



***National
Safety
Council***

**INCIDENT EXPERIENCE OF INDIANA DRIVERS
BEFORE AND AFTER PARTICIPATION IN THE
DEFENSIVE DRIVING COURSE PROGRAM
DURING THE CALENDAR YEAR 1994**

By

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The State of Indiana began using the National Safety Council's (NSC) Defensive Driving Course (DDC) programs for the retraining of repeat traffic offenders in 1975. This report assesses the incident and involvement of drivers before and after taking the Indiana DDC Program.

Use of the DDC program satisfies the requirement of part 9-30-3-12 of the Indiana Criminal & Vehicle Handbook, which states:

- (a) If during any twelve (12) month period a person has committed moving traffic violations for which the person has:
 - (1) been convicted of at least two (2) traffic misdemeanors;
 - (2) had at least two (2) traffic judgements entered against the person; or
 - (3) been convicted of at least one (1) traffic misdemeanor and has had at least one (1) traffic judgement entered against the person;the bureau may require the person to attend and satisfactorily complete a defensive driving school program. The person shall pay all applicable fees required by the bureau.
- (b) The bureau may suspend the driving license of any person who:
 - (1) fails to attend a defensive driving school program; or
 - (2) fails to satisfactorily complete a defensive driving school program; as required by this section.

For the purpose of this analysis we will define an *incident* as an “at-fault” accident or motor vehicle-violation that can increase a driver's point total on their official driving record. An incident is defined by the nature of the violation and not by the number of citations. It is possible, therefore, to receive several points for a single citation.

Once a driver accumulates 16 points in any two year period, the driver is called before a hearing to determine if his or her drivers license should be suspended. Taking any DDC program will give the driver four points of credit on their driving record, which will last for three years. How the Indiana point system defines incidents and distributes points is listed in Appendix A.

Since its introduction in the State of Indiana in 1975, 723,529 drivers have completed one of the DDC programs through 1996. Beginning with the first enrollee, a computerized record has been kept of all drivers who have taken a DDC program, as well as their driving records prior to and after completing the DDC program.

The findings presented in this report are limited to those drivers who attended and completed DDC during calendar year 1994. This allows a full one-year follow up for each driver in the sample. This study compares the pre-DDC motor-vehicle records (MVRs) of participants with their post-DDC MVRs and indicates any significant differences in incidents.

The National Safety Council's Defensive Driving Course (DDC) is a

standardized driver training program offered in six-or eight-hours. It has the highest rate of success in reducing the severity and frequency of collisions for its graduates. Based on proven, fundamental defensive driving techniques taught for more than 30 years, DDC focuses on strategies, knowledge and skills required to drive collision and violation-free. The course recognizes that participants have a considerable amount of driving experience, and is designed so instructors use participants' experiences as a learning strategy and teaching tool. It encourages them to make a personal choice to drive safely.

DDC is approved in nearly all 50 states for insurance premium reduction, court referrals, point reduction or traffic violator programs. The National Safety Council certifies all DDC instructors to assure consistent, dependable training.

Method

The Indiana Bureau of Motor Vehicles (IBMV) sent the NSC a computerized list of 10,726 drivers, chosen at random, out of the 55,375 who completed the DDC program during calendar year 1994. The IBMV furnished a list containing the MVRs for the identified drivers for the year before and the year after DDC course completion.

The course participant MVR data used in this study were as follows:

- Motorist ID
- Gender
- Age at time of DDC
- Number of Points, Accidents, Infractions, Misdemeanors, and Suspensions before and after DDC

Based on the IBMV information provided, pre and post DDC analysis was performed on these five categories:

- Points
- Accidents (includes major and minor incidents)
- Infractions
- Misdemeanors
- Suspensions

The violation descriptions used to code major and minor violations are listed in Appendix A.

Statistical tests were computed using the computer software package SPSS (Norusis, 1993). Paired samples *t*-tests were used for pre/post comparisons of mean per driver rates. Two types of *t*-tests were used. One used the actual MVR data of each subject and the other used the square root of each subject's data. The square root transformation was done to equalize pre-and post-course variances. When rare event means, such as incident rates are compared, inequality between their variances can be large enough to violate a primary assumption that must be followed for the valid use of a *t*-test (Snedecor & Cochran, 1980).

In addition, the McNemar test was used to measure the significance of the change in incidents frequency for drivers after their exposure to the DDC course (McNemar, 1966). This test requires that variables be transformed into dichotomous values, either "clean record" or "incident(s)". The test then compares the number of subjects whose records change from one disposition before exposure to the DDC course to the other, after taking DDC.

An alpha level of .05 was used for all statistical tests.

Results

The mean age of the 10,726 DDC participants was 20.7 years and, as shown in Table 1, the vast majority were males. The mean age for male participants was 20.8 years, of which just over 72% were under 21 years of age. The mean age for females was 20.4 years, of which nearly 74% were also under 21. A minimal number of drivers were over 64 (8 or 0.07%) and therefore results could not be computed regarding the effectiveness of DDC on this age group.

Table 1

Number and Percentage of DDC Course Participants
by Gender and Age

Age Group	Gender				TOTAL	
	Male		Female			
	Number	%	Number	%	Number	%
Under 21	5,957	56%	1,824	17%	7,781	73%
21-24	1,210	11%	335	3%	1,545	14%
25-34	666	6%	207	2%	873	8%
35-44	291	3%	84	1%	375	3%
45-64	119	1%	25	*	144	1%
Over 64	6	*	2	*	8	*
TOTAL	8,249	77%	2,477	23%	10,726	100%

* Less than 0.5%

Table 2 shows that in the year following exposure to DDC, participants had significantly lower incident rates than in the year before DDC in the categories: *Points*, *Infractions*, and *Misdemeanors*. There were too few *Accidents* and *Suspensions* to do “Mean Comparisons” (as shown in Tables 4 and 7).

As shown in Table 2, for the “All Age Groups” column, both male and female drivers showed statistically significant reductions in the categories of Points, Infractions, and Misdemeanors using both raw data and the square root transformations. For the “Under 21” column, both males and females had statistically significant reductions in the Points and Infractions categories, while only females showed statistically significant reductions in the Misdemeanors category, using both raw data and the square root transformations.

The percentage reductions in “incident(s)” after DDC for “All Age Groups” ranged from a 78% decrease in misdemeanors for females, to a 32% decrease in misdemeanors for males. Females

had greater post-DDC reductions in the three incident categories than did males for every age group in each of the three categories.

Participants in the age group 45-64 exhibited the greatest decrease in points (-77%) and the largest reduction in misdemeanors (-79%), while the 35-44 year age group had the largest decrease in infractions (-72%).

Tables 3-7 shows that the number of drivers whose records changed from “incident(s)” before training to “clean” also increased significantly in the year following exposure to the DDC course. Again, significant increases in “clean” MVRs after training appears across each of the incident categories except for suspension, which is due to the small number of suspensions in the “before training” group.

As can be seen in Tables 3-7, there are drivers who have clean records before training for each of the incident categories. This result may initially appear inconsistent with the fact that this sample of drivers was court mandated to participate in the DDC course because of their incidents experience. However, many drivers accumulated the incidents/points that prompt mandatory DDC participation in only one or two incident categories, therefore, their MVRs may be “clean” in other categories. In addition, there may have been a small percentage of drivers whose licenses were either suspended or revoked during the entire one year before training and thus, may not have experienced any incidences before attending the course.

Of all participants, 49 (0.46%) had at least one accident in the year prior to DDC training. Of these 49 participants, none recorded an accident the following year. Of the 10,677 participants who did not have an accident before DDC, only 24 (0.2%) had an accident recorded after DDC.

Some 7,271 (68%) of all participants had at least one infraction in the year prior to DDC training. Of this number, 4,706 (65%) did not record an infraction in the following year. Of the 3,455 participants who did not have an infraction before DDC, only 1,266 (37%) had an infraction recorded following the course.

Some 455 (4%) of all participants had at least one misdemeanor in the year prior to DDC training. Of this number, 406 (89%) did not record a misdemeanor in the following year. Of the 10,271 participants who did not have a misdemeanor before DDC, only 213 (2%) had a misdemeanor recorded following the course.

Only 2 of the 10,726 participants had a suspension in the year prior to DDC training. Of these 2, none recorded a suspension in the following year. Of the 10,722 participants who did not have a suspension before DDC, only 2 recorded a suspension following the course.

In summary, based on the information made available by the State of Indiana BMV, participants in this study showed statistically significant reductions in incidents in the year after exposure to DDC compared with the year before.

Table 2

Before/After Per Driver Incident Rates and Percentage Change for DDC Participants
By Age and Gender

Gender	Age Groups																				
	Under 21			21-24			25-34			35-44			45-64			Over 64			All Age Groups		
	Before	After	% Chg	Before	After	% Chg	Before	After	% Chg	Before	After	% Chg	Before	After	% Chg	Before	After	% Chg	Before	After	% Chg
Points																					
Male	4.59	2.02	-56*	5.45	1.93	-65	4.98	1.40	-72	5.32	1.42	-73	4.91	1.34	-73	I.S.	I.S.	I.S.	4.78	1.92	-60*
Female	3.73	0.99	-73*	4.44	1.26	-72	4.90	1.06	-78	4.43	0.76	-83	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	3.96	1.02	-74*
Both	4.39	1.78	-59*	5.23	1.79	-66	4.96	1.32	-73	5.12	1.27	-75	4.89	1.14	-77	I.S.	I.S.	I.S.	4.59	1.72	-63*
Infractions																					
Male	1.24	0.62	-50*	1.35	0.53	-61	1.17	0.43	-63	1.26	0.37	-71	1.18	0.41	-65	I.S.	I.S.	I.S.	1.25	0.58	-54*
Female	1.06	0.35	-67*	1.21	0.43	-64	1.17	0.28	-77	1.04	0.21	-79	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	1.09	0.35	-68*
Both	1.20	0.55	-54*	1.32	0.51	-61	1.17	0.39	-66	1.21	0.34	-72	1.21	0.35	-71	I.S.	I.S.	I.S.	1.22	0.52	-57*
Misdemeanors																					
Male	0.03	0.03	-6	0.07	0.05	-36	0.11	0.04	-65	0.13	0.05	-62	0.11	0.03	-77	I.S.	I.S.	I.S.	0.05	0.03	-32*
Female	0.02	0.00	-80*	0.05	0.01	-72	0.13	0.03	-77	0.10	0.01	-88	I.S.	I.S.	I.S.	I.S.	I.S.	I.S.	0.03	0.01	-78*
Both	0.03	0.02	-16	0.07	0.04	-42	0.12	0.04	-68	0.12	0.04	-67	0.10	0.02	-79	I.S.	I.S.	I.S.	0.05	0.03	-40*

Note. *t*-tests were conducted using raw data and the square root transformation for both male and female rates in the “All Age Groups” and also the “Under 21” age group, because they constituted 77% of the total sample.

* $p < .001$

I.S. = Insufficient Sample Size (less than 0.5% of total sample).

Table 3

Number of Drivers with Clean Records and Incidents, With Regard to **POINTS**, Before and After Participation in the DDC Program.

		<u>After Training</u>	
		Clean Record	Incident(s)
<u>Before Training</u>	Clean Record	2,206	1,129
	Incident(s)	4,989	2,402

Degrees of Freedom = 1, $\chi^2 = 2434.1094$, $p < .0001$

Table 4

Number of Drivers with Clean Records and Incidents, With Regard to **ACCIDENTS**, Before and After Participation in the DDC Program.

		<u>After Training</u>	
		Clean Record	Incident(s)
<u>Before Training</u>	Clean Record	10	24
	Incident(s)	1	2

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Degrees of Freedom = 1, $\chi^2 = 7.8904$, $p = .0050$

Table 5

Number of Drivers with Clean Records and Incidents, With Regard to **INFRACTIONS**, Before and After Participation in the DDC Program.

		<u>After Training</u>	
		Clean Record	Incident(s)
<u>Before Training</u>	Clean Record	2,189	1,266
	Incident(s)	4,706	2,565

Degrees of Freedom = 1, $\chi^2 = 1980.3618$, $p < .0001$

Table 6

Number of Drivers with Clean Records and Incidents, With Regard to **MISDEMEANORS**, Before and After Participation in the DDC Program.

		<u>After Training</u>	
		Clean Record	Incident(s)
<u>Before Training</u>	Clean Record	10,058	213
	Incident(s)	406	49

Degrees of Freedom = 1, $\chi^2 = 59.5541$, $p < .0001$

Table 7

Number of Drivers with Clean Records and Incidents, With Regard to **SUSPENSIONS**, Before and After Participation in the DDC Program.

		<u>After Training</u>	
		Clean Record	Incident(s)
<u>Before Training</u>	Clean Record	10,722	2
	Incident(s)	2	0

Degrees of Freedom=1
Exact two-tailed Binomial p=1.0000

REFERENCES

McNemar, Q. (1966). *Psychological Statistics* (3rd ed.). New York: John Wiley and Sons, Inc.

Norusis, M.J. (1992). *SPSS/PC+ Version 5.0* [Computer Software]. Chicago: SPSS Inc.

Snedecor, G. W., & Cochran W.G. (1980). *Statistical Methods* (7th ed.). Ames, IA: Iowa State University Press.

APPENDIX A

Violation Description Groupings

<u>INFRACTIONS</u>	<u>POINTS</u>	<u>MAND.</u> <u>SUSP.^a</u>
No valid license	0	
Learner permit violation	4	
Temp MC learner permit violation	4	
MC learner permit violation	4	
Improper MC license endorse	6	
Violation of DL restrictions	4	
Unlawful use of license	8	
Allow unlic indiv to operate veh	4	
Allow unlawful use of vehicle	4	
Drive while suspended infr.	8	Y
Disregard traffic officer	6	
Disregard traffic control device	4	
Disregard traffic signal	4	
Failure to dim lights	4	
Speeding	0	
Minimum speed/improper lane	2	
Driving wrong side of road	4	
Truck in restricted lane	4	
Driving left of center	4	
Improper passing	4	
Improper passing to left	4	
Improper passing to right	4	
Left center-obstruct view	4	
Passing in no passing zone	4	
Wrong way on one-way road	4	
Unsafe lane movement	4	
Improper use-center lane	4	
Following too closely	6	
Road entrance/exit violation	4	
Improper turn at intersection	4	
Improper u-turn	4	
Unsafe start from park	4	
Failure to signal	2	
Failure to yield right-of-way	6	
Disobedience of yield sign	6	
Failure to yield to emergency veh.	6	
Failure to avoid pedestrian	6	

<u>INFRACTIONS</u>	<u>POINTS</u>	<u>MAND.</u> <u>SUSP.</u>
Fail to stop-train signal	6	
Ignore RR-Xing stop sign	6	
Failure to stop RR-Xing	8	Y
Disregard stop/yield sign	6	
Improper parking	2	
Improper passing school bus	6	
Fail to use headlights	2	
Improper headlights	2	
Improper tail lights	2	
No brake or signal lights	2	
Improper lights/reflectors	2	
No required lights/reflectors	2	
Improper brakes	4	
Inadequate brakes	4	
No or inadequate muffler	2	
Improper bumper height	2	
Improper MC passenger	4	
Improper MC headgear	4	
Improper MC equipment	2	
Child restraint violation	4	
Oper while intox/non-mem st	0	
Drive while susp/non-mem st	0	
Leaving scene/non-mem st	0	
Seat belt violation	0	
Court imposed suspension	0	Y
Non-pointable violation	0	
Equipment violation	0	
Juvenile delinquency	0	Y
No-insurance-court	0	Y
Tamper with interlock device	0	
Operating per se .04 cmv	8	
Alcohol minor -18 w/o veh	4	Y
Alcohol +18 w/o veh	4	
Open container	4	
Open container/operator	4	
Zero tolerance	0	

^a Mandatory Suspension

<u>MISDEMEANORS</u>	<u>POINTS</u>	<u>ACCIDENT</u>	<u>MANDATORY SUSPENSION</u>
Never a valid license	4		
Unlawful license use-alcohol	8		Y
Violation of Fin. Resp. Restr.	8		
PDO accident - fail to stop	8	Y	
Excess PD accident - fail to stop	8	Y	Y
Injury accident - fail to stop	8	Y	Y
Leave scene - veh accident	8	Y	Y
Leave scene - excessive veh acc	8	Y	
Acc fail to give info/stop	8	Y	
Leave scene - parked vehicle	8	Y	
Leave scene - personal prop	8	Y	
Criminal reck w/ veh -misd	8	Y	Y
Speed contest on road	8		
Operating per se	8		Y
Operating while intoxicated	8		Y
OWI unspecified	8		Y
Prior OWI within 5 years	8		Y
OWI resulting in injury	8	Y	Y
OWI resulting in death	8	Y	Y
Operating as HTV	8		
Operating as HTV life	8		Y
Drive suspended - misdemeanor	8		Y
Drug viol w/o veh misdemeanor	0		
Court imposed susp-misdemeanor	0		Y
Criminal reck w/ veh - Felony	8	Y	Y
Felony in a motor vehicle	0		Y
Drug viol w/ vehicle misd	0		Y
Drug viol w/ vehicle felony	0		Y
Alcohol minor +18 w/ vehicle	0		