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16. Abstract

Flexible checkpoints are sometimes referred to as "phantom checkpoints," "public awareness checkpoints," "mobile awareness patrols," and "mock checkpoints." This checkpoint strategy involves staging a checkpoint, but not actually staffing the checkpoint or stopping drivers. Instead, as an example, a BATmobile, a DWI trailer, or another kinds of enforcement vehicles are parked on the side of the road and signs are positioned to indicate that DWI checkpoint activity is about to begin. Only one or two officers or auxiliary personnel are needed to work one of these checkpoints. The "checkpoint" can be readily moved to other locations during the evening. No drivers are stopped and no arrests are made at flexible checkpoints unless a driver provokes attention due to an unsafe driving action while passing by the checkpoint area. However, the primary objective of a checkpoint—awareness and hopefully deterrence—is accomplished by the number of drivers observing the law enforcement activity.

During this project, we reviewed flexible checkpoint activity nationwide, identified jurisdictions with experience conducting them, and discussed issues involved in implanting such programs. We learned that flexible checkpoints are a versatile, low-cost tool that virtually any size law enforcement agency can adapt to enhance enforcement and increase public awareness of enforcement efforts. A field test of the effectiveness of flexible checkpoints was conducted by the Illinois State Police in Madison County with Winnebago County serving as a comparison site. Checkpoint activities, termed Roadside Safety Checks (RSCs) in Illinois, were conducted monthly at both sites during 2009, with flexible checkpoints augmenting the RSCs in Madison County. ISP headquarters and field staff were supportive of the flexible checkpoint concept, thought this concept was practical and easy to implement, thought it would enhance the potential general deterrence effects of standard RSCs, and said they planned to use flexible checkpoints in the future.

While we found no adverse effects resulting from the implementation of flexible checkpoints, positive effects that can be attributed to flexible checkpoints have not been definitely proven. The evaluation did not show a significant reduction in the odds of a single-vehicle nighttime crash in the test community. The results of a public survey of drivers did not produce an increase in public awareness of checkpoint activity. A larger scale multisite study of this concept may more definitively address the issue of the effectiveness of this (as yet not demonstrably effective) strategy. The use of flexible checkpoints is gaining acceptance with law enforcement agencies. The agencies we contacted had not encountered any adverse publicity and believe that flexible checkpoints are useful and economical. They believe flexible checkpoints expand the general deterrence reach of their other DWI countermeasure enforcement strategies.

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Background

There is substantial evidence that an important factor in impaired driving deterrence is the perceived probability of apprehension. Raising the perceived probability of apprehension is an important element of an effective impaired driving enforcement program. Checkpoint operations are highly visible and are often used for anti-DWI enforcement efforts. However, checkpoints can be resource intensive and so it is often difficult to generate as much use of that tactic as is desired.

There are alternative enforcement methods and tactics to increase the scope of traditional checkpoints. A lower cost, low-staffing checkpoint method to augment traditional checkpoints is flexible checkpoints, sometimes referred to as "phantom," "mobile awareness," "public awareness," or "mock" checkpoints. This checkpoint strategy involves staging, but not fully staffing the checkpoint. Instead, the appearance of setting up a checkpoint is created with, for example, a small number of officers setting out signs, parking one or more patrol vehicles with flashing lights and a "BATmobile" (mobile breath testing facility) or other DWI enforcement vehicle on the side of the road. The "checkpoint" can then be moved to other locations during the evening. No drivers are stopped and no arrests are made, unless some provocation occurs by drivers passing by the flexible checkpoint. However, a main objective of a checkpoint—awareness—is accomplished by the number of drivers observing and potentially telling others about the law enforcement activity.

Flexible checkpoints, however, should not be used in isolation. Instead, they should be used to supplement other DWI enforcement activity employed in the jurisdiction, either concurrently or within a short period of time of those other activities. This is intended to enhance the visibility, and, theoretically, increase the deterrent effect of the jurisdiction's overall enforcement operations by heightening awareness of enforcement activities. The motoring public should not become aware of the "phantom" nature of some of the enforcement efforts. However, little is known about the actual use of flexible checkpoints nationwide, or their effectiveness in reaching these objectives. Thus, additional research and evaluation may be warranted.

Objectives

The main objectives for this project were:

- Determine the extent that flexible checkpoints are being used in the United States.
- Identify four agencies that use flexible checkpoints, document problems or concerns that have arisen in those agencies, and determine and document any solutions developed that could be used by other interested agencies that may want to implement flexible checkpoints.
- Conduct a study to determine the effectiveness of flexible checkpoints in one site.

Methods

The extent of flexible checkpoint use was studied by networking through the National Highway Traffic Safety Administration Regional Offices and State Highway Safety Offices; six States were identified where flexible checkpoints were being conducted. Telephone discussions were held with law enforcement supervisors to gain an understanding of how flexible checkpoints were employed in those jurisdictions, if any problems were encountered and, if so, any solutions that were developed to minimize or eliminate the problems.

A field test of the effectiveness of flexible checkpoints was conducted by the Illinois State Police (ISP) in Madison County with Winnebago County serving as a comparison site. Checkpoint activities, termed Roadside Safety Checks (RSCs) in Illinois, were conducted monthly at both sites during 2009, with flexible checkpoints augmenting the RSCs in Madison County. ISP headquarters and field staff were supportive of the flexible checkpoint concept, thought this concept was practical and easy to implement, thought it would enhance the potential general deterrence effects of standard RSCs, and said they planned to use flexible checkpoints in the future.

Results

The use of flexible checkpoints is gaining acceptance with law enforcement agencies. The agencies we contacted had not encountered any adverse publicity and believe that flexible checkpoints are useful and economical. They believe flexible checkpoints expand the general deterrence reach of their other anti-DWI efforts.

The evaluation of the use of flexible checkpoints to augment traditional roadside safety checks in Illinois did not show a significant reduction in the odds of a SVN crash in the test community. The results of a public survey conducted at driver licensing agencies in Illinois did not produce an increase in public awareness of checkpoint activity, although more survey respondents in the test community reported driving after drinking less often at the end of 2009 than in 2008 before the monthly RSCs and flexible checkpoints were implemented. However, this finding was not statistically significant.

Conclusions and Recommendations

Flexible checkpoints are a versatile, low-cost tool that virtually any size law enforcement agency can adapt to enhance enforcement and increase public awareness of enforcement efforts. We found both during our review of flexible checkpoint activity across the country and in the context of the evaluation of flexible RSCs in Illinois, that the implementation of flexible checkpoints is readily accomplished, economical, and supported by law enforcement in general. However, while no adverse effects resulting from the implementation of flexible checkpoints have been identified, positive effects that can be attributed to flexible checkpoints have not been definitively proven.

One challenge to enhancing general deterrence through flexible checkpoints is that they essentially must affect public awareness through direct contact with the motoring public and less so through other public information mechanisms that are traditionally used to increase awareness of enforcement activities. For example, one would not specifically advertise that flexible checkpoints were being used, but rather publicize the active enforcement that was underway and

hope that encountering flexible checkpoints enhanced the deterrent value of the traditional enforcement that they were supporting. This may not have the multiplicative effect one expects from the use of traditional mass media.

We recommend that law enforcement agencies implement flexible checkpoints as a potential means of enhancing the effectiveness of other DWI countermeasure enforcement efforts at minimal cost. A larger scale, multisite study of this concept could more definitively address the issue of the effectiveness of (as yet not demonstrably effective) strategy.

Different applications of flexible checkpoints could be considered both operationally and in the context of an evaluation. These include:

- Possibly employing multiple flexible checkpoints in conjunction with a single traditional enforcement effort (e.g., traditional checkpoint, saturation, or roving patrol).
- Encouraging law enforcement agencies to take the adaptability of flexible checkpoints into account and vary their use to meet the needs of their communities, sometimes employing multiple variations (enforcement enhancement and solely public awareness) as needed.
- Employing flexible checkpoints in the early evening, for example, from 6 to 9 p.m. (when more drivers are on the road), in combination with a standard checkpoint, saturation, or roving patrol in the later hours (when impaired driving fatalities are more likely to occur) maximizes the visibility and productivity of the law enforcement activity and the likelihood of encountering and detecting impaired drivers.

It should be recognized that the many potential variations for employing flexible checkpoints may make it difficult to test for the specific effectiveness of a single implementation strategy. Any future studies need to carefully document the flexible checkpoint methods implemented and work closely with the associated law enforcement agencies to capture the nuances of that implementation.

Introduction and Background

Introduction

This document is the final report for *Determine the Effectiveness of Flexible Sobriety Checkpoints* (Project NTS-01-5-05096 under Contract DTNH22-05-D-25043) for the National Highway Traffic Safety Administration. The project's primary objectives were to assess the extent of use of flexible checkpoints in the United States and then to conduct a study in one site to determine the feasibility of implementing flexible checkpoints as well as their potential effectiveness.

Background

Importance of Checkpoints as an Impaired Driving Deterrence Measure

Programs for preventing impaired driving (i.e., DWI or DUI[1]) can be classified into three levels: (a) primary prevention—reducing risky alcohol consumption; (b) secondary prevention—reducing drinking and driving; and (c) tertiary prevention—reducing the recidivism of convicted drinking drivers. In most communities, prevention efforts concentrate on creating deterrence to impaired driving through enforcement. Deterrence, as described by Ross (1984) and classical writers, is a function of the perceived probability of apprehension, the severity of the resulting sanction, and the swiftness with which the penalty is administered. There is substantial evidence that the most important of those factors is the probability of apprehension because the public is generally unaware of the sanctions, and tends to believe that they can be avoided or ameliorated (Ross & Voas, 1989; Ross, 1992a). When the presence of law enforcement was certain (e.g., checkpoints, patrol cars positioned outside of bars), repeat DWI offenders reported a decrease in DWI behavior (Wiliszowski, Murphy, Jones, & Lacey, 1996). Thus, raising the perceived probability of apprehension is the most essential element of an effective DWI enforcement program. The perceived risk of apprehension is not necessarily the number of officers engaged in the enforcement activity or the number of DWI arrests, but the public's perception of that enforcement. Thus, conducting enforcement that the public is made aware of and that is associated with DWI countermeasure efforts is important to an effective deterrence program. DWI checkpoints are often used for anti-DWI countermeasure enforcement efforts. However, because enforcement administrators often perceive that mounting them is resource intensive and that checkpoints do not yield a large number of arrests relative to costs expended, it often is difficult to generate as much use of that tactic as is desired by many public safety advocates. This is particularly true in rural areas where most fatal alcohol-impaired driving crashes occur, but where less of the anti-DWI enforcement takes place.

[1] DWI refers to the offense driving while intoxicated or driving while impaired; DUI refers to the offense driving under the influence. Some States label the impaired driving offense DWI, others DUI. We use these labels interchangeably within this report.

The Problem

Although the research evidence is limited, it is clear that publicizing enforcement is essential to its effectiveness (Levy, Shea, & Asch, 1988; Levy, Asch, & Shea, 1990; Wells, Preusser, & Williams, 1992; Lacey, Jones, & Smith, 1999). The most effective methods for attracting public and media coverage are not well documented, and the resources available to most law enforcement departments for publicizing their programs are limited, particularly in the growing suburban areas where the major newspapers and TV stations devote little coverage to local community affairs. A partial response to this problem is to use enforcement methods that attract public attention and that are easy to publicize. Sobriety checkpoints are an example of such a method. Concern with being stopped and checked for alcohol use may attract attention to that enforcement method. Further, checkpoint operations are highly visible, so they provide a direct indication to the public that an intensive enforcement effort is underway.

Studies in the early 1980s found significant decreases in alcohol-related crashes associated with sobriety checkpoint programs in various communities (Epperlein, 1985; Lacey et al., 1986; Voas, Rhodenizer, & Lynn, 1985). Later studies (Levy, Shea, & Asch, 1988; Levy, Asch, & Shea, 1990; Wells, Preusser, & Williams, 1992; Lacey, Jones, & Smith, 1999) confirmed that frequent, highly publicized checkpoint programs substantially reduced alcohol-related crashes by 10 to 20 percent. A summary of the U.S. literature examined nine studies through the early 1990s and concluded that "the accumulation of evidence supports the hypothesis that checkpoints reduce impaired driving" (Ross, 1992b). The Centers for Disease Control and Prevention (CDC) conducted a systematic review of the evidence regarding interventions to reduce alcohol-impaired driving (Shults et al., 2001; also see Elder, Shults, Sleet, Nichols, Zaza, & Thompson, 2002). That review included 15 studies of the effectiveness of sobriety checkpoints and concluded that they produced a median reduction of 20 percent in fatal and injury crashes associated with sobriety checkpoint programs.

The evidence for the effectiveness of checkpoints has encouraged NHTSA to promote their use by law enforcement agencies throughout the country. However, although checkpoints increase the deterrence to impaired driving because they are more likely to attract public and media attention than traditional patrol enforcement activities, their effectiveness is still limited if they are not extensively employed and well publicized. Fell, Ferguson, Williams, and Fields (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 checkpoints within the State as frequently as once a week. Cost and the large number of officers necessary were among the most frequently cited reasons for the limited use of checkpoints. However, Stuster & 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 as low staffing 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, 2006), suggesting that small communities experience significant impaired-driving problems.

A study of low staffing checkpoints (Lacey, Ferguson, Kelley-Baker, & Rider, 2005) evaluated this concept in two rural counties, Raleigh and Greenbrier, in West Virginia. The intent was to establish a sustainable, low-staffing DUI checkpoint enforcement program that would overcome the persistent objections of personnel requirements and cost. The study assessed 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 law enforcement 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 law enforcement procedures/general orders were revised to permit checkpoints operated by fewer officers. Each of these two relatively rural counties conducted checkpoints staffed by from three to five officers (as opposed to the customary eight or more) at least once a week for a full year. Two comparison counties continued DWI enforcement at a pace similar to previous years. The experimental counties reported that the checkpoints were relatively low cost ($350 to 400 per checkpoint), could be readily staffed, even with the low overall staffing levels of the agencies involved, and could be sustained throughout the full year. Roadside surveys were conducted just before initiation of the program, and then one year later. The experimental counties experienced a reduction of the proportion of drivers with blood alcohol concentrations (BACs) over .05 grams per deciliter (g/dL) of 70 percent relative to the comparison counties. They also generated arrests other than for DWI, and even foiled a kidnapping/carjacking attempt. The concept attracted the attention of other agencies around the country and at the time of this report, agencies in 25 to 30 of West Virginia's 55 counties were conducting low-staffing checkpoints.

Based partially on the findings described above, expanded use of low-staffing and flexible (phantom) checkpoints have been proposed as ways to overcome the reluctance of law enforcement administrators to incorporate checkpoint activities into routine operations, extend the use of checkpoints to more places within jurisdictions as well as to rural areas where checkpoints would otherwise infrequently or never take place and thus increase public perceptions of risk of arrest. Any increased perception of law enforcement activity could subsequently result in fewer impaired drivers on roadways and reduced crashes and fatalities.

Flexible checkpoints are sometimes referred to as "phantom checkpoints," "public awareness checkpoints," "mobile awareness patrols," and "mock checkpoints." This checkpoint strategy involves staging a checkpoint, but not actually staffing the checkpoint or stopping drivers. Instead, as an example, a BATmobile, DUI trailer, or kinds of other law enforcement vehicles are parked on the side of the road and signs are positioned to indicate that DWI checkpoint activity is about to begin. Only a small number of officers or auxiliary personnel (one or two) are needed to work one of these checkpoints. The "checkpoint" can readily be moved to other locations during the evening. No drivers are stopped and no arrests are made at flexible checkpoints unless a driver provokes attention due to an unsafe driving action while passing by the checkpoint area. However, the primary objective of a checkpoint—awareness and hopefully deterrence—is accomplished by the number of drivers observing the law enforcement activity.

This type of enforcement activity should not be used in isolation. Instead, they should be used to supplement other DWI countermeasure activity employed in the jurisdiction, either concurrently or within a short period of time of those other activities. This is intended to enhance visibility and, theoretically, increase the deterrent effect of the jurisdiction's overall enforcement operations by heightening awareness of enforcement activities. The motoring public should not

become aware of the "phantom" nature of the efforts. As noted above, should a driver's actions generate concern for public safety, law enforcement officers from the flexible checkpoint should stop the vehicle or auxiliary personnel should radio concerns to a law enforcement unit in the area.

Though these flexible checkpoints are intended "to raise the awareness level of the motoring public of DWI law enforcement presence," and "create an enhanced perception of risk," little was known about their actual use nationwide, or their effectiveness in reaching those objectives. Those were the objectives of this project.

An initial phase of this project was to assess the extent to which flexible checkpoints were being conducted nationwide, identify some jurisdictions with experience conducting them and learn whether there were specific issues involved in implanting such programs. The second phase of the project was to identify jurisdictions willing to implement and test flexible checkpoints and assess the feasibility of implementing them and their potential effects on public awareness and possibly crashes.

State Restrictions on Checkpoints

Currently, there are twelve States that prohibit checkpoints either by statute, State constitution or court rulings. They are Alaska, Idaho, Iowa, Michigan, Minnesota, Montana, Oregon, Rhode Island, Texas, Washington, Wisconsin, and Wyoming. Thus, jurisdictions in these States would not be able to implement flexible checkpoints.

Distinctions between Types of Checkpoints

Three different variants of checkpoint activities have been described above: traditional checkpoints, low staffing checkpoints, and flexible checkpoints.

Traditional checkpoints typically require specific planning, justification and approval processes to be followed and a minimum number of officers. The planning often involves justifying the location of the checkpoint based on crash or other DWI activity data, developing an operational plan and site drawing, and obtaining command approval. Typically, they also require a supervisory level officer on site at the checkpoint and advance public notice that a checkpoint will be conducted on a certain weekend or week. Some jurisdictions may require that the checkpoint location afford a place where drivers may turn off onto another roadway to avoid going through a checkpoint. In most jurisdictions, there is also a requirement of having a specific number of sworn officers assigned to the checkpoint. Typically, this staffing requirement sets a minimum of eight or more officers, but may more generally require a sufficient number of officers to insure a safe operation. These checkpoints usually must have signage upstream of their location indicating they are checkpoints and often, but not necessarily, are supported by specialized equipment such as a mobile breath testing facility. Many times, traditional checkpoints involve the cooperation and participation of multiple law enforcement agencies.

Low staffing checkpoints usually must adhere to the same planning and approval standards as traditional checkpoints, but have a lower requirement in terms of number of sworn officers. Typically, that number is three to five, but in some jurisdictions as few as two officers may be required.

Flexible checkpoints typically do not involve active enforcement within the checkpoint location, are usually staffed by one or two officers (though in some jurisdictions can be staffed by auxiliary officers), and typically do not require the same formal planning and approval as traditional or low staffing checkpoints, though they often are deployed in support of a traditional or low staffing checkpoint. Another favorable aspect of flexible checkpoints for some agencies is that because active checkpoint enforcement is not involved, they can be located on roadways where checkpoints otherwise would not be permitted such as more traveled roads or intersections or, conversely, more rural locations. In addition, since officers who "work" flexible checkpoints rarely make arrests, they generally can remain visible on the road during their entire shift and they generally do not need to spend additional hours in court, which might be necessary if they were making arrests.

The resources required to deploy these different levels of checkpoints vary by jurisdictional requirements and salary levels, but decrease significantly from traditional, to low staffing, to flexible. Another consideration besides the effort and resource requirements for implementing a traditional checkpoint is the difficulty in staffing them. Many agencies noted that their respective staffs are stretched thin with both regular and overtime work and that it is increasingly difficult to recruit officers for checkpoint operations. This poses an additional barrier to their implementation and to a certain extent would make flexible checkpoints attractive if they enhanced the effectiveness of traditional or low staffing checkpoints.

Flexible Checkpoints Defined

Flexible checkpoints, sometimes referred to as "phantom checkpoints," "mobile awareness patrols," "public awareness checkpoints," or "mock checkpoints", are a low-cost, low-staffing alternative to traditional or even previously defined "low staffing" checkpoints. This checkpoint strategy involves staging but not fully staffing the checkpoint. Instead, the appearance of setting up a checkpoint is created with, for example, a small number of officers setting out signs, and one or more patrol vehicles with flashing lights and/or a "BATmobile" (mobile breath testing facility) or other DWI enforcement vehicle parked on the side of the road. The "checkpoint" can then be moved to other locations during the evening. No drivers are stopped and no arrests are made (unless warranted by unsafe driver actions near the checkpoint area); however, a main objective of a checkpoint—awareness—is increased by the number of drivers observing and potentially telling others about the perceived law enforcement activity. As stated throughout this report, the most important deterrent to impaired driving is the public perception that there is a high probability of apprehension and the use of flexible checkpoints may enhance that perception.

Flexible checkpoints should not be used in isolation. Instead, they should be used to supplement other DWI enforcement activity employed in the jurisdiction, either concurrently or within a short period of time of those other activities. This is intended to enhance visibility and, theoretically, increase the deterrent effect of the jurisdiction's overall enforcement operations by heightening awareness of enforcement activities. The motoring public should not become aware of the "phantom" nature of the enforcement efforts.

However, the term "flexible" literally describes the adaptability of this type of activity to the needs of different law enforcement agencies and communities. Flexible checkpoints are versatile enough to be incorporated into traditional enforcement activities (e.g., traditional checkpoints or roving DWI patrols), or solo as a public awareness tool.

Little is known about the utility of flexible checkpoints nationwide, or their effectiveness. Thus, additional research and evaluation systematically documenting and/or assessing the actual use of flexible checkpoints nationwide and their efficacy as a DWI enforcement countermeasure may be warranted.

Use of Flexible Checkpoints

To determine the extent of flexible checkpoint use in the United States, a three-step procedure was used. The first step was to contact the NHTSA regional offices to inform them of the study procedures, to obtain initial contact information at the State level, and to inquire about the general legality of checkpoints in the regions. The second step was to contact the Highway Safety Office for selected States and U.S. territories, and request the names of qualified individuals that could be contacted to discuss the topic of flexible checkpoints. The third step was to contact those individuals and learn about their experiences with flexible checkpoints.

Using this process, six states that reported conducting flexible checkpoints were identified, Arizona, Hawaii, Maryland, Pennsylvania, Virginia, and West Virginia.

Discussions were held in 2006 with law enforcement agencies in these States to gain an appreciation of certain aspects of their use of flexible checkpoints. The following table summarizes the results of those discussions with agencies in individual jurisdictions and input from people in State highway safety agencies.

Table 1. Summary of Findings About Use of Flexible Checkpoints in the United States

Topic	AZ	HI	MD	PA	VA	WV
Estimated frequency of flexible checkpoints:	3 in last 5 months	Rarely	15-20 times a year	10-15 times a year	Very rarely	3-4 days per week
Are there legal issues that must be addressed prior to implementation?	No	No	No	No	No	No
Need command or judicial approval?	No	No	No	No	N/A	Yes
Set-up time:	30 min	10 min	10 min	10-15 min	10 min	3-4 min
Checkpoint duration:	2-5 hours	Cannot exceed 3 hours	1 ½ hours	1 hour	1 hour	½ hour
Staffing levels:	1-2 officers	0 officers	cadets, enforcement explorers, and interns	0 officers	N/A	1 officer
Other types of checkpoints conducted?	Yes	Yes	Yes	Yes	Yes	Yes
Other types of checkpoints conducted at other locations during same shift as flexible checkpoint?	No	Rarely	No	No	Yes	Yes
Other types of checkpoints conducted at same location before or after flexible checkpoint?	Yes	Yes	No	No	No	No

Topic	AZ	HI	MD	PA	VA	WV
Other non-flexible checkpoint conducted on a regular basis?	Yes	Yes	Yes	Yes	Yes	Yes
Publicized?	Yes	No	No	No	N/A	No
Media inquiries about checkpoints in general?	Yes	Yes	Yes	Yes	N/A	Yes

On the basis of these discussions, it was determined that use of flexible checkpoints varies greatly as a function of agency. Some agencies, especially in Arizona and West Virginia, use them routinely. Individuals from those agencies viewed flexible checkpoints favorably, particularly the low cost of implementation. Agencies in other states allow them but used them sparingly, if at all.

Legal issues and media relations were not reported as problems in the implementation of flexible checkpoints. Besides staffing limitations, limited equipment (signs, other displays, and trailers) appears to be the main reason why some agencies do not conduct multiple checkpoints (either normal or flexible) simultaneously. Follow-up conversations in 2009 and 2010 with law enforcement supervisors in several of those agencies indicated that (with the exception of Hawaii) they were still using flexible checkpoints in a similar manner.

Types of Flexible Checkpoints

We learned about different basic types of flexible checkpoints, variously referred to as phantom checkpoints, flexible checkpoints, and mobile awareness patrols, during our discussions with law enforcement agencies. They all shared some common elements. These elements were that flexible checkpoints.

- Only required one or two officers or support personnel to set up and staff
- Used signage similar to the signs used at standard checkpoints
- Parked law enforcement vehicle(s) with emergency lights flashing by the side of the road
- Did not typically station officers in the road to interact with drivers
- Did not primarily intend to generate arrests through identifying impaired drivers as they passed by the checkpoint, and
- Through their presence and visibility were intended to generate general deterrence of impaired driving through heightened awareness of enforcement activity and increased perceived risk of detection by potential impaired drivers.

Minor variants were whether or not support vehicles such as signed DUI trailers used to transport checkpoint equipment or mobile testing and processing vehicles such as BATmobiles were positioned at the location and if cones were set up at the site in any manner.

One way flexible checkpoints differed was in the way flexible checkpoint *locations* were selected by the law enforcement agency. The most common approaches are described in Table 2.

Table 2. Approaches to Staging Flexible Checkpoint Locations

Approach	Description of Location Variant	Intent
Auxiliary mobile flexible checkpoint	• located in the general area of an active traditional checkpoint; • the location of the flexible checkpoint is moved several times during the period the active checkpoint is underway	Broaden the general deterrence effect of the active checkpoint
Directional flexible checkpoint	• located on roadways that lead to an active, traditional checkpoint • stationary	Funnel drivers attempting to avoid the enforcement activity into an active checkpoint
Stand alone flexible checkpoint (public awareness checkpoint)	• located in the same area that traditional checkpoints are most often deployed • stationary or mobile	Increase public awareness of enforcement activities when budgets and staffing do not permit active checkpoints

Flexible checkpoints also varied in the extent to which they were used as an active enforcement tool intended to facilitate arrests rather than purely as an awareness tool. That is, in some instances, flexible checkpoints may be set up and patrol vehicles are deployed nearby and patrol officers are on the lookout for drivers who appear to turn off to avoid the flexible checkpoint. Driving behavior is then observed and, if reasonable suspicion is developed, the officer will make a stop and investigate the possibility of impaired driving or some other offense. As mentioned earlier, another active enforcement enhancement approach is to position flexible checkpoints in a way that steers potential impaired drivers to an active checkpoint operation.

Another general way that flexible checkpoints varied as described in discussions with law enforcement was in their timing in relation to other enforcement activities. Generally, flexible checkpoints are deployed in conjunction with an active checkpoint or directed patrol operation. However, they can also be deployed as a public information and deterrence activity without another DUI specific enforcement effort underway. In one community that also conducts frequent traditional checkpoints, flexible checkpoints are sometimes deployed at the same time an active checkpoint is underway, but are also implemented on days and times when other checkpoints are not in operation. Other law enforcement agencies also used flexible checkpoints to encourage seat belt use. In at least one jurisdiction, flexible checkpoints were used to publicize seat belt use. At a traditional checkpoint that occurred in the area later, officers rewarded vehicle occupants who were belted (with free ice cream certificates) and issued warnings to those who were unbelted.

Concerns With and Responses to the Use of Flexible Checkpoints

None of the agencies we had discussions with reported any specific problems with conducting flexible checkpoints. Some indicated that local media were aware that they were using flexible checkpoints, but had not made an issue of the concept. One agency chose to label their “Mobile Awareness Units” as such to pointedly not have checkpoint in the name. This was done partly to obviate any possible objection to them not going through all the legal steps required to implement a traditional checkpoint.

We did encounter one jurisdiction that used the “flexible checkpoint” label to describe essentially what we have earlier described as a “low staffing checkpoint.” This agency also uses “Phantom Checkpoints” and uses the “Flexible Checkpoint” label for smaller active checkpoint efforts that are flexible in that they can be readily moved from one location to another.

Flexible Checkpoint Field Study: Illinois State Police (ISP)

Methodology

A field study was conducted in Illinois in partnership with the Illinois State Police (ISP) to assess the feasibility of implementing flexible checkpoints on a regular basis in conjunction with standard checkpoints or as referred to in Illinois, Roadside Safety Checks, (RSCs), and to attempt to determine whether implementing flexible checkpoints in that manner had any effect on public awareness and crashes. The basic experimental design was to identify two counties of comparable size within Illinois where it would be feasible to conduct flexible checkpoints in conjunction with regular checkpoints RSCs.

The two counties identified in conjunction with the ISP were Madison County, in Southeastern Illinois, with a population of 258,941, and Winnebago County in North Central, Illinois, with a population of 278,418. The ISP district commanders with jurisdiction over those counties both agreed to implement flexible checkpoints if desired. Thus we had two similar-sized counties with similar willingness to implement flexible checkpoints. This information was presented to NHTSA and they randomly selected Madison County to be the experimental county (where flexible checkpoints were to be deployed in conjunction with regular RSCs). Winnebago was selected as the control county where only regular RSCs would be implemented during the course of the study. The study period was Calendar Year 2009.

Description of Illinois State Police Flexible Roadside Safety Checks

The ISP in consultation with Bedford Research and NHTSA developed a procedure for how its Flexible RSCs were to be conducted. The basic procedure was to equip two law enforcement officers with separate vehicles and standard reflective RSC signage and deploy them within approximately a 3-mile radius of the standard RSC that they were supporting. The officers were instructed to be at the same general location, but to position their vehicles so that they were encountering different streams of traffic either by being on opposite sides of the road or different legs of an intersection. They deployed their RSC signs (and cones, if desired), activated their emergency lighting and in-vehicle video cameras. They were instructed not to make vehicle stops unless they observed impaired driving or other serious crime. They maintained traffic counts for the period they were at each location. The Flexible RSCs typically lasted 1 hour (including setup time) and then were moved to another location. Often, for each 5-hour standard RSC, there was a supporting Flexible RSC that moved to cover up to five different locations. Examples of typical Operational Plans for Flexible RSCs and standard RSCs appear in Appendices A and B.

Implementation

As indicated above, the basic project design was for the ISP to conduct standard RSCs on a monthly basis throughout 2009. In the experimental county (Madison), these standard RSCs were to be supplemented by Flexible RSCs, while in the control county (Winnebago), no

Flexible RSCs would be conducted. This basic design was adhered to by the ISP. In Madison County, the ISP conducted one standard RSC on a weekend night in each of the twelve months for a total of 12 RSCs. The RSCs each had a duration of 5 hours; the earliest were conducted from 9 p.m. to 2 a.m. and the latest from 11 p.m. to 4 a.m. The Madison County RSCs were all staffed exclusively by ISP officers. These RSCs were all supplemented by Flexible RSCs. The range of RSCs per Standard RSC was from three to five. A total of 52 Flexible RSCs were conducted throughout the year.

Twelve RSCs were conducted by the ISP in Winnebago County during 2009, one during each month of the year. On eleven of those RSCs, local law enforcement agencies supplemented the ISP staff.

Results

Opinions of ISP and Other LEAs

Debriefing discussions were held both with ISP headquarters staff and field supervisors who worked flexible RSCs. In all instances, they were supportive of the concept, thought flexible checkpoints were practical and easy to implement, and said they would continue to do them in the future. Their opinion was that Flexible RSCs enhance the potential general deterrence effects of Standard RSCs and they raised no adverse issues about the ability to staff them. NHTSA project funds helped defray the costs of purchasing the additional signs and some of the staff time. Standard Illinois Department of Transportation (IDOT) funding to support regular RSCs was also increased to help defray the additional staff time for this study. The additional cost for this model is the staffing costs for two additional law enforcement officers above the standard staffing an agency would use for a RSC.

IDOT has encouraged local law enforcement agencies to use Flexible RSCs. Five local LEAs reportedly received grant funds to implement Flexible RSCs. The five jurisdictions were: Calumet City, Collinsville, Joliet City, Palatine, and Rock Island. We spoke with representatives from these agencies and all were as supportive as ISP in the use of flexible checkpoints and have adapted their use to fit the needs of their communities.

- Calumet City police reportedly implemented both RSCs along with flexible RSCs extensively in 2009 with 10 each per 10 campaigns; unfortunately, this community is too small to be able to have any positive results in a crash analysis (as detailed in the crash analysis section of this report).
- Collinsville (located in Madison County, the test site), police used flexible checkpoints near their headquarters to emphasize seat belt use (*Click It or Ticket*).
- Joliet City police used one flexible RSC to funnel traffic to one operating RSC six times in 2009 during the national campaigns targeting impaired driving.
- Palatine police rotated the flexible RSCs hourly around high-traffic-volume areas in conjunction with an RSC during four separate campaigns.
- Rock Island police conducted two flexible RSCs with corresponding RSCs over two years (2008 and 2009) with the flexible RSC moving once per event. The flexible RSC location must be within a 10 mile radius of the operating RSC.

Counts of vehicles passing by RSCs and Flexible RSCs

One measure of exposure of checkpoints and thus potential public awareness is counts of vehicles passing through the checkpoints. During the 12-month test period, the ISP reported 1,891 vehicles passing the 12 standard RSCs conducted in Madison County. During that same period 2,267 vehicles were reported passing through Winnebago County RSCs. An additional 2,393 vehicles passed by Flexible RSCs in Madison County. Thus, implementation of the RSCs could have doubled driver exposure to checkpoint activities in Madison County compared to Winnebago County. (Note that depending on the Flexible RSC locations, some vehicles in Madison County may have passed by the Flexible RSC and through the standard RSC.)

Arrests

The ISP reported more arrests and issued more citations and warnings at Madison County RSCs (the test site) during the study period than the ISP along with local law enforcement in Winnebago County (the control site). However, there were more DUI arrests in Winnebago County (see Table 3 below).

Table 3. Arrests, Citations, and Warnings, by Site

	Madison County (Test)	Winnebago County (Control)
Arrests or Citations: (Includes DUI arrests)	420 (All ISP)	359 (216 by ISP; 143 by local LEAs)
DUI Arrests:	25 (All ISP)	36 (26 by ISP; 10 by local LEAs)
Warnings:	122 (All ISP)	112 (87 by ISP; 25 by local LEAs)

During the project year, officers staffing Flexible RSCs assisted with one crash investigation, issued 10 citations (including one DUI), and wrote one warning.

Driver License Surveys

Prior to and toward the end of the Flexible Checkpoint Operations implementation period in Madison County, the Illinois Secretary of State Office surveyed drivers at driver license offices in Winnebago and Madison Counties.

For one week in October 2008 and one week in December 2008, the Illinois Secretary of State, Department of Driver Services, distributed the surveys in the two licensing offices in Winnebago County (Rockford Central Driver Services and Roscoe Driver Services) and the three licensing offices in Madison County (East Alton Driver Services, Granite City Driver Services, and Edwardsville Driver Services). Drivers in these two counties were surveyed again over a 2-week period in October 2009.

A one-page, two-sided survey asked questions about drinking and driving habits and awareness of roadside safety checks or any special enforcement operations in the last 30 days. Most customers of the driver services offices were eligible to complete the survey including new drivers, license reinstatements, transfers from other states and license renewals. Those people coming to get titles, plates, or stickers were eligible as well, as long as they were drivers. Staff of the driver services offices handed the survey to customers and asked them to complete a voluntary and anonymous survey about highway safety and then return the completed surveys to a designated box or envelope. The survey appears in Appendix C. The sample sizes for each of the waves in each of the counties appear below.

Completed Surveys:

	2008	**2009**
Winnebago County	577	561
Madison County	890	603

Analyses of Driver License Surveys

The analytic design for these surveys incorporated, as the main factors, experimental versus comparison and pre- versus post- responses in a basic 2X2 design, with the interaction of these being the test of primary interest. The specific analysis for each outcome (or survey question) depended on the nature of its metric: dichotomous questions, such as yes/no responses, were analyzed using logistic regression; interval/ratio questions (such as counts), where sufficiently normal in distribution, were analyzed using ARIMA models. Questions that were ordinal in measure were analyzed using ordinal logistic regression.

Response patterns for questions of interest and significant differences between the two counties in terms of changes are summarized below. All statistical tests and reported probabilities refer to the interaction term of change over time (pre- versus post-) by site (Madison versus Winnebago).

Results of Driver License Survey Analyses

Overall, the survey respondents in the two counties were roughly equivalent in terms of age, gender, and race/ethnicity. Response patterns for questions of interest, and where there were significant differences between the two counties in terms of changes in response patterns, are summarized below in the responses for each question.

One question asked about frequency of driving. In Madison County there was an increase between waves in the percentage of drivers reporting driving every day (from 71.6% everyday, to 78.5% everyday) versus essentially no change in Winnebago County (interaction term p=.037).

How often do you usually drive a car or other motor vehicle?	**County**			
	Madison		**Winnebago**	
	pre-post		**pre-post**	
	Before	**During**	**Before**	**During**
Everyday	635 71.6%	441 78.5%	417 73.7%	436 73.3%
Several days per week	119 13.4%	62 11.0%	72 12.7%	89 15.0%
Once a week or less/never	133 15.0%	59 10.5%	77 13.6%	70 11.8%
Total	887 100.0%	562 100.0%	566 100.0%	595 100.0%

When asked whether they had gone through a checkpoint for DUI in the past 30 days, the proportion of drivers reporting doing so decreased somewhat in Madison County (from 13.2% to 10.5%), while that value increased in Winnebago County from 5.0 percent to 6.3 percent, though the differences in response patterns were not significant (p=.101) .

In the past 30 days, have you gone through a roadside safety check where police were looking for drunk drivers?		County			
		Madison		Winnebago	
		Before	During	Before	During
Yes	Count	116	59	28	37
	%	13.2%	10.5%	5.0%	6.3%
No	Count	762	502	531	548
	%	86.8%	89.5%	95.0%	93.7%
Total	Count	878	561	559	585
	%	100.0%	100.0%	100.0%	100.0%

When queried in a follow-up question about *how many times* they went through a checkpoint in the previous 30 days, there were declines in the average proportion of respondents reporting one or more times in Madison County, while a higher proportion reported one or more times on the second survey wave in Winnebago County (p=.010).

In the past 30 days, how many times have you gone through a checkpoint?		County			
		Madison		Winnebago	
		Before	During	Before	During
.00	Count	746	491	525	531
	%	84.9%	87.8%	93.9%	90.6%
1.00	Count	100	46	22	42
	%	11.4%	8.2%	3.9%	7.2%
2.00	Count	22	14	8	6
	%	2.5%	2.5%	1.4%	1.0%
3.00	Count	11	8	4	7
	%	1.3%	1.4%	.7%	1.2%
Total	Count	879	559	559	586
	%	100.0%	100.0%	100.0%	100.0%

When asked about driving after having *too much to drink* in the past 30 days, Madison County respondents decreased from 7.7 percent answering one or more to 4.0 percent, whereas the corresponding values in Winnebago County stayed about the same (2.6% to 2.9%) (p=.077).

About how many times in the past 30 days did you drive when you thought you had too much alcohol to drink?		County			
		Madison		Winnebago	
		Before	During	Before	During
0	Count	655	498	492	496
	%	92.3%	96.0%	97.4%	97.1%
1 or more	Count	55	21	13	15
	%	7.7%	4.0%	2.6%	2.9%
Total	Count	710	519	505	511
	%	100.0%	100.0%	100.0%	100.0%

Fewer Madison respondents reported driving after drinking *compared to a year ago* on the second wave of surveys (30.2%) following the year long RSC and flexible checkpoint implementation period than did on the first survey wave (35.7%) before the study began. Conversely, a smaller proportion of Winnebago County respondents reported less driving after drinking on the second wave than on the first wave of surveys (p=.050). Note that one-third of all respondents reportedly don't drink at all, so this question was only answered by those who drink alcoholic beverages.

Compared to one year ago, are you now driving after drinking? (check one)			County			
			Madison		Winnebago pre-post	
			Before	During	Before	During
q12#	1.00 MORE often	Count %	11 3.0%	4 1.9%	8 4.3%	2 1.1%
	2.00 about the same	Count %	243 66.8%	129 62.3%	104 55.3%	132 69.5%
	3.00 LESS often	Count %	110 30.2%	74 35.7%	76 40.4%	56 29.5%
Total		Count %within	364 100.0%	207 100.0%	188 100.0%	190 100.0%

Crash Analysis Results

Another measure of the potential effect of an intervention such as flexible checkpoints is to examine crash trends in both the experimental and comparison jurisdictions. A typical analytical approach is to look for any reduction in certain types of crashes in the experimental jurisdiction that might be attributed to the intervention. The data used in the following analyses are reportable crashes occurring in Illinois from January 2006 to October 2009, inclusive. These data were provided by IDOT. In our analyses, we used a common surrogate for alcohol-related crashes, single-vehicle nighttime crashes, since law enforcement reporting of alcohol-involvement in non-fatal crashes is known to be unreliable in many jurisdictions. (Although some counts for crashes for November and December 2009 were available, they were not used because the data were not complete for these months. The plots of SVN crashes in Figures 1 and 2 confirm this.) Two sets of comparisons were made. The first was to compare the experience in Madison County (the experimental county) to Winnebago County (the control county). As indicated earlier, we learned that five other communities also conducted flexible checkpoints during 2009. We took advantage of this happenstance to compare their experience with the rest of the State (less Madison County) to see if any effect was apparent.

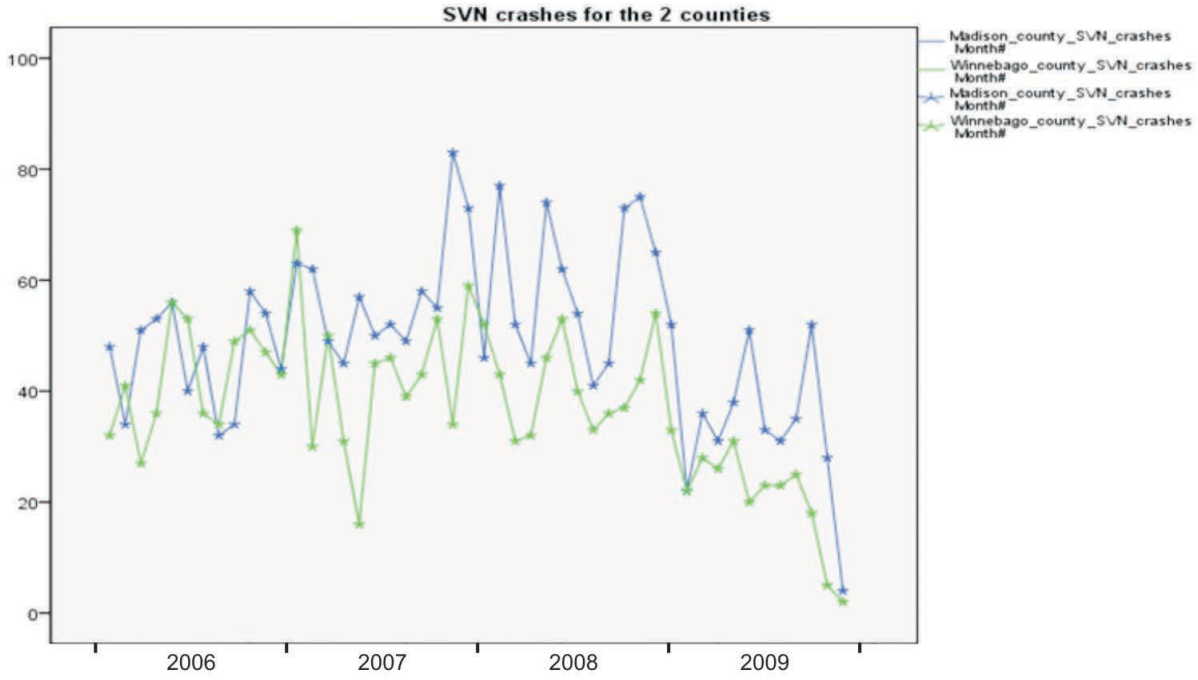


Figure 1. Single-Vehicle Nighttime Crashes in Madison and Winnebago Counties From 2006 to 2009

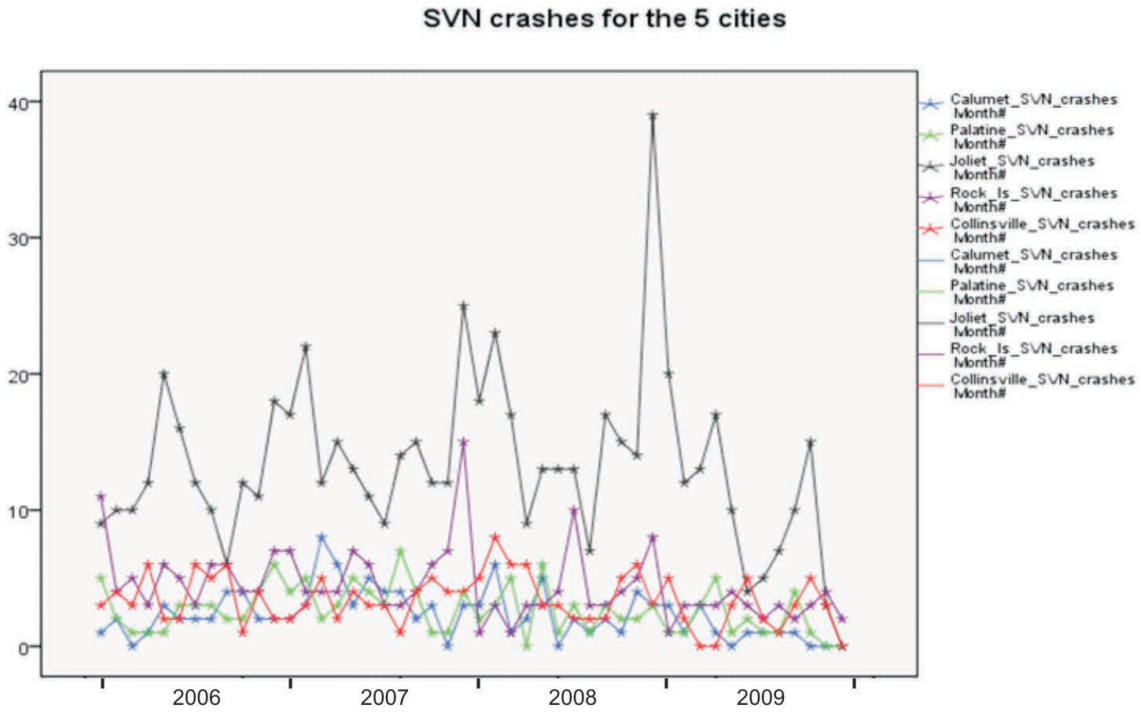


Figure 2. SVN Crashes in the Five Cities From 2006 to 2009

Tables 1 to 4 present the results from binary logistic regression models that analyzed the odds of a single-vehicle nighttime (SVN) crash versus a non-SVN crash. There are two intervention locations, which were not mutually exclusive: the first was Madison County, and the second was comprised of five intervention cities pooled together. These cities are Calumet City, Palatine, Joliet City, Rock Island, and Collinsville. There are two comparison areas, Winnebago County, and the rest of the state excluding Madison County and also excluding the five intervention cities.

Four separate logistic regression analyses were performed on the two intervention locations compared with the two comparison locations.

A seasonal variable (the quarter of the year) was used in all of the analyses to control for any variations due to the time of year. It is presented in the tables only when it was a significant factor in the analysis models. All the tables include Group (intervention locations vs. comparison locations), Intervention (pre- vs. post-), and the 2x2 Group by Intervention interaction term. It is this Group by Intervention interaction that indicates whether there was a differential effect in the treatment location when compared with the comparison location.

The results indicate that the Intervention did not cause a significant reduction in the odds of a SVN crash in either of the treatment locations, relative to the comparison locations. While the graphs of SVN crashes alone seems to indicate a drop-off for both counties near the time of the intervention, these apparent lowerings were also mirrored in the non-SVN crashes (surrogate for non-alcohol crashes), such that no decrease *relative to non-alcohol crashes* was detected.

In the tables below, presenting the results from the various logistic regression analyses, the amount of relative difference between groups, or relative change pre-intervention to post-Intervention, is indicated by an odds ratio (relative to 1.0, which is the null odds ratio, indicating no difference or no change).

Table 4. Madison County Versus Winnebago County

Variable	B	S.E.	Wald	DF	p-value	Odds Ratio
Group: Madison County (vs. Winnebago County)	.508	.035	204.766	1	< .001	1.661
Intervention: Jan. – Oct. 2009 (vs. 2006 to 2008)	-.070	.070	.995	1	.319	.932
Interaction: Madison County X Jan. – Oct. 2009	.106	.092	1.335	1	.248	1.112

As seen in the first line of Table 4, Madison County had a 66.1 percent higher incidence rate overall than Winnebago County of SVN crashes (relative to other crashes) as indicated by the odds ratio of 1.661, but neither county showed a significant decrease (p=.319), and this lack of decrease was not different among the two counties (p=.248).

Table 5. Madison County Versus the Remainder of the State (State Minus Madison County and the 5 Cities)

Variable	B	S.E.	Wald	DF	p-value	Odds Ratio
Group: Madison County (vs. State minus Madison & the 5 cities)	.616	.024	655.555	1	< .001	1.852
Intervention: Jan. – Oct. 2009 (vs. 2006 to 2008)	.130	.011	144.151	1	< .001	1.139
Interaction: Madison County X Jan. – Oct. 2009	-.077	.060	1.648	1	.199	.926
Quarter (ref=1st quarter)			176.686	3	< .001	

When contrasted with the rest of the State (non-intervention locations only), Madison County again had a much higher incidence rate overall of SVN crashes relative to other crashes (85.2% higher), but both groups showed a significant 13.9 percent *increase* at the intervention point; the relatively smaller increase for Madison County that would have indicated a putative intervention effect was not significant (p=.199).

Table 6. The Five Cities Combined (Calumet City, Palatine, Joliet City, Rock Island, and Collinsville) Versus Winnebago County

Variable	B	S.E.	Wald	DF	p-value	Odds Ratio
Group: The 5 cities combined (vs. Winnebago County)	-.376	.041	83.380	1	< .001	.687
Intervention: Jan. – Oct. 2009 (vs. 2006 to 2008)	-.070	.070	.995	1	.319	.932
Interaction: The 5 cities combined X Jan. – Oct. 2009	.051	.106	.236	1	.627	1.053

When contrasted with Winnebago County (Table 6), the five intervention cities combined showed a significantly lower incidence rate overall (i.e., both pre- and post-) of SVN crashes relative to other crashes (31.3% lower; 1.0 minus the odds ratio of .687), but both groups showed no decrease at the intervention point (p=.319). The interaction term showed no differential change between sites (p=.627).

Table 7. The Five Cities Combined (Calumet City, Palatine, Joliet City, Rock Island, and Collinsville) Versus the Remainder of the State (State Minus Madison County and the Five Cities)

Variable	B	S.E.	Wald	DF	p-value	Odds Ratio
Group: The 5 cities combined (vs. State minus Madison & the 5 cities)	-.265	.032	69.055	1	< .001	.767
Intervention: Jan. – Oct. 2009 (vs. 2006 to 2008)	.130	.011	144.616	1	< .001	1.139
Interaction: The 5 cities combined X Jan. – Oct. 2009	-.132	.080	2.755	1	.097	.876
Quarter (ref=1st quarter)			181.055	3	< .001	

When contrasted with the rest of the state (non-intervention locations only), the five intervention cities again had a lower incidence rate overall of SVN crashes relative to other crashes (23.3% lower; 1.0 minus odds ratio of .767), but both groups again showed a significant 13.9 percent *increase* at the intervention point. The lack of any increase at all for the five intervention cities relative to the rest of the State (as noted by the interaction term essentially 'cancelling out' the overall intervention increase) was not significant (p=.097).

In summary, the analyses of crash data indicated no effect on crashes due to the implementation of flexible checkpoints either in the formal experiment (Madison County versus Winnebago County) or in the natural experiment comparing the five communities conducting flexible checkpoint activities with the rest of the State.

Conclusions and Recommendations

Conclusions

Flexible checkpoints are a versatile, low-cost tool that virtually any size law enforcement agency can adapt to enhance enforcement methods and increase public awareness of enforcement efforts.

We found both during our review of flexible checkpoint activity across the country and in the context of the evaluation of flexible RSCs in Illinois that the implementation of flexible checkpoints is readily accomplished. The law enforcement agencies we contacted had not encountered any adverse publicity and believe that flexible checkpoints are useful and economical. They also believe flexible checkpoints expand the general deterrence reach of their other anti-DWI enforcement efforts.

Notwithstanding those opinions, our small scale study involving a field test of the effectiveness of flexible checkpoints did not show a consistent effect on public awareness or self-reported DWI behavior nor was an effect on SVN crashes detected. This could be because the limitations of scope (sample size) and intensity of enforcement (i.e., one flexible checkpoint per one traditional checkpoint/roadside safety check per month) in our study precluded our detection of a potential effect.

Our analysis results indicate no adverse effects of implementation of flexible checkpoints.

One challenge to enhancing general deterrence through flexible checkpoints is that they essentially must affect public awareness through direct contact with the motoring public and less so through other public information mechanisms that are traditionally used to increase awareness of enforcement activities. For example, one would not specifically advertise that flexible checkpoints were being used, but rather would use flexible checkpoints to publicize the active enforcement that was underway and hope that encountering flexible checkpoints enhanced the deterrent value of the traditional enforcement that they were supporting. This may not have the multiplicative effect one expects from the use of traditional mass media.

Recommendations

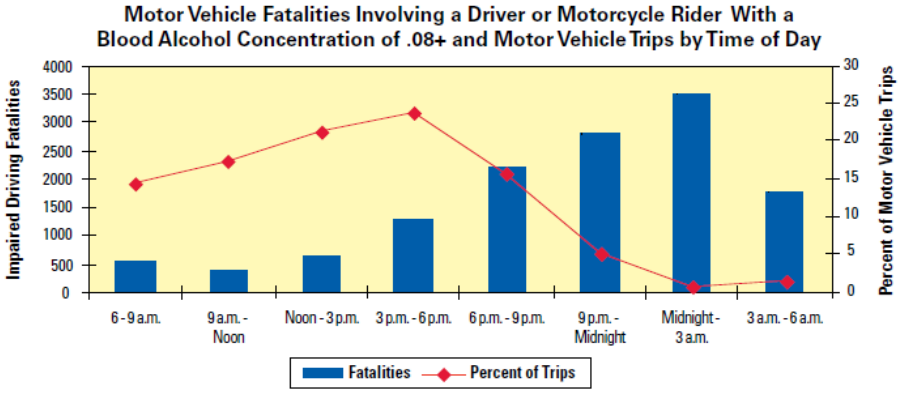
We recommend that law enforcement agencies examine flexible checkpoints as a potential means of enhancing the visibility of other DWI countermeasure enforcement efforts at minimal cost. A larger scale, multi-site study of this concept could more definitively address the issue of the effectiveness of this (as yet not demonstrably effective) strategy.

Different applications of flexible checkpoints could be considered both operationally and in the context of an evaluation. These include:

- Possibly employing multiple flexible checkpoints in conjunction with a single traditional enforcement effort (e.g., traditional checkpoint, saturation, or roving patrol).
- Encouraging law enforcement agencies to take the adaptability of flexible checkpoints into account and vary their use to meet the needs of their communities, sometimes

employing multiple variations (enforcement enhancement and solely public awareness) as needed.

- Employing flexible checkpoints in the early evening, for example, from 6 to 9 p.m. A NHTSA (2008) *Call to Action* recommended that law enforcement agencies set up standard or low-staffing checkpoints in the early hours of the evening to increase the visibility of their enforcement efforts. It also recommended that the checkpoints be supplemented by saturation or roving patrols later at night. As the figure below demonstrates, Travel Surveys indicate that most driving trips take place between noon and 9pm, and most impaired driving fatalities occur between 9 p.m. and 3 a.m. Based on these figures, a flexible checkpoint early in the evening (when more drivers are on the road), combined with a standard checkpoint, saturation, or roving patrol in the later hours (when impaired driving fatalities are more likely to occur) maximizes the visibility and productivity of the law enforcement activity and the likelihood of encountering and detecting impaired drivers.



SOURCE: 2006 FARS and the 2001 National Household Travel Survey, daily trip file, U.S. DOT
NOTES: More accurately the categories are Midnight to 00:59 a.m., 1 a.m. to 1:59 a.m., etc. A trip is defined as going from one address to another, other than changing the mode of transportation. Trips include all transportation modes including walking trips, transit trips, etc. The majority, 87% of trips are with personal vehicle.

It should be recognized that the many potential variations for employing flexible checkpoints may make it difficult to test for the specific effectiveness of a single implementation strategy. Any future studies should carefully document the flexible checkpoint methods implemented and work closely with the associated law enforcement agencies to capture the nuances of that implementation.

References

Elder, R. W., Shults, R. A., Sleet, D. A., Nichols, J. L., Zaza, S., & Thompson, R. S. (2002). Effectiveness of sobriety checkpoints for reducing alcohol-involved crashes. *Traffic Injury Prevention, 3*, 266-274.

Epperlein, T. (1985). *The use of sobriety checkpoints as a deterrent: an impact assessment*. Phoenix, AZ: Arizona Department of Public Safety.

Fell, J. C., Ferguson, S. A., Williams, A. F., & Fields, M. (2003). Why are sobriety checkpoints not widely adopted as an enforcement strategy in the United States? *Accident Analysis and Prevention, 35*, 897-902.

Lacey, J. H., Ferguson, S. A., Kelley-Baker, T., & Rider, R. (2005). *Low-manpower checkpoints: Can they provide effective DUI enforcement in small communities?* Arlington, VA: Insurance Institute for Highway Safety.

Lacey, J. H., Jones, R. K., & Smith, R. G. (1999). *An evaluation of Checkpoint Tennessee: Tennessee's statewide sobriety checkpoint program* (DOT HS 808 841). Washington, DC: National Highway Traffic Safety Administration.

Lacey, J. H., Stewart, J. R., Marchetti, L. M., Popkin, C. L., Murphy, P. V., Lucke, R. E., & Jones, R. K. (1986). *Enforcement and public information strategies for DWI general deterrence: Arrest drunk driving: The Clearwater and Largo, Florida experiences* (DOT HS 807 066). Washington, DC: National Highway Traffic Safety Administration.

Levy, D., Asch, P., & Shea, D. (1990). An assessment of county programs to reduce driving while intoxicated. *Health Education Research, 5*, 247-255.

Levy, D., Shea, D., & Asch, P. (1988). Traffic safety effects of sobriety checkpoints and other local DWI programs in New Jersey. *American Journal of Public Health, 79*, 291-293.

National Highway Traffic Safety Administration [NHTSA]. (2006). Alcohol-related fatalities and alcohol involvement among drivers and motorcycle operators in 2005 (Traffic Safety Facts Crash•Stats.DOT HS 810 644). Washington, DC: Author.

National Highway Traffic Safety Administration. (2008, June). *Call to action: How you can increase the visibility and effectiveness of law enforcement efforts*. Washington, DC: author.

Ross, H. L. (1984). *Deterring the drinking driver: Legal policy and social control*, 2nd ed.. Lexington, MA: Lexington Books.

Ross, H. L. (1992a). *Confronting drunk driving: Social policy for saving lives*. New Haven, CT: Yale University Press.

Ross, H. L. (1992b). *The deterrent capability of sobriety checkpoints: Summary of the American literature* (DOT HS 807 862). Washington, DC: National Highway Traffic Safety Administration.

Ross, H. L., & Voas, R. B. (1989). *The new Philadelphia story: The effects of severe penalties for drunk driving*. Washington, DC: AAA Foundation for Traffic Safety.

Shults, R. A., Elder, R. W., Sleet, D. A., Nichols, J. L., Alao, M. O., Carande-Kulis, V. G., … & Task Force on Community Preventive Services. (2001). Reviews of evidence regarding interventions to reduce alcohol-impaired driving. *American Journal of Preventive Medicine, 21*(4 Suppl), 66-88.

Stuster, J. W., & Blowers, M. A. (1995). *Experimental evaluation of sobriety checkpoint programs* (DOT HS 808 287). Washington, DC: National Highway Safety Administration.

Voas, R. B., Lacey, J. H., & Fell, J. C. (2005). The Passpoint system - passive sensors at mini-checkpoints: Bringing Australia's random breath-test system to the United States. In P. Spellman & J. Gawel (Eds.), *Transportation Research Circular E-C072: Implementing Impaired Driving Countermeasures: Putting Research into Action (A Symposium, August 21-23, 2003, Irvine, CA)* (pp. 45-53).Washington, DC: Transportation Research Board of the National Academies.

Voas, R. B., Rhodenizer, A. E., & Lynn, C. (1985). *Evaluation of Charlottesville checkpoint operations* (DOT HS 806 989). Washington, DC: National Highway Traffic Safety Administration.

Wells, J. K., Preusser, D. F., & Williams, A. F. (1992). Enforcing alcohol-impaired driving and seat belt use laws, Binghamton, New York. *Journal of Safety Research, 23*, 63-71.

Wiliszowski, C., Murphy, P., Jones, R., & Lacey, J. (1996). *Determine reasons for repeat drinking and driving* (DOT HS 808 401). Washington, DC: National Highway Traffic Safety Administration.

Appendices

Appendix A: Typical Illinois State Police Operational Plan for Flexible Roadside Safety Checks

Appendix B: Typical Illinois State Police Operational Plan for Standard Roadside Safety Checks

Appendix C: Driver License Survey Form

Appendix A: Typical Illinois State Police Operational Plan for Flexible Roadside Safety Checks

OPERATIONAL PLAN
ILLINOIS STATE POLICE DISTRICT 11
ROADSIDE SAFETY CHECKS

MISSION:

Provide the appearance of increased enforcement by setting up phantom checkpoints.

Officer and motorist safety is primary, as well as courtesy.

DATE: June 13, 2009

LOCATION: 3 miles of Primary location of IL 3 and New Poag Rd

EXECUTION:

- Two officers will be assigned to work the flexible or phantom checkpoint within a three mile radius of the actual RSC.
- The two officers assigned to the flexible checkpoint will work together at the same locations. The officers may be stationed at different directions (e.g. north bound and south bound). Officers working the flexible detail will post RSC signs and use emergency lighting to give the appearance of increased enforcement. Traffic cones may also be set-up at the flexible locations.
- Officers working the flexible locations will have in-car video cameras activated.
- Officers will move the flexible checkpoints to various high traffic locations during the detail to increase visibility. The flexible checkpoints will be conducted for one hour and then moved to another location. The hour will include set-up and tear down.
- Officers at flexible RSC locations will not make stops or arrests unless a serious violation of impaired driving or other crime is observed. Any vehicle stop at the flexible checkpoint **must** be based on standard probable cause.

COMMUNICATIONS:

The detail supervisor will assign the designated radio channel: Detail 11-A

Appendix B: Typical Illinois State Police Operational Plan for Standard Roadside Safety Checks

OPERATIONAL PLAN
ILLINOIS STATE POLICE DISTRICT 11
ROADSIDE SAFETY CHECKS

MISSION:

In accordance with the authority granted by 20ILCS 2610/6, the Illinois State Police will utilize a roadside safety check to specifically enforce:

- Equipment violations (625 ILCS 5/12)
- Drivers must have licenses or permits (625 ILCS 5/6-101)
- Driving while under the influence of alcohol, other drug or drugs, intoxicating compound or compounds or any combination thereof (625 ILCS 11-501)

Officer and motorist safety is primary, as well as courtesy.

DATE: June 13, 2009

LOCATION: Location 1 (primary) IL 3 and New Poag Rd
Location 2 (secondary) IL 3 and Chain of Rock Rd

EXECUTION:

- Signs will be placed advising the motoring public of the check point.
- All vehicles will be checked unless traffic congestion begins. In case of back-up or delay, the detail supervisor may change the sequence to every third vehicle. The time and reason will be documented and the sequence will return to every vehicle as soon as feasible.
- Driver's license/insurance that appears valid on it's face is to be considered *prima facie* proof and unless other PC is present, the motorist should be allowed to proceed through checkpoint
- All ISP officers will were reflective safety material.
- A minimum of one squad car will record all vehicles entering the check point
- Each location will have a designated secondary screening area. If you have PC for an offense, the vehicle should be moved to the screening area and continue interview.

COMMUNICATIONS:

The detail supervisor will assign the designated radio channel: Detail 11-A

Appendix C: Driver License Survey Form

1. **What is your Zip Code?**

2. **How often do you usually drive a car or other motor vehicle?**

   Every day
   Several days a week
   Once a week or less
   Only certain times a year
   I'm here for my first driver's license
   Never

Compared to one year ago, do you drive? (check one)
More often ***Less often*** ***About the same*** ***Not sure***

Why is that? _____

3. **In your opinion, do you think enforcement of drinking and driving laws in your community is too strong, too weak, or about right?**

   Too strong ***Too weak*** ***About right*** ***Don't know***

4. **In the past 30 days, have you read, seen or heard anything about the police setting up roadside safety checks?**

If yes, where did you see or hear about it? (check all that apply)

Newspaper ***Radio*** ***TV*** ***Poster*** ***Brochure*** ***Police Roadside Safety Check***
Other

5. **In the past 30 days, how many police roadside safety checks have you actually seen? (*circle one*)**

   0 1 2 3 4 5 6 7 8 9 10

6. **In the past 30 days, have you gone through a roadside safety check where police were looking for drunk drivers?**

   Yes ***No***

   If Yes, how many times? (circle one)
   1 ***2*** ***3*** ***4*** ***5***

7. **If you refuse a breath test for *Driving Under the Influence* in Illinois, the official penalties are:**

   Less than when you take the breath test
   More than when you take the breath test
   The same as when you take the breath test

8. **During the <u>past 30 days</u>, how often did you usually drink any alcoholic beverages, including beer, wine, or liquor? Would you say you usually drank alcoholic beverages? (*check one*)**

   Every day
   Several days a week
   Once a week or less
   Weekends only
   Celebration/Special occasions
   Never
   Don't know

9. **About how many times in the past 30 days did you drive when you thought you had too much alcohol to drink?**

   Enter number of times: _____
   Don't Drink
   Don't Know

10. **If you drove after having too much to drink, how likely do you think are you to be stopped by a police officer? (*check one*)**

    Almost certain Very likely Somewhat likely Somewhat unlikely Very unlikely

Compared to <u>one year ago</u>, are you now driving after drinking? (check one)
More often Less often About the same Not sure
Why is that? _____

11. **What is your sex?**

12. **What is your age?**

13. **What is your race?**

14. **Are you of Spanish/Hispanic origin?**

<u>Thanks for your time in completing this survey</u>.

(IL_DMV_Survey_Word_Version_Sept9)

DOT HS 812 420
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U.S. Department
of Transportation

**National Highway
Traffic Safety
Administration**

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