

Low-Manpower Checkpoints: Can They Provide Effective DUI Enforcement in Small Communities?

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Objective. *Sobriety checkpoints can be effective in reducing alcohol-impaired driving. Checkpoints are underutilized, however, partially because police believe a large number of officers are required. This study evaluated the feasibility and impact of conducting small-scale checkpoints in rural communities.*

Methods. *Law enforcement agencies in two counties agreed to conduct weekly checkpoints for one year. Two nonadjacent counties did not undertake additional checkpoints. Evaluation included public-awareness surveys and roadside surveys (including blood alcohol concentration [BAC] measurements) of weekend nighttime drivers.*

Results. *Relative to drivers in the comparison counties, the proportion of drivers in the experimental counties with BACs >0.05% was 70% lower. Drivers surveyed at driver's license offices in the experimental counties after program implementation were more likely to report seeing or passing through a checkpoint and were more aware of publicity on driving under the influence (DUI) enforcement.*

Conclusions. *Small rural communities can safely and effectively conduct low-staff sobriety checkpoints on a weekly basis. Such programs can be expected to result in large reductions in drivers operating at higher BACs.*

Keywords Impaired Driving; Checkpoints; Enforcement; Staffing; Deterrence

Enforcement of alcohol-impaired driving (e.g., DUI) in the United States falls into three broad categories: regular patrols, special or dedicated patrols, and sobriety checkpoints. During regular patrols, arrests result from contacts with drinking drivers by officers conducting normal traffic patrol operations. Regular patrols are the basic enforcement system in most communities across the nation. Dedicated patrols consist of officers with special training or experience in DUI enforcement employed during high DUI risk periods, such as weekend nights. A small number of officers working part-time on weekend evenings can double the number of DUI arrests in a community (Levy et al., 1977); however, most department budgets do not include funding for such extra enforcement efforts. Sobriety checkpoints are typically short-term operations conducted only on special occasions. At checkpoints all drivers passing a given location are stopped

and interviewed by the police and, if they are suspected of drinking and driving, are pulled over for further testing. Currently, checkpoints generally involve as many as 15 to 20 officers, who are usually on overtime status. Thus, conducting checkpoints is expensive, both in dollars and in terms of police resources. This limits their implementation in most communities to a few national holidays.

Sobriety checkpoints are one of the most effective approaches to deterring impaired driving (Lacey et al., 1999; Ross, 1992; Shults et al., 2001; Stuster & Blowers, 1995; Voas et al., 1985). Stuster and Blowers (1995) compared the effectiveness of checkpoints with dedicated patrols and found that checkpoints were more effective in reducing alcohol-related crashes. Shults and colleagues (2001) reviewed 12 studies evaluating the effectiveness of sobriety checkpoints and concluded that, if well implemented and well publicized, they can reduce alcohol-related fatal and injury crashes by about 20%.

The effectiveness of this type of enforcement has also been demonstrated in other countries. For example, Homel (1990; Homel et al., 1995) evaluated the effects of Random Breath Test (RBT) operations in Australia. This enforcement strategy

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differs from U.S. sobriety checkpoints in that drivers are randomly stopped and asked to submit to a breath test, whereas in the U.S. stops are not random and a breath test is only requested after probable cause has been developed. Homel found an approximate 25% reduction in alcohol-related fatalities associated with the implementation of a widespread RBT program.

Despite this evidence, Fell et al. (2003) found in a nationwide survey that, in many U.S. states, law enforcement agencies rarely use sobriety checkpoints. When the survey was conducted in 2000, 13 states did not use sobriety checkpoints, mainly because court rulings determined that checkpoints did not comply with state constitutions. Of the remaining 37 states, only 11 reported conducting statewide checkpoints as frequently as once a week. Cost and the large number of officers necessary were among the most frequently cited reasons for not conducting checkpoints. However, Stuster and Blowers (1995) found that checkpoints involving small numbers of officers (four to six) were as effective in reducing alcohol-related crashes as those employing a dozen officers or more. A procedure for small communities to implement such low-manpower checkpoints has been described by Voas, Lacey, and Fell (2005). Thus, it should be possible for communities with relatively small numbers of patrol officers to conduct effective sobriety checkpoints. This is important, because more than half of all alcohol-related traffic fatalities occur on rural roadways (NHTSA, 2004), suggesting that small communities experience significant impaired-driving problems.

We conducted this study to evaluate this concept in two rural counties: Raleigh and Greenbrier in West Virginia. The intent was to establish a sustainable, low-manpower DUI checkpoint enforcement program that would overcome the persistent objections of personnel requirements and cost. We evaluated both the feasibility and effectiveness of such a program. West Virginia, a largely rural state, was identified as an appropriate venue for the study. Two experimental counties and two comparison counties were recruited to participate. Existing police policies in the communities under study called for a minimum of eight officers to conduct sobriety checkpoints legally. Inquiries revealed, however, that the policy was an assumption without legal basis, so police procedures/general orders were revised to permit checkpoints operated by fewer officers.

METHODS

Research Design

Raleigh and Greenbrier Counties, in the southern part of the state, were recruited as experimental counties. Harrison and Monongalia, in the northern part of the state, were identified as comparison counties. The primary criterion for the comparison counties was sufficient geographic separation to minimize contamination by public-information efforts in the experimental counties. Officials in the comparison counties also indicated they would not dramatically change DUI enforcement activity during the test period.

In spring 2003 baseline data on public awareness and self-reported behavior, as well as driver BACs, were gathered in the

experimental and comparison counties. Drivers were surveyed when renewing or applying for their driver's licenses at departments of motor vehicles (DMVs) and at the roadside on weekend nights. From August 2003 to 2004, weekly sobriety checkpoints were conducted in the experimental counties, whereas basic DUI enforcement strategies remained unchanged in the comparison counties. Concurrently, publicity for the sobriety checkpoints began. One year after the baseline surveys, follow-up surveys to measure driver BACs, public awareness, and self-reported behavior were conducted at the roadside and at DMVs in all four counties.

The surveys of drivers at DMVs addressed their perceptions of the intensity of DUI enforcement and their drinking and driving behaviors. Drivers in roadside surveys were asked similar questions beyond being asked to provide a breath sample to measure BAC.

Program

Low-manpower checkpoints were to be conducted in each of the experimental counties once a week for one year, beginning 1 August 2003, for a total of 104 checkpoints. A few checkpoints were cancelled because of inclement weather; nonetheless, a total of 90 low-manpower checkpoints still were conducted during the study period: 48 in Greenbrier County and 42 in Raleigh County. Checkpoints were conducted in both municipal and rural areas and were staffed by municipal police officers as well as sheriff's deputies. The number of officers involved in each checkpoint varied from three to five. Passive alcohol sensors (PASs) were used during checkpoint operations to aid officers in identifying drinking drivers (Ferguson et al., 1995). Additionally, 16 checkpoints were conducted in the experimental counties during the program year under other auspices that, though separate from the low-manpower checkpoints, were still able to be counted as totals in the county for a grand total of 106 checkpoints; this compares with 25 checkpoints conducted during the preceding year. In contrast, 19 checkpoints were conducted in the comparison counties during the program year and 13 during the preceding year. The low-manpower checkpoints were relatively inexpensive to conduct, costing from \$350 to \$400 per checkpoint.

The local program coordinator contacted local news outlets about the program, and initiation of the program was covered by both local and statewide electronic and print media. The program also generated letters of support in local newspapers. Throughout the program, there were several print, radio, and television stories, but local coverage waned toward the end of the program. An incident early in the enforcement period brought attention to the initiative and heightened its overall profile. A man had carjacked his estranged girlfriend's vehicle, leaping into the back of her pickup, breaking out the rear window, and forcing her to drive to a rural area. When they passed through a checkpoint, officers intervened and arrested him, thus averting a potential murder. The checkpoint was in a location where one had not been conducted prior to the program and the incident was reported widely by local and state media. A congratulatory "thumbs-up" notice appeared in a local newspaper.

Survey Procedures

Researchers worked with a West Virginia Law Enforcement Liaison (LEL) and others in the Governor’s Highway Safety Program to recruit assistance from law-enforcement agencies in the four counties. Roadside surveys were conducted as a separate data-collection activity and not in conjunction with checkpoints. We, along with the law-enforcement agencies, determined roadside survey locations and we used established survey techniques developed for previous national roadside surveys (Voas et al., 2000). The protocol incorporated PASs to screen drivers, preliminary breath test (PBT) devices, and a brief interview. Survey teams of civilian interviewers were selected and trained by a research team member and the LEL. The LEL coordinated and supervised the actual roadside surveys. Surveys were conducted between 10:00 pm and 3:00 am on Fridays and Saturdays in spring 2003 and in spring 2004, at the same locations, during the same periods, on the same weeknights, and at the same times. There were 20 survey evenings in 2003 and 19 in 2004.

An off-duty police officer directed motorists into a safe area off the roadway (e.g., a closed service station lot). Interviewers then approached the vehicle, explained the voluntary nature of the survey to the driver, and obtained informed consent for a brief interview. The 15-item survey lasted about five minutes and covered topics such as general demographics, annual mileage information, origin and destination of the trip, drinking, and drinking and driving. Additionally, interviewers recorded the number of passengers, use of seat belts, and driver gender. After the interviews, PBTs were used to obtain BACs from the drivers. The PBTs displayed the BAC results. If a driver registered a BAC of 0.05% or higher, either a sober passenger drove the vehicle home or a ride home was provided. PAS readings were used to provide a qualitative measure of drinking for drivers who refused the breath test.

The short paper-and-pencil surveys conducted at DMVs were administered to driver’s license applicants after they had completed their applications and while they waited for their photo licenses to develop. Applicants were questioned after they knew they would receive their licenses to avoid undue biases in their responses. This type of convenience survey has been used frequently to obtain a sample of licensed drivers in DMVs (Lacey et al., 1999). Experience has shown that a reasonably representative sample of motorists is obtained using this method, provided the surveys are available throughout the time the office is open for business.

RESULTS

Roadside Surveys

Table I shows sample sizes for baseline and post-intervention roadside surveys for the experimental and comparison counties. In the experimental counties, data were collected from a larger number of respondents to increase statistical power. Overall, the participation rate was very high; only 106 (2.4%) of the 4,389 drivers approached refused to participate. However, there was some further attrition in obtaining breath samples because of issues such as insufficient breath sample, failure to match breath

Table I Roadside survey sample sizes for experimental and comparison counties

	Experimental Counties (n = 3,128)		Comparison Counties (n = 1,261)		Total
	Greenbrier	Raleigh	Harrison	Monongalia	
Baseline	665	576	403	169	1,813
Post intervention	1,141	746	423	266	2,576
Total	1,806	1,322	826	435	4,389

sample with other survey data, equipment error, or insufficient time. These missing data reduced the dataset to 3,571 cases (81%) with valid BAC readings.

There were no significant gender differences among respondents in the experimental and comparison counties at baseline ($\chi^2(1) = 0.72, p > 0.10$) or post intervention ($\chi^2(1) = 0.11, p > 0.10$). There were, however, significant differences in the race of respondents at baseline and post intervention: Race was categorized as Caucasian, African American, and Other (due to very small n-sizes for all other races which were pooled into the Other category). Caucasians were slightly underrepresented and African Americans were slightly overrepresented in our experimental group, relative to the comparison group, $\chi^2(2) = 18.97, p < .001$. The analysis of our post-intervention data revealed a similar pattern, $\chi^2(2) = 37.97, p < .001$. A one-way analysis of variance revealed no significant age difference among respondents in the experimental and comparison counties at baseline (36.84 vs. 35.67; $F(1, 1684) = 2.30, p > 0.10$), but the post-intervention mean age for respondents was significantly higher in the experimental counties than in the comparison counties (37.6 vs. 34.3 years; $F(1, 2484) = 23.90, p < 0.001$).

Because of the race and age differences among respondents subsequent analyses controlled for these factors. We performed binary logistic regression analyses to compare changes over time in the experimental and comparison counties with respect to the proportion of drivers with positive BACs above .01%, BACs of 0.05% or higher, and BACs of 0.08% or higher (with each outcome dichotomized). Treatment status (experimental vs. comparison), time (baseline vs. post intervention), their interaction term, race, and age were included in the regression equation. Subsequent analyses also examined responses to the various survey questions.

The proportion of drivers with BACs of 0.01% or higher, BACs of 0.05% or higher, and BACs at 0.08% or higher were examined separately (Table II). Based on the test of the interaction terms in the logistic regression models, the proportion of

Table II Percentages with various BACs in experimental and comparison counties

Percent BAC	Experimental Counties		Comparison Counties	
	Baseline	Post intervention	Baseline	Post intervention
≥0.01	4.6%	3.6%	5.1%	4.5%
≥0.05	1.6%	1.0%	1.4%	2.8%
≥0.08	1.1%	0.7%	0.9%	1.5%

Table III DMV surveys: Respondents in experimental and comparison counties

	Experimental Counties (n = 1,994)		Comparison Counties (n = 1,956)		Total
	Greenbrier	Raleigh	Harrison	Monongalia	
Baseline	499	500	483	500	1,982
Post intervention	500	495	474	499	1,968
Total	999	995	957	999	3,950

drivers with positive BACs (>0.01%) was reduced by 5% from baseline to post intervention in the experimental counties relative to the comparison counties. However, this difference was not statistically significant (odds ratio (OR) = 0.95, $p > 0.10$).

The proportion of drivers with BACs at 0.05% or higher was reduced from baseline to post intervention in the experimental counties (1.6% vs. 1.0%), but went up in the comparison counties (1.4% vs. 2.8%). After controlling for sample differences, a 70% reduction was estimated in the experimental counties relative to the comparison counties, which was statistically significant (OR = 0.30, $p < 0.05$). For drivers with BACs of 0.08% or higher, the estimated relative decline was 64%, although the effect did not reach statistical significance (OR = 0.36, $p = 0.18$).

DMV Surveys

Table III shows the number of DMV survey respondents in the experimental and comparison counties at baseline and post intervention. There were significant gender differences among respondents in the experimental and comparison counties at baseline ($\chi^2(1) = 3.94, p < 0.05$) and postintervention ($\chi^2(1) = 4.93, p < 0.05$). There were no significant race differences among respondents in the experimental and comparison counties at baseline ($\chi^2(4) = 7.73, p > 0.10$), but differences were apparent post intervention ($\chi^2(4) = 46.94, p < 0.001$) (Table III). There also were significant differences in the self-reported age of respondents at baseline ($\chi^2(4) = 67.05, p < 0.001$). Because of the sample differences, these factors were controlled for in all subsequent analyses.

Table IV presents the survey questions and responses for respondents in the experimental and comparison counties during the baseline and post-intervention periods. Binary logistic regression was used to analyze most data because the items had dichotomous outcomes. Respondents were asked whether during the past 30 days they had seen or heard about a police checkpoint. After the intervention respondents in the experimental counties were significantly more likely to say they had (41% vs. 62%), whereas respondents in the comparison counties were less likely to say they had (42% vs. 38%; OR = 2.64, $p < 0.001$).

Table IV DMV survey: Responses of drivers in experimental and comparison counties

	Experimental Counties				Comparison Counties							
	Baseline		Postintervention		Baseline		Postintervention					
	No	Yes	No	Yes	No	Yes	No	Yes				
In the past 30 days have you seen or heard about a police checkpoint?	587 (59.0%)	408 (41.0%)	373 (37.8%)	613 (62.2%)	565 (57.9%)	411 (42.1%)	592 (61.7%)	367 (38.3%)				
In the past 30 days have you gone through a police checkpoint?	860 (86.8%)	131 (13.2%)	745 (75.3%)	244 (24.7%)	843 (86.8%)	128 (13.2%)	852 (88.7%)	109 (11.3%)				
Have you recently read, seen, or heard any news on impaired driving?	474 (47.7%)	520 (52.3%)	332 (33.6%)	656 (66.4%)	530 (54.2%)	448 (45.8%)	488 (50.8%)	472 (49.2%)				
Compared with three months ago, do you see police on the roads you normally drive?	Same/ less often	More often	Same/ less often	More often	Same/ less often	More often	Same/ less often	More often				
	640 (66.5%)	323 (33.5%)	570 (59.8%)	383 (40.2%)	667 (71.0%)	272 (29.0%)	632 (67.4%)	306 (32.6%)				
In the past 30 days how many times have you driven within two hours after drinking?	One or more	None	One or more	None	One or more	None	One or more	None				
	76 (9.0%)	767 (91.0%)	86 (9.5%)	817 (90.5%)	87 (9.6%)	823 (90.4%)	76 (8.9%)	778 (91.1%)				
In the past 30 days how many times did you drive when you had too much to drink?	32 (3.9%)	788 (96.1%)	31 (3.6%)	837 (96.4%)	27 (3.0%)	865 (97.0%)	13 (1.6%)	808 (98.4%)				
	Too weak	About right	Too strong	Too weak	About right	Too strong	Too weak	About right	Too strong			
Is enforcement of drinking-and-driving laws in your community too strong, too weak, or about right?	453 (49.9%)	414 (45.6%)	41 (4.5%)	370 (42.6%)	415 (47.8%)	83 (9.6%)	378 (43.1%)	435 (49.6%)	64 (7.3%)	365 (42.0%)	434 (49.9%)	70 (8.1%)

After the intervention, respondents in the experimental counties were significantly more likely to report they had gone through a police checkpoint during the past 30 days (experimental: 13% vs. 25%; comparison: 13% vs. 11%; OR = 2.40, $p < 0.001$). Similarly, there was an increase in the percentage of respondents in the experimental counties reporting they had recently read, seen, or heard news about impaired driving (experimental: 52% vs. 66%; comparison: 46% vs. 49%; OR = 1.51, $p < 0.01$). Respondents were asked about their drinking-and-driving practices during the past 30 days. Fewer than 5% of respondents in either the experimental or the comparison counties admitted to drinking and driving after having too much to drink. There was little change in the responses to this question from respondents in the experimental counties between baseline and post intervention (3.9% vs. 3.6%). The percentage of respondents in the comparison counties admitting to drinking and driving declined from 3% to 1.6%, not significantly different from the change in the experimental counties (OR = 1.53, $p > 0.10$).

Respondents were asked whether enforcement of drinking-and-driving laws in their communities was too strong, too weak, or about right. There was a significant interaction of the treatment and time effects (OR = 1.19, $p > 0.05$). The proportion of respondents answering “too weak” decreased in the experimental counties between baseline and post intervention, whereas responses of “about right” and “too strong” increased. This change did not occur in the comparison counties. Finally, respondents in the experimental counties reported after the intervention that they felt they had a higher likelihood of being stopped (OR = 0.76, $p < 0.001$). Results of ordinal logistic regressions were used for these two analyses because the outcomes had more than two levels and were not normally distributed.

DISCUSSION AND CONCLUSIONS

This study demonstrated that a sobriety-checkpoint enforcement program using only three to five police officers can be a very effective deterrent against drinking and driving in rural jurisdictions. These checkpoints can be maintained over a long period without outside funding. Because these checkpoints were conducted with simplicity and ease, police administrators in the experimental communities have embraced the concept and continued the program after the conclusion of the formal research study. This is particularly important in rural communities with fewer staff resources, but it also may be appropriate on certain roadways in urban areas.

Roadside surveys, conducted after the program had been in place for about 10 months, revealed large reductions in the proportions of drinking drivers with higher BACs (0.05% or higher) at the experimental sites; although, the overall proportion of drivers who had been drinking at all declined only a little (5%). Also, drivers with illegal BACs (0.08% or higher) decreased 64% in the experimental counties relative to the comparison counties, but this decrease did not meet statistical significance. Thus, for the three roadside survey measures of drinking and driving, only one—that of drivers with BACs of 0.05% or higher—showed

significant reductions. This pattern is understandable in that, fortunately, driving and BACs of 0.08 and higher is quite rare and, thus, with our limited sample size, would require even more dramatic reductions to approach statistical significance. Similarly, the intent of the intervention is primarily to reduce driving with BACs at impairing levels, which was achieved but without substantially reducing all drinking and driving. This is consistent with self-reported data, as drivers from the experimental and comparison counties interviewed at DMVs did not report lower levels of drinking and driving, nor of driving after having too much to drink. It should be noted that in the experimental counties, self-reported driving after having too much to drink was slightly higher in both pre- and postmeasures than in the comparison counties, though not to a statistically significant extent. Overall, these results suggest that the checkpoints reduced driving after heavier drinking but did not affect the overall likelihood of drinking and driving.

Survey data collected at the local DMVs confirmed that drivers in the experimental counties were aware of the increased enforcement. There was widespread publicity at the beginning of the checkpoints that waned toward the end of the program. The lack of paid media may be less important in a rural community, where information can be spread by word of mouth. After the program had been under way for some time, more of the respondents reported having recently read, seen, or heard about checkpoints, and more of them said they actually had been through one. There was no change in the perception or experience of enforcement during the same period in the comparison counties.

Though checkpoints are known to be effective, they are not as widely used in the United States as they should be. Police administrators often contend that they are reluctant to conduct checkpoints because of the drain on both personnel and financial resources. This project has demonstrated that low-manpower checkpoints can have the desired effect of reducing impaired driving without unduly taxing the financial or human resources of even small agencies. Because they tend to involve more officers, jurisdictions that conduct checkpoints on a regular basis are more dependent on supplemental government funding to maintain them. Low-manpower checkpoints could serve to expand DUI enforcement in jurisdictions where additional funds are not available and where police administrators perceive them to be costly or difficult to implement, regardless of the size of the jurisdiction.

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