

Law Enforcement

Issues in the Enforcement of Impaired Driving Laws in the United States

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In our best year, 1983, 1.9 million drivers were arrested for driving while impaired (DWI) in the United States. This number represented approximately 1 percent of the Nation's total licensed drivers. This was a significant increase over the 1970s, when only about one-half of 1 percent of licensed drivers were arrested for DWI each year. Still, it is not enough. Speaking a decade ago, Borkenstein (1975) noted that

Roadside surveys of the occurrence of alcohol in the driving public have shown that when enforcement is at the current level of 2 arrests per officer per year, and with automobile density what it is in the average congested city today, there are about 2,000 violations for each arrest. A "violation" is a trip from one point to another with a blood alcohol concentration of .10 percent or higher; thus, in a typical community of 1 million population, with 1,000 patrol officers making two arrests per man per year, there will be 2,000 arrests and 4 million violations.

Since Borkenstein made that statement, the percentage of licensed drivers arrested for DWI has doubled and, therefore, the ratio of violations to arrests may now be down to 1,000 to one. Indeed, two studies suggested that where intensive enforcement is applied, the violation-to-arrest ratio can be reduced to approximately 300 to one (Beitel et al. 1975; Hause et al. 1982). These higher arrest rates, which are not typical of the enforcement level of the country as a whole, have been shown to produce small reductions in alcohol-related accidents (Voas and Hause 1987).

DWI arrests nationally rose significantly from 1979 to 1983; the proportion of highway fatalities that were alcohol-related dropped 10 to 15 percent from 1982 to 1986. The extent to which this increase in arrests contributed to the subsequent decrease in alcohol-related fatalities is difficult to determine. The increase probably contributed as one element in a larger complex of factors that included citizen activist programs, new alcohol legislation, and increased public interest in health and safety (Howland 1988). Regardless, a doubling of the total number of arrests has had, at best, a modest effect on the alcohol-related casualty rate.

Luckily, deterrence of drunk driving is not determined by the absolute number of arrests but by the public's perception of the probability of being arrested (Ross 1984). While it may be generally true that the more arrests made, the more the public will be deterred, there is no precise relationship between the number of arrests and the extent of deterrence. In some cases, highly publicized programs result in a higher perceived

level of enforcement than is produced by simply raising the number of arrests without publicity.

An example of this phenomenon was reported by Williams and Lund (1984). These researchers conducted a telephone survey of drivers in Fairfax County, Virginia and Montgomery County, Maryland. Fairfax County consistently had the highest arrest rate per licensed driver, but Montgomery County police regularly used roadside sobriety checkpoints. Citizens of both Fairfax and Montgomery counties stated that they were more likely to be arrested in Montgomery County, apparently because of the higher visible use of checkpoints.

The extent to which an enforcement program succeeds in convincing potential drinking drivers that their probability of apprehension is high is important. Highly visible enforcement offers the possibility that programs can be implemented that, while not greatly increasing the total number of DWI arrests, will reduce alcohol-related crashes.

Development of the Traditional Behavioral Enforcement System in the United States

The drunk driving problem was first recognized in scientific literature in 1904, approximately 5 years after the first highway safety fatality in the United States. The United States and Norway were among the first industrialized nations to make impaired driving a criminal offense. In 1910, New York adopted an impaired driving law, and in 1911, the State of California followed suit. This early criminalization of drunk driving set it apart from other traffic infractions. For example, higher penalties were provided for the offense, including incarceration and substantial periods of license suspension. By 1924, the State of Connecticut was jailing 254 drivers per year for DWI. Thus, from the early years of this century, the United States has treated this offense as seriously as any nation in the world. The system of enforcement that emerged can be described by the four-step process outlined in figure 1.

The first step in this process is to identify vehicles in the traffic flow that are being driven by impaired operators. This is done based on either the vehicle being involved in a crash or the officer on patrol observing unusual, aberrant, or illegal behavior. Once stopped, the second step is performed. The driver is interviewed to determine whether he or she has been drinking and shows signs of intoxication. Common symptoms used for this purpose are bloodshot eyes, flushed appearance, slurred speech, odor of alcohol, and so forth. If this initial interview indicates that the individual may be impaired, the officer normally takes a third step, which is to invite the driver out of the vehicle to perform a set of sobriety tests (e.g., walking a straight line, touching the nose with eyes closed) which, along with the aberrant driving, become the basis of the officer's testimony to support the charge of "driving while impaired".

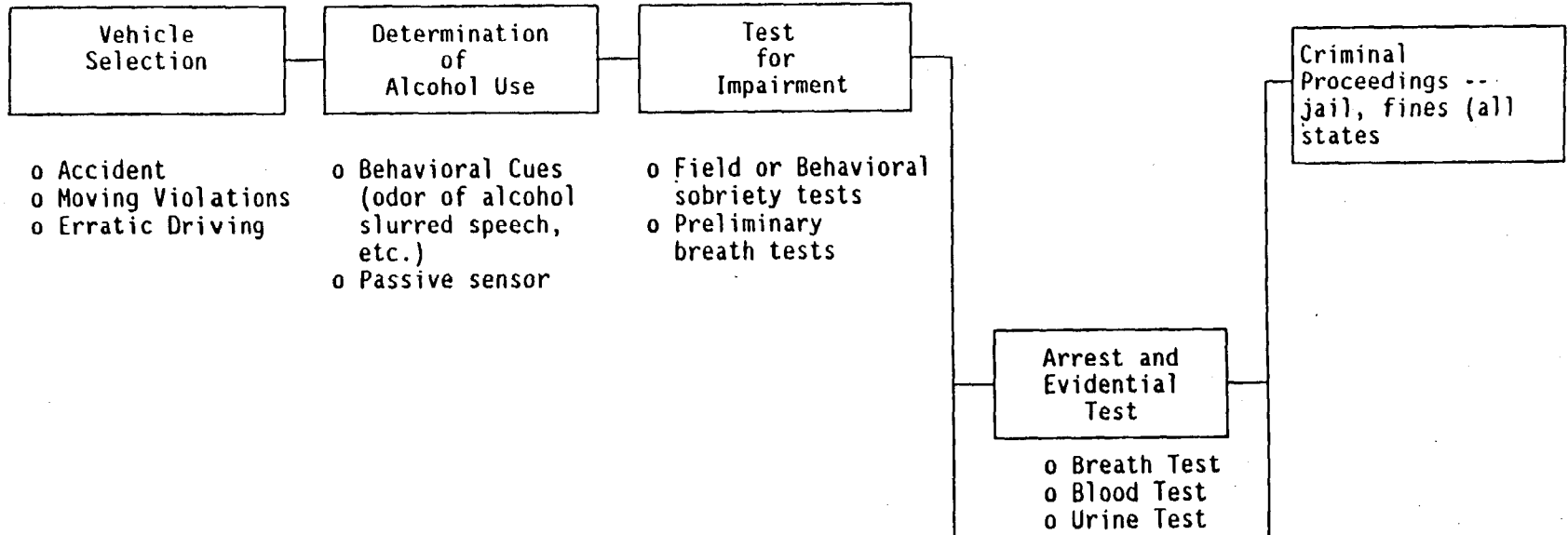
The term "drunk driving" presented considerable problems in adjudicating the DWI offense because of its lack of objective definition. The popular conception of a drunk individual involved highly aberrant behavior (e.g., staggering gait, incoherence). However, it soon became evident that individuals could be at increased risk of crash involvement without displaying such symptoms. Efforts were made to strengthen initial legislation by substituting such terms as "under the influence of alcohol" and, more recently, "impaired by alcohol." However, with no objective measure of driving skill available for testing individuals charged with drunk driving, much was left to the interpretation of the jury, which was prone to find that the behaviors described were similar to their own party behaviors and were not commonly accepted as being risky.

Just before the Second World War, a new factor was added to the enforcement

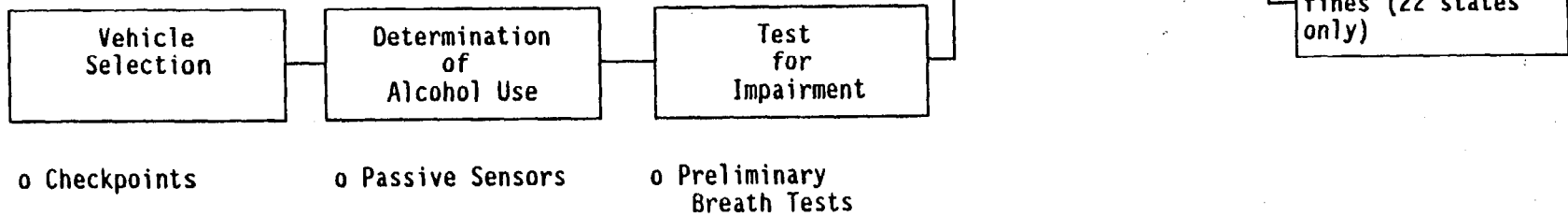
FIGURE 1

STAGES IN THE DWI ENFORCEMENT PROCESS

A. TRADITIONAL U.S. "BEHAVIORAL BASED" ENFORCEMENT



B. SCANDINAVIAN "CHEMISTRY BASED" ENFORCEMENT



process—the use of chemical tests for alcohol to determine impairment. Initially, these test results were added to the total evidence presented to support the testimony of the police officer. Once the courts began to accept this new scientific evidence, State legislatures moved to enact laws that specifically provided for chemical testing. In 1939, Indiana became the first State to provide for a chemical test; Maine, New York, and Oregon soon followed.

This legislation was significant in that it established the principal that chemical test data provided competent evidence of impairment. In addition, these laws established specific alcohol concentrations (AC) as presumptive evidence of intoxication. Establishing such a presumption required the defense to provide other competent evidence to rebut the chemical test data or lose its case. The initially prescribed levels followed the recommendations of the American Medical Association (AMA), which proposed that an individual with an AC of 0.15 or greater was presumed to be under the influence, while an AC between 0.05 and 0.15 was competent evidence of impairment when supported by other, verbal testimony. Finally, the AMA recommendation held that an AC below 0.05 was presumptive evidence that the individual was not under the influence.

Since the Second World War, most States have lowered this presumptive level to 0.10, and several States have lowered it to 0.08. Recently, the National Safety Council Committee on Alcohol and Drugs recommended that the presumption that an individual is not impaired when the AC is below 0.05 be stricken from DWI legislation, since recent evidence shows that the performance of a substantial number of individuals is impaired at ACs below 0.05 (Moskowitz and Robinson 1988).

Thus, with the passage of these laws, a fourth step was added to the enforcement system illustrated in figure 1. Once police officers obtain sufficient evidence from sobriety tests to convince them that individuals are impaired under the State's DWI law, they will charge the drivers with the offense, take the individuals into custody, and transport them to the police station for a chemical test.

Robert Borkenstein's development of an inexpensive breath test device, the *Breathalyzer*[™], provided a means for police departments to rapidly test individuals for their AC. The use of breath testing in the United States avoided many of the problems experienced in the foreign countries that continued to rely on blood tests that required a police surgeon to come to the station and draw blood. The Borkenstein *Breathalyzer*[™] and those breath test instruments that succeeded it have provided a reliable means of collecting highly accurate breath test data. States have established control systems for approving and calibrating these units and for training and supervising breath test operators in each police department.

The success of the chemical test in achieving convictions for impaired driving raised the issue of whether the State could require drivers to submit to this test. In a landmark decision, the Supreme Court decided in *Schmerber v California* that the police had the authority to take a blood sample forcibly, under limited circumstances. The Court held with respect to the Fifth Amendment that this did not constitute self-incrimination, since the evidence gathered was not testimonial but physical in character. Secondly, the Court determined that the forcible taking of a blood sample did not violate the Fourth Amendment prohibition against unreasonable searches and seizures since there was full probable cause to suspect the driver of driving under the influence (see Laurence 1988 for a discussion of constitutional issues related to DWI enforcement and adjudication.)

This decision opened the way for States to pass laws providing for the forcible taking of blood samples from arrested drivers. However, neither police departments nor legislatures wanted a system in which people would be held down and needles inserted in their arms as part of the arrest process. Therefore, a compromise was developed under which the State passed legislation providing that operating a vehicle on the State's highways implied consent for giving a sample for a chemical test in the event of a DWI arrest. If the driver, having been arrested, refused to provide a sample, then the Motor

Vehicle Administrator was empowered to suspend the driver's permit for a some stated period.

It required almost two decades for all States to adopt this implied consent procedure. To achieve adoption by the final hold-out States, it was necessary to increase the safeguards in the breath testing process. As the breath test became a more important element in the drunk driving litigation process and as implied consent statutes gave less opportunity for the driver to refuse testing, States added legislation to require that breath test devices be equipped with safeguards that would prevent the operator from making errors in the testing process. As a result, units were developed that automatically stepped through the process of calibrating and checking the instrument, collecting a breath sample, and providing printed output so that the possibility of error was minimized.

The four-step process provides a reasonably effective enforcement system. However, the seriousness of the drunk driving offense, with its potential for a jail sentence and a lengthy driving suspension, resulted in a number of pressures being applied to the lower courts that reduced their overall effectiveness with DWI offenses. Those charged with DWI hired lawyers to argue their cases, increasing the procedural paperwork for police officers. Each step of the enforcement process had to be documented to demonstrate probable cause for the stop and the DWI charge and to show that the breath test was conducted according to State regulations by qualified personnel. The bureaucratic procedures became very onerous for the police, frequently requiring 2 to 4 hours for each arrest and thereby discouraging DWI enforcement.

Because of the serious penalties, many offenders insisted upon full legal recourse, and court dockets frequently became overloaded. Significant backlogs were created, particularly when defendants demanded jury trials. The court and the prosecution were often motivated to seek plea bargains in which the individual charged with DWI pleaded to a lesser offense in return for having the drunk driving charge dropped. When the police saw this, some were discouraged from making DWI arrests.

The traditional behavioral enforcement system provides wide discretion to the individual officer in determining which vehicles to stop and, once the vehicle is stopped, whether to proceed with the investigation of the DWI offense. Thus, the officers' attitudes, detection skills, and motivation are extremely important to effective enforcement. In studies of police officers' attitudes toward DWI enforcement, most officers admitted to occasions when they did not pursue investigations where they were fairly sure the driver was impaired. One of the primary reasons given for failure to follow through was the length and bureaucratic nature of the paperwork involved. Arrests were less likely to be made toward the end of an officer's daily tour because completing the arrest would require staying overtime.

Officers were also likely to consider the significance of drunk driving compared with the fairness of penalties for this offense in making their arrest decision. Where they believed the penalties were inappropriately severe, they were more prone not to pursue arrests of marginally impaired drivers. Arrests were frequently avoided by allowing a passenger to take over the driving or, in the case of teenaged drivers, driving the individual home (Oates 1974).

With the founding of the Department of Transportation, the new Highway Safety Bureau (soon to be the National Highway Traffic Safety Administration) attempted to overcome some of these problems by establishing 35 demonstration programs called Alcohol Safety Action Projects (ASAPs). These projects were designed to provide an integrated approach to the drinking/driving problem (NHTSA 1979). Courts, prosecutors, and the police received additional funds and participated in a coordinated program to increase DWI arrests by simplifying police paperwork and by increasing the speed of prosecution and adjudication.

These projects generally succeeded in increasing (usually doubling) the number of

arrests for DWI (Levy et al. 1978). Within the enforcement activity, the arrest increases were primarily achieved through special DWI-emphasis patrols that operated on weekend evenings. These patrols usually consisted of 2 to 10 vehicles, depending on the size of the community. They normally made as many arrests in a year, on the two or three weekend evenings when they were active, as the full police force had made annually prior to the ASAP programs. While the ASAP programs came to an end by 1975, this dedicated patrol procedure has continued to be a feature of most communities in which DWI enforcement is emphasized.

Aside from sponsoring the ASAP demonstrations, the Federal Government attempted to assist DWI law enforcement by developing more scientific and objective procedures for identifying drinking drivers. A program to determine which vehicle maneuvers were most likely to indicate an intoxicated driver was funded by NHTSA and resulted in a set of driving "symptoms" graded by the probability that the driver would be at 0.10 AC or greater (Harris et al. 1979). A second research effort was directed at developing a standardized set of field sobriety tests for use by police officers. The sobriety tests commonly in use, up until the last decade, were highly influenced by individual officers' preferences. NHTSA sponsored a review of the literature and the development of a standardized set of three tests: lateral gaze nystagmus, body sway, and divided attention. The availability of these tests, particularly the gaze nystagmus test, has increased the capability of police officers to estimate the probable alcohol content of the suspected driver (Tharp et al. 1981).

By the latter part of the 1970s, the traditional behavioral system for detecting and apprehending drinking drivers had been significantly improved. This was evidenced by the fact that close to 1 million drivers were being arrested each year for this offense. It is probable that even more arrests would have been made had it been possible for the courts to handle the increase in case load.

The Chemistry-Based Enforcement System

The behavioral system of enforcement just described, which developed in the United States, was fairly typical of most industrialized nations. The U.S. system had some advantage in that it was based on breath rather than blood alcohol measurement. This simplified the enforcement process by not requiring the presence of a physician to collect blood. While this system was developing and maturing in the United States, the Scandinavian countries developed a significantly different approach to the enforcement of DWI laws.

In 1936, Norway passed legislation that provided that being in charge of a vehicle and having a blood alcohol concentration in excess of 0.50 was an offense. This was the first of the so-called "illegal per se" laws. Similar laws were later adopted by the other Scandinavian countries. The significance of the illegal per se approach is that it circumvents the issue of behavioral interpretation, since the offense has only two relevant criteria—being in charge of a vehicle and having an AC over a given limit.

Once these laws were in place, the police departments in the Scandinavian countries began to use field breath test devices. These consisted of tubes through which the suspect blew. Any alcohol in the breath would cause a chemical reaction in the dichromate crystals in the tube and produce a color change, from yellow to green. The length of the stain provided a rough measure of alcohol concentration. These legal and chemical test changes, when combined with the traditionally severe sanctions provided in Scandinavian laws, became known as the "Scandinavian model" (Ross 1975; Andenaes 1988).

The British Government implemented elements of this system in the Road Safety Act of 1967. Because of the wide publicity elicited in the British press while this new

legislation was being debated, the law produced one of the most dramatic examples of changed drinking driving behavior resulting from DWI legislation (Ross 1973, 1988). The success of the British Road Safety Act stimulated other nations, such as Canada, the United States, and Australia, to attempt similar programs. The implementation of the system in Canada had a much smaller effect because of limitations on the authority of police officers to require field tests. In Britain, roadside breath tests could be required of anyone in an accident or guilty of a driving infraction. In Canada, the officers could test only when there was cause to believe the individual was impaired.

In the United States, the success of the British Road Safety Act increased interest in roadside breath testing of drivers. Implementation of roadside testing was held back because of a challenge to the accuracy of the tube-type testers (Prouty and O'Neill 1971) and the question of whether roadside breath tests could be administered without reason to believe that a DWI offense had been committed.

The first problem was overcome through the development of miniature, electronic test devices using fuel cell or semi-conductor sensors. By the mid-1970s a small fuel cell test device the "Alco-Sensor"™ became available and was sold to police departments throughout the country. This device permitted roadside breath tests with substantially the same accuracy as could be obtained with the evidential breath test devices in the police station. It also appeared to increase the number of arrests. In Minnesota, in early 1980, the State purchased a large number of roadside breath testers and distributed them to State and local police departments. A time-series analysis performed by Cleary and Rodgers (1986) suggested that this distribution produced a permanent increase in arrests by Minnesota police agencies.

The second issue, regarding the authority of the officer to require a preliminary breath test in the absence of probable cause, has not been resolved by the Federal courts. Most police departments use field breath test devices only after the field investigation has been completed and the officer has decided that the driver is impaired and is about to charge him with the DWI offense. The field test device is then used to verify the officer's decision and to avoid transporting an individual who later turns out to be below the legal limit to the police station for the evidential test.

Rarely, if at all, are these devices used during the second step of the investigation where the officer attempts to determine if the individual has been drinking heavily. Because these devices are not used earlier in the arrest process, many impaired drivers avoid detection because they fail to give the signs typically observed by police. Field studies (Taubenslag and Taubenslag 1954; Vingilis et al. 1982; Jones and Lund 1985) have demonstrated that police officers miss at least half the impaired drivers with whom they come in contact. This is not surprising, since studies of the ability of physicians to identify drivers with ACs over 0.10 indicate that even they fail to detect half the individuals who would be legally impaired for driving (National Safety Council 1976, page 11).

Of all the nations that adapted modifications of this Scandinavian system, the state of New South Wales, Australia has recently made the most rigorous application of what Voas (1982) has labeled the "chemistry-based" enforcement program. In New South Wales and in Tasmania, laws were passed authorizing random breath testing of all drivers using the roads, and the police were provided with funds to establish a policy of vigorous use of sobriety checkpoints.

During 1982, the first year of the New South Wales "Staysafe Program," Homel (1986) reported that nearly 1 million breath tests were made on a driving population of 3 million, or nearly one in three licensed drivers, and monthly fatalities decreased by an average of 23 percent compared with the previous 6 years. Other data (Ross 1988) suggested that this change has been relatively permanent. As Ross noted, the evidence clearly supports the deterrence theory, since surveys of the driving public indicate that they are well aware of the law and the police enforcement practices. Moreover, it appears that a fair amount

of this information is reaching drivers through their own experience of being tested or through friends who have been tested at checkpoints.

The chemistry-based enforcement system implemented in New South Wales, Australia is in sharp contrast to the more behavioral approach used in America. Rather than selecting vehicles from the traffic flow based on aberrant or illegal behavior, the chemistry-based system makes extensive use of roadside checkpoints. A breath test is then conducted on every driver stopped. This makes it unlikely that drinking drivers can drive in a manner that will avoid observation and testing by the police. Once the field test for alcohol indicates that the driver has an illegal alcohol concentration, the individual is charged and taken to the police station for an evidential test.

While checkpoints have been used as an occasional feature of the enforcement programs in a number of communities throughout the United States, no jurisdiction has adopted this method as a principal feature of its enforcement activities. More widespread use of checkpoints has been constrained by questions regarding the constitutionality of the procedure and the manpower required to conduct checkpoints.

A series of Federal court decisions (Ifft 1983) have established a "balancing" procedure that permits the police to conduct checkpoints under certain highly controlled procedures where the State can demonstrate that this technique is required to protect citizens against the hazards posed by the drunk driver. The procedures required by the court are somewhat limiting. Survey sites must be preselected on the basis of drunk driving incidents and surveyed for safety. A plan must be developed in advance and approved by the highest authority in the police department. Checkpoints must be manned by a number of police officers, with their vehicles, to provide a significant "show of force" to reassure drivers that they are not being singled out for investigation. The procedure for selecting vehicles from the traffic flow must prevent individual officer discretion in order to avoid arbitrary or biased selection procedures.

Because of these rather elaborate requirements, checkpoints in the United States have been relatively expensive operations. Considerable controversy has arisen as to whether they are cost effective. In part, this controversy depends on the objectives of checkpoints. Some police departments hold that deterrence is accomplished by simply stopping and interviewing a large number of motorists, regardless of the number of arrests made. Other departments stress making DWI arrests in checkpoint operations.

Those departments that emphasize driver contacts and the creation of deterrence as the principal role of checkpoints generally employ very brief interviews (10-15 seconds) and only rarely use prearrest breath-testing devices. Such brief interviews make it unlikely that the officer can detect any but the most highly impaired drivers. Other departments conduct somewhat longer interviews (resulting in fewer drivers contacted), but make greater use of prearrest test devices, with a resulting higher arrest rate. Voas, Rhodenizer, and Lynn (1985) demonstrated that a checkpoint can produce more DWI arrests per hour than traditional patrol procedures.

The use of prearrest breath-test devices at checkpoints has been limited by the continuing issue as to whether a test can be required without probable cause, or at least "reason-to-believe" that the driver is impaired by alcohol. In an effort to overcome this limitation, passive sensors have been developed (Voas 1983; Jones 1986; Jones and Lund 1985). These handheld units pump mixed environmental and expired air from in front of the driver's face into the sensor and can be made sufficiently sensitive to reliably detect, those individuals who are over the legal limit (Jones and Lund 1985).

Legal analysis of these devices (Fields and Henricko 1986) suggested that they are not limited by the provisions of the Fourth Amendment prohibition against warrantless searches and could be used without establishing probable cause that an offense had been committed. This should make it possible for police to use such devices at sobriety checkpoints. When this is done, a drinking driver can be detected in 10-15 seconds (Voas

and Layfield 1983). Passive sensors are currently being tested by a number of police departments but the courts have not yet ruled on their constitutionality.

Current Status of DWI Enforcement in the United States

Beginning in 1980, a new element entered the DWI enforcement picture. This was the emergence of citizens' activist groups, such as Mothers Against Drunk Driving (MADD) and Remove Intoxicated Drivers (RID). These groups succeeded in calling public attention to the drunk driving problem and in motivating legislators to pass substantial DWI legislation. Most of the legislation dealt with increasing penalties and making them mandatory, or with prohibiting plea bargaining. The general effect of this type of legislation, with respect to enforcement, was to increase the efforts of defendants to avoid conviction, thereby putting increased stress on the quality of the evidence provided by the police officer in court. This increased pressure on the police investigation was counterbalanced somewhat by the adoption of illegal per se laws in 45 States. These laws made it an offense to be at an illegal AC while in control of a vehicle.

An illegal per se law reduces the requirement on the police officer to present evidence of impairment, though it does not eliminate it entirely. It is still necessary to show probable cause for administering the evidential breath test in the first place. In addition, despite the per se law, many courts continue to accept arguments regarding the behavior of the defendant.

A second significant element in the new wave of legislation was the passage of "administrative per se" laws that empowered motor vehicle departments to suspend the licenses of drivers not only for refusal to take a chemical test but also for failing a test. Many of these laws permit the police officer to seize the driving permit at the time of arrest and substitute a notice of hearing, which serves as a temporary license. The license is then forwarded to the motor vehicle administrator. The suspension takes place unless the hearing determines that the police officer did not have probable cause to require a chemical test or that the chemical test procedure was faulty.

Administrative per se laws provided an additional incentive for the police to make arrests by ensuring that arrests for drunk driving will result in an immediate consequence and that the efforts of the police will not be invalidated by plea bargaining or some other limitation in judicial procedures. At the same time, such laws add somewhat to the paperwork required at the time of arrest.

This wave of legislation also produced an increase in the number of States that specifically provided for the use of prearrest breath tests at the roadside by police officers. However, most police forces continue to use these devices as they had before, only at the end of the investigation.

Perhaps the most significant effect of this wave of legislation and the public attention given to drunk driving was the fact that it reminded police departments and individual police officers of the extent of public support for rigorous DWI enforcement. This public support also resulted in additional funds for many police departments for DWI enforcement and political support to pursue drunk driving arrests more rigorously.

Currently, the traditional behavioral system of enforcement (shown in the upper portion of figure 1) remains the primary method of apprehending drinking drivers in the United States. Considerable technology has been applied to this system since its initiation early in the century, particularly in the area of breath testing. However, the system remains basically dependent upon the experience and judgment of the officer in selecting the vehicles to be stopped and identifying drinking drivers, because breath test technol-

ogy is not applied until near the end of the investigative process. The chemistry-based system shown in the lower portion of figure 1 is not used in this country except for partial application in occasional checkpoints conducted in some jurisdictions.

Total arrests peaked in 1983 and have decreased slightly since then. The number of arrests seems unlikely to increase unless considerable additional funding becomes available to police departments to augment their traditional behavioral system or to pursue more extensive use of sobriety checkpoints.

Evaluation of Enforcement Efforts in the United States

While considerable effort has gone into the enforcement of drunk driving laws in the United States, and significant sums have been spent on equipment and overtime payments to special DWI patrols, relatively little rigorous scientific evaluation of these efforts has occurred (Jonah and Wilson 1983). Several factors mitigate against such evaluations. First, most enforcement efforts are implemented as part of a package of DWI legislative programs, making it difficult to separate the effect of the increased enforcement effort from other changes in the DWI control system.

Second, the public appears to accept relatively superficial evaluations and shows little appreciation of the need for rigorous scientific evaluation. Many enforcement programs are evaluated on the basis of a change in the number of DWI arrests. This is a completely inadequate basis for such evaluations, since the estimated arrest rate is 1 for every 1,000 offenses. Doubling such a rate can hardly have much impact in and of itself. Further, changes in the arrest rate are subject to differing interpretations. Increases in arrests are often cited as evidence that the increased enforcement is achieving its goal. Decreases in arrests are sometimes also cited as evidence that the enforcement process is achieving its goal, because (so the reasoning goes) fewer drunk drivers are on the road. Thus, this measure of enforcement effectiveness is completely circular and useless for the purposes of research, except as an intervening variable when an effort is made to determine the actual reduction in alcohol-related crashes.

The alcohol-related crash criterion is a difficult one to apply because AC data are principally available only for fatally injured drivers. Other AC data are available only for that small proportion of less severe crashes in which a DWI arrest is made, a clearly biased statistic. To obtain a more objective measure of enforcement impact, crash series, such as single vehicle crashes occurring late at night, are frequently used. Such crashes are more likely to involve a drinking driver than multivehicle crashes occurring during daylight hours. In many communities, relevant crash records are too poorly kept or the numbers of crashes are too few to provide a good basis for evaluating enforcement programs. A better, but much more costly, measure is to use voluntary roadside surveys in which the drivers are asked to voluntarily provide a breath sample for research purposes. These surveys provide a measure of the number of drivers who are impaired during those times when most drinking and driving occurs, an important measure of the impact of an enforcement program.

Two studies have shown changes in the average alcohol concentrations of drivers using the roadways as a result of enforcement programs. The first of these, Levy et al. (1978), evaluated the changes in roadside surveys at 19 of the 35 Alcohol Safety Action Projects. They found a statistically significant reduction in the number of drivers with illegal ACs in roadside surveys conducted after the projects were initiated, compared with results obtained before program implementation. These results, however, were undoubtedly influenced by elements of the ASAPs in addition to the increased enforcement of DWI laws.

A demonstration of impact more specifically traceable to increased enforcement was

reported by Voas and Hause (1987) in a study of a special enforcement program in the city of Stockton, California. Over a 3-year period, they reported a drop of as much as one-third in the number of drivers above the 0.10 legal limit. This drop in impaired drivers was accompanied by a significant reduction in nighttime crashes, compared to four other similar cities in the central valley of California. The reduced level of alcohol-related crashes was maintained during the 3 years of enforcement activity, but tended to disappear when the special enforcement project came to an end. Several other scientific evaluations of enforcement programs that have found positive results are available in the literature (e.g., Klein 1982; Lacey et al. 1986).

Overall, the studies of traditional enforcement programs in the United States have tended to be similar to those covered in Ross' (1984) international review of DWI programs. Short-term reductions in drinking driving crashes were obtained in some cases, particularly where enforcement was accompanied by considerable publicity. However, the changes tended to be transitory, maybe because the police failed to fully utilize the powers provided to them by the law (as in the case of the British Road Safety Act) or because, after an initial intensification, enforcement efforts returned to previous levels (as in Stockton). Finally, as Borkenstein (1975) hypothesized, it may be necessary to keep changing enforcement procedures to make them "new" and newsworthy and to attract the attention of the public.

Few chemistry-based checkpoint systems in the United States have been scientifically evaluated. Voas, Rhodenizer, and Lynn (1985) reported on a year-long enforcement program in which checkpoints were implemented every weekend within the city of Charlottesville, Virginia. Their evaluation indicated that the police apprehended for DWI approximately 1 percent of the drivers stopped at the checkpoint. In addition, another 1 percent of the drivers were arrested for driving without a license. Random digit dialing telephone surveys indicated that approximately one-fourth of the nighttime drivers in Charlottesville came into direct contact with a checkpoint and that more than 90 percent of all drivers were aware of the checkpoint program. Comparison of the nighttime and alcohol-related crash rates in Charlottesville with those of a similar community that did not employ checkpoints revealed that this procedure reduced such crashes by approximately 15 percent. A similar reduction was apparent when crash rates for Charlottesville were compared with those for the State of Virginia as a whole.

Additional evidence for the impact of checkpoint procedures was obtained by Williams and Lund (1984), who conducted a random digit dialing survey and compared the attitudes and knowledge of the driving public in those communities that used checkpoints with communities that did not use checkpoints. Where checkpoints were used, drivers reported higher levels of deterrence to drinking and driving than citizens of counties where they were not used. These studies provide some evidence for the effectiveness of the chemistry-based enforcement system. A full evaluation of the chemistry-based enforcement system awaits an adequate application of this technique in the United States.

Eight Issues for Future Enforcement Programs

This summary of the status of DWI enforcement in the United States suggests that it is having a significant general (but unmeasured) impact on deterrence to drunk driving. However, little additional effectiveness can be expected unless new resources are committed to, or new technology and procedures are employed in, the enforcement effort. Among the issues that are currently being debated and the proposals for new enforcement methodology being considered, the following 10 items should provide the subject matter for recommendations to be made in the Surgeon General's Report.

Issue 1: Increasing the use of sobriety checkpoints

As noted, the Federal courts have provided for the use of sobriety checkpoints under certain constraints (Ifft 1983); however, the legality of this procedure under the Federal constitution does not necessarily mean that it meets the requirements of each of the 50 State constitutions. As of this date, the Supreme Courts of 18 of the 50 States have made favorable decisions regarding checkpoints, while the Supreme Courts of 9 other States have made unfavorable decisions. These unfavorable decisions, however, frequently resulted from the consideration of checkpoint programs that did not meet Federal guidelines. Where there is full compliance with the Federal guidelines, it is probable that most States will find that checkpoint procedures meet the appropriate constitutional tests.

Perhaps more significant than constitutional issues is the acceptability to the public of checkpoint programs. Police administrators tend to be highly sensitive to public opinion. While police departments are often interested in new and novel procedures, police organizations tend to be basically conservative. Most public surveys show significant support for use of the checkpoint procedure. Voas, Rhodenizer, and Lynn (1985) found that the public in Charlottesville, where checkpoints were regularly conducted, were more in favor of checkpoints than the public in the comparison community which had not experienced a checkpoint program. Most available evidence suggests that police departments will be supported by the public if they implement checkpoint programs. Nevertheless, the concern with public relations remains a major drawback to checkpoint programs in the minds of many police administrators.

A third problem in mounting checkpoint operations is the issue of cost effectiveness. The Federal court specifications for checkpoint operations require the assembly of a number of police vehicles and the use of a minimum of four to six officers. (In contrast, a checkpoint can be conducted in New South Wales, Australia by a single officer). This requirement for a relatively large force presents personnel and cost problems for many localities. Some jurisdictions have addressed this problem by combining resources from State, county, and local police. Others have used overtime or diverted officers from other duties.

Depending on the procedures used and the policies implemented, a checkpoint may result in relatively few arrests or, alternatively, in more arrests per man hour than would be achieved in an equal amount of traditional enforcement activity. In any case, the impact of a checkpoint should not be assessed on the basis of the number of arrests produced. As demonstrated by Williams and Lund (1984), the impact of sobriety checkpoints on the general driving population is more important in creating deterrence than the number of arrests made by traditional enforcement procedures.

States and communities could be encouraged to promote checkpoint operations. This could be done both by influencing police policy and by providing additional funds for checkpoint equipment and operations. At issue is whether this procedure, which is a basic part of the chemistry-based enforcement system, would be cost effective in increasing deterrence to drunk driving. Evidence from Scandinavia and Australia suggests that it may be the most cost-effective procedure.

Issue 2: Using portable breath tests earlier in the DWI enforcement process

Portable breath test devices, about the size of a cigarette package, have been available to the police for over a decade. Twenty-six of the 50 States have passed legislation specifically authorizing their use. However, they are rarely used early in the investigative procedure. This occurs partly because of the general assumption made by police departments that the preliminary breath tester (PBT) cannot be used prior to obtaining

reason to believe that the individual has been driving while impaired. Thus, the devices are used only after the officer has completed his investigation. They are used only to verify the officer's decision, with the result that many over-the-limit drivers who did not appear to be intoxicated escape detection.

The prearrest breath test is clearly a search in the constitutional sense because the suspect is required to blow through a mouthpiece and provide an active breath sample. The Federal courts, however, have been willing to accept a compromise or a balancing test when the need of the State to protect its citizens is sufficiently great and the intrusion provided by the search is sufficiently small to make the search reasonable. Some constitutional experts believe that the act of blowing into a mouthpiece is such a small intrusion that it would meet this test. They predict that the Federal courts would find it acceptable to administer a breath test to motorists in accidents or to motorists guilty of driving offenses without requiring specific evidence that they are impaired by alcohol.

Should the courts find that the PBT does not meet constitutional standards without probable cause to suspect a DWI offense, then the passive sensing technology is available for use early in the arrest process. These devices, while somewhat less accurate than the PBT, would almost certainly pass constitutional tests since most experts agree that the passive sensor does not involve a search within the meaning of the Fourth Amendment (Fields and Henrico 1986). The use of such sensors on all individuals stopped at sobriety checkpoints or all individuals stopped for speeding or other traffic infractions would result in a significant increase in DWI arrests, since current evidence indicates that police engaged in these enforcement activities fail to detect half or more of the intoxicated drivers with whom they come in contact.

States and localities could encourage the use of PBTs and passive sensors through their influence on police policies and by providing funding for the purchase of this type of equipment. The important issue, however, is not providing additional equipment, but more significantly, encouraging police officers to use this technology at the beginning, rather than at the end, of their DWI investigation procedure.

Issue 3: Expanding DWI enforcement through new legislation

Borkenstein (1975) noted that a typical community with a population of 1 million will have 1,000 patrol officers. This same hypothetical city, would have approximately 325,000 hazardous moving violations per year. He proposed that, to increase deterrence to impaired driving, every driver stopped for such a hazardous moving offense should be tested for alcohol. If such a driver were found to have an AC over a minimum level (e.g., 0.05), he would be given a special aggravated-by-alcohol traffic citation. The offense of speeding might carry a fine of \$20.00 or \$30.00, but the offense of speeding while aggravated-by-alcohol would carry a higher fine (e.g., \$50.00) and would also result in a notation on the driving record that an alcohol-related offense had occurred. Drivers with ACs over the per se limit could also be charged with the DWI offense.

The principal issue that arises in this procedure is the Fourth Amendment limitation on conducting searches without probable cause. The proposal to test all individuals guilty of serious driving infractions is similar to the British Road Safety Act of 1967. Enforcement would require court acceptance of a driving infraction as meeting the requirements for permitting a "search" such as the use of a prearrest breath test device. If the courts determined that such a search was not permitted without specific evidence that the individual was impaired, passive sensors could be used to obtain evidence of drinking, followed by the use of a PBT. This procedure would likely result in a significant increase in the number of drivers arrested for DWI and an increase in the number of drivers receiving an alcohol-related offense citation on their driving records.

Another type of program directed at increasing the number of drinking drivers apprehended is the "Roadside License Suspension" program used in several Canadian

provinces. This legislation has two forms. In the first, as practiced in New Brunswick, Ontario, Manitoba, and Saskatchewan, the driver can be required to take a roadside breath test if the officer has reason to believe the driver is impaired. If the result is over 0.05, the officer can suspend the individual's driving permit for periods varying from 6 to 24 hours.

Another approach, used in Alberta, British Columbia, and the Yukon Territories, places the testing decision on the driver. Relevant to this approach, the British Columbia Motor Vehicle Act (Section 214) states that (a) if a police officer believes a driver's ability is affected by alcohol (or other drug), he may request the driver to surrender his license; and (b) the period of suspension is 24 hours unless the driver voluntarily submits to a test that determines an AC not exceeding 50 mg percent.

Thus, the suspected offender has the choice of submitting to the test to demonstrate that he is not over the 0.05 limit or of surrendering his driving license to the police officer, finding other means to get home, and returning to the police station the next morning to retrieve his driving license.

One potential problem with such lesser offenses is that they can be used inappropriately to avoid the paperwork and hassle involved in the prosecution of more serious drunk driving offenses. If the offense of a traffic violation aggravated-by-alcohol were created with lower penalty levels, it might well be used as an opportunity for plea bargaining with individuals apprehended with illegal ACs being allowed to plea down to this lesser offense. Police officers might also use the short-term suspensions to avoid the paperwork involved in bringing more serious charges in the first place. The basic issue is whether the enactment of such a law would increase the deterrence of drunk driving.

Issue 4: Expanding officer participation in alcohol enforcement

As noted earlier, the ASAP program popularized the use of special, dedicated DWI enforcement teams. This system was intended to stimulate the apprehension of impaired drivers by all members of the traffic patrol by offering the opportunity to earn overtime pay on the special patrols. Sometimes this opportunity was extended only to those officers who achieved a high arrest rate on their normal duty hours. To a certain extent, this general concept worked as intended. However, in the long run, it tended to establish a policy of allowing a few highly motivated officers to specialize in DWI, while permitting the large majority of traffic officers to make few, if any, DWI arrests. The fact that a two- or three-man special enforcement team active on Friday and Saturday nights could make as many arrests as the rest of the traffic department was more an indication of the lack of attention to drunk driving by the average officer on patrol than an indication of the level of skill of the special patrol members.

It will be difficult to greatly increase arrest rates as long as the pursuit of the drunk driver is seen as a specialist activity for a few officers. Expanding the role of the rest of the traffic department in DWI enforcement activities would not only increase the number of arrests but would also broaden the impact on the driver, since individuals would be investigated for impairment, not only on Friday and Saturday nights, but throughout the week.

States and localities should be able to increase the number of arrests by the regular traffic patrols through training and by providing the officers with prearrest breath testers or passive sensors. With a passive sensor backed up by an active preliminary breath tester to use in the field, the traffic officer need not be an expert in conducting sobriety tests or in detecting evidence of impairment from the appearance of the driver. Using these devices, he can identify individuals who are over the limit and bring them in for evidential tests.

With police management emphasizing the importance of drunk driving enforcement,

all officers who are trained and equipped with passive sensors and PBTs should be able to contribute substantially to the drinking driving enforcement effort within a community. The principal issue here is whether the State and locality should fund police departments to train officers, purchase passive sensors and PBTs, and encourage police administrators to make DWI enforcement a high-priority activity for all officers engaged in traffic patrol activities.

Issue 5: Lowering AC limits for private vehicles

Of the 50 States, 41 currently have per se limits at 0.10, while 2 others have 0.08 limits. The National Safety Council Committee on Alcohol and Drugs has taken the position that *all* individuals at 0.08 AC are impaired. The American Medical Association has gone even further, recommending that the National limit be 0.05 AC. Considerable controversy exists regarding the desirability of lowering the AC limit from 0.10, which is the current standard in the United States. The first issue is whether, in fact, ACs below this level increase the probability of accident involvement. The second issue is whether lowering the illegal AC level reduces the number of high AC drivers on the road or the number of alcohol-related accidents. The third issue is whether lower AC levels can be enforced, and, if so, what such enforcement costs.

With regard to the first issue, laboratory and epidemiological studies have indicated that increases in impairment and crash risk begin at low AC levels (Moskowitz and Robinson 1988). Hurst (1973) found that no matter how experienced with alcohol, any individual is at higher risk for involvement in a crash at any AC level over zero. This provides a basis for arguing that the AC limit should be zero, since any level above that will increase the probability of crash involvement. On the other hand, an attempt to eliminate all driving with any positive AC is beyond the resources and capability of the criminal justice system, as shown by the Nation's experience with prohibition.

With respect to the second issue, no adequate scientific studies demonstrate the effectiveness of lower AC levels per se. Data from Scandinavia (where the AC limit is 0.05) indicate that the number of high AC drivers on the roadways is clearly lower than in the United States, Canada, and the Netherlands, where the AC limits are 0.10, 0.08, and 0.08, respectively (Snortum 1984). However, many other differences between these nations could contribute to these differences, and it is not possible to determine the relative role of the AC limit compared to the differences in enforcement policy and procedure, the penalties for the offense, and the general cultural attitudes toward alcohol use and drinking and driving.

Overall, no reliable research evidence clearly demonstrates that lowering the AC alone produces a reduction in alcohol-related accidents. Rarely in real life is a single countermeasure feature implemented so that it can be evaluated on its own without the interacting effect of other changes in the law or in enforcement. A change in the AC level would probably also be accompanied by a change in enforcement, since enforcing lower AC limits may well require different enforcement techniques.

Relative to the issue of enforcing a lower AC limit, some police forces are currently experiencing considerable success in apprehending drivers at lower ACs with traditional patrols. In North Carolina, approximately 10 to 15 percent of all drivers arrested are below 0.10. A significant number of arrests below the 0.10 level are also made by other police departments, such as in the District of Columbia. A serendipitous impact of lowering the AC limit is to increase the probability of conviction for those at 0.10 and higher, since many prosecutors provide for a buffer zone at the legal limit, whatever it may be. In many cities, for example, the prosecutors operating under the current 0.10 law only move those cases where the measured AC is 0.12 or 0.13 and above, because of the difficulty in obtaining convictions where the AC is near the legal limit. Moving the

legal AC limit to 0.08 could lower this buffer zone and increase convictions for those with 0.10 ACs.

If the legal limit is reduced to 0.05 or 0.08, greater reliance will probably have to be placed on the chemistry-based system shown in the lower portion of figure 1. The use of checkpoints and passive sensors will likely be increased, since the individuals who are at these levels are less likely to present the signs of impairment on which the police normally rely.

Whatever final decision is made regarding lowering the AC limit, it is important to repeal the section of many State laws that provides that an AC below 0.05 is presumptive evidence that the individual is *not* intoxicated. More recent studies of the effect of alcohol on performance (Moskowitz and Robinson 1988) clearly demonstrated that some individuals are impaired below that level. Further, a number of individuals with low ACs may also have consumed drugs so that the combination of alcohol and drugs produce an impairing effect. This provision could make an AC below 0.05 an obstacle to prosecution of these cases. Further, a number of States have established zero AC limits in which any measurable AC (generally 0.01 to 0.02) is an offense for teenage drivers who are not permitted, under law, to drink. The presumption that an individual below 0.05 is not impaired is in clear conflict with this type of legislation.

Issue 6: Suspending driver's licenses

Historically, the suspension of the driving privilege has been the most salient penalty for a conviction of driving-while-impaired. The laws of the States varied in their procedures for administering the license suspension penalty. In some cases, this became a province of the court with the court seizing the license and, perhaps, substituting a limited driving permit. Usually, the court would forward an order to the Motor Vehicle Administrator to suspend the license. Because the driving public feared the loss of license and saw that as a significant penalty, it became the basis for considerable plea bargaining, to such an extent that in the early 1970s, license suspension occurred only irregularly, and many defendants got off with only fines.

Studies conducted principally in the States of California, Washington, and North Carolina (Popkin et al. 1983; Salzberg and Klingberg 1983; Sadler and Perrine 1984; Peck et al. 1985) demonstrated that while as many as one-half to two-thirds of those who receive suspensions continue to drive, suspended drivers were involved in fewer total accidents and fewer non-alcohol related accidents than individuals who retained their licenses in return for attending education or treatment programs.

Partly as a result of this evidence and partly as a result of the public concern and attention to the DWI problem stimulated by citizen activist groups such as MADD and RID, administrative suspension laws, which bypassed the courts, were enacted during the late 1970s and early 1980s. The lead was taken by the State of Minnesota, which enacted so-called administrative per se legislation in 1976. This legislation operated in conjunction with the implied consent law, so that the driver was not only to lose his license if he refused a chemical test, but also if he failed such a test. This administrative withdrawal procedure was adjudicated to be constitutional, provided the offender had the opportunity to have a hearing to determine that there was probable cause for his arrest and that the chemical test had been properly conducted (Reeder 1981).

An important feature of a number of these laws was that the police officer was allowed to pick up the license on the spot, upon either refusal or failure of the test, and replace the license with a hearing notice. The license was then returned to the Motor Vehicle Administrator by the police officer. In this way, an initial penalty for drunk driving was administered on the spot, a feature that could enhance the deterrence to DWI by reducing the time between offense and punishment and that has been shown to increase the motivation of police officers in some States.

Zador et al. (1988) conducted a study of the impact of per se legislation and the administrative per se laws and found evidence that the administrative per se law contributed to some of the national reduction in alcohol-related accidents that occurred between 1982 and 1986. The issue of the effectiveness of administrative license revocation as a penalty lies beyond the scope of this paper. However, this law is significant to the DWI enforcement effort in that it places an additional requirement on police officers but, also, provides them with a potentially motivating element in that they can be assured that the offender is receiving a significant penalty. Too often in the past, when the application of sanctions has been dependent upon litigation, plea bargaining, and other delaying tactics, the offender has received minor punishment or none at all. Currently, 23 States have administrative per se laws. The success of this procedure suggests that it would be desirable for the remaining States to enact similar legislation.

Issue 7: Enforcing driver's license suspensions

Suspension or revocation of the driver's license is considered to be the single most effective DWI sanction for reducing subsequent traffic offenses and accidents. However, this sanction comes under attack from practitioners and citizens groups alike because of compelling evidence that a majority of DWI offenders continue to drive to some degree during the period of their license revocation or suspension (Sadler and Perrine 1984).

Despite these indications that many offenders continue to drive while under suspension or revocation, there is evidence that those under suspension, as a group, have significantly lower rates of rearrest for DWI and of crash involvement (Popkin et al. 1983; Peck et al. 1985). However, those who do continue to drive (even if they are driving more safely than otherwise) are flaunting the sanction imposed on them and should be arrested and punished. The problem has been that driving with a suspended or revoked license has been a relatively invisible offense. In other words, it generally does not come to a police officer's attention unless some other violation of the law is detected. Even when it is detected and a citation for driving without a license is issued, the court frequently does not convict because of the inability of the prosecutor to demonstrate that the driver received legal notice of his or her suspension. This occurs because the notices frequently go through the mail, and there is no acceptable evidence that they were received.

The State of Virginia, among others, has attempted to use police in surveillance of the residences of suspended drivers in an effort to apprehend those who continue to drive. This procedure has yet to be adequately evaluated, but obviously involves fairly high costs in police manhours. Another traditional approach to dealing with this problem is to increase the penalties for driving while suspended by providing for vehicle impoundment or jail time for suspended drivers. The effectiveness of these more salient penalties procedures is unknown, but their deterrent effect is most probably highly dependent upon the effectiveness of the enforcement system in apprehending suspended drivers.

In urban areas with large numbers of automobiles, there is simply no way in which the police can, without some technological assistance, determine whether the individual operating a vehicle is properly licensed. One aid employed by the State of Minnesota and in certain other jurisdictions, such as New Philadelphia, Ohio, is to confiscate the vehicle tags of the drivers who are convicted of driving without a license or convicted of DWI and replace them with distinctive plates that call attention to the vehicle. This provides a means for identifying those vehicles that may be driven by a suspended driver. Several States are currently placing more emphasis on this approach.

A more technological approach to the identification of vehicles driven by suspended drivers is the use of the so-called TAGS system, which has been evaluated by the Insurance Institute for Highway Safety (Miller 1978). In that system, police officers are provided with a keyboard on which to enter vehicle tag numbers at random. These

numbers are transmitted to a central data file that checks to determine if the tag belongs to a vehicle that has been stolen, if the driver is wanted for other criminal offenses, or if the vehicle is owned and driven by a suspended driver. If a match occurs, a signal is sent to the patrol vehicle so that it can stop the car and interview the suspected driver. Using this TAGS system in Maryland, Miller found that 9.6 offenders were identified per officer hour compared to only .5 offenders per officer hour using traditional patrol methods.

The sobriety checkpoint also offers a method of enforcing the laws against driving while suspended. In the Charlottesville checkpoint program (Voas et al. 1985), 1 percent of the drivers stopped were given citations for driving without a proper license, equal to the number arrested for DWI. (For a full discussion of the technical problems in enforcing license suspension, see Voas 1988).

It is clear that if suspension of driver's licenses is to be the principal penalty for drunk driving, and if a large number of drivers are to be arrested each year, it will be important to enforce this restriction effectively. Approximately one-half of the drivers suspended do not reapply for licenses when they are eligible, apparently because of the high cost of automobile insurance to offenders. Therefore, between 500,000 and 1 million drivers come off the rolls of State driving license registers each year, but these dangerous individuals continue to drive. This places them outside the normal license control system. An efficient enforcement procedure that can deal with this problem needs to be developed.

Issue 8: Managing license penalties automatically

One function of sanctions is to incapacitate the offender and prevent a repetition of the offense by making it impossible to commit the same crime. Incarceration is the classic method for ensuring that an offender will not repeat his offense, at least during the prison term. In DWI adjudication, jail terms are generally far too short to have any significant effect through incapacitation. The offender is soon released and able to operate his automobile. Suspension of the driving license is intended to continue the incapacitation for a significant period, usually several months to a year or more. However, this type of incapacitation is only partially effective because it is difficult to enforce. A recently developed alternative to traditional enforcement methods, which will incapacitate the individual from repeating his offense, is the alcohol safety interlock. The concept for a device that would be mounted on the car and test the operator's performance or AC was first proposed in the Secretary of Transportation's report, *Alcohol and Highway Safety*, in 1968 (U.S. DOT, 1968). In 1970, Voas reviewed this concept, describing the opportunities and the problems posed by what he dubbed as "Alcohol Safety Interlock Systems" (Voas 1970)

The idea of an in-vehicle system that can determine the impairment of the driver and prevent vehicle operation is such a parsimonious and attractive approach to the solution of the DWI problem that this concept has long enjoyed considerable support among safety specialists and politicians. As a result, the Federal Government undertook a decade of research directed at developing an interlock system (Compton 1988). This research was primarily directed at using performance tests as a method for identifying the impaired driver. This is attractive because performance tests can detect drivers impaired by drugs as well as alcohol. However, the first commercially developed devices have all been based on the measurement of breath alcohol using simple semiconductor sensors.

Currently, at least 10 States have passed legislation authorizing the testing of these devices, and individual courts in a number of other States have established demonstration programs. To this date, however, there has not been a sufficient number of these devices in the field to provide an adequate scientific test of their effectiveness. Slightly over 200 units are currently authorized in two experimental counties in California in an

evaluation program that is being supervised by the Office of Highway Safety of the State of California. In another year or two, this program should provide scientific evaluation of these devices.

While these devices control only the driving in the vehicles in which they are placed and therefore do not control driving by offenders in other vehicles, they offer the potential for taking over much of the supervision problem. Since the systems are predicated upon the offender paying for their cost and the monitoring being done by commercial companies, these systems relieve the State of considerable expense. They will free the police to use their time in enforcing basic drinking driving and other hazardous driving laws. The principal concern of the highway safety community is that these devices will be implemented widely before they are fully evaluated and will be substituted by the courts for the full suspension penalty, which has been proven to be effective.

Conclusion

The issues listed above provide an important agenda for consideration in action programs and research studies. The first half of this decade has brought considerable progress in the reduction of alcohol-related accidents as a portion of total fatal accidents. It has provided the first evidence in history that it is possible to ameliorate the drinking driving problem through the criminal justice system. The recent leveling off of DWI arrests and alcohol-related fatalities suggest that new initiatives are needed if the progress seen during the first half of this decade is to be continued.

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