, 111 accidents
RW	cycleway, type 52:	14 junctions, 68 accidents