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Lower BAC Limits for Youth: Evaluation of the Maryland .02 Law

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16. Abstract The purpose of this study was to determine the effects of special drinking driving sanctions aimed at youthful drivers under the age of 21 years. This purpose was accomplished by focusing on a Maryland law which restricts driving by those under 21 to a blood alcohol concentration (BAC) less than 0.02% rather than the 0.10% prevailing limit for older drivers. The specific objectives were to: 1) evaluate the impact of adoption of the sanction; 2) mount a public information and education (PI&E) campaign in selected counties to attempt to potentiate the effects of the sanction; and 3) evaluate any added benefit of the PI&E. Crash data were used statewide and in six experimental counties. The unit of analysis was accident-involved drivers under 21 years of age judged "had been drinking" (HBD) on the police accident report. Box-Jenkins time series analysis of this measure indicated a significant step reduction in crash-involved drivers under 21 judged HBD coincident with adoption of the sanction and an additional significant step reduction in the experimental counties after application of the PI&E. Only the reduction coincident with the sanction adoption was detected in two comparison counties. Survey data in the experimental and comparison counties confirmed that knowledge of the sanction among youth increased significantly after exposure to the PI&E at the experimental sites but not at the comparisons. It was concluded that this special sanction for youth was effective and this effectiveness was significantly potentiated by a public service information program which emphasized the possible penalties for violation of the regulation.			
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Although a study of this complexity could not have been undertaken without the participation of these people and others, the findings and opinions expressed herein are solely those of the author.

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I. INTRODUCTION

This is the final report of a study conducted under Contract Number DTNH22-88-C-07012 from the U.S. Department of Transportation, National Highway Traffic Safety Administration (NHTSA). The purpose of the study was to determine the effects of special drinking driving sanctions aimed at youthful drivers under the age of 21 years. This purpose was accomplished by focusing on a Maryland law which prohibits driving by those under 21 with a BAC of 0.02 or more (in this report, BAC refers to either blood alcohol concentration, stated as grams per 100 milliliters of blood, or breath alcohol concentration, stated as grams per 210 liters of breath). This is in sharp contrast to the prevailing BAC limits for drivers 21 and over in Maryland and elsewhere which are typically set at 0.10 or 0.08.

The balance of this section summarizes the extent of the problem caused by youthful drinking and driving. Section II discusses the nature of special sanctions which might be applied to youth, the specific methods used in this study to accomplish sanction and site selection, sanction enhancement and the evaluation of deterrence. Section III presents the quantitative evaluation findings, and Section IV discusses the implications of the results.

A. The Problem

The use of alcohol has been implicated as one of the major causes of highway crashes and deaths. This is true even among those under 21 years of age, for whom it is illegal to buy and/or possess alcohol in public virtually everywhere in the U.S. Recent data from the Fatal Accident Reporting System (FARS) operated by NHTSA show that over 29 percent of the drivers under 21 years of age involved in fatal crashes had a BAC of 0.01 or more. Nineteen percent had a BAC of 0.10 or more. Thus, 65 percent of drivers under 21 in fatal crashes who had any measurable BAC showed a BAC of 0.10 or more (NHTSA, 1991).

Recent trends in the BACs of drivers in fatal crashes have shown significant improvements for all age groups. These trends are most pronounced for drivers under 21 and those over 65. For the young group, those showing a positive BAC (0.01 or more) in the FARS data declined from 42.7 percent in 1982 to 29.2 percent in 1989. Those exhibiting BACs at or above 0.10 declined from 30.1 percent of all under 21 drivers involved in fatal crashes in 1982 to 19.0 percent in 1989. In spite of these noteworthy declines, however, the residual problem is still significant (NHTSA, 1991).

In the early 1970s, the minimum alcohol purchase age was lowered in 29 states, in most cases from 21 to 18. Data from FARS indicate that one of the probable effects of lowering the alcohol purchase age was that alcohol-related crashes increased in the affected age groups. In the mid-1970's, a trend to raise the alcohol purchase age began among states that had, a few years earlier, reduced the purchase age. In response to Federal encouragement, by mid-1987 almost all states had adopted a purchase age of 21 for all alcoholic beverages. FARS data for the 1980s, as cited above, suggest that the effect of raising the purchase age of alcohol was a reduction in fatal crash involvement. One likely explanation for at least part of the observed reduction in BACs among young drivers in fatal crashes is that higher minimum drinking ages may delay the time at which youth experiment with alcohol (see for example Williams and Lillis, 1986). This, in turn, reduces driving at elevated BACs by inexperienced drivers who are also inexperienced drinkers.

The benefits of raising the minimum drinking age likely come primarily from reduced alcohol consumption by youth. Further increases in minimum drinking age above 21, however, are not apt to be acceptable to society. Therefore, attempts to achieve additional reductions in alcohol-related crashes among youth will either have to deter youth from consuming alcohol prior to driving through methods other than changes in the drinking age or deter them from driving after drinking, or both.

What constitutes deterrence in this context and by what mechanisms it works has been primarily the province of legal theorists and criminologists. Andenaes (1966), for example, makes a basic distinction between the effects of punishment on the person being punished (one form of specific deterrence) and the effects of punishment upon the members of society in general (one form of general deterrence). Andenaes suggests that receptivity to general deterrents will vary among individuals and that group norms play an important role in determining the extent to which general deterrents will be effective. Since few youth are actually arrested for alcohol-related driving offenses compared to their involvement in alcohol-related fatal crashes (Voas and Williams, 1986), it is logical that youth-alcohol sanctions will rely primarily on general deterrence for their effectiveness.

B. Sanctions and Deterrence

There is a growing body of evidence that suggests that general deterrents can be constructed which at least temporarily reduce both the number of people who drive after drinking and the number of alcohol-related crashes. This evidence comes primarily from examining the effects of well publicized enforcement or sanction efforts. A classic outcome in this regard is found in the British Road Safety Act of 1967 which outlawed motor vehicle operation with BAC's of 0.08 or more, and authorized police to screen motorists suspected of having alcohol in their blood. As reported by Codling and Samson (1974), alcohol-related crashes declined sharply when the act was introduced, but returned to former levels several years hence. Similar results have been reported in "crackdowns" conducted in New Zealand (Hurst and Wright, 1980), and among the Alcohol Safety Action Projects (ASAPs) funded by NHTSA (Levy, et al., 1978). More recently, a study of Wisconsin's mandatory license suspension for a first driving while intoxicated (DWI) conviction showed that sanctions can be effective and that their effectiveness can be greatly enhanced by a supporting public information and education (PI&E) program (Blomberg, Preusser and Ulmer, 1987). The results of that study supported the generally held notion that vehicle and traffic laws are not fully "operative" if much of the involved population is unaware of their existence or provisions. Therefore, one of the objectives of the present study was to mount a PI&E campaign at the selected study site and determine its effectiveness in enhancing the benefits of the sanction selected for study.

A complete discussion of the evidence in support of general deterrence of DWI is beyond the scope of this report. The interested reader can find additional background in Ross (1981) and Ennis (1977). The critical point with respect to the present study is that if young people perceive that sanctions for alcohol use and driving are highly probable, a climate of general deterrence will have been created. Previous research suggests that this climate will produce the desired end result of reduced highway crashes involving young (under 21) drivers who have been drinking. It therefore became the task of this study to identify a study site which had a suitable sanction in place and at which the possibility existed for using PI&E to increase the perceived probability of a penalty for drinking driving among youth.

II. SITE SELECTION AND METHODS

This section addresses the selection of the study site and the chronology of activities initiated as part of this research.

A. Site Selection

States with a variety of "special" sanctions for youthful DWI offenders were available to the present project. Selection of the study site was based both on considerations of the representativeness and "realism" of the sanction to be studied and the ability of the candidate state and sanction to support a rigorous program of PI&E enhancement and impact evaluation.

There are two basic methods for applying "special" drinking driving sanctions to youth. The first involves a different type or level of penalty for the prevailing "adult" offense. The second is implemented through different BAC limits or other special alcohol offenses only applicable to youth. At the time this study was being planned (mid-1989), 25 states had some form of special sanctioning or special offenses for youthful drinking driving.

Of the 25 states with some form of special youth sanction, 19 had legislation which was only applicable to a subset of youthful driver ages such as those 17 and under. These potential sites were rejected because it was judged that the sanction did not correspond sufficiently with the identified problem. First, FARS data for 1989 (NHTSA, 1991) show that nearly twice as many drivers between the ages of 18 and 20 were involved in fatal crashes (6,529) as were drivers under 18 (3,304). Also, since alcohol purchase laws universally prohibit sales to those under 21, it is logical to consider separate and "special" sanctions for everyone below 21 who drinks and drives.

Among the six states which applied their sanction to everyone 20 years of age and younger, two (Maine and Maryland) set a lower BAC limit (0.02) and four established longer suspension periods (Colorado, Illinois, Montana and New York). Both of these sanction types were valid study targets since each had been implemented in multiple states. Each had also been shown by previous research to have the capability to create general deterrence of drinking driving. Lower BAC limits were, however, considered somewhat more interesting for several reasons. First, they are logically consistent with a prohibition on alcohol consumption. Second, they involve a quantitative criterion (BAC) which is easily measured. Third, they are more consistent with the research implication that youths may be impaired as drivers at a lower BAC than older drivers who are more experienced at both driving and drinking. Finally, it was the judgment of the project staff that a lower BAC limit would be easier to publicize than a harsher sanction. The extremely low BACs involved in the laws in Maine and Maryland were relatively easy to relate directly to drinking behavior since one drink was sufficient to cause a violation for most people.

In order to mount a PI&E campaign to attempt to enhance a lower BAC law, several conditions had to be present in the prospective study state. First, the availability of interested local groups to "sponsor" the campaign was considered essential. Previous experience with PI&E using public service (free) air time and print space clearly indicated that media exposure is heightened when local groups promote the effort (e.g., Blomberg, Preusser and Ulmer, 1987). Second, it was considered desirable for the selected state to contain at least two isolated media markets. This

would facilitate an uncontaminated, experimental versus comparison evaluation of the additive effect of the PI&E. Finally, it was preferable to have media markets which did not encompass major metropolitan areas. Simply, the major markets such as New York, Philadelphia or Baltimore are characterized by extreme competition for the available public service time. It was believed that PI&E exposure could be maximized if smaller media markets were used as the focus of the test.

The PI&E considerations suggested that Maryland would be preferable to Maine as the selected study site. Its larger size yielded several isolated media markets which were capable of supporting the desired research. These included at least three media markets of "manageable" size outside of Baltimore. In addition, local groups in each of these markets were willing and eager to support the project. Hence, Maryland was the preliminary choice if it could meet evaluation needs.

From the evaluation perspective, the selected site had to have two major characteristics. First, its sanction had to have been in place for some time when the project started. This would permit a pre/post analysis *before* PI&E enhancement as well as an examination of post-PI&E effects. Second, crash data for the selected site had to be available for a period of at least one year prior to enactment of the sanction to establish a suitable baseline for analysis. Clearly, it was also necessary to have the cooperation of the state's traffic records retention agency to ensure that crash data could be made available. Information on citations and resulting convictions was also considered of interest as a measure of the *process* by which the sanction was working. It was not, however, viewed as essential if high quality information on the ultimate measure, crashes, was available.

Based upon all of the foregoing considerations, Maryland appeared to be the best choice as a study location. Therefore, with the agreement of NHTSA and Maryland State officials, a research design was developed for a study in Maryland.

B. The Maryland Research Plan

Once Maryland was selected as a test site, a research plan was developed which met the requirements of the project and was consistent with the applicable sanction and prevailing conditions in the State.

1. Objectives

The plan which emerged had the following specific objectives:

- To conduct an evaluation of the Maryland 0.02 BAC limit for drivers under 21 as it existed prior to the project's activities using alcohol-related crash involvements of drivers under 21 as the primary evaluation measure.
- To mount a PI&E campaign to enhance the operability of the 0.02 BAC limit by making knowledge of its existence and the consequences of violating it more widespread.
- To evaluate the extent to which the PI&E enhanced the effects of the 0.02 BAC limit.

2. The Maryland Sanction

In July 1988, Maryland enacted legislation requiring the Motor Vehicle Administration (MVA) to impose on each licensee under the age of 21 an alcohol restriction prohibiting the licensee from driving or attempting to drive a motor vehicle with alcohol in his/her blood. Under the law, a police officer who has reasonable grounds to suspect that a young driver is driving or attempting to drive with alcohol in their system can request a breath or blood test for Alcohol Concentration (AC) and, if the resulting AC is 0.02 or more, can charge the driver with violating the license restriction. Following court conviction, a fine of up to \$500 can be levied. In addition, after a court conviction or the filing by police of a complaint, MVA will hold a hearing and has the discretionary authority to suspend the driver's license, typically for 30 days, and up to one year maximum. Also, young drivers who test at an AC of 0.07 or more can be charged with Driving under the Influence (DUI), and with Driving While Intoxicated (DWI) if they test at an AC of 0.10 or higher. The State's new Administrative Per Se law also affects drivers of any age who test at 0.10 or more. The license restriction violation can be charged along with DUI or DWI. Also, when MVA receives a report under the provisions of Administrative Per Se and the driver is under age 21, violation of the alcohol license restriction also will be charged. Young drivers being processed on the license restriction violation who refuse a test for AC, invoke the implied consent provisions of the law (120 day license suspension). Appendix A contains copies of the relevant sections of Maryland law.

Operationally, the 0.02 BAC license restriction has the effect of prohibiting persons under 21 years of age from operating a motor vehicle after having consumed virtually any quantity of an alcoholic beverage. A Maryland police officer who suspects that a person under 21 has been operating a motor vehicle after consuming alcoholic beverages is authorized to request a test for Alcohol Concentration. This is really not different from the situation applicable to older drivers. However, for the driver under 21 years old, a set of increasingly severe sanctions can result, depending on the outcome of the Alcohol Concentration test.

At a minimum, if the young driver has an Alcohol Concentration of 0.02 or higher, he or she can be charged with violating the alcohol restriction on their license. Because of the way it was implemented, this restriction has the same *legal* form as a requirement for the driver to wear eyeglasses or a hearing aid when operating a motor vehicle.

If the resulting Alcohol Concentration is high enough to reach the levels defined in the law for Driving Under the Influence of Alcohol (DUI) or Driving While Intoxicated (DWI), an arrest for one of these charges can be made. The processing and possible sanctions in these instances are the same as those that apply to drivers 21 and older. For example, an Alcohol Concentration of 0.10 or higher can result in a DWI charge. Also, under Maryland's Administrative Per Se law effective January 1, 1990, police officers are empowered to confiscate the licenses of persons who test at 0.10 Alcohol Concentration or higher. License suspensions of 45 days for a first offense and 90 days for subsequent offenses are specified under the Administrative Per Se law.

The Maryland law was initially considered structurally defective by some elements of the criminal justice system because young drivers were not adequately informed of the restriction. As a result, there was little if any initial enforcement and adjudication of the restriction. To correct the situation, the legislation was modified in July 1989 to require that MVA imprint the restriction on all new licenses and renewals issued to young drivers. By the end of 1989, all new and renewal licenses issued to drivers under 21 carried the imprint *Under 21 Alcohol Restricted*. This was in

addition to the basic differentiation of licenses for those under 21 through the use of a profile photograph and the designation of *provisional license* (for those under 18). The 1989 legislature also adopted an Administrative Per Se law which became effective January 1, 1990. As a part of the implementation of this law, training was carried out for state and local police, with the 0.02 license restriction also being described. The *Maryland Driver's Manual* was reprinted to contain material about the alcohol license restriction.

In summary, the Maryland sanction as operative at the time of this study was technically a license restriction. The maximum penalties for violation of this restriction were substantially less than the penalties for DWI. Nevertheless, they included license suspension of up to one year, monetary fine and a point against the license.

At the time that the project entered the picture in Maryland (early 1989), all available information indicated that the Maryland law could be operationally improved. Changes were made by the State in mid-1989 and were beginning to be seen at the start of 1990. A statewide information campaign dealing with Administrative Per Se and the license restriction was mounted in early 1990 as a part of the Maryland Department of Transportation's *Drive to Survive* program. Nevertheless, it was the opinion of the project staff, Maryland contacts and NHTSA that there was still ample opportunity to operationalize the restriction further through a well-targeted PI&E program.

3. Maryland Evaluation Design

The Maryland evaluation design involved the analysis of statewide traffic accident data to assess the effects of instituting the 0.02 license restriction. In selected areas of Maryland, the project supported the creation of informational materials dealing with the alcohol license restriction and worked with local sponsors to encourage their dissemination. Locally sponsored surveys among young drivers were obtained to evaluate the effects of these informational efforts.

a. Test Areas

In the fall of 1989, strong support for the study was obtained from Maryland State officials including representatives of the Maryland DOT Safety Programs Division, the Motor Vehicle Administration and the State Police. In discussions regarding possible study areas within the State, it was noted that there were three Alcohol and Drug Prevention Resource Centers funded in part by the Maryland DOT that served widely separated regions of Maryland. One of these centers was located at Salisbury State University situated in Wicomico County on the lower Eastern Shore. The second center was at Frostburg State University located in Allegany County in extreme Western Maryland, and the third center was at Charles County Community College in southern Maryland. As a portion of the mission of these centers deals with alcohol and highway safety, they provided an available and desirable local focal point for the study's program. Also, they are centered in three independent media markets remote from the Baltimore/Washington area (which would have been difficult to address with available project resources).

Based on this "natural" division of the State and the promised support of the three Alcohol and Drug Prevention Resource Centers, three test areas were defined coincident with the Centers. The *Eastern Shore* area (Salisbury State) and *Western Maryland* regions (Frostburg State) were selected as experimental sites designated to receive the PI&E program and the direct

involvement of local law enforcement agencies. The *Southern Maryland* area served by Charles County Community College was designated as a comparison region that would not receive the PI&E. A map of Maryland with the counties in each test area highlighted is shown in Figure 1. Population figures from the 1990 Census are shown on the Figure for each of the involved counties. A brief description of each region follows.

Eastern Shore: The southern four counties on the Eastern Shore were selected as one study site. In the 1990 census, this region had a total population of 164,953 distributed as follows:

Wicomico	75,462
Worcester	35,488
Dorchester	30,271
Somerset	23,732.

This area has been growing in recent years. Its population increased over 13 percent from the 1980 to 1990 Census. Visible new construction in the area suggests that the population is still on the increase.

The media center for the area is Salisbury with two broadcast television stations, a cable operator and six radio stations. Radio stations are also located in Ocean City (5 stations), Cambridge (2), Pocomoke City (1) and Princess Anne (1). Daily newspapers are published in Salisbury, Cambridge, Ocean City and Princess Anne.

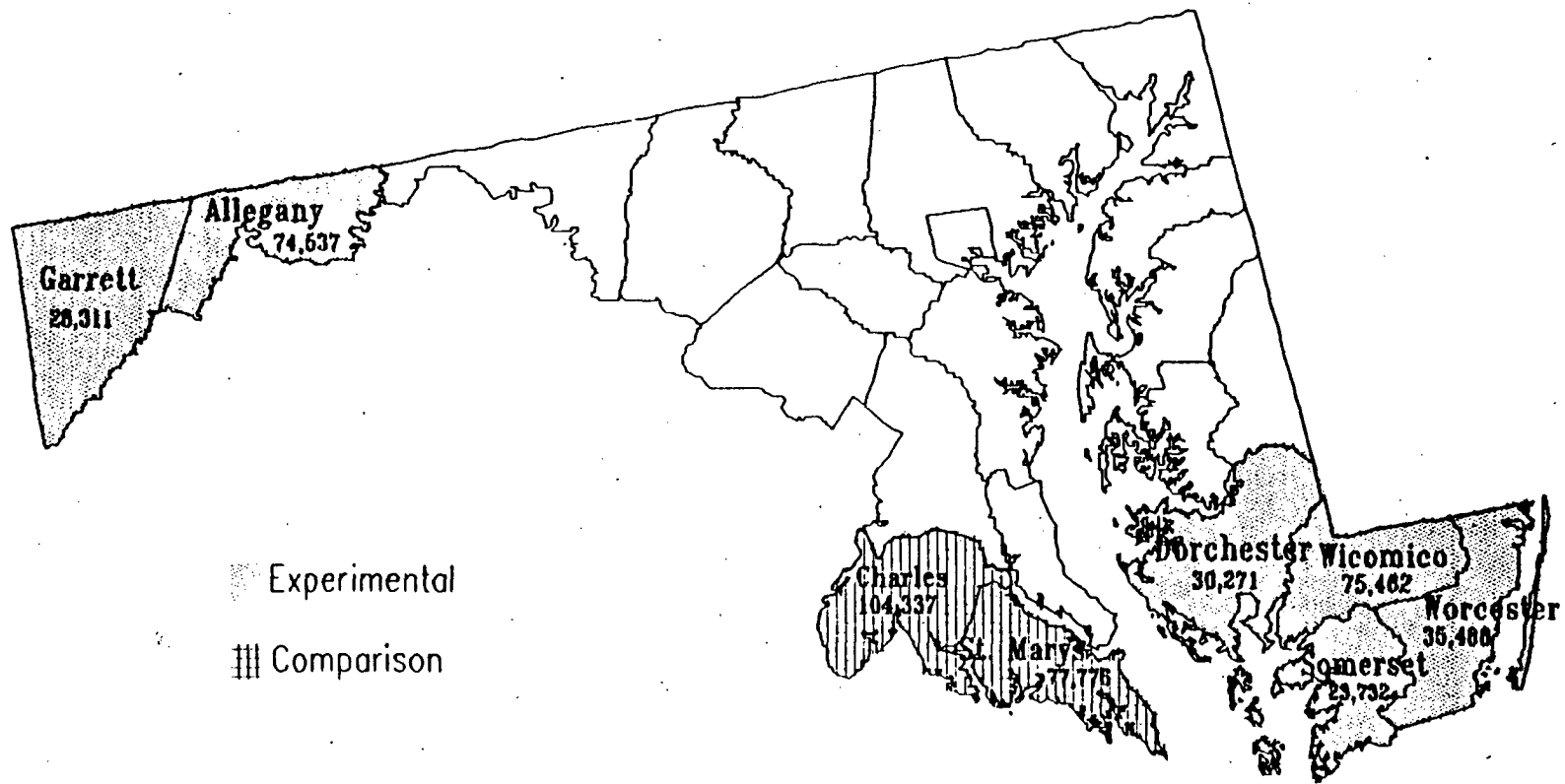
Seven high schools serve the region, with approximately 8,000 students in grades 9-12. Colleges in the area are Salisbury State University with some 4,840 students, University of Maryland Eastern Shore with approximately 1,850 students and Warwick Tech with approximately 1,250 students.

Tourism is a major industry for the region. Ocean City, especially, has an enormous increase in population during the summer, and much of this increase comes from young people. As discussed below, this fact had to be considered in the design of the present project.

Traffic law enforcement on the Eastern Shore is carried out primarily by the Maryland State Police. Highway patrols are also operated by the Sheriff's Departments in three of the four counties (in the fourth, traffic is not a mission of the agency). Traffic law enforcement is also performed by municipal police. The largest year round department in the four county area is the Salisbury Police Department with 47 officers followed by the Cambridge Police Department with 33 officers and Pocomoke City (11 officers). The Ocean City Police Department has a small year round force. This agency swells to over 70 officers hired for the summer months. Other municipal police in the region and their officer strength are: Berlin (7), Delmar (6), Fruitland (5), Hurlock (5), Oxford (2), Princess Anne (3) and Snow Hill (6).

Western Maryland: The two most western Maryland counties, Allegany and Garrett, were selected as the second experimental site. This provided a replication of the Eastern Shore test, albeit on a smaller scale.

Figure 1: Study Counties in Maryland



The 1990 Census populations of Allegany and Garrett Counties were, respectively, 74,537 and 28,311. Population totals in both counties declined slightly between the 1980 and 1990 Censuses. The area is served by relatively isolated media. Broadcast television comes from a station located in Oakland and from two in Hagerstown (Washington County). There are five radio stations in Allegany and three in Garrett. Daily newspapers are published in Cumberland, Frostburg and Oakland.

Eight high schools in Allegany County and two in Garrett County have a total enrollment of approximately 4,600 students. Frostburg State University and Garrett County Community College have enrollments of approximately 3,000 each, and about 1,000 students attend Allegany Community College.

Traffic law enforcement in Allegany and Garrett Counties is performed by the State Police and Sheriffs Departments as well as municipal police in Cumberland (50 officers), Frostburg (14 officers) and Oakland (4 officers).

Comparison Counties: The two southernmost Maryland Counties, St. Mary's (77,776 population) and Charles (population 104,337) served as a comparison site for analysis of crash trends and the informational program. No program activities were carried out in these two counties, but surveys among young drivers were sought on behalf of the project (see evaluation measures below). They are sufficiently far from the experimental sites to preclude the possibility of reception of any significant amount of the project's PI&E.

b. Program Activities

It is generally accepted that for a legal sanction to act as a general deterrent the target group (in this case drivers under age 21) must be aware of the sanction, must perceive the sanction as a significant punishment or inconvenience to be avoided, must perceive that there is a reasonable chance of being apprehended if they violate the law, and if apprehended, must know that the sanction will be applied.

The situation at the end of 1989 on the Eastern Shore and in Western Maryland provided nearly ideal conditions for testing the deterrent value of the State's alcohol license restriction. That is, there was less than complete awareness among young persons of the existence of the restriction, little or no enforcement had been carried out, and at least some police agencies apparently were unaware of the law (in the project planning process, several police agencies in the study areas were contacted and indicated they simply did not know of the law). MVA offices said they were handling no more than one hearing a month on violation of the restriction. Similarly, educators and alcohol resource specialists suggested that no significant amounts of information had been provided on the restriction and that young people generally did not know its provisions.

Program activities on the Eastern Shore and in the western counties therefore were structured to include three primary efforts. These were:

- Development of an informational program on the license restriction including TV and radio public service announcements (PSAs) and brochures and posters for local distribution and placement. The goal of this effort was to

inform all young drivers of the law and penalties, and that police agencies would be enforcing vigorously.

- Stimulation of enforcement by informing police agencies of the law and its importance, and by seeking participation of law enforcement in the informational campaign.
- Encouraging local groups to assist in distribution of materials and carrying out other activities to reach young drivers.

Specifically, the informational program was planned to build upon the ongoing Maryland DOT informational program, *Drive to Survive*, which periodically focused on various highway safety issues. Part of this program's efforts in early 1990 were devoted to the alcohol license restriction. The package of materials produced by this NHTSA project included five TV PSAs and four radio PSAs. Multiple versions of each TV and radio spot were made using various local police officials from the Eastern Shore and western counties as the spokespersons. A four-color pamphlet and matching poster were also prepared to support the broadcast media. The primary theme of the campaign was that if you are under 21, you will be fined or your license will be suspended if you are caught driving after having as little as one drink. In other words, *You Don't Have to be Drunk to Lose Your License in Maryland*. Appendix B presents scripts for the TV and radio PSAs, black and white reproductions of the poster and brochure and copies of the two press releases issued at the start of the program.

Copies of the TV and radio spots were distributed to all stations serving the experimental counties. Approximately 25,000 pamphlets and 1,000 posters were initially distributed in the test areas. As the program progressed, demand among the cooperating groups for additional pamphlets was strong. As a result, a reprinting of 20,000 was accomplished to support additional distribution. As this report is being prepared, the Maryland Motor Vehicle Administration was in the process of reprinting an additional 200,000 copies.

In addition to their use within the experimental counties, the TV spots were also adapted by Channel 45 (WBFF-TV) in the Baltimore area to support their *Operation Prom* campaign against youthful drinking and driving. Their adaptation involved substituting a local police spokesperson for those used in the experimental counties. The basic script and graphics remained unchanged.

c. Evaluation Measures

Assessment of the general deterrent effect of the alcohol license restriction was based on examining three basic questions:

- 1) Did adoption of the sanction by the State of Maryland result in any reduction in crash involvements by drivers under 21 years of age who had been drinking?
- 2) Did the PI&E program significantly increase awareness of the alcohol restriction among young drivers in the experimental as compared to the comparison counties?

- 3) Did the PI&E program enhance the effectiveness of the license restriction in the experimental counties, i.e., was it associated with a reduction in the number of drivers under age 21 who were involved in alcohol-related motor vehicle crashes?

In order to answer these questions, two basic types of information were obtained and analyzed. Issues related to the impact of the sanction on crash involvements before and after PI&E enhancement necessitated an examination of crash data covering a period from before the sanction was instituted through the PI&E campaign. The data source for this measure was statewide crash records collected and maintained by the State Police. This agency provided annual crash data tapes covering 1985-1990 to both the project and NHTSA's National Center for Statistics and Analysis (NCSA). NCSA then provided the project with a single, six year data file in which the unit of analysis was accident-involved drivers. This file was tabulated to obtain counts of drivers involved in crashes by demographics (age, sex, etc.), location (statewide, experimental counties, comparison counties), crash descriptors (severity, time of day, type of crash, etc.) and month of occurrence. These data then became the input to time series analyses to determine if the adoption of the sanction and/or introduction of the PI&E program were associated with a reduction in accident-involved drivers under the age of 21. Details of these analyses are presented in the first part of Section III.

Data dealing with the impact of the PI&E program on the awareness of the target population were obtained from surveys among young drivers. These surveys were locally sponsored within the experimental and comparison counties by the Alcohol and Drug Prevention Resource Centers. In order to reach a representative cross section of drivers under 21, three types of survey sampling sites were used. First, questionnaires were distributed among all persons under age 21 at the license application/renewal counter at MVA offices. The MVA offices in Salisbury (Eastern Shore), Cumberland (Allegany County), Oakland (Garrett County) and Waldorf (Charles County) participated in these surveys on behalf of the local sponsoring agencies.

The second type of survey sampling site consisted of colleges in the two experimental areas and the comparison area. On the Eastern Shore, Salisbury State University and the University of Maryland Eastern Shore distributed surveys for the project. Similarly, in the western counties, Frostburg State University and Garrett Community College participated, and Charles County Community College and St. Mary's College were the sites in the comparison counties. In the cases of schools with both resident and commuter students, questionnaires were distributed in student housing and parking lots so that both student groups were represented.

The third survey source was high schools. The large majority of high schools in the experimental and comparison areas agreed to conduct surveys for the local sponsors who cooperated with the project.

In addition to addressing knowledge of the alcohol sanction, the questionnaire addressed perceived enforcement levels and respondent exposure to media (print, TV and radio) about drinking and driving and the alcohol license restriction. Details on the questionnaire and the results of the survey are presented in the second part of Section III.

Data on the rate of citation and conviction for violation of the sanction would also have been of interest. Unfortunately, these data, although provided by the State, could not be used for several reasons. First, the violation of the 0.02 BAC restriction was a newly-created offense. Hence, there were no applicable "before" data to support a pre/post evaluation. Second, violation of the alcohol restriction can often result in the same charge as violation of any other restriction. It therefore was impossible with the available data to make a reliable separation of alcohol-related citations. In light of these and other data problems, it was decided to limit the evaluation to crash measures and survey data.

d. Program Chronology

Baseline survey data were collected by the cooperating Resource Centers during December, 1989 and January, 1990 in the experimental counties and during the first week of February, 1990 in the comparison counties. Production of PI&E materials took place during January, 1990.

Once the TV, radio and print materials were available for distribution, program "kickoff" and distribution of materials to the media took place. Simultaneous press conferences were held on February 1, 1990 in Salisbury and Cumberland by the Resource Centers and cooperating police agencies to announce the PI&E availability and reinforce the commitment of the police agencies to enforce the restriction. After the PI&E materials had been in use for at least one month, a second wave of survey data was collected.

Program activities were reinforced during the spring/fall of 1990 when the Eastern Shore region, and especially Ocean City, received its usual large influx of seasonal residents, many of whom are young persons. During this phase, special efforts were made to reach all young drivers in the Worcester County/Ocean City area regarding the license restriction. PSAs were provided to Ocean City radio stations, and the program's posters and brochures were distributed.

The history of the sanction and the project's activities may be summarized chronologically as follows:

- *Pre-sanction:* 1985 through 1988 (48 months) - Drivers under 21 years of age were subject to the same drinking and driving sanctions as older drivers.
- *Early sanction/no imprint:* January, 1989 through June, 1989 (6 months) - The sanction was instituted but there was no requirement to imprint the licenses of drivers under 21 with the restriction.
- *Pre PI&E/with imprint:* July, 1989 through January, 1990 (7 months) - New licenses were imprinted with the *Under 21 Alcohol Restricted* legend, but the PI&E program in the experimental counties had not begun.
- *Post PI&E:* February, 1990 through December, 1990 (11 months) - The PI&E had been distributed and continued to be in use. The end of this period was defined arbitrarily by the available crash data.

These periods are directly related to the three basic research questions enumerated above and define an hypothesized progression of successively greater sanction impact. The next section presents the crash and survey results structured in accordance with this chronology.

III. RESULTS

The Maryland youth alcohol sanction can be considered to have as its ultimate objective the reduction of drivers on the road under 21 years of age who have a positive (> 0.00) BAC. This, in turn, should reduce crashes involving these drivers in which alcohol is causally related. The sanction, however, is only operable to the extent that affected drivers are aware of it. Therefore, as discussed in the previous section, both crash and survey data were included in the evaluation -- the former to measure the "ultimate" impact of the sanction, and the latter to describe the extent to which it was known before and after the application of a PI&E program as well as the extent of penetration of the PI&E itself.

A. Crash Data

In order to answer the questions related to the impact of the sanction on youth crashes involving alcohol, an analysis of the available crash data as a function of the ages of the involved drivers and some measure of the role of alcohol had to be conducted. Quantitative alcohol measures are typically only collected for fatally injured drivers or when an arrest is made, and the expected samples of fatalities or arrests involving drivers under 21 were too small to support a meaningful analysis. Therefore, a qualitative estimate of alcohol involvement was needed. Several surrogate alcohol measures were considered. For example, a previous study by Blomberg, Preusser and Ulmer (1987) to evaluate the mandatory license suspension sanction for DWI in Wisconsin had used late night, single vehicle crashes involving middle-aged male drivers on Thursday, Friday and Saturday nights as an indicator of alcohol involvement. Because the sanction being studied in that case was applicable to drivers of all ages, a surrogate alcohol measure could be used which took advantage of the previous research evidence that middle aged males are more likely to be involved in an alcohol-related crash than any other age/sex group. In the present study, however, the primary focus on drivers under 21 was considered to negate to some extent the predictive power of this type of measure.

Instead of an "indirect" estimate of alcohol involvement from crash characteristics, it was decided to use the direct assessment of the investigating officer. The Maryland accident report includes an assessment of driver condition. One of the available options is *had been drinking* (HBD). In some cases, this may be based on a quantitative test. In the absence of a quantitative BAC measure, it is predicated upon the officer's judgment based on the available evidence likely including direct interaction with the driver. It was reasoned that a judgment of HBD by a police officer would be relatively consistent over time. It was also considered to be conservative. That is, if the officer's judgment is at all biased, it is likely to be in the direction of false negatives. Officers will typically not check HBD unless they have some relatively apparent evidence on which they can rely if forced to testify. As such, the HBD assessment may be an underestimate of the *absolute* incidence of alcohol in crash involved drivers. It is, however, assumed in the context of the present study to be a valid, though potentially biased, measure of the *relative* incidence of alcohol across the introduction of the sanction or the PI&E program. Further, as discussed in Section IV, any bias is assumed to be in the direction of underestimating the effectiveness of the studied sanction.

In addition to being a direct measure of alcohol involvement, the HBD alcohol measure was potentially available for every accident-involved driver regardless of age, sex or the characteristics

of the crash in which he or she was involved. This made it possible to have a sufficient sample size to analyze alcohol-involved crashes for the experimental and comparison sites separately. This proved critical to answering the research questions related to the sanction enhancement accomplished by the PI&E program.

It was also decided to use accident-involved drivers as the crash measure rather than crashes themselves. This is consistent with the choice of HBD as the alcohol measure since it is driver-based rather than crash-based. Using a driver measure was also considered to be in keeping with the intent of the law which clearly intends to reduce the incidence of driving after drinking by those under 21 years of age.

The primary technique chosen for the crash data analysis was the Box-Jenkins time series approach (see for example McCleary and Hay, 1980). This approach was selected because of its ability to examine directly the intervention of a countermeasure while accounting for such potentially confounding factors as seasonal cycles and underlying trends. The first step in applying the Box-Jenkins technique is to develop a univariate time series model for the series being examined. The general form of a univariate model is:

$$\Delta \phi p(B)(Y_t - u) = \Theta_0 + \Theta q(B)A_t$$

- where
- Y_t = the discrete time series
 - u = the mean of the stationary series
 - Δ = the differencing factor(s)
 - ϕp = the autoregressive factor(s)
 - Θ_0 = the deterministic trend
 - Θq = the moving average factor(s)
 - A_t = the noise series
 - B = the backshift operator.

Time series analysis also permits the use of one or more covariate series to control for possible related effects on the series being examined. These covariate series can either be other data series or intervention series. Intervention series are typically constructed of a value of zero for each month in which the countermeasure is *not* assumed to be operative and a value of one for each month in which it is assumed to be operating. When a covariate series is used in the analysis, the technique develops a transfer function between the univariate model's output series and the independent covariate series. The general form of a time series model with transfer function(s) is:

$$Y_t = f_1(X1_t) + f_2(X2_t) + \dots + f_N(XN_t) + f_A(A_t)$$

where	Y_t	=	the dependent output series
	$X1_t$	=	independent input series #1 (covariate series)
	$X2_t$	=	independent input series #2 (covariate series)
	XN_t	=	independent input series #N (covariate series)
	A_t	=	the noise series
	f_1	=	the transfer function between series Y and series X1
	f_2	=	the transfer function between series Y and series X2
	f_N	=	the transfer function between series Y and series XN
	f_A	=	the noise model.

In the present study, two independent, intervention covariate series were of interest. The first was used to examine the impact of introduction of the sanction. It consisted of 48 zeros corresponding to the 48 months in the pre-sanction period and 24 values of one representing the 24 months examined by the study in which the sanction was in effect statewide ("sanction series"). The second intervention series used was composed of 61 zeros representing the 61 months in the analysis before the start of the PI&E program and 11 ones to represent the months starting in February, 1990 during which the PI&E could have been effective ("PI&E series"). These two interventions were used individually to examine the separate impacts of the law and PI&E programs, and in combination to determine the relative strengths of the two interventions. The basic procedure employed was to develop a univariate model and examine its r-squared value (r^2). Then, each intervention was used separately to determine if it led to the development of a significant transfer function and increased the r^2 . Finally, both interventions were used together to see if both effects were operating.

It is important to realize that the Box-Jenkins time series technique examines the significance of each input series by considering it with respect to all other input series. Each developed time series model must satisfy three basic diagnostic checks before the model building process is complete and the final model is accepted. First, each identified model parameter must be statistically significant. Second, the model must be invertible, and, third, the residuals from the model should be "white noise" (i.e., the residuals should not display any time dependencies). The *AutoBox* software used (Automatic Forecasting Systems, 1986) will iterate through parameters and will eliminate parameters or entire independent series if subsequently entered series provide a better description of the data. It is also important to understand that the technique does not result in a unique solution. Alternative model forms with comparable fits to the underlying data can often be identified.

Operationally within this study, *AutoBox* was first used to identify the model it considered "best" using its programmed selection criteria. If this automatically identified model was not of the form typically found in previous applications of the time series technique to highway safety data, alternate model forms were explored manually using the estimation procedure contained in the software. If these alternate models provided a different view of the data, they are detailed below along with the model automatically identified by *AutoBox*.

1. Statewide Data

The first analyses were structured to examine the impact of the sanction itself. Since this sanction was applicable to all Maryland drivers under the age of 21, statewide data on HBD assessments for accident-involved drivers were tabulated. Initially, these were examined with respect to the four study time periods previously defined. Table 1 presents these data separately for drivers under 21 years of age, and 21 and over. For both age groups, the distribution of those judged HBD and those not judged to be HBD are significantly different across the four periods as shown by the chi-squared statistics below the data ($\chi^2 = 96.3$ with 3 d.f., $p < .001$ for drivers under 21 and $\chi^2 = 162.7$ with 3 d.f., $p < .001$ for drivers 21 and over). However, the younger drivers judged HBD drop a full percentage point after imposition of the sanction (5.7% pre to 4.7% early/no imprint and PI&E with imprint) and continue to fall during the PI&E period. Older drivers judged HBD drop by less than a percent over the same time period (6.4% pre to 5.7% by the time the PI&E was instituted). These trends would seem to be consistent with the general reduction in alcohol-related crashes indicated earlier in the discussion of the FARS data.

A time series model with a significant transfer function for the sanction intervention (I_{1t}) was fit to the statewide series for drivers under 21 judged HBD using the automatic procedures in *AutoBox*. The data used to develop this model and all of the others discussed in this section are presented in Appendix C. The PI&E intervention series was not significant when entered in combination with the sanction series. The resulting equation was:

$$Y_t = -43.8I_{1t} + \frac{133 + A_t}{(1 - .44B)(1 + .51B^6)}$$

and had an r^2 of 0.63. The transfer function coefficient (I_{1t}) of -43.8 can be interpreted as a reduction of 43.8 accident-involved drivers per month after the time the sanction became effective on January 1, 1989.

This decline in accident-involved drivers under 21 judged HBD can also be expressed in terms of a percentage decrease. If this decrease is calculated with respect to the baseline monthly mean of 133 accident-involved drivers under 21, the estimated reduction is almost 33 percent. Alternatively, the decrease can be examined only with respect to the sanction period by calculating the ratio of the decrease to the sum of the decrease and the mean of the actual series for the 24 months covered by the sanction intervention. This is one type of "actual versus expected" view of the decrease. Coincidentally, for the model presented above this approach yields the same reduction estimate of 33 percent.

Table 1.
Police Officer Judgment of "Had Been Drinking" (HBD)
by Study Period *Statewide* in Maryland

Drivers Under 21

	Pre	Early/ No Imprint	Pre P1&E with Imprint	P1&E	SUM	
HBD	6401	5881	6741	9081	85711	# Drivers
	5.7%	4.7%	4.7%	4.3%	5.4%	% of Period
Not HBD	105790	119561	137531	201261	1516251	# Drivers
	94.3%	95.3%	95.3%	95.7%	94.6%	% of Period
SUM	112191	125441	144271	210341	1601961	# Drivers
	100.0%	100.0%	100.0%	100.0%	100.0%	% of Period

$(\chi^2 = 96.3$ with 3 d.f., $p < .001)$

Drivers 21 and Over

	Pre	Early/ No Imprint	Pre P1&E with Imprint	P1&E	SUM	
HBD	38388	40241	48101	71271	543491	# Drivers
	6.4%	5.9%	5.7%	5.7%	6.2%	% of Period
Not HBD	559573	641681	801271	1185441	8224121	# Drivers
	93.6%	94.1%	94.3%	94.3%	93.8%	% of Period
SUM	597961	681921	849371	125671	876761	# Drivers
	100.0%	100.0%	100.0%	100.0%	100.0%	% of Period

$(\chi^2 = 162.7$ with 3 d.f., $p < .001)$

The model shown above suggests a large and statistically significant step down in the number of accident-involved drivers under 21 judged HBD coincident with the effective date of the statute. This is one possible interpretation of the shape of the time series shown in Figure 2. Another possible interpretation of this series is that a downward trend was already in existence prior to the adoption of the statute. When this interpretation is adopted, both a trend parameter and a step down might be needed to explain the data. To examine this alternative theory, a more traditional model form was examined which contained a single autoregressive parameter with lag 12 (essentially an annual adjustment) and a single moving average term of lag 4 (essentially a trend factor). This model also yielded a significant transfer function for the sanction intervention. The r^2 value of this model was 0.62, which is approximately equivalent to that of the model shown above, but the magnitude of the transfer function parameter (-14.9) was considerably less. This alternate model is shown below:

$$Y_t = -14.9I_{1t} + \frac{102 + (1 + .37B^4) A_t}{(1 - .51B^{12})}$$

The decrease of 14.9 accident-involved drivers under 21 judged HBD is a reduction of slightly more than 11 percent from the baseline mean of the series or just over 14 percent using the actual versus predicted calculation approach. In addition to the statewide data series, Figure 2 shows the baseline mean and the step decreases at the effective date of the statute referenced to the baseline mean for the automatically determined model with only the step presented on the previous page ("Model 1") and the model with both a step and a moving average trend component ("Model 2") shown above.

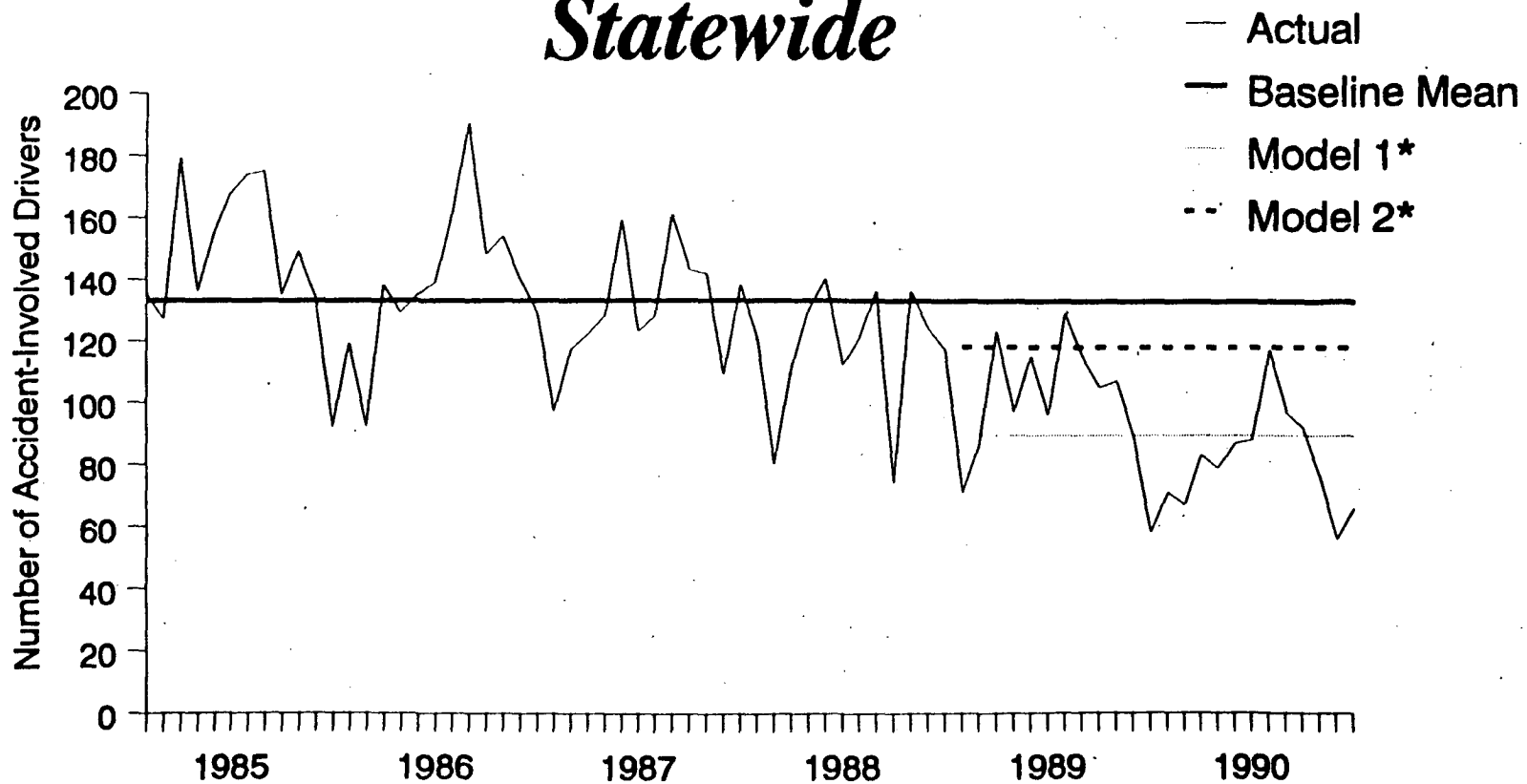
The two separate models discussed above each explains approximately the same proportion of the variance in the series (r^2 values of 0.63 and 0.62). They characterize the statewide decline in the number of accident-involved drivers under 21 judged HBD over the study period as *either* a large single step (Model 1) or as a moving average trend with a smaller superimposed step (Model 2). Since there is no definitive way to select between these two interpretations, both models are presented herein as background to the reader for estimating the *extent* of the impact of the statute. A conclusion that the effective date of the statute was, in fact, associated with a step decrease in the criterion measure of accident-involved drivers under 21 judged HBD is supported by both interpretations of the data.

Similar analyses of the HBD series for drivers 21 and older, and of drivers under 21 not judged HBD showed no significant effects of either the sanction or PI&E intervention series. Thus, the effective date of the sanction was associated with a significant drop in both accident-involved drivers under 21 years of age who were judged to have been drinking and the ratio of accident-involved drivers under 21 judged HBD to crash-involved drivers judged not HBD. The extent of the reduction observed varies as a function of the model form and method of calculating the percentage. Further, the observed reduction was not the result of a general decrease in alcohol-involved crashes or in all crashes involving drivers under 21.

Figure 2

Drivers < 21 Judged "HBD"

Statewide



*Reductions of 43.8 for Model 1 and 14.9 for Model 2 referenced to baseline mean

2. Experimental versus Comparison

The PI&E program intended to enhance the effectiveness of the sanction was only mounted in the two experimental regions (Eastern Shore and Western Maryland). The two comparison counties were selected so that there was little chance young drivers in them received any of the developed materials (TV, radio or print). The first step in the analysis was to examine the HBD versus non-HBD distributions for the experimental and control counties as a function of time period. Table 2 presents these data for drivers under 21 years of age. In the experimental counties, drivers judged HBD declined in each successive period from 8.9 percent of all under 21 crash-involved drivers in the pre period to 7.4 percent during the early law period, 6.3 percent after licenses were imprinted and 5.0 percent after the PI&E campaign. This is a decrease in percentage of under 21 drivers judged HBD of 43.8 percent from before the law to the PI&E period. The corresponding drop in the comparison counties was only 30.2 percent.

It is interesting to note that the rate of crash-involved drivers judged HBD in the experimental counties was much higher than in the statewide data presented in Table 1. During the pre period, the experimental counties showed 8.9 percent HBD among crash-involved drivers under the age of 21 while the statewide percentage was only 5.7 percent. This may be due to the presence of the Eastern Shore resort areas in the experimental group. It is not unreasonable that resort areas such as those on the Eastern Shore would be associated with higher alcohol use than non-resort areas. Table 3, which shows the same experimental and comparison county data for drivers 21 and over, also tends to indicate that there is a higher level of HBD in the experimental counties than would be expected from the statewide totals. Table 3 also indicates no consistent downward trend in the percentage of HBD crashes among older drivers, although an overall reduction is evident.

As with Table 1, the data in Tables 2 and 3 are largely descriptive. Therefore, in order to assess the possible effects of the sanction and the PI&E program, time series models were developed. For drivers under 21 judged HBD in the experimental counties, significant intervention effects were found for *both* the sanction and PI&E interventions. The resulting model, which had an r^2 of 0.60, was:

$$Y_t = -3.2I_{1t} - 4.6I_{2t} + \frac{(1 - .93B^{12})A_t}{(1 - B^{12})}$$

indicating that the sanction intervention (I_{1t}) was associated with a significant reduction of 3.2 crash-involved HBD drivers per month and the PI&E program (I_{2t}) accounted for an *additional* reduction of 4.6 crash-involved drivers per month. The series itself and these reductions referenced to the baseline mean are depicted in Figure 3. Since this model was already of a "traditional" form, no alternative was calculated.

With respect to the baseline mean, the pre-sanction mean level of 15.2 crash-involved drivers judged HBD is reduced by more than 21 percent with the introduction of the sanction and a further 30 percent (of the pre period level) by the PI&E. When viewed in terms of actual versus predicted, the calculated reductions are in excess of 21 percent for the sanction introduction and

Table 2.

Police Officer Judgment of "Had Been Drinking" (HBD)
by Study Period for Accident-Involved *Drivers Under 21*

Experimental Counties

	Pre	Early/ No Imprint	Pre PI&E with Imprint	PI&E	SUM	
HBD	730	77	75	87	969	# Drivers
	8.9%	7.4%	6.3%	5.0%	7.9%	% of Period
Not HBD	7495	961	1124	1657	11237	# Drivers
	91.1%	92.6%	93.7%	95.0%	92.1%	% of Period
SUM	8225	1038	1199	1744	12206	# Drivers
	100.0%	100.0%	100.0%	100.0%	100.0%	% of Period

($\chi^2 = 35.7$ with 3 d.f., $p < .001$)

Comparison Counties

	Pre	Early/ No Imprint	Pre PI&E with Imprint	PI&E	SUM	
HBD	383	37	52	57	529	# Drivers
	6.3%	4.9%	5.8%	4.4%	5.9%	% of Period
Not HBD	5689	725	843	1226	8483	# Drivers
	93.7%	95.1%	94.2%	95.6%	94.1%	% of Period
SUM	6072	762	895	1283	9012	# Drivers
	100.0%	100.0%	100.0%	100.0%	100.0%	% of Period

($\chi^2 = 8.3$ with 3 d.f., $p < .05$)

Table 3.

Police Officer Judgment of "Had Been Drinking" (HBD)
by Study Period for Accident-Involved *Drivers 21 and Over*

Experimental Counties

	Pre	Early/ No Imprint	Pre PI&E with Imprint	PI&E	SUM	
HBD	30161	3471	3961	6181	43771	# Drivers
	9.9%	9.5%	7.9%	9.1%	9.6%	% of Period
Not HBD	273631	32891	46121	61691	414331	# Drivers
	90.1%	90.5%	92.1%	90.9%	90.4%	% of Period
SUM	303791	36361	50081	67871	458101	# Drivers
	100.0%	100.0%	100.0%	100.0%	100.0%	% of Period

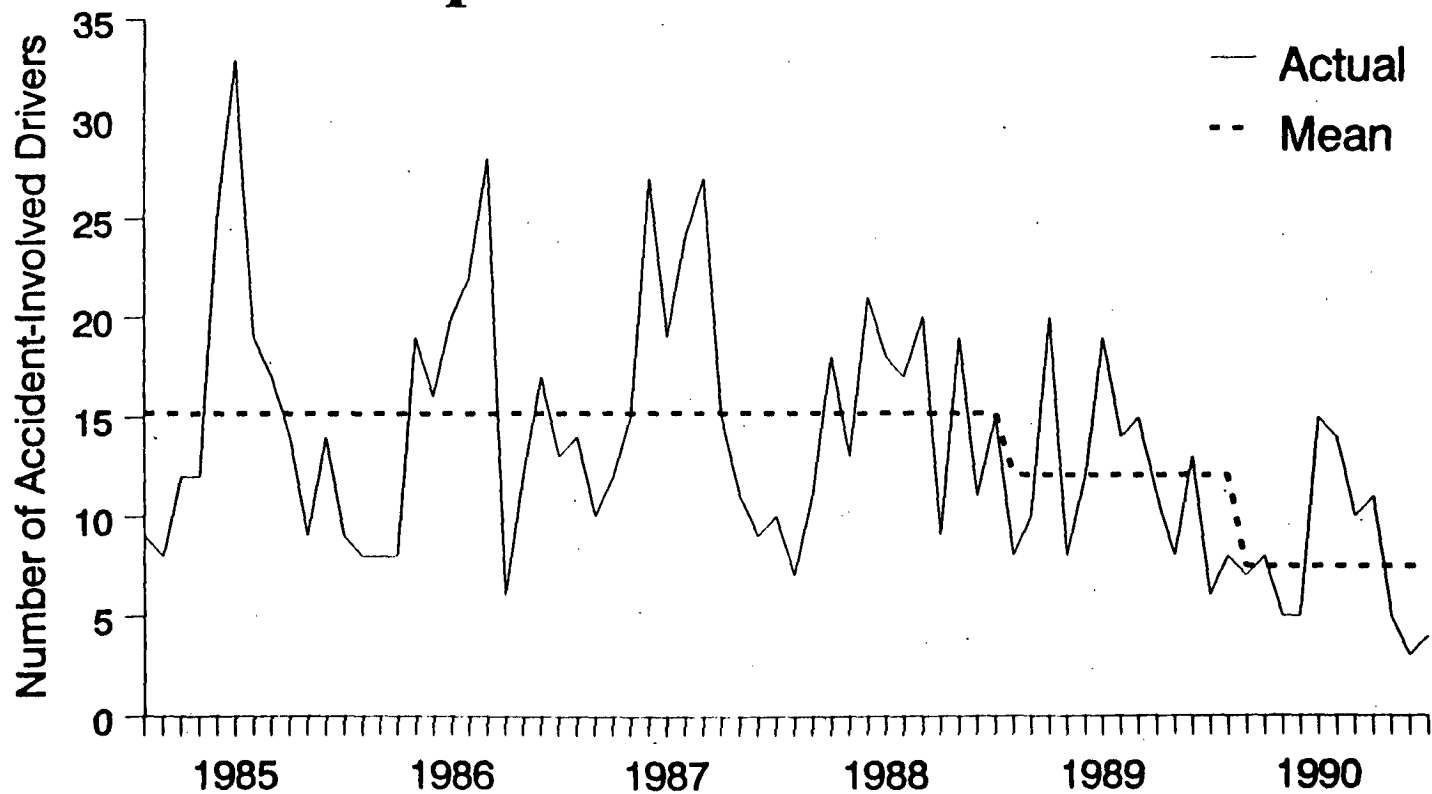
($\chi^2 = 22.2$ with 3 d.f., $p < .001$)

Comparison Counties

	Pre	Early/ No Imprint	Pre PI&E with Imprint	PI&E	SUM	
HBD	18891	2141	2791	4251	28071	# Drivers
	9.0%	8.0%	8.0%	8.2%	8.7%	% of Period
Not HBD	190131	24561	32011	47741	294441	# Drivers
	91.0%	92.0%	92.0%	91.8%	91.3%	% of Period
SUM	209021	26701	34801	51991	322511	# Drivers
	100.0%	100.0%	100.0%	100.0%	100.0%	% of Period

($\chi^2 = 8.4$ with 3 d.f., $p < .05$)

Figure 3
Drivers <21 Judged "HBD"
Experimental Counties



almost 37 percent for the PI&E. Clearly, this overall decrease of over 50 percent suggests that these countermeasures *may* have been effective. Verifying that effectiveness, however, required examining the balance of the data to determine if the observed reductions could be attributed to other salient factors such as a general reduction in alcohol-involved crashes among all ages or simply among youth. It is noteworthy that the magnitude of the decline coincident with the sanction adoption is consistent with the pattern detected by Model 1 in the statewide data (Figure 2).

In order to shed additional light on the pattern of results, the youth HBD series for the comparison counties was modeled. As with the statewide series, only the intervention associated with the effective date of the sanction at month 49 (I_{1t}) produced a significant transfer function. There was no significant effect of the PI&E intervention at month 62. The resulting model ($r^2 = 0.19$) was:

$$Y_t = -2.1I_{1t} + \frac{8.0 + A_t}{(1 - .34B)}$$

indicating that the pre-law mean of 8.0 HBD crash-involved drivers was reduced by 26 percent (2.1 accident-involved HBD drivers per month) with respect to the baseline or on an actual versus predicted basis coincident with the introduction of the sanction. This finding is depicted in Figure 4. The patterns of results in Figures 2, 3 and 4 at the point of the January, 1989 adoption of the law are strikingly similar.

The experimental, comparison and statewide data all show a significant drop in crash-involved drivers under 21 coincident with the adoption of the 0.02 BAC law, thereby providing evidence supporting cause and effect. Since only the experimental counties showed a significant intervention effect at the time of the PI&E, there is a strong suggestion that it was the cause of the observed decline. However, in order to examine other possible explanations for the observed results such as a general decline in all crashes among youth (HBD and not HBD) or in alcohol-related accidents involving all ages, additional crash analyses were performed.

The first additional analysis examined the series composed of experimental county accident-involved drivers under 21 judged not to have been drinking (not HBD). This series is shown in Figure 5. Although there are seasonal patterns evident in this plot, there do not appear to be any trends or step interventions such as those seen in Figures 2, 3 and 4. This was confirmed by the time series modeling which found no significant interventions associated with the adoption of the sanction or the initiation of the PI&E program. The absence of these interventions indicates that the observed declines in HBD accident-involved drivers were not the result of a general decline in all under 21 crash involvements. This was further confirmed by three analyses which examined the *ratio* of HBD crash-involved drivers under 21 to all under 21 accident-involved drivers for the experimental and comparison counties and statewide. The pattern of results found was identical to that reported above for the *number* of accident-involved drivers. The sanction adoption showed as a significant intervention in all three analyses but the PI&E intervention series was only significant in the experimental counties. Thus, with the number of under 21 crash-involved drivers judged HBD declining along with their ratio to all crash-involved drivers under 21, and those judged not HBD showing no intervention effect, the evidence for a countermeasure effect is strong.

Figure 4
Drivers < 21 Judged "HBD"
Comparison Counties

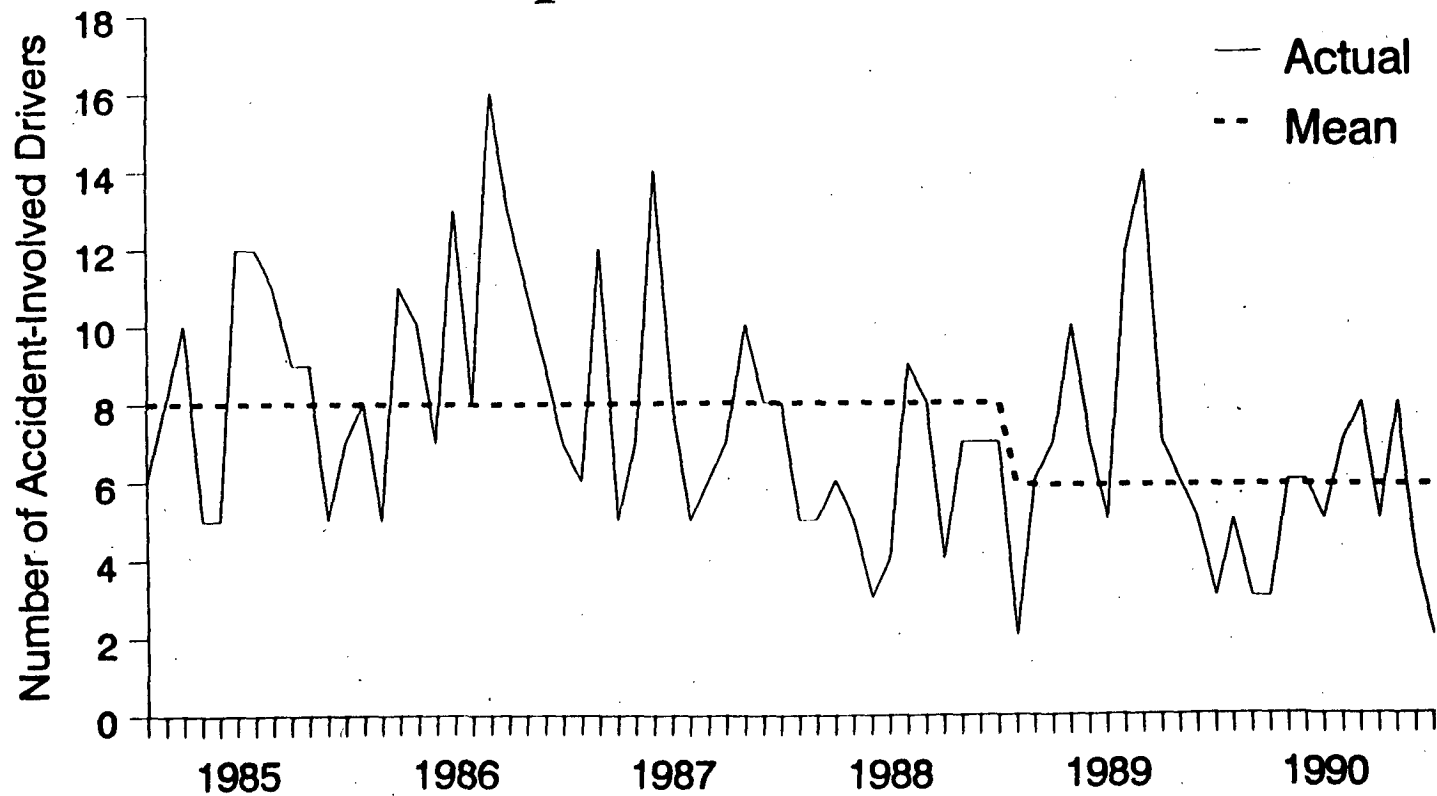
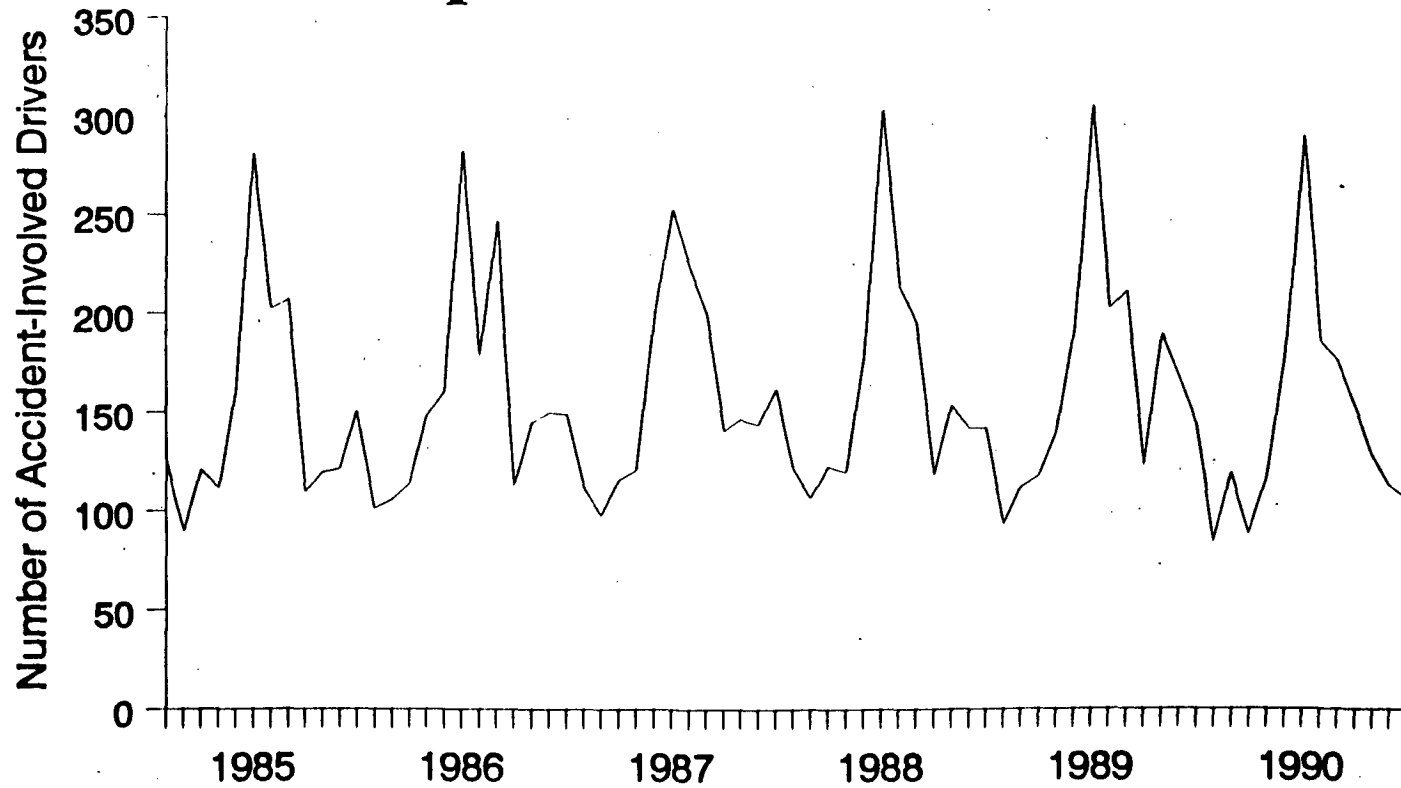


Figure 5
Drivers < 21 Judged Not "HBD"
Experimental Counties



Another possible cause of the observed pattern of results could be a general reduction in crash-involved drivers who had been drinking regardless of age. If this were true, the series for drivers 21 and over judged HBD would also be expected to show intervention effects. An examination of Figure 6 which shows the HBD series for older drivers suggests the presence of neither a trend nor any step interventions. This was confirmed by a time series analysis which showed no significant intervention effects coincident with either the sanction adoption or PI&E initiation.

Finally, it was possible that the reduction in HBD crashes among drivers under 21 was simply a manifestation of a general downward trend in all accidents or in those involving youth. To examine this theory, additional time series were calculated for the under 21 HBD series using all crashes to youth and all crashes regardless of age as covariate input series. A significant transfer function between either of these covariate series and the under 21 HBD crash series would have indicated that at least part of the observed reduction in under 21 HBD crashes could be explained by general trends in all crashes or all crashes involving youth. Although a downward trend in all crashes was identified, there was no significant transfer function between the covariate series and the under 21 HBD output series. Moreover, the observed effects of the sanction were step effects and not trends. Thus, the observed crash results could not be a result of a general trend of crash reduction in Maryland.

After the examination of the crash-involved older drivers, no other crash data were available to support additional analyses which would shed further light on the sanction or PI&E interventions. However, the consistency of the findings coincident with adoption of the sanction for all examined regions of the state was, by itself, compelling. It was reasoned that the analysis of the survey would provide the final evidence. If there was sufficient knowledge of the sanction in the survey baseline (before the PI&E was mounted but well after adoption of the law), further support would be developed for the observed crash results. Likewise, if significant changes in knowledge and exposure to the PI&E materials could be documented in the experimental counties, the sanction enhancement benefits of the PI&E program would be strongly supported.

B. Survey Data

The survey data in support of this study were collected in two waves by the cooperating drug and alcohol Resource Centers in the experimental and comparison counties. The first wave was collected before any PI&E was released in the experimental counties. The second was collected after the PI&E had been ongoing for approximately one month. Each center used the questionnaire shown in Figure 7 with the introductory paragraph varied to localize the appeal for cooperation. The first three questions on the survey identified the respondent in terms of age, sex and period of licensure. Questions four and five were not directly related to the youth sanction, but were included to set a context of drinking and driving for the survey. Question six addressed the respondent's perception of the extent to which his/her peers drink and drive.

Questions seven and eight dealt most directly with the respondent's perception of the youth sanction. Question seven asked for the breath alcohol concentration applicable to the respondent. Since the survey sampling plan called for data collection primarily among those under 21, this question was essentially asking about the 0.02 limit. Question eight asked about the number of drinks which would make it illegal for the respondent to drive. This relates directly to the sanction and to the theme of the PI&E which stressed that even one drink could make it illegal for someone under 21 to drive in Maryland.

Figure 6
Drivers 21+ Judged "HBD"
Experimental Counties

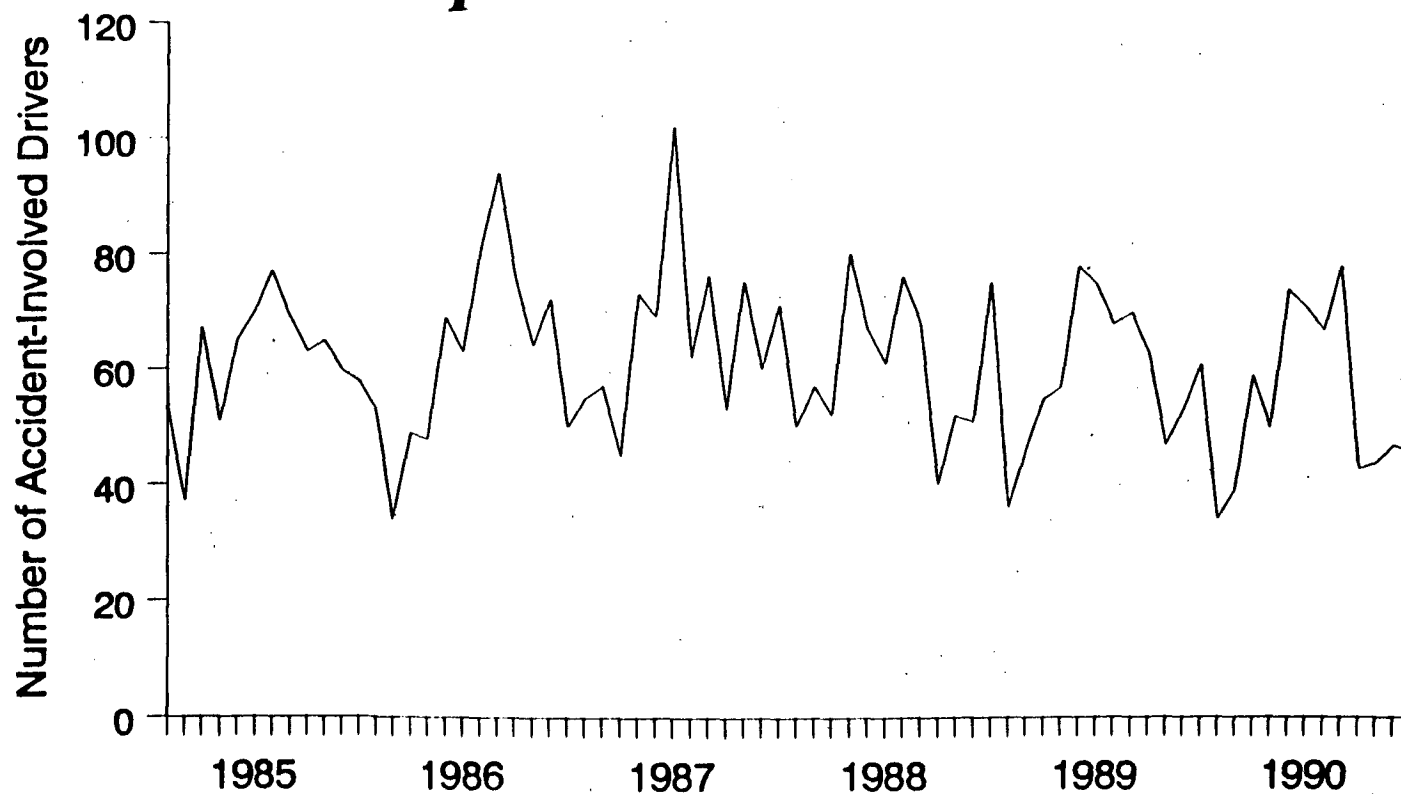


Figure 7

Questionnaire Used in Survey

ALCOHOL AND DRUG PREVENTION SURVEY											
<p>This survey is completely anonymous. Please do not put your name on this form. Survey results will be used to determine the effectiveness of awareness programs targeted at drinking and driving. Make your "best guess" if you aren't sure of the answer to any question. Please circle all answers.</p>											
1) Your Sex	<i>male</i>	<i>female</i>									
2) Your Age	15	16	17	18	19	20	21	<i>or older</i>			
3) How long have you held a driver's license?											
	<i>not licensed (or learner)</i>	<i>less than 6 months</i>	<i>6 months to 1 year</i>	<i>more than 1 year</i>							
4) On a typical night, approximately what percent of people who drive in violation of the drinking and driving laws in Maryland do you think are arrested?											
	1%	10%	20%	30%	40%	50%	60%	70%	80%	90%	99%
5) Approximately what percent of drivers who are arrested in Maryland for violating the drinking and driving laws do you think are convicted?											
	1%	10%	20%	30%	40%	50%	60%	70%	80%	90%	99%
6) In Maryland, approximately what percent of people your age do you think drink and drive at least once per month?											
	1%	10%	20%	30%	40%	50%	60%	70%	80%	90%	99%
7) Maryland law states that <u>you</u> may not operate a motor vehicle if your blood or breath alcohol concentration is equal to or greater than:											
	.01%	.02%	.03%	.04%	.05%	.06%	.07%	.08%	.09%	.10%	
8) If you could legally purchase alcohol, how many drinks would put <u>you</u> "over the limit" for driving in Maryland?											
	1	2	3	4	5	6	7	8	9	10	
9) Have you seen any printed material (pamphlets, posters, etc.), seen any TV commercials or heard any radio commercials which talked about											
				PRINT		TV		RADIO			
Injury caused by drunk drivers?	yes	no		yes	no		yes	no			
Alcohol license restrictions?	yes	no		yes	no		yes	no			
Jail for convicted drunk drivers?	yes	no		yes	no		yes	no			

The last set of questions, grouped under number nine, dealt with media exposure. The item of interest, exposure to messages on *Alcohol license restrictions*, was surrounded by two more general topics related to drunk driving. Separate responses for the three types of media forms used in the PI&E campaign (print, TV and radio) were requested.

Overall, the results of the survey strongly supported the crash results presented earlier. The specific findings are discussed in the sections that follow.

1. Sample Description

As discussed in Section II, the survey was mounted by the cooperating agencies at three basic types of sampling locations - high schools, colleges and Motor Vehicle Administration offices. Table 4 shows the distribution of the responses received by type of sampling location for the baseline (before PI&E) and post (after PI&E) waves of collection. It can be seen that the sample size decreased quite markedly in both experimental and comparison counties between the baseline and post surveys. Part of this decrease may be attributed to the desire not to sample any person twice and a possible decreased interest in the project among both the cooperating Resource Center personnel and potential respondents. Nevertheless, the sample size in all categories is quite robust and capable of supporting the analyses of interest to the present project.

It can also be seen in Table 4 that the experimental and comparison county distributions were different in each wave. In the baseline, the comparison sample included a higher proportion of high school and a lower percentage of college respondents than the experimental sample. This reversed in the post period. The Motor Vehicle Administration offices increased as a proportion of the post sample in the comparison counties. It had been postulated when designing the sample that the three types of survey locations would yield somewhat different types of respondents. High schools would clearly have the youngest group and colleges the most educated. Motor vehicle offices were expected to have a cross-section, including some youth who were not attending school or were high school dropouts.

Since the distribution by type of survey site varied across the waves, all subsequent analyses were conducted by type of location as well as for the aggregate sample. Those meaningful differences identified are reported separately in the remainder of this section.

Tables 5, 6 and 7 show, respectively, the gender, age and length of licensure distributions of the entire sample (experimental and comparison combined). The separate results for the experimental and comparison counties mirrored those shown in these Tables. The sample was approximately evenly split between males and females, although there was a small increase in the proportion of female respondents in the post wave.

The age distribution of respondents did shift significantly in the post wave as shown in Table 6. There was a marked decrease in the proportion of 15 and 16 year olds and an increase in 17 and 18 year olds. The percent of respondents 21 and over declined slightly from 11.5 percent in the baseline to 8.3 percent in the post wave.

The data for how long the respondent held a drivers license is consistent with the reported age distributions. As would be expected from the slightly older sample in the post period, a higher percentage of respondents was licensed, and the typical length of licensure was longer. Although age and license period certainly changed across waves, it is not believed that the shifts observed could account for the pattern of results presented below.

Table 4.

Type of Survey Site by Survey Sampling Period

Baseline (Before PI&E)

	High School	Motor Vehicle Office	College	SUM	
Experimental	2643	356	1365	4364	# Surveys
	60.6%	8.2%	31.3%	100.0%	% of Wave
	65.6%	69.0%	75.3%	68.7%	% of Column
Comparison	1384	160	448	1992	# Surveys
	69.5%	8.0%	22.5%	100.0%	% of Wave
	34.4%	31.0%	24.7%	31.3%	% of Column
SUM	4027	516	1813	6356	# Surveys
	63.4%	8.1%	28.5%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 54.2$ with 2 d.f., $p < .001$)

Post (After PI&E)

	High School	Motor Vehicle Office	College	SUM	
Experimental	2053	219	589	2861	# Surveys
	71.8%	7.7%	20.6%	100.0%	% of Wave
	79.2%	58.2%	72.4%	75.6%	% of Column
Comparison	540	157	224	921	# Surveys
	58.6%	17.0%	24.3%	100.0%	% of Wave
	20.8%	41.8%	27.6%	24.4%	% of Column
SUM	2593	376	813	3782	# Surveys
	68.6%	9.9%	21.5%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 83.8$ with 2 d.f., $p < .001$)

Table 5.

Gender of Survey Respondents by Sampling Period

	Male	Female	Unknown	SUM	
Baseline	3145	3147	64	6356	# Surveys
	49.5%	49.5%	1.0%	100.0%	% of Wave
	63.9%	61.8%	52.5%	62.7%	% of Column
Post	1780	1944	58	3782	# Surveys
	47.1%	51.4%	1.5%	100.0%	% of Wave
	36.1%	38.2%	47.5%	37.3%	% of Column
SUM	4925	5091	122	10138	# Surveys
	48.6%	50.2%	1.2%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 4.8$ with 1 d.f., $p < .05$)

Table 6.

Age of Survey Respondents by Sampling Period

	15	16	17	18	19	20	21 or Older	Unknown	SUM	
Baseline	681	1646	1482	948	503	346	731	19	6356	# Surveys
	10.7%	25.9%	23.3%	14.9%	7.9%	5.4%	11.5%	0.3%	100.0%	% of Wave
	79.4%	66.1%	54.7%	57.6%	61.7%	62.8%	70.0%	86.4%	62.7%	% of Column
Post	177	846	1229	697	312	205	313	3	3782	# Surveys
	4.7%	22.4%	32.5%	18.4%	8.2%	5.4%	8.3%	0.1%	100.0%	% of Wave
	20.6%	33.9%	45.3%	42.4%	38.3%	37.2%	30.0%	13.6%	37.3%	% of Column
SUM	858	2492	2711	1645	815	551	1044	22	10138	# Surveys
	8.5%	24.6%	26.7%	16.2%	8.0%	5.4%	10.3%	0.2%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 230.9$ with 6 d.f., $p < .001$)

Table 7.

Length Drivers License Held by Sampling Period

	Not Licensed	Less Than 6 Months	6 Months to 1 Year	More Than 1 Year	Unknown	SUM	
Baseline	1993	702	841	2801	191	6356	# Surveys
	31.4%	11.0%	13.2%	44.1%	0.3%	100.0%	% of Wave
	70.2%	64.6%	54.1%	60.6%	57.6%	62.7%	% of Column
Post	847	384	713	1824	141	3782	# Surveys
	22.4%	10.2%	18.9%	48.2%	0.4%	100.0%	% of Wave
	29.8%	35.4%	45.9%	39.4%	42.4%	37.3%	% of Column
SUM	2840	1086	1554	4625	331	10138	# Surveys
	28.0%	10.7%	15.3%	45.6%	0.3%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 127.6$ with 3 d.f., $p < .001$)

2. Knowledge of the Sanction

The first set of survey results of interest relate to the extent to which the 0.02 BAC sanction was known by the target group and their perception of the enforcement of drinking driving laws. Question four asked for an estimate of the percentage of illegal drinking drivers who are arrested on a typical night. Table 8 shows the distribution of responses received in the experimental and comparison counties on the two survey waves. In the comparison counties, there was no significant difference from the baseline to the post waves. In the experimental counties, however, there was a small but statistically significant change with the emphasis in the post wave on higher estimates by the respondents. In the baseline, 9.4 percent of the respondents estimated that 60 percent or more of the drunk drivers were arrested. This increased to 12.0 percent of the respondents in the post wave. This change, although small, is still in the desired direction of an enhanced perception of the risk of a drinking driving arrest.

Table 9 gives the results for question five which addressed the perceived risk of a conviction if arrested for drunk driving. As with the arrest data in Table 8, only the baseline/post difference for the experimental counties was significant. Also, as with the perception of arrest risk, the shift was towards a higher percentage estimate, i.e., a greater perceived risk of conviction if arrested. In the baseline, 20.1 percent of the respondents selected 60 percent or more as the percent of drivers convicted. This increased to 23.2 percent in the post wave again indicating the possibility of a small increase in perceived sanction risk among youthful drivers in the experimental counties.

The sixth question dealt with the respondent's estimate of the percent of people his or her age who drink and drive at least once per month. The resulting response distribution shown in Table 10 showed no significant baseline-to-post changes for the experimental counties and a small but statistically significant shift towards lower estimates for the comparison counties. In general, the pattern of results was largely uninformative. Approximately half of the respondents in each wave in both the experimental and comparison regions estimated that 60 percent or more of their peers drive after drinking at least once per month. It is not surprising that the distribution of responses to this question did not change markedly from baseline to post in the experimental counties as none of the PI&E was addressed to this topic. It is, however, considered noteworthy that there was not a clear modal response to this question. Across the two waves and both types of sites no response category was selected by as much as 15 percent of the respondents.

Table 11 presents the most directly relevant sanction knowledge results. Question 7, from which these results were derived, asked specifically what blood or breath alcohol concentration would make it illegal for the respondent to drive. For approximately 90 percent of the sample (those under 21 years of age), the correct answer is 0.02. However, allowing for possible misinterpretation of either the wording of the Maryland restriction (*greater than or equal to 0.02*) or the PI&E message that even one drink can make it illegal for a youth to drive, a response of 0.01 might also be considered "correct." For those 21 and over, the prevailing BAC limit in Maryland is 0.10 under the administrative per se law.

The data in Table 11 present strong evidence for the impact of the PI&E campaign. The baseline-to-post distribution of responses for the experimental counties is statistically significant and in the expected direction. The comparison county response distribution is not significantly different across survey wave. The graphical depiction of these data in Figures 8 and 9 facilitates examining the pattern of results obtained.

Table 8.

Responses to the Question:

On a typical night, approximately what percent of people who drive in violation of the drinking and driving laws in Maryland do you think are arrested?

for Experimental and Comparison Counties by Sampling Period

Responses for Experimental Counties

	1%	10%	20%	30%	40%	50%	60%	70%	80%	90%	99%	No Answer	SUM	
Baseline	732	961	762	715	487	290	182	124	59	23	21	81	4364	# Surveys
	16.8%	22.0%	17.5%	16.4%	11.2%	6.6%	4.2%	2.8%	1.4%	0.5%	0.5%	0.2%	100.0%	% of Wave
	63.0%	60.7%	60.3%	62.7%	59.6%	59.1%	57.6%	52.8%	53.2%	44.2%	53.8%	57.1%	60.4%	% of Column
Post	429	623	502	426	330	201	134	111	52	29	18	6	2861	# Surveys
	15.0%	21.8%	17.5%	14.9%	11.5%	7.0%	4.7%	3.9%	1.8%	1.0%	0.6%	0.2%	100.0%	% of Wave
	37.0%	39.3%	39.7%	37.3%	40.4%	40.9%	42.4%	47.2%	46.8%	55.8%	46.2%	42.9%	39.6%	% of Column
SUM	1161	1584	1264	1141	817	491	316	235	111	52	39	14	7225	# Surveys
	16.1%	21.9%	17.5%	15.8%	11.3%	6.8%	4.4%	3.3%	1.5%	0.7%	0.5%	0.2%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 22.1$ with 10 d.f., $p < .05$)

Responses for Comparison Counties

	1%	10%	20%	30%	40%	50%	60%	70%	80%	90%	99%	No Answer	SUM	
Baseline	325	425	344	293	216	154	77	69	44	15	15	15	1992	# Surveys
	16.3%	21.3%	17.3%	14.7%	10.8%	7.7%	3.9%	3.5%	2.2%	0.8%	0.8%	0.8%	100.0%	% of Wave
	65.4%	67.5%	68.4%	66.9%	69.5%	75.1%	62.6%	70.4%	83.0%	68.2%	88.2%	93.7%	68.4%	% of Column
Post	172	205	159	145	95	51	46	29	9	7	2	1	921	# Surveys
	18.7%	22.3%	17.3%	15.7%	10.3%	5.5%	5.0%	3.1%	1.0%	0.8%	0.2%	0.1%	100.0%	% of Wave
	34.6%	32.5%	31.6%	33.1%	30.5%	24.9%	37.4%	29.6%	17.0%	31.8%	11.8%	6.2%	31.6%	% of Column
SUM	497	630	503	438	311	205	123	98	53	22	17	16	2913	# Surveys
	17.1%	21.6%	17.3%	15.0%	10.7%	7.0%	4.2%	3.4%	1.8%	0.8%	0.6%	0.5%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 17.6$ with 10 d.f., n.s.)

Table 9.

Responses to the Question:

Approximately what percent of drivers who are arrested in Maryland for violating the drinking and driving laws do you think are convicted?

for Experimental and Comparison Counties by Sampling Period

Responses for Experimental Counties

	1%	10%	20%	30%	40%	50%	60%	70%	80%	90%	99%	No Answer	SUM	
Baseline	544	932	596	550	389	456	240	205	182	134	115	21	4364	# Surveys
	12.5%	21.4%	13.7%	12.6%	8.9%	10.4%	5.5%	4.7%	4.2%	3.1%	2.6%	0.5%	100.0%	% of Wave
	62.2%	62.6%	59.8%	61.5%	58.3%	62.5%	62.5%	53.7%	54.2%	56.3%	57.5%	61.8%	60.4%	% of Column
Post	330	557	401	344	278	274	144	177	154	104	85	13	2861	# Surveys
	11.5%	19.5%	14.0%	12.0%	9.7%	9.6%	5.0%	6.2%	5.4%	3.6%	3.0%	0.5%	100.0%	% of Wave
	37.8%	37.4%	40.2%	38.5%	41.7%	37.5%	37.5%	46.3%	45.8%	43.7%	42.5%	38.2%	39.6%	% of Column
SUM	874	1489	997	894	667	730	384	382	336	238	200	34	7225	# Surveys
	12.1%	20.6%	13.8%	12.4%	9.2%	10.1%	5.3%	5.3%	4.7%	3.3%	2.8%	0.5%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 23.2$ with 10 d.f., $p < .05$)

Responses for Comparison Counties

	1%	10%	20%	30%	40%	50%	60%	70%	80%	90%	99%	No Answer	SUM	
Baseline	291	400	292	215	170	208	101	83	85	52	80	15	1992	# Surveys
	14.6%	20.1%	14.7%	10.8%	8.5%	10.4%	5.1%	4.2%	4.3%	2.6%	4.0%	0.8%	100.0%	% of Wave
	69.8%	69.0%	68.1%	64.6%	66.1%	70.5%	71.1%	66.9%	65.4%	60.5%	76.9%	93.7%	68.4%	% of Column
Post	126	180	137	118	87	87	41	41	45	34	24	11	921	# Surveys
	13.7%	19.5%	14.9%	12.8%	9.4%	9.4%	4.5%	4.5%	4.9%	3.7%	2.6%	0.1%	100.0%	% of Wave
	30.2%	31.0%	31.9%	35.4%	33.9%	29.5%	28.9%	33.1%	34.6%	39.5%	23.1%	6.2%	31.6%	% of Column
SUM	417	580	429	333	257	295	142	124	130	86	104	16	2913	# Surveys
	14.3%	19.9%	14.7%	11.4%	8.8%	10.1%	4.9%	4.3%	4.5%	3.0%	3.6%	0.5%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 11.1$ with 10 d.f., n.s.)

Table 10.

Responses to the Question:

In Maryland, approximately what percent of people your age do you think drink and drive at least once per month?

for Experimental and Comparison Counties by Sampling Period

Responses for Experimental Counties

	1%	10%	20%	30%	40%	50%	60%	70%	80%	90%	99%	No Answer	SUM	
Baseline	1481	2671	3151	3711	4521	5931	4911	5661	5501	3571	2341	201	43641	# Surveys
	3.4% ¹	6.1% ¹	7.2% ¹	8.5% ¹	10.4% ¹	13.6% ¹	11.3% ¹	13.0% ¹	12.6% ¹	8.2% ¹	5.4% ¹	0.5% ¹	100.0% ¹	% of Wave
	68.8% ¹	61.4% ¹	60.7% ¹	59.1% ¹	59.9% ¹	59.4% ¹	57.8% ¹	59.8% ¹	59.1% ¹	62.5% ¹	66.7% ¹	76.9% ¹	60.4% ¹	% of Column
Post	671	1681	2041	2571	3031	4051	3591	3801	3811	2141	1171	61	28611	# Surveys
	2.3% ¹	5.9% ¹	7.1% ¹	9.0% ¹	10.6% ¹	14.2% ¹	12.5% ¹	13.3% ¹	13.3% ¹	7.5% ¹	4.1% ¹	0.2% ¹	100.0% ¹	% of Wave
	31.2% ¹	38.6% ¹	39.3% ¹	40.9% ¹	40.1% ¹	40.6% ¹	42.2% ¹	40.2% ¹	40.9% ¹	37.5% ¹	33.3% ¹	23.1% ¹	39.6% ¹	% of Column
SUM	2151	4351	5191	6281	7551	9981	8501	9461	9311	5711	3511	261	72251	# Surveys
	3.0% ¹	6.0% ¹	7.2% ¹	8.7% ¹	10.4% ¹	13.8% ¹	11.8% ¹	13.1% ¹	12.9% ¹	7.9% ¹	4.9% ¹	0.4% ¹	100.0% ¹	% of Wave
	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	% of Column

($\chi^2 = 17.6$ with 10 d.f., n.s.)

Responses for Comparison Counties

	1%	10%	20%	30%	40%	50%	60%	70%	80%	90%	99%	N/A	SUM	
Baseline	431	1361	1191	1721	1901	2811	2211	2571	2821	1771	1091	51	19921	# Surveys
	2.2% ¹	6.8% ¹	6.0% ¹	8.6% ¹	9.5% ¹	14.1% ¹	11.1% ¹	12.9% ¹	14.2% ¹	8.9% ¹	5.5% ¹	0.3% ¹	100.0% ¹	% of Wave
	43.4% ¹	65.1% ¹	67.6% ¹	68.0% ¹	66.2% ¹	72.1% ¹	70.2% ¹	73.2% ¹	73.6% ¹	70.2% ¹	57.7% ¹	55.6% ¹	68.4% ¹	% of Column
Post	561	731	571	811	971	1091	941	941	1011	751	801	41	9211	# Surveys
	6.1% ¹	7.9% ¹	6.2% ¹	8.8% ¹	10.5% ¹	11.8% ¹	10.2% ¹	10.2% ¹	11.0% ¹	8.1% ¹	8.7% ¹	0.4% ¹	100.0% ¹	% of Wave
	56.6% ¹	34.9% ¹	32.4% ¹	32.0% ¹	33.8% ¹	27.9% ¹	29.8% ¹	26.8% ¹	26.4% ¹	29.8% ¹	42.3% ¹	44.4% ¹	31.6% ¹	% of Column
SUM	991	2091	1761	2531	2871	3901	3151	3511	3831	2521	1891	91	29131	# Surveys
	3.4% ¹	7.2% ¹	6.0% ¹	8.7% ¹	9.9% ¹	13.4% ¹	10.8% ¹	12.0% ¹	13.1% ¹	8.7% ¹	6.5% ¹	0.3% ¹	100.0% ¹	% of Wave
	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	100.0% ¹	% of Column

($\chi^2 = 52.3$ with 10 d.f., $p < .001$)

Table 11.

Responses to the Question:

Maryland law states that you may not operate a motor vehicle if your blood or breath alcohol concentration is equal to or greater than:

for Experimental and Comparison Counties by Sampling Period

Responses for Experimental Counties

	.01	.02	.03	.04	.05	.06	.07	.08	.09	.10	No Answer	SUM		
Baseline	10201	7891	3561	2601	8761	1511	1991	1451	181	5001	501	43641	# Surveys	
	23.4% 52.0%	18.1% 48.5%	8.2% 68.7%	6.0% 65.3%	20.1% 70.2%	3.5% 78.2%	4.6% 73.7%	3.3% 67.4%	0.4% 60.0%	11.5% 72.5%	1.1% 68.5%	100.0%	60.4%	% of Wave % of Column
Post	9421	8391	1621	1381	3721	421	711	701	121	1901	231	28611	# Surveys	
	32.9% 48.0%	29.3% 51.5%	5.7% 31.3%	4.8% 34.7%	13.0% 29.8%	1.5% 21.8%	2.5% 26.3%	2.4% 32.6%	0.4% 40.0%	6.6% 27.5%	0.8% 31.5%	100.0%	39.6%	% of Wave % of Column
SUM	19621	16281	5181	3981	12481	1931	2701	2151	301	6901	731	72251	# Surveys	
	27.2% 100.0%	22.5% 100.0%	7.2% 100.0%	5.5% 100.0%	17.3% 100.0%	2.7% 100.0%	3.7% 100.0%	3.0% 100.0%	0.4% 100.0%	9.6% 100.0%	1.0% 100.0%	100.0%	100.0%	% of Wave % of Column

($\chi^2 = 316.0$ with 9 d.f., $p < .001$)

Responses for Comparison Counties

	.01	.02	.03	.04	.05	.06	.07	.08	.09	.10	No Answer	SUM		
Baseline	4351	5181	1511	1151	4461	471	461	501	51	1601	191	19921	# Surveys	
	21.8% 70.7%	26.0% 68.2%	7.6% 69.9%	5.8% 62.8%	22.4% 66.0%	2.4% 72.3%	2.3% 69.7%	2.5% 69.4%	0.3% 45.5%	8.0% 73.1%	1.0% 63.3%	100.0%	68.4%	% of Wave % of Column
Post	1801	2421	651	681	2301	181	201	221	61	591	111	9211	# Surveys	
	19.5% 29.3%	26.3% 31.8%	7.1% 30.1%	7.4% 37.2%	25.0% 34.0%	2.0% 27.7%	2.2% 30.3%	2.4% 30.6%	0.7% 54.5%	6.4% 26.9%	1.2% 36.7%	100.0%	31.6%	% of Wave % of Column
SUM	6151	7601	2161	1831	6761	651	661	721	111	2191	301	29131	# Surveys	
	21.1% 100.0%	26.1% 100.0%	7.4% 100.0%	6.3% 100.0%	23.2% 100.0%	2.2% 100.0%	2.3% 100.0%	2.5% 100.0%	0.4% 100.0%	7.5% 100.0%	1.0% 100.0%	100.0%	100.0%	% of Wave % of Column

($\chi^2 = 11.7$ with 9 d.f., n.s.)

Figure 8
BAC Limit Applicable to Self
Experimental Sites

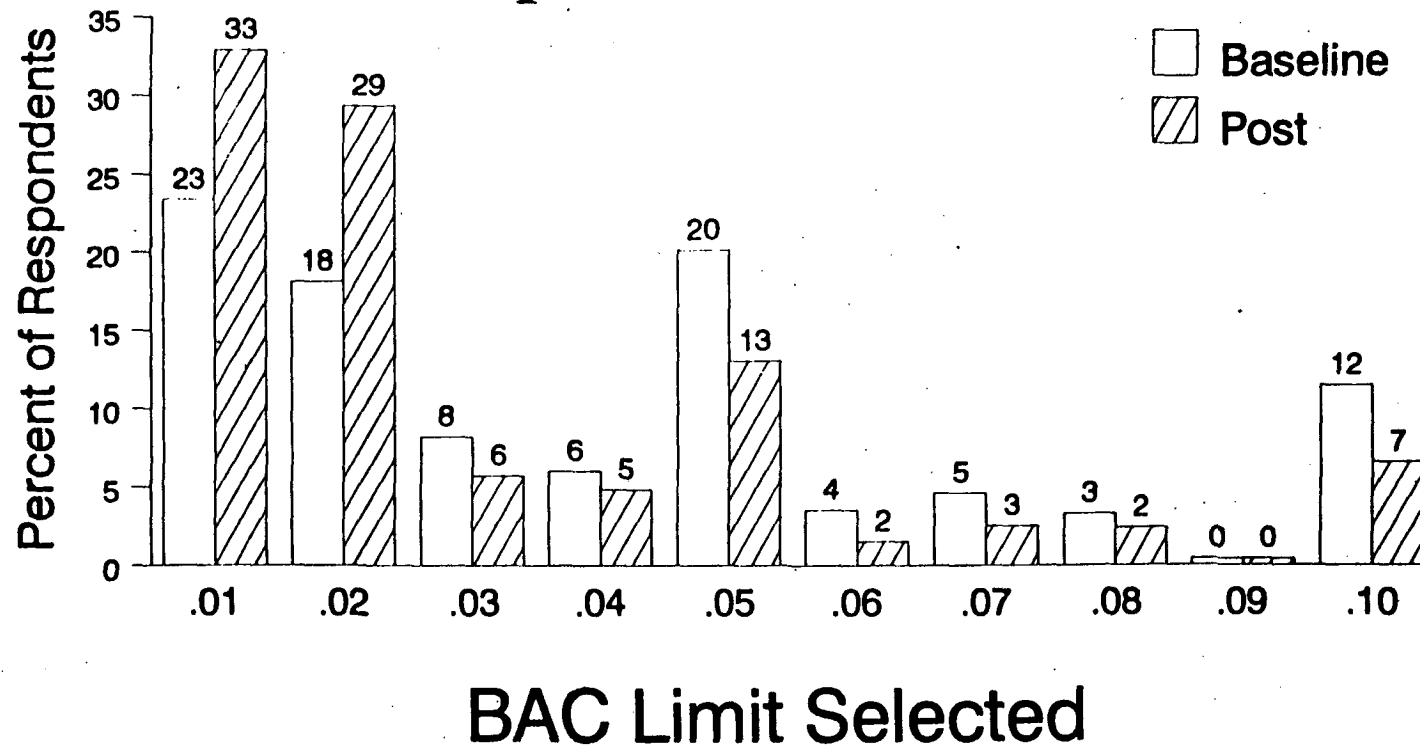
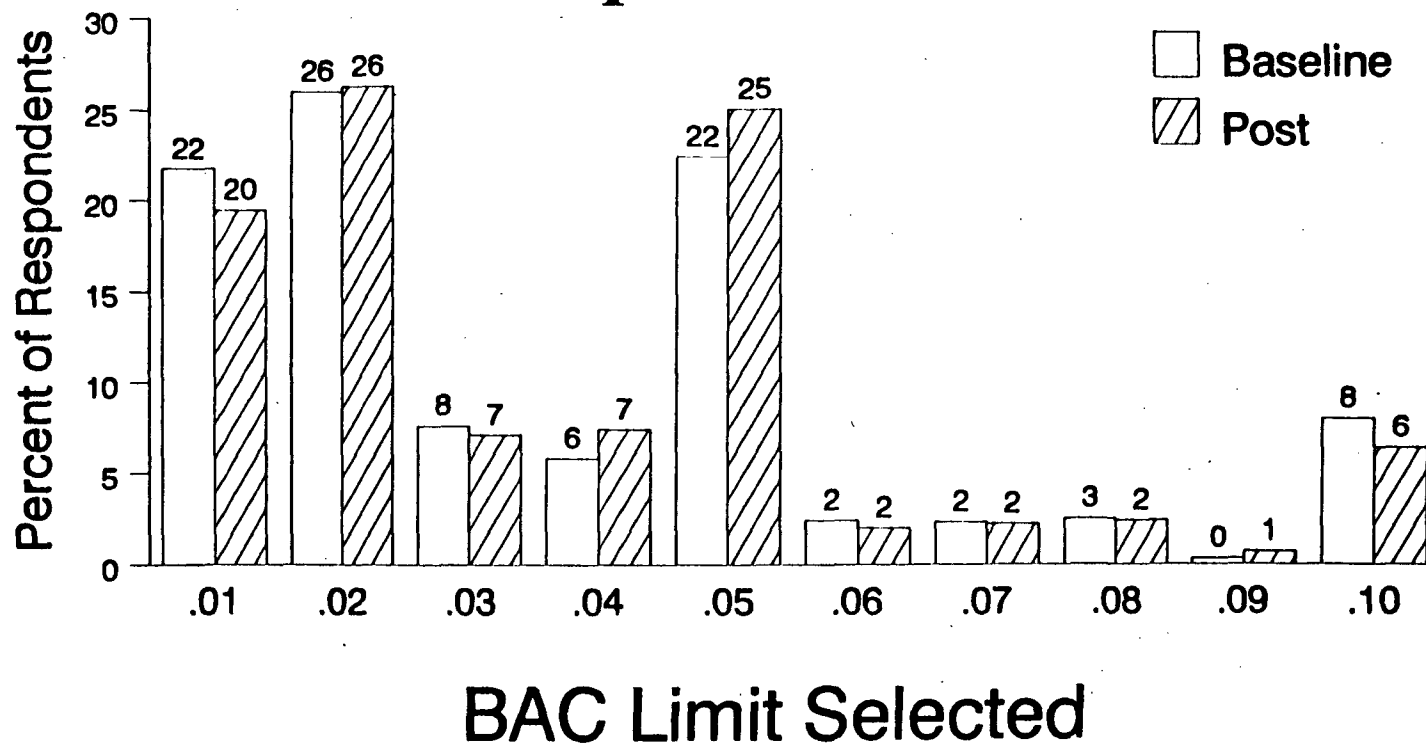


Figure 9
BAC Limit Applicable to Self
Comparison Sites



In both Figures 8 and 9, four data "peaks" can be seen corresponding to BACs of 0.01, 0.02, 0.05 and 0.10. The fact that over 41 percent of the baseline respondents in the experimental counties and almost 48 percent of those in the comparison communities selected either 0.01 or 0.02 is noteworthy. It supports the statewide crash results presented earlier. Simply, there was sufficient knowledge of the prevailing BAC limit to make it reasonable that the sanction was operative following the effective date of the law.

The rate of respondents selecting 0.10 is not surprising since that is the prevailing general BAC limit in the state. The relatively large proportion of respondents choosing 0.05, however, is curious. There seems to be no legal basis for this level. The greater than expected number of responses in this category may therefore simply have been a tendency for respondents to select "round" numbers when they were unsure and guessing.

Finally, Figure 8 clearly shows that the shift by respondents at the experimental sites to the "correct" (0.01 and 0.02) responses in the post wave came largely from the 0.05 and 0.10 categories. This suggests that the PI&E message was received and resulted in a significant knowledge change.

To facilitate further examination of the responses to Question 7, a collapsed set of response intervals was used. These are shown in Table 12. The first interval combines the responses of 0.01 and 0.02, which may be considered the "correct" answer to the question. The second category aggregates all responses of 0.03 through 0.09, and the last category comprises respondents who selected 0.10. Those not answering the question were excluded from this collapsed set of intervals. Table 12 highlights the results discussed above. In the experimental counties, the number of respondents selecting a BAC of 0.01 or 0.02 rose from 41.9 percent in the baseline sample to 62.8 percent in the post wave. This is almost a 50 percent increase in the proportion selecting the correct response. Simultaneously, there was no significant change in the percentage of comparison county respondents making the correct selection.

Tables 13, 14 and 15 separate the Question 7 responses on applicable BAC by type of sampling location. The pattern of results for high schools (Table 13), Motor Vehicle Administration offices (Table 14) and colleges (Table 15) is the same. In all cases, the comparison county samples show no significant baseline-to-post changes while all experimental county samples do. However, the magnitude of the shift to the correct answer of 0.01 or 0.02 is quite different as a function of sampling location.

The high school respondents in the experimental counties showed a 49.4 percent increase in the proportion of 0.01 or 0.02 responses between the baseline and post waves. Those answering the questions in Motor Vehicle Administration offices increased only 22.5 percent. The college sample exhibited the largest baseline-to-post change of 54.3 percent. These results are entirely consistent with the nature of the distribution of the print PI&E materials. The alcohol and drug Resource Centers at the universities handled most of the pamphlet and poster distribution. As a result, college students would have been expected to be exposed to a much higher concentration of the printed PI&E with its more detailed message on BAC limits. The responses to the media exposure questions discussed below confirm that the college sample recalled printed material on alcohol restrictions far more than either of the other two groups.

Table 12.

Collapsed Class Intervals for Response to the Question:

Maryland law states that you may not operate a motor vehicle if your blood or breath alcohol concentration is equal to or greater than:

for Experimental and Comparison Counties by Sampling Period

Responses for Experimental Counties

	.01 or .02	.03-.09	.10	SUM	
Baseline	1809	2005	500	4314	# Surveys
	41.9%	46.5%	11.6%	100.0%	% of Wave
	50.4%	69.8%	72.5%	60.3%	% of Column
Post	1781	867	190	2838	# Surveys
	62.8%	30.5%	6.7%	100.0%	% of Wave
	49.6%	30.2%	27.5%	39.7%	% of Column
SUM	3590	2872	690	7152	# Surveys
	50.2%	40.2%	9.6%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 298.5$ with 2 d.f., $p < .001$)

Responses for Comparison Counties

	.01 or .02	.03-.09	.10	SUM	
Baseline	953	860	160	1973	# Surveys
	48.3%	43.6%	8.1%	100.0%	% of Wave
	69.3%	66.7%	73.1%	68.4%	% of Column
Post	422	429	59	910	# Surveys
	46.4%	47.1%	6.5%	100.0%	% of Wave
	30.7%	33.3%	26.9%	31.6%	% of Column
SUM	1375	1289	219	2883	# Surveys
	47.7%	44.7%	7.6%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 4.4$ with 2 d.f., n.s.)

Table 13.

Collapsed Class Intervals for Response to the Question:

Maryland law states that you may not operate a motor vehicle if your blood or breath alcohol concentration is equal to or greater than:

for Experimental and Comparison *High School* Samples by Sampling Period

Responses for Experimental High Schools

	.01 or .02	.03-.09	.10	SUM	
Baseline	1134	1241	243	2618	# Surveys
	43.3%	47.4%	9.3%	100.0%	% of Wave
	46.3%	68.0%	64.3%	56.3%	% of Column
Post	1315	584	135	2034	# Surveys
	64.7%	28.7%	6.6%	100.0%	% of Wave
	53.7%	32.0%	35.7%	43.7%	% of Column
SUM	2449	1825	378	4652	# Surveys
	52.6%	39.2%	8.1%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 210.8$ with 2 d.f., $p < .001$)

Responses for Comparison High Schools

	.01 or .02	.03-.09	.10	SUM	
Baseline	595	666	106	1367	# Surveys
	43.5%	48.7%	7.8%	100.0%	% of Wave
	73.3%	70.1%	77.4%	72.0%	% of Column
Post	217	284	31	532	# Surveys
	40.8%	53.4%	5.8%	100.0%	% of Wave
	26.7%	29.9%	22.6%	28.0%	% of Column
SUM	812	950	137	1899	# Surveys
	42.8%	50.0%	7.2%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 4.3$ with 2 d.f., n.s.)

Table 14.

Collapsed Class Intervals for Response to the Question:

Maryland law states that you may not operate a motor vehicle if your blood or breath alcohol concentration is equal to or greater than:

for Experimental and Comparison Motor Vehicle Administration Office Samples by Sampling Period

Responses for Experimental Motor Vehicle Administration Offices

	.01 or .02	.03-.09	.10	SUM	
Baseline	138	179	36	353	# Surveys
	39.1%	50.7%	10.2%	100.0%	% of Wave
	56.8%	63.3%	78.3%	61.7%	% of Column
Post	105	104	10	219	# Surveys
	47.9%	47.5%	4.6%	100.0%	% of Wave
	43.2%	36.7%	21.7%	38.3%	% of Column
SUM	243	283	46	572	# Surveys
	42.5%	49.5%	8.0%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 8.1$ with 2 d.f., $p < .05$)

Responses for Comparison Motor Vehicle Administration Offices

	.01 or .02	.03-.09	.10	SUM	
Baseline	72	78	10	160	# Surveys
	45.0%	48.7%	6.2%	100.0%	% of Wave
	51.4%	51.0%	41.7%	50.5%	% of Column
Post	68	75	14	157	# Surveys
	43.3%	47.8%	8.9%	100.0%	% of Wave
	48.6%	49.0%	58.3%	49.5%	% of Column
SUM	140	153	24	317	# Surveys
	44.2%	48.3%	7.6%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 0.8$ with 2 d.f., n.s.)

Table 15.

Collapsed Class Intervals for Response to the Question:

Maryland law states that you may not operate a motor vehicle if your blood or breath alcohol concentration is equal to or greater than:

for Experimental and Comparison College Samples by Sampling Period

Responses for Experimental Colleges

	.01 or .02	.03-.09	.10	SUM	
Baseline	537	585	221	1343	# Surveys
	40.0%	43.6%	16.5%	100.0%	% of Wave
	59.8%	76.6%	83.1%	69.7%	% of Column
Post	361	179	45	585	# Surveys
	61.7%	30.6%	7.7%	100.0%	% of Wave
	40.2%	23.4%	16.9%	30.3%	% of Column
SUM	898	764	266	1928	# Surveys
	46.6%	39.6%	13.8%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 81.2$ with 2 d.f., $p < .001$)

Responses for Comparison Colleges

	.01 or .02	.03-.09	.10	SUM	
Baseline	286	116	44	446	# Surveys
	64.1%	26.0%	9.9%	100.0%	% of Wave
	67.6%	62.4%	75.9%	66.9%	% of Column
Post	137	70	14	221	# Surveys
	62.0%	31.7%	6.3%	100.0%	% of Wave
	32.4%	37.6%	24.1%	33.1%	% of Column
SUM	423	186	58	667	# Surveys
	63.4%	27.9%	8.7%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 3.9$ with 2 d.f., n.s.)

The eighth question on the survey addressed the number of drinks required to put the respondent "over the limit" for driving in Maryland. The distribution of results for the 10 possible choices is shown in Table 16. It can be seen from this Table that there were significant baseline-to-post changes in both the experimental and comparison counties. Overall, both the experimental and comparison site distributions shift towards selection of a lower number of drinks in the post wave.

Responses of one and two drinks are particularly interesting because they relate to the 0.02 restriction and were covered by some of the PI&E materials distributed by the project in the experimental counties and statewide by the Maryland Department of Transportation as part of its *Drive to Survive* campaign. Therefore, the data from Table 16 were collapsed into two categories representing one or two drinks and three or more drinks. The results, shown in Table 17, confirm that the percent of respondents selecting one or two increased significantly in both the experimental and comparison counties. However, the magnitude of the increase in the experimental counties (27.8%) was more than double that in the comparison (12.2%).

Tables 18, 19 and 20 separate the Question 8 results by type of sampling location. An examination of these tables shows that the comparison county baseline-to-post distribution of responses was only significant for the college sample (Table 20). There was no statistically significant change for *either* the experimental or comparison samples drawn from Motor Vehicle Administration offices (Table 19). The high school (Table 18) and college (Table 20) samples in the experimental counties showed significant increases in the selection of one or two drinks as the quantity which would make it illegal for the respondent to drive.

From the foregoing, it is clear that knowledge of the sanction increased in the experimental counties after application of the PI&E program. Since no similar pattern of results was observed for the comparison counties, the strong presumption must be that the gains can be attributed to the PI&E program. This is further supported by the responses to Question 9 related to exposure to print, TV and radio messages.

3. Media Exposure

In order to gain insights on the effectiveness of the PI&E program, it was necessary to determine if the developed messages were seen, heard or read by the target audience. Question 9 embedded the specific probe related to alcohol license restrictions between two other topics related to drinking and driving. These "distractors" addressed injury caused by drunk drivers and jail for convicted drunk drivers.

The responses for the distractor items showed no consistent pattern related to the present study. In general, there were no significant differences between the baseline and post response distributions in either the experimental or comparison counties. In both waves, many more respondents said they had read, heard or seen materials on injuries caused by drunk drivers (80% to 90% of responses) than recalled items related to a jail sanction (60% to 70%). TV spots were recalled by the greatest percentage of respondents followed closely by printed materials. Radio trailed somewhat but was still well in excess of a majority of the sample.

Table 16.

Responses to the Question:

*If you could legally purchase alcohol, how many drinks would
put you "over the limit" for driving in Maryland?*

for Experimental and Comparison Counties by Sampling Period

Responses for Experimental Counties

	1	2	3	4	5	6	7	8	9	10	No Answer	SUM	
Baseline	760	1015	942	644	343	206	111	75	31	157	80	4364	# Surveys
	17.4%	23.3%	21.6%	14.8%	7.9%	4.7%	2.5%	1.7%	0.7%	3.6%	1.8%	100.0%	% of Wave
	46.9%	61.7%	64.6%	66.9%	66.3%	61.7%	67.3%	63.0%	67.4%	66.5%	66.7%	60.4%	% of Column
Post	862	630	517	318	174	128	54	44	15	79	40	2861	# Surveys
	30.1%	22.0%	18.1%	11.1%	6.1%	4.5%	1.9%	1.5%	0.5%	2.8%	1.4%	100.0%	% of Wave
	53.1%	38.3%	35.4%	33.1%	33.7%	38.3%	32.7%	37.0%	32.6%	33.5%	33.3%	39.6%	% of Column
SUM	1622	1645	1459	962	517	334	165	119	46	236	120	7225	# Surveys
	22.4%	22.8%	20.2%	13.3%	7.2%	4.6%	2.3%	1.6%	0.6%	3.3%	1.7%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 169.3$ with 9 d.f., $p < .001$)

Responses for Comparison Counties

	1	2	3	4	5	6	7	8	9	10	No Answer	SUM	
Baseline	404	467	423	253	145	78	47	35	13	66	61	1992	# Surveys
	20.3%	23.4%	21.2%	12.7%	7.3%	3.9%	2.4%	1.8%	0.7%	3.3%	3.1%	100.0%	% of Wave
	62.9%	68.2%	70.5%	68.4%	72.1%	66.1%	85.5%	71.4%	65.0%	71.7%	75.3%	68.4%	% of Column
Post	238	218	177	117	56	40	8	14	7	26	20	921	# Surveys
	25.8%	23.7%	19.2%	12.7%	6.1%	4.3%	0.9%	1.5%	0.8%	2.8%	2.2%	100.0%	% of Wave
	37.1%	31.8%	29.5%	31.6%	27.9%	33.9%	14.5%	28.6%	35.0%	28.3%	24.7%	31.6%	% of Column
SUM	642	685	600	370	201	118	55	49	20	92	81	2913	# Surveys
	22.0%	23.5%	20.6%	12.7%	6.9%	4.1%	1.9%	1.7%	0.7%	3.2%	2.8%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 19.8$ with 9 d.f., $p < .05$)

Table 17.

Collapsed Class Intervals for Response to the Question:

If you could legally purchase alcohol, how many drinks would put you "over the limit" for driving in Maryland?

for Experimental and Comparison Counties by Sampling Period

Responses for Experimental Counties

	1 or 2	3 or more	SUM	
Baseline	1775	2509	4284	# Surveys
	41.4%	58.6%	100.0%	% of Wave
	54.3%	65.4%	60.3%	% of Column
Post	1492	1329	2821	# Surveys
	52.9%	47.1%	100.0%	% of Wave
	45.7%	34.6%	39.7%	% of Column
SUM	3267	3838	7105	# Surveys
	46.0%	54.0%	100.0%	% of Wave
	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 89.9$ with 1 d.f., $p < .001$)

Responses for Comparison Counties

	1 or 2	3 or more	SUM	
Baseline	871	1060	1931	# Surveys
	45.1%	54.9%	100.0%	% of Wave
	65.6%	70.4%	68.2%	% of Column
Post	456	445	901	# Surveys
	50.6%	49.4%	100.0%	% of Wave
	34.4%	29.6%	31.8%	% of Column
SUM	1327	1505	2832	# Surveys
	46.9%	53.1%	100.0%	% of Wave
	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 7.5$ with 1 d.f., $p < .01$)

Table 18.

Collapsed Class Intervals for Response to the Question:

If you could legally purchase alcohol, how many drinks would put you "over the limit" for driving in Maryland?

for Experimental and Comparison *High School* Samples by Sampling Period

Responses for Experimental High Schools

	1 or 2	3 or more	SUM	
Baseline	10611	15341	25951	# Surveys
	40.9%	59.1%	100.0%	% of Wave
	49.3%	62.2%	56.2%	% of Column
Post	10911	9311	20221	# Surveys
	54.0%	46.0%	100.0%	% of Wave
	50.7%	37.8%	43.8%	% of Column
SUM	21521	24651	46171	# Surveys
	46.6%	53.4%	100.0%	% of Wave
	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 78.0$ with 1 d.f., $p < .001$)

Responses for Comparison High Schools

	1 or 2	3 or more	SUM	
Baseline	5161	8241	13401	# Surveys
	38.5%	61.5%	100.0%	% of Wave
	70.4%	72.7%	71.8%	% of Column
Post	2171	3091	5261	# Surveys
	41.3%	58.7%	100.0%	% of Wave
	29.6%	27.3%	28.2%	% of Column
SUM	7331	11331	18661	# Surveys
	39.3%	60.7%	100.0%	% of Wave
	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 1.2$ with 1 d.f., n.s.)

Table 19.

Collapsed Class Intervals for Response to the Question:

If you could legally purchase alcohol, how many drinks would put you "over the limit" for driving in Maryland?

for Experimental and Comparison Motor Vehicle Administration Office Samples by Sampling Period

Responses for Experimental Motor Vehicle Administration Offices

	1 or 2	3 or more	SUM	
Baseline	210	142	352	# Surveys
	59.7%	40.3%	100.0%	% of Wave
	63.4%	59.4%	61.8%	% of Column
Post	121	97	218	# Surveys
	55.5%	44.5%	100.0%	% of Wave
	36.6%	40.6%	38.2%	% of Column
SUM	331	239	570	# Surveys
	58.1%	41.9%	100.0%	% of Wave
	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 1.0$ with 1 d.f., n.s.)

Responses for Comparison Motor Vehicle Administration Offices

	1 or 2	3 or more	SUM	
Baseline	91	61	152	# Surveys
	59.9%	40.1%	100.0%	% of Wave
	50.8%	48.4%	49.8%	% of Column
Post	88	65	153	# Surveys
	57.5%	42.5%	100.0%	% of Wave
	49.2%	51.6%	50.2%	% of Column
SUM	179	126	305	# Surveys
	58.7%	41.3%	100.0%	% of Wave
	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 0.2$ with 1 d.f., n.s.)

Table 20.

Collapsed Class Intervals for Response to the Question:

If you could legally purchase alcohol, how many drinks would put you "over the limit" for driving in Maryland?

for Experimental and Comparison College Samples by Sampling Period

Responses for Experimental Colleges

	1 or 2	3 or more	SUM	
Baseline	504	833	1337	# Surveys
	37.7%	62.3%	100.0%	% of Wave
	64.3%	73.5%	69.7%	% of Column
Post	280	301	581	# Surveys
	48.2%	51.8%	100.0%	% of Wave
	35.7%	26.5%	30.3%	% of Column
SUM	784	1134	1918	# Surveys
	40.9%	59.1%	100.0%	% of Wave
	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 18.5$ with 1 d.f., $p < .001$)

Responses for Comparison Colleges

	1 or 2	3 or more	SUM	
Baseline	264	175	439	# Surveys
	60.1%	39.9%	100.0%	% of Wave
	63.6%	71.1%	66.4%	% of Column
Post	151	71	222	# Surveys
	68.0%	32.0%	100.0%	% of Wave
	36.4%	28.9%	33.6%	% of Column
SUM	415	246	661	# Surveys
	62.8%	37.2%	100.0%	% of Wave
	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 3.9$ with 1 d.f., $p < .05$)

The probe related to alcohol license restrictions is directly germane to the present study. Tables 21, 22 and 23 present the distribution of responses for print, TV and radio, respectively. For all three media forms, there was a significant baseline-to-post *increase* in recall of the message in the experimental counties. The observed increases in the percent of respondents who recalled the message of 22.6 percent for printed material (Table 21), 25.0 percent for TV (Table 22) and 25.5 percent for radio (Table 23) are sufficiently large to suggest that the PI&E program was successful in reaching the target audience.

In contrast, the comparison counties exhibited a *decrease* for all three media types. The drop even reaches statistical significance for printed materials. This pattern of results is entirely consistent with the circumstances under which this project operated. The State-produced PI&E coincident with the passage of the sanction was waning at the time the project PI&E was launched.

When the data related to exposure to printed materials are disaggregated by type of sampling site, an interesting result emerges. As shown in Tables 24, 25 and 26, there were baseline-to-post increases in recall in the experimental counties and decreases in the comparison counties for all three types of sampling sites. However, the proportional increases in the experimental counties for high schools (Table 24) and Motor Vehicle Administration offices (Table 25) are only 15.9 percent and 17.6 percent, respectively. For colleges (Table 26), the proportion of respondents who recall reading some printed material increases by 43.5 percent from 56.8 percent of the baseline sample to 81.5 percent of the post sample. As mentioned earlier, it is possible that the college students were more directly within the distribution chain for printed materials than either of the other two sampled groups since college Resource Centers were the major groups cooperating with the study.

The results for TV exposure have a somewhat different pattern as shown in Tables 27, 28 and 29. As with printed materials, there was a significant increase in recalled exposure for all high schools, Motor Vehicle Administration offices and colleges in the experimental counties. However, there were no statistically significant changes in recall for any type of sampling location in the comparison counties. Moreover, the extent of change in the experimental counties varies greatly by type of sampling location. For high schools (Table 27), the proportional increase, though significant, is relatively small at 11.4 percent. Recall among respondents in the Motor Vehicle Administration office sample (Table 28) rose by 36.2 percent over the baseline proportion, and the college sample recall of TV (Table 29) rose by a remarkable 63.5 percent (42.7% in baseline to 69.8% in post).

The results for radio exposure were also noteworthy. As shown in Table 30, there was no statistically significant change for high school students in either the experimental or comparison counties. In sharp contrast, the proportion of experimental county respondents recalling radio spots at MVA offices (Table 31) and colleges (Table 32) almost doubled between the baseline and post waves. No significant change was observed in the radio exposure of the Motor Vehicle Administration office or college respondents in the comparison counties.

It is not possible to determine why such large differences existed in the TV and radio exposure. It is likely that media consumption habits played some role. For example, if a large proportion of radio listening by youth is in cars, one might expect higher exposure among the college and Motor Vehicle Administration samples because they are older and likely drive more. However, the extremely low relative impact of the TV spots on the high school sample is curious and impossible to explain with the available data.

Table 21.

Responses to the Question:

Have you seen any printed material (pamphlets, posters, etc.) which talked about:

Alcohol license restrictions?

for Experimental and Comparison Counties by Sampling Period

Responses for Experimental Counties

	Yes	No	No Answer	SUM	
Baseline	2648	1468	248	4364	# Surveys
	60.7%	33.6%	5.7%	100.0%	% of Wave
	55.4%	71.9%	60.9%	60.4%	% of Column
Post	2128	574	159	2861	# Surveys
	74.4%	20.1%	5.6%	100.0%	% of Wave
	44.6%	28.1%	39.1%	39.6%	% of Column
SUM	4776	2042	407	7225	# Surveys
	66.1%	28.3%	5.6%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 161.7$ with 1 d.f., $p < .001$)

Responses for Comparison Counties

	Yes	No	No Answer	SUM	
Baseline	1199	661	132	1992	# Surveys
	60.2%	33.2%	6.6%	100.0%	% of Wave
	70.2%	65.1%	69.1%	68.4%	% of Column
Post	508	354	59	921	# Surveys
	55.2%	38.4%	6.4%	100.0%	% of Wave
	29.8%	34.9%	30.9%	31.6%	% of Column
SUM	1707	1015	191	2913	# Surveys
	58.6%	34.8%	6.6%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 7.6$ with 1 d.f., $p < .01$)

Table 22.

Responses to the Question:

Have you seen any TV commercials which talked about:

Alcohol license restrictions?

for Experimental and Comparison Counties by Sampling Period

Responses for Experimental Counties

	Yes	No	No Answer	SUM	
Baseline	2118	1904	342	4364	# Surveys
	48.5%	43.6%	7.8%	100.0%	% of Wave
	55.0%	67.2%	63.5%	60.4%	% of Column
Post	1735	929	197	2861	# Surveys
	60.6%	32.5%	6.9%	100.0%	% of Wave
	45.0%	32.8%	36.5%	39.6%	% of Column
SUM	3853	2833	539	7225	# Surveys
	53.3%	39.2%	7.5%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 102.0$ with 1 d.f., $p < .001$)

Responses for Comparison Counties

	Yes	No	No Answer	SUM	
Baseline	890	902	200	1992	# Surveys
	44.7%	45.3%	10.0%	100.0%	% of Wave
	69.6%	66.8%	70.4%	68.4%	% of Column
Post	388	449	84	921	# Surveys
	42.1%	48.8%	9.1%	100.0%	% of Wave
	30.4%	33.2%	29.6%	31.6%	% of Column
SUM	1278	1351	284	2913	# Surveys
	43.9%	46.4%	9.7%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 2.5$ with 1 d.f., n.s.)

Table 23.

Responses to the Question:

Have you heard any radio commercials which talked about:

Alcohol license restrictions?

for Experimental and Comparison Counties by Sampling Period

Responses for Experimental Counties

	Yes	No	No Answer	SUM	
Baseline	1504	2391	469	4364	# Surveys
	34.5%	54.8%	10.7%	100.0%	% of Wave
	54.8%	64.7%	59.5%	60.4%	% of Column
Post	1239	1303	319	2861	# Surveys
	43.3%	45.5%	11.1%	100.0%	% of Wave
	45.2%	35.3%	40.5%	39.6%	% of Column
SUM	2743	3694	788	7225	# Surveys
	38.0%	51.1%	10.9%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 64.5$ with 1 d.f., $p < .001$)

Responses for Comparison Counties

	Yes	No	No Answer	SUM	
Baseline	661	1094	237	1992	# Surveys
	33.2%	54.9%	11.9%	100.0%	% of Wave
	69.3%	67.1%	72.3%	68.4%	% of Column
Post	293	537	91	921	# Surveys
	31.8%	58.3%	9.9%	100.0%	% of Wave
	30.7%	32.9%	27.7%	31.6%	% of Column
SUM	954	1631	328	2913	# Surveys
	32.7%	56.0%	11.3%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 1.4$ with 1 d.f., n.s.)

Table 24.

Responses to the Question:

Have you seen any printed material (pamphlets, posters, etc.) which talked about:

Alcohol license restrictions?

for Experimental and Comparison *High School* Samples by Sampling Period

Responses for Experimental High Schools

	Yes	No	No Answer	SUM	
Baseline	1663	820	160	2643	# Surveys
	62.9%	31.0%	6.1%	100.0%	% of Wave
	52.6%	65.5%	56.1%	56.3%	% of Column
Post	1496	432	125	2053	# Surveys
	72.9%	21.0%	6.1%	100.0%	% of Wave
	47.4%	34.5%	43.9%	43.7%	% of Column
SUM	3159	1252	285	4696	# Surveys
	67.3%	26.7%	6.1%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 60.2$ with 1 d.f., $p < .001$)

Responses for Comparison High Schools

	Yes	No	No Answer	SUM	
Baseline	858	445	81	1384	# Surveys
	62.0%	32.2%	5.9%	100.0%	% of Wave
	73.8%	68.0%	75.7%	71.9%	% of Column
Post	305	209	26	540	# Surveys
	56.5%	38.7%	4.8%	100.0%	% of Wave
	26.2%	32.0%	24.3%	28.1%	% of Column
SUM	1163	654	107	1924	# Surveys
	60.4%	34.0%	5.6%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 6.8$ with 1 d.f., $p < .01$)

Table 25.

Responses to the Question:

Have you seen any printed material (pamphlets, posters, etc.) which talked about:

Alcohol license restrictions?

for Experimental and Comparison *Motor Vehicle Administration Office* Samples
by Sampling Period

Responses for Experimental Motor Vehicle Administration Offices

	Yes	No	No Answer	SUM	
Baseline	210	119	27	356	# Surveys
	59.0%	33.4%	7.6%	100.0%	% of Wave
	58.0%	68.0%	71.1%	61.9%	% of Column
Post	152	56	11	219	# Surveys
	69.4%	25.6%	5.0%	100.0%	% of Wave
	42.0%	32.0%	28.9%	38.1%	% of Column
SUM	362	175	38	575	# Surveys
	63.0%	30.4%	6.6%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 5.0$ with 1 d.f., $p < .05$)

Responses for Comparison Motor Vehicle Administration Offices

	Yes	No	No Answer	SUM	
Baseline	91	57	12	160	# Surveys
	56.9%	35.6%	7.5%	100.0%	% of Wave
	51.7%	51.8%	38.7%	50.5%	% of Column
Post	85	53	19	157	# Surveys
	54.1%	33.8%	12.1%	100.0%	% of Wave
	48.3%	48.2%	61.3%	49.5%	% of Column
SUM	176	110	31	317	# Surveys
	55.5%	34.7%	9.8%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 0.0$ with 1 d.f., n.s)

Table 26.

Responses to the Question:

Have you seen any printed material (pamphlets, posters, etc.) which talked about:

Alcohol license restrictions?

for Experimental and Comparison College Samples by Sampling Period

Responses for Experimental Colleges

	Yes	No	No Answer	SUM	
Baseline	775	529	61	1365	# Surveys
	56.8%	38.8%	4.5%	100.0%	% of Wave
	61.8%	86.0%	72.6%	69.9%	% of Column
Post	480	86	23	589	# Surveys
	81.5%	14.6%	3.9%	100.0%	% of Wave
	38.2%	14.0%	27.4%	30.1%	% of Column
SUM	1255	615	84	1954	# Surveys
	64.2%	31.5%	4.3%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 115.1$ with 1 d.f., $p < .001$)

Responses for Comparison Colleges

	Yes	No	No Answer	SUM	
Baseline	250	159	39	448	# Surveys
	55.8%	35.5%	8.7%	100.0%	% of Wave
	67.9%	63.3%	73.6%	66.7%	% of Column
Post	118	92	14	224	# Surveys
	52.7%	41.1%	6.2%	100.0%	% of Wave
	32.1%	36.7%	26.4%	33.3%	% of Column
SUM	368	251	53	672	# Surveys
	54.8%	37.4%	7.9%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 1.4$ with 1 d.f., n.s)

Table 27.

Responses to the Question:

Have you seen any TV Commercials which talked about:

Alcohol license restrictions?

for Experimental and Comparison *High School* Samples by Sampling Period

Responses for Experimental High Schools

	Yes	No	No Answer	SUM	
Baseline	1363	1053	227	2643	# Surveys
	51.6%	39.8%	8.6%	100.0%	% of Wave
	53.6%	59.1%	61.0%	56.3%	% of Column
Post	1180	728	145	2053	# Surveys
	57.5%	35.5%	7.1%	100.0%	% of Wave
	46.4%	40.9%	39.0%	43.7%	% of Column
SUM	2543	1781	372	4696	# Surveys
	54.2%	37.9%	7.9%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 13.0$ with 1 d.f., $p < .001$)

Responses for Comparison High Schools

	Yes	No	No Answer	SUM	
Baseline	642	611	131	1384	# Surveys
	46.4%	44.1%	9.5%	100.0%	% of Wave
	72.4%	70.2%	78.4%	71.9%	% of Column
Post	245	259	36	540	# Surveys
	45.4%	48.0%	6.7%	100.0%	% of Wave
	27.6%	29.8%	21.6%	28.1%	% of Column
SUM	887	870	167	1924	# Surveys
	46.1%	45.2%	8.7%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 1.0$ with 1 d.f., n.s.)

Table 28.

Responses to the Question:

Have you seen any TV Commercials which talked about:

Alcohol license restrictions?

for Experimental and Comparison *Motor Vehicle Administration Office* Samples
by Sampling Period

Responses for Experimental Motor Vehicle Administration Offices

	Yes	No	No Answer	SUM	
Baseline	172	149	35	356	# Surveys
	48.3%	41.9%	9.8%	100.0%	% of Wave
	54.4%	72.7%	64.8%	61.9%	% of Column
Post	144	56	19	219	# Surveys
	65.8%	25.6%	8.7%	100.0%	% of Wave
	45.6%	27.3%	35.2%	38.1%	% of Column
SUM	316	205	54	575	# Surveys
	55.0%	35.7%	9.4%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 17.5$ with 1 d.f., $p < .001$)

Responses for Comparison Motor Vehicle Administration Offices

	Yes	No	No Answer	SUM	
Baseline	67	77	16	160	# Surveys
	41.9%	48.1%	10.0%	100.0%	% of Wave
	50.0%	51.3%	48.5%	50.5%	% of Column
Post	67	73	17	157	# Surveys
	42.7%	46.5%	10.8%	100.0%	% of Wave
	50.0%	48.7%	51.5%	49.5%	% of Column
SUM	134	150	33	317	# Surveys
	42.3%	47.3%	10.4%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 0.1$ with 1 d.f., n.s)

Table 29.

Responses to the Question:

Have you seen any TV Commercials which talked about:

Alcohol license restrictions?

for Experimental and Comparison College Samples by Sampling Period

Responses for Experimental Colleges

	Yes	No	No Answer	SUM	
Baseline	583	702	80	1365	# Surveys
	42.7%	51.4%	5.9%	100.0%	% of Wave
	58.7%	82.9%	70.8%	69.9%	% of Column
Post	411	145	33	589	# Surveys
	69.8%	24.6%	5.6%	100.0%	% of Wave
	41.3%	17.1%	29.2%	30.1%	% of Column
SUM	994	847	113	1954	# Surveys
	50.9%	43.3%	5.8%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 127.4$ with 1 d.f., $p < .001$)

Responses for Comparison Colleges

	Yes	No	No Answer	SUM	
Baseline	181	214	53	448	# Surveys
	40.4%	47.8%	11.8%	100.0%	% of Wave
	70.4%	64.7%	63.1%	66.7%	% of Column
Post	76	117	31	224	# Surveys
	33.9%	52.2%	13.8%	100.0%	% of Wave
	29.6%	35.3%	36.9%	33.3%	% of Column
SUM	257	331	84	672	# Surveys
	38.2%	49.3%	12.5%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 2.2$ with 1 d.f., n.s.)

Table 30.

Responses to the Question:

Have you heard any Radio Commercials which talked about:

Alcohol license restrictions?

for Experimental and Comparison *High School* Samples by Sampling Period

Responses for Experimental High Schools

	Yes	No	No Answer	SUM	
Baseline	1007	1349	287	2643	# Surveys
	38.1%	51.0%	10.9%	100.0%	% of Wave
	55.6%	57.3%	54.0%	56.3%	% of Column
Post	804	1005	244	2053	# Surveys
	39.2%	49.0%	11.9%	100.0%	% of Wave
	44.4%	42.7%	46.0%	43.7%	% of Column
SUM	1811	2354	531	4696	# Surveys
	38.6%	50.1%	11.3%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 1.2$ with 1 d.f., n.s.)

Responses for Comparison High Schools

	Yes	No	No Answer	SUM	
Baseline	470	753	161	1384	# Surveys
	34.0%	54.4%	11.6%	100.0%	% of Wave
	71.8%	70.7%	78.9%	71.9%	% of Column
Post	185	312	43	540	# Surveys
	34.3%	57.8%	8.0%	100.0%	% of Wave
	28.2%	29.3%	21.1%	28.1%	% of Column
SUM	655	1065	204	1924	# Surveys
	34.0%	55.4%	10.6%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 0.2$ with 1 d.f., n.s.)

Table 31.

Responses to the Question:

Have you heard any Radio Commercials which talked about:

Alcohol license restrictions?

for Experimental and Comparison *Motor Vehicle Administration Office* Samples
by Sampling Period

Responses for Experimental Motor Vehicle Administration Offices

	Yes	No	No Answer	SUM	
Baseline	1181	1831	551	3561	# Surveys
	33.1%	51.4%	15.4%	100.0%	% of Wave
	47.4%	72.6%	74.3%	61.9%	% of Column
Post	1311	691	191	2191	# Surveys
	59.8%	31.5%	8.7%	100.0%	% of Wave
	52.6%	27.4%	25.7%	38.1%	% of Column
SUM	2491	2521	741	5751	# Surveys
	43.3%	43.8%	12.9%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 33.2$ with 1 d.f., $p < .001$)

Responses for Comparison Motor Vehicle Administration Offices

	Yes	No	No Answer	SUM	
Baseline	521	871	211	1601	# Surveys
	32.5%	54.4%	13.1%	100.0%	% of Wave
	53.1%	50.3%	45.7%	50.5%	% of Column
Post	461	861	251	1571	# Surveys
	29.3%	54.8%	15.9%	100.0%	% of Wave
	46.9%	49.7%	54.3%	49.5%	% of Column
SUM	981	1731	461	3171	# Surveys
	30.9%	54.6%	14.5%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 0.2$ with 1 d.f., n.s)

Table 32.

Responses to the Question:

Have you heard any Radio Commercials which talked about:

Alcohol license restrictions?

for Experimental and Comparison College Samples by Sampling Period

Responses for Experimental Colleges

	Yes	No	No Answer	SUM	
Baseline	379	859	127	1365	# Surveys
	27.8%	62.9%	9.3%	100.0%	% of Wave
	55.5%	79.0%	69.4%	69.9%	% of Column
Post	304	229	56	589	# Surveys
	51.6%	38.9%	9.5%	100.0%	% of Wave
	44.5%	21.0%	30.6%	30.1%	% of Column
SUM	683	1088	183	1954	# Surveys
	35.0%	55.7%	9.4%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 109.8$ with 1 d.f., $p < .001$)

Responses for Comparison Colleges

	Yes	No	No Answer	SUM	
Baseline	139	254	55	448	# Surveys
	31.0%	56.7%	12.3%	100.0%	% of Wave
	69.2%	64.6%	70.5%	66.7%	% of Column
Post	62	139	23	224	# Surveys
	27.7%	62.1%	10.3%	100.0%	% of Wave
	30.8%	35.4%	29.5%	33.3%	% of Column
SUM	201	393	78	672	# Surveys
	29.9%	58.5%	11.6%	100.0%	% of Wave
	100.0%	100.0%	100.0%	100.0%	% of Column

($\chi^2 = 1.2$ with 1 d.f., n.s)

Overall, the media exposure data provide additional strong support for the impact of the PI&E program in the experimental counties. Statistically significant increases in the recall of printed, TV and radio messages on alcohol license restrictions were found in the experimental counties and not in the comparisons. Together with the crash data and survey findings on knowledge of the sanction, these exposure measures lead to the inescapable conclusion that the PI&E program increased the safety benefits obtained from the introduction of the 0.02 law.

IV. DISCUSSION

The results presented in the previous section clearly support several straightforward conclusions with respect to the objectives of this study. These are presented below followed by some thoughts on the implications of the findings for future highway safety efforts.

This study leads to the conclusion that the Maryland 0.02 BAC sanction for youth is a highly effective highway safety countermeasure. As initially implemented, the sanction was associated with a statistically significant statewide reduction of accident-involved drivers under 21 judged to have been drinking. This reduction was attributed to the adoption of the sanction, the "normal" publicity attendant to the passage and implementation of the law and the imprinting of new licenses with the words *Under 21 Alcohol Restricted*. There was no reported enforcement "blitz" or change in the adjudication process. A reduction in accident-involved drivers of even the 11 percent shown by the lower of the two time series analyses performed represents a major safety benefit to society.

The beneficial effects of the Maryland sanction were enhanced by the PI&E campaign mounted as part of this study. This multi-media campaign used public service time/space for distribution. The combined effects of the sanction and the PI&E campaign were associated with an estimated reduction in accident-involved drivers under 21 years of age judged HBD of approximately 50 percent in six experimental counties. Thus, the addition of localized PI&E *which emphasized the sanctions for violation of the law* appeared to increase the beneficial effects of the sanction. It was also apparent that the multi-media characteristic of the PI&E program was an essential ingredient as indicated by the differential responses of the high school, Motor Vehicle Administration office and college survey samples.

Given the extent of benefits documented for the Maryland sanction and the PI&E enhancement, it is reasonable to conclude that a lower BAC restriction for youth is a countermeasure which should be widely implemented. There is no evidence from the present study that Maryland itself or its implementation of the countermeasure was in any way atypical of the U.S. in general. Therefore, there is reason to believe that other locales can achieve safety benefits analogous to those observed in Maryland if they adopt and publicize similar sanctions.

In a field study of this type, the possibility of spurious results must always be considered. It is believed that the findings presented herein are sufficiently robust to preclude significant doubt concerning their validity. The quantitative estimates of the reduction in youth crash involvements related to alcohol are subject to normal statistical variability and the subjectiveness inherent in using police officers' judgments of "had been drinking" as a measure of alcohol involvement. However, the basic conclusion that the law and PI&E worked appears tenable. Several factors support the validity of the basic findings. First, the very magnitude of the safety benefits found provides a significant margin for error. Simply, the 0.02 BAC sanction would still have to be considered a highly effective countermeasure even if the reductions it spawned were half as large as actually measured. Second, the apparent stability of the Maryland crash data base and the inherent control over extraneous factors provided by the Box-Jenkins time series approach limit the possibility that the reported results are incorrect. Third, any bias in the use of the HBD measure is likely towards understating the positive effects of the law. Simply, if police officers were sensitized by the passage

of the law and its attendant PI&E, they would be expected to indicate "HBD" more frequently after its adoption.

Another factor which supports the underlying validity of the results is the fact that the basic pattern of findings was replicated for the statewide, experimental and comparison county analyses. The consistency of the observed effect for all regions and sub-regions of Maryland examined by the study provides considerable confidence in the validity of the results. The findings are also internally consistent. That is, the crash and survey data are mutually supportive of a basic hypothesis that the adoption of the law and its attendant publicity resulted in a significant safety benefit which was profoundly enhanced by this study's PI&E efforts. Finally, the findings reported herein are in basic agreement with those recently reported in the literature (see for example Hingson, et. al, 1991).

This study did not focus on the effects of the minimum legal drinking age. Other research has shown rather conclusively that placing the drinking age at 21 years has significant highway and other safety benefits (see for example, Jones, Pieper and Robertson, 1992). If the drinking age in Maryland had been raised to 21 during the study period, it might have confounded the interpretation of the effects reported herein. However, Maryland raised its minimum legal drinking age to 21 in 1982, over three years before the start of the baseline data period for the present study. It is therefore possible to conclude that observed effectiveness of the sanction was not a result of changes in the drinking age since it was accomplished in a period of a stable legal drinking age of 21 years.

Some parts of the process by which the sanction and PI&E enhancement operated could not be rigorously evaluated. For example, there is no quantitative evidence that the addition of the *Under 21 Alcohol Restricted* imprint to the license in July, 1989, seven months after sanction initiation, had an effect. Anecdotal information, however, would suggest that it was supportive and would likely be a worthwhile inclusion in future similar implementations.

It also is not possible to assess directly the totality of PI&E to which Maryland youth were exposed. The contents of the various campaigns which came to the attention of this study such as *Drive to Survive* and *Operation Prom* in Baltimore appear to have been consistent with the messages which proved effective in the present study. In the absence of a rigorous evaluation it is impossible to document their impact. However, the survey data show an unusually high knowledge of the sanction even before this study's PI&E program was launched. Therefore, it is reasonable to conclude that at least part of the success of the Maryland sanction is due to a relatively vigorous and continual PI&E support program. The marked effect of this project's PI&E efforts in the experimental counties certainly supports the sanction potentiation benefits of such messages.

Part of the success of the PI&E may be attributed to its ability to convey an extremely straightforward message. The fact that even one drink can make it illegal to drive removes much of the uncertainty associated with the amount and timing of alcohol consumption needed to reach higher BAC levels. When this was coupled with mention of possible loss of license, as it was in both *Drive to Survive* and this project's PI&E, a compelling motivation to avoid drinking and driving was likely created.

It is worth noting that the PI&E effects engendered by this project in the experimental counties were accomplished completely through the use of public service time and space. No TV or radio station was paid to air the PSAs. All pamphlet and poster distribution was accomplished with volunteer labor. To be sure, the project provided creative talent and bore production and

printing costs. However, it is believed that the State or local community groups could have readily obtained these services if this project had not been available.

In summary, the Maryland 0.02 BAC sanction for youth under the age of 21 appears to be a highly effective highway safety countermeasure when coupled with a reasonable level of PI&E. The strength of the safety benefits observed, the absence of potentially confounding factors which could invalidate the findings and the absence of any readily apparent counterproductive aspects to the sanction suggest that it should be vigorously promoted and widely adopted.

V. REFERENCES

- Andenaes, J. The general preventive effects of punishment. *University of Pennsylvania Law Review*, 114, 1966, 949-983.
- Automatic Forecasting Systems, Inc. *AutoBox manual*. Automatic Forecasting Systems, Inc., Hatboro, PA, 1986.
- Blomberg, R.D., Preusser, D.F. and Ulmer, R.G. *Deterrent effects of mandatory license suspension for DWI conviction*. DOT HS 807 138, Dunlap and Associates, Norwalk, CT, 1987.
- Codling, P.J. and Samson, P. *Blood-alcohol in road fatalities before and after the Road Safety Act, 1967*. Transport and Road Research Laboratory, Supplemental Report 45UC, Crawthorne, Berkshire, 1974.
- Ennis, P.K. General deterrence and police enforcement: Effective countermeasures against drinking and driving? *Journal of Safety Research*, 9, 1977, 15-25.
- Hingson, R., Heeren, T., Howland, J. and Winter, M. Reduced BAC limits for young people (impact on night fatal crashes). *Alcohol Drugs and Driving*, 7 (2), 1991, 117-127.
- Hurst, P. and Wright, R. *Deterrence at last: The Ministry Transport's alcohol blitzes*. Paper presented to the Eighth International Conference on Alcohol, Drugs and Traffic Safety, Stockholm, 1980.
- Jones, N.E., Pieper, C.F. and Robertson, L.S. The effect of legal drinking age on fatal injuries of adolescents and young adults. *American Journal of Public Health*, 82 (1), January, 1992, 112-115.
- Levy, P., Voas, R., Johnson, P. and Klein, T.M. An evaluation of the Department of Transportation's Alcohol Safety Action Projects. *Journal of Safety Research*, 10, 1978, 162-176.
- McCleary, R. and Hay, R.A., Jr. *Applied time series analysis for the social sciences*. Sage Publications, Beverly Hills, 1980.
- National Highway Traffic Safety Administration, *Fatal accident reporting system 1989: A decade of progress*. DOT HS 807 693, Washington, D.C., March 1991.
- Ross, L.H. *Deterrence of the drinking driver: An international survey*. NHTSA contract DTNH22-80-C-07425, Washington, D.C., 1981.
- Voas, R.B. and Williams, A.F. Age differences of arrested and crash-involved drinking drivers. *Journal of Studies on Alcohol*, 47 (3), May 1986, 244-248.
- Williams, T.P. and Lillis, R.P. Changes in alcohol consumption by 18-year-olds following an increase in New York State's purchase age to 19. *Journal of Studies on Alcohol*, 47 (4), July 1986, 290-296.

Appendix A

Applicable Maryland Law Sections

Maryland Vehicle Law § 16-113. Restricted Licenses

§ 16-113. Restricted licenses.

(a) *Authority to issue.* — In addition to the vision and other restrictions provided for in this subtitle, when it issues a driver's license, the Administration for good cause may impose on the licensee:

(1) Any restrictions suitable to the licensee's driving ability with respect to the type of special mechanical control devices required on motor vehicles that the licensee may drive; and

(2) An alcohol restriction which prohibits the licensee from driving or attempting to drive a motor vehicle while having alcohol in his blood; and

(3) Any other restrictions applicable to the licensee that the Administration determines appropriate to assure the safe driving of a motor vehicle by the licensee.

(b) *Licensees under age of 21.* — (1) Notwithstanding the licensee's driving record, the Administration shall impose on each licensee under the age of 21 years an alcohol restriction that prohibits the licensee from driving or attempting to drive a motor vehicle with an alcohol concentration of 0.02 or more as determined by an analysis of the person's blood or breath.

(2) An alcohol restriction imposed under this subsection expires when the licensee reaches the age of 21 years.

(3) This subsection may not be construed or applied to limit:

(i) The authority of the Administration to impose on a licensee an alcohol restriction described in subsection (a) (2) of this section; or

(ii) The application of any other provision of law that prohibits consumption of an alcoholic beverage by an individual under the age of 21 years.

(c) *Form; indication of restrictions.* —

(1) Subject to the provisions of paragraph (2) of this subsection, the Administration may:

(i) Issue a special restricted license; or

(ii) Set forth the restrictions on the usual license form.

(2) The Administration shall indicate on the license of a licensee under the age of 21 years that an alcohol restriction has been imposed on the licensee under subsection (b) of this section.

(d) *Provisional license.* — (1) In addition to the other restrictions provided in this subtitle, the Administration may issue a provisional driver's license to applicants who are under the age of 18.

(2) The license may be restricted by requiring that the licensee be accompanied and supervised at certain times by a licensed driver who is at least 21 years old.

(3) The Administrator may modify or waive the restriction if the restriction would affect adversely:

(i) The employment or opportunity for employment of the licensee; or

(ii) The participation of the licensee in an organized volunteer program approved by the Administration and designed to provide transportation to prevent alcohol- or drug-related driving offenses and promote highway safety; or

(iii) The opportunity of the licensee to participate in athletic events and related training sessions.

(e) *"Maryland only" license.* — In addition to the other restrictions provided under this subtitle, the Administration may issue a driver's license that is valid only in the State of Maryland to an applicant who has been suspended in another jurisdiction as a result of failing to comply with the financial responsibility requirements of that jurisdiction.

(f) *Suspension or revocation for violation of restriction.* — After receiving satisfactory evidence of any violation of a restricted or provisional driver's license, the Administration may suspend or revoke the license. However, the licensee may request a hearing as provided for a suspension or revocation under Subtitle 2 of this title.

(g) *Record of order not to drive or attempt to drive.* — If a circuit court or a District Court orders a licensee not to drive or attempt to drive a motor vehicle with alcohol in his blood, the Administration shall have the licensee's driving record and driver's license reflect that the court ordered restriction was imposed, and shall keep records of the order.

(h) *Violation of restrictions.* — An individual may not drive a vehicle in any manner that violates any restriction imposed in a restricted license issued to him.

Maryland Vehicle Law § 16-113. Restricted Licenses (continued)

(i) *Same — Provisional licenses.* — An individual may not drive a vehicle in any manner that violates any restriction imposed in a provisional license issued to the individual. (An. Code 1957, art. 66^{1/2}, § 6-113; 1977, ch. 14, § 2; 1978, ch. 803; 1980, ch. 404, §§ 1, 2; 1985, chs. 404, 584; 1986, ch. 369; ch. 472, § 1; 1988, ch. 254; 1989, ch. 438; ch. 551, §§ 1, 2; 1991, ch. 335.)

Effect of amendment. — Section 2, ch. 551, Acts 1989, effective Jan. 1, 1990, substituted "an alcohol concentration of 0.02" for "0.02 percent" and deleted "by weight of alcohol in the licensee's blood" following "or more" in (b) (1).

The 1991 amendment, effective July 1, 1991, added (d) (3) (iii).

Editor's note. — Section 2, ch. 254, Acts 1988, provides that "this act shall be construed only prospectively to apply to the issuance or renewal of drivers' licenses on or after July 1, 1988, and the Motor Vehicle Administration is not required to reissue a driver's license until the regular expiration of a current driver's license."

Section 2, ch. 438, Acts 1989, provides that "this Act shall be construed only prospectively to apply to the issuance or renewal of drivers' licenses on or after July 1, 1989, and the Motor Vehicle Administration is not required to reissue a driver's license until the regular expiration of a current driver's license."

Section 4, ch. 551, Acts 1989, provides that "§ 2 of this Act shall take effect January 1, 1990, contingent on the taking effect of Chapter — (S.B. 396/H.B. 556 of the Acts of the General Assembly of 1989. However, if Chapter — does not become effective, then § 2 of this Act may not take effect and shall be null and void without the necessity of further action by the General Assembly." Senate Bill 396 failed of enactment; House Bill 556 was enacted as ch. 284, Acts 1989.

Stated in *In re David K.*, 48 Md. App. 714, 429 A.2d 313 (1981).

Laws of Maryland Chapter 254, 1988

AN ACT concerning

Vehicle Laws - Drivers' Licenses - Alcohol Restrictions

FOR the purpose of requiring the Motor Vehicle Administration under certain circumstances to impose on a licensee under a certain age an alcohol restriction which prohibits the licensee from driving or attempting to drive a motor vehicle with a certain percentage or more of alcohol in the licensee's blood; providing that the alcohol restriction expires except under certain circumstances, when the licensee reaches a certain age; ~~authorizing---the Administration--or--certain--courts--to--extend--the--expiration--date--of--the--alcohol--restriction--for--good--cause~~ providing that it is prima facie evidence that a defendant has violated a specific alcohol restriction if a certain test determines a blood alcohol level above a certain level; providing for the construction and application of this Act; and generally relating to the imposition of an alcohol restriction on the driver's license of a certain licensee.

BY repealing and reenacting, with amendments,

Article - Transportation
Section 16-113
Annotated Code of Maryland
(1984 Replacement Volume and 1987 Supplement)

BY adding to

Article - Courts and Judicial Proceedings
Section 10-307(g)
Annotated Code of Maryland
(1984 Replacement Volume and 1987 Supplement)

Laws of Maryland Chapter 254, 1988 (continued)

SECTION 1. BE IT ENACTED BY THE GENERAL ASSEMBLY OF MARYLAND, That the Laws of Maryland read as follows:

Article - Transportation

16-113.

(a) In addition to the vision and other restrictions provided for in this subtitle, when it issues a driver's license, the Administration for good cause may impose on the licensee:

(1) Any restrictions suitable to the licensee's driving ability with respect to the type of special mechanical control devices required on motor vehicles that the licensee may drive; and

(2) An alcohol restriction which prohibits the licensee from driving or attempting to drive a motor vehicle while having alcohol in his blood; and

(3) Any other restrictions applicable to the licensee that the Administration determines appropriate to assure the safe driving of a motor vehicle by the licensee.

(B) (1) NOTWITHSTANDING THE LICENSEE'S DRIVING RECORD, THE ADMINISTRATION SHALL IMPOSE ON EACH LICENSEE UNDER THE AGE OF 21 YEARS AN ALCOHOL RESTRICTION AS DESCRIBED IN SUBSECTION (A) (2) OF THIS SECTION THAT PROHIBITS THE LICENSEE FROM DRIVING OR ATTEMPTING TO DRIVE A MOTOR VEHICLE WITH 0.02 PERCENT OR MORE BY WEIGHT OF ALCOHOL IN THE LICENSEE'S BLOOD.

Laws of Maryland Chapter 254, 1988 (continued)

(2) ~~EXCEPT AS PROVIDED IN PARAGRAPH (3) OF THIS SUBSECTION, AN ALCOHOL RESTRICTION IMPOSED UNDER THIS SUBSECTION EXPIRES WHEN THE LICENSEE REACHES THE AGE OF 21 YEARS.~~

~~(3) THE ADMINISTRATION, A DISTRICT COURT, OR A CIRCUIT COURT FOR GOOD CAUSE MAY EXTEND THE EXPIRATION DATE OF AN ALCOHOL RESTRICTION IMPOSED UNDER THIS SUBSECTION.~~

(3) THIS SUBSECTION MAY NOT BE CONSTRUED OR APPLIED TO LIMIT:

(I) THE AUTHORITY OF THE ADMINISTRATION TO IMPOSE ON A LICENSEE AN ALCOHOL RESTRICTION DESCRIBED IN SUBSECTION (A)(2) OF THIS SECTION; OR

(II) THE APPLICATION OF ANY OTHER PROVISION OF LAW THAT PROHIBITS CONSUMPTION OF AN ALCOHOLIC BEVERAGE BY AN INDIVIDUAL UNDER THE AGE OF 21 YEARS.

[(b)] (C) The Administration may:

(1) Issue a special restricted license; or

(2) Set forth the restrictions on the usual license form.

[(c)] (D) (1) In addition to the other restrictions provided in this subtitle, the Administration may issue a provisional driver's license to applicants who are under the age of 18.

Laws of Maryland Chapter 254, 1988 (continued)

(2) The license may be restricted by requiring that the licensee be accompanied and supervised at certain times by a licensed driver who is at least 21 years old.

(3) The Administrator may modify or waive the restriction if the restriction would affect adversely:

(i) The employment or opportunity for employment of the licensee; or

(ii) The participation of the licensee in an organized volunteer program approved by the Administration and designed to provide transportation to prevent alcohol- or drug-related driving offenses and promote highway safety.

[(d)] (E) In addition to the other restrictions provided under this subtitle, the Administration may issue a driver's license that is valid only in the State of Maryland to an applicant who has been suspended in another jurisdiction as a result of failing to comply with the financial responsibility requirements of that jurisdiction.

[(e)] (F) After receiving satisfactory evidence of any violation of a restricted or provisional driver's license, the Administration may suspend or revoke the license. However, the licensee may request a hearing as provided for a suspension or revocation under Subtitle 2 of this title.

[(f)] (G) If a circuit court or a District Court orders a licensee not to drive or attempt to drive a motor vehicle with alcohol in his blood, the Administration shall have the licensee's driving record and driver's license reflect that the court ordered restriction was imposed, and shall keep records of the order.

Laws of Maryland Chapter 254, 1988 (continued)

[(g)] (H) An individual may not drive a vehicle in any manner that violates any restriction imposed in a restricted license issued to him.

[(h)] (I) An individual may not drive a vehicle in any manner that violates any restriction imposed in a provisional license issued to the individual.

Article - Courts and Judicial Proceedings

10-307.

(G) IF AT THE TIME OF TESTING THERE WAS IN THE PERSON'S BLOOD 0.02 PERCENT OR MORE BY WEIGHT OF ALCOHOL, AS DETERMINED BY AN ANALYSIS OF THE PERSON'S BLOOD OR BREATH, IT SHALL BE PRIMA FACIE EVIDENCE THAT A DEFENDANT WAS DRIVING IN VIOLATION OF § 16-113(B) OF THE TRANSPORTATION ARTICLE.

SECTION 2. AND BE IT FURTHER ENACTED, That this Act shall be construed only prospectively to apply to the issuance or renewal of drivers' licenses on or after the effective date of this Act, and the Motor Vehicle Administration is not required to reissue a driver's license until the regular expiration of a current driver's license.

SECTION 3. AND BE IT FURTHER ENACTED, That this Act shall take effect July 1, 1988.

Approved May 17, 1988.

Laws of Maryland Chapter 255, 1988

AN ACT concerning

Vehicle Laws - Alcohol-Related Driving Offense
Offenses - Evidentiary Presumptions

FOR the purpose of prohibiting a person if in a person's blood there is a certain percentage or more by weight of alcohol; from driving or attempting to drive a vehicle; altering the percentage of alcohol by weight in a person's blood, as determined by a certain analysis of a the person's blood or breath, that may not give rise to certain presumptions; altering the percentage of alcohol by weight in a person's blood, as determined by a certain analysis of a the person's blood or breath, that shall be prima facie evidence that a person was driving while under the influence of alcohol; and altering the percentage of alcohol by weight in a person's blood, as determined by a certain analysis of a person's blood or breath, that shall be prima facie evidence that a person was driving while intoxicated, altering the percentage of alcohol by weight in a person's blood, as determined by a certain analysis of the person's blood or breath, that shall be prima facie evidence that the defendant was driving with alcohol in the defendant's blood, and generally relating to altering the evidentiary effect of certain percentages of alcohol by weight in a person's blood, as determined by a certain analysis; providing that certain provisions of law relating to a certain chemical test may not be construed to preclude or limit the admissibility of evidence of a certain chemical test in a prosecution for a certain alcohol-related driving offense; authorizing the Motor Vehicle Administration to revoke the license of an individual who is convicted of a certain alcohol-related driving offense; providing that certain provisions of law relating to a chemical test to determine the alcohol content of the blood of a person who is detained on suspicion of certain alcohol-related driving offenses shall apply to the alcohol-related driving offense created by this Act; providing that certain provisions of law relating to a preliminary breath test to determine the alcohol content of a person's blood shall apply to the alcohol-related driving offense created by this Act; requiring the Motor Vehicle Administration to assess a certain number of points after a conviction for the alcohol-related driving offense created under this Act; authorizing a police officer to arrest without a warrant if the police officer has probable cause to believe that a person violated the alcohol-related driving offense created under this Act; providing that a certain bond certificate may not be accepted for a person charged with the alcohol-related driving offense created under this Act; establishing a certain penalty; making technical changes; and generally relating to providing that if in a person's blood there is a certain percentage or more by weight of alcohol the person may not drive or attempt to drive a vehicle.

Laws of Maryland Chapter 255, 1988 (continued)

BY repealing and reenacting, with amendments,

Article - Courts and Judicial Proceedings
Section 10-307(c), (d), and ~~(e)~~, and ~~(f)~~
Annotated Code of Maryland
(1984 Replacement Volume and 1987 Supplement)

BY adding to

Article --- Courts and Judicial Proceedings
Section 10-307(g)
Annotated Code of Maryland
(1984 Replacement Volume and 1987 Supplement)

BY repealing and reenacting, with amendments,

Article --- Transportation
Section --- 16-205(a)(1), 16-205-1(a), --- (b)(2), --- and --- (d)(1),
16-205-2(a), --- 16-402(a)(24), --- 21-902(a),
26-202(a)(3)(1), and 26-404(f)(2)(1)
Annotated Code of Maryland
(1987 Replacement Volume)

BY repealing and reenacting, without amendments,

Article --- Transportation
Section 27-101(k)
Annotated Code of Maryland
(1987 Replacement Volume)

SECTION 1. BE IT ENACTED BY THE GENERAL ASSEMBLY OF MARYLAND, That the Laws of Maryland read as follows:

Article - Courts and Judicial Proceedings

10-307.

(c) If at the time of testing there was in the person's blood more than 0.05 percent but less than [0.08] 0.07 percent by weight of alcohol, as determined by an analysis of the person's blood or breath, this fact may not give rise to any presumption that the defendant was or was not intoxicated or that the defendant was or was not driving while under the influence of alcohol, but this fact may be considered with other competent evidence in determining the guilt or innocence of the defendant.

(d) If at the time of testing there was in the person's blood [0.08] 0.07 percent or more by weight of alcohol, as determined by an analysis of the person's blood or breath, it shall be prima facie evidence that the defendant was driving while under the influence of alcohol.

Laws of Maryland Chapter 255, 1988 (continued)

(e) If at the time of testing there was in the person's blood [0.13] 0.10 percent or more by weight of alcohol, as determined by an analysis of the person's blood or breath, it shall be prima facie evidence that the defendant was intoxicated.

(f) If at the time of testing there was in the person's blood [0.01] 0.02 percent or more by weight of alcohol, as determined by an analysis of the person's blood or breath, it shall be prima facie evidence that the defendant was driving with alcohol in the defendant's blood.

~~(6) -- THE -- PROVISIONS -- OF -- THIS -- SECTION -- MAY -- NOT -- BE -- CONSTRUED -- TO -- PRECLUDE -- OR -- LIMIT -- THE -- ADMISSIBILITY -- OF -- EVIDENCE -- OF -- THE -- CHEMICAL -- ANALYSIS -- IN -- A -- PROSECUTION -- FOR -- A -- VIOLATION -- OF -- § -- 21 -- 502 (A) (2) -- OF -- THE -- TRANSPORTATION -- ARTICLE -- OR -- ANY -- OTHER -- PROVISION -- OF -- LAW -- THAT -- RELATES -- TO -- THE -- PROHIBITION -- OF -- A -- PERSON -- DRIVING -- A -- VEHICLE -- IF -- IN -- THE -- PERSON'S -- BLOOD -- THERE -- IS -- 0.06 -- PERCENT -- OR -- MORE -- BY -- WEIGHT -- OF -- ALCOHOL -- AS -- DETERMINED -- BY -- AN -- ANALYSIS -- OF -- THE -- PERSON'S -- BLOOD -- OR -- BREATH.~~

Approved May 17, 1988

Laws of Maryland Chapter 734, 1988

AN ACT concerning

Chemical Test Results - Presumptions

FOR the purpose of altering the percentage of alcohol by weight in a person's blood, as determined by a certain analysis of the person's blood or breath, that may not give rise to certain presumptions; ~~altering the percentage of alcohol by weight in a person's blood, as determined by a certain analysis of the person's blood or breath, that shall give rise to a presumption that the person was not intoxicated and that the person was not driving while under the influence of alcohol;~~ altering the percentage of alcohol by weight in a person's blood, as determined by a certain analysis of the person's blood or breath, that shall be prima facie evidence that a person was driving while under the influence of alcohol; altering the percentage of alcohol by weight in a person's blood, as determined by a certain analysis of a person's blood or breath, that shall be prima facie evidence that a person was driving while intoxicated; ~~altering the percentage of alcohol by weight in a person's blood, as determined by a certain analysis of the person's blood or breath, that shall be prima facie evidence that the defendant was driving with alcohol in the defendant's blood;~~ and generally relating to altering the evidentiary effect of certain percentages of alcohol by weight in a person's blood, as determined by a certain analysis.

BY repealing and reenacting, with amendments,

Article - Courts and Judicial Proceedings
Section 10-307
Annotated Code of Maryland
(1984 Replacement Volume and 1987 Supplement)

SECTION 1. BE IT ENACTED BY THE GENERAL ASSEMBLY OF MARYLAND, That the Laws of Maryland read as follows:

Article - Courts and Judicial Proceedings

10-307.

(a) In a proceeding in which a person is charged with a violation of § 388A of Article 27 or with driving or attempting to drive a vehicle in violation of § 21-902 of the Transportation Article, the amount of alcohol in the person's breath or blood shown in chemical analysis as provided in this subtitle is admissible in evidence and has the effect set forth in subsections (b) through (e) of this section.

Laws of Maryland Chapter 734, 1988 (continued)

(b) If there was in the person's blood at the time of testing ~~0.05~~ ~~0.04~~ 0.05 percent or less by weight of alcohol, as determined by an analysis of the person's blood or breath, it shall be presumed that the defendant was not intoxicated and that the defendant was not driving while under the influence of alcohol.

(c) If at the time of testing there was in the person's blood more than ~~0.05~~ ~~0.04~~ 0.05 percent but less than [0.08] 0.07 percent by weight of alcohol, as determined by an analysis of the person's blood or breath, this fact may not give rise to any presumption that the defendant was or was not intoxicated or that the defendant was or was not driving while under the influence of alcohol, but this fact may be considered with other competent evidence in determining the guilt or innocence of the defendant.

(d) If at the time of testing there was in the person's blood [0.08] 0.07 percent or more by weight of alcohol, as determined by an analysis of the person's blood or breath, it shall be prima facie evidence that the defendant was driving while under the influence of alcohol.

(e) If at the time of testing there was in the person's blood [0.13] 0.10 percent or more by weight of alcohol, as determined by an analysis of the person's blood or breath, it shall be prima facie evidence that the defendant was intoxicated.

(f) If at the time of testing there was in the person's blood ~~0.02~~ 0.02 percent or more by weight of alcohol, as determined by an analysis of the person's blood or breath, it shall be prima facie evidence that the defendant was driving with alcohol in the defendant's blood.

SECTION 2. AND BE IT FURTHER ENACTED, That this Act shall take effect July 1, 1988.

Approved May 27, 1988.

Laws of Maryland Chapter 551, 1989

AN ACT concerning

Vehicle Laws - Drivers' Licenses - Alcohol Restrictions

FOR the purpose of clarifying that an alcohol restriction on a licensee under a certain age prohibits the licensee from driving or attempting to drive a motor vehicle with a certain amount of alcohol in the licensee's blood as determined by an analysis of the licensee's blood or breath; clarifying that an alcohol restriction on a licensee under a certain age prohibits the licensee from driving or attempting to drive a motor vehicle with a certain alcohol concentration as determined by an analysis of the licensee's blood or breath; making certain provisions of this Act contingent on the passage of another Act; and providing for the effective dates of this Act.

BY repealing and reenacting, with amendments,

Article - Transportation
Section 16-113(b)
Annotated Code of Maryland
(1987 Replacement Volume and 1988 Supplement)

BY repealing and reenacting, with amendments,

Article - Transportation
Section 16-113(b)
Annotated Code of Maryland
(1987 Replacement Volume and 1988 Supplement
As enacted by Section 1 of Chapter (S.B. 71)
of the Acts of the General Assembly of 1989)

SECTION 1. BE IT ENACTED BY THE GENERAL ASSEMBLY OF MARYLAND, That the Laws of Maryland read as follows:

Article - Transportation

16-113.

(b) (1) Notwithstanding the licensee's driving record, the Administration shall impose on each licensee under the age of 21 years an alcohol restriction that prohibits the licensee from driving or attempting to drive a motor vehicle with 0.02 percent or more by weight of alcohol in the licensee's blood AS DETERMINED BY AN ANALYSIS OF THE PERSON'S BLOOD OR BREATH.

(2) An alcohol restriction imposed under this subsection expires when the licensee reaches the age of 21 years.

(3) This subsection may not be construed or applied to limit:

Laws of Maryland Chapter 551, 1989 (continued)

(i) The authority of the Administration to impose on a licensee an alcohol restriction described in subsection (a)(2) of this section; or

(ii) The application of any other provision of law that prohibits consumption of an alcoholic beverage by an individual under the age of 21 years.

~~SECTION 2. AND BE IT FURTHER ENACTED, That this Act shall take effect July 1, 1989.~~

SECTION 2. AND BE IT FURTHER ENACTED, That the Laws of Maryland read as follows:

Article - Transportation

16-113.

(b) (1) Notwithstanding the licensee's driving record, the Administration shall impose on each licensee under the age of 21 years an alcohol restriction that prohibits the licensee from driving or attempting to drive a motor vehicle with AN ALCOHOL CONCENTRATION OF 0.02 (percent) or more (by weight of alcohol in the licensee's blood) as determined by an analysis of the person's blood or breath.

(2) An alcohol restriction imposed under this subsection expires when the licensee reaches the age of 21 years.

(3) This subsection may not be construed or applied to limit:

(i) The authority of the Administration to impose on a licensee an alcohol restriction described in subsection (a)(2) of this section; or

(ii) The application of any other provision of law that prohibits consumption of an alcoholic beverage by an individual under the age of 21 years.

SECTION 3. AND BE IT FURTHER ENACTED, That Section 1 of this Act shall take effect July 1, 1989.

SECTION 4. AND BE IT FURTHER ENACTED, That Section 2 of this Act shall take effect January 1, 1990, contingent on the taking effect of Chapter IS.B. 398/H.B. 5561 of the Acts of the General Assembly of 1989. However, if Chapter does not become effective, then Section 2 of this Act may not take effect and shall be null and void without the necessity of further action by the General Assembly.

Approved May 25, 1989.

Laws of Maryland Chapter 438, 1989

AN ACT concerning

Vehicle Laws - Young Drivers - Alcohol Restriction

FOR the purpose of requiring the Motor Vehicle Administration to indicate on the driver's license of a licensee under a certain age that a certain alcohol restriction has been imposed on the licensee; clarifying language; providing for the construction and application of this Act; and generally relating to alcohol restrictions imposed on young drivers.

BY repealing and reenacting, without amendments,

Article - Transportation
Section 16-113(b)
Annotated Code of Maryland
(1987 Replacement Volume and 1988 Supplement)

BY repealing and reenacting, with amendments,

Article - Transportation
Section 16-113(c)
Annotated Code of Maryland
(1987 Replacement Volume and 1988 Supplement)

SECTION 1. BE IT ENACTED BY THE GENERAL ASSEMBLY OF MARYLAND, That the Laws of Maryland read as follows:

Article - Transportation

16-113.

(b) (1) Notwithstanding the licensee's driving record, the Administration shall impose on each licensee under the age of 21 years an alcohol restriction that prohibits the licensee from driving or attempting to drive a motor vehicle with 0.02 percent or more by weight of alcohol in the licensee's blood.

(2) An alcohol restriction imposed under this subsection expires when the licensee reaches the age of 21 years.

(3) This subsection may not be construed or applied to limit:

(i) The authority of the Administration to impose on a licensee an alcohol restriction described in subsection (a)(2) of this section; or

(ii) The application of any other provision of law that prohibits consumption of an alcoholic beverage by an individual under the age of 21 years.

Laws of Maryland Chapter 438, 1989 (continued)

(c) (1) [The] SUBJECT TO THE PROVISIONS OF PARAGRAPH (2) OF THIS SUBSECTION, THE Administration may:

{(1)} (I) Issue a special restricted license; or

{(2)} (II) Set forth the restrictions on the usual license form.

(2) THE ADMINISTRATION SHALL INDICATE ON THE LICENSE OF A LICENSEE UNDER THE AGE OF 21 YEARS THAT AN ALCOHOL RESTRICTION HAS BEEN IMPOSED ON THE LICENSEE UNDER SUBSECTION (B) OF THIS SECTION.

SECTION 2. AND BE IT FURTHER ENACTED, That this Act shall be construed only prospectively to apply to the issuance or renewal of drivers' licenses on or after July 1, 1989, and the Motor Vehicle Administration is not required to reissue a driver's license until the regular expiration of a current driver's license.

SECTION 3. AND BE IT FURTHER ENACTED, That this Act shall take effect July 1, 1989.

Approved May 19, 1989.

Appendix B

Public Information and Education Materials Used to Publicize the Maryland Law

TV Spots

IF YOU'RE UNDER 21 (TV :30)

VIDEO

Fade up on front of Provisional Driver License with licensee's picture in profile. License rotates to show words: *Under 21 Alcohol Restricted* which highlight as the Announcer says them.

Words *Alcohol Concentration of .02 or More is Illegal* super on back of license.

License zooms back and a shot glass full of vodka slides across screen, left to right.

A full wine glass now slides across the screen left to right behind the shot glass.

A beer mug full of beer with a good head on it follows the wine glass across.

The license zooms back up full and the words *Under 21 Alcohol Restricted* on the license flash.

Cut to Police spokesperson* with his name and title supered.

AUDIO

Announcer: If you're a Maryland driver who is under 21, these words are important to you. They mean that...

Announcer: it's illegal for you to drive with an alcohol concentration of .02 or more.

Announcer: For most people that's only about one shot of vodka...

Announcer: or one glass of wine...

Announcer: or one frosty cold beer.

Announcer: If you're under 21, the law's the same whether or not the words actually are on your license.

Spokesperson: If you're under 21 in Maryland, you don't have to be drunk to lose your license.

* Four versions made with different spokespersons.

A TALK (TV :30)

VIDEO

Fade up on a young man in a dorm lounge. He is facing the camera flanked by two other students reading and watching TV. An off-screen female voice speaks to him and he looks up to respond.

Young Man looks at license. Says line. It zooms up from his hand to full screen of back of license with restriction words not present.

License rotates to show front. Words *Under 21 Alcohol Restricted* flash onto license. Words *Alcohol concentration of .02 or more is illegal* snap on around the license.

Word *Suspended* "stamps" on license with a "thump" sound effect.

AUDIO

V.O.: Hey...Got a drivers license?

Young Man: Sure. I've had one for years.

V.O.: You use it a lot?

Young Man: You bet. Driving gives me independence. I drive everywhere.

V.O.: Did you ever read your license?

Young Man: Not really. It just has my name, address and stuff like that on it.

V.O.: Does it say *Under 21, Alcohol Restricted*?

Young Man: No.

V.O.: It doesn't matter whether the words are there or not. The law's the same. If you're under 21 in Maryland it's illegal to drive after as little as one drink.

Announcer: You don't have to be drunk (SFX) to lose your license in Maryland.

I JUST GOT (TV :30)

VIDEO

Fade up on a medium shot of a 16 year old girl sitting with a friend. She is holding her new drivers license.

Pause and Zoom in as she admires the license. She reads from it. Obviously pleased with herself. Words *Under 21 Alcohol Restricted* super as she reads them from the back.

Freeze and zoom up a mortise of the Police spokesperson* with his name supered.

Mortise zooms back and we're back on the girl. Zoom her back into a mortise and super the words *You Don't Have to be Drunk* above her and *to lose your license* below her.

AUDIO

Girl: I did it! I passed on the first try...Freedom! From now on, I'm a driver.

Girl: My very own license...It says: *Under 21 Alcohol Restricted*. I'm not sure what that means.

Spokesperson: It means that if you're under 21 in Maryland, it's illegal to drive at an Alcohol Concentration of just .02. That's only one drink for most people.

Girl: If you're under 21, you don't have to be drunk to lose your license in Maryland.

* Two versions made with different spokespersons.

WHY ME (TV :30)

VIDEO

Fade up on room door opening. It is clearly a student's room. Student1 enters and slams the door. View is from behind Student2 seated on bed.

Student1 responds.

Reaction shot of Student2

Student1 (matter of fact)

Student2 reacts

Student1 continues

Dissolve to Police spokesperson* with his name supered.

Dissolve to title card which says You Don't Have to Be Drunk and shows a drivers license. The license is stamped *Suspended* with a loud thunk.

AUDIO

Student2: What's the matter?

Student1: They took away my license. I can't drive for months.

Student2: What for?

Student1: Drinking and driving.

Student2: You! You're strictly a one beer man!

Student1: That's all it took. If you're under 21, you don't have to be drunk to lose your license in Maryland.

Spokesperson: That's right. If you're under 21 in Maryland, it's illegal to drive at an Alcohol Concentration of just .02. That's only one drink for most people.

Announcer: You don't have to be drunk (SFX) to lose your license in Maryland.

* Two versions made with different spokespersons.

QUESTIONS (TV :30)

VIDEO

AUDIO

Entire spot is set in a centered mortise with the words *If you're under 21* supered on top.

Young woman asks:

Woman1: If you're under 21 in Maryland, how many drinks does it take to make it illegal to drive?

Police officer responds:

Officer1: Usually just one.

Young man asks:

Man1: Can you really lose your license for just one drink?

Another police officer responds:

Officer2: Just one drink, that's all it takes.

Another young man asks:

Man2: Will you really ticket someone for driving after just one drink?

Third police officer responds:

Officer3: That's correct and they're going to lose their license.

A second young woman asks:

Woman2: Do you think the penalty is worth the risk?

Fourth police officer responds:

Officer4: It's a very dear price to pay for something you've worked so hard to get.

A drivers license zooms up to full screen. The license is stamped *Suspended* with a loud thunk.

Announcer: You don't have to be drunk (SFX) to lose your license in Maryland.

Radio Spots

THE RULES (Radio :30)

Police Spokesperson*: If you're a driver under 21, the words Under 21 Alcohol Restricted are important to you. They mean that it's illegal for you to drive with an alcohol concentration of .02 or more.

This is (title and last name of spokesperson) of (affiliation of spokesperson) reminding you that for most people, getting to .02 takes only about one beer.

The law's the same whether or not the words are actually printed on the back of your license.

So remember, if you're under 21 in Maryland, you don't have to be drunk to lose your license.

* Five versions made with different spokespersons.

READ YOUR LICENSE (Radio :30)

Announcer: Are you under 21? Well, take a minute to read your drivers license. I know it has your name, address and stuff like that. But, it should also say Under 21 Alcohol Restricted. That's to remind you that it's illegal for you to drive with an alcohol concentration of .02 or more.

Police Spokesperson*: This is (title and last name of spokesperson) of (affiliation of spokesperson). Even if the words are not printed on your license, the law's the same. It's illegal for you to drive after as little as one drink.

Announcer: You don't have to be drunk to lose your license.

* Six versions made with different spokespersons.

QUESTIONS AND ANSWERS (Radio :30)

- Announcer:** Are you a Maryland driver under 21?
- Young Woman1:** If you're under 21 in Maryland, how many drinks does it take to make it illegal to drive?
- Police Officer1:** Usually just one.
- Young Man1:** Can you really lose your license for just one drink?
- Police Officer2:** Just one drink, that's all it takes.
- Young Man2:** Will you really ticket someone for driving after just one drink?
- Police Officer3:** That's correct and they're going to lose their license.
- Young Woman2:** Do you think the penalty is worth the risk?
- Police Officer4:** It's a very dear price to pay for something you've worked so hard to get.
- Announcer:** A reminder from this station that you don't have to be drunk to lose your license in Maryland.

A TALK (Radio :30)

Woman's Voice: Hey...Got a drivers license?

Young Man: Sure. I've had one for years.

Woman's Voice: You use it a lot?

Young Man: You bet. Driving gives me independence. I drive everywhere.

Woman's Voice: Did you ever read your license?

Young Man: Not really. It just has my name, address and stuff like that on it.

Woman's Voice: Does it say *Under 21, Alcohol Restricted?*

Young Man: No.

Woman's Voice: It doesn't matter whether the words are there or not. The law's the same. If you're under 21 in Maryland it's illegal to drive after as little as one drink.

Announcer: A reminder from this station that you don't have to be drunk to lose your license in Maryland.

Poster

(Finished Size = 16 x 20 Inches - 4 Color)

If you're
under
21

You
can turn

Into

With
as little
as one
drink?



YOU DON'T HAVE TO BE DRUNK TO LOSE YOUR LICENSE

Since you're under 21, Maryland law says that you're restricted from driving or attempting to drive a motor vehicle with 0.02 percent or more blood alcohol. That's only one drink for most people.

ALCOHOL and DRUG PREVENTION RESOURCE CENTER
Eastern Shore

ALCOHOL, DRUGS AND ANTI-DRUGS INFORMATION CENTER
Preventing Abuse On Campus

Front and Back of Pamphlet

(Finished Folded Size = 3½ x 8½ Inches - 4 Color)

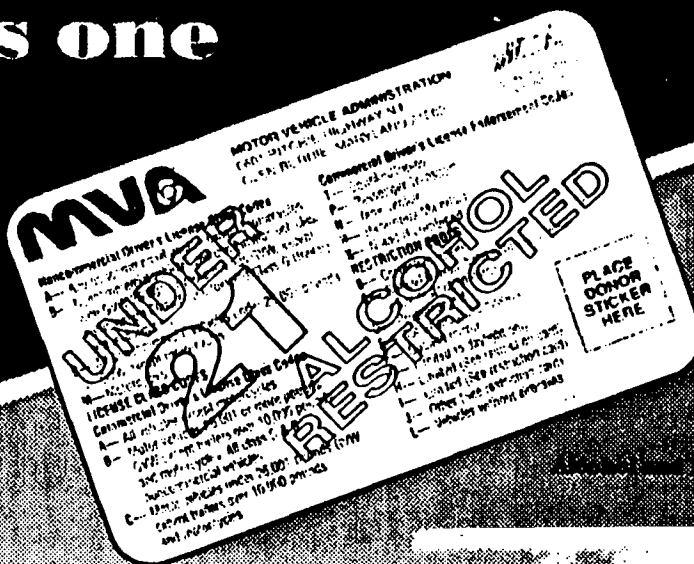
If you're
under
21



You
don't
have
to be
drunk to
lose your
license

-103-

As little as one
drink can
make it
illegal for
you to
drive



Inside of Pamphlet

(Finished Folded Size = 3½ x 8½ Inches - 4 Color)

If you're under 21

You know it's illegal for you to drink. You also know there is a law against drunk driving. But, do you know about another law which says you can lose your driver's license for driving after as little as one drink? Read on. It might just save you a lot of grief.

Since you're under 21, Maryland law says that you're restricted from driving or attempting to drive a motor vehicle with 0.02 percent or more blood alcohol. That's only one shot of vodka or one glass of wine or one beer for most people.

If you've recently gotten your license, it might say *UNDER 21 ALCOHOL RESTRICTED* on it as a reminder of the law. But, even if the words are not printed on your license, the law's the same and the penalties are stiff!

**For a first offense you could:
Have your license suspended
for up to one year
Be fined up to \$500**

Ask yourself...

IS ONE DRINK WORTH THE PRICE?

Eastern Shore Press Release



FOR IMMEDIATE RELEASE

Salisbury, February 1, 1990

Area law enforcement and other officials today announced the start of a new program to reduce drinking and driving among young persons. Salisbury Police Chief Colbourn Dykes, Wicomico County Sheriff Hunter Nelms, Chief Hal Saylor of the Delmar Police, Chief Dale Littleton of the Fruitland Police and State Police representatives described the program as focusing on Maryland's alcohol license restriction which prohibits persons under the age of 21 from driving with even small amounts of alcohol in their system. Under Maryland law, persons under 21 are restricted from driving with an alcohol concentration of .02 percent or more. For most people, one beer will get them to that level. "The restriction makes good sense. It is illegal for people under 21 to drink alcohol, and it follows that they should not have the right to drive after drinking", law enforcement officials indicated. Young drivers caught violating the alcohol restriction will have their licenses suspended for up to one year. Fines of up to \$500 are also possible.

In addition to enforcement, the program will consist of a widespread information campaign designed to inform young drivers of the alcohol license restriction. Radio and TV spots, along with brochures and posters are being distributed throughout the lower eastern shore starting today. "Young drivers have to know about the alcohol license restriction and that if they are caught violating it, they are going to lose their license. We think it is much better if young people don't drink and drive than for us to have to make arrests or handle the traffic accidents that result", police said.

Beginning in Wicomico County, the program will also extend to Dorchester, Somerset and Worcester Counties. The goal of the information program regarding the license restriction is to reach all young drivers in the four counties. "Alcohol is a major cause of fatal and serious injury motor vehicle crashes among young drivers. The bottom line here is reducing deaths and injuries among our young people", police said.

The Alcohol and Drug Prevention Resource Center located at Salisbury State University is coordinating the information campaign. Jennifer Berkman the Center's Director, believes that everyone in the community should support the law and the program. "Our police can't do the job alone", she explained. "For example, I hope that parents also will become familiar with the significance of the alcohol license restriction". Berkman said she is searching for as many ways as possible to get the message to young drivers. "I hope that people with good ideas as well as locations for our brochures and posters will let us know", Berkman concluded.

Western Counties Press Release

News Release

Contact: Cindy Stacy or Debra Beck (301) 689-4161

FOR IMMEDIATE RELEASE

Cumberland, February 1, 1990

Area law enforcement and other officials today announced the start of a new program to reduce drinking and driving among young persons. The program was described by Cumberland Chief Robert Giles, Frostburg Chief Ed Bevan, Allegany County Sheriff Don Wade, Garrett County Sheriff Van Evans and Lieutenant John McGowan of Barracks W, Maryland State Police along with Tim Malloy, (Director, the Alcohol and Drug Awareness Resource Center) and Brian Shanley (Director, Public Safety), Frostburg State University.

The program focuses on Maryland's alcohol license restriction which prohibits persons under the age of 21 from driving with even small amounts of alcohol in their system. Specifically, Maryland law restricts persons under 21 from driving with an alcohol concentration of 0.02 percent or more. That's about one beer for most people. Harry Holiday, Manager of Motor Vehicle Administration Operations in Cumberland, answered questions about the license suspension process associated with the 0.02 restriction.

The law enforcement officials emphasized that the restriction would be enforced cooperatively by their respective departments and would reach throughout Allegany and Garrett Counties, paralleling enforcement efforts across the State. This means that young drivers caught violating the alcohol restriction in Maryland will have their licenses suspended and could also be fined up to \$500.

In addition to enforcement of the alcohol license restriction, the program will consist of a widespread information campaign designed to inform young drivers of the alcohol license restriction. Pamphlets and posters will

News Release

Contact: Cindy Stacy or Debra Beck (301) 689-4161

be distributed starting today to alert young drivers about the alcohol license restriction and that if they are caught violating it, they are going to lose their license.

In Western Maryland, the program will reach out to the high schools and colleges in Allegany and Garrett Counties. The goal of the information program is getting the word out to all young drivers in the two county region. "Alcohol is a major cause of fatal and serious injury motor vehicle crashes among young drivers. The bottom line here is reducing deaths and injuries among our young people", the police officers reported.

The Alcohol and Drug Awareness Resource Center located at Frostburg State University is coordinating the information campaign. "The posters, pamphlets and broadcast spots are all designed to get across the message that if you are under 21, you can lose your license if you drive after having as little as one drink", said Tim Malloy, the Center's Director. He also noted that driver licenses issued since last July have "Under 21 Alcohol Restricted" printed on them. "That's a nice reminder, but the alcohol restriction applies to everyone under 21 whether or not the words are on their licenses".

Appendix C

Data Used in Time Series Analyses

Maryland Accident-Involved Drivers - Statewide

Year of Accident = 1985

Driver Age = < 21

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	135	127	179	136	155	168	174	175	135	149	134	92	1759	# drivers
Not HBD	2260	1734	2249	1995	2587	2499	2451	2418	2052	2477	2608	2185	27515	# drivers
SUM	2395	1861	2428	2131	2742	2667	2625	2593	2187	2626	2742	2277	29274	# drivers

Maryland Accident-Involved Drivers - Statewide

Year of Accident = 1986

Driver Age = < 21

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	119	92	138	129	135	139	160	190	148	154	140	129	1673	# drivers
Not HBD	2124	2055	1995	2393	2438	2481	2253	2566	2017	2392	2382	2152	27248	# drivers
SUM	2243	2147	2133	2522	2573	2620	2413	2756	2165	2546	2522	2281	28921	# drivers

Maryland Accident-Involved Drivers - Statewide

Year of Accident = 1987

Driver Age = < 21

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	97	117	122	128	159	123	128	161	143	142	109	138	1567	# drivers
Not HBD	1514	1630	1906	2121	2440	2477	2213	2255	2299	2365	2338	2221	25779	# drivers
SUM	1611	1747	2028	2249	2599	2600	2341	2416	2442	2507	2447	2359	27346	# drivers

Maryland Accident-Involved Drivers - Statewide

Year of Accident = 1988

Driver Age = < 21

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	121	80	111	130	140	112	121	136	74	136	124	117	1402	# drivers
Not HBD	2005	1735	2028	2148	2425	2174	2226	2197	1698	2276	2184	2152	25248	# drivers
SUM	2126	1815	2139	2278	2565	2286	2347	2333	1772	2412	2308	2269	26650	# drivers

Maryland Accident-Involved Drivers - Statewide

Year of Accident = 1989

Driver Age = < 21

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	71	86	123	97	115	96	129	115	105	107	89	58	1191	# drivers
Not HBD	1464	1730	1948	2034	2362	2418	2109	2019	1929	2265	2008	1922	24208	# drivers
SUM	1535	1816	2071	2131	2477	2514	2238	2134	2034	2372	2097	1980	25399	# drivers

Maryland Accident-Involved Drivers - Statewide

Year of Accident = 1990

Driver Age = < 21

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	71	67	83	79	87	88	117	97	92	76	56	66	979	# drivers
Not HBD	1501	1492	1859	1804	2106	1989	1903	1917	1739	1914	1596	1807	21627	# drivers
SUM	1572	1559	1942	1883	2193	2077	2020	2014	1831	1990	1652	1873	22606	# drivers

Maryland Accident-Involved Drivers

Driver Age = < 21

Year of Accident = 1985

Experimental/Comparison = Experimental

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	91	81	121	121	251	331	191	171	141	91	141	91	1811	# drivers
Not HBD	1241	891	1201	1111	1601	2811	2021	2071	1091	1191	1211	1501	17931	# drivers
SUM	1331	971	1321	1231	1851	3141	2211	2241	1231	1281	1351	1591	19741	# drivers

Maryland Accident-Involved Drivers

Driver Age = 21+

Year of Accident = 1985

Experimental/Comparison = Experimental

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	541	371	671	511	651	701	771	691	631	651	601	581	7361	# drivers
Not HBD	5121	4281	4091	4161	5161	5441	6381	7061	4861	5401	4811	5651	62411	# drivers
SUM	5661	4651	4761	4671	5811	6141	7151	7751	5491	6051	5411	6231	69771	# drivers

Maryland Accident-Involved Drivers

Driver Age = < 21

Year of Accident = 1986

Experimental/Comparison = Experimental

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
NBD	81	81	81	191	161	201	221	281	61	121	171	131	1771	# drivers
Not HBD	1011	1051	1131	1471	1601	2821	1781	2461	1121	1441	1491	1481	18851	# drivers
SUM	1091	1131	1211	1661	1761	3021	2001	2741	1181	1561	1661	1611	20621	# drivers

Maryland Accident-Involved Drivers

Driver Age = 21+

Year of Accident = 1986

Experimental/Comparison = Experimental

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
NBD	531	341	491	481	691	631	811	941	761	641	721	501	7531	# drivers
Not HBD	4251	4721	4491	4771	5921	7131	6951	8271	4971	5871	5601	6101	69041	# drivers
SUM	4781	5061	4981	5251	6611	7761	7761	9211	5731	6511	6321	6601	76571	# drivers

Maryland Accident-Involved Drivers

Driver Age = < 21

Year of Accident = 1987

Experimental/Comparison = Experimental

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	141	101	121	151	271	191	241	271	151	111	91	101	1931	# drivers
Not HBD	1111	971	1151	1201	1991	2521	2221	1991	1401	1461	1431	1611	19051	# drivers
SUM	1251	1071	1271	1351	2261	2711	2461	2261	1551	1571	1521	1711	20981	# drivers

Maryland Accident-Involved Drivers

Driver Age = 21+

Year of Accident = 1987

Experimental/Comparison = Experimental

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	551	571	451	731	691	1021	621	761	531	751	601	711	7981	# drivers
Not HBD	5241	4691	4811	5241	5531	7011	7021	6981	5521	6201	6971	6251	71461	# drivers
SUM	5791	5261	5261	5971	6221	8031	7641	7741	6051	6951	7571	6961	79441	# drivers

Maryland Accident-Involved Drivers

Driver Age = < 21

Year of Accident = 1988

Experimental/Comparison = Experimental

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	71	111	181	131	211	181	171	201	91	191	111	151	1791	# drivers
Not HBD	1211	1061	1221	1191	1771	3031	2141	1951	1181	1531	1421	1421	19121	# drivers
SUM	1281	1171	1401	1321	1981	3211	2311	2151	1271	1721	1531	1571	20911	# drivers

Maryland Accident-Involved Drivers

Driver Age = 21+

Year of Accident = 1988

Experimental/Comparison = Experimental

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	501	571	521	801	671	611	761	681	401	521	511	751	7291	# drivers
Not HBD	5211	4211	4871	5051	6361	6911	6851	7971	4571	5611	6211	6901	70721	# drivers
SUM	5711	4781	5391	5851	7031	7521	7611	8651	4971	6131	6721	7651	78011	# drivers

Maryland Accident-Involved Drivers

Driver Age = < 21

Year of Accident = 1989

Experimental/Comparison = Experimental

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	81	101	201	81	121	191	141	151	111	81	131	61	1441	# drivers
Not HBD	931	1121	1181	1401	1921	3061	2031	2121	1231	1901	1681	1441	20011	# drivers
SUM	1011	1221	1381	1481	2041	3251	2171	2271	1341	1981	1811	1501	21451	# drivers

Maryland Accident-Involved Drivers

Driver Age = 21+

Year of Accident = 1989

Experimental/Comparison = Experimental

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	361	461	551	571	781	751	681	701	631	471	531	611	7091	# drivers
Not HBD	3881	5331	4901	4761	6871	7151	6901	7751	5711	7261	6671	6771	73951	# drivers
SUM	4241	5791	5451	5331	7651	7901	7581	8451	6341	7731	7201	7381	81041	# drivers

Maryland Accident-Involved Drivers

Driver Age = < 21

Year of Accident = 1990

Experimental/Comparison = Experimental

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	81	71	81	51	51	151	141	101	111	51	31	41	951	# drivers
Not HBD	841	1191	881	1161	1781	2911	1871	1771	1531	1201	1131	1071	17411	# drivers
SUM	921	1261	961	1211	1831	3061	2011	1871	1641	1331	1161	1111	18361	# drivers

Maryland Accident-Involved Drivers

Driver Age = 21+

Year of Accident = 1990

Experimental/Comparison = Experimental

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	341	391	591	501	741	711	671	781	431	441	471	461	6521	# drivers
Not HBD	5061	4111	4761	5041	5741	7071	7261	6091	5371	5391	5541	5321	66751	# drivers
SUM	5401	4501	5351	5541	6481	7781	7931	6871	5801	5831	6011	5781	73271	# drivers

Maryland Accident-Involved Drivers

Driver Age = < 21

Year of Accident = 1985

Experimental/Comparison = Comparison

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	61	81	101	51	51	121	121	111	91	91	51	71	991	# drivers
Not HBD	1011	781	1031	881	951	1041	1251	1061	1101	1341	1351	1041	12831	# drivers
SUM	1071	861	1131	931	1001	1161	1371	1171	1191	1431	1401	1111	13821	# drivers

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Maryland Accident-Involved Drivers

Driver Age = 21+

Year of Accident = 1985

Experimental/Comparison = Comparison

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	351	261	381	251	351	281	321	451	341	341	331	381	4031	# drivers
Not HBD	3281	2411	3631	2921	3891	2951	3521	3101	3171	3831	4301	3841	40841	# drivers
SUM	3631	2671	4011	3171	4241	3231	3841	3551	3511	4171	4631	4221	44871	# drivers

Maryland Accident-Involved Drivers

Driver Age = < 21

Year of Accident = 1986

Experimental/Comparison = Comparison

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	81	51	111	101	71	131	81	161	131	111	91	71	1181	# drivers
Not HBD	941	1131	921	1141	991	1091	1071	1551	1271	1461	1421	1381	14361	# drivers
SUM	1021	1181	1031	1241	1061	1221	1151	1711	1401	1571	1511	1451	15541	# drivers

Maryland Accident-Involved Drivers

Driver Age = 21+

Year of Accident = 1986

Experimental/Comparison = Comparison

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	391	231	441	381	381	331	321	521	431	471	411	561	4861	# drivers
Not HBD	3871	3751	2951	3361	3821	3761	3381	4741	3681	5021	5321	4861	48511	# drivers
SUM	4261	3981	3391	3741	4201	4091	3701	5261	4111	5491	5731	5421	53371	# drivers

Maryland Accident-Involved Drivers

Driver Age = < 21

Year of Accident = 1987

Experimental/Comparison = Comparison

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	61	121	51	71	141	81	51	61	71	101	81	81	961	# drivers
Not HBD	1081	1021	1101	1591	1361	1471	1191	1181	1251	1291	1471	1421	15421	# drivers
SUM	1141	1141	1151	1661	1501	1551	1241	1241	1321	1391	1551	1501	16381	# drivers

Maryland Accident-Involved Drivers

Driver Age = 21+

Year of Accident = 1987

Experimental/Comparison = Comparison

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	541	321	411	311	461	311	371	411	401	641	491	411	5071	# drivers
Not HBD	3891	3561	3601	4241	4351	4631	3441	3491	4241	5721	5191	4761	51111	# drivers
SUM	4431	3881	4011	4551	4811	4941	3811	3901	4641	6361	5681	5171	56181	# drivers

Maryland Accident-Involved Drivers

Driver Age = < 21

Year of Accident = 1988

Experimental/Comparison = Comparison

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	51	51	61	51	31	41	91	81	41	71	71	71	701	# drivers
Not HBD	1131	1211	1161	1071	1471	1291	1291	1091	801	1141	1361	1271	14281	# drivers
SUM	1181	1261	1221	1121	1501	1331	1381	1171	841	1211	1431	1341	14981	# drivers

Maryland Accident-Involved Drivers

Driver Age = 21+

Year of Accident = 1988

Experimental/Comparison = Comparison

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	331	411	461	601	461	321	381	361	361	501	381	371	4931	# drivers
Not HBD	4311	3401	4331	3851	5151	3861	4131	4011	2961	4221	4531	4921	49671	# drivers
SUM	4641	3811	4791	4451	5611	4181	4511	4371	3321	4721	4911	5291	54601	# drivers

Maryland Accident-Involved Drivers

Driver Age = < 21

Year of Accident = 1989

Experimental/Comparison = Comparison

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	21	61	71	101	71	51	121	141	71	61	51	31	841	# drivers
Not HBD	981	1061	1311	1071	1431	1401	1091	1161	1341	1581	1071	1211	14701	# drivers
SUM	1001	1121	1381	1171	1501	1451	1211	1301	1411	1641	1121	1241	15541	# drivers

Maryland Accident-Involved Drivers

Driver Age = 21+

Year of Accident = 1989

Experimental/Comparison = Comparison

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	411	181	421	291	411	431	261	391	391	421	521	401	4521	# drivers
Not HBD	3421	4111	4301	4111	4381	4241	3771	3471	4201	6031	4921	5331	52281	# drivers
SUM	3831	4291	4721	4401	4791	4671	4031	3861	4591	6451	5441	5731	56801	# drivers

Maryland Accident-Involved Drivers

Driver Age = < 21

Year of Accident = 1990

Experimental/Comperison = Comparison

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	51	31	31	61	61	51	71	81	51	81	41	21	621	# drivers
Not HBD	981	751	1291	1171	1181	1161	1071	1021	1171	1241	1011	1201	13241	# drivers
SUM	1031	781	1321	1231	1241	1211	1141	1101	1221	1321	1051	1221	13861	# drivers

Maryland Accident-Involved Drivers

Driver Age = 21+

Year of Accident = 1990

Experimental/Comparison = Comparison

Month of Accident BY Police Officer Judgment of Had Been Drinking (HBD)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	SUM	
HBD	411	441	361	331	411	321	451	551	401	261	361	371	4661	# drivers
Not HBD	4291	3841	4211	4201	4561	4121	3801	4531	3981	5081	4631	4791	52031	# drivers
SUM	4701	4281	4571	4531	4971	4441	4251	5081	4381	5341	4991	5161	56691	# drivers