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U.S. Department  
of Transportation

**National Highway  
Traffic Safety  
Administration**

# Memorandum

NHTSA-02-13680-6

Subject: ACTION: Preliminary Regulatory Evaluation  
0.08 Sanction Program

Date:

FEB 11 2003

From: Rose A. McMurray *Jane Robinson for*  
Associate Administrator  
for Planning, Evaluation, and Budget

Reply to  
Attn. of:

To: Docket

Thru: Jacqueline Glassman *Jyle Bol for*  
Chief Counsel

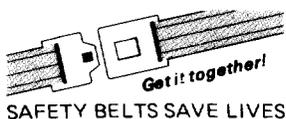
Please submit the attached copy of the "Preliminary Regulatory Evaluation 0.08 Sanction Program, October 2002" to the appropriate docket.

Attachment

cc:

Associate Administrator for Rulemaking  
Associate Administrator for Enforcement  
Chief Counsel  
Senior Associate Administrator for Policy and Operations  
Associate Administrator for Traffic Injury Control

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NHTSA-02-13680-6



U.S. Department  
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## PRELIMINARY REGULATORY EVALUATION

### 0.08 SANCTION PROGRAM

*Office of Regulatory Analysis and Evaluation  
Plans and Policy  
October, 2002*

## Preliminary Regulatory Evaluation

### Section 163(a)

#### 0.08-BAC-Law Sanction Program

##### SUMMARY

- **Benefits:** Published estimates of the effect of 0.08 BAC laws indicate they may reduce alcohol-related crashes by 0% to 16%. NHTSA feels that a reasonable estimate of the effectiveness of these laws is a 7% reduction in alcohol-related fatalities. Under this assumption, in the 32 states affected by Section 163, 616 fatalities, over 13,600 non-fatal injuries, and over 50,000 damaged vehicles involved in over 30,000 property-damage-only (PDO) crashes (are being/could be)<sup>1</sup> prevented annually.
- In addition, because this is a sanction program which will withhold percentages of federal highway construction funds if a state does not pass a compliant 0.08 BAC law, those states that pass the laws would receive their full allotment of funds.
- **Costs:** The costs for implementing this program are minimal and consist of changes that states make as a matter of course when a state law is amended, such as this change from a 0.10 BAC law to a 0.08 BAC law. As in the states that already have 0.08 BAC laws, media campaigns will probably be waged through public service messages and news stories.
- **Costs to State Highway Funds:** States that do not pass 0.08 BAC laws risk a variety of penalties, potentially totaling from \$100 million to \$400 million per year across the 17 states which have not yet conformed to section 163.

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<sup>1</sup> There are 15 states which enacted a conforming law after section 163 was passed. In these states the fatalities, injuries, or crashes **are being** or **will be** prevented. There are 17 states which have not enacted a conforming 0.08 BAC law (including Rhode Island). In these states the fatalities, injuries, or crashes **could be** prevented.

## **INTRODUCTION**

In October 2000, as part of the FY 2001 DOT Appropriations Act, the President signed into law a provision making 0.08 BAC the national standard for *per se* impaired driving. This law makes it illegal in and of itself to drive with an alcohol concentration in the blood that is at or above 0.08, as opposed to the 0.10 level presently stipulated by 34 states and the District of Columbia. States that do not adopt 0.08 BAC laws by fiscal year 2004 would have certain highway construction funds withheld. A joint NHTSA/FHWA regulation shall be published to implement this sanction. This assessment examines the impact this program will have on motor vehicle safety as well as the potential impact on funding that could occur in the affected states.

## **EFFECTIVENESS DATA**

Measuring the effect of 0.08 BAC laws is difficult. First, state laws involving impaired driving are often passed in combinations. This makes it difficult to examine the effectiveness of an individual law without the confounding influence of other laws that are enacted concurrently or almost concurrently. Second, the degree of the law's enforcement, and especially the publicity surrounding that enforcement, can vary significantly and such variability can influence the law's effectiveness. In order for laws to be effective, drivers must be aware of them. They must either believe it is their responsibility to comply with such laws and thus voluntarily reduce their drinking and driving behavior or they must believe they are now more likely to be stopped, arrested, and convicted of DWI and thus curtail the alcohol they drink before driving. In any case, maximum effectiveness requires publicity, education, enforcement, prosecution, and adjudication.

At least ten studies and two reviews have investigated the effectiveness of 0.08 BAC laws.

These studies are summarized in Table 1, which specifies the source of the study, its database, and conclusions regarding effectiveness.

Table 1. Synopses of studies and reviews on 0.08 BAC law effectiveness.

<b>Source</b>	<b>Data</b>	<b>Effectiveness</b>	<b>Notes</b>
The Effects Following the Implementation of an .08 BAC Limit and an Administrative <i>Per Se</i> Law In California. <b>NHTSA, 1991</b>	From the Fatality Analysis Reporting System (FARS) and others	12% reduction in alcohol-related fatalities, resulting from both laws being enacted within six months of each other.	Little negative effect on police, courts, etc. Hard to separate effects of the two laws
A Preliminary Assessment of the Impact of Lowering the Illegal BAC <i>Per Se</i> Limit to .08 in Five States. <b>NHTSA, 1994</b>	FARS	Ten of 30 tests (six measures times five states) showed significant <i>decreases</i> . Only 5 of 30 tests showed <i>increases</i> after the laws were introduced, and all those effects were insignificant.	No controls were available to control extraneous variables. "... further analysis is warranted."
An Evaluation of the Effectiveness of California's .08% Blood Alcohol Concentration Limit and Administrative <i>Per Se</i> License Suspension Laws. <b>California DMV, num 158 (1995) and 167, (1997)</b>	Statewide traffic records. Used police-identified alcohol crashes.	In general, no significant reduction in proportion of "Had Been Drinking" crashes during 6 months when 0.08 BAC law was by itself, but significant reductions found in night-time single vehicle crashes and crashes occurring between 2 and 3 am.	Authors concluded there was an overall effect but could not separate 0.08 BAC and ALR laws. See discussion below.
Lowering State Legal Blood Alcohol Concentration Limits to .08%: The Effect on Fatal Motor Vehicle Crashes. Hingson, <i>et al.</i> , <b>American Journal of Public Health. 1996</b>	FARS	Over 5 states, a 16% greater reduction in the proportion of fatal crashes with a fatally-injured driver whose BAC was $\geq 0.08\%$ . Inadequate control of ALR law effect in some of the control states.	Compare to Hingson, <i>et al.</i> , <b>Injury Prevention, 2000</b> , see discussion in text.

<b>Source</b>	<b>Data</b>	<b>Effectiveness</b>	<b>Notes</b>
The Effects of 0.08 Laws. Apsler, <i>et al.</i> , NHTSA, 1999	FARS	Trend-line analyses did not give percentage reduction figure that can be directly compared to other studies. See text for details.	Five of eleven states showed significant reductions in the rate of alcohol involvement.
Evaluation of the Effects of North Carolina's 0.08% BAC Law. Foss, <i>et al.</i> , NHTSA, 1999	Telephone surveys, Crash data	Drivers were more aware, but there were few significant decreases in variety of measures from crash data.	
The Relationship of Alcohol Safety Laws to Drinking Drivers in Fatal Crashes. Voas & Tippetts. NHTSA, 1999	FARS	0.08 BAC laws accounted for an 8% reduction in the ratios of high BAC (0.10+) and low BAC (0.01-0.09) drivers in fatal crashes. This implies a 5.25% reduction in alcohol-related fatalities. See text.	Separated effects of several laws. Effect sizes may be conservative.
Highway Safety: Effectiveness of State .08 Blood Alcohol Laws. Government Accounting Office (GAO), 1999	<b>Critical-analysis of previous studies</b>	"Overall, the evidence does not conclusively establish that .08 BAC laws, by themselves, result in reductions . . . ." It can be effective in combination with other laws and programs.	NHTSA acknowledges that laws do not work in a vacuum
Effects of recent 0.08% legal blood alcohol limits on fatal crash involvement. Hingson, <i>et al.</i> , Injury Prevention, 2000.	FARS: % alcohol-involved drivers, % alcohol-related crashes	"States adopting 0.08% laws experienced a 6% greater post-law decline in the proportion of <b>drivers</b> in fatal crashes with blood alcohol levels at 0.10% or higher and a 5% greater decline in the proportion of fatal <b>crashes</b> that were alcohol related at 0.10% or higher."	Points up the importance of power in statistical tests. 400-500 lives will be saved if other states adopt.
Effectiveness of the Illinois .08 Law. Voas, <i>et al.</i> , NHTSA, December 2000	FARS, state & local data, including media archives	The percentage of FARS drivers in Illinois with positive BACs decreased by 13.7%	Measured other system variables at the same time.

<b>Source</b>	<b>Data</b>	<b>Effectiveness</b>	<b>Notes</b>
Effectiveness of the Illinois .08 Law: An update with 1999 FARS data. Voas, <i>et al.</i> , NHTSA, 2001	FARS, state & local data.	The number of FARS drivers in Illinois with positive BACs decreased by 13.6%, with an overall 3.4% <b>increase</b> in surrounding states.	
Reviews of Evidence Regarding Interventions to Reduce Alcohol-Impaired Driving. Shults, <i>et al.</i> , <b>American Journal of Preventive Medicine. 2001.</b> (CDC review)	<b>Systematic review of studies by a consultation team</b>	“The median post-law percent change in alcohol-related motor vehicle fatalities was – 7% . . . . Results were generally consistent in direction and size across the studies.”	The authors strongly recommend such laws to states and communities

The first analysis on this topic was done by NHTSA on two California laws that took effect in 1990 (NHTSA, 1991). On January 1, a law setting 0.08 as the *per se* limit came into effect, and on July 1, an administrative per se (administrative license revocation or ALR<sup>2</sup>) law came into effect. The latter law allows immediate suspension of the driver’s license by the Department of Motor Vehicles without a court trial. At that time very few states had ALR laws. With only six months between the two laws, it was difficult to separate the effects of the two laws, although there were significant decreases in several measures.

The researchers concluded that there was a 12% reduction in alcohol-related fatalities, but could not differentiate the effect of the two laws and their concurrent publicity. Note that the FARS definition of “alcohol-related,” in addition to crashes involving alcohol-involved drivers,

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<sup>2</sup> Administrative License Revocation (ALR) refers to a government body, such as the Department of Motor Vehicles, taking away the driver’s license without a court trial or hearing. It is sometimes used to take the license of a driver who refuses to take a BAC test. Illegal *per se* laws make driving at or above a specific BAC illegal without further evidence. In this evaluation they are referred to as 0.08 laws. The California DMV studies (1995, 1997) refer to the former as an “administrative per se” law but in this evaluation we call it an ALR law.

includes crashes where only a pedestrian or bicyclist was drinking, and does not insure that a blood-alcohol test was done in any type of alcohol-related crash.

Later, the state of California published two reports on the effectiveness of the two laws (California, 1995/1996). Rather than use “alcohol-related fatalities” as defined by FARS, their first study used four related variables: “had been drinking,” an estimate by the officer writing the crash report, “nighttime crashes,” “2-3 a.m.,” (the hour after the bars close), and “single-vehicle nighttime male.” The latter three are surrogates of alcohol-related driving, and are used by FARS to impute whether an untested driver had been drinking. Each variable was relative to an appropriate control variable. For example, all “had been drinking” crashes were compared to all other crashes; the “2-3 a.m.” crashes were compared to “10-11 a.m.” crashes; and so forth. In addition, the California study included the entire state’s data, and looked at several severity levels: Fatal crashes only, Fatal plus severe injury, and Fatal plus any injury. Finally, this first California study used eight years of data, 1985-1993, whereas the NHTSA study only used 1985-1990 because the study was performed in 1991. This first study looked for a “general” deterrent due to the laws, that is, over the entire population of drivers. This California study found almost the same effect (12.7% versus 12% in the NHTSA study), but California’s analysis said the administrative license revocation (ALR) law was to a greater extent responsible for the change, compared with the 0.08 BAC law. California did many other tests on the data, but the effect size was similar for the analysis that matched the NHTSA study best, for example, using the “had-been-drinking” measure at the “Fatal only” severity level (Table 16, page 91). If one read the papers casually, one might think NHTSA said the decrease was due to 0.08 BAC law, and California said it was due to ALR. However, both papers are cautious when interpreting the

tests. On page 91 of the California paper the authors state, “So while empirical distinctions have been made between the effects of the two laws, from a practical standpoint, the results should be considered collectively.” In the NHTSA paper the authors state on page xv, “It is possible that effects of the Administrative *Per Se* law [**ALR law**] may have taken place earlier than the actual implementation date. In addition, only six months of data were available following implementation of the Administrative *Per Se* law [**ALR law**], making it difficult to assess any change.”

Overall, it appears that six months separation between the two California laws is insufficient to ascribe the 12% difference to either law by itself.

In December of 1994, NHTSA’s National Center for Statistics and Analysis (NCSA) published **A Preliminary Assessment of the Impact of Lowering the Illegal BAC *Per Se* Limit to 0.08 in Five States** (a final version, which appears in the references, was published by Johnson and Fell in 1995). This report looked at California, Maine, Oregon, Utah, and Vermont, using data from the Fatality Analysis Reporting System (FARS). It noted that passage of other alcohol-related laws on or near the same date could confound the results, citing as an example the implementation in California of an administrative license revocation (ALR) law only six months after the implementation of the 0.08 BAC law. The analysts chose six measures, derived from the FARS data, which were expected to show reductions after 0.08 BAC law implementation. They compared two years of data before the implementation to two years of data after the implementation, except in the case of Maine, where the span was three years before and after. Of the thirty tests, ten were significant. Although this may seem relatively small, the overall

probability of getting ten significant tests (assuming there was no effect) would be less than one in ten thousand. Twenty-five of the thirty tests showed at least some reduction. The overall probability of 25 or more decreases, assuming a 50-50 chance of an increase, would be less than one in one thousand. NCSA did not calculate effectiveness estimates for these states.

Hingson, *et al.*, have published two studies, one in 1996 and another in 2000, using a pre/post, concurrent control state design. This method compared each state that passed a 0.08 BAC law with a nearby state that did not pass the law. The first study, using five states, found “16% and 18% relative post-law declines in the proportions of fatal crashes involving fatally injured drivers whose blood alcohol levels were 0.08% or higher and 0.15% or higher.” It was criticized by some for selecting only one comparison state for each state with a 0.08 BAC law and for not describing how it selected the control states. In the second study, which addressed the criticisms to the first study, six different states with a 0.08 BAC law were compared to nearby states that retained the 0.10 BAC law. They found, “States adopting 0.08% laws experienced a 6% greater post-law decline in the proportion of drivers in fatal crashes with blood alcohol levels at 0.10% or higher . . . .” Although no one state, *by itself*, had a significant decrease relative to its control state, the overall effect combining all five states was significant. This is important to states that may pass the 0.08 BAC law in the future when they interpret these studies. Due to a number of factors, not every state will show exactly the same reduction in alcohol-related fatalities.

The latter Hingson study is important in showing the necessity of calculating the “power” of a statistical test. They show that with larger numbers, more confidence can be placed in the

results, but if there are not sufficient data, it is easy to arrive at a conclusion that no effect existed.

NHTSA published another study using time series analyses (ARIMA) in March 1999 (Apsler, *et al.*). It compared 11 states separately and without other states as controls. Regarding 0.08 BAC laws, seven of the eleven states showed significant reductions in the ratio of (fatalities with one or drivers at 0.10+ BAC) to (fatalities with all drivers at 0.0 BAC). However, in two of the states, California and Virginia, the effect was confounded by the passage of the administrative license revocation (ALR) law in close temporal proximity with the 0.08 BAC law. These two states could be used to estimate the effect of 0.08 BAC laws and ALR laws together, but not separately. In any case, the authors did not estimate sizes of effect that could be translated into percentage reduction in all alcohol-related fatalities, nor did they aggregate the data for greater statistical power.

A 1999 NHTSA study (Voas and Tippetts) used another statistical method, weighted least squares regression, to study the effects of three laws simultaneously: a 0.10 BAC law, reduction to a 0.08 BAC law, and administrative license revocation (ALR) laws. They also included covariates such as introduction of safety belt laws and overall alcohol consumption to control for concurrent changes that might bias the data. Their overall conclusion regarding the reduction from 0.10 BAC to 0.08 BAC was that it was associated with an ~8% reduction in the ratio of alcohol-involved drivers to sober drivers. The 95% confidence interval for this estimate was broad (-.25% to -14.96%) when considering drivers at lower levels of blood alcohol (0.01 to 0.09) but narrower (-3.38% to -12.4%) for drivers at 0.10 BAC or higher.

A final single-state analysis was published by NHTSA in December 2000 and was updated in December 2001. Voas, *et al.* (2000) compared Illinois to five surrounding states and found a 13.7% relative reduction in the percentage of drinking drivers in fatal crashes. This was after 18 months of data. The updated report, Voas, *et al.* (2001), included 1999 FARS data. This report indicated a 13.6% reduction in Illinois plus a 3.4% increase in the surrounding states.

Two papers have been published that reviewed all but the latest of these studies. In June 1999, the GAO critically reviewed most of the papers discussed earlier (excepting the Illinois study and the more recent Hingson study) both in methodology and in interpretation. They strongly opposed the idea that a 0.08 BAC law was a “silver bullet”. In comments, NHTSA agreed that a systems approach must be taken in reducing alcohol-related traffic fatalities, and the law does not operate in a vacuum.

An independent task force that was supported by the Center for Disease Control conducted the second review as part of a larger review of traffic injury related laws and programs (Shults, *et al.*, 2001). Regarding 0.08 BAC laws, they calculated a 7% decrease in alcohol-related fatalities as the median of the various effectiveness studies, with an interquartile range of 4% to 15%. This means that half of the studies gave effectiveness figures between 4% and 15%. The task force reviewers concluded that a 0.08 BAC law should be strongly recommended to states and communities as one of several measures to reduce injuries due to alcohol-related crashes. Even though this review did not include the Illinois study (Voas, *et al.*, 2000) or its update (Voas, *et al.*, 2001) with its higher estimates of effectiveness, the median would not have changed because there were several states at 7%.

In general, estimates of the effect of a 0.08 BAC law cover a wide range (0% to 16%), and several of the states studied had concurrent laws that clouded the results. However, the median

7% reduction in alcohol-related fatalities (Shults, *et al.*, 2001) is a reasonable estimate, even though the true estimate could be higher or lower.

## **TARGET POPULATION**

The target population consists of those people involved in alcohol-related crashes in the 17 states that have not passed a 0.08 BAC law compliant with section 163 and the 15 states which passed a compliant law after Section 163 was enacted.

### **Fatalities**

The first set of data comes from the Fatality Analysis Reporting System (FARS), and is restricted to the 32 states that did not have a 0.08 BAC law on October 23, 2000, when Section 163 became law. NHTSA's Chief Counsel has ruled that Rhode Island's 0.08 BAC law does not comply with the requirements of Section 163, so that state is included. All data except 2000 come directly from the annual Traffic Safety Facts books published by NHTSA's National Center for Statistics and Analysis. The 2000 data come from the individual report "Traffic Safety Facts 2000 for Alcohol." Table 2 lists the annual total fatalities in alcohol-related crashes from 1992 through 2000, by state. These data were graphed and visually inspected for trend lines. No state had a striking increase or decrease. The 2000 data were used to estimate the impact of 0.08 BAC laws in these states.

Table 2. from NHTSA's Traffic Safety Facts

State	FARS fatalities: Total Killed in Alcohol-Related Crashes.								from DOT HS
	pg 154 1992	pg 154 1993	pg 154 1994	pg 154 1995	pg 154 1996	pg 160 1997	pg 160 1998	pg 160 1999	809 323, pg 7. 2000
<b>States which conformed to section 163 Incentive Grant Requirements after October 23, 2000</b>									
Alaska	65	50	48	48	41	41	31	430	53
Arizona	402	400	401	447	436	433	423	406	456
Arkansas	276	266	200	217	214	193	193	190	200
Connecticut	143	149	145	155	153	152	142	134	158
Georgia	528	555	529	522	567	578	509	506	570
Indiana	373	333	340	330	335	308	379	342	270
Louisiana	495	483	425	470	401	421	426	427	447
Maryland	226	188	210	233	201	221	203	179	225
Mississippi	215	386	344	361	338	344	351	362	379
Missouri	487	493	543	572	568	509	525	441	511
Nebraska	89	107	116	93	98	105	119	125	103
Oklahoma	267	270	269	251	280	302	252	245	221
South Dakota	76	59	72	71	70	61	67	65	81
Tennessee	548	523	486	512	499	496	499	489	511
Wyoming	65	51	71	83	58	43	68	70	45
<b>SubTotal</b>	<b>4255</b>	<b>4313</b>	<b>4199</b>	<b>4365</b>	<b>4259</b>	<b>4207</b>	<b>4187</b>	<b>4411</b>	<b>4230</b>
<b>States which have not yet conformed to section 163 Incentive Grant Requirements.</b>									
Colorado	255	231	276	294	244	218	232	220	256
Delaware	59	54	63	51	48	61	45	40	60
Iowa	171	204	212	220	198	174	164	160	124
Massachusetts	267	217	214	203	185	209	192	203	218
Michigan	534	615	579	616	613	558	536	547	506
Minnesota	237	213	244	265	218	193	280	201	255
Montana	102	114	102	91	74	120	104	103	110
Nevada	130	128	147	154	174	160	177	156	145
New Jersey	261	287	278	316	280	282	271	291	319
New York	645	596	503	543	523	449	365	344	419
North Dakota	40	45	44	42	45	50	44	56	41
Ohio	469	523	396	439	461	476	464	458	516
Pennsylvania	711	687	585	610	575	631	619	605	618
Rhode Island	43	39	28	29	33	41	35	36	41
South Carolina	312	236	208	280	394	318	304	333	422
West Virginia	191	184	152	160	131	146	145	145	175
Wisconsin	297	322	304	317	322	329	302	309	345
<b>SubTotal</b>	<b>4724</b>	<b>4695</b>	<b>4335</b>	<b>4630</b>	<b>4518</b>	<b>4415</b>	<b>4279</b>	<b>4207</b>	<b>4570</b>
<b>Grand Total</b>	<b>8,979</b>	<b>9,008</b>	<b>8,534</b>	<b>8,995</b>	<b>8,777</b>	<b>8,622</b>	<b>8,466</b>	<b>8,618</b>	<b>8,800</b>
									National Total for 2000 16,653

## Injuries

Non-fatal injury data was obtained for 2000 from the National Automotive Sampling System – Crashworthiness Data System (CDS), and the NASS – General Estimates System (GES). The CDS is a nationally representative sample of tow-away crashes involving at least one passenger vehicle. CDS data are stratified by severity using the Abbreviated Injury Scale (AIS). The GES is a nationally representative sample of **all** police-reported crashes. Police reports grade injury according to the KABCO scale. GES data, for non-CDS cases only, were translated into the Maximum Abbreviated Injury Scale (MAIS) to improve the accuracy of injury estimates and to provide a better basis for injury severity. After distribution of unknown cases and translation of GES data from KABCO to MAIS, the national estimates for non-fatal injuries are shown below:

Table 3. National estimates of 2000 non-fatal alcohol-related injuries from NASS-GES, translated from KABCO ratings into MAIS ratings.

Translated NASS-CDS injuries	MAIS-1 Minor injury	MAIS-2 Moderate injury	MAIS-3 Serious injury	MAIS-4 Severe injury	MAIS-5 Critical injury
CDS	205,030	42,103	26,256	6,835	3,519
GES: Non-CDS cases	74,033	8,383	2,793	442	211
Total	279,063	50,485	29,049	7,277	3,729

Non-CDS injuries are about 6% of the column totals for the “critical” and “severe” injuries, about 10% of the “serious” injuries, but higher for “moderate” (17%) and “minor” (26%). This is due to the stricture that CDS-type crashes require at least one passenger vehicle be a tow-away severity, whereas non-CDS-type crashes include crashes of lesser severity, which would include more injuries of lower severity.

The next step in the injury estimates was to derive state estimates from the national estimates.

The ratio of the alcohol-related fatalities in each state to the national total of alcohol-related

fatalities (given at the bottom of Table 2) was applied to the non-fatal injury totals in Table 3, and shown in Table 4.

Table 4. Distribution of year 2000 non-fatal injuries to states based on ratio of fatal injuries

State	Non-fatal MAIS injuries					Fatal Injuries	State percentage
	Minor	Moderate	Serious	Severe	Critical		
<b>States which conformed to section 163 Incentive Grant Requirements after October 23, 2000</b>							
Alaska	888	161	92	23	12	53	0.32%
Arizona	7,641	1,382	795	199	102	456	2.74%
Arkansas	3,352	606	349	87	45	200	1.20%
Connecticut	2,648	479	276	69	35	158	0.95%
Georgia	9,552	1,728	994	249	128	570	3.42%
Indiana	4,525	819	471	118	60	270	1.62%
Louisiana	7,491	1,355	780	195	100	447	2.68%
Maryland	3,770	682	392	98	50	225	1.35%
Mississippi	6,351	1,149	661	166	85	379	2.28%
Missouri	8,563	1,549	891	223	114	511	3.07%
Nebraska	1,726	312	180	45	23	103	0.62%
Oklahoma	3,703	670	386	97	49	221	1.33%
South Dakota	1,357	246	141	35	18	81	0.49%
Tennessee	8,563	1,549	891	223	114	511	3.07%
Wyoming	754	136	78	20	10	45	0.27%
<i>SubTotal</i>	<i>70,884</i>	<i>12,824</i>	<i>7,379</i>	<i>1,848</i>	<i>947</i>	<i>4,230</i>	<i>25.40%</i>
<b>States which have not yet conformed to section 163 Incentive Grant Requirements.</b>							
Colorado	4,290	776	447	112	57	256	1.54%
Delaware	1,005	182	105	26	13	60	0.36%
Iowa	2,078	376	216	54	28	124	0.74%
Massachusetts	3,653	661	380	95	49	218	1.31%
Michigan	8,479	1,534	883	221	113	506	3.04%
Minnesota	4,273	773	445	111	57	255	1.53%
Montana	1,843	333	192	48	25	110	0.66%
Nevada	2,430	440	253	63	32	145	0.87%
New Jersey	5,346	967	556	139	71	319	1.92%
New York	7,021	1,270	731	183	94	419	2.52%
North Dakota	687	124	72	18	9	41	0.25%
Ohio	8,647	1,564	900	225	116	516	3.10%
Pennsylvania	10,356	1,874	1,078	270	138	618	3.71%
Rhode Island	687	124	72	18	9	41	0.25%
South Carolina	7,072	1,279	736	184	95	422	2.53%
West Virginia	2,933	531	305	76	39	175	1.05%
Wisconsin	5,781	1,046	602	151	77	345	2.07%
<i>SubTotal</i>	<i>76,582</i>	<i>13,854</i>	<i>7,972</i>	<i>1,997</i>	<i>1,023</i>	<i>4,570</i>	<i>27.44%</i>
<b>Grand Total</b>	<b>147,466</b>	<b>26,678</b>	<b>15,351</b>	<b>3,845</b>	<b>1,971</b>	<b>8,800</b>	<b>52.84%</b>
National Totals	279,063	50,485	29,049	7,277	3,729	16,653	100.00%

**Property-Damage-Only Crashes**

In addition to fatal or injury crashes, alcohol is involved in property-damage-only (PDO) crashes. The Economic Cost of Motor Vehicle Crashes 1994 (DOT HS 808 425), which includes adjustments for unreported and missing crashes, places the number of alcohol-related PDO crashes at over 3.9 million per year. That study found 3.677 PDO-alcohol-involved vehicles for every alcohol-related MAIS 1-5 injury. In the 32 affected states, applying this ratio to the 127,485 MAIS 1-5 police reported injuries for 2000 gives an estimate of 1,359,038 PDO vehicles in alcohol-related crashes. Multiplying this by 0.6186 gives an estimate of 840,733 PDO alcohol-related crashes. The multiplier comes from Table 3 (page 9) of “The Economic Cost of Motor Vehicle Crashes 1994.” These vehicles and crashes were distributed among the 32 states in the same ratio as their alcohol-related fatalities. Table 5 shows the target population of PDO crashes and vehicles that could be affected by the 0.08-BAC-law sanction program.

Table 5. Distribution of 2000 PDO Crashes and vehicles involved, by state.

State	estimated PDO Crashes	estimated vehicles	Fatal Injuries	State percentage
<b>States which conformed to section 163 Incentive Grant Requirements after October 23, 2000</b>				
Alaska	2,676	4,325	53	0.32%
Arizona	23,021	37,214	456	2.74%
Arkansas	10,097	16,322	200	1.20%
Connecticut	7,977	12,894	158	0.95%
Georgia	28,777	46,517	570	3.42%
Indiana	13,631	22,034	270	1.62%
Louisiana	22,567	36,479	447	2.68%
Maryland	11,359	18,362	225	1.35%
Mississippi	19,134	30,930	379	2.28%
Missouri	25,798	41,702	511	3.07%
Nebraska	5,200	8,406	103	0.62%
Oklahoma	11,157	18,036	221	1.33%
South Dakota	4,089	6,610	81	0.49%
Tennessee	25,798	41,702	511	3.07%
Wyoming	2,272	3,672	45	0.27%
<i>Sub Total</i>	<i>213,553</i>	<i>345,207</i>	<i>4,230</i>	<i>25.40%</i>
<b>States which have not yet conformed to section 163 Incentive Grant Requirements.</b>				
Colorado	12,924	20,892	256	1.54%
Delaware	3,029	4,897	60	0.36%
Iowa	6,260	10,120	124	0.74%
Massachusetts	11,006	17,791	218	1.31%
Michigan	25,546	41,294	506	3.04%
Minnesota	12,874	20,810	255	1.53%
Montana	5,553	8,977	110	0.66%
Nevada	7,320	11,833	145	0.87%
New Jersey	16,105	26,033	319	1.92%
New York	21,153	34,194	419	2.52%
North Dakota	2,070	3,346	41	0.25%
Ohio	26,050	42,110	516	3.10%
Pennsylvania	31,200	50,434	618	3.71%
Rhode Island	2,070	3,346	41	0.25%
South Carolina	21,305	34,439	422	2.53%
West Virginia	8,835	14,282	175	1.05%
Wisconsin	17,417	28,155	345	2.07%
<i>Sub Total</i>	<i>230,718</i>	<i>372,954</i>	<i>4,570</i>	<i>27.44%</i>
<b>Total</b>	<b>444,272</b>	<b>718,161</b>	<b>8,800</b>	<b>52.84%</b>
<b>National Totals</b>	<b>840,733</b>	<b>1,359,038</b>	<b>16,653</b>	<b>100.00%</b>

**BENEFITS**

The benefit from this requirement will be a reduction in alcohol-related fatalities, non-fatal injuries, and property-damaged-only vehicles. It must be emphasized that the effectiveness of this law depends on how much it is publicized, enforced, and adjudicated. In addition, in smaller states the outcomes are likely to be more variable.

Based on the 7% effectiveness estimate discussed in the previous chapter, the best estimate of the number of lives saved per year is 616 for the 32 states affected by Section 163. This is 7% of the 8,800 alcohol-related fatalities in the 32 states (See Tables 2 and 4). Using the same percentage for injury estimates and property-damage-only (PDO) crashes, passage of the law in the 32 states is estimated to prevent 138 critical injuries, 269 severe injuries, 1,075 serious injuries, 1,867 moderate injuries, 10,323 minor injuries, and 31,099 PDO crashes involving 50,271 vehicles. Please note that these figures, although our best estimates, are not as precise as they look. True effectiveness could be higher or lower. The 7% median stated in Shults, *et al.* gives an interquartile range of 4% to 15%. Four percent of 8,800 is 352 lives saved, 15% is 1,320 lives saved. The “true” number of lives that can be saved is probably somewhere between those two estimates. The 7% estimates are broken down by state in Table 6:

Table 6. Distribution of benefits, by state, at 7% effectiveness.

State	estimated vehicles	Non-fatal MAIS injuries					Fatal injuries
		Minor	Moderate	Serious	Severe	Critical	
<b>States which conformed to section 163 Incentive Grant Requirements after October 23, 2000</b>							
Alaska	303	62	11	6	2	1	4
Arizona	2,605	535	97	56	14	7	32
Arkansas	1,143	235	42	24	6	3	14
Connecticut	903	185	34	19	5	2	11
Georgia	3,256	669	121	70	17	9	40
Indiana	1,542	317	57	33	8	4	19
Louisiana	2,554	524	95	55	14	7	31
Maryland	1,285	264	48	27	7	4	16
Mississippi	2,165	445	80	46	12	6	27
Missouri	2,919	599	108	62	16	8	36
Nebraska	588	121	22	13	3	2	7
Oklahoma	1,262	259	47	27	7	3	15
South Dakota	463	95	17	10	2	1	6
Tennessee	2,919	599	108	62	16	8	36
Wyoming	257	53	10	5	1	1	3
<i>Sub Total</i>	<i>24,164</i>	<i>4,962</i>	<i>898</i>	<i>517</i>	<i>129</i>	<i>66</i>	<i>296</i>
<b>States which have not yet conformed to section 163 Incentive Grant Requirements.</b>							
Colorado	1,462	300	54	31	8	4	18
Delaware	343	70	13	7	2	1	4
Iowa	708	145	26	15	4	2	9
Massachusetts	1,245	256	46	27	7	3	15
Michigan	2,891	594	107	62	15	8	35
Minnesota	1,457	299	54	31	8	4	18
Montana	628	129	23	13	3	2	8
Nevada	828	170	31	18	4	2	10
New Jersey	1,822	374	68	39	10	5	22
New York	2,394	491	89	51	13	7	29
North Dakota	234	48	9	5	1	1	3
Ohio	2,948	605	110	63	16	8	36
Pennsylvania	3,530	725	131	75	19	10	43
Rhode Island	234	48	9	5	1	1	3
South Carolina	2,411	495	90	52	13	7	30
West Virginia	1,000	205	37	21	5	3	12
Wisconsin	1,971	405	73	42	11	5	24
<i>Sub Total</i>	<i>26,107</i>	<i>5,361</i>	<i>970</i>	<i>558</i>	<i>140</i>	<i>72</i>	<i>320</i>
<b>Total</b>	<b>50,271</b>	<b>10,323</b>	<b>1,867</b>	<b>1,075</b>	<b>269</b>	<b>138</b>	<b>616</b>

## **COSTS**

The impact of this law will depend on drinking drivers' perceptions that they are more likely to be caught over the limit, and thereby reduce the amount they drink before driving. To get this message to the public, States will develop public information campaigns, both at the time of legislative debate to inform the public concerning the need for the law and later during enforcement and prosecution of the law to help achieve compliance. Typically, States will use "earned" (unpaid) media exposure, which involves use of news stories and public service messages. Some States will implement public information campaigns that involve paying for airtime on radio and television and/or for advertising space in print media and billboards. Both approaches would require the time of State and local workers, especially in the State Highway Safety Office, to develop and manage these public information programs.

For example, Voas, *et al.*, 2000, discuss two campaigns in Illinois, one organized by the Illinois Office of the Secretary of State during the legislative process, and an awareness program after passage during 1997 and 1998 involving road signs, brochures, fact sheets, and ads in public service magazines. In another example, Indiana's Governor's Council on Impaired and Dangerous Driving describes two paid media campaigns in their 2001 Annual Report.<sup>3</sup> The first campaign in early 2001 used billboards and other outdoor advertisements to develop awareness of the lives lost to drunk drivers and helped encourage the passage of a .08 law in May 2001. Then, as the law went into effect in July 2001, Indiana launched another media campaign concerning enforcement of the new law. "Placement costs for the combined campaigns were approximately \$250,000."<sup>4</sup>

To mitigate State costs in educating the public, States may use Federal highway safety grant funds to pay for the development of public information programs and for airtime and print

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<sup>3</sup> Governor's Council on Impaired and Dangerous Driving, 2001 Annual Report, Turning the Curve Toward Safer Indiana Roads, p. 40-42.

<sup>4</sup> *Ibid.*, p. 41.

advertising space. Also, NHTSA provides sample press release kits to aid communities in publicizing new programs through newspapers, TV, and radio.

Other costs for implementing this program are expected to be minimal and consist of changes that states make as a matter of course when a state law is amended, such as this change from a 0.10 BAC law to a 0.08 BAC law. Some examples might include the regular updating of driver handbooks by Motor Vehicle Departments, or updating of forms by police and sheriff departments. Most of these changes will occur along with other revisions, such as the handbooks and forms. NHTSA has training materials on hand to train officers to identify the lower levels of intoxication, but this will not require additional sessions, as it will be incorporated into the officers' continuing education. Breath-testing machines will not need to be recalibrated because they already give a continuous reading, not a yes/no cutoff at a preset level. Just as with the officers, prosecutors and judges will receive updates through ongoing continuing education.

#### **WITHHOLDING CONSTRUCTION FUNDS TO NON-CONFORMING STATES**

There are currently 16 states that currently do not have a 0.08 BAC law. They are: Colorado, Delaware, Iowa, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Jersey, New York, North Dakota, Ohio, Pennsylvania, South Carolina, West Virginia, and Wisconsin. In addition, NHTSA's Chief Counsel has ruled that Rhode Island's 0.08 BAC law does not comply with the requirements of Section 163, so that state is presently affected. Unless a state enacts a compliant law, the federal government will withhold 2% of highway construction funds in FY 2004, 4% in FY 2005, 6% in 2006, and 8% in FY 2008 and every year thereafter. These funds will become available upon passage of the law, unless the state waits until FY 2008 or later, in which case the funds withheld four years earlier will be lapsed. Assuming continued non-

compliance, the predicted amounts withheld are tabled below. However, the numbers represent a worst-case scenario. When sanction programs have been enacted in the past to withhold highway construction funds, only Puerto Rico has actually had funds withheld.

Table 7. U.S. Department of Transportation, Federal Highway Administration. Annual Core Apportionments and Potential Penalties under Sec. 163(A) for FY 2004 and Thereafter. (Assuming Various Rates of Penalty)

State	Total	2% Penalty	4% Penalty	6% Penalty	8% Penalty
Colorado	247,386,936	4,947,739	9,895,477	14,843,216	19,790,955
Delaware	82,934,413	1,658,688	3,317,377	4,976,065	6,634,753
Iowa	233,761,151	4,675,223	9,350,446	14,025,669	18,700,892
Massachusetts	269,627,680	5,392,554	10,785,107	16,177,661	21,570,214
Michigan	578,169,423	11,563,388	23,126,777	34,690,165	46,253,554
Minnesota	304,583,674	6,091,673	12,183,347	18,275,020	24,366,694
Montana	191,791,565	3,835,831	7,671,663	11,507,494	15,343,325
Nevada	141,949,392	2,838,988	5,677,976	8,516,964	11,355,951
New Jersey	358,791,296	7,175,826	14,351,652	21,527,478	28,703,304
New York	615,866,843	12,317,337	24,634,674	36,952,011	49,269,347
North Dakota	143,729,580	2,874,592	5,749,183	8,623,775	11,498,366
Ohio	597,212,812	11,944,256	23,888,512	35,832,769	47,777,025
Pennsylvania	593,111,563	11,862,231	23,724,463	35,586,694	47,448,925
Rhode Island	86,676,803	1,733,536	3,467,072	5,200,608	6,934,144
South Carolina	316,689,556	6,333,791	12,667,582	19,001,373	25,335,164
West Virginia	131,056,525	2,621,131	5,242,261	7,863,392	10,484,522
Wisconsin	387,366,903	7,747,338	15,494,676	23,242,014	30,989,352
<b>Possible Total Penalties</b>		105,614,122	211,228,245	316,842,368	422,456,487
* Based on estimated FY 2003 apportionments, after distribution of Minimum Guarantee funds All states that have passed compliant laws have been omitted from this table.					

## REGULATORY FLEXIBILITY ACT

The Regulatory Flexibility Act of 1980 (Public Law 96-354) requires agencies to evaluate the potential effects of their final rules on small businesses, small organizations, and small government jurisdictions. As a sanction program, this regulation will have different consequences depending on whether the States pass a 0.08 BAC law or whether they choose to accept the penalties from not doing so.

In States that have passed 0.08 BAC laws, consumption of beer has dropped 3.5% on average (Voas and Tippetts, 1999). By contrast, consumption of wine and spirits do not correlate with the number of drinking drivers in fatal crashes. (*Ibid.*) Thus, if a State passes a 0.08 BAC law, all businesses, large and small, that sell and serve beer are likely to experience a small reduction in sales. Most businesses sell other products such as other beverages or food. The overall impact on those businesses would therefore be significantly less than 3.5%. For some businesses, such as beer distributors (where a small business is defined as 100 employees or less), the decline may be in the 3.5% range.

If a State does not pass a law, it may impact highway construction firms, where a small business is defined as \$28.5 million in annual gross income. An unknown portion of State highway construction is carried out by small businesses. The Federal Highway Administration targets 10% of its funding for small businesses, and 10% for Disadvantaged Business Enterprises (DBE). Almost all DBE are small businesses. In addition, the penalty only affects Federal Highway funds, which make up, on the average in the 17 states affected, only 16% of all State highway expenditures. In Table 8 a worst-case scenario involving the highest possible penalty (8%) is examined. The penalty was compared to each State's 1998 highway expenditures (the latest year's data available). Under these circumstances, highway expenditures in the relevant states could be reduced from 0.77% in Massachusetts to 3.62% in Montana. There is no way to determine how much of this reduction could be borne by small business, but it is assumed that it is just as likely to impact businesses of any size. This is not a significant impact on the small businesses involved, especially considering that most of these businesses do not rely totally on highway construction contracts.

Table 8. Federal Aid Sanction compared to Total State Highway Expenditures, by state.

State	2004 Apportionment*	8.0% Penalty*	Total Expenditures for Highways, 1998**	Percentage of Total
Colorado	247,386,936	19,790,955	1,553,000,000	1.27%
Delaware	82,934,413	6,634,753	343,000,000	1.93%
Iowa	233,761,151	18,700,892	1,449,000,000	1.29%
Massachusetts	269,627,680	21,570,214	2,809,000,000	0.77%
Michigan	578,169,423	46,253,554	2,826,000,000	1.64%
Minnesota	304,583,674	24,366,694	2,245,000,000	1.09%
Montana	191,791,565	15,343,325	424,000,000	3.62%
Nevada	141,949,392	11,355,951	805,000,000	1.41%
New Jersey	358,791,296	28,703,304	2,636,000,000	1.09%
New York	615,866,843	49,269,347	6,219,000,000	0.79%
North Dakota	143,729,580	11,498,366	412,000,000	2.79%
Ohio	597,212,812	47,777,025	3,316,000,000	1.44%
Pennsylvania	593,111,563	47,448,925	3,601,000,000	1.32%
Rhode Island	86,676,803	6,934,144	244,000,000	2.84%
South Carolina	316,689,556	25,335,164	816,000,000	3.10%
West Virginia	131,056,525	10,484,522	850,000,000	1.23%
Wisconsin	387,366,903	30,989,352	2,222,000,000	1.39%
<b>Total</b>	<b>5,280,706,115</b>	<b>422,456,489</b>	<b>32,770,000,000</b>	<b>1.29%</b>

\*From Table 7

\*\*From **2001 Statistical Abstract of the United States**,<http://www.census.gov/prod/2002pubs/01statab/stat-ab01.html>, Table 429.

## CONCLUSIONS

Changing the level of alcohol from 0.10 to 0.08 in state BAC laws will result in fewer alcohol-related traffic crashes and fatalities if the laws are reinforced with adequate publicity and enforcement.

Numerous reports have been published analyzing the effectiveness of 0.08 BAC laws. These studies have found reductions in alcohol-related fatalities ranging from 0% to 16%. All research reports on the effectiveness of 0.08 BAC laws have found it difficult to separate its effects from other alcohol-related driving laws passed concurrently or within the same year. Overall, NHTSA feels that the best estimate of the effectiveness of these laws is a 7% reduction in alcohol-related fatalities. Under this assumption, in the 32 states affected by Section 163 Incentive Grants, 616 fatalities, over 13,500 non-fatal injuries, and over 50,000 vehicles involved in over 31,000 PDO crashes have been/could be prevented annually.

Driver behavior will not change simply because a law is passed. Drivers must be aware of the new law, and they must believe that they will get caught if they drink and drive at the new BAC levels. This requires educational programs, publicity, and enforcement. This can be accomplished with minimal expense to states. States that have not passed 0.08 BAC laws risk a variety of penalties, potentially totaling from approximately \$100 million to approximately \$400 million across the 17 states.

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