SECTION II. PREVENTION COMPONENTS AND RESULTS

Drinking and driving prevention in the community: program planning and implementation

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Abstract

This paper describes the rationale, development and implementation of the Drinking and Driving Component, which is one of five components of the Community Trials Project conducted by the Prevention Research Center, Berkeley, California (USA). It traces the background of drunk driving enforcement technology and practice against which the programs at the three sites were implemented. A conceptual model for the enforcement component of a comprehensive community alcohol-related trauma project is presented and its implementation at the three sites is described. Limitations in the available police department resources delayed the implementation of local programs. Media advocacy tied to specific operations proved to be successful in publicizing sensors and sobriety checkpoints were only partially accepted. Overall, the community trials sites increased or held steady their arrest rates in contrast to the comparison sites where DUI arrests declined.

Introduction

The goal of the Drinking and Driving Component was to reduce alcohol-involved crashes through an increase in drunk driving enforcement and public awareness of enforcement. This increase in awareness was expected to heighten public perception of the risk of arrest if driving after drinking. This in turn was expected to produce a reduction of drivers on the road with high BACs and result in a reduction of alcohol-related crashes. A secondary objective of this component was to call attention to the relationship of alcohol to injury and thereby increase public support for the other prevention trials components, such as responsible beverage service, which were designed to reduce consumption and alcohol related trauma.

The primary basis for this component is deterrence theory (Gibbs, 1975; Beyleveld, 1979a, 1979b). The theory holds that the rate of crime (in this case drinking and driving) varies with the certainty of detection and punishment. The key intervening variables between detection and punishment and the crime rate (driving under the influence (DUI) offenses) are the perceived probability of detection and the swiftness and severity of the sanction. The general validity of this theory has been demonstrated by Ross (1982) and Homel (1988). Thus, it is the perceived risk of apprehension, not the actual probability of being arrested, that determines the level of deterrence (Vingilis & Salutin, 1980; Voas, 1982; Jonah & Wilson, 1983, Williams & Lund, 1984).
Because it is perception, not actual detection risk, which is significant to deterrence some studies have found that drinking and driving can be manipulated through publicity alone (Vingilis & Salutin, 1980; Liban, Vingilis & Blefgen, 1985; Mercer, 1985). However, publicity alone has rarely produced lasting changes in safety behavior (Wilde et al., 1971). The deterrence effect is best understood as an interaction between public information and the personal experience of drivers. Thus Ross (1982), in his analysis of the British Road Safety Act of 1967, noted that the public initially believed that the probability of being tested for alcohol and arrested was very high and as drivers gradually learned that actual detection was much lower than their perception, there was a subsequent reduction in effectiveness of the law.

Voas & Hause (1987) reached a similar conclusion in a study undertaken in Stockton, California. Ten extra police patrols dedicated to DUI enforcement (a 10-fold increase) on weekend evenings were added on 1 January 1976. From late in 1975 to the end of 1976, the novelty of the enforcement program produced considerable coverage in local papers and electronic media. During this “publicity” phase, alcohol-involved crash rates declined by 25%. As the novelty declined, news attention dropped off and the driving public was left to test its expectations through actual contact with police on the roads. During this “reality testing” phase, the number of night-time crashes increased but did not return to pre-program levels. During the “adjustment” phase, the last 18 months of the program when publicity continued to be sparse, the weekend night-time crash rate leveled off at about 10% below the pre-program period, suggesting that the presence of the extra patrols had produced a reduction in drinking and driving, independent of news attention. Drivers with BACs over 0.10% in roadside surveys did decline (Voas & Hause, 1987).

When the program ended, the crash rate remained at the same level for approximately 6 months (until the motoring public became aware that enforcement patrols were gone) and then increased to pre-program trends. Ross (1982) calls changes in driver behavior produced by deterrence as “evanescent” (as illustrated in Stockton) when the source of deterrent was removed. Enforcement efforts that cannot be permanently maintained are likely to lose impact once terminated. Thus, long-term effects must be based on an increase in DUI enforcement efficiency and effectiveness, together with public information efforts that enhance DUI perceived risk and reinforce this perception over time.

The Drinking and Driving Component of the Community Trials Project was designed to utilize a purposeful interaction between enforcement and public information by using enhanced innovative DUI enforcement efforts that would attract the attention of the news media and thus the public. Three elements were required: (1) police utilization of novel, high visibility enforcement methods; (2) citizen support for policy to carry out these activities; and (3) a local news effort to enhance the impact of enforcement, that is, increase perceived risk.

Police world-wide have competing law enforcement priorities. It is difficult for a police department in a US community to increase the resources applied to DUI if other high priority law enforcement efforts subsequently decline. The department command needs to feel DUI enforcement has the support of the public and local government.

Local police departments have limited or no ability to undertake media efforts. The Drinking and Driving Component utilized the overall local Community Trials Project and community mobilization to establish a “Drinking and Driving” task force to support police department programs and to organize media advocacy efforts. This paper will describe the actual implementation of these efforts.

**Background to implementation**

The Drinking and Driving Component implementation occurred against the background of two important national trends in DUI enforcement in the United States: (1) the transition from behavioral definitions of “drunk driving” based upon officer observation to per se laws which define drunk driving by driver blood alcohol concentration (BAC), and (2) a general reduction in police resources.

First, the “Chemistry Based” per se system as practiced in Europe, Australia and New Zealand is based upon a defined illegal driver BAC level, the random stopping of vehicles and the testing of large numbers of drivers (Homel, 1988). In the US, DUI laws either prohibit the behavior of ‘impaired’ driving which is defined by behavior, or chemical testing based upon a BAC limit
(Voas & Lacey, 1989). Behavioral based enforcement requires the officer to go through three steps: (1) the detection of vehicles being driven by an impaired driver, (2) the identification of heavy drinking and potential impairment in a brief interview with the driver, and finally (3) documenting impairment by inviting the driver out of his vehicle for a set of "Field Sobriety Tests".

The full implementation of chemistry based enforcement appears to be prohibited by the Fourth Amendment to the US Constitution which requires that searches and seizures be "reasonable", that is, based on prior suspicion of wrongdoing. The Fourth Amendment has been interpreted by some state and local courts to prohibit random stopping of motorists under all conditions. This has limited the use of police checkpoints for testing drivers. However, a 1990 Supreme Court decision on checkpoints in the Michigan Department of State Police et al. v. Sitz et al. has established a "balancing test" which permits states to stop vehicles and interview motorists without prior suspicion provided that intrusion is kept to a minimum and the state has a "grave and legitimate interest" in curbing drunken driving.

A similar concern with Fourth Amendment rights has limited the use of hand-held preliminary breath testers (PBTs) by the police to aid in roadside investigations. It has never been determined through adjudication whether the PBT, which requires the driver to blow into a tube, is sufficiently intrusive to constitute a prohibited search. In practice, the police have reserved this device for use only when driver behavior establishes a "reason to believe" that the individual is alcohol impaired. As a result, police can miss up to half of the illegal drivers with whom they come into contact (Jones & Lund, 1985).

Thus, local police have been caught between public pressure to intensify DUI enforcement, concerns over meeting constitutional requirements and their preference for the traditional behavioral detection methods for which they have been trained. Because it is believed that PBTs (which require the driver to blow into a straw or mouthpiece) cannot be used early in the investigation, passive alcohol sensors that draw in exhaled air from in front of the face of the driver without requiring a mouthpiece have been developed. The use of these devices is believed not to be limited by the Fourth Amendment (Fields & Henricko, 1986). Jones & Lund (1985) found in an actual DUI enforcement checkpoint that when police used passive sensors, the proportion of drivers actually detected over the BAC limit rose from 45% to 68%.

A second national background factor in the implementation of the Drinking and Driving Component was the pressure on communities to reduce local government budgets. Police departments had to absorb reductions in personnel. Since a "war on drugs" was in full operation and there was local concern with street crime, these reductions frequently occurred at the expense of the traffic patrol responsible for DUI enforcement.

It became obvious at an early point in the program development that the Community Trials would have to assist police departments to obtain additional funding for their DUI enforcement efforts. The police department in the Southern California site, for example, had no traffic patrol at all when the Community Trials Project began. All officers on patrol at night were assigned to answer emergency calls only.

State of California
The DUI laws in the State of California are probably as advanced and "modern" as any in the 50 states. California has a statute which establishes a BAC of 0.08% as illegal per se. It also has an administrative per se law which provides for the arresting officer to take the driver's license at the time of arrest of any motorist who refuses a BAC test or who provides a test result over 0.10%. The state supreme court has upheld the use of sobriety checkpoints and the state attorney general has given a favorable opinion on the use of PBTs and passive sensors by the police. The California Highway Patrol (CHP) is active in DUI enforcement. The CHP has purchased PBTs for all its officers and regularly conducts sobriety checkpoints, frequently in association with local police.

On 1 January 1994, halfway through the Community Trials operational period, a zero tolerance law for drivers aged under 21 years went into effect. This law is a model for the rest of the nation in that it provides for testing of young drivers at the roadside with a hand-held breath test device and establishes a 0.01 BAC limit for underage drivers. If the roadside test yields a BAC over that level, the young offender's license is immediately suspended for a year. Lest this
sanction be taken lightly, the penalty for driving while suspended in California was stiffened by the implementation of a 30-day vehicle impoundment law on 1 January 1995.

**State of South Carolina**

South Carolina lies at the opposite end of the legal continuum from California. It does not have a *per se* law. Its impaired driving law sets the BAC which provides presumptive evidence of impairment at 0.10%, 0.02% higher than California's *per se* law. South Carolina does not have an administrative *per se* law which allows the police officer to take the offender's driver's license at the time of arrest. Moreover, in most of the smaller cities such as in the Community Trials site, the officer must take on the role of prosecutor and conduct the case in court. However the state police, as well as local police, are actively employing sobriety checkpoints. Passive sensors are also in use in several communities in the state.

It was against this background that the implementation of the Drinking and Driving Component of the Community Trial Project occurred. This underscored the need for a local coalition in which a Drinking and Driving Task Force could be established to support the police department in experimenting with new procedures such as DUI enforcement checkpoints and new equipment such as passive sensors, as well as news media activities to publicize enforcement.

**Program overview**

Voas, Holder & Gruenewald (1997, this issue) show the overall causal model of the Drinking and Driving Component (Fig. 1) to contain: (a) program inputs, (b) community inputs, (c) intermediate variables and (d) distal outcome (alcohol-involved traffic crashes). The developmental model of the Drinking and Driving Component is shown in Fig. 1 of this paper. Drinking and Driving Component inputs will be described as they relate to community outputs (DUI news coverage and DUI enforcement). The next paper, by Voas et al. (1997, this issue), describes the evaluation of the overall causal effects of community outputs on intermediate variables and ultimately on alcohol-involved traffic crashes.

General community mobilization established the base for all prevention components as discussed by Treno & Holder (1997, this issue). The local coalition in each experimental community worked with the City Council of elected officials as well as stimulated general media advocacy (see Holder & Treno, 1997, this issue). This general mobilization was to increase community support for DUI enforcement by establishing a Drinking and Driving Task Force and obtaining police chief and command support for the elements of the Drinking and Driving Component.

Figure 1 indicates the relationship between support efforts and the DUI enforcement program carried out by the police. Support efforts grew out of the broader community mobilization effort which was initiated prior to the formal start of the enforcement component. Community support activities were provided by members of the DUI Task Force under the leadership of the local Community Trials Prevention Coordinator.

DUI enforcement (see right side of Fig. 1 as “Drinking and Driving Component inputs”) was to be enhanced through four means: (1) state grants to provide additional officer hours for enforcement (2) the provision of specialized breathalyzer equipment such as passive sensors, (3) the provision of specialized training to officers in the detection and apprehension of impaired drivers and the use of breathalyzers and (4) the use of high visibility DUI enforcement operations such as DUI enforcement checkpoints. Through these four inputs actual DUI enforcement was to be increased, not only by a rise in the number of DUI arrests, but also by increases in the number of motorists who were stopped and checked for sobriety by the police at checkpoints and other enforcement operations.

The novelty of the procedures adopted was expected to stimulate the interest of the news media and provided the basis for increased local news coverage of the drinking and driving problem. To take advantage of this opportunity, media advocacy training was provided to members of the task force and media advocacy technical assistance provided to the community trials coordinator and the police department. This combination of DUI enforcement and DUI news coverage (as shown in Fig. 1) was to increase the perceived probability of arrest. A rise in perceived risk was expected to result in
fewer drinking drivers on the road which in turn would result in a reduction in alcohol-involved crashes (see Fig. 1 in the paper by Voas et al. (1997, this issue). Each of the elements of the developmental model are described below.

**Drinking and driving task force**

The membership of each local Drinking and Driving Task Force included those community leaders and officials who could be most effective in providing law enforcement with support for high visibility DUI activities. This included citizen activists groups such as Mothers Against Drunk Driving (MADD), elected city or county officials, the police chief or his designee, representatives of the business community and the licensed beverage industry.

The task force had three major objectives. The first objective was to provide support to the police department by endorsing the potentially controversial operations such as DUI enforcement checkpoints and the use of passive sensors to increase the efficiency of enforcement. A second objective was to assist the police department in obtaining local government (City Coun-
cil) support of an application for state highway safety funds. This required the City Council to appropriate matching funds. The third objective was to raise funds for the production of public information materials used by the police department to publicize its enforcement efforts. This also included obtaining local merchants support by providing services such as printing at a reduced cost or donating meals for officers working at the enforcement checkpoints.

**Police command support**

As noted above, local police are often caught in competing priorities. Police chief and command leadership must establish a priority to adopt the DUI enforcement activities of this component and agree to submit a grant for state traffic safety funds to provide additional officer hours for DUI enforcement.

**State grants to communities to provide additional officer hours**

The original intent of the drinking/driving component was to intensify existing DUI enforcement in the three experimental communities by increasing enforcement efficiency without requiring an augmentation of the manpower devoted to drunk driving at the initiation of the project. However, it soon became clear that at least the two California sites would require additional financial assistance if they were to participate effectively in an intensive DUI enforcement program since local patrols were so limited by budget reductions. The Drinking and Driving Component, working with the Task Force, assisted the police departments at all three sites to apply for grants under Section 402 of the National Highway Safety Act from each state Office of Highway Safety. The Southern California site prepared its grant proposal a year ahead of the other two communities but even when grant funds became available, the city council took 9 months to appropriate matching funds required by the state. Thus, the two California sites were begun at approximately the same time in October 1993. The South Carolina site did not succeed in its first year in obtaining a highway safety grant. They initiated their intensive enforcement program in January 1994 and eventually obtained a grant in 1995.

**Breathalyzer equipment**

The use of passive sensors in DUI enforcement activities, particularly at checkpoints, provides the officer with an additional method for detecting the high BAC driver who does not present the normal indication of heavy drinking, such as the odor of alcohol, blood shot eyes, slurred speech, etc. In addition, these units can play an important role in deterring the public because they attract news and public attention, helping to convince the heavy drinking driver that he/she is likely to be detected if stopped by the police. During the first year of operations, the project made a limited number of hand-held preliminary breath test devices available to the Southern California site. The other sites each had two units of their own. Approximately a year after the program began in December 1994, the California Highway Patrol provided the Southern California site with 25 and the Northern California site with 20 devices. The Community Trials Project planned to provide each of the three communities a dozen passive sensor flashlights at the start of the enforcement program. However, when subjected to a field test at the Southern California site, it was found that the light in the unit was not as bright as the normal flashlights carried by the officers. It took the manufacturer 9 months to develop a unit with the brightness the officers would accept. It was not until October 1995 that 18 passive sensor flashlights were delivered to the Southern California site. The Northern California site received six units then and began using them the following month. The South Carolina site began operations with these units in January 1995.

**Training of officers**

In an era in which the impaired driving offense is defined in terms of BAC, apprehending drinking drivers has become a highly technical process involving subtle observations of vehicle behavior followed by observations of the driver’s appearance and behavior to determine whether he or she should be required to perform a set of standardized sobriety tests (Voas & Lacey, 1989). Once the decision to arrest has been made, a detailed set of procedures must be followed to ensure that the suspect receives a valid evidential breath test and that the necessary administrative paperwork is properly completed. For the most part, officers who were assigned to DUI patrols
at the two California sites had recently taken part in a DUI training program. The potential enforcement programs suggested for inclusion in the enforcement effort at all three sites shown below contains two programs which required additional specialized training for officers: the use of the hand-held preliminary breath testers and the passive sensor flashlights. The operation of each of these devices could be taught rather rapidly, however, the passive sensor which must be positioned with reasonable accuracy and activated only when the subject is providing a breath sample by talking, requires some practice in the field.

**DUI enforcement checkpoints**

Impaired drivers can be apprehended as a result of a number of different types of operations. In addition to dedicated DUI patrols, officers enforcing speed limits, using radar or investigating accidents will identify and arrest drinking drivers. While these traditional activities may be effective in producing DUI arrests, augmenting the current force with additional officers may not produce a sufficient increase in the visibility of enforcement to convince the public that a significant change has occurred in the level of enforcement. DUI enforcement or “sobriety” checkpoints, on the other hand, are a high visibility enforcement technique which has been shown to produce an increase in deterrence beyond that which would be obtained by simply increasing the number of DUI patrols (Stusser & Blowers, 1995). Thus, certain operation techniques hold promise for increasing deterrence to drinking and driving without large increases in officer personnel. A planned method for increasing enforcement efficiency at the three experimental sites was to implement sobriety checkpoints which can be expected to attract public attention.

Checkpoints require safety cones and special lights and signs to ensure that traffic is handled safely and that the public is aware that the police activity is a sobriety checkpoint. This type of equipment is provided by the state of California Office of Traffic Safety (OTS) to local police departments that are willing to conduct at least 12 checkpoints a year. The police department at the Northern California site took advantage of this offer.

**Public education information and support for the Drinking and Driving Component**

Public education information and support for the Drinking and Driving Component grew out of the general media advocacy training provided to the members of the local consortium through the Community Trials Project (see Treno et al. (1996) for a description and evaluation of general media advocacy as well as Holder & Treno (1997) in this issue). To support the DUI enforcement effort, the Community Trials Coordinator and members of the consortium worked with police department managers to develop news media activities and events that focused upon specific enforcement operations.

A key feature of these media activities was that the police department officers played a central role in all of them. The officers were often the spokesperson at the media event or news conference. When more traditional media materials were purchased, such as billboards or bus signs, the photographs of the officers were featured on these advertisements at all three sites. Featuring the officers in the media served to provide them with some recognition and increase their individual motivation to take part in the enforcement effort, and their appearance in uniform in the advertisements also provided instant recognition that the advertisement was related to drinking and driving. Finally, these activities provided good public relations material for the department as a whole, which was welcomed by agencies that were frequently criticized and rarely praised in the press.

A number of examples of media activities can be cited. At the Southern California site, officers on DUI patrol during the Thanksgiving Holiday gave away turkeys donated by a local market to drivers who were stopped but found to be alcohol-free. At Christmas time, Santa Claus stood at the end of the sobriety checkpoint line and gave out candy canes to cars driven by alcohol-free drivers. While these were fairly frivolous gimmicks they succeeded in their principal purpose, which was to attract prime time coverage from the local TV stations. Such programs were not intended to motivate the public through a positive incentive to avoid drinking and driving, rather they were intended to place the police department in a positive light thereby improving the department’s public image. Among the original proposals for enforcement programs was a positive incentive plan to distribute “know your limit cards” at sobriety
checkpoints and provide merchant discounts for individuals who could produce such a card. However, this program was not adopted at any of the sites.

The announcements of other enforcement operations were planned to attract news media attention. The introduction of the passive sensor flashlights was well covered at all three sites. A TV truck from a Los Angeles station traveled almost 100 miles to the Southern California site to cover the introduction of passive sensors. Media events involving young people were particularly effective. At the Northern California site, high school students organized a news conference which was well covered by the print and electronic media.

**Maintenance of enforcement effectiveness**

A basic problem which the Drinking and Driving Component faced at each of the sites was the maintenance of enforcement novelty to minimize the tendency of the news and thus public attention to be diverted away from the effort over time. A proposed strategy to avoid this loss of effectiveness was to change the focus of the enforcement effort and its associated news emphasis every 3–6 months to draw renewed attention to local DUI enforcement.

Table 1 summarizes eight examples of possible enforcement foci that were developed for possible implementation at the experimental sites and describes the elements of the proposed enforcement program. It gives examples of the support required from the “Drinking and Driving Task Force” and the public information support required for each program as described below.

Table 2 provides an extension of the analysis of these eight programs to include the factors that should be considered in making choices among the alternatives for implementation. A basic principal of the community trials program was to recommend for implementation only programs which had been proven through developmental research or were sufficiently similar to programs proven to be successful in the field that there was a high probability that they would be effective at the project sites. Table 2 also provides an indication of the ease of implementation. Finally, Table 2 contains an estimate of outside technical resources needed to assist the departments in implementing a new procedure.

1. **Intensified traditional patrol.** Most police agencies can increase the number of arrests for drunken driving simply by placing additional emphasis on DUI enforcement (Voas, 1982).

2. **“Light up drunk drivers” passive sensor program.** This slogan was used as a title for the use of flashlight passive sensors at sobriety checkpoints and with DUI patrols.

3. **“If you don’t buckle up, you must be drunk” campaign.** For this campaign, the police chief announces a policy of having officers on patrol use the passive sensor to test any driver who did not have his or her safety belt buckled. This campaign would accomplish two objectives. First, it motivates night-time drivers to buckle their safety belts to avoid attracting the attention of police and being checked for alcohol. Secondly, it provides a continuous focus on passive sensing as a DUI detection threat, rather than relying on use of the Horizontal Gaze Nystagmus (HGN) test to screen drivers for alcohol.

4. **“The eyes have it” campaign.** The focus of this campaign is on the HGN test to screen drivers for alcohol. Work by Compton (1985) in simulated checkpoints has shown that HGN can be used as a rapid screening method with the driver still seated in the vehicle. The HGN test is the most valid of the three tests in a standardized field sobriety test (SFST), but often suffers from a lack of reliability from officer to officer because of the failure to administer it according to a standardized procedure. Special training would be provided to DUI Patrol Officers in the use of HGN as a diagnostic method for identifying impaired drivers during the initial interview while still seated in the vehicle.

5. **“Know your limit” program.** The objective of this effort would be to assist the public to understand the per se law which provides for a 0.08 BAC limit in California and 0.10 BAC limit in South Carolina. The campaign would focus on relating the number of drinks that a driver can consume and still remain below the legal limit. Such a campaign will be modeled on the successful program reported by Worden et al. (1989).

6. **“How to recognize a drunk” campaign.** This program would be directed at reducing service to intoxicated individuals in “on-premise” service establishments through police
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<th>Program</th>
<th>Drinking Driving Task Force</th>
<th>Public education support</th>
<th>Police Department police activities</th>
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<td>News media</td>
<td>Informal communications</td>
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<td>(1) Traditional patrol—</td>
<td>Organize volunteers</td>
<td>Police department press</td>
<td>Merchants provide table tent with</td>
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<td>eyes in HGN test</td>
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<td>(2) “Light up drunk</td>
<td>Recruit merchants to produce</td>
<td>Police department press</td>
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<td>drivers” educational</td>
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<td>Recruit merchants to</td>
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<td>Merchants provide table tents</td>
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<td>(5) “Know your limits”</td>
<td>Recruit merchants to fund</td>
<td>Police chief announces</td>
<td>Merchants provide KYL cards</td>
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<td>(7) “I’d rather drive”</td>
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<td>Police chief announces</td>
<td>Merchants provide table tents</td>
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<td>Organize merchants’</td>
<td>(1) Police chief</td>
<td>Licensees use signs and table</td>
</tr>
<tr>
<td></td>
<td>discounts for green card</td>
<td>announces intensified</td>
<td>tents to publicize checkpoints</td>
</tr>
<tr>
<td></td>
<td>holders</td>
<td>checkpoint program</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(2) Press coverage of</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>checkpoints</td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Examples of possible DUI enforcement focii
<table>
<thead>
<tr>
<th>Program</th>
<th>Effectiveness</th>
<th>Ease of implementation</th>
<th>Cost to Police Department</th>
<th>Cost to community trials grant</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Traditional patrol—increased emphasis</td>
<td>Moderate to high evidence of effectiveness (Voas &amp; Hause, 1987)</td>
<td>Easy—traditional</td>
<td>No training, some supervision</td>
<td>Low to none</td>
</tr>
<tr>
<td></td>
<td>Expected to be high (Jones &amp; Lund, 1985)</td>
<td>New—controversial</td>
<td>High cost if extra officers required</td>
<td></td>
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<tr>
<td>(2) “Light up drunk drivers”</td>
<td>Moderate—increased use of belts proven in states with primary laws</td>
<td>Easy—traditional enforcement. Possibly controversial with public</td>
<td>Low—some training and supervision</td>
<td>$14 000 for passive sensor equipment and training</td>
</tr>
<tr>
<td>(3) “If you don’t buckle up you must be drunk”</td>
<td>Low/moderate. Some novelty. Some increase in arrests</td>
<td>Very easy—a traditional method</td>
<td>Considerable training and supervision expense</td>
<td>Considerable—training expense Bring in expert on gaze nystagmus</td>
</tr>
<tr>
<td>(4) “The eyes have it”</td>
<td>Moderate—proven by Worden et al., 1989</td>
<td>Moderate—traditional enforcement, but low motivation to hand out cards</td>
<td>Low—little training, more supervision. Modest cost for handouts</td>
<td>Low—training</td>
</tr>
<tr>
<td>(5) “Know your limits”</td>
<td>Enforced RBS proven in Michigan (McKnight &amp; Streff, 1994)</td>
<td>Moderate—officers not highly motivated</td>
<td>Moderate—training and supervision</td>
<td>High training cost</td>
</tr>
<tr>
<td>(6) “How to recognize a Drunk”</td>
<td>No direct evidence, but age 21 law effectiveness</td>
<td>Moderate</td>
<td>Moderate—training and supervision. Passive sensors</td>
<td>High—training and purchase passive sensors (14 000)</td>
</tr>
<tr>
<td>(7) “I’d rather drive”</td>
<td>Proven effectiveness (Stuster &amp; Blowers, 1995)</td>
<td>Moderate to hard availability</td>
<td>High in personnel expense and some special equipment expenses</td>
<td>Low</td>
</tr>
</tbody>
</table>
monitoring of service to intoxicated drivers in bars and restaurants. It is modeled on the successful campaign documented by McKnight & Streff (1994) in Michigan.

(7) “I’d rather drive” campaign. This campaign could be built around California Senate Bill 1300 (Chapter 1254, Statutes of 1988) which became effective on 1 January 1989, and provides that anyone in the age group 13–21 years old who is convicted of an alcohol or drug offense (purchase, sale, possession or under the influence) will receive a mandatory 1-year suspension of driving privilege or a postponement of 1 year in their right to apply for a driver’s license.

(8) Sobriety checkpoints. Sobriety checkpoints provide a high visibility enforcement method which attracts the attention of news media and has been shown to be effective in reducing alcohol-related crashes (Voas, Rhodenizer & Lynn, 1985; Levy, 1988).

Actual implementation in experimental communities
Each of the experimental communities adopted unique tactics and processes for actually implementing the basic elements of the developmental model. Each of the communities is described below.

The Northern California site
The Police Department of the Northern California site has an authorized strength of 137 sworn officers of whom 85 are patrol officers. When the program began, four motorcycle officers made up the Traffic Department. In 1989 the Department had a DUI Task Force of officers dedicated to drunk driving enforcement but personnel shortfalls resulted in the disbanding of the group. In that same year the Department made 1749 DUI arrests, approximately 13 for each of the 137 officers—a high rate considering that Borkenstein (1975) found that in the average police department there were only two DUI arrests per officer per year. Unfortunately, DUI arrests fell off to 937 in 1990 due to a dispute between the Department and the city administration. That dispute was resolved and a new chief of police appointed. DUI arrests continued to decline slowly (as they have state-wide) through the 1991 to 1993 period.

A section 402 grant from the California Office of Traffic Safety was applied for and awarded in 1994. That grant provided for four overtime officers on Friday and Saturday nights who were to form a DUI patrol dedicated to drunk driving enforcement. This grant paid for the purchase of 16 passive sensor flashlights and in November 1994, 20 preliminary sensors were received from the California Highway Patrol. This training program in DUI detection procedures and the use of passive sensors was ultimately attended by 85 officers. Monthly sobriety checkpoints began in March of 1994. As new equipment, officer training and checkpoints became operational, news attention to DUI enforcement increased stimulated via the media advocacy efforts of the local project staff (Holder & Treno, 1997, this issue). Figure 2 shows the changes in breathalyzer equipment, checkpoints and DUI news in this site for 1992–1995.

The Department also applied for an additional special grant for a checkpoint trailer from the state. However, the Department used these funds to modify a panel truck to provide not only for the transport of checkpoint equipment but also to allow evidential breath tests to be administered at the roadside.

The comparison city for the Northern California site is well separated from the experimental site. The two media markets do not overlap. This comparison site was one of the experimental locations used in the study of sobriety checkpoint procedures funded by the National Highway Traffic Administration, US Department of Transportation (Stuster & Blowers, 1995). This program was initiated in August 1992 and continued to April 1993. The California Office of Highway Safety provided a grant for a checkpoint trailer and during that time period the city police held two checkpoints a month. Following the termination of the experimental program the checkpoints continued on a once-a-month basis throughout 1994. The experimental program required the establishment of a local consortium to assist in publicizing the checkpoint operations. Members of the consortium attended the checkpoints, passed out literature and provided refreshments to the officers much as was done at the Community Trials sites. The history of this comparison site illustrates the difficulty in finding an adequate comparison for DUI operation at the local level. There is no way to know in advance and avoid those localities
that may take on unique programs during the study period. It is similar to the experimental site. In the current case the special program accounted for only 10% of the arrests during the implementation period and while there was a reduction in alcohol-related crashes at the comparison site this change was not statistically significant.

Figure 3 shows DUI arrests for Northern California and the comparison site. There was a slight rise in DUI arrests in the experimental site beginning at the end of 1993 and early 1994 with the initiation of the OTS grant and the beginning of the Community Trials Drinking and Driving Component. In contrast DUI arrests fell through out this period in the comparison community. The slight increase in arrests that occurred during the NHTSA funded checkpoint study at the comparison site between August 1992 and April 1993, disappeared in 1994. Both sites illustrate the long-term state-wide, downward trend in DUI arrests. The primary impact of the Community Trials drinking and driving component appears to have been to stop the downward trend for the 2 years of the project operations. This is a more modest increase than obtained in projects conducted a decade ago (e.g. Voas & Hause, 1987) where a doubling of the number of DUI arrests was frequently achieved.

The Southern California site
This Police Department had 128 sworn officers of whom six were motor officers at the initiation of the program. In 1988 there were 28 felony DUI, 542 adult misdemeanor DUI, 1278 public inebriate arrests and 169 liquor law misdemeanor arrests at this site, for a total of 2017 adult felony and misdemeanor alcohol-related arrests. There were an additional 24 juvenile alcohol-related arrests. In the past, two officers had been assigned to weekend DUI enforcement, but by 1991 budgetary constraints resulted in cut-backs and DUI patrols were limited to special events and holidays.

Therefore, as in the Northern California site, it was necessary to make an application to the California Office of Traffic Safety for funds to support a special DUI effort. The Police Department requested support for two full-time officers

Figure 2. Implementation of drinking and driving component, Northern California experimental site. ——, DUI news; •••breathalyzers; ■, checkpoints.
for a period of 3 years. The OTS required as a condition of its grant that the city pick up an increasing portion of the personnel costs over the 3-year period. This almost resulted in the loss of the grant when the council, diverted by other matters, failed to appropriate its portion of the expense for 9 months after the grant was to begin.

The Department was also delayed in initiating the use of the passive sensor flashlights. They obtained a shipment of six units for test in September of 1993, but a field test indicated that the flashlight portion of the unit was not bright enough and their implementation was delayed until October of 1994. Figure 4 shows the rise in the accumulated number of passive sensors and officers on patrol, and checkpoints. Figure 4 also shows the rise in local news attention to DUI enforcement in the Southern California site as indicated by a 7-month moving average.

The Southern California experimental site is well separated from its comparison city. The media markets do not overlap. This comparison site received small grants from the California Office of Traffic Safety in 1992 and 1994. These grants required that the Police Department conduct at least one checkpoint a month during that period. At the end of this period the frequency of checkpoint operations dropped to six per year. The funds were used to purchase a checkpoint trailer and other equipment to support checkpoint operations. Funds were also provided for publicizing the checkpoints with a media blitz conducted at Christmas time. This comparison city provided a reasonable match for the Southern California experimental site. It did, however, begin its checkpoint operations 2 years before the experimental site and continued them at a higher frequency than at the experimental site during the first year (1994) of the Community Trials operational period.

Figure 5 provides a timeline of enforcement activities at the Southern California site with the arrest trends for both the experimental and comparison sites. The introduction of passive sensors was begun in October 1993 at the Southern California site and a first checkpoint was held that December. Checkpoints were implemented on a monthly basis until halfway through 1995. Despite the relatively slow start on both breathalyzer use and checkpoints, sobriety checkpoints, DUI arrests increased rapidly during 1994. This
may be partly accounted for by the fact that passive flashlight sensors were widely used from the beginning of the program in October 1993. Prior to the initiation of the drinking and driving component at the Southern California site, the DUI arrest rate had been flat and the numbers of arrests lower than in the comparison site. In contrast the number of arrests at the comparison site had been falling for several years and continued to fall until the last quarter of 1995. It appears that the Community Trials program at the experimental site increased arrests by approximately 50–70%.

**The South Carolina site**

This site incorporated a whole county which included several police jurisdictions. The Police Department in the principal city had an authorized strength of 70 sworn officers of which 48 had patrol duties at the beginning of the project. There was a traffic division consisting of four motorcycle officers and two officers in cruisers. This city department also included a part-time DUI task force of patrol officers who worked overtime on holidays or at special local events. The county sheriff was not involved in traffic enforcement. About 1000 DUI arrests (1003 in 1989; 1031 in 1990) are made each year in the county and there are about 200 (208 in 1988; 231 in 1989) alcohol-related crashes yearly according to the state highway department.

The county has a significant transient traffic flow. It lies at the halfway point for travelers from the northeast, bound for south Florida. However, these travelers do not vacation in the site, so the indigenous population is not seasonal. Twice a year, spring and fall, large crowds do come for a week of stock car racing. As in all the experimental communities, the specific enforcement program for the city and the other Police Departments in the county grew out of the community drunk driving task force and Police Department planning process. At this site there was less resistance to checkpoints since this technique had been used regularly in the past.

All 48 patrol officers in the city received training in detection techniques and the use of passive sensors in an effort to involve them actively in checking drivers as part of their regular patrol activity. Since the state patrol is also active in

![Graph showing implementation of drinking and driving component, Southern California experimental site.](image)
using checkpoints, joint operations were frequent, particularly during the racing season.

The South Carolina comparison site was the county adjacent to the experimental site and there was some overlap of the two media markets. While the comparison site was technically outside the media market for the three TV stations in the experimental site, there appeared to be a considerable but unmeasured viewership among the residents of the control area (one station reported that their viewership in the comparison area included 7000 households). The radio and newspaper markets also overlapped to some extent. Since 95% of the activities of the local coalition at the South Carolina site were covered by both the newspapers and the TV stations, it is probable that much of the publicity of the DUI enforcement activities in the experimental site were channeled into the comparison site.

The major city in the comparison county received a 5-year grant from the South Carolina Office of Highway Safety in October 1993, which enabled them to hire one additional officer and six breathalyzers. The Department, while not mounting sobriety checkpoints, did conduct "license" checkpoints several times a year and used the breathalyzers at these operations. Unlike the sheriff in the experimental site, the sheriff in the comparison site does enforce drunk driving laws and the Department also received a 5-year grant from the Office of Highway Safety in October 1993. The sheriff conducts license checkpoints and joins the state highway patrol in conducting sobriety checkpoints.

Thus, comparisons between the experimental and comparison counties in South Carolina on DUI enforcement are clouded by the fact that a good amount of the publicity given to DUI activities in the experimental site may have had an impact on the comparison site, and the comparison site received more state support during the first year of the project than did the experimental site. In addition, the experimental county (unlike the comparison county) has a large transient traffic flow which results in it experiencing a significant number of crashes involving transient drivers who have had little or no exposure to the local DUI enforcement program.

Figure 6 plots the implementation of DUI enforcement in the experimental site. Figure 7
shows the arrest trends for both the experimental and comparison sites. The South Carolina site began using the passive sensor flashlights in January 1994 and by the middle of that year had established regular monthly checkpoint operations. The arrest rate, which had been falling in the 2 years prior to the initiation of the project, rose during the first months of the program and remained at a higher level than the year before the project throughout the program period. Arrests in the comparison community showed a slight rise corresponding to that in the experimental community at the beginning of the project period but overall appeared to follow the general downward course shown in the pre-project period. The rise in arrests in the comparison community which appears to correspond so closely to that in the experimental site may be a result of cross-contamination between these two adjacent counties.

Summary
This paper has described an overall theoretical model for the development of a drinking driving component for a comprehensive community alcohol-related trauma reduction program. Such a program involves the coordination of a number of major elements to permit the application of the knowledge gained through research. These include the resources of the community and its Police Department, the community’s readiness for change and the extent to which it will tolerate change, the Police Department’s assessment of support for change in the community and the willingness of the Department management to try new procedures, the legal barriers to innovation in enforcement, and the access that program managers have to media outlets. All these factors came into play in the three programs described.

The communities proved to be more ready than expected to support programs directed at reducing alcohol trauma (see Holder et al., 1997, this issue). Despite the importance given to the drunk driving problem in community surveys, there was stiff competition for enforcement resources for the control of drug and gang problems, particularly at the California sites.
Moreover, the project was initiated in an era of declining resources so that it became necessary at all three sites for the project to assist the experimental communities to obtain funds for their Police Departments. Even when these funds were provided by the state, the city council at the Southern California site delayed the initiation of the program for a year before it approved the required matching funds.

While all three sites ultimately employed the two major technological elements of the Drinking and Driving Component—sobriety checkpoints and passive sensor flashlights—there were additional delays while the Department administration and the officers came to accept the utility of the new technology. Moreover, there were limitations on the extent of acceptance of these elements of the program. The Departments were urged to implement “mini-checkpoint” operations that require only four officers and, therefore, could be mounted more frequently than those that required larger numbers of officers. However, this procedure never found acceptance and checkpoint operations were generally limited to one a month. The passive flashlight sensors were utilized at the sobriety checkpoints, but were not routinely carried on regular patrols by all the officers at the three sites. It is noteworthy that they were most consistently used at the Southern California site, which had the largest increase in DUI arrests.

Probably the most successful new “technological” element of the enforcement programs at all three sites was the use of media advocacy procedures to attract coverage of enforcement operations. By the development of a close working relationship between the Drunk Driving Task Force members responsible for public information programs and the Police Department managers of the DUI enforcement effort, each major operation could be planned around a media effort to ensure that there would be good coverage of the event. Such planning was particularly important for sites such as the Southern California city that lies on the outskirts of a TV market area and must attract camera crews from some distance away. As a result of the emphasis on media advocacy, the majority of the media effort for the enforcement was developed by non-professionals and was specific to local events. There was also some use of professionally developed media: PSAs, billboards,
flyers and bus posters. Since these materials were developed by local public relations firms on minimum budgets, the amount of pretesting of the messages was limited. It was not possible to gauge separately the impact of this portion of the public information support program for the enforcement effort. However these materials, like the media advocacy effort, were designed not only to inform the public, but also to support the Police Department and individual officers by featuring their pictures on the flyers and billboards.

Overall, the principal impact of the Community Trials Drinking and Driving Component on the DUI programs in the three experimental sites was to stop the trend to lower numbers of arrests and to attract increased public attention to the drinking driving problem. This increased public attention to the problem was intended to help create a climate that would support the other elements of the Community Trials effort, particularly the Responsible Beverage Service Component where the threat of DUI arrest of outlet customers was expected to help motivate merchants to join community efforts to train servers and adopt RBS policies. To what extent the Drinking and Driving Component served this purpose is not clear. That it did achieve a reduction in alcohol-related crashes is demonstrated by the companion article (Voas et al., 1997) in this issue.

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