REPORT OF COMMITTEE ON TRAFFIC

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A STUDY OF TRAFFIC LAW VIOLATIONS

BY WILLIAM A. VAN DUZER

SYNOPSIS

This study of traffic practices at a number of intersections in Washington, D C was undertaken for the purpose of accumulating data upon which analyses could be made of the reasonableness or unreasonableness of various regulations Data were secured at four intersections controlled by traffic lights, three at uncontrolled intersections, and three at intersections with stop signs for through traffic on one street The law observance was best (85 per cent) at light controlled intersections and poorest (51 per cent) at the stop-street intersections Vehicle speeds were studied on uncontrolled secondary streets, on arterial streets protected by stop signs and on streets controlled by traffic lights A study of the data indicates a reasonable speed which a large majority of the drivers will be willing to observe under the different conditions If the speed limits are set on these bases, it may be possible to curb the small number of dangerous drivers who exceed them If the limit is unreasonably low, the violators are so numerous that the police cannot cope with them

With the increase in traffic, there has grown the need for governing laws and regulations. The list of regulations has now grown to considerable length While the only excuse for traffic regulations is the protection of the driver and the pedestrian or the relief of traffic congestion, there has been little study of the rules to see if they accomplish the desired results The lack of a real reason for some rules becomes obvious as soon as the practices of different communities are compared As one instance, in some cities it is required in a left turn to pass to the left of the center point of the intersection In others, it is strictly required that the driver in making the left turn pass to the right of the button or other marker on the center point The decision as to which rules are to be enforced usually depends only on the opinion of the local officials

With the idea of getting information on which regulations of traffic could have a sound basis, a study of violations of the present regulations was begun in the summer of 1932 by the traffic department of Washington, D. C It seems obvious that if any regulation is continually

violated by most of the drivers, there is probably something wrong with it At least, there is small chance of being able to enforce such a regulation With this in mind, a study is now being made to see which regulations are obeyed and which violated and by what percentage of the drivers To get the information, one observer and one recorder are stationed at an intersection and the data are entered on prepared blanks which cover ten of the most important regulations Traffic is checked for one hour to two hours until a considerable number of vehicles have passed Data gathered at several typical intersections appear in Tables I, II and III Since it early appeared that the speed limit regulation was one of those most frequently violated, special observations of speed between intersections were made on various streets These data appear in Table IV and Figures 1 and 2 For measuring the speed, a Speed Detector developed by the Eno Foundation was used in conjunction with a stop watch The device is a simple L-shaped box with the ends of the L open A mirror of about 5 x 7 inches is placed in the corner of the box so that the light which enters one opening will be reflected out the other opening The box is placed on a tripod beside the road with one line of sight perpendicular and one parallel to the road When a car passes the box, the observer stationed at a convenient distance down the road can see the flicker in the mirror and start his watch, then stop it as the car passes the observer

In Table I are shown data for intersections controlled by traffic lights, Table II covers uncontrolled intersections with approximately equal traffic on each street, Table III covers intersections which have stop signs on the less important streets A study of the tables reveals some interesting facts At light-controlled intersections, 85 per cent of the 12,000 drivers checked were driving in accordance with the regulations At uncontrolled intersections, 70 per cent of 6,000 were driving in accordance with the regulations At stop-street intersections, 51 per cent of 3,700 did not violate the rules The latter two percentages were decreased because of more drivers exceeding the speed limit If allowance is made for the percentage over the speed limit, all three cases show from 80 to 85 per cent driving lawfully It is thought that the allowance for the violation of the speed limit of 22 miles per hour can be made as the accident records do not show such a violation to be the cause of accidents at the particular corners studied This figure agrees with the record of accidents in the city which shows that approximately 85 per cent of the drivers have no serious trouble but that the other 15 per cent furnish the repeaters It has also been shown by several years records in Connecticut that the accidents there are confined to approximately 15 per cent of the drivers licensed by the state

High up in the list of causes of accidents in Washington is failure to yield right of way These tables show that from 5 to 13 per cent of the drivers fail to yield right of way to the other vehicle or to pedestrians.

TABLE I

RECORD OF VIOLATERS OF TRAFFIC REGULATIONS AT INTERSECTIONS CONTROLLED BY TRAFFIC LIGHTS

6 hour count, September 2, 1932, Washington, D C

	7th and New York N W		9th and New York N W		7th and Mass N W		9th and Mass N W		Totals	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Exceeding speed limit	73	2 41	48	1 85	64	1 90	15	0 54	200	1 66
Failing to yield right of way (to vehicles)	86	2 84	20	0 70	136	4 00	107	3 84	349	2 90
Failing to yield right of way (to pedestrians)	190	6 28	140	4 92	113	3 36	88	3 16	531	4 42
Cutting Corner	56	1 85	16	0 56	87	2 58	52	1 87	211	1 74
Driving through safety zone										
Turning from wrong lane	18	0 59	9	0 35	11	0 33	4	0 14	42	0 35
Driving on left of center line	21	0 69	6	0 23	18	0 54	2	0 07	47	0 38
Entering on amber signal										
Entering on amber-green, leave on red	43	1 42	81	3 12	143	4 25	42	1 51	309	2 56
Entering on red signal	16	0 53	46	1 77	77	2 28	31	1 11	170	1 41
Total Violators	503	16 5	366	13 45	649	19 3	341	12 2	1,859	15 42
Driving Lawfully	2532	83 5	2507	86 55	2713	80 7	2444	87 8	10,196	84 58
Total through Intersection	3035	100 0	2873	100 0	3362	100 0	2785	100 0	12,055	100 00

To eliminate this type of driver, it seems some test will be necessary which will reveal his social attitude. Since this has not been found feasible, the way out may be to revoke his license after an accident has occurred for which he is responsible.

A dangerous practice at light controlled intersections is entering late on the amber signal or on the red signal Table I shows 309 entering on the amber late enough so that they left on the red signal There were 170 who entered on the red signal While the total is only four per cent of the total traffic, it constitutes 479 cases of potential accidents during a six hour period of observation on only four intersections

Entering a stop street without due care is also a dangerous practice In Table III, it is shown that of 1184 entering the stop streets, 526 (44

TABLE II

RECORD OF VIOLATORS OF TRAFFIC REGULATIONS AT UNCONTROLLED INTERSECTIONS

5½ hour count, Washington, D C

	14th and Constitution N W		15th and Constitution N W		15th and E Sts N W		Totals	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Exceeding speed limit	53	3 8	460	12 9	188	18 2	701	11 7
Failing to yield right of way (to vehicles)	154	10 9	260	7 3	17	1 7	431	7 2
Failing to yield right of way (to pedestrians)	25	1 8	292	8 2	24	2 4	341	5 7
Cutting corner	20	1 4	90	2 6	45	4 4	155	2 6
Turning from wrong lane	15	1 1	11	0 31	6	0 6	32	0 5
Driving left of center line	12	0 9	26	0 73	5	0 5	43	0 7
Passing car in intersection	45	3 2	37	1 04	7	0 7	89	1 5
Total Violators	324	23 1	1176	33 0	292	28 6	1792	29 9
Driving Lawfully	1082	76 9	2388	67 0	727	71 4	4197	70 1
Total through intersection	1406	100 0	3564	100 0	1019	100 0	5989	100 0

per cent) made a complete stop, 373 (32 per cent) made a partial stop under control, and 285 (24 per cent) entered without stopping Hence in this case, 76 per cent of the drivers were careful and 24 per cent were potential trouble makers. Isn't it possible that STOP signs on arterial highways and streets should be replaced with signs such as CAUTION —THROUGH TRAFFIC? When 56 per cent of the drivers disobey a STOP sign, is such a sign desirable? The 44 per cent of the drivers who made a complete stop would obey a CAUTION sign The 32 per cent who made a partial stop would continue so with a CAUTION sign and would not be breaking the law as they now do The 24 per cent who pay no attention to a STOP sign will not stop for any other sign short of the traffic officer's whistle

The results of the special study of vehicle speeds are given in Table IV On the two secondary streets shown, there is little tendency to exceed the limit of 22 M P H However, on 7 out of 8 arterial streets where the limit is 22 M P H and STOP signs are on entering streets, the average speed ranges from 25 to 29 M P H Moreover, from 70 to

TABLE III

RECORD OF VIOLATORS OF TRAFFIC REGULATIONS AT INTERSECTIONS WITH STOP SIGNS ON ONE STREET

3½ hour count, Washington, D C

	M and 22nd St N W		Penn and Minn Ave S E		Conn Ave and Tilden, N W		Totals	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Exceeding speed limit	42	2 9	235	17 7	537	52 8	814	21 6
Failing to yield right of way (to vehicle)	45	3 2			20	2 0	65	1 7
Failing to yield right of way (to pedestrians)	114	8 1	6	0 5	11	1 1	131	3 5
Cutting Corner	43	3 0	19	1 4	6	0 6	68	1 8
Driving through safety zone					7	0 7	7	0 2
Turning from wrong lane	5	0 4			3	0 3	8	0 2
Driving left of center line	34	2 4	9	0 7	8	0 8	51	1 3
Passing car in intersection	4	0 3	4	0 3	26	2 6	34	0 9
Partial stop under control at STOP signs	172	12 1	138	10 4	63	6 2	373	9 9
Not stopping at STOP signs	202	14 2	50	3 8	33	3 2	285	7 6
Total Violators	661	46 6	461	34 8	714	70 3	1836	48 7
Driving Lawfully	765	53 4	864	65 2	302	29 7	1931	51 3
Total through intersection	1426	100 0	1325	100 0	1016	100 0	3767	100 0
Drivers entering STOP street								
Complete stop at STOP signs	344	48 0	134	41 6	48	33 4	526	44 5
Partial stop under control	172	24 0	138	42 8	63	43 7	373	31 5
Not stopping at STOP signs	202	28 0	50	15 6	33	22 9	285	24 0
Total Violators	374	52 0	188	58 4	96	66 7	658	55 5
Total Driving Lawfully	344	48 0	134	41 6	48	33 3	526	44 5

94 per cent of the drivers are traveling above the limit and breaking the law A speed diagram for one of these streets is shown in Figure 1 In this it is seen that the average speed is 29 3 M P H If the speed limit were set at 30 M P H on this street, a traffic officer might be able to curb the 30 per cent who exceed that speed but he cannot cope with the 94 per cent who exceed the present limit It is seen that 62 per cent are driving between 20 and 30 M P H. and only 15 per cent go over 35

M P H From the above figures it would seem that a reasonable rate which most drivers would be willing to observe on this street is near the 30 M P H limit On Wisconsin Avenue, a street similar to the one shown in Figure 1 except that the limit is 30 M P H , the average speed

TABLE IV

VEHICLE SPEEDS ON TYPICAL STREETS

Washington, D C

Location	Number of vehicles timed	Miles per hour			Exceeding limit	
		Min	Ave	Max	Number	Per cent
(1) Lanier Place between Adams Mill and Ontario Rds	79	13	23	32	50	63
(1) Holmead Place at Monroe Street	57	10	16	29	3	5
(2) Conn Avenue between Tilden and Upton	110*	15	29	60	103	94
(2) Conn Avenue between Ordway and Porter	62†	17	28	40	56	90
(2) 13th Street between Ingraham and Jefferson	58	15	29	55	48	83
(2) 13th Street between Emerson and Farragut	63	16	28	40	54	86
(2) 13th Street between Quincy and Randolph	67‡	16	25	40	47	70
(2) 13th Street between Euclid and Clifton	68‡	13	23	38	39	57
(2) Georgia Avenue between Taylor and Upshur	127	17	27	50	109	86
(2) Georgia Avenue between Ingraham and Jefferson	147	15	27	40	116	79
(2) Wisconsin Avenue between Fessenden and Garrison	108	15	30	40	45	42
(3) 16th Street between Columbia Rd and Irving	63†	12	23	30	31	49
(3) Rhode Island Ave between N Capitol and 1st, N W	117	14	25	38	80	68
(3) Rhode Island Ave between 1st and 2nd, N W	109	15	25	37	73	67
(3) Rhode Island Ave between 6th and 7th, N W	84	13	23	30	53	63
(3) Rhode Island Ave between 10th and 11th, N W	83	18	26	40	58	70

(1) Secondary Streets

(2) Arterial streets protected by STOP signs

(3) Arterial streets, signalized

Speed limit is 22 M P H at all above locations except Wisconsin Avenue which is 30 M P H

* Every 4th car

† Every 5th car

‡ Every 2nd car

is 30 with only 42 per cent exceeding the speed limit and only 14 per cent over 35 M P H

On the streets controlled by traffic lights timed for 22 M P H , the average speeds are from 23 to 26 although from 49 to 70 per cent of the drivers exceed this limit between intersections The maximum speeds on such streets are almost as high as on arterial streets but in both cases, a very small percentage of the drivers are offenders

Figure 2 shows minimum, maximum and average speeds on typical streets and also on Connecticut Highway, Route 335 The data for the highway were taken from Bulletin No 88 of the Connecticut Motor Vehicle Department A speed diagram for this highway shows that

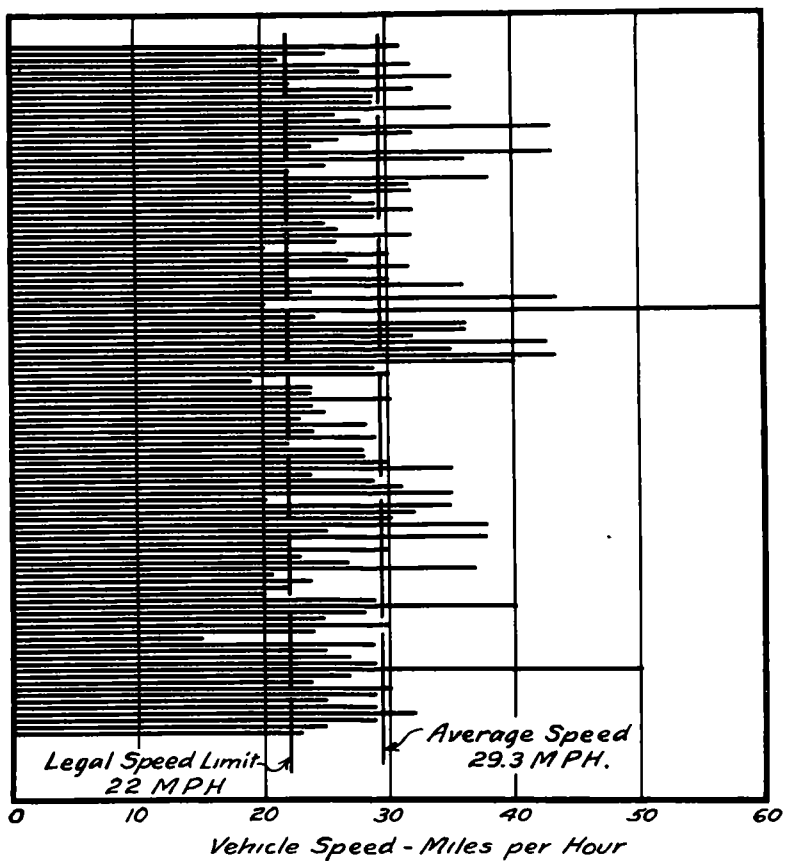

Figure 1. Driving Speeds on Connecticut Avenue between Tilden and Upton Streets, Washington, D C , October 8, 1932

One hundred ten vehicles (every fourth one) were timed, between 9 30 and 10 30 a m , sixty-two per cent were between 20 and 30 M.P H., 31 per cent were over 30 M P H , 15 per cent were over 35 M.P H., 94 per cent were over 22 M P H

62 per cent of the cars traveled at 30 to 40 M P H , 78 per cent under 40 and 93 per cent under 45 M P H This was on a highway which invites high speed

Similar studies of traffic and speed diagrams will give data on which a speed law may be based on any road or street A study of the diagram will show a "reasonable" speed which the majority of the drivers will be willing to observe Then the minority who drive at high speeds may be treated as the dangerous drivers that they are.

In Table V are shown the records of traffic violations for two intersections in Philadelphia, one signalized and one non-signalized From 92 to 95 per cent of the 13,000 drivers were driving properly which is a

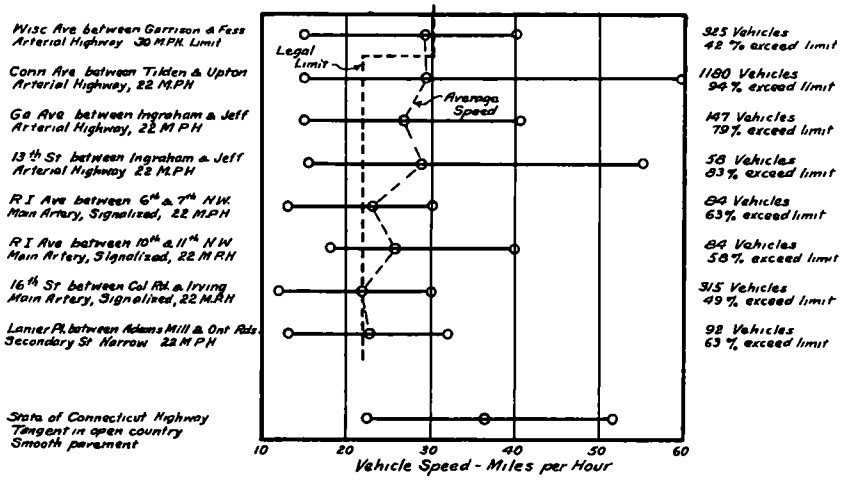

Figure 2. Minimum, Maximum and Average Speeds on Typical Streets, Washington, D. C.

Ninety-two vehicles. Sixty-two per cent between 30 and 40 M.P.H.; 78 per cent under 40 M.P H , 93 per cent under 45 M P H

TABLE V

RECORD OF VIOLATORS OF TRAFFIC REGULATIONS AT ONE SIGNALIZED CORNER AND ONE NON-SIGNALIZED CORNER

9 hour count at each intersection, Philadelphia, Pa

	52nd and Girard, signalized		40th and Powellton, non-signalized	
	Number	Per cent	Number	Per cent
Speeding over 25 M P H	88	1 49	60	0 86
Turning from wrong lane	9	0 15	2	0 03
Fail to signal left turn	68	1 15	68	0 97
Cutting Corner	3	0 05	6	0 09
Failure to yield right of way (to pedestrian)	3	0 05	4	0 06
Passing trolley on left	4	0 07	1	0 01
Failure to yield right of way (to vehicle)	1	0 02	187	2 66
Driving left of center line	30	0 51	22	0 31
Going through red light	29	0 49		
Start before green light	17	0 29		
Stop in cross walk	222	3 77		
Park too close to corner	5	0 08	1	0 01
Parking at fire hydrant	13	0 22		
Total violators	492	8 34	351	5 00
Driving lawfully	5416	91 66	6551	95 00
Total through intersection	5908	100 00	7002	100 00

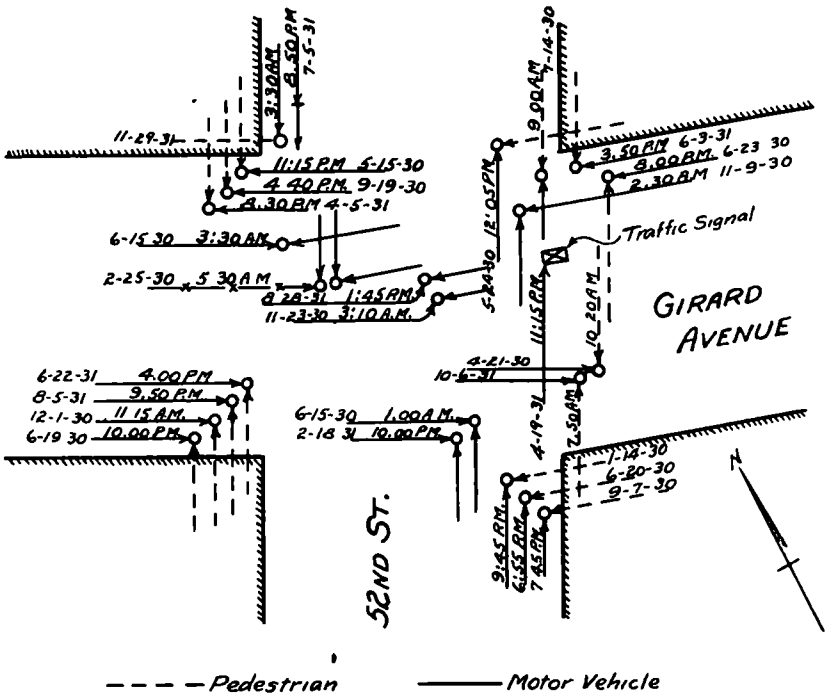

Figure 3. Accident Diagram—1930 and 1931. 52nd Street and Girard Avenue, Philadelphia, Pa.

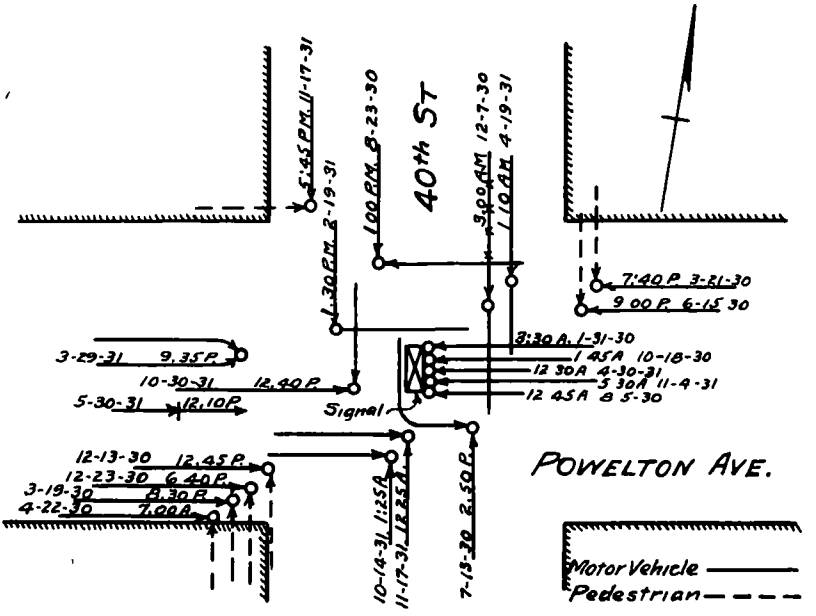

Figure 4. Accident Diagram—1930 and 1931. 40th Street and Powelton Avenue, Philadelphia, Pa.

slightly better record than Washington shows Nevertheless, the accident data show that during 1931 at the signalized corner there were 10 accidents in which 13 persons were injured and 1 was killed At the non-signalized corner, there were 10 accidents in which 8 persons were injured These two corners rank 80th and 130th respectively on the three year "worst" corner list (according to accident frequency). Thus the record shows that only 5 to 8 per cent of the drivers are responsible for serious accidents on these corners Figures 3 and 4 are accident diagrams for the two corners showing the accidents during 1930 and 1931 By a study of such diagrams, it is frequently possible to better the conditions in a way which reduces the number of accidents

By studies similar to those shown in this paper, it is hoped to be able to reduce the number of accidents in Washington These accidents for a number of years have resulted in an annual toll of approximately 80 deaths and some 3,000 serious injuries Up to November 12th in 1932, there have been 106 deaths, 3301 injuries and 6816 accidents This is a considerably higher rate than previous years have shown

DISCUSSION
ON
TRAFFIC LAW VIOLATIONS

MR. D A. SOULE, *of Rhode Island State Board of Public Roads* Has the use of caution signs instead of stop signs been tried out in practice? It was tried in Rhode Island for a week's test this last summer and we were not satisfied with the results We had approximately 70 per cent observation of the stop sign, about 20 per cent of the drivers used reasonable caution and 10 per cent paid no attention at all When we put the caution sign up we got about 70 per cent reasonable caution and the rest slid by without paying any attention at all So we went back to stop signs This was tried at four intersections

MR VAN DUZER: We have a stop sign at an intersection where about 400 vehicles an hour pass Motorists did not pay much attention to the stop sign We put in a caution sign of ten miles per hour, which it has been there for six months without an accident occurring

DR H C DICKINSON, *National Bureau of Standards* I wonder whether the meaning of a caution sign of that kind at an arterial highway is thoroughly understood It seems to me the logical sign at an arterial highway ought to be one whose meaning is known right away In other words the person crossing an arterial highway should do so at his own risk If it were understood that a caution sign meant that, or if a sign was adopted which meant that, it might remedy the situation

There is another point which I would like to leave with you Mr Van Duzer said that the failure to yield right of way was one of the most important causes of accidents here It seems to me that points to the question of what we mean by right of way If we analyze the situation we will find that there is just one position aside from that of light controlled intersection in which we have an absolute right of way In meeting another vehicle on the right hand side of the road we have no shadow of right to be on the opposite side of that road That situation considering the number of risks causes less accidents than anything else in the entire list I believe there is no other situation except the light controlled intersection where the law does not give some sort of a qualified right of way to everyone Thus there is a certain shadow of legal right for two vehicles to be in the *same place at the same time* I believe that is true of every other situation with the exception of the simple ones noted above Would it not be possible to draft our right of way regulations so that one of the vehicles would not have any right to be where the other is?

It seems to me that it would be possible to redraft rules of the road with regard to right of way in such a way that in all the important cases one vehicle or another would be absolutely prohibited from encroaching on the right of way

REVIEW

OF THE

REPORT OF THE COMMITTEE TO STUDY COMPENSATION FOR AUTOMOBILE ACCIDENTS

COLUMBIA UNIVERSITY COUNCIL FOR RESEARCH IN THE SOCIAL SCIENCES[1]

BY N W DOUGHERTY, *Professor of Civil Engineering*
University of Tennessee

SYNOPSIS

This Committee of the Council for Research in the Social Sciences undertook the study of 8800 accidents, and, in addition, made a study of the operation of compulsory insurance laws now in force The case studies were made at seven different locations, Philadelphia, New York, San Francisco, Muncie, Indiana, Terre Haute, Indiana, Boston and New Haven Enough studies were made of partial disability, total disability, and death to give a good indication of the amount of damage recovered by persons injured in accidents

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[1] Committee to Study Compensation for Automobile Accidents, Commercial Trust Building, Philadelphia, Pa