Abstract
Persistent drinking drivers continue to threaten public safety even though efforts at reducing the consequences of drinking and driving have met with some success over the last two decades (1). Although license suspension/revocation is considered to be one of the more effective countermeasures for alcohol-impaired driving, many alcohol offenders whose licenses have been suspended/revoked as a result of convictions for driving under the influence/while intoxicated (DUI/DWI) continue to drive illegally and go undetected. In a California study, at least 75 percent of drivers with suspended licenses drove at least occasionally (2). The probability of arrest when driving while impaired by alcohol is low, ranging from 1 in 200 to 1 in 2,000 trips (3-8), the majority of traffic convictions occurring during license suspension/revocation are not prosecuted as suspension/revocation violations (2), and many drivers with suspended licenses never bother to obtain a valid license (9). Unlicensed drivers are more likely to have higher blood alcohol content (BAC) levels at the time of arrest compared to licensed drivers, and in fatal crashes BAC levels \( > 0.25 \) are twice as likely among unlicensed drivers (18 percent) as compared to licensed drivers (8 percent) (10). Data suggest that enforcement should be targeted against those DUI/DWI offenders who continue to drive following a license revocation/suspension arising from an alcohol-related violation. The current study evaluated the deterrent effect of a novel sting operation on Maryland drivers whose licenses had been suspended/revoked following an alcohol-related offense. We further investigated whether repeat sting operations in the same city confer added benefits.

Introduction
The purposes of this study were to evaluate the effectiveness of a novel sting operation in determining the proportion of drivers who continue to drive after a court-ordered license suspension/revocation for DUI/DWI and to determine whether sting operations have a deterrent effect on this population of offenders. We also investigated the extent to which repeated sting operations in the same city would result in additional deterrence. Three general types of traffic enforcement operations exist: patrol activity, sobriety checkpoints and special operations (10). The sting operation described in this study was a non-routine operation specifically designed to investigate the problem of convicted DUI/DWI offenders who continue to drive after their licenses have been suspended/revoked; it is therefore categorized as a “special operation.”
Methods
A specialized unit within Maryland’s Division of Parole and Probation, the Drinking Driver Monitor Program (DDMP), monitors offenders on court-ordered probation for DUI/DWI as well as referrals from the Maryland Motor Vehicle Administration. DDMP collected data for this study during the 40-month period from September 1, 1997, to December 31, 2000. Alcohol offenders who were under a court-ordered license suspension/revocation and on probation were observed and videotaped as they reported to their probation monitors for their weekly appointments, a time when drivers were thought to be in maximum compliance with their probationary license suspension/revocation conditions. Those offenders who were observed driving a vehicle were arrested and criminally charged with driving on a suspended/revoked license. A total of 33 1-day sting operations were held in 22 cities throughout the State of Maryland (Figure 1). Eight cities held at least two sting operations, and two cities held three sting operations. The results of the sting operations received widespread media attention. We examined arrest rate time trends using logistic regression and modeled change over time in the probability of arrest as a function of the number of months since the first Maryland sting operation. To assess the deterrent effect of repeated sting operations, we estimated separate models for the first sting in all cities, for cities holding only one sting operation during the study period and for cities holding both two and three sting operations.

Figure 1: Maryland Cities Where Sting Operations Were Held

valid license while under a court-ordered license suspension/revocation for DUI/DWI and were
arrested as they reported to their probation monitors for their weekly appointments. The proportion arrested varied from 2 percent in rural areas (Denton, Maryland) to 51 percent in more heavily populated areas (Pasadena, Maryland). Offenders were also arrested or cited on a number of other charges, including possession of a controlled dangerous substance, carrying a concealed weapon, expired vehicle tags, speeding, carrying an open container, failure to wear a seatbelt, uninsured and/or unregistered vehicle, ignition interlock violation and failure to pay child support.

It is clear from the data that arrest rates declined over time. We examined arrest rate time trends using logistic regression and modeled change over time in the probability of arrest as a function of the number of months since the first Maryland sting operation, stratified by the number of sting operations. From September 1, 1997, to December 31, 2000, average arrest rates declined by about 1.1 percent per month (model 1).

**Model 1:** \[ \text{Logit}(p) = -0.75 - 0.011 \text{ Months} \]

<table>
<thead>
<tr>
<th>DF</th>
<th>Parameter Estimate</th>
<th>Standard Error</th>
<th>Chi-Square</th>
<th>Pr&gt;Chi-Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept 1</td>
<td>-0.7471</td>
<td>0.1266</td>
<td>34.84</td>
<td>&lt;0.0001</td>
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<td>Months 1</td>
<td>-0.0107</td>
<td>0.0050</td>
<td>4.54</td>
<td>0.0331</td>
</tr>
</tbody>
</table>

To assess the deterrent effect of multiple sting operations, we estimated separate models for cities holding only one sting operation and for each of the cities with two and three sting operations (models not shown). Table 1 summarizes the monthly decline in arrest rates by number of stings within a city from the start of the sting operations, September 1, 1997, until December 31, 2000.

<table>
<thead>
<tr>
<th>Number of Sting Operations</th>
<th>Percent Change in Arrest Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>First – Any City</td>
<td>-0.2 (± 1.1)</td>
</tr>
<tr>
<td>One</td>
<td>-0.8 (± 1.6)</td>
</tr>
<tr>
<td>Two</td>
<td>0.6 (± 1.8)</td>
</tr>
<tr>
<td>Three</td>
<td>-6.6 (± 6.8)</td>
</tr>
<tr>
<td>All</td>
<td>-1.1 (± 1.0)</td>
</tr>
</tbody>
</table>

As of December 31, 2000, arrest rates declined by about 0.8 percent per month among all cities holding one sting operation. Among cities holding only two sting operations, arrest rates
increased by about 0.6 percent per month. Overall, the sting operations resulted in a 1.1 percent decline per month in arrest rates.

All estimates were based on logistic regression models of arrest rate and month of sting operations. As of December 31, 2000, the average monthly arrest rate in cities with one, two or three sting operations was not statistically significant, although the overall effect of sting operations was significant. The best estimate to date is that sting operations have reduced driving to probation supervision without a valid license by about 1.1 percent per month. The finding that three sting operations conducted in the same city confer added benefits is suggestive but requires further investigation.

We note that the rate of decline varied widely around the average rate among cities with two or more sting operations, from a statistically significant monthly decline of 9.4 percent per month (Ellicott City, Maryland) to a statistically significant increase of 8.0 percent per month (Denton, Maryland).

**Discussion**

This study demonstrated that a novel sting operation was effective in determining noncompliance by probationary drivers under court-ordered license suspension/revocation for DUI/DWI and that sting operations have reduced driving without a valid license among alcohol offenders with suspended/revoked alcohol licenses. Many of these sting operations received widespread media attention, possibly contributing to their deterrent effect. Despite their probationary and license suspension/revocation status, a large proportion of offenders continued to drive, even when reporting to their probation monitor at police stations. We note that our estimates for driving without a valid license are extremely conservative, since maximum compliance would be expected under the conditions of this study. The results of this study highlight the usefulness of special operations for general traffic enforcement of license suspension/revocation and the need for improved enforcement of hard license suspension/revocation for alcohol offenders. Other states should conduct similar sting operations to determine the level of generalizability for the current findings. Additional research is needed to investigate the factors associated with the observed geographic variation in arrest rates, to identify the causes of differences between probation compliers and noncompliers and to determine any added benefits of repeat sting operations.

**Acknowledgements**

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**References**