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AN EVALUATION OF THE EFFECTIVENESS OF IGNITION INTERLOCK IN CALIFORNIA

TECHNICAL REPORT

September 2005

Authors: David J. DeYoung, Helen N. Tashima,
and Scott V. Masten
Research and Development Branch
Licensing Operations Division

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This study is one of two studies of ignition interlock in California mandated by the California Legislature (AB 762). The first study, published in 2002, was a process evaluation that examined the degree to which ignition interlock has been implemented in California. This current study is an outcome evaluation that examines the effectiveness of ignition interlock in reducing alcohol-related crashes and convictions, and crashes overall (alcohol and non-alcohol). The results of the study show that interlock works for some offenders in some contexts, but not for all offenders in all situations. More specifically, ignition interlock devices work best when they are installed, although there is also some evidence that judicial orders to install an interlock are effective for repeat DUI offenders, even when not all offenders comply and install a device. California's administrative program, where repeat DUI offenders install an interlock device in order to obtain restricted driving privileges, is also associated with reductions in subsequent DUI incidents. One group for whom ignition interlock orders do not appear effective is first DUI offenders with high blood alcohol levels.

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PREFACE

This report is the second of a two-study evaluation of ignition interlock in California that was mandated by the California Legislature (AB 762 -Torlakson), and funded in part by the California Office of Traffic Safety. The report was prepared by the Research and Development Branch of the California Department of Motor Vehicles under the administrative direction of Clifford J. Helander, Chief. The opinions, findings and conclusions expressed in the report are those of the authors and not necessarily those of the State of California.

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INTRODUCTION

Background

The mixture of alcohol and driving presents a major public health problem in the United States. The National Highway Traffic Safety Administration (NHTSA) reports that in 2002, 17,419 people died in alcohol-involved crashes in the United States, and that alcohol was involved in 41% of all traffic fatalities (National Highway Traffic Safety Administration, 2002). The National Safety Council states that 3 of every 10 Americans will be involved in an alcohol-involved collision in their lifetimes, and estimates that such crashes cost the United States $29.1 billion in 2000 (National Safety Council, 2001). The magnitude of the drinking and driving problem in California is revealed in crash data reported by the California Highway Patrol (CHP), which show that 1,308 people died and 31,806 were injured in alcohol-involved crashes in California in 2001 (California Highway Patrol, 2001).

There is a long history of efforts to control drinking and driving in North America and Europe. For several decades, the courts and motor vehicle departments have prescribed fines, jail terms and driver license suspension/revocation (S/R) in an effort to better control the risk posed by drinking drivers. These traditional penalties are meant to incapacitate the drinking driver, so that for at least some period of time they cannot reoffend, and also to deter them from reoffending in the future. Somewhat more recently, efforts have also been directed toward rehabilitating drinking drivers, by requiring them to participate in alcohol education and treatment programs, such as the drinking driver treatment programs that DUI offenders in California are required to attend.

These traditional countermeasures have had some success in reducing alcohol-involved crashes, especially during the early 1980s through the mid-1990s, when increasing attention was focused on drunk driving through the formation of grass roots organizations such as MADD, and significant new anti-DUI legislation was enacted. From 1982 until 1997, alcohol-involved fatalities declined 33% in the United States (Subramanian, 2003). However, the proportion of fatalities in alcohol-involved crashes reached a nadir in 1997, and increased slightly in 2000 and 2001.

This leveling off and then slight increase in alcohol-involved crashes during the past several years has policy makers and traffic safety professionals concerned, and searching for new countermeasures to better control drinking drivers. One new class of countermeasures targets offenders' vehicles, rather than the offenders themselves. One advantage of such vehicle-based countermeasures is that they do not rely upon rehabilitating the drinking driver, but instead focus upon removing the drivers access to their vehicle, either completely, through vehicle impoundment/immobilization/ forfeiture, or after drinking, through the installation of ignition interlock devices (IIDs).

IIDs are devices that consist of an alcohol breath testing unit that is linked to the ignition switch of a motor vehicle. The vehicle cannot be started until the driver

provides a breath sample, and if the sample contains more than a predetermined amount of alcohol, the device locks the vehicle's ignition, thereby preventing the person from driving.

Although IIDs have yet to be used widely, the devices are not new, having been the focus of research and development since the 1960s (National Highway Traffic Safety Administration, 1990). The early devices proved easy to circumvent, and so did not gain wide acceptance, but as development has continued, IIDs have become increasingly sophisticated, and more difficult to bypass. Newer devices contain features such as the rolling retest, which requires drivers to provide breath tests at random intervals, to discourage drinking drivers from asking sober people to blow into the IID to start the vehicle. However, while IIDs have become more sophisticated, they are not the "silver bullet" that will finally solve the drinking and driving problem. Even if the devices were foolproof, circumvention is as easy as finding another vehicle to drive that is not equipped with an IID (International Council on Alcohol, Drugs and Traffic Safety, 2001).

IID Programs & Evaluations

A number of states developed and implemented pilot-IID programs beginning in the mid-1980s, including California, which was the first state to enact legislation that authorized judges to order DUI offenders to install IIDs (Fulkerson, 2003). Many of these programs were evaluated in order to determine whether IIDs are an effective countermeasure for drunk driving, but only a handful of studies were done with sufficient methodological rigor to yield results that are reliable.

California's ignition interlock pilot program was one of the first to be evaluated. This study compared a group of drivers convicted of driving-under-the-influence (DUI) who were ordered to install an IID, and who did so, with a matched comparison group of DUI offenders. While the matching and study design helped control some of the potential biases, there are limitations to the study and its results should be viewed cautiously. This study found that there was no statistically significant difference in the subsequent DUI conviction rate between DUI offenders who installed IIDs and DUI offenders who did not (EMT Group, 1990).

The findings from the California study that IIDs have no impact on DUI recidivism were supported by a study of a pilot IID program implemented in Oregon in 1988. This program consisted of an eleven-county region where DUI offenders could apply for a restricted license by installing an IID, and also where DUI offenders who were ready to reinstate their driver licenses could choose between an additional 6-month period of license suspension, or license reinstatement if they installed an interlock. This study, while not employing random assignment, did use statistical controls to attempt to control bias, and so like the California study should be viewed as somewhat, but not fully, controlling bias. Jones, the study's principal investigator, summarized the results by stating that IIDs are effective while installed, but not more effective than license suspension (Jones, 1992).

Several other credible studies have been conducted of ignition interlock programs implemented in other states, and these studies, contrary to the California and Oregon studies, show that IIDs can be effective in reducing DUI recidivism. Two studies conducted shortly after the California and Oregon studies, examined ignition interlock programs in North Carolina (Popkin et al., 1992) and Ohio (Elliot & Morse, 1993). The North Carolina study was not well controlled, so its findings should be regarded as suggestive rather than definitive. This study compared a group of relatively low-risk second DUI offenders with IIDs to second DUI offenders who were granted a conditional driver license, and found that those offenders receiving IIDs had a lower rate of subsequent DUI convictions than offenders in the comparison group. Interestingly, the DUI recidivism rates for the interlock group were similar to a group that included DUI offenders who began the relicensing process but did not complete it, and those offenders who were offered a license if they installed an interlock, but refused to do so. This group, who remained unlicensed, recidivated at the same rate as the interlock group, suggesting that the effects of IID are no better than licensing actions.

The Ohio study was better controlled, and in this way is more similar to the California and Oregon studies. This study examined a population of multiple DUI offenders in Hamilton County Ohio, comparing drivers who installed IIDs with drivers with suspended driver licenses. The results showed that drivers installing interlocks had significantly fewer subsequent DUI convictions than suspended drivers, although this positive effect vanished once the IIDs were removed from the vehicles.

A more recent study, notable for its use of random assignment in a scientifically rigorous design, examined multiple DUI offenders in Maryland who had petitioned a medical advisory board for driver license reinstatement (Beck et al., 1999). The study randomly assigned drivers to a 1-year term of IID use, or to a control group that included participation in an alcohol program. The results from this study demonstrated that drivers installing an IID had significantly lower rates of subsequent DUI convictions than drivers in the control group during the period that the interlock remained installed on the vehicle, but that this positive effect disappeared once the devices were removed. These findings should be regarded as the most definitive to date on the effects of IIDs on DUI recidivism, although they only generalize to a relatively small, specific group (i.e., multiple DUI offenders willing to install an IID to become relicensed).

Three additional ignition interlock studies deserve mention. The first study evaluated the effects of an ignition interlock program that was implemented in Alberta, Canada in 1990 (Weinrath, 1997). This study found that drivers installing an IID were significantly less likely to be convicted for a subsequent DUI than suspended drivers in the comparison group, and also less likely to be involved in an injury crash. The second study examined multiple DUI offenders in Illinois, some of who were required to install IIDs in their vehicles (Raub et al., 2003). The results demonstrated that drivers in the interlock group were significantly less likely to be rearrested for DUI during the year that the interlock was installed in their vehicle than drivers in the comparison group,

although the recidivism rate of the interlock group rose to the comparison group's rate once the IID was removed. The final study presents preliminary results from an evaluation of a pilot ignition interlock program recently implemented in Sweden (Bjerre, 2003). This study is unique in that it examines biological markers of alcohol use at periodic intervals to measure changes in drinking. Early results indicate that drivers participating in the ignition interlock program showed a decline in alcohol use as measured by biological markers, as well a decline in recidivism, relative to drivers in a comparison group.

The results of research conducted to date of ignition interlock programs implemented throughout North America are somewhat mixed, although the preponderance of evidence suggests that IIDs are effective in reducing DUI recidivism, by as much as 40-95%, at least as long as they remain installed on vehicles (International Council on Alcohol, Drugs and Traffic Safety, 2001). Most studies showing positive results of interlock also show that there is no social learning associated with the devices—that is, once removed from the vehicle, recidivism climbs back up.

While the weight of the research evidence to date shows that IIDs can be effective in reducing DUI recidivism, there are significant problems in utilizing IIDs effectively, and important questions about the devices remain unanswered. Perhaps the biggest roadblock in implementing a successful interlock program is getting the devices into vehicles; most studies show that only a small minority of drivers will install IIDs, even when ordered to do so by the courts (DeYoung, 2002; International Council on Alcohol, Drugs and Traffic Safety, 2001). In addition, while the devices appear to reduce DUI recidivism, little is known about their impact on crashes, and which types of offenders the devices work most effectively for.

Ignition Interlock in California

The first use of IIDs in California was authorized by the Farr-Davis Safety Act of 1986, which established a pilot program in four counties in the state where judges could order DUI offenders to install an interlock on their vehicles as a condition of probation. The law also mandated that the pilot program be evaluated, and included a sunset provision so that IIDs would not be used indefinitely in California if they were shown to be ineffective.

As discussed previously, California's interlock program was evaluated (EMT Group, 1990) and found to be ineffective. Despite the fact that the evaluation results did not show IIDs to be an effective DUI countermeasure in California, subsequent legislation (AB 2040) authorized the use of interlock devices statewide. Like the Farr-Davis Safety Act, this new law allowed judges to discretionarily order IIDs for DUI offenders. However, it soon became clear that judges were not using interlock as a sentencing option for most eligible DUI offenders, so the Legislature enacted AB 2851 in 1993, which eliminated the discretionary nature of the previous interlock law, and <u>required</u> judges to order IIDs for <u>all</u> repeat DUI offenders. Even with this new mandatory law, judges ordered IIDs for only 20-25% of repeat DUI offenders.

In order to develop a more robust interlock program in California that had sufficient numbers of participants that the effectiveness of the devices could be evaluated, the Research and Development (R&D) Branch at the Department of Motor Vehicles (DMV) convened an interagency task force to critically examine the interlock laws, and recommend changes. As a result of this effort, the California Legislature enacted AB 762 (see Appendix), which shifted the focus of "mandatory" IID law from repeat DUI offenders to drivers convicted of driving on a DUI-suspended driver license (DWS-DUI). The rationale behind this shift is that while DUI offenders with suspended driver licenses may or may not continue to drive in violation of their suspension, DWS-DUI offenders have already demonstrated that they will drive and pose a risk on the highways, and thus need more corrective measures. This shift in focus was in response to judicial concerns over the logical inconsistency of prior laws.

Although the Legislature has enacted subsequent legislation concerning IID (AB 2227), the thrust of AB 762 remains intact. Under the current IID laws, judges must order IIDs for DWS-DUI convictees, and for drivers arrested for DWS-DUI who are convicted of a less serious driving while suspended (DWS) offense. Judges may also order IIDs for DUI offenders at their discretion. In addition to this judicial IID program, there is a discretionary IID program administered by the DMV. Under this administrative program, multiple DUI offenders may, after serving half of their license suspension period, install an IID and apply to the DMV for a restricted driver license. These IID laws became effective July 1999.

The legislation that created the current IID program also contains a provision that requires the DMV to conduct rigorous, scientific evaluations of IIDs and report the findings to the Legislature. The first evaluation is a process study, which examines the degree to which interlock laws have been implemented in California. This study was completed and delivered to the Legislature in July 2002. The results of the process evaluation showed that the ignition interlock laws have been poorly implemented; judges order IIDs for only a fraction of the DWS-DUI offenders who are required by law to receive such an order, only a minority of offenders ordered to install an IID do so, and few repeat DUI offenders opt to shorten their license suspension by installing an IID and applying to DMV for a restricted driver license (DeYoung, 2002). While some recommendations were made in the final report of the process study for changes in court reporting of IID orders, and the monitoring of offenders ordered to install an IID, the main recommendation was to delay further modifications to California's interlock laws until the results of the second study, an outcome evaluation, were available to guide any changes.

This report describes this second, Legislatively-mandated study, of California's ignition interlock program. It employs the most rigorous methods possible to evaluate the effectiveness of IIDs in reducing DUI recidivism, and improving traffic safety in California. The results of this study, used along with those of the Legislatively-mandated process study of IIDs, provide important information that can guide law and policy regarding the most effective and efficient use of ignition interlock in California.

METHODS

California's ignition interlock program is really several different programs, because California law regarding IIDs both mandates and authorizes their use with different types of offenders in different circumstances. For example, judges are required to order IIDs for drivers convicted of DWS-DUI, while repeat DUI offenders can choose to install an interlock after serving half of their license suspension period in order to obtain a restricted license. Because of this variation in the use of IIDs, this outcome evaluation is comprised of six smaller studies, each of which examines the effectiveness of the devices used in a specific context. Taken together, these six studies provide a comprehensive picture of the effectiveness of IIDs as a traffic safety countermeasure in California. These six studies are described below.

Selection of Subjects

Study 1: DWS-DUI offenders with an IID order or restriction

California law requires judges to order drivers convicted of DWS-DUI and drivers arrested for DWS-DUI but convicted of a lesser DWS offense, to install an IID on their vehicle. This is a central part of California's ignition interlock program, and represents the only mandatory use of the devices in the state. However, the process evaluation of California's IID program showed that judges often restrict drivers to driving an IID-equipped vehicle, rather than order them to install an interlock device, because offenders either have no vehicle, or cannot pay for an IID. Thus, study 1, which examines the effectiveness of IIDs for DWS-DUI offenders ordered by the court to install a device, or restricted to driving an IID-equipped vehicle, is the main evaluation of California's interlock program.

Subjects were initially identified using court conviction data reported to DMV and stored on the department's driver license database. All drivers who were convicted of DWS-DUI between January 2000 and July 2002 were included in the initial selection process. The next step in forming the sample involved excluding some subjects, because data on their driving records is unreliable, and including them in the study could yield misleading results. For obvious reasons, drivers who were reported deceased, and drivers who lived outside California, were removed from the sample. In addition, drivers who did not have a California driver license were excluded, due to the difficulty in tracking any subsequent crashes and convictions on their driving records.

One group of drivers who were <u>not</u> excluded were subjects whose record indicated that the court ordered them to install an IID, but who failed to comply by actually installing a device. It is important to include such "dropouts," because they represent part of the effect of California's ignition interlock program. All sanctions, whether they involve jail, fines or license suspension, involve offenders who fail to comply, and these non-compliers should be included in any evaluation of the sanction in order to give a complete picture of its effects. Two other studies, which are described later in the

paper, examine only those offenders who actually installed an interlock, and this provides information on the efficacy of the devices themselves (as opposed to California's program utilizing them).

After removing deceased, out-of-state and unlicensed drivers, those subjects who were ordered to install an IID or restricted to driving an IID-equipped vehicle were identified using court sentencing information contained on DMV's driver license database. In addition, it was important to identify and develop a comparison group of drivers who were convicted of DWS-DUI and who did not receive a court order to install an interlock device or a restriction to driving an IID-equipped vehicle. This comparison group was identified using court sentencing information contained on the driver license database.

Study 2: DWS-DUI offenders with an IID order

As was mentioned in the description of study 1, the intent of California's mandatory IID law is that judges order all offenders convicted of DWS-DUI to install an interlock device, but that for reasons of cost and non-possession of a vehicle, many offenders are instead simply restricted to driving a vehicle equipped with an IID. In order to assess the effectiveness of just court orders to install an IID, study 2 identified a sample of offenders who received a court order to install an interlock device, removing restricted drivers from the sample. Thus, while study 1 examines California's mandatory IID program as it is presently implemented, study 2 evaluates California' mandatory program as it was intended to be implemented.

Subjects for study 2 were initially identified from DMV records by selecting all drivers who received a DWS-DUI conviction between January 2000 and July 2002. As with study 1, the next step was to identify and remove drivers who were reported deceased, who lived outside of California, or who did not have a California driver license.

Because of the way court sentencing information is reported to DMV, it was not possible to use DMV records to identify those DWS-DUI convictees in the sample who received a court order to install an IID, from the larger group who received either a court order to install an IID or who were restricted to driving an IID-equipped vehicle. Instead, it was necessary to develop a subsample of offenders with an IID order/restriction, track them back to the adjudicating court, and then use court records to identify those who had a court order to install an interlock device.

It was infeasible to track offenders back to all courts in the state, because some courts did not keep sufficiently detailed records, and also because such a strategy would have been excessively time-consuming and expensive. Instead, a subsample of drivers was selected who were adjudicated by seven counties in the state, representing Southern and Northern California, inland and coast, and large urban areas and rural jurisdictions. These seven counties were; Kern, Los Angeles, Monterey, Orange, San Diego, Shasta and Solano.

It was necessary to select a comparison group of drivers who did not receive an order to install an IID. The comparison group was selected from the same overall DWS-DUI conviction sample that was convicted in one of the seven counties in the state, but drivers in the comparison group did not receive an order to install an IID, or a restriction to driving an IID-equipped vehicle.

Study 3: DWS-DUI & DUI offenders installing an IID

While studies 1 and 2 evaluate California's IID program as implemented, and as intended, respectively, study 3 is fundamentally different in that it examines the efficacy of the devices. This is important, because while California's IID program may not be effective due to problems with implementation, the devices may effectively reduce DUI recidivism when installed. If such a situation exists, it would be important to revise California's program to more effectively utilize IIDs. Conversely, if the IIDs are shown to be ineffective, there would be no point in using them as a DUI countermeasure.

Because DMV's driver license database does not contain information on drivers who install an IID, and court records only sporadically contain such data, it proved necessary to rely on records maintained by ignition interlock providers. Five interlock manufacturers/installers representing the interlock companies licensed to provide IIDs in California were contacted, and asked to provide identifying information on all offenders for whom they installed IIDs after January 2000. Once data for these drivers were obtained, the identifying information was used to locate their driving record on DMV's driver license database.

Using driver record data, drivers who were reported deceased, who lived outside California, or who did not have a California driver license, were removed from the sample. Drivers were also removed from the sample if their IID was installed after January 2003, because there would be insufficient time for subsequent traffic convictions and crashes to accrue and be posted to their DMV record.

As with the other studies, it was important to identify and develop a comparison group of drivers who did not experience the sanctions. Comparison group drivers for this study consisted of drivers who were convicted of the same offense (i.e., DWS-DUI or DUI) as drivers in the interlock-installed group, who were neither ordered to install an IID, nor restricted to driving an IID-equipped vehicle. Comparison group drivers were identified using DMV's driver license database, and consisted of drivers convicted of DWS-DUI or DUI between January 2000 and January 2003.

Study 4: DUI first offenders with an IID order or restriction

California law allows, but does not require, judges to order first DUI offenders to install IIDs in their vehicles, with special consideration given to first DUI offenders who had a blood alcohol concentration (BAC) level of .20% or higher at the time of their arrest. The rationale underlying this law is that first DUI offenders with such a high BAC level

are likely problem drinkers or alcoholics, and that IIDs can minimize their risk on the highways.

The sample of first DUI offenders was initially identified using conviction information on DMV's database. When the department receives data from a court showing a conviction for DUI, this information is posted to the offender's driving record, and information about the conviction and the offender is also written to a separate file consisting of drivers convicted of DUI. This file, referred to as the BAC tape, was the source used to identify first DUI offenders for this study.

Using driver record information, those drivers who were convicted of their first DUI offense between January 2000 and January 2003, and whose record indicated that the court either ordered them to install an IID, or restricted them to driving an IID-equipped vehicle, were selected. Drivers whose record indicated that they were deceased, resided outside California, or did not possess a California driver license were removed from the sample. Since the law states that judges should give heightened consideration to prescribing interlocks for those first offenders with BACs of .20% or higher at the point of arrest, first offenders in the sample whose driver record contained BAC information (approximately 88%) were identified, and those whose record showed that their BAC at arrest was .20% or higher were selected for the sample.

In order to evaluate the effectiveness of IIDs for first offenders, a comparison group was created. Drivers in the comparison group were also selected from the BAC tape, and consisted of offenders receiving their first DUI conviction during the same time frame as the first offenders in the IID group. Drivers were ultimately selected for inclusion in the comparison group if their record indicated that their BAC at the time of arrest was .20% or higher, and the court neither ordered them to install an IID, nor restricted their driving to vehicles equipped with an interlock device.

Study 5: DUI second offenders with an IID order or restriction

Prior California law required judges to order second DUI offenders to install an IID in their vehicle. This mandatory law was subsequently amended to target DWS-DUI offenders, rather than repeat DUI offenders, but current law still allows judges to order repeat offenders to install an interlock, and judges do issue such orders to some extent. Study 5 is an evaluation of the effectiveness of IID orders/restrictions for second DUI offenders, and can be compared to study 1, which focuses on the somewhat different population of DWS-DUI offenders.

The methods used to sample second DUI offenders were very similar to those outlined above for the first DUI sample in study 4. The BAC tape was used as the sampling frame, and using this data file all drivers convicted of DUI between January 2000 and January 2003 were initially selected. Driver record data were gathered for the drivers initially selected, and using these data, those drivers with a prior DUI conviction within the previous seven years were identified and selected. Court conviction data on the driver record were used to identify those second DUI offenders who were either

ordered by the court to install an IID in their vehicle, or who were restricted to driving a vehicle equipped with an interlock device. Finally, the sample was refined by removing those drivers who were reported deceased, who resided outside of California, or who had no California driver license.

In order to provide a baseline with which to compare the traffic safety effects of an IID order/restriction, a comparison group of drivers was created, using the BAC tape. Second DUI offenders whose driver record indicated that they were neither ordered by the court to install an IID, nor restricted to driving an interlock-equipped vehicle, were identified. As with the IID ordered/restricted group, drivers who were reported deceased, resided outside California, or who were unlicensed, were removed from the comparison group.

Study 6: DUI second offenders installing an IID

While most of California's IID laws either require or allow the court to order DWS-DUI or DUI offenders to install an IID, there is another law that leaves the choice of IID installation up to the offenders themselves. This law allows repeat DUI offenders who have served half of their period of license suspension/revocation, to install an IID and apply to the DMV for a restricted driver license. This final study, study 6, examines the effectiveness of IIDs for repeat DUI offenders who choose to install an IID. Note that this study is different from the others, with the exception of study 3, in that it evaluates the efficacy of interlock devices for those drivers who actually install them.

DMV's driver license database was used to develop the second DUI offender sample for study 6. When a second DUI offender installs an interlock device and applies to the department for a restricted driver license, certain codes are placed in the database to record this event. Thus, using these codes, DMV records were searched to identify those second DUI offenders installing an IID and applying for a restricted driver license between January 2000 and July 2001. One year was added to the initial selection date to correspond to the eligibility requirement of IID.

Once the initial second DUI offender sample was identified, it was necessary to use driver record data to remove those drivers who were reported deceased, who lived outside of California, or who did not possess a California driver license. In addition, it was necessary to develop a comparison sample that would serve as a baseline for assessing the traffic safety effects of interlock installation. A comparison sample was developed using DMV records to identify second DUI offenders who remained suspended, rather than opting to install an IID and obtain a restricted driver license. As with the other analyses, the comparison sample for study 6 excluded deceased, unlicensed and out-of-state drivers.

Research Design

The same research design was used in all six studies that comprise this outcome evaluation to answer questions about the effectiveness of ignition interlock in

California. This design compares the rates of DUI convictions and crashes for drivers who are "treated" with interlock, to the rates for a very similar group of drivers in the comparison group who did not install an interlock, or receive an IID order/restriction. The logic of this design is that, all other things being equal, if IIDs are an effective traffic safety countermeasure, then this should be reflected in a lower rate of subsequent DUI convictions/crashes on the records of treated drivers, relative to drivers in the comparison group, who do not receive an IID treatment. The key to this design is, "all other things being equal."

If all other things are not equal, then there can be other, extraneous factors, that can influence differences in subsequent driving behavior between the IID treated drivers and the comparison drivers, besides that of IID treatment. For example, if drivers treated with interlock have worse prior driving records than comparison drivers, we would expect that IID treated drivers would have worse subsequent driving records, apart from the interlock treatment that they received. In short, these extraneous pre-existing differences between the groups could bias the results, rendering the findings misleading or ambiguous.

The gold standard in research is to randomly assign subjects to the groups being compared, so that extraneous factors are spread evenly among the groups. Unfortunately, as in almost all of the prior research on ignition interlock, random assignment was infeasible in the present study. Instead, the drivers in this study selected themselves into IID treatment or comparison groups, and/or were selected by judges into the groups. This selection process could have produced treatment and comparison groups that were different to begin with, in ways that may have influenced the results.

In order to attenuate as much of this potential pre-existing group bias as possible, statistical controls were used at two levels, firstly to match control drivers to treated drivers, and secondly to remove bias during the analysis by using covariates in the statistical models. The use of covariates will be discussed in more detail in the analysis section of the paper, while this section will describe the matching process.

Comparison drivers were matched to treated drivers through the use of propensity scores, following the work of Rosenbaum and Rubin (1985). Propensity scores can be thought of as predicted values, and as used here they reflect the probability that a driver was in the IID treatment group. Propensity scores were calculated for all drivers in the IID treatment and comparison groups using SAS PROC LOGISTIC to perform logistic regression analysis, incorporating demographic and prior driving variables as predictors in the model.

Once propensity scores were computed for all drivers, the next step was to match control drivers to treated drivers based on two criteria, propensity score and the number of days in the study. The latter criterion was included to ensure that the follow-up periods were the same for the two groups. A program was developed using SAS software to perform the matching. For each study, the program first selected a

driver in the IID treatment group, and then chose from the much larger pool of comparison drivers, all those drivers who had a days-in-study value that was within 15 days of the corresponding value for the treated driver. In the next step, the program compared the propensity scores of each comparison driver from the initially selected pool of such drivers, to the score for the selected treated driver, and then selected the control driver with the closest propensity score to include in the final sample of comparison drivers. In this way, the comparison drivers selected for the final sample were as similar as possible to the IID treated drivers on those dimensions used to form the propensity scores, thus helping to reduce potential pre-existing group differences that might bias the study results. The final sample sizes, average propensity scores, and average days in study are presented in Table 1.

Table 1

Mean Propensity Scores, Days in Study and Sample Sizes for Study Groups

	Mean propensity score	Mean days in study	Sample size
Study 1			
Interlock	0.069345	724.49	6742
Comparison	0.069292	724.53	6742
Study 2			
Interlock	0.049961	767.25	1691
Comparison	0.045008	767.72	1691
Study 3			
Interlock	0.043136	602.18	4219
Comparison	0.043090	602.18	4219
Study 4			
Interlock	0.028961	766.21	1227
Comparison	0.028207	766.15	1227
Study 5			
Interlock	0.088445	786.95	5416
Comparison	0.088410	786.99	5416
Study 6			
Interlock	0.029028	653.49	600
Comparison	0.029025	653.34	600

While the use of propensity score matching and covariates in the statistical modeling are valuable in reducing bias, they cannot reduce all bias, because it is impossible to know all of the dimensions on which the groups differ that might affect study results, and to have data on these dimensions. Because of this, the study results should be viewed as portraying relationships between IID treatment and subsequent traffic safety

measures, rather than providing definitive evidence that IID treatment results in a particular traffic safety outcome.

Analysis

Prior to running the statistical models, descriptive statistics were calculated for all variables to check for outliers, missing data and potential multicollinearity problems. Means and variances were calculated for all covariates and outcome measures, and group means and variances were calculated and compared between the groups.

The same analytical procedures were used in each of the six studies in the evaluation. For each study, statistical models were developed separately for each of the three outcome measures: days to first subsequent DUI conviction, days to first subsequent DUI incident (alcohol-involved arrest, conviction or crash), and days to first subsequent crash. The statistical technique used to analyze these measures was Cox regression, a particular type of survival analysis.

Cox regression analyzes the time to some event or outcome, in the case of this study, the number of days to first subsequent DUI conviction, incident or crash. An important aspect of Cox regression is that covariates can be used in the model. In the Cox models developed for this study, demographic and prior driving measures were included as covariates to help control bias, and in a hierarchical fashion, group (IID treatment versus comparison) was entered after the covariates to assess whether IID treatment affected the particular traffic safety outcome measure being analyzed, after controlling for the covariates. A significant treatment effect is indicated by a significant chi-square for the effect, with the direction of the effect shown by the sign of the parameter estimate and associated hazard ratio. Because Cox regression omits the baseline hazard from the partial likelihood equations used to estimate the treatment and other effects in the model, and instead focuses on estimating the coefficients for the variables in the model, it was not necessary to specify a distributional form for the three outcome measures.

The first step in conducting the statistical modeling for each outcome measure in each study was to select the covariates to use in the model. This was done by first examining for each potential covariate, its simple correlations with the group variable, and with the outcome measure, and selecting the covariate if its relationship with both measures was significant. Next, SAS PHREG was used to run a backward elimination stepwise Cox regression analysis, using all potential covariates identified in the first step as predictors, and the particular outcome measure of interest as the outcome (e.g., days to first subsequent DUI conviction, etc.). Those covariates that were found to be significant in the stepwise model were used in the final Cox regression model. Note that most of the prior driving covariates were measured 3 years prior to the reference date of IID installation/order/restriction, except for major convictions (usually alcohol involved), which were measured 7 years prior.

After the covariates were selected, SAS PROC LIFETEST was used to produce Kaplan-Meier estimates of the sample (i.e., no covariates) survivor, log negative log survivor, and hazard plots. These plots were used to examine the raw survivor and hazard functions for the IID treatment and comparison groups, not adjusted for the covariates,

which provided information on the groups' survival over time, and times at which they were at particular risk of recidivating. The plots were also used to check whether the hazards of the groups were proportional over time, a requirement of Cox regression.

In addition to using sample plots to check the proportional hazards assumption, this assumption was also examined by calculating differences between the log negative log functions for the different levels of each covariate and treatment group in the model, as discussed by Singer and Willett (2003). Based on these initial steps, a final statistical check of the proportional hazards assumption was performed by using SAS PROC PHREG to run Cox models that included covariate x time (e.g., days to first subsequent DUI conviction), and group by time interactions, with the form of the interaction informed by the initial plots. As Allison (1995) points out, a violation of the proportional hazards assumption is not fatal, but simply one of several possible model misspecifications that, in this case, is appropriately handled by leaving the significant interaction(s) in the final model.

With the preliminary steps taken care of, final Cox regression models were developed for each outcome measure, in each of the six studies. The models included all of the covariates, entered as a block, followed by any covariate x time interactions, then the treatment group, and finally any treatment group x time interactions. The models fit the covariates first and then entered the treatment group variable, in order to assess the relationship between IID treatment and the three variables DUI convictions, DUI incidents, and crashes, after adjusting for the covariates. Ties in event times were handled by the exact method. The significance of an interlock treatment effect was judged by a chi-square that was significant at $p = .05$, with the direction of the effect revealed by the sign of the associated parameter estimate and the hazard ratio. Finally, fitted survivor and hazard graphs were produced to provide a visual representation of the effects of IID treatment on the outcome measure, controlling for the covariates.

The adequacy of each Cox regression model was assessed through several diagnostic tests. Deviance residuals were calculated and plotted to check for outliers. In addition, likelihood displacement statistics were produced to look for cases that would produce unusually large changes in the log likelihood of the model if they were removed, and dfbeta statistics were calculated to look for cases that would strongly affect parameter estimates if removed.

RESULTS

Study 1: DWS-DUI offenders with an IID order or restriction

As a part of the various data screening procedures for study 1, ANOVA and contingency tables were used to assess how the IID treatment group and the comparison group differed on prior driving history and demographic variables. Differences between the groups that were statistically significant provided clues as to how pre-existing group differences might affect the study results. The results of the analyses comparing the groups showed that the offenders in the IID treatment group had, on average, higher numbers of 3-year prior traffic convictions, 7-year prior alcohol/drug major convictions, 3-year prior injury crashes, 3-year prior alcohol/drug-

related crashes, and 3-year prior DWS convictions. Although these differences were statistically significant, they were relatively small in size. These results indicate that offenders in the IID treatment group were riskier than drivers in the comparison group, and that IID treatment group offenders could be expected to have higher recidivism rates than comparison offenders apart from any effects of the IID treatment. These results also indicated that it was important to include covariates in the Cox regression model that assessed the effectiveness of IID orders/restrictions.

Days to first subsequent DUI conviction

Simple correlations were computed between the prior driving history and demographic variables, and days to first subsequent DUI conviction and treatment group, in order to assess which variables could be used as covariates in the Cox regression models. There were three variables that had statistically significant correlations with both days to first subsequent DUI conviction and treatment group, and these variables were: 3-year prior traffic convictions, 7-year prior alcohol/drug major convictions, and 3-year prior DWS convictions.

In order to determine which of these variables were significant in the context of all three variables considered together, and which could be eliminated from consideration due to significant shared variance, all three variables were entered into a backward elimination stepwise Cox regression model predicting days to first subsequent DUI conviction. The results from this analysis showed that two of the three variables were statistically significant, and should be used as covariates in the final Cox regression model. These two significant variables were 3-year prior traffic convictions and 7-year prior alcohol/drug major convictions.

Once the covariates were selected, procedures were run to check the adequacy of one of the main assumptions underlying the Cox regression model, the proportional hazards assumption. This assumption specifies that the hazard rates for the levels or groups defined by each predictor variable are proportional over time. This assumption was examined first by creating difference plots of the log negative log function for each level of a predictor variable (Singer & Willett, 2003). In addition, SAS PROC LIFETEST was used to produce sample survivor and hazard plots, which provided clues as to the form of any possible non-proportionality.

The final, and definitive test for checking the proportional hazards assumption was to create interaction terms of each predictor x time (days to first subsequent DUI) in a Cox regression model, and determine whether the interaction was statistically significant. When the statistical interaction tests were run for the two covariates and treatment group variable, in a Cox regression model predicting days to first subsequent DUI conviction, the results showed that none of the interactions were significant, and thus that the proportional hazards assumption was not violated.

SAS PHREG was used to fit the final Cox regression model for days to first subsequent DUI conviction, incorporating the two covariates and treatment group variable as predictors. The results are shown in Table 2.

Table 2

Cox Regression Model, Study 1, Days to First Subsequent DUI Conviction

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
3-yr prior traffic convictions	0.0428	4.336	0.0373	1.044
7-yr prior alc/drug major conv	0.2227	57.598	< .0001	1.249
Treatment group	0.0187	0.095	0.7577	1.019

While the two covariates are statistically significant, the group effect is clearly not significant, with a *p* value = .76. Thus, this analysis shows that there is no difference in the number of days to first subsequent DUI conviction between DWS-DUI offenders receiving an IID order or restriction, and DWS-DUI offenders not receiving such an order or restriction. In other words, the issuance of an order to install an IID, or an IID restriction, by the court did not affect the recidivism rate of DWS-DUI offenders. This can be seen visually in Figure 1, below.

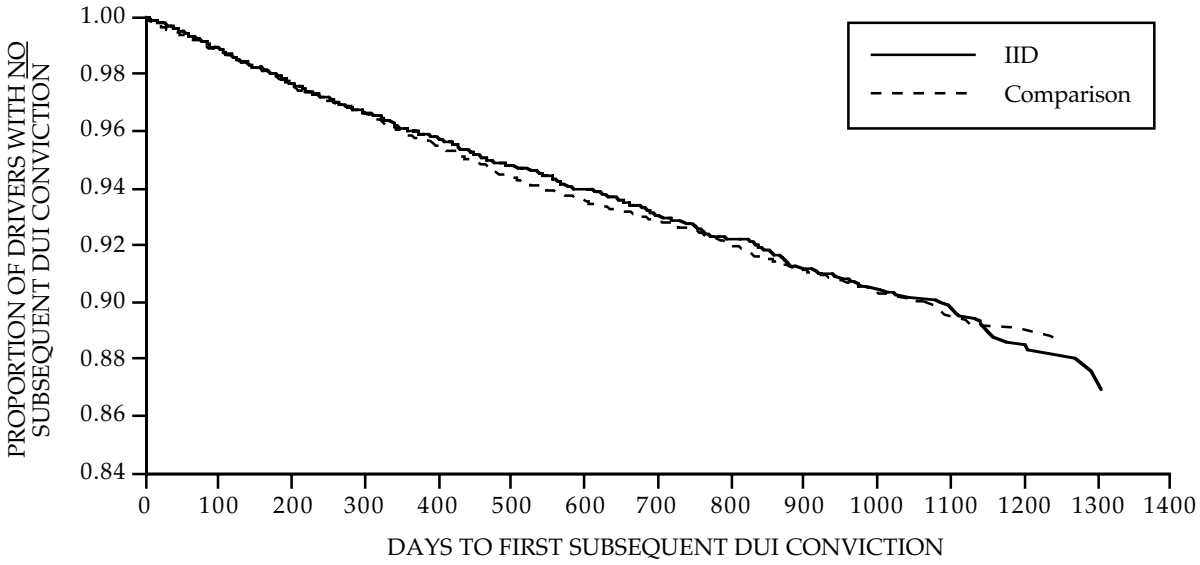

Figure 1. Final survival model: Number of days to first subsequent DUI conviction for DWS-DUI offenders receiving an IID order/restriction versus DWS-DUI offenders not receiving an IID order/restriction.

Figure 1 shows the proportion of drivers in the IID treatment and comparison groups who survive, or who do not have a subsequent DUI conviction during the study follow-

up period. Note that a higher line for a group represents a lower DUI recidivism rate, since more drivers survive without a subsequent DUI conviction.

The most salient aspect of Figure 1 is that the survival rates for the two groups are very close together, confirming the result from the statistical analysis that showed that there was no difference between the IID treatment and comparison groups in days to first subsequent DUI conviction.

Days to first subsequent DUI incident

SAS was used to compute simple correlations between each of the prior driving history and demographic variables that could be used as covariates, and days to first subsequent DUI incident, and the treatment group variable. There were five prior driving history/demographic variables that had statistically significant correlations with both treatment and subsequent DUI incidents, and these were: gender, 7-year prior alcohol/drug major convictions, 3-year prior traffic convictions, 3-year prior DWS convictions, and 7-year prior alcohol-related crashes.

The five variables identified as potential covariates were used as predictors in a backward elimination stepwise Cox regression analysis, where days to first subsequent DUI incident served as the outcome. The results of this analysis revealed that two variables—gender and 7-year prior alcohol/drug major convictions—were significant within the context of all five variables considered together. These two variables were used as covariates in the main Cox regression analyses of subsequent DUI incidents.

Once the covariates were identified and selected, the next step was to check whether the covariates or the treatment group variable violated the proportional hazards assumption. SAS LIFETEST was used to produce sample survival and hazard plots, which were then checked for potential violations of the proportional hazards assumption; these plots did not reveal strong evidence of such a violation. This finding was confirmed by calculating difference plots of the log negative log survival function for each level of each covariate and the treatment variable.

While the preliminary test did not reveal evidence of a violation of the proportional hazards assumption, a final, definitive check was performed by using SAS PHREG to perform a Cox regression analysis, where interactions were formed with each predictor variable and days to first subsequent DUI incident, and entered in to the model. These analyses showed that all interaction terms were non-significant, confirming the results of the preliminary tests that showed that there were no violations of the proportional hazards assumption.

The final Cox regression analysis of subsequent DUI incidents was performed using SAS PHREG. The model fit the two covariates first, and then assessed the significance of the IID treatment group variable, after adjusting for the covariates. The results of this analysis are shown in Table 3.

Table 3

Cox Regression Model, Study 1, Days to First Subsequent DUI Incident

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
Gender	-0.8165	33.326	< .0001	0.442
7-yr prior alc/drug major conv	0.2471	91.077	< .0001	1.280
Treatment group	0.0006	0.0001	.9910	0.999

Both of the covariates are statistically significant, but the treatment group variable, with a *p* value of .99, clearly is not, indicating that there is no difference between the IID treatment and comparison groups in their number of days to first subsequent DUI incident. Thus, there is no evidence that DWS-DUI offenders who receive a court order to install an IID or a restriction to driving an IID-equipped vehicle, have different rates of subsequent DUI incidents than DWS-DUI offenders who receive no IID order/restriction. These results can be seen in Figure 2, below.

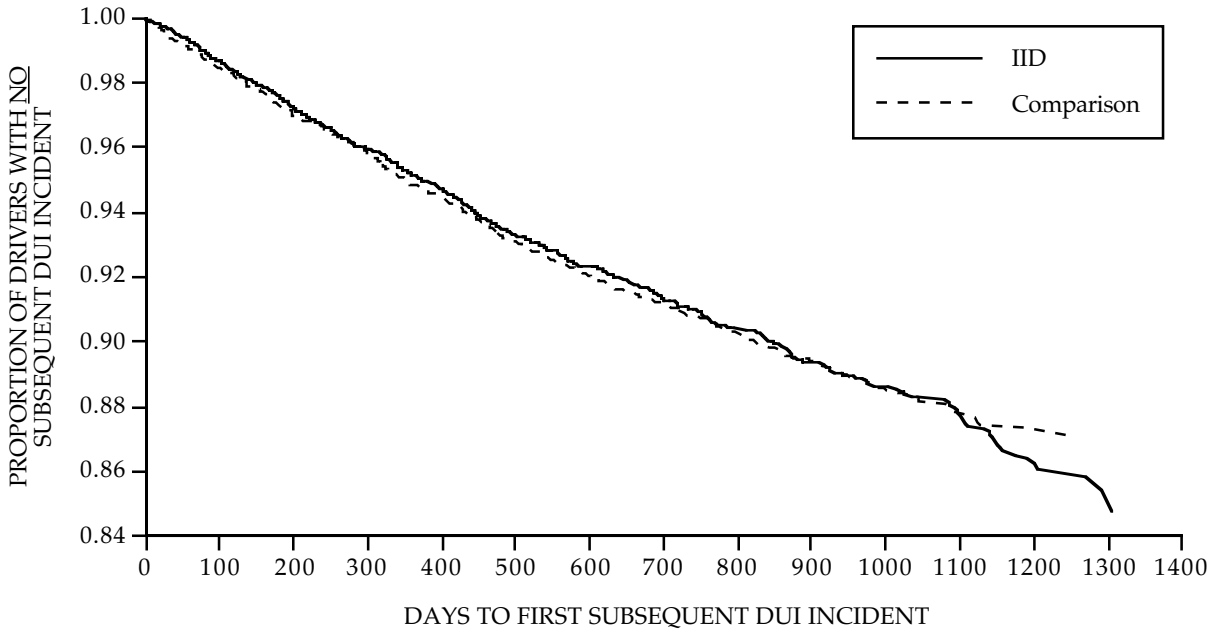

Figure 2. Final survival model: Number of days to first subsequent DUI incident for DWS-DUI offenders receiving an IID order/restriction versus DWS-DUI offenders not receiving an IID order/restriction.

Figure 2 shows the survival rates for the IID treatment and comparison groups over the course of the study. It is clear from the figure that the rates of days to first subsequent DUI incident are very similar for the two groups, and the lines are so close at some points the survival rates are indistinguishable. This confirms the results from the statistical analyses shown in Table 3, which show that there is no statistically significant difference in days to first subsequent DUI incident between the IID treatment and comparison groups.

Days to first subsequent crash

Simple correlations were computed between the prior driving history and demographic variables, and days to first subsequent crash and the treatment group variable. An examination of these correlations revealed that the following four variables had statistically significant correlations with both treatment group and days to first subsequent crash, and so should be considered as potential covariates; gender, 3-year prior traffic convictions, 7-year prior alcohol/drug major convictions and, 3-year prior DWS convictions.

In order to exclude variables with significant shared variance with the other variables, the four prior driving history and demographic variables were entered as predictors in a backward elimination stepwise Cox regression analysis, with days to first subsequent crash the outcome. The results of this analysis showed that two of the four variables were statistically significant predictors of days to first subsequent crash, within the context of all variables considered together. These variables were, 3-year prior traffic convictions and 7-year prior alcohol/drug major convictions.

With the covariates selected, analyses were performed to see whether they, and the treatment group variable, violated the proportional hazards assumption underlying the Cox regression method. The LIFETEST procedure in SAS was used to graph the sample survival and hazard functions, in order to provide an indication whether the proportional hazards assumption was violated, and if so, what form the violation took. In addition, log negative log survival difference plots were produced for each level of the predictor variables. Neither the sample survival and hazard plots, nor the log negative log survival difference plots, suggested a violation of the proportional hazards assumption.

The final determination of whether the proportional hazards assumption had been violated was provided by several Cox regression analyses, where each covariate and the treatment variable were used, in turn, to form interaction terms with days to first subsequent crash. The results of these analyses showed that none of the interaction terms was significant, indicating that there is no evidence of a violation of the proportional hazards assumption.

SAS PHREG was used to run the final Cox regression model, which included the two covariates and the treatment group variable as predictors and days to first subsequent crash as the outcome. The model adjusted for the covariates first, and then calculated the contribution made by the treatment group variable, which indicated the effects of the IID order/restriction. The results of the Cox regression analysis are displayed in Table 4.

Table 4

Cox Regression Model, Study 1, Days to First Subsequent Crash

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
3-yr prior traffic convictions	0.1202	36.862	< .0001	1.128
7-yr prior alc/drug major conv	-0.1516	20.618	< .0001	0.859
Treatment group	0.2704	17.594	< .0001	1.311

It can be seen from Table 4 that all of the predictors are statistically significant. Of particular importance is the treatment group effect, which is statistically significant, with a *p* value < .0001. This dichotomous variable was coded IID treatment = 0 and comparison = 1, so the positive parameter estimate and associated hazard ratio > 1.0 indicate that the hazard of a subsequent motor vehicle crash is greater for the comparison group. By taking the reciprocal of the hazard ratio for the treatment group, the focus can be shifted to how much lower the risk of a subsequent crash is for the IID treatment group. When this is done, it shows that offenders receiving a court IID order/restriction have a 24% lower crash risk than comparison offenders. This can be seen visually in Figure 3.

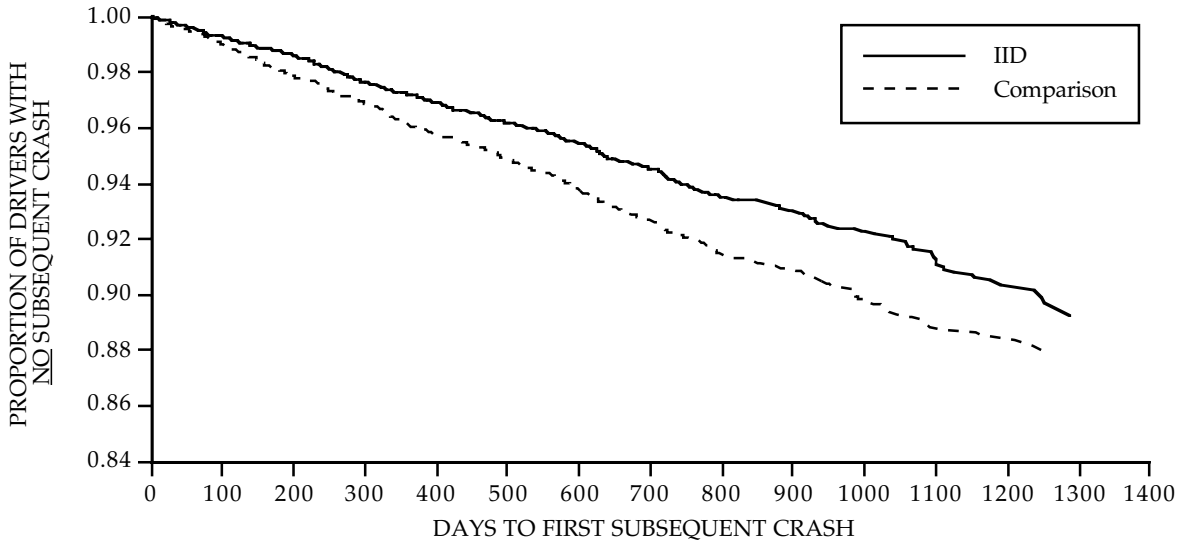

Figure 3. Final survival model: Number of days to first subsequent crash for DWS-DUI offenders receiving an IID order/restriction versus DWS-DUI offenders not receiving an IID order/restriction.

Figure 3 shows that the IID treatment group's survival curve is higher than the survival curve for the comparison group, confirming the findings from the statistical analysis that drivers receiving a court order to install an IID, or an IID driving restriction, survive longer without a subsequent crash than drivers not receiving an IID order/restriction. Thus, a court IID order/restriction is associated with a reduction in the rate of subsequent crashes, even though it does not seem to effect subsequent DUI convictions or DUI incidents.

Study 2: DWS-DUI offenders with an IID order

As a part of the various data screening procedures for study 2, ANOVA and contingency tables were used to assess how the IID treatment group and the comparison group differed on prior driving history and demographic variables. Differences between the groups that were statistically significant provided clues as to how pre-existing group differences might affect the study results. The results of the analyses comparing the groups showed that the offenders in the IID treatment group had, on average, higher numbers of 3-year prior traffic convictions, 7-year prior alcohol/drug major convictions, 3-year prior injury crashes, 3-year prior alcohol/drug-related crashes, and 3-year prior DWS convictions. Although these differences were statistically significant, they were relatively small in size. These results indicate that offenders in the IID treatment group were riskier than drivers in the comparison group, and that IID treatment group offenders could be expected to have higher recidivism rates than comparison offenders apart from any effects of the IID treatment. These results also indicated that it was important to include covariates in the Cox regression model that assessed the effectiveness of IID orders/restrictions.

Days to first subsequent DUI conviction

Simple correlations were computed between each of the potential covariates, and days to first subsequent DUI conviction and the treatment group variable. Variables that proved to have statistically significant correlations with both treatment group and days to first subsequent DUI conviction were selected as potential covariates. These potential covariates were: 3-year prior traffic convictions, 7-year prior alcohol/drug major convictions and, 3-year prior DUI convictions.

The three potential covariates identified in step 1 were next used as predictors in a backward elimination stepwise Cox regression model predicting days to first subsequent DUI conviction. The results of this analysis showed that only one of the three potential covariates was statistically significant within the context of all three considered together. This clearly shows that there was considerable overlapping variance among the three variables, and that only one needed to be used as a covariate in the final Cox regression model. The significant covariate used in the final model was 3-year prior alcohol/drug major convictions.

Sample survival and hazard plots were produced for the covariate selected—3-year prior alcohol/drug major convictions—and also for the treatment group variable, in order to check whether either variable violated the proportional hazards assumption. These plots did not show evidence of a violation of the assumption. Similarly, plots of the log negative log survival function of the levels of the two variables also failed to indicate a violation.

The final test of the proportional hazards assumption was conducted by forming interactions of 3-year prior alcohol/drug major convictions, and the treatment group variable, with days to first subsequent DUI conviction, and entering these into a Cox regression model. The results from these analyses showed that neither interaction was statistically significant, confirming the results of the visual inspection of the plots, which showed that the proportional hazards assumption was not violated. With the model assumption intact, final Cox regression models were developed to test the effects of IID orders on subsequent DUI convictions.

The final Cox regression model included the covariate, 3-year prior alcohol/drug major convictions, which was entered first, and the treatment group variable, whose effect on subsequent DUI convictions was adjusted for the effects of the covariate. The results of this analysis are presented in Table 5.

Table 5

Cox Regression Model, Study 2, Days to First Subsequent DUI Conviction

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
3-yr prior alc/drug major conv	0.2122	11.206	.0008	1.236
Treatment group	0.0579	0.282	.5954	1.060

The covariate is statistically significant, but more importantly, the treatment group effect is not. With a *p* value of 0.59, it is clear that this analysis finds no evidence that a court order to install an IID is associated with a reduced risk of a subsequent DUI conviction. This can be seen in Figure 4, below.

Figure 4 shows that, initially, the comparison group has a slightly better survival rate than the IID treatment group, but that this trend shifts, and that by about 500 days, the IID treatment group better survives the risk of a subsequent DUI conviction. This appears to be a disordinal interaction, and it suggests that the overall effect of treatment group might be non-significant, but that an interaction of treatment group with time (days to first subsequent DUI conviction) might be significant. However, several forms of such an interaction were modeled, and none were significant. Thus, there is no

evidence that court orders to DWS-DUI offenders to install an IID have any impact on offenders' risk of a subsequent DUI conviction.

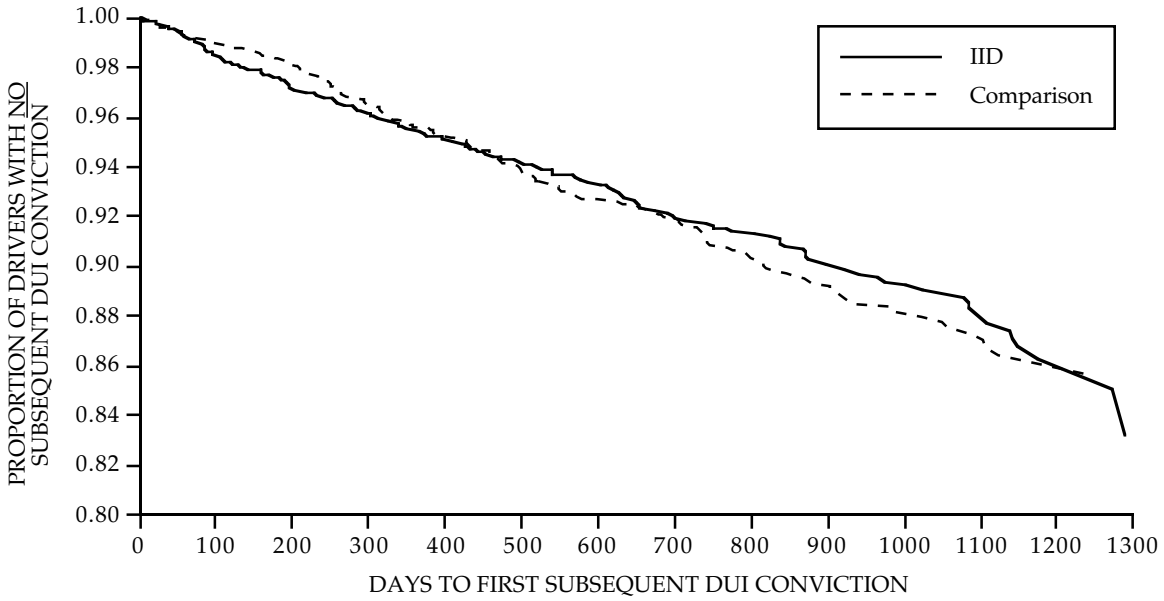

Figure 4. Final survival model: Number of days to first subsequent DUI conviction for DWS-DUI offenders receiving an IID order versus DWS-DUI offenders not receiving an IID order.

Days to first subsequent DUI incident

Simple correlations were computed between demographic and prior driving history variables that might be useful as covariates, and days to first subsequent DUI incident and treatment group. Six variables had significant correlations with both days to first subsequent DUI incident and treatment group, and so were selected as potential covariates at this stage. These six variables were: age, 3-year prior traffic convictions, 7-year prior alcohol/drug major convictions, 3-year prior crashes, 7-year prior DWS convictions, and 7-year prior DUI convictions.

It is likely that there is some shared variance among these six variables, and so to reduce redundancy and use only those variables contributing unique variance to the Cox regression models, all six variables were entered into a backward elimination stepwise Cox regression model in order to identify significant and unique covariates. Using this approach, it was found that three of the six variables were significant when all of the variables were considered together. These three variables, which were used as covariates in the final Cox regression models were: 3-year prior traffic convictions, 7-year prior DWS convictions, and 7-year prior DUI convictions.

With the covariates selected, it was important to check whether they, and the treatment variable, met the Cox regression assumption that the levels of each variable had hazards that were proportional over the course of the study. The integrity of this assumption was first evaluated by visually examining the sample survival and hazard plots for each variable to check whether the hazard rates were proportional. The results of this examination, as well as log negative log difference plots of survival for each variable, suggested the possibility that at least one of the covariates might violate the proportional hazards assumption.

A more formal test of the proportional hazards assumption was conducted by forming interaction terms between each predictor and time (days to first subsequent DUI incident), and then running a Cox regression analysis to see if the interactions were significant. These analyses showed that one of the interactions, 7-year prior DWS convictions by days to first subsequent DUI incident, dichotomized at 500 days, was statistically significant, indicating that this covariate violated the proportional hazards assumption. The "cure" for the violation of this assumption is simply to leave the significant interaction in the final model, so that the non-proportional hazards are accounted for (Allison, 1995).

The final Cox regression model included the three covariates, the interaction between one of the covariates and time, and the treatment group variable. The covariates and interaction terms were entered first, so that the treatment variable, which was entered last, represented the effects of an IID order on days to first subsequent DUI incident, after adjusting for the effects of the covariates. The results from this analysis are presented in Table 6.

Table 6

Cox Regression Model, Study 2, Days to First Subsequent DUI Incident

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
3-yr prior traffic convictions	0.0665	3.920	.0477	1.069
7-yr prior DUI convictions	0.0884	9.177	.0025	1.092
7-yr prior DWS convictions	0.1410	9.594	.0020	1.151
7-yr prior DWS x 1st subsequent DUI incident	-0.1866	5.151	.0232	0.830
Treatment group	0.0656	0.413	.5206	1.068

All three of the covariates, plus the interaction between 7-year prior DWS convictions and days to first subsequent DUI incident, are statistically significant, indicating that the model is adjusting for the effects of these covariates. However, the effect that is of primary interest is treatment group, and with a *p* value of .52, it clearly is not significant. Thus, the findings show that there is no association between IID orders and subsequent DUI incidents. This can be seen graphically in Figure 5.

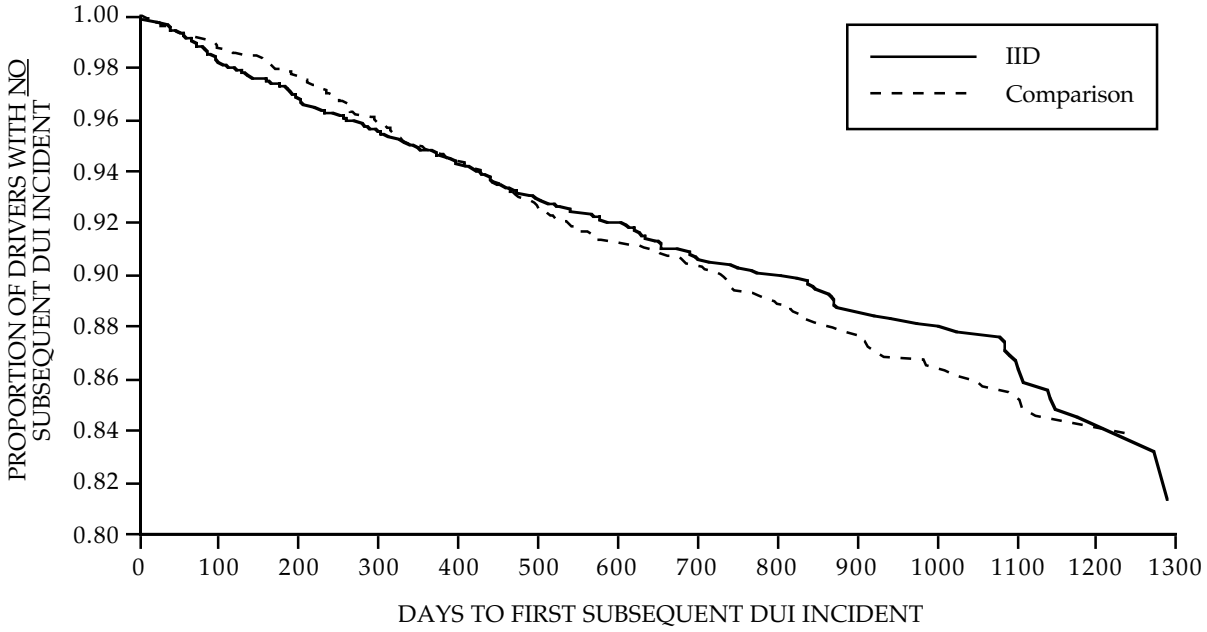

Figure 5. Final survival model: Number of days to first subsequent DUI incident for DWS-DUI offenders receiving an IID order versus DWS-DUI offenders not receiving an IID order.

Figure 5 shows that the comparison group better survives the risk of a subsequent DUI incident for about the first year, but that this switches, and after approximately 500 days, the IID treatment group has a better survival rate on subsequent DUI incidents. While this suggests a possible disordinal interaction that could also have a non-significant main effect, statistical tests failed to find evidence for this. Thus, while there is some small difference between the treatment and comparison group on subsequent DUI incidents, this difference is small and non-significant, and could simply be the result of sampling error. The findings from this analysis do not show evidence that court orders to DWS-DUI offenders to install an IID affect the risk of a subsequent DUI incident.

Days to first subsequent crash

As a first step in identifying possible covariates to use in the Cox regression model predicting crashes, simple correlations were computed between the demographic and prior driving history variables that could be used as covariates, and days to first subsequent crash and the treatment variable. Three of the demographic and prior driving history variables had significant correlations with both subsequent crashes and treatment, and so were identified as possible covariates. These three variables were: 7-year prior alcohol/drug major convictions, 7-year prior DWS convictions, and 7-year prior DUI convictions.

These three variables are similar, and likely share variance, so there is probably some redundancy in using all three as covariates. In order to isolate and remove those variables that didn't contribute uniquely to the Cox regression analysis predicting crashes, a backward elimination stepwise Cox regression model was run which included all three covariates as predictors. The results from this analysis showed that two of the three variables, 7-year prior alcohol/drug major convictions and 7-year prior DWS convictions, were statistically significant within the model that considered all three variables together; these two variables were used as covariates in the final Cox regression model.

In order to check for proper specification of the Cox regression model, analyses were undertaken to check whether either of the covariates, or the treatment group variable, violated the proportional hazards assumption. The first step was more informal, and involved plotting the sample survival and hazards plots for each variable and visually examining whether the hazards for the groups were proportional over the course of the study. A visual inspection of the plots did not show evidence that either of the covariates, or treatment, violated the proportional hazards assumption, and this was confirmed by the results of log negative log difference plots of survival for each variable.

Although the visual inspection of the plots failed to reveal evidence of a violation of the proportional hazards assumption, a more definitive check was made by forming interaction terms of each variable with days to first subsequent crash, and testing their significance in a Cox regression analysis. The results of these analyses showed that, while neither covariate violated the proportional hazards assumption, the treatment group variable did, and this violation was best captured through a simple linear interaction with time. Thus, in order to capture, and deal appropriately with this non-proportionality, the interaction between treatment and days to first subsequent crash was included in the final Cox regression model.

The final model first assessed the effects of the two covariates, 7-year prior alcohol/drug major convictions and 7-year prior DWS convictions, and the interaction

between treatment group x days to first subsequent crash, and then examined the relationship between IID orders and crashes, after adjusting for the covariates and interaction. The results of this analysis are presented in Table 7.

Table 7

Cox Regression Model, Study 2, Days to First Subsequent Crash

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
7-yr prior alc/drug major conv	-0.2619	13.436	.0002	0.770
7-yr prior DWS convictions	-0.1019	2.897	.0890	0.903
Treatment group	0.5499	4.862	.0275	1.733
Treatment x time	-0.0009	4.079	.0434	0.999

The first covariate, 7-year prior alcohol/drug major convictions, is statistically significant, while the second, 7-year prior DWS convictions, is no longer significant in the full model. Treatment group, which assesses the difference in the hazards of a subsequent crash between offenders receiving an IID order and those offenders not receiving an order, is significant, indicating an association between IID orders and crashes. The positive parameter estimate for the treatment variable and the hazard ratio greater than 1, indicate that the risk of a subsequent crash is higher for offenders in the comparison group. Taking the reciprocal of this hazard ratio expresses how much lower the risk is for offenders in the IID treatment group. Doing so reveals that DWS-DUI offenders receiving a court order to install an IID have a 42% lower risk of a subsequent crash than DWS-DUI offenders who do not receive a court order to install an IID. This can be seen in Figure 6.

Because it is not possible to produce fitted plots for Cox models that contain time-dependent variables, Figure 6 is based on a model that omits the interaction of treatment x time. It is clear from Figure 6 that offenders receiving an order to install an IID survive a subsequent crash better than do offenders not receiving an IID order, thus confirming the association between IID orders and subsequent crashes found in the statistical analysis.

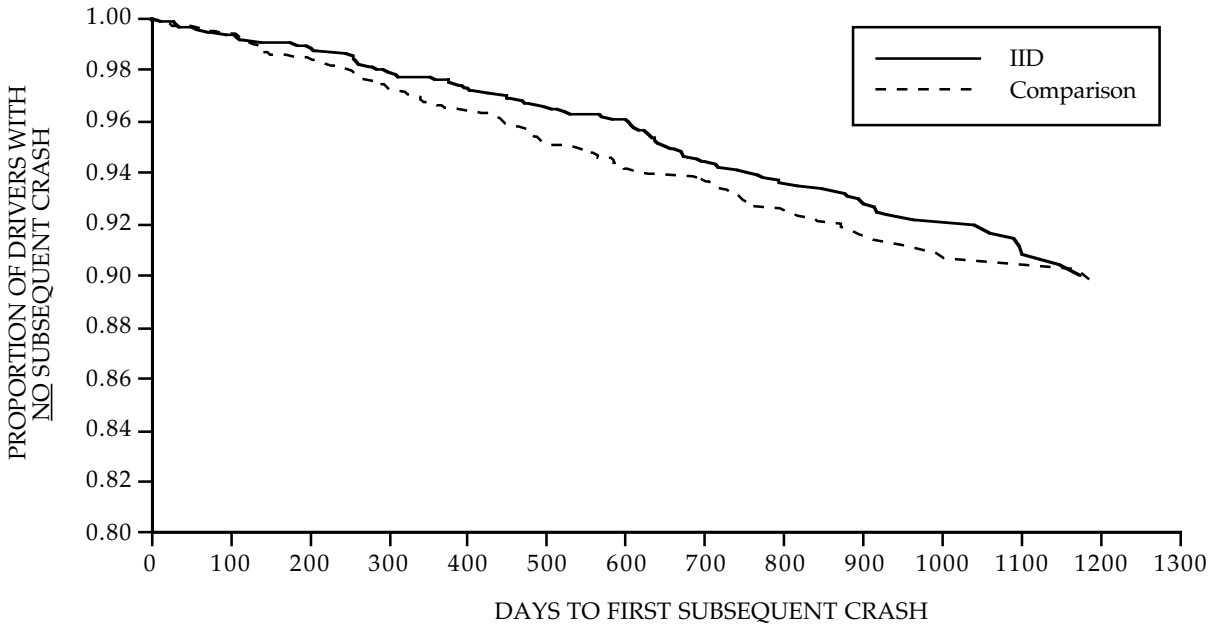

Figure 6. Final survival model: Number of days to first subsequent crash for DWS-DUI offenders receiving an IID order versus DWS-DUI offenders not receiving an IID order.

Study 3: DWS-DUI & DUI offenders installing an IID

ANOVA and Chi-square tests were computed on demographic and prior driving history variables in order to check whether there were pre-existing differences between the IID treatment and comparison groups that might influence the results of the study. The results from these tests were mixed. The IID treatment group was, on average, slightly older and more female than the comparison group, which would indicate that the IID treatment group was less risky than the comparison group. However, group differences on three other variables painted a different picture. IID treatment offenders had higher average numbers of 3-year prior traffic convictions, 3-year prior alcohol/drug major convictions, and 3-year prior crashes. Overall, while these results are mixed, it is likely that offenders in the IID treatment group are somewhat more risky than offenders in the comparison group, which has two important implications. The first is that it is important to use covariates in the final Cox models for study 3, to remove as much of the pre-existing group bias as possible. The second implication is that it appears that judges assign somewhat riskier offenders to interlock, perhaps because they feel such offenders need an additional control on their driving. It should be emphasized that while these group differences were statistically significant, they were relatively small, with differences between groups ranging from 1% - 10%.

Days to first subsequent DUI conviction

The analysis of group differences on prior driving history and demographic variables showed that the IID group was somewhat riskier than the comparison group, and suggested that it would be important to use covariates in the statistical models. The first step in selecting covariates was to compute simple correlations between demographic and prior driving history variables, and days to first subsequent DUI conviction and treatment group. Variables that had significant correlations with both DUI convictions and treatment group were selected as potential covariates. The following variables had significant correlations and thus were selected as potential covariates; age, gender, 3-year prior traffic convictions, 3-year prior alcohol/drug major convictions, and 7-year prior alcohol-involved crashes.

Because it was important to fit a parsimonious model, the final selection of covariates involved entering all of the potential covariates in a backward elimination stepwise Cox regression model predicting days to first subsequent DUI conviction, and determining which of the potential covariates were still significant in the context of all covariates considered together. The results from this stepwise analysis showed that two of the potential covariates, gender and 3-year prior traffic convictions, remained statistically significant and contained no significant shared variance. Thus, gender and 3-year prior traffic convictions were used as covariates in the final Cox regression analysis predicting days to first subsequent DUI conviction.

With the covariates selected, it was important to test whether they, or the treatment group variable, violated the proportional hazards assumption. The first test was an informal one, and involved producing sample survival and hazard plots for each variable, and then checking the plots to determine whether the levels of that variable had hazards that were proportional over the course of the study. The plots for gender and treatment group both looked fine, but the plot for 3-year prior traffic convictions showed evidence of a possible violation of proportional hazards. A somewhat more formal test, producing and examining plots of the difference between log negative log survival for each variable, also suggested a possible violation by 3-year prior traffic convictions.

The final and definitive check of the integrity of the proportional hazards assumption was to compute likely forms of statistical interactions between each predictor and days to first subsequent DUI conviction, in a Cox regression analysis, and then examine the significance of the interactions. The results showed that none of the predictors violated the proportional hazards assumption, and that the model was correctly specified in this regard. While the plots of 3-year prior traffic convictions suggested a possible violation of the proportional hazards assumption, these differences turned out to be small and not significant.

The final Cox regression model stepped in the two covariates first, and then entered treatment group, assessing its effects after having adjusted for the covariates. The results of this main analysis are presented below, in Table 8.

Table 8

Cox Regression Model, Study 3, Days to First Subsequent DUI Conviction

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
Gender	-0.3334	4.642	.0312	0.716
3-yr prior traffic convictions	0.1113	16.396	< .0001	1.118
Treatment group	0.1967	4.863	.0274	1.217

All of the predictors in the model are statistically significant. The two covariates are significant, indicating that pre-existing differences between the treatment and comparison group have been removed on those dimensions. Importantly, the treatment group effect is also statistically significant, indicating that the risk of a subsequent DUI conviction is associated with the installation of an IID. The positive parameter estimate and hazard ratio for treatment group indicate that offenders not installing an IID have a higher risk of subsequent DUIs. Taking the reciprocal of the hazard ratio expresses the difference between the groups in terms of the lower risk for the IID treatment group. When this is done, it shows that offenders installing an IID have a 17.8% lower risk of subsequent DUI conviction than offenders not installing a device. This difference can be seen visually in Figure 7.

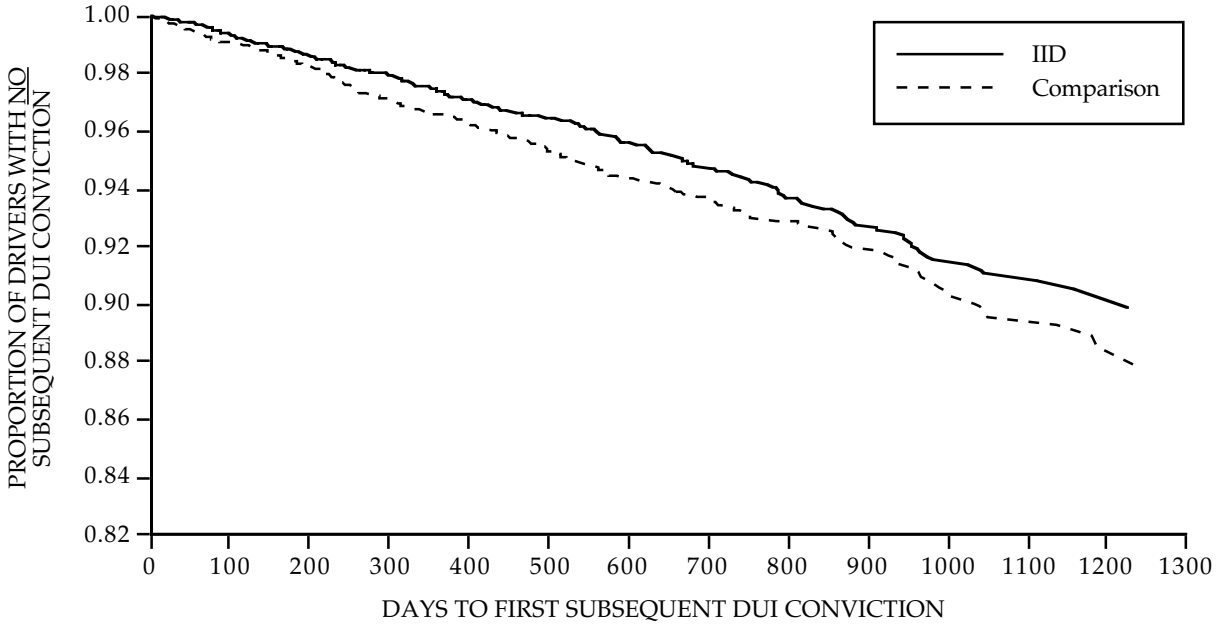

Figure 7. Final survival model: Number of days to first subsequent DUI conviction for drivers installing an IID versus drivers not installing an IID.

It can be seen that, after about 200 days, the survival rates of a subsequent DUI conviction for the two groups begin diverging, with offenders installing an IID having better survival throughout the study period. This confirms the results of the statistical analysis; the installation of an ignition interlock is associated with a lower risk of a subsequent DUI conviction.

Study 3 differs from the other 6 studies in that it focuses not just on suspended/revoked (S/R) or DUI offenders, but instead includes offenders from both of these groups. This presents an interesting question: does the installation of an IID work better for one group than for the other? This question was addressed by running additional analyses, where the treatment variable was replaced by three dummy variables, each dummy consisting of a different combination of the levels of the two dichotomous variables, IID treatment (IID install versus comparison) and offender type (DUI versus S/R). The excluded category, which represents the comparison category for each dummy, was S/R offenders installing an IID. The results of this analysis are shown in Table 9.

Table 9

Cox Regression Model, Study 3, Subsequent DUI: IID Effects on Offender Type

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
Gender	-0.3081	3.954	.0468	0.735
3-yr prior traffic convictions	0.0871	9.296	.0023	1.091
Treatment dummy 2	-0.1738	1.634	.2011	0.840
Treatment dummy 3	0.3367	6.183	.0129	1.400
Treatment dummy 4	-0.0871	0.421	.5164	0.917

The main effect of interest in Table 9 is treatment dummy 3, which assesses the difference between S/R offenders who installed an IID, and S/R offenders in the comparison group. This effect is statistically significant, with a positive parameter estimate and hazard ratio greater than 1.0, indicating that there is a significant difference between the two groups, and that S/R offenders in the comparison group have a higher risk of subsequent DUI conviction than S/R offenders in the interlock group. The S/R offenders in the IID treatment group have a risk of subsequent DUI conviction that is 28.6% lower than S/R offenders in the comparison group.

So, it appears that installing an IID has salutary effects on S/R offenders, but what is the effect of IID installation on DUI offenders? In order to assess this, it was necessary to

construct a test statement comparing treatment dummy 2 (IID S/R versus IID DUI) to treatment dummy 4 (IID S/R versus comparison DUI). The results of this test (not shown on Table 9) showed a chi-square of 0.532 and associated *p* value of 0.47, far from statistical significance. Thus, IID installation appears to be significant in reducing the hazard of DUI for S/R offenders, but not necessarily for DUI offenders. This finding should be viewed with some caution, because each group typically receives different sanctions, and these other sanctions likely also impacted subsequent driving behavior.

Days to first subsequent DUI incident

The first step in the process of selecting covariates for the Cox regression model predicting days to first subsequent DUI incident was to compute simple correlations between each of the demographic and prior driving history variables, and days to first subsequent DUI incident and treatment group. An examination of these correlations, and their significance levels, revealed that the following five variables had significant correlations with both days to first subsequent DUI incident and treatment group: age, gender, 3-year prior traffic convictions, 3-year prior alcohol/drug major convictions, and 7-year prior alcohol-involved crashes.

In order to avoid including covariates that did not make a unique contribution to the Cox model, all five potential covariates were entered into a backward elimination stepwise Cox regression model predicting days to first subsequent DUI incident. An examination of the model statistics revealed that three of the variables were statistically significant within the context of all variables considered together. These three variables, which were included as covariates in the final Cox regression model were: gender, 3-year prior traffic convictions, and 3-year prior alcohol/drug major convictions.

The three selected covariates, plus the treatment group variable, were examined to determine whether they violated the proportional hazards assumption. The first tests were informal, and involved visually inspecting the sample survival and hazard plots for the levels of each variable, and also looking at the log negative log survival difference graphs. The plots suggested that treatment group and gender had proportional hazards over the course of the study. The plots for 3-year prior traffic convictions, and 3-year prior alcohol/drug major convictions, were more ambiguous, and suggested the possibility that these covariates violated the proportional hazards assumption.

The predictors were more formally tested for violations of the proportional hazards assumption by forming interactions of each of them with days to first subsequent DUI incident. Common forms of interactions were tested, including forms suggested by the

sample survival and hazard plots. These interactions were entered into a Cox regression model predicting days to first subsequent DUI incident, and an examination of the results showed that only the treatment group interaction was statistically significant. In order to account for the non-proportional hazards of the two levels of treatment group, the interaction of treatment group with days to first subsequent DUI incident was included in the final Cox regression model, along with the main effects of the other predictors.

The final Cox regression model fit the three covariates first, adjusting for their effects, followed by the main effect of treatment group, and lastly the interaction of treatment group with days to first subsequent DUI incident. The results of this analysis are shown in Table 10.

Table 10

Cox Regression Model, Study 3, Days to First Subsequent DUI Incident

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
Gender	-0.2755	4.038	.0445	0.759
3-yr prior traffic convictions	0.0932	12.085	.0005	1.098
3-yr prior alc/drug major conv	0.1211	3.047	.0809	1.129
Treatment group	0.3830	18.382	< .0001	1.467
Treatment group x time	-0.5129	5.323	.0211	0.599

All effects in the model are statistically significant, with the exception of 3-year prior alcohol/drug major convictions, which is significant at $p = .10$, but not at $p = .05$. The effect of interest is treatment group, which is clearly statistically significant. The positive parameter estimate and associated hazard ratio > 1.0 indicate that offenders in the comparison group have a higher risk of subsequent DUI incident than offenders who installed an interlock device. Taking the reciprocal of the hazard ratio for treatment group shifts the focus to the lower risk for the IID treatment group, rather than the higher risk for the comparison group. Doing so reveals that offenders installing an IID have a risk of subsequent DUI incident that is 31.8% lower than offenders not installing an IID. This difference between the groups can be seen in Figure 8.

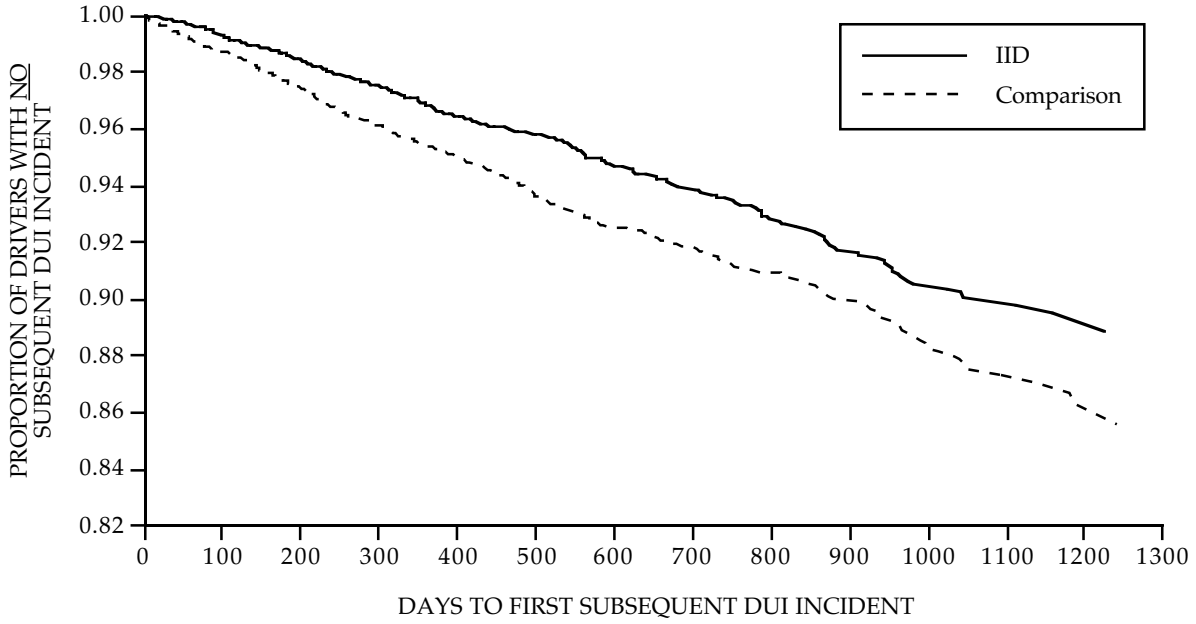

Figure 8. Final survival model: Number of days to first subsequent DUI incident for drivers installing an IID versus drivers not installing an IID.

The higher line in Figure 8 represents the survival rate of a subsequent DUI incident for drivers installing an IID, while the lower line is the rate for comparison group drivers. The graph shows that the survival rates of the groups begin diverging shortly after the study begins, and the difference grows larger over the course of the study. This is a visual depiction of what the Cox model showed; offenders installing an IID have a lower risk of subsequent DUI incident than similar offenders not installing an interlock device.

Because the treatment group effect was significant, follow-up analyses were conducted to determine whether IID installation has differential effects for S/R versus DUI offenders. Three dummy variables were created to replace the dichotomous treatment group variable, with each dummy representing a particular combination of the variable treatment group (IID versus comparison) and offender type (S/R versus DUI). The reference group for the dummies was S/R offenders installing an IID. The three dummy variables were entered into a Cox regression model, along with the three covariates, and the results are presented below, in Table 11.

Table 11

Cox Regression Model, Study 3, Subsequent DUI Incident: IID Effects on Offender Type

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
Gender	-0.2483	3.274	.0704	0.780
3-yr prior traffic convictions	0.0494	2.842	.0918	1.051
3-yr prior alc/drug major conv	0.2168	9.617	.0019	1.242
Treatment dummy 2	-0.4616	10.666	.0011	0.630
Treatment dummy 3	0.3675	7.730	.0054	1.444
Treatment dummy 4	-0.0632	0.231	.6308	0.939
Treatment dummy 2 x time	0.5898	3.185	.0743	1.804
Treatment dummy 3 x time	-0.1616	0.197	.6571	0.851
Treatment dummy 4 x time	-0.1252	0.134	.7145	0.882

The main effect of interest in table 11 is treatment dummy 3, which represents the difference in hazards between S/R offenders installing an IID, and S/R offenders in the comparison group. Said another way, treatment dummy 3 expresses how effective IID installation is for S/R offenders. Treatment dummy 3 is statistically significant, with a positive parameter estimate and hazard ratio > 1.0, indicating that S/R offenders <u>not</u> installing an IID have a significantly higher hazard of a subsequent DUI incident than S/R offenders installing an interlock device. Taking the reciprocal of the hazard ratio and expressing the difference between the groups in terms of the lower risk for offenders installing an IID, shows that S/R offenders installing a device have a 30.7% lower risk of subsequent DUI incident than S/R offenders not installing an interlock.

So, IID installation is associated with a lower risk of subsequent DUI incidents for S/R offenders, but is it also effective for DUI offenders? Because of the way the dummy variables were coded, this could not be tested directly through the dummies, but instead was tested by creating a linear hypothesis test that compared treatment dummy 2 (IID S/R versus IID DUI) to treatment dummy 4 (IID S/R versus comparison DUI). The results of this test were statistically significant, with a chi-square value of 10.827 and associated p value of 0.001. This means that there is a significant difference between DUI offenders installing an IID and DUI offenders not installing a device, and that DUI offenders installing an IID have a significantly lower risk of subsequent DUI incidents than DUI offenders not installing an IID. In terms of DUI incidents, the installation of an IID is associated with a lower hazard of such incidents for both S/R and DUI offenders.

Days to first subsequent crash

Simple correlations were computed between demographic and prior driving history variables, and days to first subsequent crash and treatment group, as a first step in identifying covariates to use in the Cox regression models predicting days to first subsequent crash. Variables that had statistically significant correlations with both days to first subsequent crash and treatment group were selected in this first stage as potential covariates. Four variables had significant correlations and thus were identified as potential covariates. These variables were: age, 3-year prior alcohol/drug major convictions, 3-year prior crashes, and 7-year prior alcohol-related crashes.

In an effort to build a parsimonious model, and to omit variables that had significant shared variance with other predictor variables, the four potential covariates identified in the first stage were entered into a backward elimination stepwise Cox regression model predicting days to first subsequent crash. The results of the stepwise analysis revealed that three of the four variables were statistically significant in a model where all variables were considered together, and adjusted for each other. These three significant variables, which were used in the final Cox model as covariates were: age, 3-year prior alcohol/drug major convictions, and 3-year prior crashes.

The three covariates, and the treatment group variable, were examined to see whether they violated the proportional hazards assumption of Cox regression. First, sample survival and hazard plots were produced for each variable, and each variable's plot was examined to see whether the hazards for all levels of that variable were proportional over the course of the study. While not definitive, the plots suggested possible violations of the proportional hazards assumption, and indicated the need to more formally test for assumption violations.

Interaction terms were created for the three covariates, and treatment group, where each predictor was crossed with time, or days to first subsequent crash, as a way to statistically test for non-proportional hazards. These interactions were included in a Cox regression model predicting days to first subsequent crash, and the results showed that one of the variables, treatment group, had non-proportional hazards. The cure for this violation was simply to include the treatment group interaction term in the final Cox regression model, so that the effects of the non-proportionality were accounted for.

The final Cox regression model predicting days to first subsequent crash first fit the three covariates, and adjusted for their effects, then entered the treatment group variables. The treatment group x days to first subsequent crash interaction term was entered last, so that the non-proportionality of the hazards for the two levels of treatment group was accounted for. The results of this analysis are presented in Table 12.

Table 12

Cox Regression Model, Study 3, Days to First Subsequent Crash

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
Age	-0.0103	7.001	.0081	0.990
3-yr prior alc/drug major conv	-0.1705	6.241	.0125	0.843
3-yr prior crashes	0.2195	15.158	< .0001	1.245
Treatment group	-0.6101	14.668	.0001	0.543
Treatment group x time	0.4022	4.790	.0286	1.495

All effects in the Cox regression model predicting days to first subsequent crash are statistically significant. The chi-square of 14.67 for treatment group, and associated *p* value of 0.0001, shows that the installation of an IID is significantly associated with crashes, but the negative parameter estimate and hazard ration < 1.0 indicate that the comparison group has a lower subsequent crash rate than the IID treatment group. The reciprocal of the hazard ratio was computed, to shift the focus from the comparison group to the IID treatment group, and the result showed that drivers installing an IID have a risk of subsequent crash that is 84% higher than drivers who do not install an interlock device on their vehicle. This can be seen in Figure 9, below.

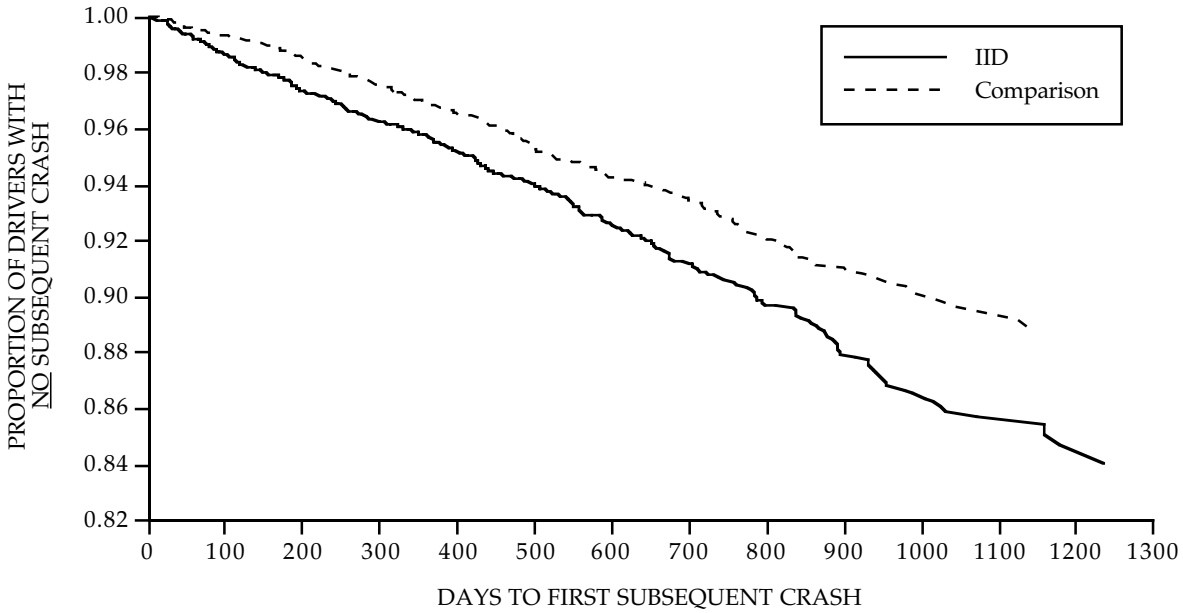

Figure 9. Final survival model: Number of days to first subsequent crash for drivers installing an IID versus drivers not installing an IID.

Figure 9 shows that, after only about 40 or 50 days into the follow-up period, the comparison group better survives the risk of a subsequent crash than offenders installing an IID, and that this difference in subsequent crash risks between the groups increases over the course of the study. This confirms the results of the statistical analysis, which indicates that installing an IID is associated with a higher subsequent crash risk.

As with the analyses of subsequent DUIs and subsequent DUI incidents conducted as part of study 3, the analyses of subsequent crashes included additional Cox regression models to address the question of whether IID installation had differential effects upon S/R versus DUI offenders. Three dummy variables were created and used in the Cox regression models in place of the original dichotomous treatment group variable, with each dummy representing a particular combination of the dichotomous variables treatment group (IID versus comparison) and offender type (S/R versus DUI). The omitted category, which served as the reference group for each dummy, was S/R offenders installing an IID. The treatment dummy variables were entered into a Cox regression model along with the three covariates, and the dummy x time interactions (to account for the non-proportionality of treatment group), and the results are shown in Table 13.

Table 13

Cox Regression Model, Study 3, Subsequent Crashes: IID Effects on Offender Type

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
Age	-0.0099	6.328	.0119	0.990
3-yr prior alc/drug major conv	-0.1590	5.068	.0244	0.853
3-yr prior crashes	0.2193	15.130	.0001	1.245
Treatment dummy 2	-0.0602	0.094	.7596	0.942
Treatment dummy 3	-0.8914	10.078	.0015	0.410
Treatment dummy 4	-0.5242	5.840	.0157	0.592
Treatment dummy 2 x time	0.0083	0.001	.9717	1.008
Treatment dummy 3 x time	0.7454	5.535	.0186	2.107
Treatment dummy 4 x time	0.2244	0.783	.3764	1.252

The variable of most interest in Table 13 is treatment dummy 3, which represents the difference in subsequent crash risk between two groups of S/R drivers, those who installed an IID and those who did not. The chi-square for treatment dummy 3 is 10.078, and its p value is 0.0015, which indicates that there is a statistically significant difference in subsequent crashes between S/R drivers installing an IID and S/R drivers in the comparison group. The negative parameter estimate for treatment dummy 3, and the hazard ratio of 0.410, indicate that S/R drivers in the comparison group have a

lower risk of subsequent crash than S/R drivers in the IID group. Taking the reciprocal of the hazard rate shows that S/R offenders installing an IID have a subsequent crash risk that is 2.4 times higher than S/R offenders not installing an IID.

It has just been shown that the installation of an IID is associated with a higher risk of subsequent crashes for S/R offenders, but what are the effects of IID installation on DUI offenders? This question cannot be directly answered from the dummy variables shown in Table 13. Instead, a linear hypothesis test statement was constructed in which dummy variable 2 (IID S/R versus IID DUI) was compared to dummy variable 4 (IID S/R versus comparison DUI); the results were statistically significant, with a chi-square of 5.667 and p value of 0.0173. This indicates that IID installation is associated with a higher subsequent crash risk for DUI offenders. Thus, the installation of an IID has similar effects on the crash risks for both S/R and DUI offenders; for both groups, IID installation is associated with higher subsequent risks of a crash.

Study 4: DUI first offenders with an IID order or restriction

In order to check whether there were any pre-existing differences between first DUI offenders in the IID treatment group, and first DUI offenders in the comparison group, ANOVA and chi-square tests were conducted. Particular attention was directed to differences that might affect study results. While the results of these analyses were somewhat mixed, most of the results showed that offenders in the IID treatment group were less risky than their counterparts in the comparison group, and that, apart from the effects of the IID treatment, IID treated offenders could be expected to have better subsequent records. First DUI offenders who received a court IID order or restriction had, compared to their counterparts in the comparison group, fewer 3-year prior total crashes, 3-year prior fatal/injury crashes, 3-year prior alcohol-related crashes, and 7-year prior alcohol/drug major convictions. IID treated offenders looked riskier than comparison group offenders on only two variables, 3-year prior traffic convictions and 3-year prior DWS-DUI convictions. While these results are somewhat mixed, it appears that first DUI offenders with court IID orders/restrictions are somewhat less risky than first offenders who receive no such order/restriction. These pre-existing group differences show the importance of including covariates in the final Cox regression models.

Days to first subsequent DUI conviction

The first step in the analysis of the effects of IID orders and restrictions on subsequent DUI convictions for first DUI offenders was to select covariates to use in the Cox regression models. Simple correlations were computed between demographic and prior driving variables, and days to first subsequent DUI conviction and treatment group. Those demographic and prior driving history variables that had statistically significant correlations with both subsequent DUI convictions and treatment group were identified and selected as potential covariates at this first step. These potential covariates were: age, 3-year prior alcohol-related crashes, and 3-year prior total crashes.

While an examination of the simple correlations provided three potential covariates, it is possible that there is significant shared variance among the three variables. In order to avoid including more variables than necessary in the final Cox regression model, the three potential covariates were entered into a backward elimination stepwise Cox regression model predicting days to first subsequent DUI conviction. The results of this analysis revealed that two of the three potential covariates contributed uniquely to predicting subsequent DUI convictions, and so should be used in the final Cox regression model. These final two covariates were age and 3-year prior alcohol-related crashes.

The selection of the two covariates completed the variable selection process. The next step was to examine whether the two covariates, and the treatment group variable, violated the proportional hazards assumption that underlies Cox regression. In order to visually inspect the hazard profiles over the course of the study, and look for instances where the levels of a variable had hazards that were not proportional over time, sample survival and hazard plots were produced. These plots were ambiguous, but suggested the possibility that some of the predictors violated the proportional hazards assumption.

In order to more fully examine the possibility that one or more predictors violated the proportional hazards assumption, interaction terms were created for each predictor by crossing it with time, or for this set of analyses, days to first subsequent DUI conviction. These interaction terms were included with the main effect of the predictor in a Cox regression model predicting days to first subsequent DUI conviction, and the interaction terms were evaluated for significance. The results from these analyses showed that none of the predictors violated the proportional hazards assumption, although the treatment variable came close. Thus, all of the interaction terms were excluded from the final Cox regression model, since there was no significant non-proportionality that needed to be accounted for.

In the final Cox regression model the two covariates, age and 3-year prior alcohol-related crashes, were entered first, so that the model adjusted for their effects, and then the treatment group variable was entered last. The results of this analysis are shown in Table 14.

Table 14

Cox Regression Model, Study 4, Days to First Subsequent DUI Conviction

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
Age	-0.0145	5.440	.0190	0.986
3-year prior alcohol-related crashes	-0.2893	3.155	.0757	0.749
Treatment group	0.1120	0.709	.3998	1.119

The treatment group effect in Table 14 shows the association between IID orders/restrictions and subsequent DUI convictions, after removing pre-existing differences between the IID treatment and comparison group related to age and 3-year prior alcohol-related crashes. With a chi square of 0.709 and *p* value of .40, it is clear that the treatment group effect is not significant. Said another way, there is no evidence that court orders to install an IID/restriction to driving an interlock-equipped vehicle for first DUI offenders have any effect on subsequent DUI convictions. This non-significant effect can be seen in Figure 10.

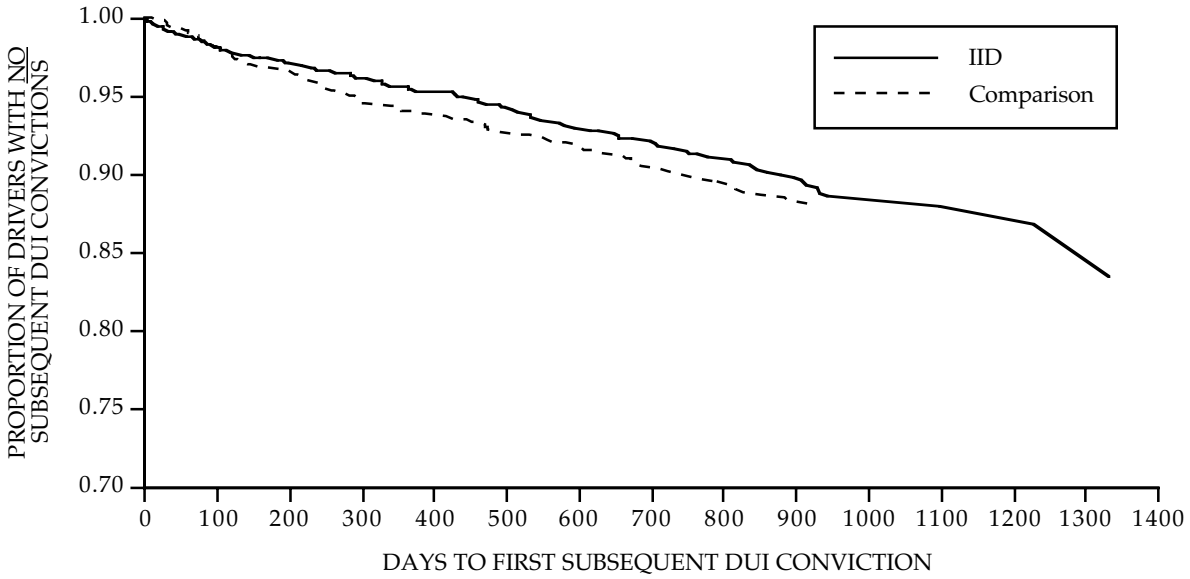

Figure 10. Final survival model: Number of days to first subsequent DUI conviction for first DUI offenders receiving a court IID order/restriction versus first DUI offenders not receiving an IID order/restriction.

Figure 10 shows that, with the exception of the first 150 days of the study, the IID treated offenders better survive a subsequent DUI conviction than offenders in the comparison group. However, these differences in the group survival rates are small, and not statistically significant, and could simply be due to chance. Thus, there is no evidence that court orders to first DUI offenders to install an IID, or not drive a vehicle unless it is equipped with an IID, have any effect on their risk of a subsequent DUI conviction.

Days to first subsequent DUI incident

Simple correlations were computed between demographic and prior driving history variables, and treatment group and days to first subsequent DUI incident, in order to

identify variables that could be used as covariates in the Cox regression models predicting days to first subsequent DUI incident. An examination of the correlations revealed that three variables—age, 3-year prior alcohol-related crashes, and 3-year prior had-been-drinking (HBD) crashes—had statistically significant correlations with both days to first subsequent DUI incident and treatment group. These three variables were considered as potential covariates for the final Cox regression model.

In order to learn about the degree to which there was overlapping variance among the three potential covariates, all three variables were entered into a backward elimination stepwise Cox regression model predicting days to first subsequent DUI incident. The results of this analysis showed that, in the context of all three variables considered together, HBD crashes did not add a significant amount of unique variance, and that the model could be adequately fit using just age and 3-year prior alcohol-related crashes. Thus, these two covariates were used in the final Cox regression model.

With the covariates selected, all predictors were identified, and the last task before running the final analysis was to check whether any of the predictors violated the proportional hazards assumption. Sample survival and hazard plots were produced for each predictor, and the plots were examined for evidence that the different levels of the predictor had hazards that were not proportional over the course of the study. The plots were ambiguous, but suggested the possibility that one or more predictors may have non-proportional hazards.

To explore further the integrity of the proportional hazards assumption, interaction terms were created by crossing each predictor with days to first subsequent DUI incident, and entering both the main effect and interaction terms in a Cox regression model. The results of these analyses showed that none of the predictors violated the proportional hazards assumption. Thus, with regard to the assumption of proportional hazards, the model was correctly specified with the two covariates and treatment group variables, and no interaction terms were needed in the final model.

The final Cox regression model first fit the two covariates, and adjusted the model for their effects, and then entered the treatment group variable. The results of this analysis are presented in Table 15.

Table 15

Cox Regression Model, Study 4, Days to First Subsequent DUI Incident

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
Age	-0.0121	4.579	.0324	0.988
3-year prior alcohol-related crashes	-0.2737	3.367	.0665	0.761
Treatment group	0.1377	1.263	.2612	1.148

The model shown in Table 15 shows that the first covariate, age, is statistically significant while the second, 3-year prior alcohol-related crashes, is borderline. Of greater interest is the treatment group effect, which has been adjusted for the two covariates. With a chi-square of 1.263 and *p* value of .26, treatment group is not significant, indicating that there is no evidence that court IID orders/restrictions for first DUI offenders are associated with a reduction in subsequent DUI incidents. This can be seen in Figure 11.

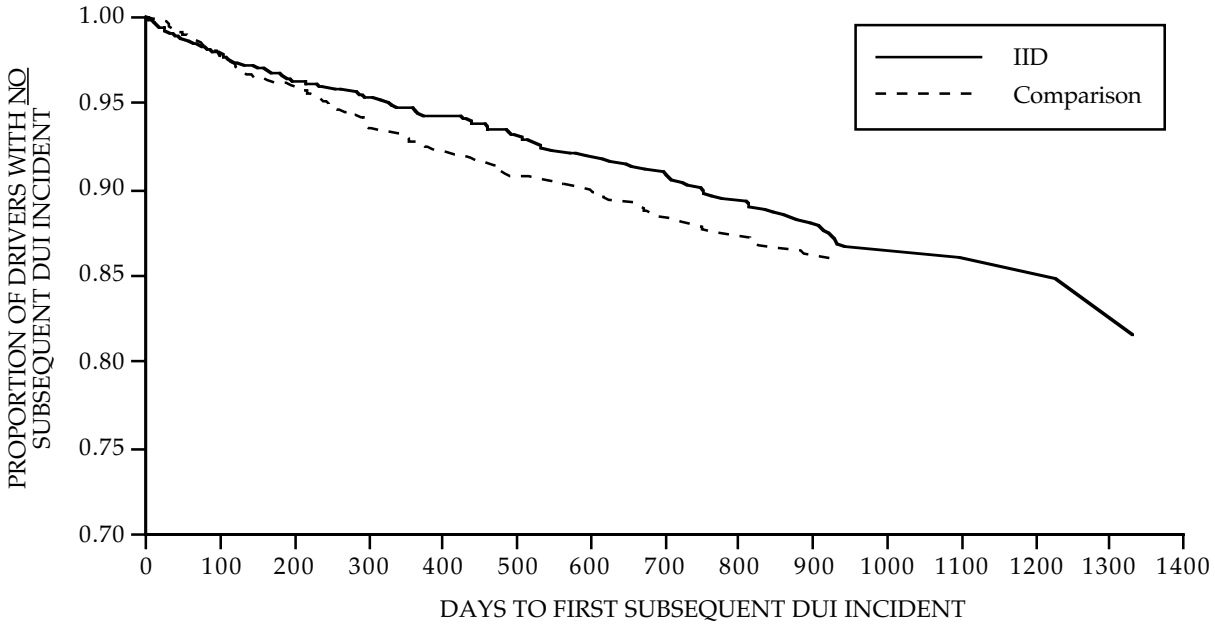

Figure 11. Final survival model: Number of days to first subsequent DUI incident for first DUI offenders receiving a court IID order/restriction versus first DUI offenders not receiving an IID order/restriction.

Figure 11 shows that the risk of a subsequent DUI incident is the same for the IID treatment and comparison groups at the beginning of the study, and then after about 150 days, the IID treatment group better survives a subsequent DUI incident. However, these differences are small, and are not statistically significant, and could simply be due to chance rather than any effects of IID orders and restrictions. Thus, there is no evidence that court orders to first DUI offenders to install an IID/restricted to driving an IID-equipped vehicle, have any effect on subsequent DUI incidents.

Days to first subsequent crash

The relationship between demographic and prior driving record variables that might be important to use as covariates, and days to first subsequent crash and treatment group, were explored by computing simple correlations among the variables. Four demographic and prior driving history variables had statistically significant correlations with both subsequent crashes and treatment group, and thus were selected at this stage as potential covariates. These four variables were: 3-year prior alcohol-related crashes, 3-year prior total crashes, 3-year prior DWS-DUI convictions, and 7-year prior DWS-DUI convictions.

It is likely that there is shared variance among these four potential covariates, and that one or more of them might not contribute uniquely to the Cox regression analysis when all variables are considered together. This possibility was checked by entering the four potential covariates in a backward elimination stepwise Cox regression model predicting days to first subsequent crash. The results of this analysis revealed that there was significant overlapping variance, and that 3-year prior alcohol-related crashes and 7-year prior DWS-DUI convictions did not make statistically significant contributions to the model, and thus could be omitted from the final Cox regression analysis. Therefore, the final model included the remaining two covariates, which did contribute significantly to the model, 3-year prior total crashes and 3-year prior DWS-DUI convictions.

Proper specification of the final Cox regression model includes ensuring that none of the predictors violated the proportional hazards assumption, or if they do, that this non-proportionality is accounted for in the model. This was first checked by producing sample survival and hazard plots for each predictor, and examining the levels of each predictor to see whether the hazards were proportional over the course of the study. While there were some differences in the hazards evident in the plots, it was unclear if they were great enough to be significant.

In order to check whether the differences in hazards between the levels of some of the predictors were significant, interaction terms were formed for each predictor, where the predictor was crossed with time, or days to first subsequent crash. These interaction terms were then included, along with all of the predictors, in a Cox regression model predicting days to first subsequent crash. The results of these analyses showed that both covariates, and treatment group, had proportional hazards, and that the Cox regression model was correctly specified with just the main effects of the predictors.

The final Cox regression model first fit the two covariates, 3-year prior total crashes and 3-year prior DWS-DUI convictions, and adjusted for their effects, and then entered the treatment group variable, assessing its contribution. The results of this analysis are shown below, in Table 16.

Table 16

Cox Regression Model, Study 4, Days to First Subsequent Crash

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
3-year prior total crashes	0.2317	5.774	.0163	1.261
3-year prior DWS-DUI conviction	-0.2116	3.680	.0551	0.809
Treatment group	0.1457	1.009	.3152	1.157

After adjusting for the two covariates, the chi-square for the treatment group is 1.009, with an associated *p* value of .31, far from statistical significance. Thus, there is no evidence that court orders for first DUI offenders to install an IID or restrict their driving to an interlock-equipped vehicle are associated with the risk of a subsequent crash. These results are presented below in Figure 12.

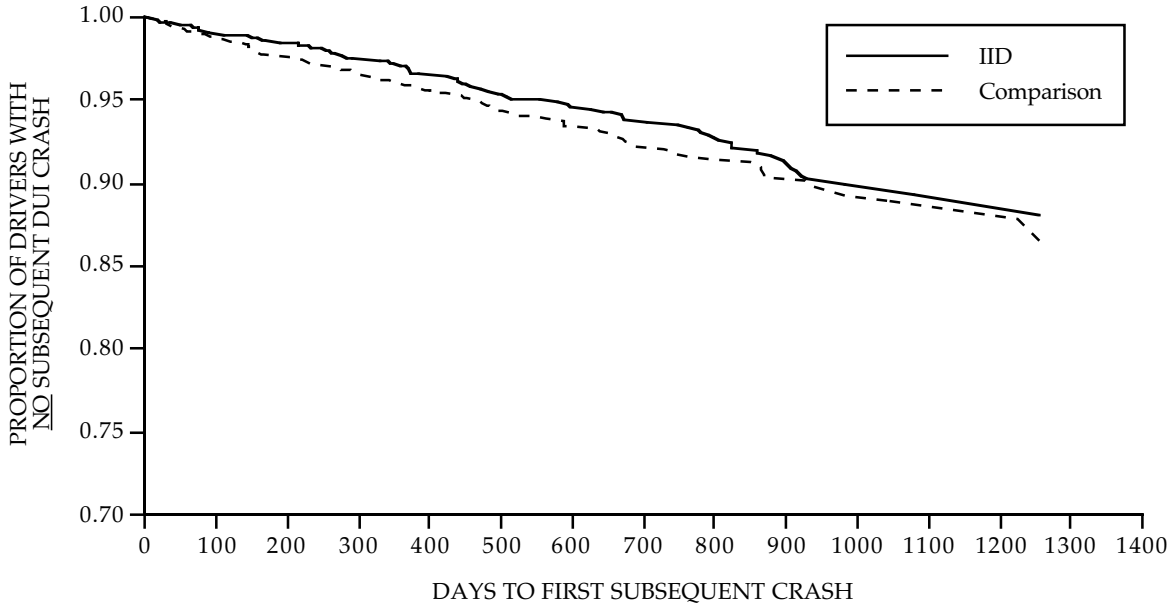

Figure 12. Final survival model: Number of days to first subsequent crash for first DUI offenders receiving a court IID order/restriction versus first DUI offenders not receiving an IID order/restriction.

The survival rates for the IID treatment and comparison groups in Figure 12, shown by the solid and dotted lines, respectively, show a small difference in subsequent crash rates favoring the IID treatment group. However, these differences are small, so small

that they could be due to chance factors, and thus are not meaningful. In sum, there is no evidence that court orders to install an IID/restricted to driving an IID-equipped vehicle, have any effect on the subsequent crash rates of first DUI offenders.

Study 5: DUI second offenders with an IID order or restriction

ANOVAs and chi-square tests were used to check for potential pre-existing differences on prior driving and demographic variables between the second DUI offenders ordered to install an IID/restricted to driving an IID-equipped vehicle, and second DUI offenders in the matched comparison group. Identifying these group differences is critical to the outcome of the study, since these differences can confound the study results if there is no attempt to control for them statistically. Since the two groups were already matched to each other on most of the prior driving and demographic variables (propensity score matching), there were very few variables that were significantly different between the two groups. Second DUI offenders with IID orders/restrictions had fewer 7-year prior alcohol/drug major convictions and fewer 3-year prior traffic convictions than second DUI offenders without interlock orders or restrictions; these differences suggest that second offenders without IID orders were more likely to recidivate than the IID group even before the effects of the IID intervention were evaluated. Therefore, these prior driving record variables were included as covariates in the Cox regression model to remove any remaining bias between the two groups before assessing the effectiveness of IID orders.

Days to first subsequent DUI conviction

The initial correlations provided information between potential covariates and their relationship to treatment group and to the outcome measure, days to first subsequent DUI conviction. The variables that were significantly correlated with treatment group and days to first subsequent DUI conviction were selected as potential covariates; these variables consisted of 7-year prior alcohol/drug major convictions and 3-year prior traffic convictions. Although initially, the variable 3-year prior traffic convictions was found to be only directionally significant to group but significantly related to the outcome measure, it was used as a covariate, to remove even the smallest amount of bias between the two groups; any opportunity to remove bias was considered to be useful to the overall analysis.

Since there is a part/whole relationship between these two potential covariates (major convictions is part of total convictions, but cover different time periods), it is possible that there is shared variance among these two variables, and that one of them may not contribute uniquely when both are considered together. To test for this possibility, these two potential covariates were entered into a backward elimination stepwise Cox regression model to predict days to first subsequent DUI conviction. The findings from this analysis indicated that only one covariate was statistically significant in predicting

the outcome measure when both covariates were considered together; this meant that there was overlapping variance between these two variables. The only potential covariate that remained in the backward elimination model was 3-year prior traffic convictions, and therefore, it was included in the final Cox regression model.

Next, it was necessary to determine whether the levels of the covariate or the treatment group variable violated the proportional hazards assumption, which is fundamental to the Cox regression model. Sample survival and hazard plots of the levels of the covariate and treatment group variable over the study time period were produced and examined to determine if these variables violated the proportional hazards assumption. The plots, including the log negative log plot, comparing the two groups and the levels of 3-year prior traffic convictions over time did show small differences suggesting the possibility of a violation of the proportional hazards assumption.

In order to confirm these potential violations statistically, interaction terms for the predictors by days to first subsequent DUI were computed; each interaction term was entered into the Cox regression model in separate runs, which included the main effect of the predictors, and then tested for significance. The results of these analyses indicated that neither the treatment group variable nor 3-year prior traffic convictions violated the proportional hazards assumption; therefore, only the main effect of 3-year prior traffic convictions and the treatment group were entered into the final Cox regression model. Entering the covariate first before the treatment group allowed for the effects of the 3-year traffic convictions to be adjusted prior to computing the effects of the treatment group. The findings from this analysis are shown below in Table 17.

Table 17

Cox Regression Model, Study 5, Days to First Subsequent DUI Conviction

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
3-year prior traffic convictions	.0746	13.838	.0002	1.077
Treatment group	.1093	2.966	.0850	1.115

After pre-existing differences on 3-year prior traffic convictions between the two groups are removed, the treatment group effect indicates the association between IID orders/restrictions and the outcome measure, days to subsequent DUI conviction. From Table 17 it is evident that the covariate, 3-year prior traffic convictions, is statistically significant, but the effect of greater interest is the treatment group effect, which is only directionally and not statistically significant at a *p* value of .085. Although

this result is suggestive of an effect, it is not conclusive. Figure 13 below displays the two groups and their days to first subsequent DUI conviction.

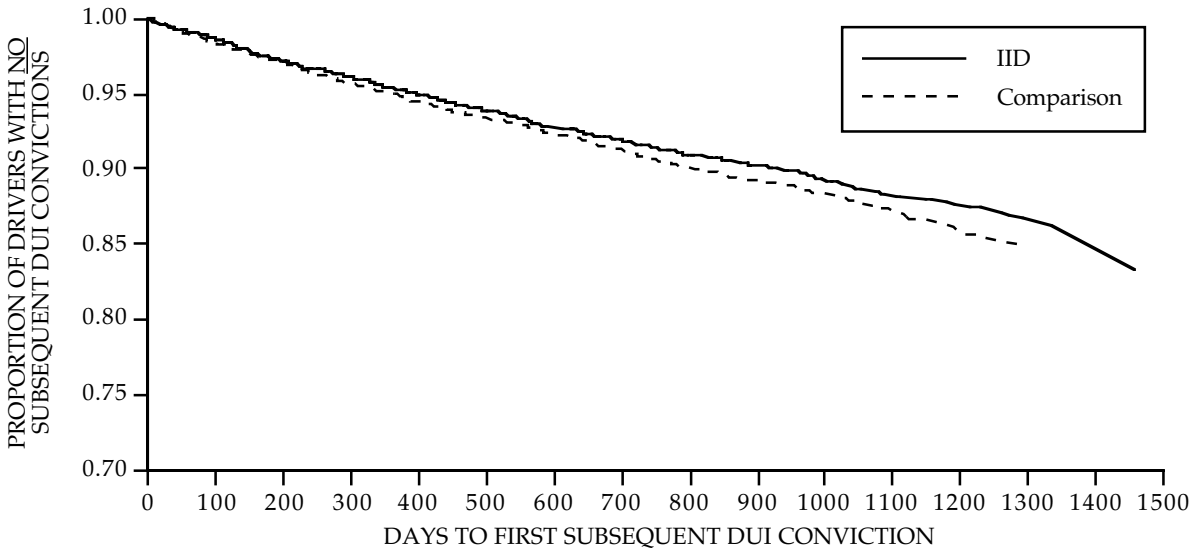

Figure 13. Final survival model: Number of days to first subsequent DUI conviction for second DUI offenders receiving a court IID order/restriction versus second DUI offenders not receiving an IID order/restriction.

The above figure shows that the group with IID orders/restrictions has fewer subsequent DUI convictions over time than those of the comparison group, but, as stated earlier, the difference between the two groups is only directionally suggestive (p = .085) of an effect. Up to the first 600 days, differences in recidivism between the two groups appear minimal, but beyond 600 days, the difference widens, and the comparison group recidivates at a greater rate than the group with IID orders/restrictions.

Days to first subsequent DUI incident

In order to identify variables that could be used as covariates, simple correlations were initially produced between biographical and prior driving record variables, and treatment group and days to first subsequent DUI incident. The purpose of using these relevant covariates is to help remove pre-existing differences between the two matched groups on these variables. Two variables were significantly or directionally correlated with treatment group and days to first subsequent DUI incident, and they were, 7-year prior alcohol/drug major convictions, and 3-year prior traffic convictions. As noted

earlier, directional significance was accepted so that even small differences between the two groups could be removed in order to improve the overall analysis.

To determine if these two potential covariates shared variance or contributed uniquely to predicting days to first subsequent DUI incident, they were entered into a backward elimination stepwise Cox regression model. The findings from this analysis indicated that when both variables were considered together, prior 7-year prior alcohol/drug major convictions did not contribute uniquely to predicting the outcome measure. Therefore, only the variable 3-year prior traffic convictions was used as a covariate in the final model.

Underlying the Cox regression model is the assumption that different levels of the predictors over time should not violate the proportional hazards assumption. Sample survival and hazard plots of the covariate and treatment group variables were inspected to see if the levels of these variables violated the proportional hazards assumption. The plots that compared the two groups over time and the levels of 3-year prior traffic convictions across the study time period suggested slight indications of such a violation. However, in order to check statistically for a violation of the proportional hazards assumption, interaction terms were created for group by time (days to first subsequent DUI incident) and for the levels of prior 3-year traffic convictions by time; each interaction term was entered into the Cox regression model after its respective main effect and before the effect of treatment group. The findings from this analysis showed that neither of the two interaction terms showed a violation of the proportional hazards assumption.

Therefore, in the final model, the covariate, 3-year prior traffic convictions, was entered first, followed by treatment group, so that any effects of the IID orders/restrictions on days to first subsequent DUI incident are derived after adjusting for the effects of the 3-year prior traffic convictions. Table 18 shows the findings from this analysis:

Table 18

Cox Regression Model, Study 5, Days to First Subsequent DUI Incident

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
3-year prior traffic convictions	0.0796	19.612	.0001	1.083
Treatment group	0.1365	5.679	.0172	1.146

Table 18 shows that there is a significant effect of the covariate, 3-year prior traffic convictions, on the outcome measure, days to first subsequent DUI incidents, at a

p value of .0001. Of greater interest is the treatment group effect, which is significant at a *p* value of .0172. The differences between the two groups in their days to subsequent DUI incidents over time are displayed below in Figure 14.

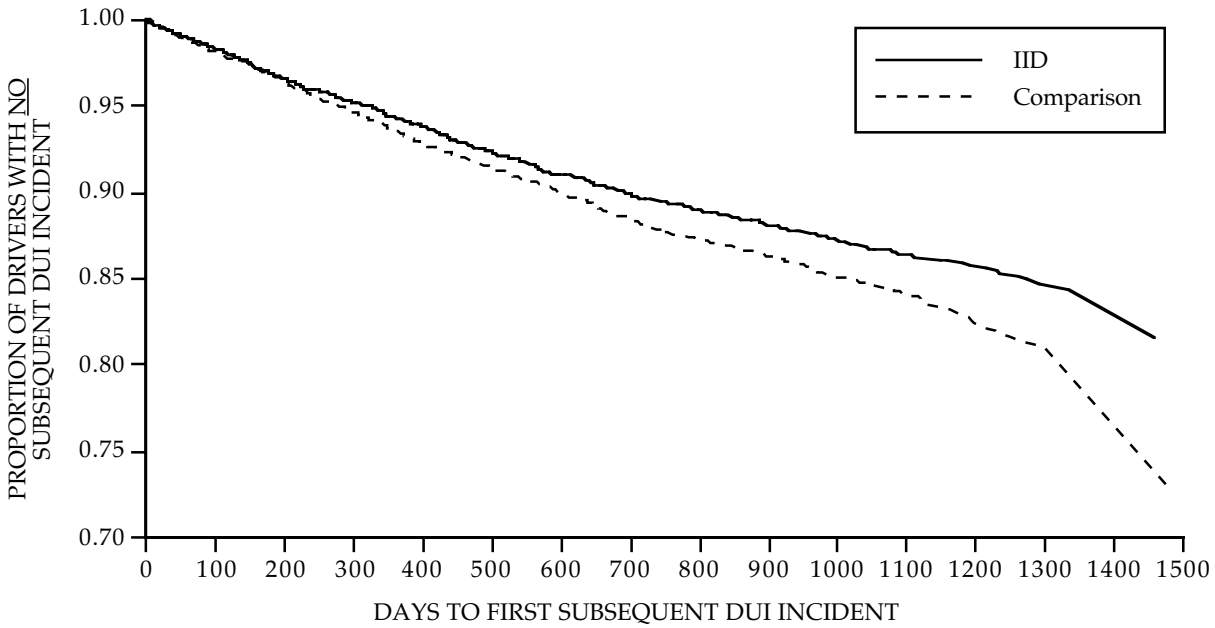

Figure 14. Final survival model: Number of days to first subsequent DUI incident for second DUI offenders receiving a court IID order/restriction versus second DUI offenders not receiving an IID order/restriction.

In the above figure, it is apparent that throughout the study time period, the group with IID orders/restrictions survives with fewer DUI incidents than that of its comparison group; the group with IID orders/restrictions has a 13% lower risk of subsequent DUI incidents than drivers not receiving an IID order/restriction. Initially, over the first 200 days, the two groups show about the same rate of first DUI incidents; however, over time, the comparison group recidivates at a greater rate than the group with IID orders. Both groups recidivate at a greater rate after 1300 days, toward the end of the study period. Since the range of data elements in DUI incidents is larger than DUI convictions alone, there is a greater possibility of detecting significant differences between the two groups for DUI incidents than it is for DUI convictions alone.

Days to first subsequent crash

Simple correlations were initially calculated between the demographic and prior driving history variables, and the treatment group variable and days to first subsequent crash, in order to select potential covariates for reducing bias in group composition.

The two variables that were either significantly or directionally correlated with treatment group and days to first subsequent crash were 7-year prior alcohol/drug major convictions and 3-year prior traffic convictions. Although the variable 3-year prior traffic convictions was found to be only directionally significant, it was allowed to be used as a covariate to remove even a small amount of bias in order to improve the overall analysis.

Since there is the possibility that variance could be shared among the predictors, both of these potential covariates were entered into a backward elimination stepwise Cox regression model in order to determine if they shared variance or contributed uniquely to predicting days to first subsequent crash. The results of this analysis indicated that when both variables were considered together, 7-year prior alcohol/drug major convictions did not contribute uniquely as a predictor. Therefore, only the variable 3-year prior traffic convictions was used as a covariate in the final Cox regression model.

The final Cox regression model requires that none of the predictors violate the proportional hazards assumption, and if there is a violation then the model should account for the non-proportionality. For a cursory view of such a violation for both treatment group and the covariate prior 3-year prior traffic convictions, sample survival and hazard plots were created to evaluate these variables over time; these plots showed slight possibilities of a violation of the proportional hazards assumption over the study time period for both treatment group and 3-year prior traffic convictions. To check this statistically, group by time and covariate by time interaction terms were created and each interaction term followed its respective main effect in the Cox regression model. The results from these analyses did not show a significant violation of the proportional hazards assumption for either treatment group or 3-year prior traffic convictions.

Therefore, in the final Cox regression model, 3-year prior traffic convictions were entered first, followed by treatment group, so that the effects of the covariate were adjusted before the effects of the IID order/restriction on subsequent crashes. The results from this analysis are shown below in Table 19.

Table 19

Cox Regression Model, Study 5, Days to First Subsequent Crash

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
3-year prior traffic convictions	0.1619	56.964	.0001	1.176
Treatment group	0.2077	7.749	.0055	1.231

Table 19 shows that, after removing bias between the two groups on 3-year prior traffic convictions, the primary effect of interest, the treatment group effect, is statistically significant at a *p* value of .005. The differences between the two groups in their days to subsequent crash over time are displayed below in Figure 15.

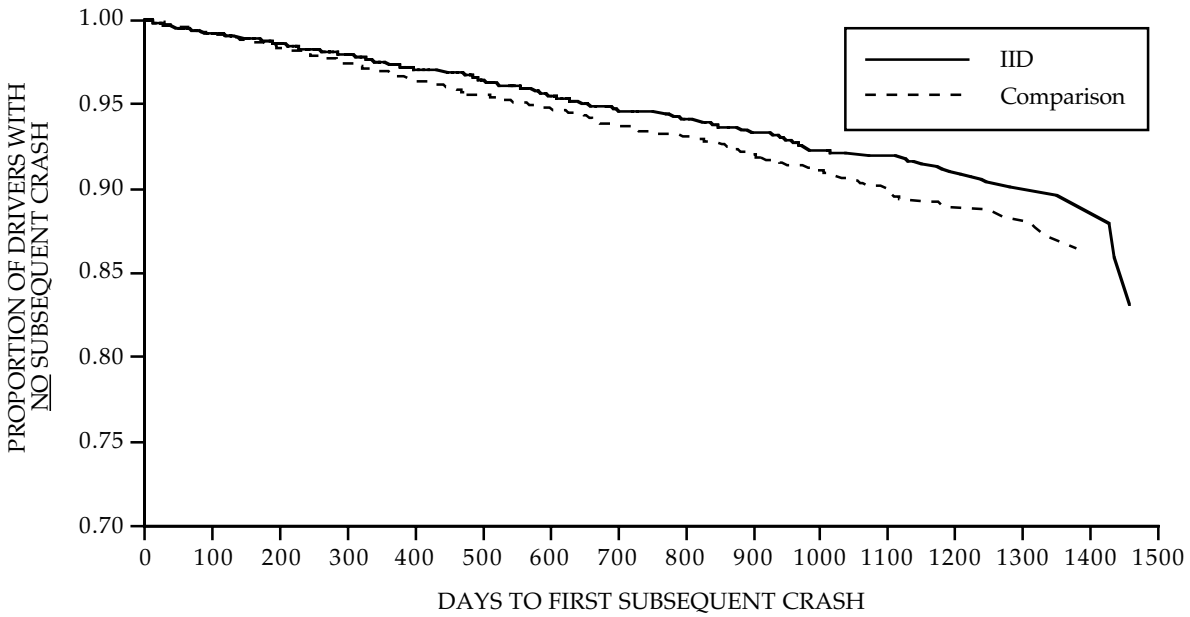

Figure 15. Final survival model: Number of days to first subsequent crash for second DUI offenders receiving a court IID order/restriction versus second DUI offenders not receiving an IID order/restriction.

The above figure shows that the group with IID orders/restrictions has significantly fewer subsequent crashes compared to the matched comparison group; the hazard ratio from the model showed that second offenders with IID order/restriction had a 19% lower risk of a subsequent crash than drivers in the comparison group. The comparison group's survival rate declines more rapidly around 700 days than those with IID orders/restrictions; the crash rate of the group with IID orders/restrictions maintains a better trend until the very end of the study period, where at 1400 days there are very few cases left in the study.

Study 6: Second DUI Offenders Installing an IID with Restricted Licenses

Like the previous analyses, ANOVAs and contingency tables were used to detect preexisting differences on prior driving records and demographic variables between the

second DUI offenders who installed an IID (with license restriction after one year of suspension) and the comparison group of suspended second DUI offenders without IID. Preexisting group differences can confound the relationship between the treatment group effect and the outcome measure, unless efforts are taken to minimize these group biases. The analyses showed that the suspended group was older, had significantly more 3-year prior alcohol/drug major convictions, 3-year prior traffic convictions, and 7-year prior DWS-DUI convictions than the IID group; these differences might suggest that the suspended group was more likely to recidivate than the IID group even before the effects of the IID intervention are considered. Therefore, it was critical to include these prior driving record variables as covariates in the Cox regression model in order to remove the bias between the two groups before evaluating the effectiveness of IID.

Days to first subsequent DUI conviction

Initially, simple correlations were computed to assess the relationship between potential covariates and treatment group, as well as the outcome measure, days to first subsequent DUI conviction. The variables that were significantly correlated with treatment group and days to first subsequent DUI conviction were selected as potential covariates; these variables were 3-year prior alcohol/drug major convictions and 7-year prior DWS convictions.

The next step was to determine whether the two potential covariates shared variance when included together in the model or if they contributed uniquely. In order to minimize the overlapping of variance, these two potential covariates were entered into a backward elimination stepwise Cox regression model to predict days to first subsequent DUI conviction. The findings from this analysis indicated that both potential covariates contributed uniquely to predicting days to subsequent DUI conviction, and therefore, they were both included in the subsequent procedure of the Cox regression model.

Next, it was critical to check the treatment group and the levels of the covariates for violations of the proportional hazards assumption, which underlies the Cox regression model. Sample survival and hazard plots of the covariates and the treatment group variable were developed to determine if these variables showed such violations. The plots, including the log negative log plot, comparing the two groups over time did not indicate a violation of the proportional hazards assumption; this assessment was verified statistically by creating an interaction term for group by days to first subsequent DUI and entering the interaction term into the Cox regression model. The results from this analysis showed that the two groups did not violate the proportional hazards assumption.

However, the plots of the 3-year prior alcohol/drug major conviction covariate indicated a possible slight interaction between the levels of prior major convictions and days to first subsequent DUI conviction; this was further verified by entering the covariate by time interaction term into the Cox regression model, and the findings from this analysis showed that there was a statistically significant difference among the levels of prior major convictions over time. Consequently, this interaction term was entered into the final model to adjust for differences in the levels of prior major convictions over the study period. Although the plots for the levels of 7-year prior DWS convictions over time showed the possibility of a slight interaction, the statistical test for checking the violation of the proportional hazards assumption did not show significant differences.

The covariates, 3-year prior alcohol/drug major and 7-year prior DWS convictions, were entered first in the final Cox regression model, followed by the prior major conviction by time interaction term, and lastly, the treatment group variable. The findings from this analysis are shown below in Table 20.

Table 20

Cox Regression Model, Study 6, Days to First Subsequent DUI Conviction

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
3-yr prior alcohol/drug major conv	1.1712	10.736	.0011	3.226
7-year prior DWS convictions	.2223	3.173	.0749	1.249
3-year prior major conv by time	-.0021	5.053	.0246	0.998
Treatment group	.4365	3.174	.0748	1.547

Table 20 shows that the covariate 3-year prior major convictions and its interaction with days to first subsequent DUI are statistically significant, while the covariate 7-year prior DWS convictions and the treatment group effect are only directionally but not statistically significant at a *p* value of .075. While this result is suggestive of an effect, it is not conclusive. Figure 16 below displays the two groups and their days to subsequent DUI convictions.

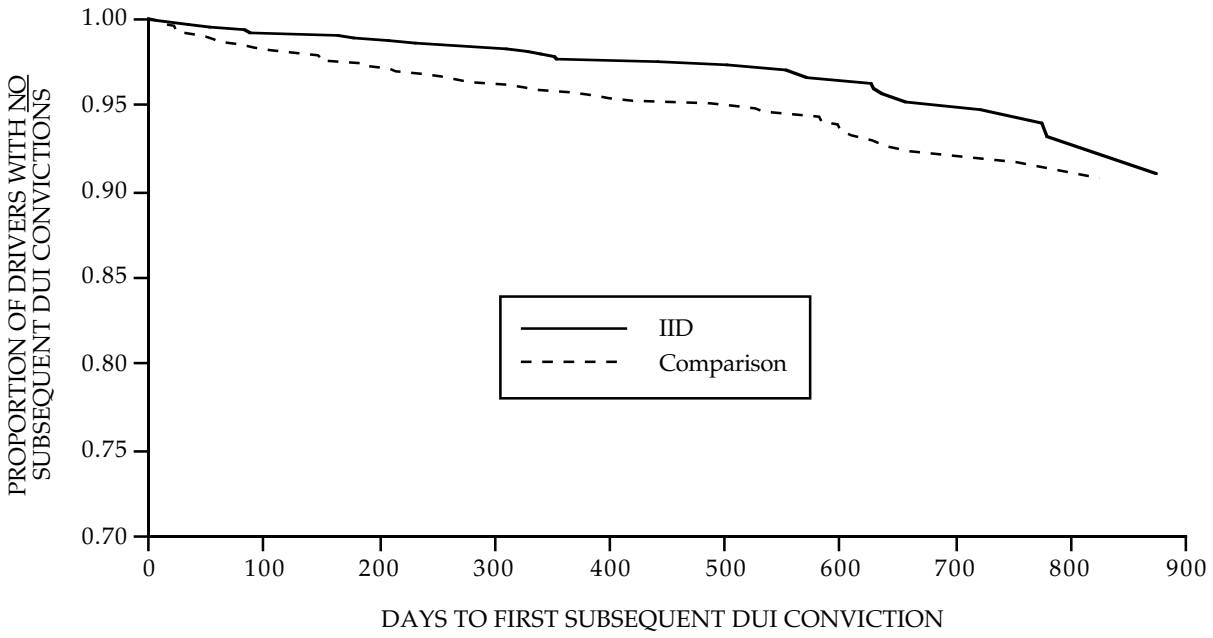

Figure 16. Final survival model: Number of days to first subsequent DUI conviction for second DUI offenders installing an IID with restriction versus second DUI offenders not installing an IID with license suspension.

From the above figure, it appears that the drivers installing an IID have fewer subsequent DUI convictions over time than drivers in the suspended group, but the difference between the two groups is only directionally suggestive (p = .075) of an effect.

Days to first subsequent DUI incident

Simple correlations were produced between biographical and prior driving record variables, and both treatment group and days to first subsequent DUI incident, in order to select relevant covariates that would eventually help remove some of the remaining differences between the two groups. The two variables that were significantly correlated with treatment group and days to first subsequent DUI incident were 3-year prior alcohol/drug major convictions and 7-year prior DWS convictions.

These two variables were entered into a backward elimination stepwise Cox regression model to determine if they shared variance or contributed uniquely to the outcome measure. Since neither variable was eliminated from the analysis, even when considered together, it was determined that each contributed uniquely to days to subsequent DUI incident. Therefore, they were both used as covariates in the subsequent Cox regression model.

Sample survival and hazard plots of the covariates and treatment group variable were examined to determine if the levels of these variables violated the proportional hazards assumption. The plots that compared the two groups over time did not indicate such a violation. This assessment was subsequently confirmed by including an interaction term for group by time (days to first subsequent DUI incident) and entering it into the Cox regression model after the covariates.

However, the plots of the prior major conviction covariate showed some indication of a possible interaction between the covariate 3-year prior alcohol/drug major convictions and days to first subsequent DUI incident. This potential interaction was further verified by entering the covariate by time interaction term into the Cox regression model; the findings from this analysis showed that the levels of prior major convictions and days to subsequent DUI incidents violated the proportional hazards assumption. Consequently, this interaction term was left in the final model to account for the non-proportional hazards that occurred over the study period. The results from testing the violation of the proportional hazards assumption for the covariate 7-year prior DWS convictions did not show a significant violation.

The covariates, 3-year prior alcohol/drug major and 7-year prior DWS convictions, were entered first, followed by the 3-year prior major convictions by time interaction term; treatment group was entered last in the final Cox regression model. Therefore, the effects of the IID intervention on days to first subsequent DUI incident, are derived after adjusting for the effects of the covariates and the interaction. The findings from this analysis are shown below in Table 21.

Table 21

Cox Regression Model, Study 6, Days to First Subsequent DUI Incident

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
3-year prior alcohol/drug major conv	1.3267	16.476	.0001	3.769
3-year prior DWS convictions	0.2676	6.099	.0135	1.307
3-year prior major conv by time	-0.0027	8.630	.0033	0.997
Treatment group	0.5300	5.420	.0200	1.699

Table 21 shows that the covariates 3-year prior DWS convictions, 3-year prior alcohol/drug major convictions, and its interaction with days to first subsequent DUI incident, are all statistically significant at *p* values of .0135 and lower. The finding of

major interest is the treatment group effect, (significant at a *p* value of .02) which indicates that drivers installing an IID have a reduced risk of subsequent DUI incidents, compared to suspended drivers. This significant difference between the two groups and their days to subsequent DUI incidents over time are displayed below, in Figure 17.

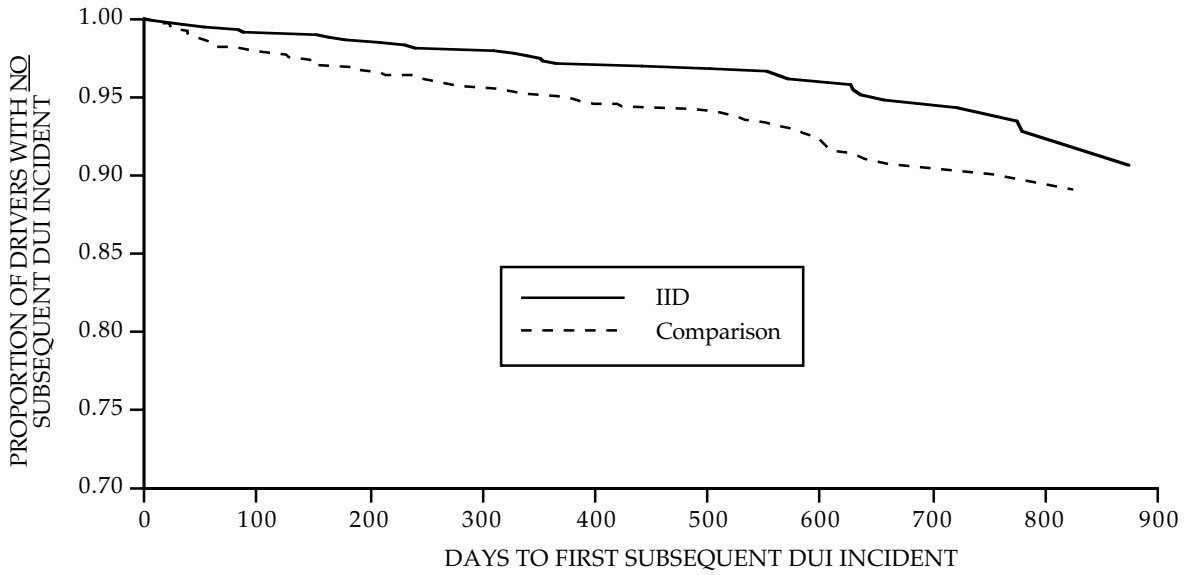

Figure 17. Final survival model: Number of days to first subsequent DUI incident for second DUI offenders installing an IID with license restriction versus second DUI offenders not installing an IID with license suspension.

From the above figure, it is evident that drivers installing an IID have fewer subsequent DUI incidents throughout the study than suspended drivers, and the hazard ratio indicates that the IID group has a 41% lower risk of incurring a subsequent DUI incident than second offenders who remained suspended. Although overall the suspended group maintains a higher recidivism trend than that of the installers, both groups recidivate at a greater rate after 600 days and onward to the end of the study period.

Days to first subsequent crash

The initial step in selecting potential covariates to help reduce bias in group composition was to calculate correlations between the demographic and prior driving history variables, and treatment group and days to first subsequent crash. The one potential covariate that was found to be significantly related to both the treatment group and to days to first subsequent crash was age. Since the variable, 3-year prior traffic convictions, was found to be directionally significant, it was included as a covariate to remove whatever small amount of bias was associated with it.

In order to determine if these two potential covariates shared variance or contributed uniquely to predicting days to first subsequent crash, they were both entered into a backward elimination stepwise Cox regression model. Neither of the two covariates was eliminated, indicating that they each provided unique variance. Although the findings of this analysis showed that age was very close to significance at $p = .06$, and the variable prior 3-year traffic convictions was only directionally significant ($p = .09$), it was decided to proceed with both covariates, in order to remove any remaining differences between the two groups on these dimensions.

The next step was to test for the violation of the proportional hazards assumption for both treatment group and the two covariates, age and 3-year prior traffic convictions. For plotting purposes, age had to be converted into a categorical variable by delineating four age groups, but when age was entered into the Cox regression model, it was processed as a continuous variable. Sample survival and hazard plots were produced for viewing these variables over time; a cursory view of these plots did not indicate a violation of the proportional hazards assumption over the study time period for the two groups, but showed slight possibilities for an interaction among the levels of the two covariates. To test this assessment statistically, group by time and covariate by time interaction terms were entered separately into the Cox regression model; the findings from these analyses did not indicate a violation of the proportional hazards assumption for treatment group, 3-year prior traffic convictions, or age, over time (days to subsequent crash).

The covariates, 3-year prior traffic convictions and age, were entered first and then followed by the treatment group variable in the final Cox regression model; this sequence allowed for the assessment of the effects of the IID on days to first subsequent crash, after adjusting for the effects of the covariates. The findings from this analysis are shown below in Table 22.

Table 22

Cox Regression Model, Study 6, Days to First Subsequent Crash

Variable	Parameter estimate	Chi-square	*P* value	Hazard ratio
3-year prior traffic convictions	0.1264	2.848	.0915	1.135
Age	-0.0191	3.570	.0588	0.981
Treatment group	-0.8340	14.878	.0001	0.434

Although Table 22 shows that the covariate 3-year prior traffic convictions is only directionally significant while age is bordering on significance at (p = .059), they are primarily entered for removing whatever bias exists between the two treatment groups on these variables. The primary effect of interest is the treatment group effect, which is statistically significant at a p value of .0001. The significant difference between the two groups and their days to subsequent crash over time are displayed below, in Figure 18.

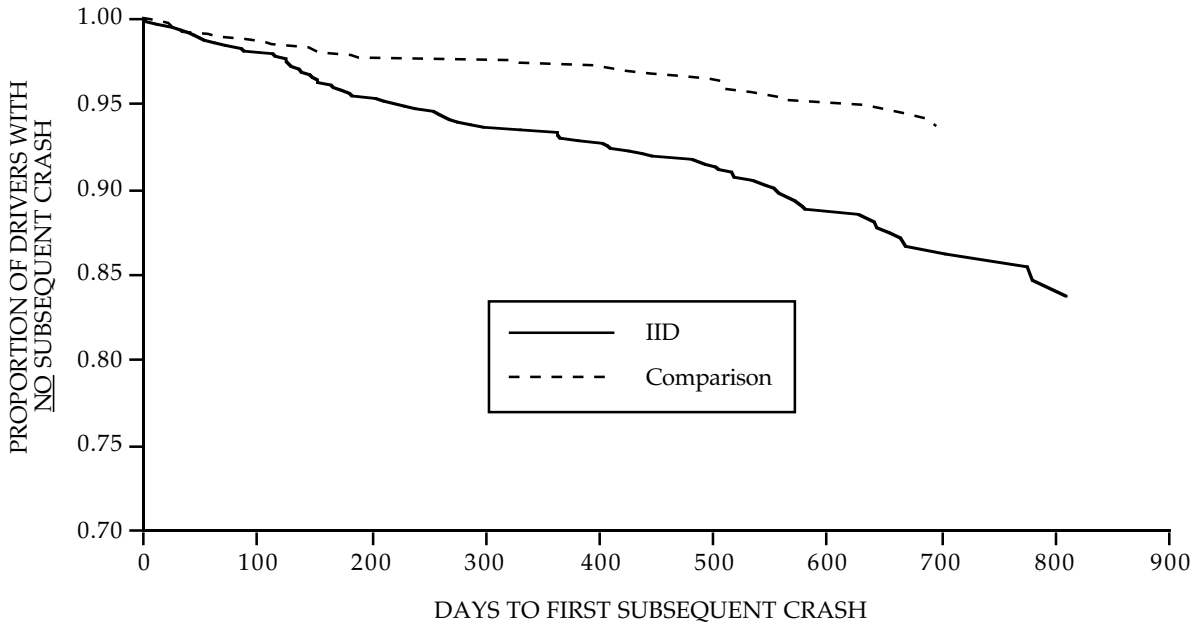

Figure 18. Final survival model: Number of days to first subsequent crash for second DUI offenders installing an IID with license restriction versus second DUI offenders not installing an IID with license suspension.

From the above figure, it is evident that drivers installing an IID show a much higher subsequent crash rate compared to that of the suspended group, which is a reverse finding to that of subsequent DUI incidents. Looking at the graph, the IID group's crash survival rate decreases at a more rapid rate than that of the suspended group. Although second offenders who installed an IID had a 130% higher risk of a subsequent crash than suspended drivers, it should be noted that they had obtained restricted licenses, and therefore likely drove more than those not installing a device, whose licenses remained suspended. Early DMV research studies have shown that the crash rates of the second DUI offender suspended groups have been consistently lower than other sanction groups among second offenders; while suspended drivers may continue to drive, they may drive less and more cautiously.

In addition, while the mean total crash rate of drivers installing an IID (7.5 per 100 drivers) is higher than the mean crash of the suspended drivers (3.0) and the average drivers (5.2), the mean of their fatal/injury crashes (1.8) is only slightly higher than the respective mean of the average driver (1.4), and that of the suspended driver (1.5).

CONCLUSIONS AND RECOMMENDATIONS

Before discussing the results of this study, some limitations inherent in the quasi-experimental nature of the study need to be mentioned so that appropriate conclusions can be drawn. One potential problem is that because it was not feasible to randomly assign drivers to ignition interlock or comparison groups, it is possible that selection processes operated to produce groups that were different to begin with. The issue here is that such pre-existing group differences might lead to different expected DUI conviction/crash rates for the groups, and this would be an alternative hypothesis to that of the effects of ignition interlock in explaining the results of the study.

The study design attempted to control potential pre-existing group bias in two ways. In the first, comparison group subjects were matched to ignition interlock subjects based on propensity scores. This produced a group of comparison subjects who were very similar to interlock subjects on those variables used to form the propensity scores. In addition, the analyses that evaluated the effects of ignition interlock used prior driving history and demographic variables as covariates, which statistically made the groups equivalent on those dimensions measured by the covariates.

While useful, there are limits to the effectiveness of statistical controls. Perhaps the most significant limitation is that it is difficult to capture and measure all of the dimensions on which the groups differ and which would affect their DUI conviction and crash rates. Thus, even though strong statistical controls were used to attempt to control potential group bias, there remains the possibility that uncontrolled bias operated to affect study results. Because of this, the results of this study do not so much prove the efficacy of ignition interlock orders/restrictions/installations as they portray relationships between interlock and subsequent DUI convictions and crashes that are suggestive of its effects.

One other limitation needs to be mentioned that pertains to study 2 only. In this study, a sample of drivers was selected from several counties in the state, and data on their convictions and interlock sentencing orders were gathered from court records. The limitation here involves questions about the degree to which the results generalize throughout California. An effort was made to ensure that the counties sampled were representative of the state, but it is possible that some geographical bias remains.

Conclusions

The results from this study are mixed. They show that IIDs can be effective in reducing DUI recidivism, but not in all situations or for all offenders. When DUI recidivism is examined, the results indicate that IIDs are effective in reducing subsequent DUI convictions when they are actually installed on offenders' vehicles, but that requiring judges to order offenders to install interlock devices and/or restrict offenders to driving IID-equipped vehicles generally has little effect. To the extent that most other studies of interlock have focused on situations where the devices are actually installed, the findings from this study are in accord with prior research (Beck et al., 1999; Bjerre, 2003; Elliot & Morse, 1993; EMT Group, 1990; International Council on Alcohol, Drugs and Traffic Safety, 2001; Jones, 1992; Popkin et al., 1992; Weinrath, 1997).

Thus, it could be said that IIDs are efficacious, but not necessarily effective, or that the devices themselves can work, but that programs utilizing them are more problematic. This is certainly the case in California, where after almost two decades of experience with interlocks, a truly effective program has yet to be developed. The findings from the process evaluation of California's program show that judges do not order most DWS-DUI offenders to install an IID, as required by law, and that only a minority of those who do receive an order comply and actually install a device (DeYoung, 2002). Given this, the findings from the current study that much of California's interlock program is ineffective in reducing DUI recidivism are not surprising.

The effectiveness of IIDs can also be measured by examining their effects on crashes. Crashes could be considered an important, albeit unintended, effect of California's program. Interestingly, the results of this study showed that offenders who received an interlock order/restriction had a <u>lower</u> risk of crashes than offenders who did not receive an order, even though there was no difference between the groups on DUI recidivism. The explanation for these findings is not completely clear, although it seems likely that the reduction in crashes is due to a change in offenders' driving, similar to what happens when a license suspension order is issued. Studies have shown that suspended drivers drive less often and more carefully, to avoid detection by law enforcement (Hagen et al., 1980; Ross & Gonzales, 1988). The situation is similar with DWS-DUI/DUI offenders who have been ordered by the court to install an IID; most such offenders do not comply, and they may drive more carefully and less frequently, in order to avoid being apprehended for violating a court order.

The relationship between IIDs and crashes changes when crashes are examined for offenders who installed an interlock device. Surprisingly, the two analyses that examined this both showed that the risk of crashes was <u>higher</u> for offenders installing an interlock. Thus, even though installing an IID is associated with a reduction in DUI recidivism, it is also linked with an increase in crash risk, so that the overall traffic safety effect of IIDs are mixed, even when installed. With the exception of a study of

Oregon's interlock program (Jones, 1992), which also found that IIDs were associated with an increase in crashes, prior research on IIDs has generally not examined the devices' effect on crashes, so the findings of this study are somewhat unique, and in need of replication. One possible explanation for the findings here is that drivers installing IIDs generally obtain restricted driver licenses, and so may drive more and thus have more exposure than drivers not installing a device, many of whom remain suspended.

This study also examined whether IIDs are more effective with DWS-DUI or DUI drivers. One analysis clearly demonstrated that IIDs are linked with reduced DUI recidivism for DWS-DUI offenders who installed an interlock device, and the study examining repeat DUI offenders receiving an IID order/restriction showed that such an order or restriction was linked with a reduced risk of DUI recidivism and crashes. One group for whom the devices seem to have little effect is first DUI offenders; first offenders ordered to install a device/receiving an interlock restriction had the same risk of subsequent crash and DUI conviction as first offenders not receiving an order/restriction. All first offenders in the current study had elevated BAC levels, with an average BAC of .20%, and could be considered high risk.

A final situation that was examined in the current study is the effectiveness of IIDs for second DUI offenders who choose to install a device in order to obtain a restricted driver license from the DMV. This study showed that such offenders had a significantly lower risk of DUI incidents, but a higher risk of crashes, compared to second offenders who remain suspended. This shows that a voluntary, administrative interlock program can work to reduce DUI recidivism, at least for second DUI offenders.

The results of this study are mixed and somewhat complex regarding the effectiveness of IIDs in California. IIDs are not the "silver bullet" that will solve the DUI problem, but they are effective in some situations with some offenders. Based on the results of this study, as well as the legislatively-mandated process study of IID in California, the following recommendations are made for modifying law and policy on ignition interlock in California.

Recommendations

1. <u>The Judicial Council should investigate the development of an improved monitoring system for defendants ordered to install an IID.</u>
   The legislatively-mandated process evaluation showed that many offenders ordered to install an IID never do so, with little repercussion. This outcome evaluation indicates that IIDs can reduce DUI recidivism, when they are installed. Thus, the effectiveness of IIDs can be considerably enhanced by making sure that offenders ordered to install a device actually do so, and an effective monitoring system is essential. It is important that the courts play a central role in ordering

IIDs, because the issuance of bench warrants for offenders who do not install a device likely has a significant effect in reducing driving and thus lowering the crash risk of DWS-DUI and DUI offenders.

2. Introduce legislation that would allow repeat DUI offenders who install an IID to reinstate their driver licenses early, after serving their APS suspension, or court-DMV suspension, whichever is shorter.
The results of this study show that second DUI offenders who serve half of their suspension period, and install an IID in order to obtain a restricted driver license, have a lower risk of DUI recidivism than their counterparts who remain suspended. This supports the findings of a randomized study of multiple DUI offenders in Maryland, who installed IIDs in order to reinstate their driver licenses (Beck et al., 1999). While the results of both studies generalize only to those repeat DUI offenders who choose to install an IID, they do clearly show that interlocks can be effective for repeat DUI offenders.

   The effectiveness of IIDs could be enhanced by encouraging more repeat offenders to install an interlock in order to gain valid driving privileges. The legislatively-mandated process evaluation showed that only a small minority of eligible repeat offenders takes advantage of the current law, which allows them to obtain a restricted license if they install an IID (DeYoung, 2002).

   One way to encourage more repeat offenders to install interlocks is to shorten their period of suspension if they install a device. Currently, repeat DUI offenders receive a one-year APS suspension upon arrest, and upon conviction receive another suspension of two years or longer, depending upon their number of prior DUI convictions. By requiring repeat DUI offenders to serve only the shorter APS suspension if they install an IID, it is likely more repeat offenders will choose to install an interlock. It is important that a period of license suspension, such as the term required under APS, remain in effect, as numerous studies have shown that license suspension is one of the most effective countermeasures for DUI offenders.

3. Introduce legislation that would allow peace officers to impound the vehicles of drivers who are restricted to driving IID-equipped vehicles, and who are apprehended driving a vehicle without an interlock device.
One of the easiest ways to circumvent the IID sanction is simply to drive a vehicle that is not equipped with an interlock. Currently, there is no strong sanction in place that serves as a disincentive to drive a vehicle without an interlock, in violation of an interlock-restricted license. However, there is a logical and proven-effective countermeasure that would work to discourage circumventing an IID-restricted license in this way, and that is vehicle impoundment. A number of studies have demonstrated that vehicle impoundment works to reduce recidivism and lower crash rates for DUI and suspended drivers (Voas & DeYoung, 2002). It

is likely that the threat of having their vehicle impounded would deter IID-restricted drivers from driving a vehicle without a device, thus adding teeth to the IID laws and enhancing traffic safety. It might also encourage offenders to install an interlock, knowing that circumventing their IID-restricted license by driving another vehicle could have a high cost.

4. Convene a task force comprised of representatives from the courts, DMV, law enforcement, district attorneys, public defenders and ignition interlock providers to investigate barriers to the use of IIDs.
   The results of both legislatively-mandated studies of ignition interlock in California—the process study and this outcome study—indicate that interlock devices can reduce DUI recidivism, but that developing and implementing a workable program utilizing the devices has proven elusive. The process study (DeYoung, 2002) identified several barriers to utilizing IIDs on a larger and more consistent basis, such as the cost of the devices, and these barriers need to be better identified and solutions to them developed in order for the devices to be used consistently, as provided for by statute. DMV should be charged with the responsibility of developing and leading the task force, and writing grants to fund it.

5. De-emphasize the use of IIDs for first DUI offenders.
   The results of this outcome study clearly show that IIDs are not effective in reducing DUI convictions or incidents for first DUI offenders, even those with high BACs at arrest. While their high blood alcohol levels suggest that they are an alcohol-dependent population, ignition interlock does not appear to be the answer to reducing their drinking and driving risk. This conclusion finds support in a study that interviewed drivers, and found that first offenders were more hostile to interlocks and regarded them as less useful, compared to repeat offenders (Baker, 1988). Because there is no evidence that interlocks are an effective traffic safety measure for first DUI offenders, the use of the devices should not be emphasized, even for those first offenders with high BACs at the time of arrest, as is currently done in California Vehicle Code (CVC) Section 23575 (a)(1).

6. Support the current law which requires judges to order DWS-DUI offenders to install an IID.
   CVC 23575 requires judges to order DWS-DUI convictees to install an IID on their vehicle. While the process study found that judges ordered IIDs for only a small minority of the DWS-DUI convictees that should have received an order, the results of this outcome study show that IIDs are associated with lower rates of recidivism for such offenders. Additionally, the degree of judicial compliance with mandatory IID sentencing is higher than under the previous IID law, showing a higher degree of judicial approval and acceptance of this new law. Thus, it is important that this law remains intact, and that methods be explored for

increasing court orders for DWS-DUI offenders, as required by law. Strategies for increasing the use of IIDs would be developed as a part of recommendation 4 in this report.

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APPENDIX

Assembly Bill No. 762

CHAPTER 756

An act to amend Sections 11837 and 11837.1 of the Health and Safety Code, to amend Sections 1803, 12813, 13352, 13352.4, 14601.2,23160, 23161, 23166, 23186, 23203, 23204, 23235, 23246, and 23247 of, to amend the heading of Article 4.5 (commencing with Section 23246)of Chapter 12 of Division 11 of, to add Section 23249.1 to, to repeal Sections 23167 and 23187 of, and to repeal and add Sections 13352.5 and 23249 of, the Vehicle Code, relating to vehicles

.[Approved by Governor September 22, 1998. Filed with Secretary of State September 23, 1998.]

LEGISLATIVE COUNSEL'S DIGEST

AB 762, Torlakson. Vehicles: ignition interlock devices: driver's license restriction.

(1) Under existing law, if a person is referred to an 18-month or 30-month licensed alcohol and other drug education and counseling service program, the Department of Motor Vehicles is required to revoke or suspend the privilege of the person to operate a motor vehicle if the person has failed to comply with the rules and policies of the program. The department is required to notify the person and the court and to inform the person of the opportunity to be reinstated in the program and to avoid suspension of the driving privilege in accordance with a specified procedure.

Existing law also provides for termination in the participation in the described alcohol and drug program of persons who refuse to consent to a chemical test.

This bill would require the department to suspend, rather than suspend or revoke, the privilege, would delete the requirement that the department inform the court, would delete the program reinstatement and opportunity to avoid the suspension procedure, and would delete procedures regarding failure to consent to a chemical testing. The bill would make technical, conforming changes.

(2) Under existing law, a person, who is convicted of driving a vehicle while under the influence of an alcoholic beverage, any drug, or both, driving with an excessive blood-alcohol concentration, or driving when addicted to any drug, (DUI), is required to be punished by specified imprisonment and fines. The punishment is enhanced if a person is convicted of a second violation by, among other things, providing that the court prohibit the person from operating a motor vehicle unless a functioning, certified ignition interlock device is installed and that the privilege to operate a motor vehicle is required to be suspended by the Department of Motor Vehicles for 18 months.

This bill would require that suspension to be for 2 years. However, the bill would allow the person to apply to the department after the completion of 12 months of the suspension period for a restricted license subject to specified conditions, including the person's continued enrollment and participation in described treatment programs and if the person agrees to install and maintain a certified, functioning ignition interlock device. The bill would require persons who are convicted of driving with a suspended or revoked license where that suspension or revocation was based on prior convictions of the DUI offenses described above, to install the described devices. The bill would make a conforming change with respect to a person who is granted probation upon a second offense.

(3) Existing law authorizes a court to prohibit any person who is convicted of a first offense of the DUI offenses described above from operating a motor vehicle unless that vehicle is equipped with a functioning, certified ignition interlock device. Existing law imposes administering and monitoring duties upon the courts, administrative offices of the courts, the Judicial Council, and county probation officers with regard to the ignition interlock device program. Other duties and responsibilities are imposed upon the Department of Motor Vehicles.

This bill would substantially recast the ignition interlock device program by authorizing the court to require the department to prohibit any person who is first convicted of the above-described DUI offense from operating a motor vehicle unless the vehicle is equipped with a functioning certified ignition interlock device. The bill would require the court to require any person convicted of driving a vehicle with a suspended or revoked license based on a prior DUI conviction to install an ignition interlock device for a period not to exceed 3 years or until the person's driving privilege is reinstated by the department. The bill would allow a person who is convicted of a DUI offense when the offense occurred within 7 years of one or more separate violations that resulted in a conviction to apply to the department for a restricted driver's license prohibiting, among other things, the person from operating a motor vehicle unless that vehicle is equipped with a functioning ignition interlock device. The bill would apply these provisions to out-of-state residents who otherwise would qualify for an ignition interlock restricted license in this state. The bill would require the department and the courts to undertake certain duties, as revised, regarding administering and monitoring the ignition interlock device program currently undertaken by the courts, administrative offices of the courts, the Judicial Council, and

probation officers. To the extent that the court would be required to order and monitor the installation and maintenance of these devices for specified offenders, including certain additional offenders, the bill would impose a state-mandated local program.

The bill would require the department to report to the Legislature on or before January 1, 2002, regarding certain aspects of the ignition interlock device program.

(4) Existing law requires the department to restrict the driver's license of any person convicted of violating the DUI provisions specified above, if (a) a court has certified to the department that the court has granted probation to the person under conditions that include participation in a specified drug and alcohol treatment program, described in (1), (b) the court has restricted the person's privilege to operate a motor vehicle, and (c) the person gives proof of financial responsibility, as defined. If a person who has been granted probation, as specified, fails at any time to participate successfully in the specified treatment program, the court is required to revoke or terminate the probation and order the department to suspend the person's driver's license, as specified.

This bill, instead, would require the department to issue a restricted driver's license, as specified, if the person (a) submits proof of enrollment in, or completion of, a specified drug and alcohol treatment program, as described, (b) submits proof of financial responsibility as described, and (c) pays all applicable reinstatement or reissue fees and any restriction fee required by the department. The restriction would become effective when the department receives all of the specified documents and fees and would remain effective for a specified period.

The bill would require the department to suspend, instead of restrict, the person's driver's license upon receipt of notification from the treatment program that the person has failed to comply with the program requirements. The license would remain suspended until the person presents evidence to the department that the person has completed the treatment program and proof of financial responsibility.

(5) Existing law requires the department to suspend for one year and, thereafter, restrict for an additional 2 years the driver's license of a person convicted of violating a specified provision prohibiting driving under the influence and causing bodily injury to another person, if the court has granted probation under conditions similar to those specified above and the person gives proof of financial responsibility, as specified.

This bill, instead, would require the department to revoke the person's driver's license as one of the conditions of probation.

(6) Existing law requires the Department of Motor Vehicles to immediately suspend the privilege to operate a motor vehicle of any person who attempts to bypass or tamper with an installed ignition interlock device, as specified, and requires the installer to notify the department.

This bill would include attempts to remove the interlock device within the above provisions. Because a violation of this provision under existing provisions of law would be a crime, this bill would expand the scope of that crime, thereby imposing a state-mandated local program.

(7) Existing law does not provide a specific procedure and authorization with regard to the removal of an ignition interlock device from a vehicle that has been impounded.

This bill would provide that procedure and authorization by authorizing the manufacturer or installer of an ignition interlock device to remove the device from a vehicle that has been impounded for any reason during the normal business hours.

(8) This bill would repeal the ignition interlock device program as of January 1, 2005, unless a later enacted statute deletes or extends that date.

(9) The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement, including the creation of a State Mandates Claims Fund to pay the costs of mandates that do not exceed $1,000,000 statewide and other procedures for claims whose statewide costs exceed $1,000,000.

This bill would provide that, if the Commission on State Mandates determines that the bill contains costs mandated by the state, reimbursement for those costs shall be made pursuant to these statutory provisions.

(10) The bill would incorporate additional changes in Section 23166 of the Vehicle Code proposed by AB 2674, to become operative only if both bills are enacted and become operative on or before January 1, 1999, and this bill is enacted last.

(11) This bill would incorporate changes in Section 11837 of the Health and Safety Code proposed by AB 1916 to become operative only if both bills are enacted and become effective on or before January 1, 1999, and this bill is enacted last.

(12) This bill would provide that its provisions shall become operative on July 1, 1999.

The people of the State of California do enact as follows:

SECTION 1. This act shall be known as, and may be cited as, the Bryan Fabian, Elijah and Isaac Howell Prevention of Drunk Driving Act.

SEC. 2. Section 11837 of the Health and Safety Code is amended to read:

11837. (a) Pursuant to the provisions of law relating to suspension of a person's privilege to operate a motor vehicle upon conviction for driving while under the influence of any alcoholic beverage or drug, or under the combined influence of any alcoholic beverage and any drug, as set forth in paragraph (3) of subdivision (a) of Section 13352 of the Vehicle Code, the Department of Motor Vehicles shall restrict the driving privilege pursuant to Section 13352.5 of the Vehicle Code, if the court has notified the department pursuant to Section 13352 of the Vehicle Code that the person convicted of that offense has consented to participate for at least 18 months in a program designed to offer alcohol and other drug education and counseling services that is licensed pursuant to this chapter.

(b) In determining whether to refer a person, who is ordered to participate in a program pursuant to Section 668 of the Harbors and Navigation Code, in a licensed alcohol and other drug education and counseling services program pursuant to Section 23161 of the Vehicle Code, or, pursuant to Section 23166, 23171, 23176, 23181, 23186, or 23191 of the Vehicle Code, in a licensed 18-month or 30-month program, the court may consider any relevant information about the person made available pursuant to a presentence investigation, that is permitted but not required under Section 23205 of the Vehicle Code, or other screening procedure. That information shall not be furnished, however, by any person who also provides services in a privately operated, licensed program or who has any direct interest in a privately operated, licensed program. In addition, the court shall obtain from the Department of Motor Vehicles a copy of the person's driving record to determine whether the person is eligible to participate in a licensed 18-month or 30-month program pursuant to this chapter. When preparing a presentence report for the court, the probation department may consider the suitability of placing the defendant in a treatment program that includes the administration of nonscheduled, nonaddicting medications to ameliorate an alcohol or controlled substance problem. If the probation department recommends that this type of program is a suitable option for the defendant, the defendant who would like the court to consider this option shall obtain

from his or her physician a prescription for the medication, and a finding that the treatment is medically suitable for the defendant, prior to consideration of this alternative by the court.

(c) The court may, as a condition of probation pursuant to Section 23161 or 23181 of the Vehicle Code, refer a first offender to a licensed program to attend all of the education, group counseling, and interview sessions described in this chapter if ordered to participate in 6, 9, or 12 months of program activities. Notwithstanding Section 13352.5 of the Vehicle Code, if a first offender is referred to a licensed program pursuant to Section 23161 or 23181 of the Vehicle Code, that person may participate in a program if convicted of another offense punishable under Section 23165 or 23185 of the Vehicle Code.

(d) The court may, subject to Section 11837.2, and as a condition of probation, refer a person to a licensed program, even though the person's privilege to operate a motor vehicle is restricted, suspended, or revoked. An 18-month program described in Section 23166 or 23186 of the Vehicle Code or a 30-month program described in Section 23171, 23176, or 23191 of the Vehicle Code may include treatment of family members and significant other persons related to the convicted person with the consent of those family members and others as described in this chapter, if there is no increase in the costs of the program to the convicted person.

SEC. 2.5. Section 11837 of the Health and Safety Code is amended to read:

11837. (a) Pursuant to the provisions of law relating to suspension of a person's privilege to operate a motor vehicle upon conviction for driving while under the influence of any alcoholic beverage or drug, or under the combined influence of any alcoholic beverage and any drug, as set forth in paragraph (3) of subdivision (a) of Section 13352 of the Vehicle Code, the Department of Motor Vehicles shall restrict the driving privilege pursuant to Section 13352.5 of the Vehicle Code, if the court has notified the department pursuant to Section 13352 of the Vehicle Code that the person convicted of that offense has consented to participate for at least 18 months in a program designed to offer alcohol and other drug education and counseling services that is licensed pursuant to this chapter.

(b) In determining whether to refer a person, who is ordered to participate in a program pursuant to Section 668 of the Harbors and Navigation Code, in a licensed alcohol and other drug education and counseling services program pursuant to Section 23161 of the Vehicle Code, or, pursuant to Section 23166, 23171, 23176, 23181, 23186, or 23191 of the Vehicle Code, in a licensed 18-month or 30-month program, the court may consider any relevant information about the person made available pursuant to a presentence investigation, that is permitted but not required under Section 23205 of the Vehicle Code, or other screening procedure. That information shall not be furnished, however, by any person who also provides services in a privately operated, licensed program or who has any direct interest in a privately operated, licensed program. In addition, the court shall obtain from the Department of Motor Vehicles a copy of the person's driving record to determine whether the person is eligible to participate in a licensed 18-month or 30-month program pursuant to this chapter. When preparing a presentence report for the court, the probation department may consider the suitability of placing the defendant in a treatment program that includes the administration of nonscheduled nonaddicting medications to ameliorate an alcohol or controlled substance problem. If the probation department recommends that this type of program is a suitable option for the defendant, the defendant who would like the court to consider this option shall obtain from his or her physician a prescription for the medication, and a finding that the treatment is medically suitable for the defendant, prior to consideration of this alternative by the court.

(c) (1) The court shall, as a condition of probation pursuant to Section 23161 or 23181 of the Vehicle Code, refer a first offender whose concentration of alcohol in his or her blood was less than 0.20 percent, by weight, to participate for at least three months or longer, as ordered by the court, in a licensed program that consists of at least 30 hours of program activities, including those education, group counseling, and individual interview sessions described in this chapter. Notwithstanding Section 13352.5 of the Vehicle Code, a first offender who is referred to a licensed program pursuant to Section 23161 or 23181 of the Vehicle Code may participate in a program if convicted of another offense punishable under Section 23165 or 23185 of the Vehicle Code.

(2) Notwithstanding any other provision of law, in granting probation to a first offender described in this subdivision whose concentration of alcohol in the person's blood was 0.20 percent or more, by weight, or the person refused to take a chemical test, the court shall order the person to participate, for at least six months or longer, as ordered by the court, in a licensed program that consists of at least 45 hours of program activities, including those education, group counseling, and individual interview sessions described in this chapter.

(d) (1) The State Department of Alcohol and Drug Programs shall specify in regulations the activities required to be provided in the treatment of participants receiving six months of licensed program services under Section 23161 or 23181 of the Vehicle Code.

(2) Any program licensed pursuant to this chapter may provide treatment services to participants receiving at least six months of licensed program services under Section 23161 or 23181 of the Vehicle Code.

(e) The court may, subject to Section 11837.2, and as a condition of probation, refer a person to a licensed program, even though the person's privilege to operate a motor vehicle is restricted, suspended, or revoked. An 18-month program described in Section 23166 or 23186 of the Vehicle Code or a 30-month program described in Section 23171, 23176, or 23191 of the Vehicle Code may include treatment of family members and significant other persons related to the convicted person with the consent of those family members and others as described in this chapter, if there is no increase in the costs of the program to the convicted person.

(f) The clerk of the court shall indicate the duration of the program in which the judge has ordered the person to participate in the abstract of the record of the court that is forwarded to the department.

SEC. 3. Section 11837.1 of the Health and Safety Code is amended to read:

11837.1. (a) In utilizing any program described in Section 11837, the court may require periodic reports concerning the performance of each person referred to and participating in a program. The program shall provide the court, the Department of Motor Vehicles, and the person participating in a program with an immediate report of any failure of the person to comply with the program's rules and policies.

(b) If, at any time after entry into or while participating in a program, a participant who is referred to an 18-month program described in Section 23166 of the Vehicle Code or a 30-month program described in Section 23171, 23176, or 23191 of the Vehicle Code, fails to comply with the rules and policies of the program, and that fact is reported, the Department of Motor Vehicles shall suspend the privilege of that person to operate a motor vehicle for the period prescribed by law in accordance with Section 13352.5 of the Vehicle Code, except as otherwise provided in this section. The Department of Motor Vehicles shall notify the person of its action.

(c) If the department withdraws the license of a program, the department shall immediately notify the Department of Motor Vehicles of those persons who do not commence participation in a licensed program within 21 days from

the date of the withdrawal of the license of the program in which the persons were previously participating. The Department of Motor Vehicles shall suspend or revoke, for the period prescribed by law, the privilege to operate a motor vehicle of each of those persons referred to an 18-month program pursuant to Section 23166 or 23186 of the Vehicle Code or to a 30-month program pursuant to Section 23171, 23176, or 23191 of the Vehicle Code.

SEC. 4. Section 1803 of the Vehicle Code is amended to read:

1803. (a) Every clerk of a court in which a person was convicted of any violation of this code, was convicted of any violation of subdivision (a), (b), (c), (d), (e), or (f) of Section 655 of the Harbors and Navigation Code pertaining to a mechanically propelled vessel but not to manipulating any water skis, an aquaplane, or similar device, was convicted of any violation of Section 655.2, 655.6, 658, or 658.5 of the Harbors and Navigation Code, or any violation of Section 191.5 of the Penal Code when the conviction resulted from the operation of a vessel, was convicted of any offense involving use or possession of controlled substances under Division 10 (commencing with Section 11000) of the Health and Safety Code, was convicted of any felony offense when a commercial motor vehicle, as defined in subdivision (b) of Section 15210, was involved in or incidental to the commission of the offense, or was convicted of any violation of any other statute relating to the safe operation of vehicles, shall prepare within 10 days after conviction and immediately forward to the department at its office at Sacramento an abstract of the record of the court covering the case in which the person was so convicted. If sentencing is not pronounced in conjunction with the conviction, the abstract shall be forwarded to the department within 10 days after sentencing and the abstract shall be certified by the person so required to prepare it to be true and correct.

For the purposes of this section, a forfeiture of bail shall be equivalent to a conviction.

(b) The following violations are not required to be reported under subdivision (a):

(1) Division 3.5 (commencing with Section 9840).

(2) Section 21113, with respect to parking violations.

(3) Chapter 9 (commencing with Section 22500) of Division 11, except Section 22526.

(4) Division 12 (commencing with Section 24000), except Sections 24002, 24004, 24250, 24409, 24604, 24800, 25103, 26707, 27151, 27315, 27360, 27800, and 27801 and Chapter 3 (commencing with Section 26301).

(5) Division 15 (commencing with Section 35000), except Chapter 5 (commencing with Section 35550).

(6) Violations for which a person was cited as a pedestrian or while operating a bicycle.

(7) Division 16.5 (commencing with Section 38000).

(8) Sections 23221, 23223, 23225, and 23226.

(c) If the court impounds a license, or orders a person to limit his or her driving pursuant to paragraph (2) of subdivision (a) of Section 23161, subdivision (b) of Section 23166, subdivision (b) of Section 23186, or subdivision (d) of Section 40508, the court shall notify the department concerning the impoundment or limitation on an abstract prepared pursuant to subdivision (a) of this section or on a separate abstract, which shall be prepared within 10 days after the impoundment or limitation was ordered and immediately forwarded to the department at its office in Sacramento.

(d) If the court determines that a prior judgment of conviction of a violation of Section 23152 or 23153 is valid or is invalid on constitutional grounds pursuant to Section 41403, the clerk of the court in which the determination is made shall prepare an abstract of that determination and

forward it to the department in the same manner as an abstract of record pursuant to subdivision (a).

(e) Within 10 days of an order terminating or revoking probation under Section 23207, the clerk of the court in which the order terminating or revoking probation was entered, shall prepare and immediately forward to the department at its office in Sacramento an abstract of the record of the court order terminating or revoking probation and any other order of the court to the department required by law.

SEC. 5. Section 12813 of the Vehicle Code is amended to read:

12813. (a) The department may, upon issuing a driver's license or after issuance whenever good cause appears, impose restrictions suitable to the licensee's driving ability with respect to the type of, or special mechanical control devices required on, a motor vehicle which the licensee may operate or impose other restrictions applicable to the licensee that the department may determine to be appropriate to assure the safe operation of a motor vehicle by the licensee.

(b) The department may issue either a special restricted license or may set forth the restrictions upon the usual license form.

(c) The authority of the department to issue restricted licenses under this section is subject to Sections 12812, 13352, and 13352.5.

SEC. 6. Section 13352 of the Vehicle Code is amended to read:

13352. (a) The department shall immediately suspend or revoke, or record the court-administered suspension or revocation of, the privilege of any person to operate a motor vehicle upon receipt of a duly certified abstract of the record of any court showing that the person has been convicted of a violation of Section 23152 or 23153 or subdivision (a) of Section 23109, or upon receipt of a report of a judge of the juvenile court, a juvenile traffic hearing officer, or a referee of a juvenile court showing that the person has been found to have committed a violation of Section 23152 or 23153 or subdivision (a) of Section 23109. If any offense specified in this section occurs in a vehicle defined in Section 15210, the suspension or revocation specified below shall apply to the noncommercial driving privilege. The commercial driving privilege shall be disqualified as specified in Section 15300. For the purposes of this section, suspension or revocation shall be as follows:

(1) Upon a conviction or finding of a violation of Section 23152 punishable under Section 23160, the privilege shall be suspended for a period of six months. The privilege shall not be reinstated until the person gives proof of ability to respond in damages and gives proof satisfactory to the department of successful completion of a program described in subdivision (b) of Section 23161. The department shall issue a restricted license upon receipt of an abstract of record from the court certifying the court has granted probation to the person based on the conditions specified in paragraph (2) of subdivision (a) of, and subdivision (b) of, Section 23161.

(2) Upon a conviction or finding of a violation of Section 23153 punishable under Section 23180, the privilege shall be suspended for a period of one year. The privilege shall not be reinstated until the person gives proof of ability to respond in damages and gives proof satisfactory to the department of successful completion of a program described in Section 23181.

(3) Except as provided in Section 13352.5, upon a conviction or finding of a violation of Section 23152 punishable under Section 23165, the privilege shall be suspended for two years. The privilege shall not be reinstated until the person gives proof of ability to respond in damages and gives proof satisfactory to the department of successful completion, subsequent to the most recent underlying conviction, of a program described in Section 23166. The department shall advise the person that after completion of 12 months of

the suspension period, the person may apply to the department for a restricted driver's license, subject to the following conditions:

(A) The person has satisfactorily provided, subsequent to the current underlying conviction, either of the following:

(i) Proof of enrollment in a licensed 18-month program pursuant to Section 11836 of the Health and Safety Code.

(ii) Proof of enrollment in a licensed 30-month program, if available in the county of the person's residence or employment, pursuant to Section 11836 of the Health and Safety Code.

(B) The person agrees, as a condition of the restriction, to continue satisfactory participation in the program described in subparagraph (A).

(C) The person submits the "Verification of Installation" form described in paragraph (2) of subdivision (e) of Section 23235.

(D) The person agrees to maintain the ignition interlock device as required under subdivision (g) of Section 23246.

(E) The person provides proof of financial responsibility, as defined in Section 16430.

(F) The person pays all applicable reinstatement or reissue fees and any restriction fee required by the department.

(G) The restriction shall remain in effect for the period required in subdivision (f) of Section 23246.

(4) Except as provided in this paragraph, upon a conviction or finding of a violation of Section 23153 punishable under Section 23185, the privilege shall be revoked for a period of three years. The privilege shall not be reinstated until evidence satisfactory to the department establishes that no grounds exist that would authorize the refusal to issue a license, the person gives proof of ability to respond in damages, and the person gives proof satisfactory to the department of successful completion, subsequent to the most recent underlying conviction, of a program described in Section 23186. The department shall advise the person that after the completion of 18 months of the revocation period, the person may apply to the department for a restricted driver's license, subject to the following conditions:

(A) The person has satisfactorily completed, subsequent to the current underlying conviction, either of the following:

(i) A licensed 18-month program pursuant to Section 11836 of the Health and Safety Code.

(ii) The initial 18 months of a licensed 30-month program, if available in the county of the person's residence or employment, pursuant to Section 11836 of the Health and Safety Code, and the person agrees, as a condition of the restriction, to continue satisfactory participation in that 30-month program.

(B) The person submits the "Verification of Installation" form described in paragraph (2) of subdivision (e) of Section 23235. (C) The person agrees to maintain the ignition interlock device as required under subdivision (g) of Section 23246.

(D) The person provides proof of financial responsibility, as defined in Section 16430.

(E) The person pays all applicable reinstatement or reissue fees and any restriction fee required by the department.

(F) The restriction shall remain in effect for the period required in subdivision (f) of Section 23246.

(5) Except as provided in this paragraph, upon a conviction or finding of a violation of Section 23152 punishable under Section 23170, the privilege shall be revoked for a period of three years. The privilege shall not be reinstated until the person files proof of ability to respond in damages and gives proof satisfactory to the department of successful completion, subsequent to the most recent underlying conviction, of one of the following

programs: an 18-month program or, if available in the county of the person's residence or employment, a 30-month program licensed pursuant to Chapter 9 (commencing with Section 11836) of Part 2 of Division 10.5 of the Health and Safety Code, or a program specified in Section 8001 of the Penal Code. The court shall advise the person at the time of sentencing that completion of one of the programs authorized by this paragraph is required in order to become eligible for a California driver's license. The department shall advise the person that after completion of 18 months of the revocation period, the person may apply to the department for a restricted driver's license, subject to the following conditions:

(A) The person has satisfactorily completed, subsequent to the current underlying conviction, either of the following:

(i) A licensed 18-month program pursuant to Section 11836 of the Health and Safety Code.

(ii) The initial 18 months of a licensed 30-month program, if available in the county of the person's residence or employment, pursuant to Section 11836 of the Health and Safety Code.

The person agrees, as a condition of the restriction, to continue satisfactory participation in the 30-month program.

(B) The person submits the "Verification of Installation" form described in paragraph (2) of subdivision (e) of Section 23235.

(C) The person agrees to maintain the ignition interlock device as required under subdivision (g) of Section 23246.

(D) The person provides proof of financial responsibility, as defined in Section 16430.

(E) Any individual convicted of a violation of Section 23152 punishable under Section 23170 may also, at any time after sentencing, petition the court for referral to an 18-month program or, if available in the county of the person's residence or employment, a 30-month program licensed pursuant to Chapter 9 (commencing with Section 11836) of Part 2 of Division 10.5 of the Health and Safety Code. Unless good cause is shown, the court shall order the referral.

(F) The person pays all applicable reinstatement or reissue fees and any restriction fee required by the department.

(G) The restriction shall remain in effect for the period required in subdivision (f) of Section 23246.

(6) Except as provided in this paragraph, upon a conviction or finding of a violation of Section 23153 punishable under Section 23190, the privilege shall be revoked for a period of five years. The privilege shall not be reinstated until evidence satisfactory to the department establishes that no grounds exist that would authorize the refusal to issue a license, and the person gives proof of ability to respond in damages and proof satisfactory to the department of successful completion, subsequent to the most recent underlying conviction, of one of the following programs: a 30-month program, if available in the county of the person's residence or employment or, if not available, an 18-month program licensed pursuant to Chapter 9 (commencing with Section 11836) of Part 2 of Division 10.5 of the Health and Safety Code, or a program specified in Section 8001 of the Penal Code. The court shall advise the person at the time of sentencing that completion of one of the programs authorized by this paragraph is required in order to become eligible for a California driver's license. The department shall advise the person that after the completion of 30 months of the revocation period, the person may apply to the department for a restricted driver's license, subject to the following conditions:

(A) The person has satisfactorily completed, subsequent to the current underlying conviction, either of the following:

(i) The initial 18 months of a licensed 30-month program, if available in the county of the person's residence or employment, pursuant to Section 11836 of the Health and Safety Code.

The person agrees, as a condition of the restriction, to continue satisfactory participation in the 30-month program.

(ii) A licensed 18-month program pursuant to Section 11836 of the Health and Safety Code, if a 30-month program is unavailable in the person's county of residence or employment.

(B) The person submits the "Verification of Installation" form described in paragraph (2) of subdivision (e) of Section 23235.

(C) The person agrees to maintain the ignition interlock device as required under subdivision (g) of Section 23246.

(D) The person provides proof of financial responsibility, as defined in Section 16430.

(E) Any individual convicted of a violation of Section 23153 punishable under Section 23190 may also, at any time after sentencing, petition the court for referral to an 18-month program or, if available in the county of the person's residence or employment, a 30-month program licensed pursuant to Chapter 9 (commencing with Section 11836) of Part 2 of Division 10.5 of the Health and Safety Code. Unless good cause is shown, the court shall order the referral.

(F) The person pays all applicable reinstatement or reissue fees and any restriction fee required by the department.

(G) The restriction shall remain in effect for the period required in subdivision (f) of Section 23246.

(7) Except as provided in this paragraph, upon a conviction or finding of a violation of Section 23152 punishable under Section 23175 or 23175.5, the privilege shall be revoked for a period of four years. The privilege shall not be reinstated until evidence satisfactory to the department establishes that no grounds exist that would authorize the refusal to issue a license, and the person gives proof of ability to respond in damages and proof satisfactory to the department of successful completion, subsequent to the most recent underlying conviction, of one of the following programs: an 18-month program or, if available in the county of the person's residence or employment, a 30-month program licensed pursuant to Chapter 9 (commencing with Section 11836) of Part 2 of Division 10.5 of the Health and Safety Code, or a program specified in Section 8001 of the Penal Code. The court shall advise the person at the time of sentencing that completion of one of the programs authorized by this paragraph is required in order to become eligible for a California driver's license. The department shall advise the person that after the completion of 24 months of the revocation period, the person may apply to the department for a restricted driver's license, subject to the following conditions:

(A) The person has satisfactorily completed, subsequent to the current underlying conviction, either of the following:

(i) A licensed 18-month program pursuant to Section 11836 of the Health and Safety Code.

(ii) The initial 18 months of a licensed 30-month program, if available in the county of the person's residence or employment, pursuant to Section 11836 of the Health and Safety Code. The person agrees, as a condition of the restriction, to continue satisfactory participation in the 30-month program.

(B) The person submits the "Verification of Installation" form described in paragraph (2) of subdivision (e) of Section 23235.

(C) The person agrees to maintain the ignition interlock device as required under subdivision (g) of Section 23246.

(D) The person provides proof of financial responsibility, as defined in Section 16430.

(E) Any individual convicted of a violation of Section 23152 punishable under Section 23175 may also, at any time after sentencing, petition the court for referral to an 18-month program or, if available in the county of the person's residence or employment, a 30-month program licensed pursuant to Chapter 9 (commencing with Section 11836) of Part 2 of Division 10.5 of the Health and Safety Code. Unless good cause is shown, the court shall order the referral.

(F) The person pays all applicable reinstatement or reissue fees and any restriction fee required by the department.

(G) The restriction shall remain in effect for the period required in subdivision (f) of Section 23246.

(8) Upon a conviction or finding of a violation of subdivision (a) of Section 23109 punishable under subdivision (e) of that section, the privilege shall be suspended for a period of 90 days to six months, if and as ordered by the court.

(9) Upon a conviction or finding of a violation of subdivision (a) of Section 23109 punishable under subdivision (f) of that section, the privilege shall be suspended for a period of six months, if the court orders the department to suspend the privilege. The privilege shall not be reinstated until the person gives proof of ability to respond in damages.

(b) For the purpose of paragraphs (2) to (9), inclusive, of subdivision (a), the finding of the juvenile court judge, the juvenile traffic hearing officer, or the referee of a juvenile court of a commission of a violation of Section 23152 or 23153 or subdivision (a) of Section 23109, as specified in subdivision (a) of this section, is a conviction.

(c) Each judge of a juvenile court, juvenile traffic hearing officer, or referee of a juvenile court shall immediately report the findings specified in subdivision (a) to the department.

(d) A conviction of an offense in any state, territory, or possession of the United States, the District of Columbia, the Commonwealth of Puerto Rico, or Canada that, if committed in this state, would be a violation of Section 23152, is a conviction of Section 23152 for purposes of this section, and a conviction of an offense that, if committed in this state, would be a violation of Section 23153, is a conviction of Section 23153 for purposes of this section. The department shall suspend or revoke the privilege to operate a motor vehicle pursuant to this section upon receiving notice of that conviction.

SEC. 7. Section 13352.4 of the Vehicle Code is amended to read:

13352.4. (a) The department shall require a person upon whom the court has imposed the condition of probation required by subdivision (b) of Section 23161 to submit proof of the satisfactory completion of a program licensed pursuant to Chapter 9 (commencing with Section 11836) of Part 2 of Division 10.5 of the Health and Safety Code or of a program defined in Section 8001 of the Penal Code, within a time period set by the department, beginning from the date of a conviction or a finding by a court of a violation of Section 23152.

(b) The department shall suspend the privilege to drive of any person who is not in compliance with subdivision (a).

(c) The department may suspend the privilege to drive of any person for failure to file proof of financial responsibility when the person has been ordered by the court to do so. The suspension shall remain in effect until adequate proof of financial responsibility is filed with the department by the person.

(d) The department shall not restore the privilege to operate a motor vehicle after a suspension pursuant to subdivision (b) until the department receives proof of the completion of a program pursuant to subdivision (a) that the department finds satisfactory.

(e) This section shall become operative on January 1, 1995.

SEC. 8. Section 13352.5 of the Vehicle Code is repealed.

SEC. 9. Section 13352.5 is added to the Vehicle Code, to read:

13352.5. (a) The department shall issue a restricted driver's license to a person granted probation under the conditions described in subdivision (b) of Section 23166 instead of suspending that person' s license, if the person meets all of the following requirements:

(1) Submits proof of enrollment in, or completion of, a drug and alcohol treatment program described in paragraph (4) of subdivision (b) of Section 23166.

(2) Submits proof of financial responsibility, as described in Section 16430.

(3) Pays all applicable reinstatement or reissue fees and any restriction fee required by the department.

(b) The restriction of the driving privilege shall become effective when the department receives all of the documents and fees required under subdivision (a) and shall remain effective for the period required under Section 23166.

(c) The restriction of the driving privilege shall be limited to the hours necessary for driving to and from the place of employment, driving during the course of employment, and driving to and from activities required in the treatment program.

(d) Whenever the driving privilege is restricted under this section, proof of financial responsibility, as defined in Section 16430, shall be maintained for three years. If the person does not maintain that proof of financial responsibility at any time during the restriction, the driving privilege shall be suspended until proof pursuant to Section 16484 is received by the department.

(e) The restriction imposed under this section may be removed when the person presents evidence satisfactory to the department that the person has completed the drug and alcohol treatment program.

(f) The department shall suspend the privilege to drive under paragraph (3) of subdivision (a) of Section 13352 upon receipt of notification from the treatment program that the person has failed to comply with the program requirements.

(g) After completion of 12 months of the suspension or probation period, the offender may apply to the department for a restricted driver's license, subject to the conditions specified in paragraph (3) of subdivision (a) of Section 13352.

SEC. 10. Section 14601.2 of the Vehicle Code is amended to read:

14601.2. (a) No person shall drive a motor vehicle at any time when that person's driving privilege is suspended or revoked for a conviction of a violation of Section 23152 or 23153 if the person so driving has knowledge of the suspension or revocation.

(b) Except in full compliance with the restriction, no person shall drive a motor vehicle at any time when that person's driving privilege is restricted pursuant to Article 2 (commencing with Section 23152) of Chapter 12 of Division 11, if the person so driving has knowledge of the restriction.

(c) Knowledge of suspension or revocation of the driving privilege shall be conclusively presumed if mailed notice has been given by the department to the person pursuant to Section 13106. Knowledge of restriction of the driving privilege shall be presumed if notice has been given by the court to the person. The presumption established by this subdivision is a presumption affecting the burden of proof.

(d) Any person convicted of a violation of this section shall be punished as follows:

(1) Upon a first conviction, by imprisonment in the county jail for not less than 10 days or more than six months and by a fine of not less than three hundred dollars ($300) or more than one thousand dollars ($1,000), unless the person has been designated an habitual traffic offender under subdivision (b) of Section 23170, subdivision (b) of Section 23175, or subdivision (b) of Section 23175.5, in which case the person, in addition, shall be sentenced as provided in paragraph (3) of subdivision (e) of Section 14601.3.

(2) If the offense occurred within five years of a prior offense that resulted in a conviction of a violation of this section or Section 14601, 14601.1, or 14601.5, by imprisonment in the county jail for not less than 30 days or more than one year and by a fine of not less than five hundred dollars ($500) or more than two thousand dollars ($2,000), unless the person has been designated an habitual traffic offender under subdivision (b) of Section 23170 or subdivision (b) of Section 23175, in which case the person, in addition, shall be sentenced as provided in paragraph (3) of subdivision (e) of Section 14601.3.

(e) If any person is convicted of a first offense under this section and is granted probation, the court shall impose as a condition of probation that the person be confined in the county jail for at least 10 days.

(f) If the offense occurred within five years of a prior offense that resulted in a conviction of a violation of this section or Section 14601, 14601.1, or 14601.5 and is granted probation, the court shall impose as a condition of probation that the person be confined in the county jail for at least 30 days.

(g) If any person is convicted of a second or subsequent offense that results in a conviction of this section within seven years, but over five years, of a prior offense that resulted in a conviction of a violation of this section or Section 14601, 14601.1, or 14601.5 and is granted probation, the court shall impose as a condition of probation that the person be confined in the county jail for at least 10 days.

(h) Pursuant to Section 23246, the court shall require any person convicted of a violation of this section to install a certified ignition interlock device on any vehicle the person owns or operates.

(i) Nothing in this section prohibits a person who is participating in, or has completed, an alcohol or drug rehabilitation program from driving a motor vehicle that is owned or utilized by the person's employer, during the course of employment on private property that is owned or utilized by the employer, except an offstreet parking facility as defined in subdivision (c) of Section 12500.

SEC. 11. Section 23160 of the Vehicle Code is amended to read:

23160. (a) If any person is convicted of a first violation of Section 23152, that person shall be punished by imprisonment in the county jail for not less than 96 hours, at least 48 hours of which shall be continuous, nor more than six months and by a fine of not less than three hundred ninety dollars ($390), nor more than one thousand dollars ($1,000).

(b) The court shall order that any person punished under subdivision (a), who is to be punished by imprisonment in the county jail, be imprisoned on days other than days of regular employment of the person, as determined by the court. If the court determines that 48 hours of continuous imprisonment would interfere with the person' s work schedule, the court shall allow the person to serve the imprisonment whenever the person is normally scheduled for time off from work. The court may make this determination based upon a representation from the defendant's attorney or upon an affidavit or testimony from the defendant.

(c) Except as provided in paragraph (2) of subdivision (a) of Section 23161, the person's privilege to operate a motor vehicle shall be suspended

by the Department of Motor Vehicles pursuant to paragraph (1) of subdivision (a) of Section 13352.

SEC. 12. Section 23161 of the Vehicle Code is amended to read:

23161. (a) Except as provided in subdivision (d), if the court grants probation to any person punished under Section 23160, in addition to the provisions of Section 23206 and any other terms and conditions imposed by the court, the court shall impose as a condition of probation that the person be subject to one of the following:

(1) Be confined in the county jail for at least 48 hours but not more than six months, and pay a fine of at least three hundred ninety dollars ($390), but not more than one thousand dollars ($1,000). Except as provided in paragraph (2), the person's privilege to operate a motor vehicle shall be suspended by the Department of Motor Vehicles pursuant to paragraph (1) of subdivision (a) of Section 13352.

(2) Pay a fine of at least three hundred ninety dollars ($390) but not more than one thousand dollars ($1,000), and, if the person gives proof of financial responsibility, as defined in Section 16430, to the Department of Motor Vehicles, have the privilege to operate a motor vehicle restricted for 90 days to necessary travel to and from that person's place of employment and to and from participation in a program described in subdivision (b). If driving a motor vehicle is necessary to perform the duties of the person's employment, the restriction also shall allow the person to drive to locations within the person's scope of employment. Whenever the driving privilege is restricted pursuant to this paragraph, the person shall maintain proof of financial responsibility for three years.

(3) If the court elects to order a 90-day restriction as provided for in paragraph (2), the court shall order that the restriction commence on the date of the reinstatement by the Department of Motor Vehicles of the person's privilege to operate a motor vehicle. If a suspension was imposed pursuant to Section 13353.2, the person shall be advised by the court of all of the following matters:

(A) The person's restricted driver's license does not allow the person to operate a motor vehicle unless and until the suspension under Section 13353.2 has either been served to completion or set aside, and his or her license has been reinstated.

(B) The restriction of the driver's license ordered by the court shall commence upon the reinstatement of the privilege to operate a motor vehicle.

(b) Except as provided in subdivision (c), in any county where the board of supervisors has approved, and the State Department of Alcohol and Drug Programs has licensed, a program or programs described in Section 11837.3 of the Health and Safety Code, the court shall also impose as a condition of probation that the driver shall enroll and participate in, and successfully complete, an alcohol and other drug education and counseling program, licensed pursuant to Chapter 9 (commencing with Section 11836) of Part 2 of Division 10.5 of the Health and Safety Code, in the driver's county of residence or employment, as designated by the court.

(c) (1) The court shall revoke the person's probation pursuant to Section 23207, except for good cause shown, for the failure to enroll in, participate in, or complete a program specified in subdivision (b).

(2) The court, in establishing reporting requirements, shall consult with the county alcohol program administrator. The county alcohol program administrator shall coordinate the reporting requirements with the department and with the State Department of Alcohol and Drug Programs. That reporting shall ensure that all persons who, after being ordered to attend and complete a program, may be identified for either (A) failure to enroll in, or failure to successfully complete, the program, or (B) successful completion of the program as ordered.

(d) Notwithstanding subdivision (a), if the offense occurred in a vehicle requiring a driver with a class A or class B driver's license or with an endorsement specified in Section 15278, the court shall upon conviction order the department to suspend the driver's privilege pursuant to paragraph (1) of subdivision (a) of Section 13352.

SEC. 13. Section 23166 of the Vehicle Code is amended to read:

23166. If the court grants probation to any person punished under Section 23165, in addition to the provisions of Section 23206 and any other terms and conditions imposed by the court, the court shall impose as conditions of probation that the person be subject to either subdivision (a) or (b), as follows:

(a) Be confined in the county jail for at least 10 days but not more than one year, and pay a fine of at least three hundred ninety dollars ($390) but not more than one thousand dollars ($1,000). The person's privilege to operate a motor vehicle shall be suspended by the Department of Motor Vehicles pursuant to paragraph (3) of subdivision (a) of Section 13352.

(b) All of the following:

(1) Be confined in the county jail for at least 48 hours but not more than one year.

(2) Pay a fine of at least three hundred ninety dollars ($390) but not more than one thousand dollars ($1,000).

(3) Have the privilege to operate a motor vehicle be restricted by the Department of Motor Vehicles pursuant to Section 13352.5, unless the offense occurred in a vehicle requiring a driver with a class A or class B driver's license or with an endorsement prescribed in Section 15278.

(4) Either of the following:

(A) Enroll and participate, for at least 18 months subsequent to the date of the underlying violation and in a manner satisfactory to the court, in a program licensed pursuant to Chapter 9 (commencing with Section 11836) of Part 2 of Division 10.5 of the Health and Safety Code, as designated by the court. The person shall complete the entire program subsequent to, and shall not be given any credit for any program activities completed prior to, the date of the current violation. The program shall provide for persons who cannot afford the program fee pursuant to paragraph (2) of subdivision (b) of Section 11837.4 of the Health and Safety Code in order to enable those persons to participate.

(B) Enroll and participate, for at least 30 months subsequent to the date of the underlying violation and in a manner satisfactory to the court, in a program licensed pursuant to Chapter 9 (commencing with Section 11836) of Part 2 of Division 10.5 of the Health and Safety Code. The person shall complete the entire program subsequent to, and shall not be given any credit for any program activities completed prior to, the date of the current violation.

SEC. 13.5. Section 23166 of the Vehicle Code is amended to read:

23166. If the court grants probation to any person punished under Section 23165, in addition to the provisions of Section 23206 and any other terms and conditions imposed by the court, the court shall impose as conditions of probation that the person be subject to either subdivision (a) or (b), as follows:

(a) Be confined in the county jail for at least 10 days but not more than one year, and pay a fine of at least three hundred ninety dollars ($390), but not more than one thousand dollars ($1,000). The person's privilege to operate a motor vehicle shall be suspended by the Department of Motor Vehicles pursuant to paragraph (3) of subdivision (a) of Section 13352.

(b) All of the following:

(1) Be confined in the county jail for at least 96 hours, but not more than one year. A sentence of 96 hours of confinement shall be served in two

increments consisting of a continuous 48 hours each. The two 48-hour increments may be served nonconsecutively.

(2) Pay a fine of at least three hundred ninety dollars ($390), but not more than one thousand dollars ($1,000).

(3) Have the privilege to operate a motor vehicle be restricted by the Department of Motor Vehicles pursuant to Section 13352.5, unless the offense occurred in a vehicle requiring a driver with a class A or class B driver's license or with an endorsement prescribed in Section 15278.

(4) Either of the following:

(A) Enroll and participate, for at least 18 months subsequent to the date of the underlying violation and in a manner satisfactory to the court, in a program licensed pursuant to Chapter 9 (commencing with Section 11836) of Part 2 of Division 10.5 of the Health and Safety Code, as designated by the court. The person shall complete the entire program subsequent to, and shall not be given any credit for any program activities completed prior to, the date of the current violation. The program shall provide for persons who cannot afford the program fee pursuant to paragraph (2) of subdivision (b) of Section 11837.4 of the Health and Safety Code in order to enable those persons to participate.

(B) Enroll and participate, for at least 30 months subsequent to the date of the underlying violation and in a manner satisfactory to the court, in a program licensed pursuant to Chapter 9 (commencing with Section 11836) of Part 2 of Division 10.5 of the Health and Safety Code. The person shall complete the entire program subsequent to, and shall not be given any credit for any program activities completed prior to, the date of the current violation.

SEC. 14. Section 23167 of the Vehicle Code is repealed.

SEC. 15. Section 23186 of the Vehicle Code is amended to read:

23186. If the court grants probation to any person punished under Section 23185, in addition to the provisions of Section 23206 and any other terms and conditions imposed by the court, the court shall impose as conditions of probation that the person be subject to the provisions of either subdivision (a) or (b), as follows:

(a) Be confined in the county jail for at least 120 days and pay a fine of at least three hundred ninety dollars ($390), but not more than five thousand dollars ($5,000). The person's privilege to operate a motor vehicle shall be revoked by the Department of Motor Vehicles pursuant to paragraph (4) of subdivision (a) of Section 13352.

(b) All of the following:

(1) Be confined in the county jail for at least 30 days, but not more than one year.

(2) Pay a fine of at least three hundred ninety dollars ($390), but not more than one thousand dollars ($1,000).

(3) Have the privilege to operate a motor vehicle revoked by the Department of Motor Vehicles under paragraph (4) of subdivision (a) of Section 13352.

(4) Either of the following:

(A) Enroll and participate, for at least 18 months subsequent to the date of the underlying violation and in a manner satisfactory to the court, in a program licensed pursuant to Chapter 9 (commencing with Section 11836) of Part 2 of Division 10.5 of the Health and Safety Code, if available in the county of the person's residence or employment, as designated by the court. The person shall complete the entire program subsequent to, and shall not be given any credit for program activities completed prior to, the date of the current violation. The program shall provide for persons who cannot afford the program fee pursuant to paragraph (2) of subdivision (b) of Section

11837.4 of the Health and Safety Code in order to enable those persons to participate.

(B) Enroll and participate, for at least 30 months subsequent to the date of the underlying violation and in a manner satisfactory to the court, in a program licensed pursuant to Chapter 9 (commencing with Section 11836) of Part 2 of Division 10.5 of the Health and Safety Code, if available in the county of the person's residence or employment. The person shall complete the entire program subsequent to, and shall not be given any credit for program activities completed prior to, the date of the current violation.

SEC. 16. Section 23187 of the Vehicle Code is repealed.

SEC. 17. Section 23203 of the Vehicle Code is amended to read:

23203. If a person is placed on probation pursuant to this article, the court shall promptly notify the Department of Motor Vehicles of the probation and probationary term and conditions in a manner prescribed by the department. The department shall place the fact of probation and the probationary term and conditions on the person's records in the department.

SEC. 18. Section 23204 of the Vehicle Code is amended to read:

23204. If a person's privilege to operate a motor vehicle is required or ordered to be suspended or revoked by the Department of Motor Vehicles pursuant to other provisions of this code upon the conviction of an offense of this article, that person shall surrender each and every operator's license of that person to the court upon conviction. The court shall transmit the license or licenses required to be suspended or revoked to the Department of Motor Vehicles pursuant to Section 13550, and the court shall notify the department.

This section does not apply to an administrative proceeding by the Department of Motor Vehicles to suspend or revoke the driving privilege of any person pursuant to other provisions of law.

SEC. 19. Section 23235 of the Vehicle Code is amended to read:

23235. (a) The Department of Motor Vehicles shall certify or cause to be certified ignition interlock devices required by this article and publish a list of approved devices.

(b) The Department of Motor Vehicles shall utilize information from an independent laboratory to certify ignition interlock devices on or off the premises of the manufacturer or manufacturer's agent, in accordance with the guidelines. The cost of certification shall be borne by the manufacturers of interlock ignition devices. If the certification of a device is suspended or revoked, the manufacturer of the device shall be responsible for, and shall bear the cost of, the removal of the device and the replacement of a certified device of the manufacturer or another manufacturer.

(c) No model of ignition interlock device shall be certified unless it meets the accuracy requirements and specifications provided in the guidelines adopted by the National Highway Traffic Safety Administration.

(d) All manufacturers of ignition interlock devices that meet the requirements of subdivision (c) and are certified in a manner approved by the Department of Motor Vehicles, who intend to market the devices in this state, first shall apply to the Department of Motor Vehicles on forms provided by that department. The application shall be accompanied by a fee in an amount not to exceed the amount necessary to cover the costs incurred by the Department of Motor Vehicles in carrying out this section.

(e) The Department of Motor Vehicles shall ensure that standard forms and procedures are developed for documenting decisions and compliance and communicating results to relevant agencies. These forms shall include all of the following:

(1) An "Option to Install," to be sent by the Department of Motor Vehicles to repeat offenders along with the mandatory order of suspension or revocation. This shall include the alternatives available for early license

reinstatement with the installation of an ignition interlock device and shall be accompanied by a toll-free telephone number for each manufacturer of a certified ignition interlock device. Information regarding approved installation locations shall be provided to drivers by manufacturers with ignition interlock devices that have been certified in accordance with this section.

(2) A "Verification of Installation" form to be returned to the Department of Motor Vehicles by the reinstating offender upon application for reinstatement. Copies shall be provided for the manufacturer or the manufacturer's agent.

(3) A "Notice of Noncompliance" form and procedures to ensure continued use of the interlock device during the restriction period and to ensure compliance with maintenance requirements. The maintenance period shall be standardized at 60 days to maximize monitoring checks for equipment tampering.

(f) Every manufacturer and manufacturer's agent certified by the Department of Motor Vehicles to provide ignition interlock devices shall adopt fee schedules that provide for the payment of the costs of the device by applicants in amounts commensurate with their ability to pay.

SEC. 20. The heading of Article 4.5 (commencing with Section 23246) of Chapter 12 of Division 11 of the Vehicle Code is amended to read:

Article 4.5. Installation of Ignition Interlock Devices

SEC. 21. Section 23246 of the Vehicle Code is amended to read:

23246. (a) In addition to any other provisions of law, the court may require that the Department of Motor Vehicles prohibit any person who is convicted of a first offense violation of Section 23152 or Section 23153 from operating a motor vehicle unless that vehicle is equipped with a functioning, certified ignition interlock device as provided in this article. The court shall give heightened consideration to applying this sanction to first offense violators with 0.20 percent or more, by weight, of alcohol in his or her blood at arrest, or with two or more prior moving traffic violations, or of persons who refused the chemical tests at arrest. If the court orders the ignition interlock restriction, the term shall be determined by the court for a period not to exceed three years.

(b) The court shall require any person who is convicted of a violation of Section 14601.2 to install an ignition interlock device on any vehicle that the person owns or operates for a period not to exceed three years or until the person's driving privilege is reinstated by the Department of Motor Vehicles.

(c) The court shall include on the abstract of conviction or violation submitted to the Department of Motor Vehicles under Section 1803 or 1816, the requirement for the use of a certified ignition interlock device. The records of the department shall reflect mandatory use of the device for the term ordered by the court.

(d) The court shall advise the person that installation of an ignition interlock device on a vehicle does not allow the person to drive without a valid driver's license.

(e) The court shall monitor the installation and maintenance of any ignition interlock device restriction ordered pursuant to subdivision (a) or (b). If any person fails to comply with the court order, the court shall give notice of the fact to the department pursuant to Section 40509.1.

(f) (1) Pursuant to Section 13352, if any person is convicted of a violation of Section 23152 or 23153, and the offense occurred within seven years of one or more separate violations of Section 23152 or 23153 that resulted in a conviction, the person may apply to the Department of Motor

Vehicles for a restricted driver's license pursuant to Section 13352 that prohibits the person from operating a motor vehicle unless that vehicle is equipped with a functioning ignition interlock device, certified pursuant to Section 23235. The restriction shall remain in effect for at least the remaining period of the original suspension or revocation and until all reinstatement requirements in Section 13352 are met.

(2) Pursuant to subdivision (g), the Department of Motor Vehicles shall immediately suspend the privilege to operate a motor vehicle of any person who attempts to remove, bypass, or tamper with the device, or who fails three or more times to comply with any requirement for the maintenance or calibration of the ignition interlock device ordered pursuant to Section 13352. The privilege shall remain suspended for the remaining period of the originating suspension or revocation and until all reinstatement requirements in Section 13352 are met.

(g) Any person whose driving privilege is restricted by the court pursuant to this section or by the Department of Motor Vehicles pursuant to Section 13352 shall arrange for each vehicle with an ignition interlock device to be serviced by the installer at least once every 60 days in order for the installer to recalibrate the device and monitor the operation of the device. The installer shall notify the Department of Motor Vehicles or the court, as appropriate, if the device indicates that the person has attempted to remove, bypass, or tamper with the device, or if the person fails three or more times to comply with any requirement for the maintenance or calibration of the ignition interlock device. There is no obligation on the part of the installer to notify the department or the court if the person has complied with all of the requirements of this article.

(h) Nothing in this section permits a person to drive without a valid driver's license.

(i) The Department of Motor Vehicles shall include information along with the order of suspension or revocation for repeat offenders informing them that after a specified period of suspension or revocation has been completed, the person may either install an ignition interlock device on any vehicle that the person owns or operates or remain with a suspended or revoked driver's license.

(j) Pursuant to subdivision (a), out-of-state residents who otherwise would qualify for an ignition interlock restricted license in California shall be prohibited from operating a motor vehicle in California unless that vehicle is equipped with a functioning ignition interlock device. No ignition interlock device is required to be installed on any vehicle owned by the defendant that is not driven in California.

(k) If a person has a medical problem that does not permit the person to breathe with sufficient strength to activate the device, then that person shall only have the suspension option.

(l) This article does not restrict a court from requiring installation of an ignition interlock device for any persons to whom subdivision (a) does not apply.

(m) For purposes of this section, "vehicle" does not include a motorcycle until the state certifies an ignition interlock device that can be installed on a motorcycle. However, a court shall order a person subject to this section not to operate a motorcycle for the duration of the ignition interlock restriction period.

(n) For purposes of this section, "owned" means solely owned or owned in conjunction with another person or legal entity. For purposes of this section, "operates" includes operating vehicles that are not owned by the person subject to this section.

SEC. 22. Section 23247 of the Vehicle Code is amended to read:

23247. (a) It is unlawful for a person to knowingly rent, lease, or lend a motor vehicle to another person known to have had his or her driving privilege restricted as provided in Section 13352 or 23246, unless the vehicle is equipped with a functioning, certified ignition interlock device. Any person, whose driving privilege is restricted pursuant to Section 13352 or 23246 shall notify any other person who rents, leases, or loans a motor vehicle to him or her of the driving restriction imposed under that section.

(b) It is unlawful for any person whose driving privilege is restricted pursuant to Section 13352 or 23246 to request or solicit any other person to blow into an ignition interlock device or to start a motor vehicle equipped with the device for the purpose of providing the person so restricted with an operable motor vehicle.

(c) It is unlawful to blow into an ignition interlock device or to start a motor vehicle equipped with the device for the purpose of providing an operable motor vehicle to a person whose driving privilege is restricted pursuant to Section 13352 or 23246.

(d) It is unlawful to tamper with, or circumvent the operation of, an ignition interlock device.

(e) It is unlawful for any person whose driving privilege is restricted pursuant to Section 13352 or 23246 to operate any vehicle not equipped with a functioning ignition interlock device.

(f) Any person convicted of a violation of this section shall be punished by imprisonment in the county jail for not more than six months or by a fine of not more than five thousand dollars ($5,000), or by both that fine and imprisonment.

(g) If any person who is restricted pursuant to Section 13352 or 23246 violates subdivision (e), the court shall notify the Department of Motor Vehicles, which shall revoke the person's driving privilege for one year from the date the court finds that the person violated this section.

(h) Notwithstanding any other provision of law, if a vehicle in which an ignition interlock device has been installed is impounded, the manufacturer or installer of the device shall have the right to remove the device from the vehicle during normal business hours. No charge shall be imposed for the removal of the device nor shall the manufacturer or installer be liable for any removal, towing, impoundment, storage, release, or administrative costs or penalties associated with the impoundment. Upon request, the person seeking to remove the device shall present documentation to justify removal of the device from the vehicle. Any damage to the vehicle resulting from the removal of the device is the responsibility of the person removing it.

SEC. 23. Section 23249 of the Vehicle Code is repealed.

SEC. 24. Section 23249 is added to the Vehicle Code, to read:

23249. The Department of Motor Vehicles shall undertake a study and report the findings of that study to the Legislature on or before January 1, 2002, on all of the following matters:

(a) The effectiveness of this article in providing a reduction in the recidivism rate of persons convicted of violations of Section 23152 or 23153, and the reduction in vehicle accidents attributed to the implementation of this article, as revised by the act that added this section.

(b) The overall effectiveness of ignition interlock devices in providing a reduction in the recidivism rate of persons convicted of violations of Section 23152 or 23153, and the reduction in vehicle accidents attributable to the use of those devices.

SEC. 25. Section 23249.1 is added to the Vehicle Code, to read:

23249.1. This article shall remain in effect only until January 1, 2005, and as of that date is repealed, unless a later enacted statute, which is enacted before January 1, 2005, deletes or extends that date.

SEC. 26. Section 2.5 of this bill incorporates amendments to Section 11837 of the Health and Safety Code proposed by both this bill and AB 1916. It shall only become operative if (1) both bills are enacted and become effective on or before January 1, 1999, (2) each bill amends Section 11837 of the Health and Safety Code, and (3) this bill is enacted after AB 1916, in which case Section 2 of this bill shall not become operative.

SEC. 26.5. Section 13.5 of this bill incorporates amendments to Section 23166 of the Vehicle Code proposed by both this bill and AB 2674. It shall only become operative if (1) both bills are enacted and become effective on or before January 1, 1999, (2) each bill amends Section 23166 of the Vehicle Code, and (3) this bill is enacted after AB 2674, in which case Section 13 of this bill shall not become operative.

SEC. 27. Notwithstanding Section 17610 of the Government Code, if the Commission on State Mandates determines that this act contains costs mandated by the state, reimbursement to local agencies and school districts for those costs shall be made pursuant to Part 7 (commencing with Section 17500) of Division 4 of Title 2 of the Government Code. If the statewide cost of the claim for reimbursement does not exceed one million dollars ($1,000,000), reimbursement shall be made from the State Mandates Claims Fund.

Notwithstanding Section 17580 of the Government Code, unless otherwise specified, the provisions of this act shall become operative on the same date that the act takes effect pursuant to the California Constitution.

SEC. 28. This act shall become operative on July 1, 1999.