Minnesota Ignition Interlock Program Evaluation

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Minnesota Ignition Interlock Program Evaluation- Final Report

Submitted to:

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1 Report Summary

Although there have been trending reductions in impaired driving fatalities over the past few years, Driving While Impaired (DWI) arrests and impaired driving fatalities are still a problem in the US. The National Highway Traffic Safety Administration (NHTSA) reported 9,967 alcohol-impaired driving fatalities in 2014, which accounted for 31% of total fatal traffic crashes (NHTSA 2015). In 2015 NHTSA reported that 35,092 people died in motor vehicle traffic crashes, an increase of 7.2 percent over the 32,744 fatalities reported in 2014. This is the largest percentage increase in nearly 50 years.

Impaired driving is a serious problem in Minnesota. In 2014, 111 people were killed in alcohol-related crashes. This accounted for 31% of all traffic fatalities in Minnesota. In 2015, the number rose. One hundred thirty-seven people were killed, more than 2,203 were injured, and costs amounted to more than $285 million. In an attempt to deter motorists from driving while impaired and thereby enhancing road safety, the use of ignition interlocks became law in Minnesota on July 1, 2011 with Minnesota Statutes 171.306 - Ignition Interlock Device Program.

Research has shown that interlock programs reduce the incidence of impaired driving when an interlock device is installed in the vehicle. A study of New Mexico's interlock program found that offenders who participated in the program had a 61% lower recidivism rate while the device was in use in their vehicle, and a 39% lower recidivism rate following the removal of the interlock compared to offenders who never had the device installed (Marques et al. 2010).

The goal of this project is to evaluate the effectiveness of the interlock program in Minnesota and provide a comprehensive report to the Minnesota Office of Traffic Safety (OTS) based on the results of the evaluation.

Background

The state's first ignition interlock pilot program was established in Anoka County in 2002. In 2007, the Minnesota Legislature authorized the Department of Public Safety (DPS) to conduct a two-year pilot in one rural and one metropolitan county. In 2009, the Minnesota Legislature expanded the two-county pilot statewide. This ran concurrent with a Driver's License Administrative Sanctions (DLAS) work group formed to thoroughly review administrative sanctions imposed on a person for driving impaired.

The current statewide program became effective on July 1, 2011 and mandates that:

- First and second offenders may voluntarily participate in the interlock program (e.g., install the interlock instead of serving the hard revocation period).
- DWI offenders with a 0.16 and above alcohol concentration (AC) will be required to have an interlock device installed on any vehicle they drive or lose their driving privileges for one year for first offense and two years for second offense.
- Repeat offenders with three or more DWIs in a 10-year period will be required to use interlocks.
- Interlock users will regain full or limited driving privileges immediately after the offense, ensuring they are driving with a valid license and not a threat on the roadway.
- Interlocks will be used to monitor chronic DWI offenders (three or more DWIs in 10-year period) to verify chemical use.

A provision was also recently added that requires anyone cited for a criminal vehicle operation (CVO) “bodily harm” to “great bodily harm” to install an interlock device on their vehicle.

Minnesota’s interlock program is an administrative type jointly run by OTS and Driver and Vehicle Services (DVS) Divisions of DPS. DVS manages enrollment, oversees device use and implements sanctions for participants who violate program requirements. OTS provides financial support, communication, education and outreach. DVS also manages the ignition interlock website, which facilitates enrollment, education and partnerships.

An individual whose driver’s license has been revoked under Minnesota Chapter 169A for an impaired driving incident or canceled under Minnesota Statute section 171.04, subdivision 1, clause (10) may apply for the ignition interlock device program if they meet the requirements. The length of time a participant must be on the ignition interlock program depends on the number of prior offenses on the driving record and the length of time the participant has lost their driving privilege. This time period may be extended for any additional ignition interlock violations.

Minnesota’s interlock program follows several evidence-based practices to increase participation and effectiveness, including:

- All-offender eligibility
- Removal of hard suspension periods
- Performance-based exit
- Treatment, alcohol education or both

Minnesota does not have a dedicated indigency program, but participants may qualify for reduced installation, removal and monitoring fees. In addition, Minnesota generally follows the standardized best practices recommendations identified by the Association of Ignition Interlock Program Administrators (AIIPA) including device certification best practices.

Evaluation Methodology

The study asked 26 research questions. These questions were refined during the course of the evaluation in response to the availability of participant data.

Participation Evaluation – This evaluates participation rates, participant characteristics and number of participant DWI incidents. The analysis used demographic data of program participants and non-participating DWI offenders.

Outcome Evaluation – This evaluation looks at the performance of the participants during and after completion of the interlock program. Performance indicators included program completion rate, recidivism (during and after completion) and device failed attempts, among others.

Data Sources

Driver and Motor Vehicle Records - The target population for this evaluation included all drivers with DWI convictions since the start of the two-county pilot program in July 1, 2007. Data included basic demographic information, vehicle ownership, driving convictions and related interlock-program events. During this process, the entire driving and vehicle history of 20,346 unique program participants plus roughly 200,000 DWI-convicted non-participant drivers were compiled, with data going back to the date of driver's license issue.

Ignition Interlock Device Data - Device data was requested from all current vendors for all participants they have served from the beginning of the pilot program to March 31, 2015. Data included driver information and records of device events ranging from installation, breath tests (both success and fails), device initiated messages, circumvention attempts, service and removal.

Participant Survey Questionnaires – Program participants themselves completed surveys administered by the interlock vendors at the installation/service centers.

Data Analysis

The data analysis was designed to answer each of the 26 research questions as thoroughly as possible within the limits of the data gathered

and the time available. All analyses were completed using the STATA® software package and Microsoft Excel (as needed). The analyses include:

- Frequency, range, mean, and standard deviation – Used for basic tabulation of frequency counts and percentages as well as cross-tabulations, where as appropriate.
- Correlation and other measures of association - Pearson's R (the correlation coefficient) and the chi-squared statistic are used as indicators of the strength of association among two or more variables collected.
- Propensity score matching – This method was designed to mimic some of the characteristics of the randomized assignment of treatment or intervention where a controlled process is not possible. It was used to select the comparison group.
- Time-to-event analysis - Also known as survival analysis, was designed to analyze recidivism and program success. Kaplan-Meier curves and Cox-proportional hazard models were used to describe the data and predict the outcomes as well as the elements that affect those outcomes.

Findings

Participant Demographics

There was a total of 23,115 program participants out of 130,455 eligible DWI drivers since July 1, 2011. Participant demographics are tabulated below.

Table 1-1: Ignition Interlock Program Participant Profiles[1]

Group/ Subgroup	Participants[2]	All Eligible DWI Drivers[3]	Non-Participating Eligible DWI Drivers[3]
Total Enrollees	23,115	130,455	107,340
Age			
Under 21	8	1,720	1,712
21–24	543	13,011	12,468
25–34	7,457	50,212	42,755
35–44	5,809	28,105	22,296
45–54	5,195	21,090	15,895
55–64	3,214	12,322	9,108
65 and older	889	3,995	3,106
SEX			
Male	17,237	92,056	74,819
Female	5,842	33,631	27,789
Unknown	36	4,768	4,732
County			
Rural	10,149	60,860	50,711
Urban[4]	12,963	69,288	56,325
Unknown	3	307	304

[1]Statewide program only (Since July 1, 2011)
[2]The number of eligible drivers or DWI events. Those with multiple enrollments or DWI convictions are counted more than once.
[3]All drivers with DWI offense since the statewide program came into effect.
[4] The 7-county Twin Cities Metropolitan area.

Participation Rates

- The statewide program participation rates based on available full calendar year data from 2012–15 for the various license types are summarized below.
  - Overall Combined - 19.8%
  - Revoked (voluntary enrollment) - 14.5%
  - Canceled-IPS (required enrollment) - 40.1%
- Voluntary enrollees outnumber those required to join the interlock program, due to the large number of first-time and second-time offenders. During 2012–15, 12,681 drivers voluntarily enrolled, out of 87,325 eligible offenders. Among 22,838 repeat offenders who

were required to join the interlock program to regain limited driving privileges, 9,162 enrolled.

- Of the overall 23,115 statewide program enrollment, 13,412 participants voluntarily enrolled and were issued interlock restricted licenses. Another 9,703 participants were required to enroll with "canceled-inimical to public safety (IPS) licenses" and were issued limited licenses.
- 62% of program participants (17,309) had a high AC or refused to take the alcohol or drug test. High AC results and test refusals result in enhanced penalties, including a longer requirement for participation even on first offense; however, high AC by itself does not lead to a mandatory interlock requirement.
- One-third of the enrollees are first offenders (based on a 10-year look-back period—offenses older than 10 years remain on the record, but there is no additional penalty for just one prior offense on record).
- Approximately 60% (78,716) of the total number of eligible drivers for all years are first offenders (for the purposes of the program-within a 10-year look back period).
- The participation rates were highest within the 55–64 age group at 26.1%, followed by the 45–54 age group at 24.6%. The lowest participation rates were for the under-21 age group (0.5%) and 21–24 age group (4.2%). Males had a slightly higher participation rate than females and Urban counties more than rural counties.

Completion Rates

Based on 11,641 completions versus 24,173 enrollments, the completion rate was 48.2%. This does not tell the whole story because some of the individuals currently in the program will eventually complete it given sufficient time. Long-term probability based on a Kaplan-Meier estimation shows that 60% of participants can be expected to successfully complete the program in the long term.

Over 78% completed the program within the prescribed time frame. The average time for successful completion of the program is 412 days. For those who were terminated, average participation length was 301 days. Roughly one person in 100 is terminated from the program.

Participants who were cancelled-IPS have a much lower long-term completion rate, compared to revoked drivers. Based on our model, over 100 months, revoked drivers would reach 83.7% completion and cancelled-IPS drivers would reach only 27.7%.

Among those who completed the program, 7.17% elected to keep the device on their vehicles for at least one month after completion. Of these, 3.72% kept it at least a year.

Factors that affect program completions were also analyzed and the key findings are listed below:

- High alcohol concentration. People who had a AC level of 0.16 or higher at the time of arrest are 40.4% less likely to complete the program, compared to people who blew a AC level of less than 0.16.
- People who refused the test are 50.8% less likely to complete the program.
- The more severe the DWI violation at the time of arrest, the less likely the driver will complete the program.
- Number of violations. People who had the second DWI in 10 years, third on record, third in 10 years, fourth on record, fourth in 10 years and fifth or more on record are 56.9%, 58.9, 84.8%, 93.7%, 95.4%, and 99.2% less likely to complete the program, compared to the first time offender.
- Age. Older drivers are more likely to complete the program.
- Male drivers are about 3.4% more likely to complete the program than females.
- Drivers who live in urban counties are 10.7% less likely to complete the program.
- Low numbers of failed start-up tests, failed and refused rolling retests are all good predictors of success.
- People whose enrollments were extended or started over are also less likely to complete the program.

Recidivism Rates

The observed recidivism rate for interlock program participants during the study period was 4.52%. This is based on the total of 526 recidivating participants divided by the total number of unique enrollees who completed the program (11,641) for the entire 2007–16 period.

The groups with the highest recidivism rates are the same as those with the lowest participation rates:

- Drivers aged 21–24
- Drivers aged 25–34
- Females

- Drivers in urban counties

Program Participant versus Non-Participant Recidivism Rates

In this study, 11,641 drivers completed the program. The chances of recidivism are higher for non-participants. The effect increases in size over months. Overall, 4.5% of interlock program participants recidivated during the study period. The longer-term survival analysis showed an 8% recidivism rate for participants over the course of 54 months post-program. In a comparable time period, non-participants recidivate at more than double that rate (20%).

A Cox-proportional hazard model was conducted using data from the drivers who completed the program and another 11,641 drivers who did not enroll in the program. This is a summary of the impact of assessed variables on recidivism risk:

- Those who completed the interlock program are 39% less likely to recidivate (get arrested for DWI again) than those who did not enroll in the program.
- Variables including sex, urban/rural, second-time offender, third-time offender were also tested but were not statistically significant.
- AC≥0.16 results in an estimated 18% increase in risk of recidivism.
- Alcohol test refusal is associated with a 29% elevated risk of recidivating.
- A failed drug test results in a 127% elevated risk.
- First-time offenders are 11% less likely to recidivate than those with more than one DWI offense in their history. As drivers age, their likelihood of recidivating drops slightly.

Among those who completed the interlock program:

- Those with AC ≥0.16 at time of arrest are 58.7% more likely to be re-arrested after completion than other program participants.
- Those who refused AC test at time of arrest are 124.5% (about 2.2 times) more likely to be arrested again after completion.
- Those who got arrested for drugged driving are 161.6% (about 2.6 times) more likely to be arrested again for a DWI violation after completion.
- First-time offenders are about 13.1% less likely to get arrested again after completion.

- The older the driver, the lower the risk of recidivism. A year increase in age is associated with about 0.9% decrease in the relative risk.
- Male drivers are 20.1% less likely than female drivers to be re-arrested after completion.
- Interlock device start-up test and rolling retest failures are good predictors of the likelihood of recidivism. Each additional failure for startup test or rolling retest is associated with about 0.9% or 2.8% increase, respectively, in the likelihood of recidivism.

While the model predicts a small increment in risk per failed test, the cumulative effect over multiple test failures grows to be quite large. There were drivers in the interlock program with more than 100 start-up failures and this analysis shows that such individuals are at a much higher risk of recidivating than other program participants. The relationship between rolling retest failures and increased likelihood of recidivism is also quite strong. Those with 35 rolling re-test failures are twice as likely to recidivate as those with no re-test failures.

The following behaviors were observed while participants were in the program:

- The vast majority of participants who recidivated did so only once; however, over 7% committed two or more DWI offenses while active in the program.
- Based on these data, the interlock program has prevented at least 12,302 instances of drunk drivers (i.e., 0.08 AC and above) from starting their vehicles.
- On average, each enrollee experienced 5.98 failed start-up tests and 1.38 rolling retest failures.
- On average participants stay in the program for 412 days (almost 14 months).
- The pattern of participant failed tests indicates that participants quickly learn how to use the device.
- Most participants experience very few failures throughout the entire time on the program. A few of them have 100 or more. Nearly 30% of start-up failures were committed by drivers with 10 or more. Those with 10 or more rolling retest failures accounted for 10% of all of them.
- On average, each enrollee completed 1,028 trips using the interlock device, an average of 2.5 trips per enrollee per day over the average of 412 days on the program.

- Overall, 13.3% of participants have been cancelled from the program. Of these, 72% were cancelled for violations of the interlock program provisions. DWI arrests caused 18% of participant cancellations.
- 12% of participants re-applied to the program at least once. The majority of them re-applied only once (77%) but 17% replied twice and 6% re-applied 3 or more times.

Public Safety Impact

As discussed above, the ignition interlock program has prevented at least 12,302 instances of drunk drivers (i.e., 0.08 AC and above) from starting their vehicles.

Program participants experienced fewer arrests for DWI and moving violations while in the program compared to the comparison group. The difference is between 30% (for moving violations) and 94% (for DWI violations). Interlock program participation reduces the long-term risk of recidivism by 39% overall. Those for whom this was a first DWI violation see a further 12% reduction in risk of recidivating.

The annual Minnesota Motor Vehicle Crash Facts Report shows that while total crashes and deaths have stayed at the same level from 2010 to 2015, there is a significant reduction in DWI-related deaths since the program was started, indicating a positive contribution to public safety. Whether this improvement is entirely due to the impacts of the program is unclear. The contribution of the ignition interlock program is, however, undeniable.

The thousands of drivers who completed the program have much lower risk of recidivating compared to their non-participating peers, both while they are active in the program and for the long term after they complete it. That translates directly to fewer DWI events than would otherwise be expected. The link to crash reductions is always more difficult to make, as crashes are rare events with some random variability and dependence on other factors besides the driver's level of intoxication. We do know from research conducted by NHTSA (DOT HS 812 117, February 2015) that crash risk rises to almost 4 times the baseline crash risk at 0.08 AC. At 0.16 AC—the most common alcohol level reported upon arrest for the program participants—crash risk is almost 15 times the baseline. It is reasonable to expect, then, that reduced DWI risk for participants translates into reduced crash risk.

Conclusions

The Minnesota Ignition Interlock Device Program is working to improve safety by reducing recidivism among those who have driven while

intoxicated. This evaluation examined participation and outcomes for participants and compared this to eligible drivers who did not participate in the program. The summary results are presented in the following two subsections.

Participation Evaluation

The overall participation rate of 19.8% compares favorably to evaluations in other states. As in the prior studies, this overall participation rate is a mix of those who joined the program voluntarily and those for whom enrollment is mandatory. Among those for whom the program is mandatory, 40.1% participated. Participation rates varied with age, sex and type of county (urban/rural) in which the person resides. The highest participation rates were for men, those in urban counties, and drivers over 45 years of age. Lowest participation rates were for women, those in rural counties, and drivers below 34 years of age (especially those below 24 years of age). As age increases; however, the opportunity to meet the criteria for mandatory program participation also increases. As a result, the age effect on participation may be partly due to those older drivers having a long-enough driving history to have accrued qualifying violations to the point where participation is mandatory for a greater proportion.

Outcome Evaluation

Ignition interlock program participation reduces recidivism. Program participants are less than half as likely to commit a new DWI offense as a matched group of non-participants. The differences appear to grow over time. One possible explanation is that participants are self-selected and are the more motivated from among the pool of candidates who are eligible for the program. This self-selection explanation says that at least some of the difference is due to the people who join the program truly wanting to succeed and, as quickly as possible, drive legally without restrictions.

This study's findings on recidivism are consistent with other interlock evaluations. A study of New Mexico's interlock program found that participants had a 61% lower recidivism rate while the device was installed and a 39% lower recidivism rate after it was removed, compared to offenders who never had the device installed (Marques et al. 2010). Similar reductions were found by Vanlaar et al. (2014) when evaluating Nova Scotia's interlock program. A meta-analysis of interlock programs conducted in 2005 found an average reduction of recidivism of 64% (Willis et al. 2005). It is clear from the research that interlocks have a positive impact on road safety because of the reductions in recidivism and alcohol-related crashes when installed.

This is not the whole story, however. Within the participant group, there are predictive factors for success over the long term. Those who avoid failures during the program (failed start-up and rolling-retests) are more likely to avoid recidivating after the program. First time offenders and those found with lower AC values are also more likely to avoid recidivating after completing the program. The record of breath tests logged into an ignition interlock has been effective in predicting the future DWI recidivism risk. A study by Rauch in 2010 shows any alcohol-impaired driving violation, not just convictions, is a marker for future recidivism. In addition, a recent NHTSA study shows offenders with higher rates of failed AC tests have higher rates of post-ignition interlock recidivism (Mayer 2014).

Retention of participants within the interlock program also allow for increased participation rates. Interlock extensions in lieu of interlock removal have been identified as a viable alternative with regard to public safety and a “best practice” or recommendation for alcohol ignition interlock programs by several organizations.

Recommended Future Actions

Mandate all offenders to participate in the ignition interlock program - A recent NHTSA study by Casanova Powell et. al. (2015) provided “potentially promising practices” to increase interlock program participation. The strongest correlation found to increase participation was a strong requirement or incentive for first offenders to install an interlock device. Several studies show that laws requiring all offenders to install an interlock device increased program participation, and in some cases significant increases were noted. A California DMV study based on a pilot program involving four counties showed that ignition interlocks are 74% more effective than license suspension alone in preventing repeat offenses for first-time offenders during first 182 days of use. During days 183 to 365 after installation, interlocks are 45% more effective in preventing a repeat DWI incidence when compared to license suspension alone. The average time for those who successfully completed the program in Minnesota is 412 days, however the majority of those enrolled are repeat offenders. Legislative changes to mandate all offenders to participate in the interlock program could lead to significant increases in participation, as well as reductions in recidivism.

A study in Washington State showed that implementing an all-offender law was associated with reductions in recidivism, even with low interlock use rates, and reductions in crashes (McCartt et.al.2013). This study also recommended that jurisdictions should reconsider permitting reductions in DWI charges to other traffic offenses without interlock order

requirements. To further strengthen the rationale for implementing an all offender law, a study conducted in 2010 showed that recidivism rates among first offenders more closely resembles that of second offenders than of non-offenders (Rauch et.al 2010).

Regarding the impact of interlock programs on crashes, recent studies have found significant reductions in alcohol-related crashes when all offender laws are implemented. Kaufman and Wiebe (2016) investigated the impact of state ignition interlock laws on alcohol-involved crash deaths in the U.S. using FARS data for 1999 to 2013. The study found that requiring ignition interlocks for all drunk-driving convictions was associated with 15% fewer alcohol-involved crash deaths, compared to states with less-stringent requirements. Further evidence from the National Traffic Safety Board (NTSB) concludes that the installation of alcohol ignition interlocks on the vehicles of all DWI offenders would reduce crashes caused by alcohol-impaired drivers.

Enhance vendor monitoring of program participants and streamline vendor reporting - Effective monitoring of offenders has also been shown to increase program participation (Casanova Powell et. al. 2015). Although it can be difficult for administrative interlock programs to monitor offenders, vendor monitoring of offenders can help to retain participants. Streamlining vendor reporting to allow consistency between vendors and increase vendor data accuracy is critical in the overall monitoring of offenders. Minnesota's recent efforts to require wireless transmittal of device data will help meet this objective. Having near real time data will help identify participants with high failed test rates early and provide time for additional intervention as they are less likely to successfully complete the program.

Reduce program barriers - Removal of program barriers (such as delinquent child support payments and expired registration) linked to the license status and developing strategies to facilitate offender entry into the interlock program may also increase participation. The benefits of interlock program participation can be emphasized in relation to other alternatives, for example requiring in-home alcohol monitoring or vehicle impoundment that may be imposed on offenders who refuse to install an interlock. Linking the renewal of the registration of the vehicle to proof of interlock installation may increase notification of those offenders who do not install a device as required.

In addition, ejecting canceled IPS drivers who fail a breath test from the program, then requiring them to re-enroll may deter participants from continuing monitoring and treatment. They may decide not to re-enroll and thus become an increased public hazard as they may continue to drive without an interlock or other monitoring. Retaining these

participants in the program would not only increase participation, but also improve public safety.

Increase the role of treatment - Research has shown that programs which included treatment have higher success rates with participants and lower recidivism rates. Although Minnesota requires treatment for some offenders, expanding the treatment options to all interlock participants may not only improve retention and participation rates, but may also result in lowering recidivism rates. A recent study conducted by the Centers for Disease Control (CDC) (Voas, et.al 2016) showed results where the ignition interlock plus treatment group experienced 32% lower recidivism following the removal of the interlock during the 12–48 months when compared with the non-treatment group. It was estimated that this decline in recidivism would have prevented 41 re-arrests, 13 crashes and almost 9 injuries in crashes involving the 640 treated offenders over the period following interlock removal. This study also provided strong support for the inclusion of treatment for offenders in interlock programs not only as a result of a risk assessment, but also based on the number of times they are “locked out.” Those offenders who were required to attend treatment reported a one-third lower DWI recidivism following their time on the interlock compared to similar untreated offenders.

Greater stakeholder involvement - Ensuring that all agencies involved are educated about all aspects of the program is critical to an effective interlock program. Close cooperation and regular communication are necessary to keep the program operating effectively and efficiently. Even with administrative programs, involving the judiciary through an interlock judicial liaison or interagency task force can improve communications and logistics between agencies and increase stakeholder involvement. Although current stakeholder involvement is good, there is always room for improvement. It seems that the lines of communication and communication protocols do exist, however time restraints, readily available data and resources may impede the ability for program agencies to be most efficient.

Improve data availability - Accurate, timely and accessible data are critical to the effectiveness of interlock programs (Casanova Powell et.al.). Data limitations are a common concern for most interlock programs. Several data elements needed to adequately evaluate the interlock program were available for this study, however, the timeliness of data availability can be improved. Electronic data systems and central repositories specific to interlock programs are helpful in this matter. The implementation of real-time data reporting would allow staff to monitor participants more closely to allow for identification of repetitive positive alcohol events which has proven to be a predictor of recidivism. Real-time

data reporting is essential to applying immediate and appropriate penalties for these violations. As stated previously, research has shown that early intervention with regard to frequent interlock violations is substantially more effective in behavior change, i.e. correcting the drinking and driving behavior and lowering recidivism. This may also be an indication that those participants who continue to attempt to drive after drinking who are not enrolled in treatment may also be in need of treatment at this time.

Enhance education effort - Ongoing public education is critical to increasing interlock participation. This is particularly important for Minnesota's interlock program where participation is voluntary for first and second time offenders. A grassroots approach may be considered to entice offenders to participate through efforts to change public perception of the program from a punitive measure to a positive mechanism to continue to allow driving privileges.

Improved communication regarding eligibility, reduced fees and benefits can increase participation. Finding additional ways to disseminate program information may also increase participation. Interlock information can be distributed at educational booths at state fairs, festivals, via on-line channels and when performing underage drinking operations. Research shows that college-age drinking is a national issue. Universities and colleges, in conjunction with treatment programs, are excellent venues to promote social norming campaigns regarding impaired driving.

2 Introduction

Although impaired driving fatalities have been trending downward over the past few years, DWI arrests and impaired driving fatalities are still a problem in the US. According to the Federal Bureau of Investigation (FBI) Uniform Crime Reports (UCR), there were 1,117,852 DWI arrests in 2014. The National Highway Traffic Safety Administration (NHTSA) reported 9,967 alcohol-impaired driving fatalities in 2014, which accounted for 31% of total fatal traffic crashes (NHTSA 2015). NHTSA reported in 2015 that 35,092 people died in motor vehicle traffic crashes – an increase of 7.2 percent over the 32,744 fatalities reported in 2014. This is the largest percentage increase in nearly 50 years.

Table 2-1: Alcohol Involvement in Fatal Traffic Crashes, by State, 2005 and 2014

State	Percentage of Fatalities by Highest Driver AC in the Crash						Percentage of Drivers Involved in Fatal Crashes Tested for AC With Known Results in 2014	
	AC 0.01+ g/dL			AC 0.08+ g/dL				
	2005	2014	Percent Change	2005	2014	Percent Change	Killed	Survived
Alabama	37%	38%	+3%	33%	32%	-3%	57%	38%
Alaska	45%	39%	-13%	39%	30%	-23%	87%	73%
Arizona	37%	32%	-14%	32%	26%	-19%	81%	29%
Arkansas	32%	35%	+9%	28%	29%	+4%	80%	71%
California	36%	34%	-6%	30%	29%	-3%	78%	26%
Colorado	39%	38%	-3%	34%	33%	-3%	82%	19%
Connecticut	43%	46%	+7%	35%	39%	+11%	59%	24%
Delaware	43%	42%	-2%	39%	40%	+3%	79%	26%
District of Columbia	50%	26%	-48%	39%	21%	-46%	92%	36%
Florida	37%	32%	-14%	31%	27%	-13%	64%	15%
Georgia	30%	28%	-7%	25%	24%	-4%	61%	22%
Hawaii	48%	37%	-23%	39%	34%	-13%	70%	29%
Idaho	31%	32%	+3%	30%	28%	-7%	55%	27%

State	Percentage of Fatalities by Highest Driver AC in the Crash						Percentage of Drivers Involved in Fatal Crashes Tested for AC With Known Results in 2014	
	AC 0.01+ g/dL			AC 0.08+ g/dL				
	2005	2014	Percent Change	2005	2014	Percent Change	Killed	Survived
Illinois	41%	40%	-2%	34%	34%	0%	86%	22%
Indiana	32%	32%	0%	27%	27%	0%	53%	65%
Iowa	25%	33%	+32%	21%	29%	+38%	57%	37%
Kansas	32%	31%	-3%	24%	27%	+13%	64%	53%
Kentucky	30%	29%	-3%	25%	25%	0%	74%	41%
Louisiana	42%	41%	-2%	35%	34%	-3%	63%	64%
Maine	35%	38%	+9%	30%	33%	+10%	87%	43%
Maryland	34%	35%	+3%	27%	29%	+7%	83%	8%
Massachusetts	38%	47%	+24%	34%	41%	+21%	68%	2%
Michigan	35%	29%	-17%	29%	24%	-17%	59%	44%
Minnesota	**34%**	**33%**	**-3%**	**29%**	**29%**	**0%**	**83%**	**22%**
Mississippi	39%	34%	-13%	35%	29%	-17%	42%	17%
Missouri	40%	33%	-18%	33%	27%	-18%	82%	59%
Montana	47%	44%	-6%	43%	38%	-12%	84%	63%
Nebraska	32%	34%	+6%	27%	27%	0%	88%	78%
Nevada	36%	39%	+8%	32%	32%	0%	94%	32%
New Hampshire	36%	36%	0%	33%	31%	-6%	96%	68%
New Jersey	33%	36%	+9%	27%	29%	+7%	83%	27%
New Mexico	34%	38%	+12%	31%	30%	-3%	76%	6%
New York	35%	36%	+3%	29%	30%	+3%	82%	7%
North Carolina	32%	33%	+3%	28%	29%	+4%	89%	5%
North Dakota	47%	49%	+4%	37%	41%	+11%	88%	28%

State	Percentage of Fatalities by Highest Driver AC in the Crash						Percentage of Drivers Involved in Fatal Crashes Tested for AC With Known Results in 2014	
	AC 0.01+ g/dL			AC 0.08+ g/dL				
	2005	2014	Percent Change	2005	2014	Percent Change	Killed	Survived
Ohio	37%	35%	-5%	30%	31%	+3%	83%	13%
Oklahoma	33%	27%	-18%	29%	23%	-21%	89%	47%
Oregon	32%	35%	+9%	26%	28%	+8%	86%	37%
Pennsylvania	37%	33%	-11%	33%	29%	-12%	70%	18%
Rhode Island	50%	35%	-30%	39%	34%	-13%	82%	13%
South Carolina	47%	40%	-15%	40%	34%	-15%	81%	10%
South Dakota	40%	38%	-5%	37%	34%	-8%	80%	78%
Tennessee	35%	32%	-9%	30%	28%	-7%	53%	45%
Texas	43%	47%	+9%	37%	41%	+11%	52%	15%
Utah	13%	24%	+85%	12%	22%	+83%	69%	43%
Vermont	41%	32%	-22%	39%	20%	-49%	66%	36%
Virginia	36%	36%	0%	29%	30%	+3%	80%	0%
Washington	43%	36%	-16%	37%	29%	-22%	82%	33%
West Virginia	33%	35%	+6%	29%	31%	+7%	89%	9%
Wisconsin	44%	40%	-9%	40%	33%	-18%	88%	63%
Wyoming	37%	36%	-3%	32%	32%	0%	66%	35%
U.S. Total	**37%**	**36%**	**-3%**	**31%**	**31%**	**0%**	**71%**	**27%**

Source: FARS 2005 Final File, 2014 ARF

Economic losses from alcohol-impaired crashes totaled $44 billion in 2010 (the most recent year for which national cost data are available). NHTSA also estimated that the relative risk of a crash for drivers with alcohol concentration (AC) of 0.05 or greater is 6.75 times the risk for drivers with no alcohol in their system (DOT HS 812 117, February 2015).

Research has shown that interlock programs reduce the incidence of impaired driving while an interlock is installed in the vehicle. A study of

New Mexico's interlock program found that offenders who participated had a 61% lower recidivism rate while the device was installed and a 39% lower recidivism rate following the removal of the interlock compared to offenders who never had the device installed (Marques et al. 2010). Similar reductions were found by Vanlaar et al. (2014) when evaluating Nova Scotia's interlock program. An ignition interlock is a small device with a camera that is installed in a vehicle to measure an individual's alcohol concentration level. When a person blows into the device, his or her alcohol concentration level is detected and if the device detects alcohol, the vehicle will not start and the device will record the violation (a failed start).

Increasing participation has shown to reduce impaired driving fatalities and injuries. A NHTSA study of 28 state interlock programs revealed that there were eight interlock program keys which may increase interlock use (Casanova Powell et al. 2015). The key that was found to have the highest correlation with increasing interlock use was implementing a strong interlock requirement and/or incentive in legislation or policy.

As of January 2016, 26 states require all alcohol-impaired driving offenders, including first offenders, to install an interlock. An additional 13 states (including Minnesota) require interlocks for offenders with a high AC (usually 0.15 or higher) and for repeat offenders, six states require devices only for repeat offenders, and one state requires them only for high-AC offenders. Finally, four states (Indiana, North Dakota, South Dakota and Montana) and D.C. do not have mandatory interlock requirements. (IIHS, 2016)

Impaired driving is a serious problem in Minnesota. In 2014, 111 people were killed in an alcohol-related crash. This accounted for 31% of all traffic fatalities in Minnesota. This number increased in 2015, where 137 people were killed, more than 2,203 were injured, and costs amounted to more than $285 million due to crashes identified as alcohol-related. In an attempt to deter motorists from driving while impaired and thereby enhancing road safety, the use of ignition interlocks became law in Minnesota on July 1, 2011 with Minnesota Statutes 171.306 - Ignition Interlock Device Program.

The Minnesota Ignition Interlock Device Program is primarily an administrative program administered by the Department of Public Safety (DPS), Driver and Vehicle Services (DVS). Two principle goals of the Minnesota Ignition Interlock Device Program are to prevent impaired driving and reduce Driving While Impaired (DWI) re-offenses. The Minnesota interlock program provides the eligible DWI offender with the option of having an ignition interlock device installed in his or her vehicle which helps to ensure safe and legal driving. Individuals are eligible for

the program if their licenses are revoked or cancelled and they meet other requirements which vary depending on the level of violation i.e. first, second or third offense, or license cancellation.

The goal of this project is to evaluate the effectiveness of the ignition interlock program in the state and provide a comprehensive report to the Minnesota Office of Traffic Safety (OTS) based on the results of the evaluation.

3 Background

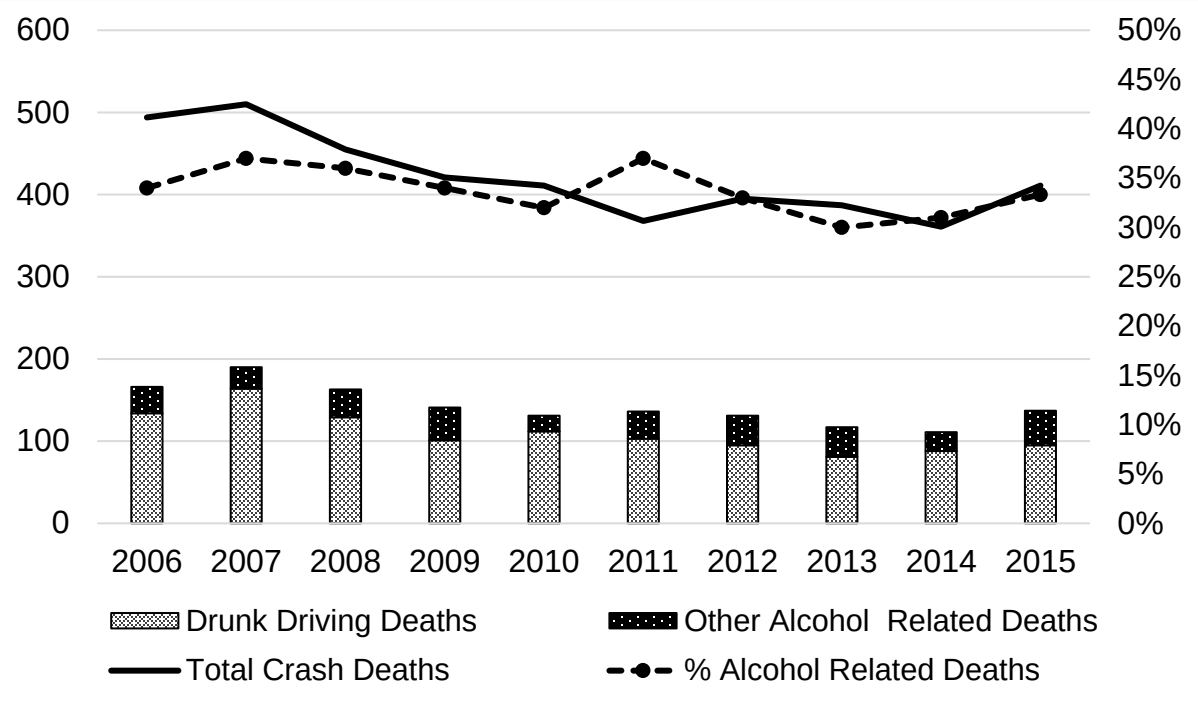
3.1 Problem of Impaired Driving in Minnesota

Impaired driving is a serious problem in every state, and Minnesota is no exception. The following information was taken from the Minnesota Motor Vehicle Crash Facts 2015 report produced by the DPS OTS.

Figure 3-1 illustrates the trend of crash fatalities and proportion of alcohol-related traffic deaths in Minnesota from 2005 to 2015.

Total crash and alcohol-related fatalities have shown a slow decline in recent years. In 2006, 166 out of a total of 494 crash deaths were alcohol-related. In 2015, there were 137 (out of 411), which is a 17% decrease. While the number of deaths has decreased, alcohol-related deaths continue to account for 33% of crash fatalities. Of these, 69% are drunk-driving related, meaning at least one driver had a 0.08 AC level or higher. There were 2,203 injuries due to impaired driving in 2015.

Figure 3-1: Total Crashes, DWI Arrest and Related Fatalities 2006–15



There were 25,027 impaired-driving incidents in Minnesota in 2015, which is a 1% decrease from the previous year. That could be due to reductions in law enforcement, as agencies have expressed difficulties filling vacancies within departments due to retirements. Where data were available, 72% of DWI offenders in 2015 were male. Females accounted

for 28% of offenders – a 4% increase from 1995, when females accounted for 24% of reported DWI offenders. Younger drivers aged 15–34 accounted for 31% of all traffic-related deaths, and 39% of alcohol-related fatalities.

There is a highly consistent pattern from year to year in the frequency of alcohol-impaired driving as related to days of the week. In 2014, Mondays through Thursdays reported the lowest proportion of impaired driving incidents. The same is true for 2015, when combined Fridays, Saturdays and Sundays accounted for 38% of all traffic crashes. Weekends played an even more significant role in alcohol-related crashes; these three days accounted for 58% of all alcohol-related crashes in 2015. Time of day has similar consistencies to national averages; the late-night hours between 9 p.m. and 3 a.m. accounted for 11% of all crashes and 44% of alcohol-related crashes.

There were 137 alcohol-related fatalities in 2015. Of these, DPS was able to obtain alcohol test results for 128. Of those 128 alcohol-related fatalities, 93 (73%) reported a AC of above the legal limit (0.08).

The National Safety Council estimates the cost of impaired driving in Minnesota due to alcohol-related traffic crashes, impaired fatalities and impaired injuries in 2015 at $285 million.

3.2 History of Ignition Interlock in the State

Minnesota implemented pilot programs to test and develop a statewide program. These efforts have provided the state an opportunity to gain significant knowledge on how to effectively implement an ignition interlock program.

3.2.1 First Ignition Interlock Pilot (2002)

The state's first ignition interlock pilot program was established in Anoka County, where Minnesota DPS, together with Anoka County Corrections, enrolled nine participants in a voluntary program. The goal of this pilot program was to test how interlock could be administered under DWI laws and licensing operational procedures. Participants were eligible for a limited-use driver's license once certain conditions were met. Only those whose licenses were "cancelled as inimical to public safety" were deemed eligible to enroll. The interlock was installed for an average of four months for these participants. Results indicated that, "In no instance has any participant had the vehicle 'lock-out' for registered alcohol usage. No major malfunctions occurred in which a participant was unable to operate the vehicle when necessary. Overall, participants were satisfied with the program and indicated it was useful for their individual situation" (DPS, 2002).

3.2.2 Two County Pilot (July 1, 2007 through June 30, 2009)

In 2007, the Minnesota Legislature authorized DPS to conduct a two-year ignition interlock pilot in one rural and one metropolitan county (MN statutes, Section 171.306). The purpose of the two-year pilot program was to determine:

- Benefits of an ignition interlock program as correlated to a reduction in alcohol related fatalities, alcohol related severe injuries, DWI arrests, and driving after revocation charges.
- Benefits of the ignition interlock device for monitoring the alcohol use of DWI offenders.
- Program guidelines for implementation of a statewide ignition interlock program.
- Performance standards for ignition interlock devices.

DPS selected Hennepin and Beltrami counties, and DPS-OTS administered the project together with DVS and county probation service offices. Probation officers oversaw daily administration of the program. The pilot targeted DWI offenders with two or more offenses. DPS and court representatives developed program guidelines and ignition interlock device performance standards. Guidelines supported a participant's ability to obtain a limited license to drive to work and treatment using ignition interlock while ensuring public safety.

Performance standards were developed to apply to ignition interlock devices installed in Minnesota. The performance standards were signed by the DPS commissioner on June 14, 2007. Ignition interlock providers were required to certify that their device complied with the standards before operating within the program.

Performance standards included compliance with the following requirements:

- Procedures for the approval, suspension and/or revocation of devices
- Process for installation, support and removal of ignition interlock devices.

Four ignition interlock devices and three manufacturers were certified for use by DPS. Those devices included:

- Smart Start BAII model SSI 20/20
- Smart Start BAII model SSI-1000
- Draeger Interlock® XT

- Consumer Safety Technology Inc., Intoxalock.

Original performance standards allowed two running re-test violations. On November 1, 2008, the performance standards were adjusted to allow three running retest violations or three failures to take breath tests. Standards were changed as participants were missing (failing) running retests when shutting off their vehicles causing them to enter into an early recall condition. An early recall condition requires the participant to take the vehicle to a service provider for calibration and pay a $50 fee.

Additionally, guidelines establishing the procedure for the pilot program were completed. Critical issues considered when developing the program guidelines included:

- Enabling a DWI offender to be productive in society without jeopardizing public safety
- Maintaining a reasonable driver's license hard-revocation period
- Requiring the use of an interlock device for a minimum of one year
- Having no alcohol use violation during the last three to six months prior to removal of the device
- Using the device in conjunction with an intensive supervision program if the participant is cancelled as inimical to public safety.

Gaining program participation proved challenging. Some of the obstacles were found to be the high cost of car insurance, re-licensing fees and the costs associated with the ignition interlock program. Further, it was determined that the statutorily defined short revocation periods were providing little incentive for participants to join. The program guidelines were adjusted to increase program participation. Effective September 15, 2008, these changes included:

- Further reduction in hard revocation periods (i.e., no driving privileges). The original pilot program guidelines reduced the hard revocation period to 30 days. The changes included the elimination of hard-revocation periods for second-time offenders and greatly reduced revocation periods for those with subsequent offenses.
- Removal of the requirement that participants complete the chemical health treatment prior to entering the program. The guidelines were adjusted so that offenders could enter the interlock program if they had completed the first 30 days of a treatment program and had a positive prognosis for successful completion.
- Removal of the requirement that cancelled as inimical to public safety participants be monitored by an intensive supervision program. The new guidelines required a probation service to agree

to monitor the ignition interlock reports and report any detection of alcohol use to DPS.

Hennepin and Beltrami counties received grant funding from DPS to create a position to implement and monitor an ignition interlock pilot program within each county. An indigent fund was included as part of the grant program to allow participation for people who could not afford to pay the costs.

One hundred people participated in the pilot.

- Hennepin County enrolled 96 participants, who tended to be white/non-Hispanic and well educated. Participants' top reasons for enrolling were to keep their job and to get their driver's licenses back quickly.
- Beltrami County's program enrolled only four participants. Beltrami concluded that a major barrier for participation was the high cost of license reinstatement (e.g., driver's license exam and license reinstatement fees) – median incomes in Beltrami and Hennepin counties were $35,547 and $54,471, respectively, in 2009.
- No person using the device reoffended while enrolled in either Hennepin or Beltrami Counties program.

The first 40 participants were asked to complete a survey designed to identify reasons for participation and how they learned about the program. Almost 54% of the participants learned of the program from judges, lawyers or their probation officer. Among the 40 participants surveyed, the top two reasons for participating were the opportunity to get their driver's licenses back faster and the need for transportation to maintain employment.

3.2.3 Statewide Pilot (July 1, 2009 through June 30, 2011)

In 2009, the Minnesota Legislature expanded the two-county pilot to a statewide pilot program. In an effort to increase effectiveness and efficiency, DPS changed four of the program's basic elements, including:

- Expanded target population. The effectiveness of the two-county pilot program convinced the state legislature to implement the program on a statewide basis and not limit enrollment to repeat DWI offenders.
- Transfer program operations. DVS became the statewide authority for the ignition interlock program and became responsible for the day-to-day operations. As the sole licensing authority, it was more efficient and appropriate to administer a statewide licensing process through DVS.

- Program guidelines adjusted. DPS adjusted program guidelines to further encourage ignition interlock use by providing full driving privileges and reducing the use of a limited license.
- Enrollment process. DPS simplified the enrollment process and developed a user-friendly website for current and prospective enrollees. DVS staff began enrolling the participants and monitoring device reports which had been done by the probation officers previously. By taking on these tasks, the enrollment process was made more efficient, and information was able to be provided to and the enrollment process more accessible for a much broader audience.

Results of the two-year pilot program included:

- DVS enrolled 2,490 individuals in the program, with at least one enrollee in 80 of Minnesota's 87 counties. Eighty-four percent of enrollees were male, with an average age of 43. Participants had one to 14 DWI incidents on their record upon enrollment. Sixty percent drove on a restricted license while enrolled, while 40 percent drove on a limited license.
- As of June 20, 2011, 79% (1,962 individuals) of the program's original enrollees continued to participate. Eleven percent (269 individuals) successfully completed the program with no new offenses. Three people completed the program and later reoffended. Ten percent of enrollees were terminated from the program either voluntarily or involuntarily because of violations or other reasons.
- Results of a survey conducted on participants indicated that 84% of respondents believe that participating in the ignition interlock program improved their quality of life.
- Challenges with implementing the program included managing the growing number of interested potential participants, making sure staffing was adequate to monitor those in the program and assuring that participants clearly understood the consequences of violations.
- Year two brought expanded promotion of the program through partnerships and outreach to many groups throughout the state.

3.2.4 Review of Administrative Sanctions (2008–2010)

A Driver's License Administrative Sanctions (DLAS) Workgroup was formed to conduct a thorough review of administrative sanctions imposed on a person for driving impaired. The initiative represented a partnership between DPS and more than 50 individuals representing key stakeholder groups, agencies and perspectives such as the Department of Human

Services and Corrections, community corrections, the judiciary, the attorney general's office, state, county and municipal law enforcement, public defense counsel, treatment and assessment professionals, prosecutors and advocacy groups.

The comprehensive review was designed to address a number of long-standing problems associated with the DLAS system, including the continuing social and economic costs of alcohol-related crashes; the removal of driver's licenses as a sanction causing unintended negative consequences; continued high recidivism rates among DWI offenders; and stresses on increasing case loads in the courts and related agencies. In addition, the emergence of ignition interlock technology prompted a study of how to incorporate its use into the sanctions system.

The review integrated the results of the two-county pilot program and other research, technology and best practices information. The final six recommendations were evidence-based, and broadly supported by the range of stakeholders involved in the research, analysis, and decision-making processes. The following recommendations put forth from this review:

- Reduce the AC level that triggers enhance DLAS from 0.20 to 0.15.
- Lengthen the revocation time for first- and second-time DWI offenders and provide the option to obtain full driving privileges if they drive a vehicle with an ignition interlock installed.
- Update sanctions for people that are cancelled as "inimical to public safety" (three offenses in 10 years or four in a lifetime).
- Provide effective chemical health screens and assessments.
- Focus enhanced consequences on people who continue to drive after their driving privileges have been withdrawn due to risky driving behavior.
- Determine effective programs that achieve long-term behavior change and assure statewide access and usage.

This review resulted in a governor's legislative proposal that was passed almost unanimously into law which included a statewide ignition interlock program.

3.2.5 Statewide program (effective July 1, 2011)

On May 18, 2010, Governor Tim Pawlenty signed legislation to strengthen DWI sanctions and significantly encourage the use of an interlock device by DWI offenders that want to drive.

Highlights of the legislation included:

- First and second offenders may voluntarily participate in the interlock program (e.g., install the interlock instead of serving the hard revocation period).
- DWI offenders with a 0.16 and above AC will be required to have an ignition interlock device installed on any vehicle they drive or lose their driving privileges for one year for first offense and two years for second offense.
- Repeat offenders with three or more DWIs in a 10-year period will be required to use ignition interlock.
- Interlock users will regain full or limited driving privileges immediately after the offense, ensuring they are driving with a valid license and not a threat on the roadway.
- Interlocks will be used to monitor chronic DWI offenders (three or more DWIs in 10-year period) to verify chemical use.

The statewide program became effective on July 1, 2011. The table below shows the growth of the current ignition interlock program and the reduction of those in the pilot.

Table 3-1: Program Participants Summary 2013–15[1]

Date	12/31/2013	12/31/2014	12/31/2015
Number of pilot program participants	787	195	113
Number of revoked participants	3,101	4,797	5,154
Number of cancelled participants	1,388	3,632	4,513
Number of graduates YTD	1,014	7,984	12,074
Total number of ignition interlocks installed YTD	5,276	8,624	9,780

Note: [1]This is a snapshot in time at the end of each year and therefore does not represent cumulative totals.

Source: Driver and Vehicle Services

3.3 Minnesota's Ignition Interlock Device Program

3.3.1 Legislation

Minnesota's interlock program is primarily administrative, governed by Minnesota Statute 171.306 – Ignition Interlock Device Program. Prior to full statewide implementation of the program, there were several pilot projects, as described previously. The state's program began with an

initial statewide pilot established in 1991 under statute section 171.305, which was repealed upon enactment of the current statute. There is however very little documentation of the outcome of this statewide pilot. The current program expanded from the two-county pilot (Hennepin and Beltrami counties 2007) to the statewide pilot (2009) to its current form which went into effect on July 1, 2011. As a result of lessons learned from these pilot programs, combined with recommendations from a Driver's License Sanctions initiative, significant statutory and program changes have been made to expand participation, lower participation barriers and improve administration efficiency. The progression of this program improvements were discussed in the preceding section.

Summary of Minnesota ignition interlock laws:

- 1991 - Minnesota Statute 171.305 created. Establishes 1-year statewide pilot program to test efficacy of ignition interlock devices.
- 2007 – Minnesota Statute 171.306 created. Two-year two-county ignition interlock pilot project established.
- 2009 – Minnesota Statute 171.306 amended. Two-year statewide ignition interlock pilot project established.
- 2010 - Minnesota Statute 171.306 amended from Pilot Project to Program. DWI Sanctions Strengthened; Ignition Interlocks Required.
- 2014 - Criminal Vehicular Offense and Ignition Interlock change. The law now requires Ignition interlock for anyone cited for a criminal vehicle operation (CVO) bodily harm to great bodily harm to install an ignition interlock on their vehicle.

Minnesota has also established a provision that allows first and second offenders to voluntarily participate in the interlock program (e.g., install the interlock instead of serving the hard revocation period). This is an incentive which has proven to substantially increase interlock participation and subsequently increase public safety (Casanova Powell et.al. 2015). Although these offenders are not required to install an interlock device, offenders may regain full driving privileges during the period of revocation. This voluntary provision allows offenders the option to install the interlock which may prevent future impaired driving.

First offenders with a AC of 0.16 or greater may either apply for an interlock restricted license or not drive during the period of revocation (one year).

Second and third offenders (not within a 10-year period on record) may either apply for an interlock restricted license or not drive during the period of revocation (one to two years)

Third-time offenders (three offenses within a ten-year period) and fourth and subsequent offenders are required to successfully complete the program as a condition of license reinstatement where these offenders receive a canceled license status. The term of the interlock varies dependent upon the number of prior offenses and length of the hard suspension period. Judges have the ability to order offenders to install the interlock as a condition of sentencing or probation however this has shown to be inconsistent throughout the state with the exception of DWI courts sanctions.

Comparison with other state programs

Interlock programs are classified into three general types: administrative, judicial and hybrid. Offender requirements and eligibility are governed by state law.

Administrative programs are governed by the state's driver licensing agency. In administrative states the licensing agency usually monitors, controls and administers offenders ordered to install an interlock. However, several administrative states have no way of tracking interlock installations, violations and completions unless the vendors send individual offender information to the agency. The licensing agency may require an interlock in addition to or in lieu of a hard driver's license revocation or as a requirement of relicensing. Administrative programs typically are administered statewide.

Judicial programs are governed by the courts. They may be administered statewide or at the county or local level where requirements may vary. The courts may order an interlock before a trial, in lieu of jail time, or as a condition of probation. While state law specifies which offenders are required to install an interlock, all states allow judges to order an interlock for any offender. Hybrid programs combine features of both. Hybrid programs usually track through both the licensing agency and the court system. Many allow interlocks to be required either by the driver licensing agency or by the courts.

In several states the interlock law itself is a major obstacle to a successful interlock program. Several states' laws do not include sanctions for violations of the interlock requirements or do not establish clear procedures for monitoring offenders. Several states have implemented laws but have not educated their law enforcement, courts, or licensing divisions on these laws. Many courts are reluctant to require interlocks for low-income or first-time offenders. However, as state interlock programs are evolving, states are learning what works and what doesn't. Evidence-based research has identified interlock program best practices for all interlock program types. With the development and release of this information, many states, including Minnesota, have improved their

interlock laws and programs in recent years and are implementing laws that close loopholes in their programs.

Minnesota's administrative interlock program follows several evidence-based practices shown to increase interlock participation and effectiveness, including:

- All-offender eligibility
- Removal of hard suspension periods
- Performance-based exit
- Treatment and/or alcohol education

In addition, Minnesota generally follows the standardized best practices recommendations as identified by the Association of Ignition Interlock Program Administrators (AIIPA) including device certification best practices. These recommendations regarding retests, alerts, calibration stability and service interval, interlock set point, anti-circumvention and other recommendations can be found at aiipaonline.org.

All offender eligibility

The structure of Minnesota's interlock program is an important strength of the existing interlock legislation. Often, repeat offenders are required to participate in interlock programs but there are no provisions that allow first offenders to opt in. Failing to include first offenders in an interlock program is a missed opportunity to reach a significant portion of the impaired driving problem. This is not an issue in Minnesota, as it specifically includes first offenders as well as second offenders and offenders with three DWI convictions on their driving records (not within a 10-year period) as described above.

Removal of hard suspension periods

Several states with administrative interlock programs continue to use lengthy hard suspension periods as an administrative sanction, which has proven to be a substantial barrier to interlock participation and a potential significant public safety issue as offenders have been reported to drive under suspension. As described previously, Minnesota offers the option to eliminate these hard suspension periods with the installation of an interlock for all offenders.

Performance-based exit

Many administrative states do not monitor positive alcohol event violations. Vendors are instructed only to send reports of installations and removals, not of violations. Therefore, a participant can have several confirmed alcohol events and or tampering or circumventions, pay for recalibration of the interlock upon a lockout, and serve no penalties for

these violations. As long as the participant completes the full interlock term, their license will be reinstated. Some states are now moving towards extending the interlock term upon notification of these violations.

The use of these performance-based exit criteria is a critical component of ensuring public safety on Minnesota highways. Rather than revoking participation in the interlock program for violations, participants' interlock periods are extended until their interlock record is free of confirmed alcohol events for the designated period of time. Treatment is required only for those within the interlock program for those who are cancelled or as a useful measure to enhance corrective behavior with regard to impaired driving. In Minnesota, it is possible for offenders to be required to participate in the interlock program indefinitely if continuous violations occur. Additionally, this ensures that participants who continue to choose to drink and drive do not have the interlock removed remain on a limited or restricted license.

Treatment

Several states have recognized the importance of treatment when dealing with repeat DWI offenders. Drug and DWI Courts have used the treatment model, as their goal is to protect public safety, which incorporates accountability and long-term treatment to change behavior of their hard-core DWI offenders (NCDC, 2016).

Most states require screening and risk assessment for DWI offenders, depending on the offense or conditions of the offense. Risk assessment may lead to mandatory or court -ordered treatment as a condition of license reinstatement or probation or as an ignition interlock requirement. Some states require all offenders to undergo treatment as a condition of license reinstatement. Florida and West Virginia have voluntary treatment programs unrelated to interlock requirements. New York has a voluntary treatment program for conditional license or reinstatement of driving privileges (NYS Drinking Driver Program). Missouri, New Mexico, North Carolina and Texas have treatment programs unrelated to the interlock requirement.

Minnesota's third and subsequent offenders must successfully complete a risk assessment and provide proof that they are enrolled in treatment or other required programing as determined by the risk assessment to be eligible to receive a restricted license with an interlock and as a requirement of license reinstatement. Treatment does not have to be completed prior to entry into the interlock program. Treatment is often concurrent with participation in the interlock program. This is not the case with many other interlock programs. Concurrent treatment increases the potential to ensure optimal results. Participants will remain under a limited license for a minimum of one year unless the participant has not

completed the required program or treatment as designated by the risk assessment, whereby the participant will remain under the limited license until the required program or treatment is completed.

3.3.2 Funding

Minnesota does not have a dedicated indigency program, but participants may qualify for reduced installation, removal, and monitoring fees. Offenders must apply for these reduced fees and be approved by DPS. Eligibility requires offenders to be within 125% of the federal poverty guidelines. Offenders are notified of approval by an approval letter, which serves as proof of eligibility. Reduced fees for those eligible include:

- $40 for all monthly service fees including calibration and device insurance,
- $25 for installation,
- $25 for removal,
- $25 for each lockout, and
- $15 for use of the emergency over-ride feature.

Reduced fees are only approved for one year. To receive continued reduction in fees, participants must re-apply. Given that vendors assume financial responsibility for indigent offenders, DPS acknowledges that no vendor will be required to have more than 10% of their business consist of indigent participants.

General cost for installation/servicing is not regulated and is approximately $90–$130/month for monitoring, $75 for installation and $50 for removal.

Comparison with other state programs

Indigent funding is a difficult matter for many states. Most states require that interlock participants are responsible for all costs associated with program participation, including installation, monthly maintenance costs and the cost of obtaining a restricted driver's license. Some states, such as Colorado, Nebraska, North Carolina, Oregon, and Washington, have a designated indigent fund to assist offenders to install and maintain an interlock.

Resources for indigent funding are difficult to find and uniform indigency requirements are difficult to establish and maintain. Most states have suggested using federal income tax records as a guide. This may not always be an adequate representation of which offenders are truly indigent. Also, some who don’t qualify for indigency according to federal or state poverty levels may still not be able to afford all the fees and fines

associated with a DWI arrest. Several states assess high fees or fines for DWI offenses.

The need for an established indigency fund is often questioned and responsibility to reduce participant costs is left to the vendors or courts. Several states report that inadequate funding hindered effective implementation of their interlock programs. Several states have suggested allocating money from alcohol fines or fees to set up an indigency fund. However, in most states this money is already allocated to funding other projects, so that creating an additional fund with this money would further deplete the funding for existing programs. Many judges are hesitant to impose interlocks on low income offenders.

3.3.3 Vendors, Reporting and Oversight

Interlock program participants have the option to select a device from one of five vendors certified to do business in Minnesota:

- ALCOLOCK
- Draeger Safety Diagnostics, Inc.
- Intoxalock
- LifeSafer Interlock, Inc.
- Smart Start MN

The costs of device installation, removal and servicing are not regulated by DPS.

During the installation appointment, the vendor provides device training to the participant, which is confirmed by sworn statements signed by the participant to be kept on file for review by DPS as requested. In addition, a reference and problem solving guide is distributed to participants that includes information on the location of service centers, servicing procedures, emergency procedures, and a conspicuous warning that the device detects non-compliance.

Service appointments are scheduled every 30 days, which is a standard best practice for interlock programs. For a participant who chooses to install a wireless interlock device that uploads data to the DVS daily, service appointments are every 60 days. During the service appointments, action may be taken by DVS on breath samples of 0.02 or greater, which is the Minnesota established calibration set point for the device.

Within 24 hours of the final calibration, the vendor must provide DVS with a final summary report of the participant’s time on the device. The

interlock should not be removed until DVS has received and reviewed the final monitoring report.

Minnesota has created an automated data reporting system to replace paper-based reporting as a result of multiple vendor participation in the program. The automated system was devised to create a more efficient manner of managing participants through multiple vendors. Vendors submit reports containing interlock data to DVS electronically via FTPS each business day. Daily reports include installations, removals, and violations. The following participant information is also included in daily reports:

- Name of program participant
- Date of birth
- DL number
- VIN (last 6 digits)
- Date of violation/installation/removal
- Time of violation and
- Any report messages.

Upon receipt of the daily reports, the DVS automated system generates violation notifications, where applicable, to be mailed to participants. Violations are also noted on the participant's record. The system also alerts DVS just before a participant reaches the final 90 days of program participation. A notification is mailed to participants to remind them to set up an appointment for final calibration and to remind them that they must not have any alcohol violations within the last three months of program participation. Within 24 hours of the final calibration, vendors provide DVS with a final summary report of the participant's time on the device. Once DVS has received and reviewed the final monitoring report, participants will either be extended on the program or advised that they can have the device removed.

Comparison with other state programs

Vendor software is usually fully electronic and more sophisticated than that of the state agencies. However, most states have multiple vendors, each with its own proprietary software and methods of reporting. In some instances, states are receiving more than 15 different forms from 15 different vendors. For this reason, some states contract with only one or two vendors to provide service for their state. This however eliminates competition among vendors within the state, which tends to drive down interlock program vendor fees.

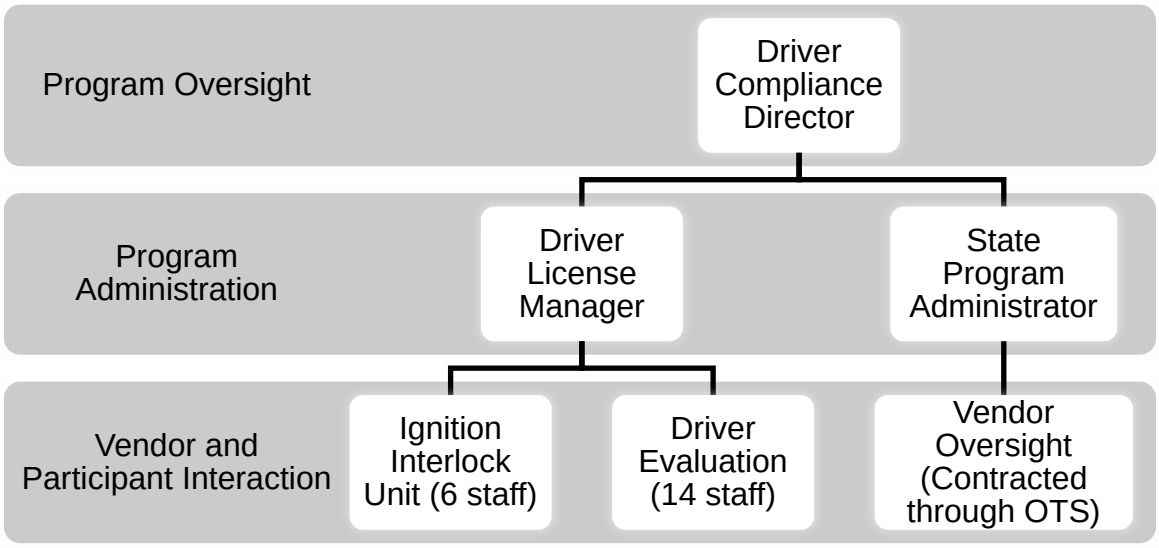
Several states still rely on paper-based reporting. Minnesota has eliminated this process with automated reporting as described above. Other states have also implemented an automatic reporting system, such as Florida, Indiana, and Colorado. Colorado has implemented an Online Interlock System (OIS) which is dedicated solely to the Colorado interlock program. This has largely improved the efficiency and accuracy of the program and is believed to have enhanced the participation rates of Colorado's program.

Most states including Minnesota require vendors to follow NHTSA recommendations for vendor certification, however some state vendors are not required to be licensed or certified. Most states with statewide vendor service, including Minnesota, require each vendor to have installation sites in all areas of the state or have other distribution requirements to ensure that all state residents have access to installation sites. Most states, including Minnesota, allow the participant to choose an interlock vendor among those registered and certified in the state and also allow the participant to select the installation facility. Minnesota has increased its vendor oversight program from one contractor to two to ensure coverage throughout the state. Several states do not have vendor oversight. In these states, each vendor proposes its specific interlock equipment to the certifying agency. If the interlock meets the criteria required by the state and is approved, any vendor who provides one may do business in that state. Vendors are left to provide oversight of their own garages and technicians.

3.3.4 Administration

Minnesota's ignition interlock program is cooperatively administered by DPS' DVS and OTS divisions. Together they developed and refined policies to assure efficient and effective program operation. DVS manages the enrollment process, oversees device use, and implements sanctions for participants who violate program requirements. OTS provides financial support, communication, education and outreach. DVS also manages the ignition interlock website, which facilitates enrollment, education and partnerships. The current program staffing structure is illustrated below.

Figure 3-2: Interlock Program Staffing Structure



3.3.5 DWI Administrative Sanctions and Program Time Periods

Individuals whose driver's license has been revoked under Minnesota Chapter 169A for an impaired driving incident or canceled under Minnesota Statute section 171.04, subdivision 1, clause (10) may apply for the ignition interlock device program if they meet the requirements. The length of time a participant must be on the ignition interlock device program depends on the number of prior offenses on the driving record and the length of time the participant has lost their driving privilege. This time period may be extended for any additional ignition interlock violations. Once participants are expected to have fulfilled their interlock requirement, within 24 hours of the final calibration, the vendor must provide DVS with a final summary report of the participant's time on the device. The interlock should not be removed until DVS has received and reviewed the final monitoring report. If any failures are noted, a participant's time on the program is extended if their license status is revoked. If failures are noted for a participant that has a canceled or denied status, their license will be canceled.

The table below presents the various options for reinstatement through participation in the interlock program.

Table 3-2: Driver Reinstatement Options

Offense and AC Level	Driver's License Administrative Sanction
First-Time Offender	• 3-month revocation of driving privileges – Driver has a choice of the following: 1. 15 days no driving privileges and a limited license provided for remaining revocation period 2. Full driving privileges provided for the revocation period with the use of ignition interlock
First-Time Offender Test Refusal	• 1-year revocation of driving privileges – Driver has a choice of the following: 1. 15 days no driving privileges and a limited license provided for remaining revocation period 2. Full driving privileges provided for the revocation period with the use of ignition interlock
First-Time Offender BAC 0.16 or over	• 1-year revocation of driving privileges Full driving privileges provided with the use of ignition interlock
Second-Time Offender	• 1-year revocation of driving privileges – Full driving privileges provided for revocation period with the use of ignition interlock
Second-Time Offender BAC 0.16 or over or Test Refusal	• 2-year revocation of driving privileges – Full driving privileges provided for revocation period with the use of ignition interlock

Offense and AC Level	Driver's License Administrative Sanction
Third, Fourth, Fifth and Subsequent Offenses (Length of time is dependent on the number of offenses)	• 3, 4 or 6 years revocation /cancellation of driving privileges* – 1-year limited license provided with the use of ignition interlock – 2, 3 or 5 years full driving privileges with the use of ignition interlock <u>Conditions of Reinstatement</u> • 3, 4 or 6 years demonstration of no alcohol or controlled substances usage • Completion of treatment • Verified by 3, 4 or 6 years of ignition interlock* • 10-year restriction of no alcohol or controlled substance usage (may remove if compliant for 10-year period) *Time may be extended if alcohol use is detected

The program guidelines at the time of this evaluation is presented in Appendix B.

4 Evaluation Methodology

4.1 Overview of the Evaluation Design

The evaluation methodology addresses various aspects of ignition interlock program administration, evaluation of traffic safety strategies, statistical research, data collection and analysis, and project management. This effort is critical, as it represents the first evaluation of the program since its statewide implementation in 2011. This study builds on the information presented in two previous pilot reports. With significantly more data from current and previous program participants, additional research methodologies and statistical techniques to address a greater range of research questions have been employed in this effort. While the previous reports largely focused on describing the characteristics of the program, this evaluation includes advanced statistical analyses (including multivariate models) to determine if the program is having the desired effect of deterring motorists from driving while impaired and thereby enhancing road safety.

The study was guided by 26 research questions selected to address particular components of the program. The questions were refined during the course of the evaluation in response to changes in the availability of participant data and as the research team and OTS worked within limitations imposed after the project's original request for proposals. For example, while it was planned to survey non-participant and program graduates, access restrictions on driver's personal information made this impossible. Additionally, some of the originally planned analyses were revised when it was discovered that the existing databases did not include some of the hoped-for data elements. The final set of research questions, purpose, and the data elements analyzed are presented in Table 4-1.

Participation Evaluation – This evaluation provides knowledge on participation rates, participant characteristics and number of participant DWI incidents. This was based on the analysis of demographic data of program participants. These percentage distributions were then compared to statewide distributions of driver and general population (aged 16+) to determine if the interlock program participants differ statistically from Minnesotan drivers and residents in general. The participation evaluation is addressed by questions 1 to 8.

Outcome Evaluation – This evaluation looks at the performance of the participants during and after completion of the interlock program. A number of performance indicators were developed which included, completion rate, recidivism (during and after program completion) and device failed attempts, among others. Subjective indicators to measure

program effectiveness were also included such as changes to participants' attitudes and behaviors as a result of the program. The outcome evaluation is addressed by questions 9 to 26.

Table 4-1 Research Questions and Data Elements

Question	Purpose	Variables of Interest
1. Who participates?	This question is attempting to answer the question of who is participating and which demographic groups are likely participating.	Age County of residence Sex Prior offense history AC level at time of arrest or refusal to test Number of vehicles owned before/after interlock Race/ethnicity Marital status Number of children Highest level of education obtained Income bracket
2. What is the license type of those enrolled in the program?	This question will inform OTS of the number of persons who obtain each type of allowable driving privileges within the program.	Type of license (limited or restricted) while in the program
3. What is the participation rate?	The interest is in knowing how many participate versus how many were eligible to participate and the rate of participation over time.	Number of eligible offenders vs. number of participants over time (2011–16).

Question	Purpose	Variables of Interest
4. How long do they stay in the program?	This question is to inform OTS of the length of stay in the program.	Number of months in the program for each individual
5. When do they exit the program and what is the attrition rate annually?	For each subcategory, OTS would like to know length of stay in the program and the overall length of stay for all participants.	Program subgroups length of stay: • Persons who complete successfully • Persons who are dismissed early • Persons who voluntarily withdraw from the program
6. What are the reasons for leaving the program and rate for each subcategory?	This question will inform OTS as to the possible reasons and the percentage of the participants that leave for the identified reasons	Number of program participants that leave the program Reasons for leaving the program which are identified on DVS records are: • successful completion • voluntary opt-out of the program • persons who are dismissed early due to the various program violations • persons who opt-out with no explanation
7. Who does not participate in the program?	This is to inform OTS staff as to the demographics of the persons eligible for the program who choose not to participate.	Age Sex Urban vs rural (county of residence) AC at arrest or refusal to take the test Number of prior DWI offenses

Question	Purpose	Variables of Interest
8. What is the distribution of participants in the program over-time?	This questions seeks to answer if there has been an incline or decline in the actual number of participants over time and if the demographics of the participants have changed over time. The question will also need to answer the participation rate vs. eligibility rate during the same time period.	Annual participation numbers for years 2011–16 vs the number eligible for the program for the same time periods; participants will be grouped by identifying demographics: • Age • Sex • Urban vs. rural • AC at time of arrest or refusal to blow
9. Who is successful?	The question is to identify the demographic profile of those most successful in the program.	The number of participants who completed the program and have full, unrestricted driving privileges reinstated and their basic demographics; • Age, • Sex, • Urban vs. rural, • AC at time of arrest or refusal to blow

Question	Purpose	Variables of Interest
10. Who recidivates and length of time before recidivating?	This question will identify the demographics of the persons who receive another DWI offense for the overall group of participants and the four subgroups identified. Also, the length of time either in the program or after leaving program before recidivating	Demographics of recidivists (age, sex, urban vs. rural, past number of offenses, AC or refusal at time of arrest) for each subpopulation listed and then comparing the groups. There are 4 subgroups: • Those currently in the program • Those who were never in the program • Those who were dismissed early from the program • Those who successfully graduated from the program.
11. How many persons, while in the program, reoffend, how often, and who are they?	This question seeks to inform OTS of the number of people who are caught driving illegally (without a license or without an interlock) for the identified subgroups.	Number of participants caught driving without the interlock while on the program; number of participants caught driving without a valid license. Subgroups: • Those who were caught driving without an interlock while in the program • Those were caught driving without a valid license who never entered the program • Those who were caught driving without a valid license after being dismissed early from the program. • Demographics of each group to include age, sex, urban vs. rural, past number of offenses, and AC or refusal at time of arrest.

Question	Purpose	Variables of Interest
12. How many failed AC tests were logged on the interlock device?	OTS would like to know how frequently someone has a failed test (start and rolling) due to a AC over 0.02 registering on the device. And, the number of persons for each AC reading.	How many failed attempts at each level of AC.
13. How many times did participants use the device while in the program? What was the mileage driven during participation?	The purpose of this question is to determine how frequently the participants are using the device and how far they are actually driving.	Use is to be determined by the number of days the participant used the device. Number of miles driven by participants during the interlock period.
14. What was the rate of failed AC tests over the program?	The question seeks to answer if, over the course of the interlock period, participants continue to have AC readings throughout the program, or is there a trend of increase or decrease in the positive breath tests.	The rate at which the AC readings occurred over time in the interlock program
15. Who supplies failed AC tests?	This seeks to identify the demographics of the persons most likely to provide positive breath samples on the interlock.	Age Sex Urban vs. rural AC or refusal at time of arrest

Question	Purpose	Variables of Interest
16. What program factors predict success?	Information gathered to determine the factors that predict successful completion of the program.	Factors that predict success will include: • Length of time the person enters the program following eligibility • Level of AC at arrest • Refusal at time of arrest vs. testing at arrest • Treatment completed vs. treatment uncompleted • Extensions in the program vs. no extensions • Overall number of extensions • Number of failed attempts • Rate of failed attempts • Rate of device usage • Program entry date (to compare those in pilot vs. those in permanent program)
17. What is the program completion rate?	The question seeks to answer how many persons complete the program and the percentage of persons who enter the program that complete the program, as well as completion rates over time.	Overall number of participants who have completed and the percentage of program completions overall and in 2011–16.

Question	Purpose	Variables of Interest
18. How many continue to use ignition interlock after successfully completing the program?	This will answer if persons who successfully complete the program find benefit of continuing use of the interlock even though it is not mandated.	The participants who graduate but who do not remove the device from the vehicle
19. How successful is the program in bringing participants to completion within the expected time frame?	Seeks to answer if program participants complete the program in minimum possible time period.	No extensions, no violations on the record while in the program
20. What is the number of canceled Driver Licenses and who is cancelled?	This will inform OTS of the how many participants are cancelled and who is likely to be cancelled.	The number of persons whose driving privileges are cancelled due to program violation while in the program and basic demographics of this population (age, sex, urban vs. rural, AC or refusal at time of arrest).
21. What are the reasons for cancelation?	This will inform OTS of the frequency of cancellations for each program violation.	Number of program participants who are cancelled for each program reason
22. How many re-apply?	OTS would like to know if there is a large or small percentage of persons who return to the program after leaving or being cancelled.	Number of people who are cancelled or withdraw from the program that re-apply

Question	Purpose	Variables of Interest
23. What are the numbers of citations and crashes of those in the program?	This will indicate the general driving safety of the identified subgroups during the program or program eligibility. In other words, are they safer drivers or riskier drivers and does the interlock make a difference?	History of prior crashes and moving violation citation history for: • program participants • those who never entered the program • those who were dismissed early from the program • Minnesota general population
24. What is the effectiveness of the program in reducing DWI re-offenses?	This question will answer if the interlock program has reduced incidents of impaired driving.	Number of those DWI offenses years prior to ignition interlock and for each year the program has been in place sorted by first offenders, second offenders, third offenders, and fourth and above offenders.
25. What other variables are affected by participating in the program, and do they influence the program graduate's perception and intent on repeating the act of impaired driving?	These questions seeks to answer if the interlock program improved participants' lives in other ways besides being able to legally drive and will these positive changes precipitate a reluctance to commit future impaired driving acts?	Positive changes in the following areas will be assessed to indicate positive changes in lifestyle: • employment • family situation • changes in social situation • access to social services • education • other legal challenges • membership and activity in civic, religious, other organizations • drinking habits

Question	Purpose	Variables of Interest
26. What is the impact of the ignition interlock program on public safety?	OTS wants to determine if the interlock program has made roads safer.	Overall number of crashes, number of fatalities number of injuries, and number of moving violations

4.2 Data Sources

The target population for this evaluation included all drivers with DWI convictions since the beginning of the two-county pilot program July 1, 2007 to the time of this evaluation. While every effort was made to include pilot program participants, data availability for these subjects was limited due to changes in record keeping and vendor participation. Data was initially received or generated by OTS and all personal identifying information was removed before forwarding to the evaluation team. Data formats were generated by the evaluation team in consultation with DVS and OTS staff and preliminary processing of records was done with the assistance of MN.IT (Minnesota Information Technology Office). The various data request and survey forms are presented in Appendix C.

4.2.1 Driving and Motor Vehicle Records

This is the biggest portion of data used in the evaluation compiled from the records of the DVS. The data requested included basic demographic information, vehicle ownership, driving convictions and related interlock program events (for program participants). During this process, the entire driving and vehicle history of 20,346 unique program participants plus roughly 200,000 DWI-convicted non-participant drivers were compiled, with data going back to date of driver's license issue. Unique driver IDs were generated to link device and survey records.

4.2.2 Ignition Interlock Device Data

Device data was requested from all current vendors for all program participants they have served from the beginning of the pilot program to March 31, 3015. Requested information included driver information and records of device events ranging from installation, breath tests (both success and fails), device initiated messages, circumvention attempts, service and removal.

Five current vendors provided device data for this evaluation;

- Draeger Safety Diagnostics, Inc.
- Guardian Interlock
- Intoxalock
- Life Safer Interlock, Inc.
- Smart Start MN

One vendor, Interceptor Ignition Interlock, Inc., which had about 200 participants, was decertified during the course of the study and was not asked to provide records. The vendor data request specified a series of

codes and definitions for interlock device events to be recorded in the database supplied for analysis. Vendors provided a sample data set, which was reviewed by the project team for compliance with the original data request. Vendors then supplied the full database of time-stamped event codes for each of their participants throughout the project period. Where AC test values were recorded, these were also supplied as part of the database. Below is a list of the event and the corresponding codes requested from the device vendors.

All vendor data submissions were scrubbed of personal identifying information before being shared with the project team. Unique identifiers were added so that vendor and driver data could be linked anonymously.

- 01 Start (Participant's initial entry into the program)
- 02 Installation of device
- 03 Removal: for successful completion of the program
- 04 Removal: for installation in new vehicle
- 05 Removal: Failure—participant is dropped from the program
- 06 Removal: Cancellation—participant voluntarily quits program
- 07 Removal: Other reason (explain in Reason for Event)
- 08 Successful breath test at Start Up (Not rolling re-test)
- 09 Successful vehicle start (actual ignition engine start up)
- 10 Successful rolling re-test
- 11 Failed Test at Start Up (blew AC≥0.02)
- 12 5-minute lockout
- 13 Failed Rolling Re-Test (blew AC≥0.02)
- 14 Missed calibration
- 15 Not enough tests in a 1-month period
- 16 Rolling Retest Requested (time device initiates retest request)
- 17 Missed rolling retest
- 18 Illegal start, bypass, circumvent, or tamper
- 19 Vehicle "ignition off/trip end"
- 20 Early Recall (provide info in Reason for Event)
- 21 Device Reset (provide info in Reason for Event)
- 99 Other (Explain in Reason for Event)

In the final analysis, not all vendors' data submissions complied with the request. The analysis section of this report details how the analysis proceeded with the data as supplied.

4.2.3 Participant Survey Questionnaires

A final source of data came from the ignition interlock program participants themselves. Participant data was collected via surveys administered with the assistance of the interlock vendors at the installation/service centers. The participant survey was used to obtain self-reports of experiences during the interlock program as well as gather additional demographic information that cannot be obtained from DVS or vendor data records. The survey included questions on what motivated them to participate in the program and to garner data on potential predisposing factors that could predict success in program. The survey form included a pull-off section of personal identifying information that was marked as optional if the participants wished to be identified. This information was used to link survey responses to the other data sources to support analysis of how individual participants' experiences predicted outcomes during and after the program.

Printed surveys forms and return envelopes were mailed or delivered to the main office of the five participating vendors who forwarded them to their service centers. Vendors were requested to administer the survey from March 1 to May 31, 2015. Completed questionnaires were returned to OTS to remove any personal identifying information and assign unique driver IDs. Where possible, the unique ID was linked to the unique ID used in the driver and vendor files, thus supporting anonymous data linkage. Completed survey forms were received from four vendors;

- Draeger Safety Diagnostics, Inc.
- Guardian Interlock
- Intoxalock
- Life Safer Interlock, Inc.

In total 657 surveys were completed. Of these 490 included the optional information that allowed for the data to be linked to driver and vendor data. A copy of the participant survey is included in Appendix C.

4.2.4 Comparison Group

A comparison group was selected from persons convicted of DWI but who chose not to participate in the program. The comparison between participants and non-participants is designed to determine if participation in the interlock program made any difference to drivers' subsequent behavior (recidivating DWI offenses and frequency of other serious

moving violations). However, participation in the program is not truly random and has an element of self-selection. For example, one could argue that those who chose to enroll in the program did so because overall they were just more responsible than the others. It is arguable that any possible difference in recidivism could be attributed to "responsibleness" or some other unknown factors, not the effect of the program itself. It seems likely that those who are more responsible would be inherently less likely to recidivate even if they did not go through the program. To overcome this bias, the propensity score method was used to mimic some of the characteristics of a truly randomized program participation. The propensity score is defined as the probability of a subject being assigned to the participant group, conditional on a set of baseline characteristics. In a set of subjects with the similar propensity score, their baseline characteristics will be similarly distributed in both participant and non-participant groups. Variables considered in the selection include demographics such as age, sex, county and prior DWI convictions.

4.3 Data Analysis

The data analysis was designed to answer each of the 26 research questions as thoroughly as possible within the limits of the available data and the time available. The following describes general analytic processes. The findings section provides details on the data used for each analysis and documents the choices made for use cases, exclusion criteria and specific data limitations that may affect the analysis. All analyses were completed using the STATA® software package and Microsoft Excel (as needed).

Frequency, range, mean, and standard deviation

Each analysis includes basic tabulation of frequency counts and percentages where appropriate. Cross-tabulations (multi-level data tables) also include row and column percentages as appropriate. For some of the analyses, measures of central tendency (mean and median) are useful for describing a typical program participant's experiences or demographics. Range (high-low) and standard deviation are used to provide information on variability within a group (program participants, non-participants, revoked drivers, or cancelled drivers, for example). Data for all figures presented in the findings were obtained through STATA and then entered into Microsoft Excel to generate the graphics.

Correlation and other measures of association

Pearson's R (the correlation coefficient) and the chi-squared statistic are used as indicators of the strength of association among two or more variables collected. The correlation coefficient can be used to measure

how much of the variance in one variable is predicted by the variance in another variable. This does not imply causation, but can gauge the level of association among variables such as failed engine start tests and the number of weeks on the program. The chi-squared statistic is used to assess the relationships among two or more variables with multiple response levels. It is ideally suited for cross-tabular data of frequency counts. Chi-squared values indicate whether the two or more variables exert independent influence on the sorting of values into the cells of a data table. For example, chi-squared is useful in assessing the relationships among demographic variables to test, for example, whether the distribution of age and sex for program participants and non-participants are similar or if they differ.

Propensity-score matching

The propensity-score method was designed to mimic some of the characteristics of the randomized assignment of treatment or intervention where a controlled process is not possible. The propensity score is defined as the probability of a subject being assigned to the treatment group, conditional on a set of baseline characteristics. In a set of subjects with the similar propensity score, their baseline characteristics will be similarly distributed in both treatment and comparison groups.

In the context of program evaluation, we used the propensity-score matching technique for selecting the comparison group following these key steps:

Step 1: Categorize the program participants into groups based on age, sex, county and prior DWI convictions.

Step 2: Identify a pool of potential comparison group members based on the same descriptors used in step 1 to define discrete groups. Note that there could be multiple comparable people in the candidate comparison group members for each person in the program participant group.

Step 3: Combine the program participants from step 1 and candidate comparison drivers from step 2 using age, sex, county, prior convictions and program status as indicator variables.

Step 4: Estimate the predicted probability of program status for each driver (from both groups) for the propensity score. Use one of the currently available methods (nearest neighbor, caliper and radius, stratification, kernel and weighting) to find matched propensity scores and select the members in the comparison group.

Propensity-score matching allows us to quantify the match between the participant and comparison groups and thus provides stronger support for

concluding that outcome differences between the two groups are attributable to the program.

Time-to-event analysis

Time-to-event analysis technique (also known as survival analysis) was designed to analyze data with binary outcomes and time to the occurrence of that outcome. It is widely used in clinical trial studies, drug studies and patient survival. The nature of this study allows the research team to adopt this technique for analyzing recidivism and program success. In the case of recidivism, the outcome is characterized by two key elements – a driver recidivates and how long before that happens. Similarly, a driver completes the program and how long it takes for that driver to complete are two key elements of the program success. Kaplan-Meier curves and Cox-proportional hazard models were used to describe the data and predict the outcomes as well as the elements that affect those outcomes. The model's predictions are based on driver characteristics and conditions such as participation in the program, age, sex, county, number of prior violations, etc. The models are tested for goodness of fit to the data to determine which variables have a significant effect on the outcome measures (recidivism, success) and which do not.

5 Findings

This section includes multiple analyses that may differ in the start date and the participants included in each data table or graphic. For many analyses here, participants' data include the earliest possible dates from the 2007 pilot study forward. For others, the analysis begins with the implementation of a statewide program in Minnesota. The start date depends on whether the analysis is focused on all people who went through the interlock program or only those who were eligible/joined the statewide program. The reader is cautioned to pay close attention to which portion of the data is used for each analysis. By default, the analysis uses all data. Where only data from the current statewide program is used, sources and dates are cited below each table and graphic

5.1 Who participates?

This question is answered by looking at the profile of those who enrolled in the program starting from the 2007 pilot study to March 31, 2016. It should be noted that the historical driver and device data from the two pilot projects (July 1 2007 to June 31 2011) is very limited, due to manual record keeping. Of the 2,590 pilot program participants, 1,058 driver and device records are used in later analyses but are not included in the answer to question 1.

For ease of comparison, the response for Question 7 (Who does not participate?) is also included in this discussion. The profile of eligible drivers is also tabulated below. The following data presentation is limited to the period July 1, 2011, when the statewide interlock program took effect. For comparison purposes, the pilot study periods cannot be used to calculate participation rates or examine participant versus non-participant demographic differences because the pilots were geographic limited.

Since July 1, 2011, there have been 23,115 program participants out of 130,455 eligible DWI drivers (Table 5-1).

The majority of participants were age 25–54. The age category with the largest number of participants, approximately one-third (7,457) were age 25–34. This age category also had the highest number of eligible DWI drivers (50,212). More than two-thirds of participants were male (17,237), and 5,842 were female. More than two-thirds of the eligible DWI drivers were also male (92,056) and 33,631 female. In terms of urban versus rural counties, the number of participants from urban counties was slightly higher (12,963) than rural county participants (10,149). Similarly, eligible DWI drivers from urban counties (69,288)

outnumber those from rural counties (60,860). Non-participating eligible DWI drivers followed the same trends for each demographic category.

Table 5-1: Ignition Interlock Program Participant Profiles[1]

Group/Subgroup	Participants[2]	All Eligible DWI Drivers[3]	Non-Participating Eligible DWI Drivers[3]
Total Enrollees	23,115	130,455	107,340
Age			
Under 21	8	1,720	1,712
21–24	543	13,011	12,468
25–34	7,457	50,212	42,755
35–44	5,809	28,105	22,296
45–54	5,195	21,090	15,895
55–64	3,214	12,322	9,108
65 and older	889	3,995	3,106
Sex			
Male	17,237	92,056	74,819
Female	5,842	33,631	27,789
Unknown	36	4,768	4,732
County			
Rural	10,149	60,860	50,711
Urban[4]	12,963	69,288	56,325
Unknown	3	307	304

[1]Statewide program only (July 1, 2011 forward)
[2]-The number of eligible drivers or DWI events. Those with multiple enrollments or DWI convictions are counted more than once.
[3]Eligible DWI Drivers are all drivers with DWI offense since the statewide program came into effect.
[4] The 7-county Twin Cities Metropolitan area.

Surveys among program participants provided additional demographic descriptions. The following are based on 657 respondent surveys collected by vendors between February and June 2015 as participants came into the service centers for monthly device calibration, device removal or early service recall. The reader should use caution in interpreting these results as they may not be representative of the entire pool of program participants. Responses were voluntary.

Table 5-2 shows the number of vehicles owned by participants who answered the survey both before and during the interlock program. Over half of the participants (368, 56%) owned only one vehicle before entering the program. That percentage increased to 61% (403

participants) during the program. Fewer than 17% of respondents owned more than 2 vehicles at the time of the DWI offense.

Table 5-2: Number of Vehicles Owned by Survey Respondents Before and During Program Participation

Number of Vehicles Owned	At Time of DWI Offense	During Enrollment
0	39	17
1	368	403
2	139	126
3	44	22
4	18	13
5	9	3
6	5	3
7	2	2
8	0	1
10	1	0
11	0	1
12	0	1
No response	32	65
Total Respondents	657	657

Table 5-3 shows the race and ethnicity of survey respondents. The vast majority of respondents reported their race as white (584, 89%) or mixed race/white (604, 92%).

Table 5-3: Race and Ethnicity of Survey Respondents

Race	One Race	Two or More Races	Total
White	584	20	604
Black	14	3	17
Hispanic, Latino or Spanish Origin	7	5	12
Asian	7	1	8
American Indian or Alaska Native	2	11	13
Others	4	4	8

Table 5-4 shows the marital status of respondents before and during the program. Because of the large non-response during the pre-program period, it is difficult to say if these respondents had experienced a change in marital status during their time in the program. Over one-half (242) of those who responded (469) reported they were single at the time of the

DWI offense. This increased by approximately 30% (152) during the period of enrollment in the interlock program.

Table 5-4: Marital Status of Survey Respondents

Marital Status	At Time of DWI Offense	During Enrollment
Single	242	327
Married	117	150
Divorced	87	140
Other	23	17
Decline to answer	10	8
No response	178	15
Total Respondents	657	657

Table 5-5 shows the number of children reported by survey respondents. The most frequent answers were zero—no children, none below or above 18 years of age, and none under 18 living at home. Only 21% of those who answered the question reported having any children under 18 living at home.

Table 5-5: Number of Children Reported by Survey Respondents

Number of Children	Total Children	Children 18 Years and Older	Children Under 18	Children Under 18 Living at Home
0	247	343	331	348
1	121	61	113	64
2	143	65	90	56
3	62	28	24	12
4	32	15	15	4
5	9	3	4	1
6	1	0	0	0
7	2	0	1	1
8	3	1	0	0
No response	37	141	79	171
Total Respondents	657	657	657	657

Table 5-65-6 shows the highest education level attained by survey respondents. All but a small percentage 3.57% (23) of those who answered the question had attained at least a high-school degree. Almost 20% (128) had attained a 4-year college degree or higher.

Table 5-6: Highest Education Level Achieved by Survey Respondents

Highest Educational Level	Number of Drivers
Elementary school	1
Some high school	22
High school grad or GED	158
Some college or university	155
Technical certificate professional program	90
2-year college degree	91
4-year college degree	93
Some post-grad	18
Master's degree	14
MD, JD, PhD or other equivalents	3
No response	12
Total Respondents	657

Table 5-7 shows the income level for survey respondents. According to US Census Bureau estimates, median household income in Minnesota in 2014 was $63,488. The majority of survey respondents are at or below the $60,000–$69,999 income bracket (436, 70.21%) indicating that the respondents' households are most likely below the state's median income.

Table 5-7: Income Bracket of Survey Respondents

Income Bracket	Number of Drivers
Below $10,000	24
$10,000–19,999	54
$20,000–$29,999	95
$30,000–$39,999	87
$40,000–$49,999	73
$50,000-$59,999	51
$60,000–$69,999	52
$70,000–$79,999	45
$80,000–$89,999	29
$90,000–$99,999	23
$100,000–$249,999	48
$250,000–$999,999	2
$1,000,000 or higher	1
Decline to answer	42
No response	31
Total Respondents	657

5.2 What is the license type of those enrolled in the program?

To examine participants' status upon entry into the program, the participants' violation history through DVS records up through the date of each driver's qualifying offense—the DWI offense which resulted in the person being eligible for the interlock program, was reviewed. Table 5-8 shows prior offense history for enrollees from July 1, 2011 forward, and the resulting license status at the time of entry into the program. Those showing revoked status could enter the program voluntarily in exchange for which they could drive legally during their period of license revocation. Those with cancelled inimical to public safety (IPS) were required to enter the program if they wished to be able to drive legally. This table does not show data for the pilot test participants.

Table 5-8: Prior Offense History and License Status at Enrollment[1]

Offense History at the Time of Enrollment	Number of Enrollments	License Status
1st or 2nd DWI on record	7,021	Revoked
2nd DWI in 10 years	5,470	Revoked
3d DWI on record	921	Revoked
3rd DWI in 10 years	4,321	Canceled -IPS
4th DWI on record	790	Canceled -IPS
4th DWI in 10 years	2,446	Canceled -IPS
5th or more DWI on record	2,146	Canceled -IPS
All DWI violations/Enrollments	23,115	

[1]Statewide program only (July 1, 2011 forward)

Based on the data, 13,412 participants voluntarily joined the program i.e., revoked license status and were issued interlock restricted licenses. The remaining 9,703 participants were required to join the program with canceled-IPS licenses and were issued limited licenses.

Table 5-9 shows the alcohol concentration (and drug use or test refusal) for the same set of program participants. Based on the data, 62% of program participants (17,309) had a high AC or refused to take the alcohol or drug test. High AC results, and a test refusal, result in enhanced penalties, including a longer requirement for program participation even on first offense; however, high AC by itself does not lead to a mandatory interlock requirement. This information, along with driver demographics, were used in creating a comparison group for the recidivism analysis described in Question 10 (Section 5.10).

Table 5-9: AC Level at Time of Arrest; or Test Refusal[1]

AC Level	Number of Arrests
0.08 - 0.159	5,831
0.16 and over	13,927
No AC Value[2]	4,415
Drug use	*278*
Test refusal	*3,382*

[1]All periods enrollments
[2] Different from sum of below due to unknowns

5.3 What is the participation rate?

An accurate way to measure the effectiveness of an interlock program within a state is to identify the percentage of offenders who actually installed an interlock among those who were eligible or required to install a device. The analysis below assumes that offenders are not deemed ineligible for other driving violations unrelated to the DWI, which may include delinquent child support payments, etc.

Table 5-10 shows the number of program enrollments for 2011–16 for each category of prior offenses. As shown in the table, about one-third of the enrollees are first offenders (based on a check of the past 10 years; offenses older than 10 years old remain on the record, but there is no additional penalty for just one prior offense on record).

Table 5-10: Total Enrollments by Year and Prior Offense[1]

Prior Offense	2011	2012	2013	2014	2015	2016	Total
1st or 2nd DWI on record	384	1,403	2,145	2,344	744	1	7,021
2nd DWI in 10 years	282	1,301	1,562	1,698	617	10	5,470
3rd DWI on record	53	209	246	310	102	1	921
3rd DWI in 10 years	181	847	1,069	1,297	895	32	4,321
4th DWI on record	43	149	180	247	164	7	790
4th DWI in 10 years	100	487	575	726	535	23	2,446
5th or more DWI on record	131	424	503	600	464	24	2,146
Total	1,174	4,820	6,280	7,222	3,521	98	23,115

[1]Statewide program only (July 1, 2011 forward)

The annual totals show a significant drop from 2014 to 2015. The reason for this has not been determined at this stage and will be investigated further by OTS.

Table 5-11-11 shows the total number of eligible drivers in each calendar year based on the number of people in each category of prior offenses. Both 2011 and 2016 are partial years but are shown here for completeness. Some later analyses require full-year data and are based on 2012–15 data. Approximately 60% (78,716) of the total number of eligible drivers for all years are first offenders (for the purposes of the program, within the past 10 years).

Table 5-11: Total Eligible Drivers (2011–16)[1]

Prior Offense	2011	2012	2013	2014	2015	2016	Total
1st or 2nd DWI on record	8,647	17,098	16,082	16,063	16,276	4,550	78,716
2nd DWI in 10 years	2,183	4,848	4,714	4,858	4,584	1,147	22,334
3rd DWI on record	266	634	649	768	751	175	3,243
3rd DWI in 10 years	1,029	2,369	2,473	2,894	2,761	525	12,051
4th DWI on record	154	379	380	504	507	97	2,021
4th DWI in 10 years	465	1,148	1,221	1,461	1,368	208	5,871
5th or more DWI on record	563	1,252	1,296	1,486	1,339	283	6,219
Total [2]	13,307	27,728	26,815	28,034	27,586	6,985	130,455

[1]Statewide program only (July 1, 2011 forward)
[2]NOTE: There are small discrepancies between the data here and the most recently reported conviction data in Minnesota's annual crash facts. The data presented here reflects arrests. Deferrals and expungements due to specialized court systems are not reflected here.

Table 5-12 shows the participation rates in the program based on the number enrolled compared to the number of people eligible in each category of prior offenses. Each year shows a majority of those who participated in the program were repeat offenders. This is consistent with the requirement of the program as only second and subsequent offenders are required to participate. 2013 and 2014 showed a peak in those voluntary participants who were first offenders within the previous 10 years.

Table 5-12: Participation Rates by Year and Prior Offense[1]

Prior Offense	2011	2012	2013	2014	2015	2016
1st or 2nd DWI on record	4.4%	8.2%	13.3%	14.6%	4.6%	0.0%
2nd DWI in 10 years	12.9%	26.8%	33.1%	35.0%	13.5%	0.9%
3rd DWI on record	19.9%	33.0%	37.9%	40.4%	13.6%	0.6%
3rd DWI in 10 years	17.6%	35.8%	43.2%	44.8%	32.4%	6.1%
4th DWI on record	27.9%	39.3%	47.4%	49.0%	32.3%	7.2%
4th DWI in 10 years	21.5%	42.4%	47.1%	49.7%	39.1%	11.1%
5th or more DWI on record	23.3%	33.9%	38.8%	40.4%	34.7%	8.5%
All DWI Violations	8.8%	17.4%	23.4%	25.8%	12.8%	1.4%

[1]Statewide program only (July 1, 2011 forward)

As noted, canceled-IPS drivers are required to enroll in the interlock program if they wish to drive legally. These are people with at least 3 DWI offenses in 10 years. For the full calendar years available for analysis (2012–15), there were 22,838 such drivers, 9,162 of whom did enroll in the program. These drivers' participation rate was much higher than for those given the option to participate (revoked drivers) where 12,681 out of 87,325 eligible drivers enrolled in the interlock program.

Overall participation statewide was just under one-in-five eligible drivers (19.8%). The participation rates based on available full calendar year data for the various license types are summarized below.

- Revoked (voluntary enrollment) 14.5% participation rate
- Canceled-IPS (required enrollment) 40.1% participation rate
- Overall combined 19.8% participation rate

5.4 How long do they stay in the program?

Table 5-13 shows the length of time participants are enrolled in the program. The table shows the time only for those who successfully completed the program. It also shows terminations (those dropped involuntarily from the program for whatever reason) and those with ongoing enrollment at the time of the analysis.

The average time for those who successfully completed the program is 412 days. For those who were terminated from the program, participation length was 301 days, on average, before being terminated.

Table 5-13: Duration Spent in the Program[1]

Time in Ignition Interlock Program	Number of Completions	Number of Terminations	Number of on-going Enrollments/ Unknown	Total
Up to 30 days	103	13	0	116
From 31 days to 90 days	372	33	103	508
From 91 days to 180 days	721	69	408	1,198
From 181 days to 1 year	6,350	65	1,233	7,648
From 366 days to 2 years	3,186	63	4,430	7,679
From 731 days to 3 years	413	14	2,620	3,047
Longer than 3 years	496	3	3,478	3,977
Total	11,641	260	12,272	24,173

[1]All periods enrollments

5.5 When do they exit the program and what is the attrition rate annually?

Just under half of those who entered the interlock program before March 30, 2016 successfully completed it. Roughly one person in 100 is terminated from the program. Table 5-14 shows the enrollments, successful completions and terminations during the years 2011–16. Because the program data runs on a calendar-year basis, this comparison is between enrollments and departures each year. The numbers are generally useful for comparison but it should be recognized that someone entering the program in one year may complete it or be terminated in a later year. For that reason, the rows showing percentage completion and percentage termination are cumulative across years.

Table 5-14: Enrollments, Completions and Terminations by Year[1]

Program Item	2011	2012	2013	2014	2015	2016	Total
Total Enrollments	1,174	4,820	6,280	7,222	3,521	98	23,115
Total Completions[2]	42	840	2,349	3,820	4,259	331	11,641
Cumulative Completion Percentage	3.58	14.16	25.83	35.74	48.65	49.86	49.86
Total Terminations	-	26	59	87	82	6	260
Cumulative Percentage Terminations	-	0.42	0.68	0.87	1.09	1.11	1.11

[1]Statewide program only (July 1, 2011 forward)
[2]Total completions for year 2011 is for full year

5.6 What are the reasons for leaving the program?

This question was answered using data from DVS only. Vendors' data also showed the reason for leaving the program; however, the data were unreliable and did not track well to the official records from DVS. Table 5-15 shows the recorded completions, terminations and ongoing enrollments as of March 31,2016. Because this analysis was limited to DVS data, there was no information on people who voluntarily left the program. For the information received, almost half (48.2%) exited the program because they successfully completed the program. Only 1.1% were terminated from the program.

Table 5-15: Reasons for Leaving the Program

Program Status	Number of Records	Percent
Enrolled	24,173	100%
Completed	11,641	48.2%
Terminated	260	1.1%
On-going/Unknown[1]	12,272	50.7%

[1]According to vendor-supplied data, 157 participants of the 12,272 voluntarily exited the program.

5.7 Who does not participate in the program?

The summary information to answer this was presented in Table 5-1 under Section 5.1. That table shows the total number of in each age

group, sex, and type of county (rural or urban) that were eligible for participation, as well as the number who did and did not participate and in the program.

Among age groups, drivers under 21 years of age were least likely to participate (0.5% of 1,720 eligible) followed by drivers aged 21–24 (4.2% of 13,011 eligible). Males were slightly more likely to participate than females (18.7% versus 17.4%). Drivers in predominantly urban counties participated at higher rates than those in predominantly rural counties 18.7% versus 16.7%). The higher participation rates are at least partly due to those groups having a greater proportion of people canceled-IPS.

5.8 What is the program participation rate over time?

Participation rates for age groups, by sex and by rural/urban county setting changed somewhat during the 2011–16 period. Table 5-16 shows the annual participation rates by age grouping. The participation rates for all program years were highest within the 55–64 age group at 26.1%, followed by the 45–54 age group at 24.6%. The lowest participation rate was reported as the under-21 age category with a 0.5% participation rate.

Table 5-16: Participation Rate by Year and Age Group[1]

Age Group	2011	2012	2013	2014	2015	2016	Total
Under 21	0.0%	0.0%	0.0%	1.0%	0.5%	0.0%	0.5%
21–24	0.4%	2.4%	5.2%	8.1%	3.3%	0.1%	4.2%
25–34	5.7%	12.4%	20.1%	23.7%	11.3%	1.1%	14.9%
35–44	9.2%	20.8%	26.7%	29.7%	15.5%	1.3%	20.7%
45–54	13.4%	24.7%	31.4%	34.5%	18.1%	3.1%	24.6%
55–64	17.0%	26.2%	34.2%	32.8%	20.5%	2.9%	26.1%
65 and older	12.7%	24.8%	26.8%	29.8%	14.9%	2.8%	22.3%
Total	8.8%	17.4%	23.4%	25.8%	12.8%	1.4%	

[1]Statewide only (July 1, 2011 forward)

Table 5-17 shows the annual participate rates for males and females. Males had a slightly higher participation rate for statewide only participants for each year, with the exception of 2011, when females had a 0.1% higher participation rate.

Table 5-17: Participation Rate by Year and Sex[1]

Sex	2011	2012	2013	2014	2015	2016	Total
Male	9.1%	18.3%	24.4%	27.1%	13.9%	1.6%	18.7%
Female	9.2%	17.0%	23.7%	25.4%	11.7%	1.1%	17.4%
Others/ Unknown	0.2%	0.7%	0.7%	1.7%	0.5%	0.0%	0.8%
Total	8.8%	17.4%	23.4%	25.8%	12.8%	1.4%	

[1]Statewide only (July 1, 2011 forward)

Table 5-18 shows the annual participation rates for urban and rural counties. Participants within urban counties showed a slightly higher participation rate for each year from 2011 through 2015.

Table 5-18: Participation Rate by Year and County Type[1]

County Type	2011	2012	2013	2014	2015	2016	Total
Rural	7.6%	15.5%	22.8%	24.6%	12.2%	1.7%	16.7%
Urban	10.0%	19.1%	24.1%	26.8%	13.4%	1.2%	18.7%
Unknown	0.0%	0.0%	0.0%	6.1%	0.9%	0.0%	1.0%
Total	8.8%	17.4%	23.4%	25.8%	12.8%	1.4%	17.7%

[1]Statewide only (July 1, 2011 forward)

5.9 Who successfully completes the program?

Table 5-19 shows the percentages of enrollees who complete the program by age group, sex and urban or rural county. Overall, 48.16% of enrollees completed the program (by the time of the data analysis). This is a minimum estimate because it counts some participants who are legitimately still part of the program. Interestingly, the data indicate that some of the groups with the lowest participation rates (drivers aged 21–24 and 25–34, and females) have higher completion rates. This may indicate a strong self-selection bias, in that those from these generally under-represented groups who voluntarily enter the program are more motivated to complete it. It may also be due to the higher participation rate groups including a greater proportion of drivers who were cancelled-IPS.

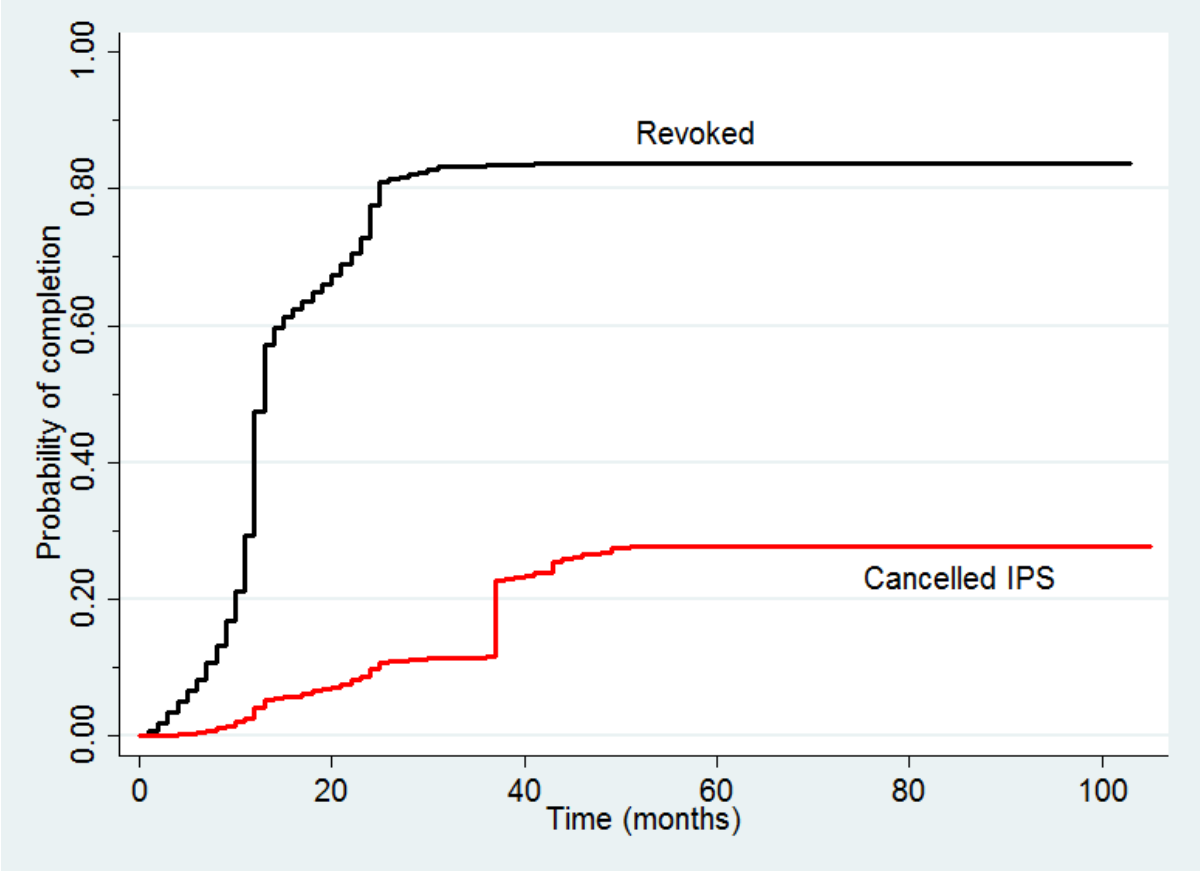
Table 5-19: Completion Rates for Participants by Age, Sex, and Type of County[1]

Group/Subgroup	Number of Completions	Percentage Completing
Total Enrollees	11,641	48.16
Age		
Under 21	4	50.00
21–24	375	69.06
25–34	4,194	55.38
35–44	2,912	47.89
45–54	2,314	41.68
55–64	1,399	40.39
65 and older	443	46.48
Sex		
Male	8,159	45.02
Female	3,464	57.62
Unknown	18	50.00
County		
Rural	4,989	47.36
Urban	6,652	48.78
Unknown	0	0.00

[1]All periods enrollments

Figure 5-1 shows the completion rates for drivers who were voluntarily in the program (revoked drivers) and those were required to enter the program (canceled-IPS). The graphs are based on a statistical model using survival analysis methods to estimate the time to complete the program over months. As the graphic shows, revoked drivers complete the program in fewer months (as expected). Their long-term estimated completion rate hits 80% after about 20 months based on the model. Drivers who were cancelled-IPS take longer to complete the program and their long-term completion rate is much lower than that for the revoked drivers (approximately 24% after 50 months). Over the full 100 months in this projection, revoked drivers reach 83.7% completion and the cancelled-IPS drivers reach only 27.7%.

Figure 5-1: Completion Rates for Revoked and Cancelled-IPS Participants



5.10 Who recidivates and in what length of time?

The observed recidivism rate for interlock program participants during the study period was 4.52%. This is based on the total of 526 recidivating participants divided by the total number of enrollees who completed the program (11,641) for the 2007–16 period. Table 5-20 shows the recidivism rates by age, sex and county type. The groups with the highest recidivism were drivers aged 21–24, females and those in urban counties.

Table 5-20: Recidivism Rates for Participants by Age, Sex and County Type

Group/Subgroup	Number of Enrollees Recidivated	Percentage Recidivating
Total	526	4.52
Age		
Under 21	0	0.00
21–24	26	6.93
25–34	199	4.74
35–44	121	4.16
45–54	109	4.71
55–64	54	3.86
65 and older	17	3.84
Sex		
Male	336	4.12
Female	190	5.48
Unknown	0	0.00
County		
Rural	213	4.27
Urban	313	4.71
Unknown	0	0.00

Table 5-21 through Table 5-25 show recidivism during the study period for participants who had completed the program. Data are grouped by age, sex, county type, prior violations and qualifying offense AC levels. The tables show recidivating drivers over months after program completion. None of the sub-groupings by age, sex or county type appear to differ across time. The level of prior violations does appear to affect the distribution of recidivism; however, the data table becomes sparse. For this reason, additional analyses were conducted to identify the factors that increase or decrease the risk of recidivating.

Table 5-21: Number of Drivers who Completed the Program and Recidivated, by Age and Time to Recidivism

Age Group	Within 6mo.	From 6 to under 12mo.	From 12 to under 24mo.	From 24 to under 36mo.	36mo. or longer	Total
21–24	10	7	9	0	0	26
25–34	55	54	71	17	2	199
35–44	23	44	41	10	3	121
45–54	26	35	34	12	2	109
55–64	10	23	17	1	3	54
65 and older	6	4	7	0	0	17
Total	130	167	179	40	10	526

Table 5-22: Number of Drivers who Completed the Program and Recidivated, by Sex and Time to Recidivism

Sex	Within 6mo.	From 6 to under 12mo.	From 12 to under 24mo.	From 24 to under 36mo.	36mo. or longer	Total
Male	86	104	113	26	7	336
Female	44	63	66	14	3	190
Total	130	167	179	40	10	526

Table 5-23: Number of Drivers who Completed the Program and Recidivated, by County Type and Time to Recidivism

County Type	Within 6mo.	From 6 to under 12mo.	From 12 to under 24mo.	From 24 to under 36mo.	36mo. or longer	Total
Rural	52	72	72	14	3	213
Urban	78	95	107	26	7	313
Total	130	167	179	40	10	526

Table 5-24: Number of Drivers who Completed the Program and Recidivated, by DWI Offense History and Time to Recidivism

DWI Offense History	Within 6mo.	From 6 to under 12mo.	From 12 to under 24mo.	From 24 to under 36mo.	36mo. or longer	Total
1st or 2nd DWI on record	73	82	99	22	7	283
2nd DWI in 10 years	41	64	58	14	3	180
3rd DWI on record	5	4	5	2	0	16
3d DWI in 10 years	9	15	16	2	0	42
4th DWI on record	0	1	0	0	0	1
4th DWI in 10 years	2	1	1	0	0	4
Total	130	167	179	40	10	526

Table 5-25: Number of Drivers who Completed the Program and Recidivated, by AC Level at Time of Arrest and Time to Recidivism

AC Level	Within 6mo.	From 6 to under 12mo.	From 12 to under 24mo.	From 24 to under 36mo.	36mo. or longer	Total
0.08–0.16	18	29	30	11	2	90
0.16 and over	91	119	132	24	7	373
No AC	21	19	17	5	1	63
Test refusal	*19*	*15*	*15*	*2*	*1*	*52*
Drug	*2*	*2*	*1*	*1*	*0*	*6*
Total	130	167	179	40	10	526

The data tables above tell only part of the recidivism story. Drivers in the interlock program may recidivate, but are expected to do so at a lower rate than comparable drivers who did not enter the program. The next set of analyses show the participants' recidivism rates in comparison to eligible drivers who did not enter the program. See the methodology section for a description of how the comparison group was defined and selected. To compare recidivism, program participants and comparable non-participants, the research team adopted a time-to-event technique

(also known as survival analysis). Survival analysis is designed to analyze data in which the outcomes are an event of interest and the time to that event. In this study, the event of interest is recidivism (any arrest for DWI-related offense) of a driver and time to that arrest. The study is designed to look at two group of drivers:

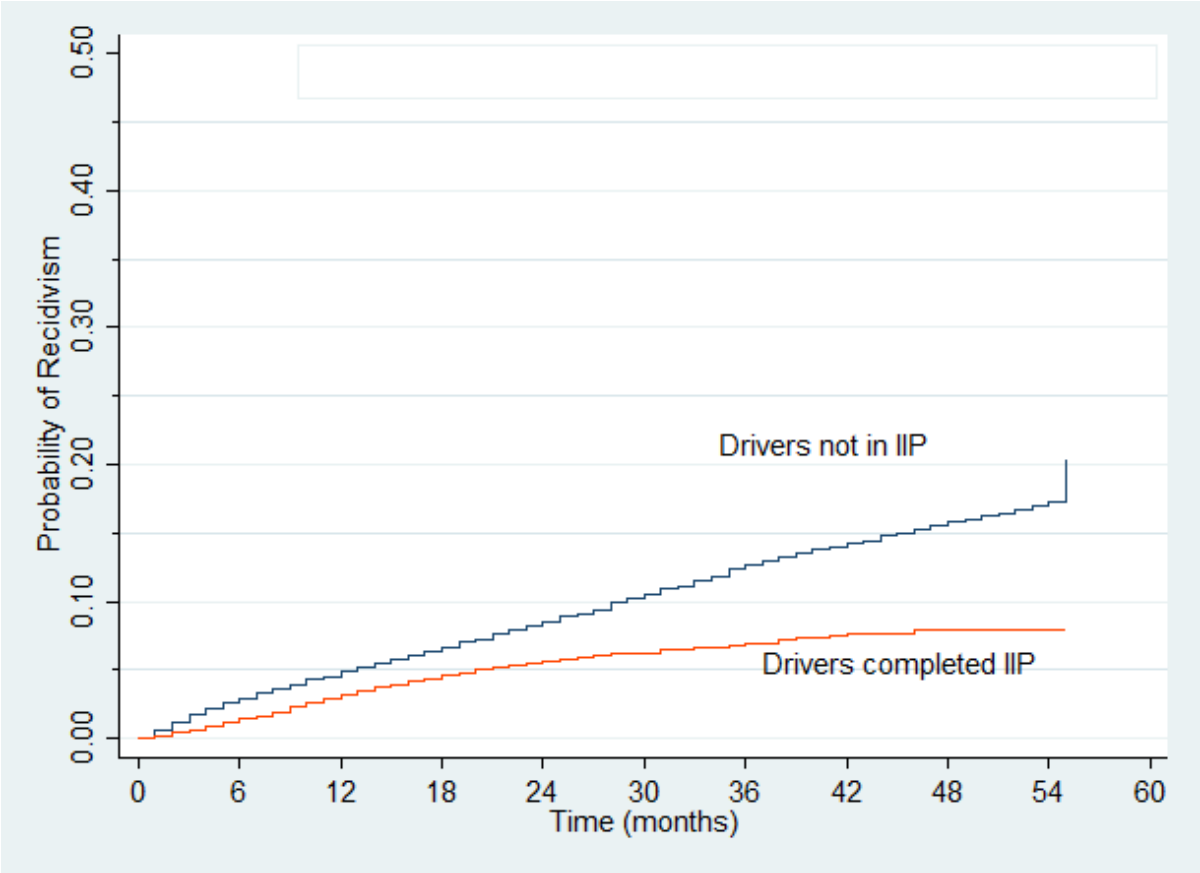
- those who enrolled and completed the interlock program
- comparable drivers who were eligible but did not participate in the program

The research team received program completion information for 11,641 drivers. Drivers without program completion information were excluded from this analysis. For each program participant, a comparable driver was selected from among those who did not enroll. Drivers were matched on age, sex, number of prior DWI offenses, and county. The methodology section describes the matching process in greater detail.

The driving records of these selected drivers were examined to extract DWI arrests during the study period. The analysis time for those drivers who completed the program starts on their completion dates. The analysis time for the comparison drivers (non-participant) starts on the date of DWI arrest that qualify them for the program. Thus, the analysis time for participant and non-participant groups are not identical. They are parallel but offset by the periods when participating drivers enrolled in the program. The analysis compensates for this by using time-to-event analysis method so that the only differences are that the non-participant group generally have more months of data available, but the time to failure is independent of start date for either group. The research team analyzed the driving records of drivers in both groups and tagged them if they were arrested for DWI. The cut-off date for the analysis period is March 31, 2016. If a driver did not recidivate before the cut-off date, that driver is coded as such and the analysis time ends there.

A Kaplan-Meier failure analysis was performed on the dataset for the probability of recidivism over time. Two separate curves were estimated for participant and non-participant groups. Figure 5-2 shows the Kaplan-Meier curves for the two groups.

Figure 5-2: Kaplan-Meier Survival Curves for Interlock and Non-Interlock Drivers



The curve for non-participant (not in IIP) drivers is consistently higher than for program participants (completed IIP). This indicates that the chances of recidivism are higher for non-participants for all months of the analysis. The effect increases in size over months. Overall, 4.5% of program participants recidivated during the study period. The analysis presented here shows a longer-term survival analysis, resulting in an 8% recidivism rate for program participants over the course of 54 months post-program. In a comparable time period, non-participants recidivate at more than double that rate (20%).

Table 5-26: Cox-proportional Hazard Model Parameter for Both Participant and Comparison Group

Variable	Description	Hazard Ratio	Std. Err.	P-value
treatment	Indicator for drivers completed the program (=1 if enrolled and completed, =0 if did not enroll)	0.61	0.032	0.000
bac_016	Indicator for AC value at time of arrest (=1 if AC at 0.16 or higher, =0 otherwise)	1.18	0.069	0.005
Refused	Indicator for refused test at time of arrest (=1 if test refused, =0 otherwise)	1.29	0.110	0.003
Drug	Indicator for drug use at time of arrest (=0 if used drug, =1 otherwise)	2.27	0.504	0.000
viol_01	Indicator for first time DWI offender at time of arrest (=1 if first offense, =0 otherwise)	0.89	0.046	0.028
Age	Age of driver (years)	0.98	0.002	0.000

Table 5-26 shows the parameters for a Cox-proportional hazard model using the combined data set of both drivers who completed the program and comparison drivers who did not enroll in the program. The dataset includes 11,641 records of drivers who completed the program and the same number of comparable drivers who did not enroll in the program. The model parameters reveal various factors that affect the likelihood of a driver getting arrested again. The estimated hazard ratios indicate how a given factor affects the likelihood of recidivism, in terms of direction and magnitude of the effect. A hazard ratio of one means that element does not affect the outcome one way or another. A hazard ratio larger than one suggests that the element of interest is associated with an increase in the likelihood of recidivism and a hazard ratio smaller than one means the opposite. The difference between the estimated hazard ratio and one indicates the magnitude of the effect. The key variable of interest in this model is “treatment”, indicating the group (i.e. program completion or comparison group of non-participants) to which the driver belongs. Other significant explanatory variables that predict an increased risk are AC≥0.16; test refusal; positive drug test. The variables associated with a significantly lower risk include 1st-time offender status and age. All estimates are significant at the $p<0.05$ level. The following summary provides interpretation of the variables and their impact on recidivism risk:

- With an estimated hazard ratio of 0.61, on average, those who completed the program (treatment=1) are 39% less likely to recidivate (get arrested for DWI again) than those who did not enroll in the program (i.e., the comparison group)
- Other variables including sex, urban/rural, second-time offender and third-time offender were also tested but did not result in acceptable levels of statistical significance so the research team decided not to include them in then model at the end. Adding and dropping these variables did not lead to a significant change in the estimated hazard ratio for "treatment", that means the estimate of the treatment effect is stable in spite of these elements.
- AC of 0.16 and above results in an estimated 18% increase in risk of recidivism. AC test refusal is associated with a 29% elevated risk of recidivating. A failed drug test results in a 127% elevated risk.
- First time offenders are 11% less likely to recidivate than those with more than one DWI offense in their history. As drivers age, their likelihood of recidivating drops slightly.

Table 5-27: Cox-proportional Hazard Model Parameter for Participant Group

Variable	Description	Hazard Ratio	Std. Err.	P-value
bac_016	Indicator for AC value at time of arrest (=1 if AC at 0.16 or higher, =0 otherwise)	1.587	0.196	0.000
refused	Indicator for refused test at time of arrest (=1 if test refused, =0 otherwise)	2.245	0.387	0.000
drug	Indicator for drug use at time of arrest (=0 if used drug, =1 otherwise)	2.616	1.092	0.021
viol_01	Indicator for first time DWI offender at time of arrest (=1 if first offense, =0 otherwise)	0.869	0.085	0.153
age	Age of driver (years)	0.991	0.004	0.012
male	Indicator for sex of driver (=1 if male, =0 otherwise)	0.799	0.073	0.015
startup_fail	Number of startup test failures during enrollment	1.009	0.001	0.000
test_fail	Number of rolling retest failures during enrollment	1.028	0.007	0.000

Table 5-27 shows the Cox-proportional hazard model using only the drivers who completed the program (i.e., no comparison group drivers are included and there is no test for a treatment effect). The dataset includes 11,641 records of drivers who completed the program. This model reveals the factors that have an effect on the risk of recidivism among those who went through and completed the program. The following is an interpretation of this model's results.

- An estimated hazard ratio of 1.578 for “bac_016” indicates that those who blew 0.16 at time of arrest or higher are 58.7% more likely to be arrested again after completion than other program participants. The estimate is statistically significant at 99 percent confidence level
- An estimated hazard ratio of 2.245 for “refused” indicates that those who refused a test at time of arrest are 124.5% (about 2.2 times) more likely to be arrested again after completion. The estimate is statistically significant at 99% confidence level
- An estimated hazard ratio of 2.616 for “drug” indicates that those who got arrested for drugged driving are 161.6% (about 2.6 times) more likely to get arrested again for a DWI violation after completion. The estimate is statistically significant at 95 percent confidence level
- An estimate hazard ratio of 0.869 for “viol_01” indicates that first time offenders are about 13.1% less likely to be arrested again after completion. The estimate is statistically significant at 80 percent confidence level
- An estimated hazard ratio of 0.991 for “age” indicates that the older the driver, the lower risk of recidivism. A year increase in age is associated with about 0.9% decrease in the relative risk. The estimate is statistically significant at 99% confidence level.
- An estimated hazard ratio of 0.799 indicates that male drivers are 20.1% less likely than female drivers to be arrested again after completion. The estimate is statistically significant at the 95 percent confidence level.
- The estimated hazard ratios for “startup_fail“and “test_fail” are 1.009 and 1.028, respectively. These numbers indicate that numbers of device start-up test and rolling retest failures are good predictors of the likelihood of recidivism. The increase of these failures during the program is strongly associated with an increased likelihood of recidivism. An additional failure for startup test or rolling retest is associated with about 0.9% or 2.8% increase, respectively, in the likelihood of recidivism.

While the model predicts a small increment in risk per failed test, Figure 5-3-3 shows that the cumulative effect over multiple test failures grows to be quite large. There were drivers in the program with more than 100 start-up failures and this analysis shows that such individuals are at a much higher risk of recidivating than other program participants. This model predicts a straight-line relationship between number of failures and risk; however, this should not be interpreted to mean that the relationship must be linear. Further research may uncover a more complex mathematical relationship.

Figure 5-3: The Relationship Between Number of Startup Test Failures During Enrollment and the Relative Risk of Recidivism

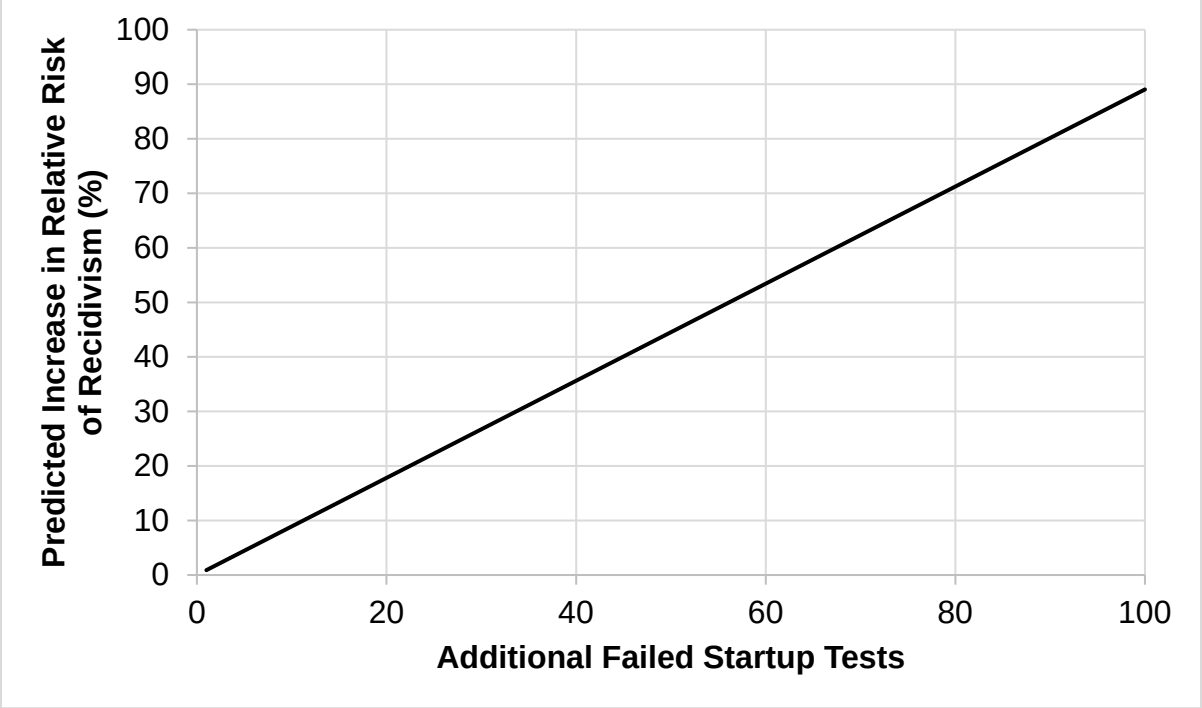
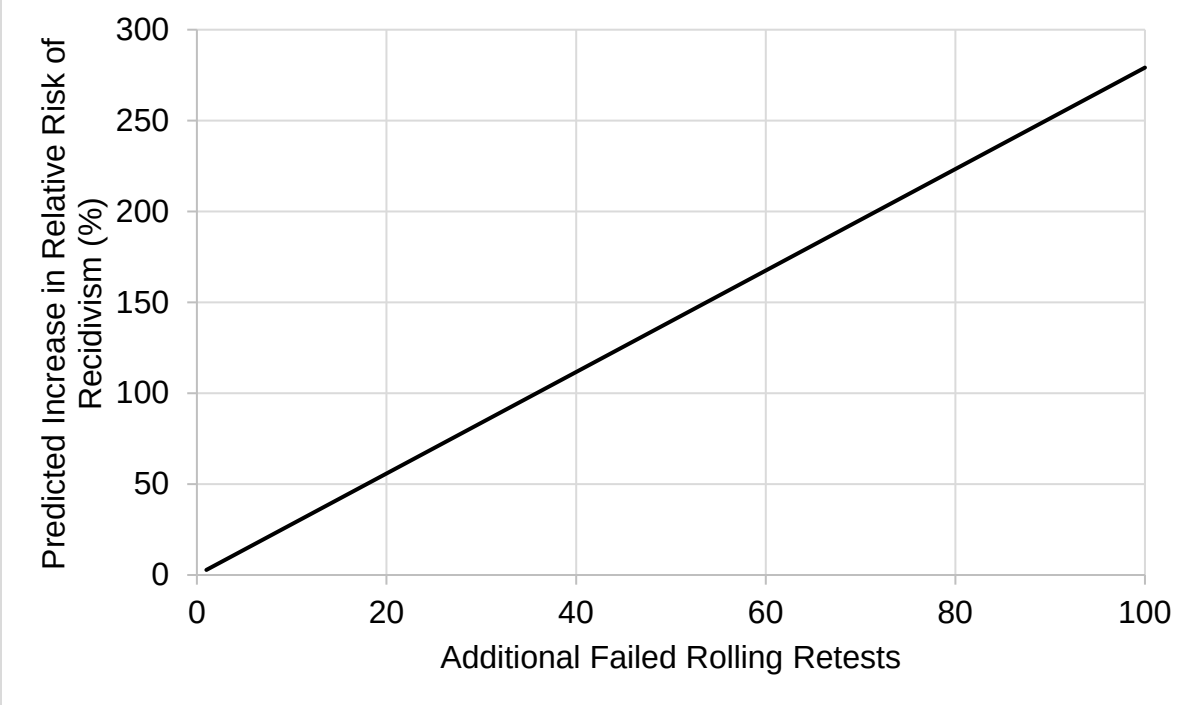


Figure 5-4 shows that the relationship between rolling re-test failures and increased likelihood of recidivism is also quite strong. Cumulative over successive rolling retest failures, the risk nearly quadruples for those with 100 or more rolling re-test violations. Those with 35 rolling re-test failures are twice as likely to recidivate as those with no re-test failures. As with Figure 5-3-3, this straight-line relationship is a product of the modeling technique. The true relationship may be more complex.

Figure 5-4: The Relationship Between Number of Rolling Re-test Failures During Enrollment and the Relative Risk of Recidivism



5.11 While in the program, how many re-offend, how often, and who are they?

Table 5-28 through Table 5-30 present data on recidivism during enrollment for all drivers who have completed the program. The data are based on DVS driver history data and show convictions for any DWI-related offense. These are offenses committed while the driver is in the program, regardless of whether or not they occurred in the interlock device-equipped vehicle. The tables show violation numbers by age, sex and county type. The tables show the number of post-program DWI arrests. The vast majority of active program drivers who did recidivate have only done so only once; however, over 7% committed two or more DWI offenses while still active in the program.

Table 5-28: Number of Enrollees who Re-offended, by Age Group and Number of DWI Arrests While in the Program

Age Group	One DWI Arrest	Two DWI Arrests	Three DWI Arrest	At Least One DWI Arrest
Under 21	2	0	0	2
21–24	14	2	0	16
25–34	149	8	0	157
35–44	118	8	0	126
45–54	131	6	1	138
55–64	73	10	0	83
65 and older	12	3	0	15
Total	499	37	1	537

Table 5-29: Number of Enrollees who Re-offended by Sex and Number of DWI Arrests while in the Program

Sex	One DWI Arrest	Two DWI Arrests	Three DWI Arrest	At Least One DWI Arrest
Male	388	33	1	422
Female	111	4	0	115
Unknown	0	0	0	0
Grand Total	499	37	1	537

Table 5-30: Number of Enrollees who Re-offended by County Type and Number of DWI Arrests while in the Program

County Type	One DWI Arrest	Two DWI Arrests	Three DWI Arrest	At Least One DWI Arrest
Rural	229	15		244
Urban	270	22	1	293
Total	499	37	1	537

5.12 How many failed AC tests were logged on the device?

Based on data supplied by vendors, Table 5-31 and Table 5-32 display failed tests at start up and rolling retests for all participants throughout the duration of the study. Table 5-31 shows the number of failed start-up tests and the AC-value recorded for each participants' first month in the program, and for all subsequent months combined. Based on this data, it can be said that the ignition interlock program has so far prevented at least 12,302 instances of drunk drivers (i.e., 0.08 AC and above) from

starting their vehicles. The highest number of failed start up tests was within the 0.021–0.039 AC level range.

Table 5-31: Number of Failed AC Start up Tests

AC Level	First Month	After the First Month	Total
Under 0.02	473	3,978	4,451
From 0.021 to 0.039	7,000	85,153	92,153
From 0.04 to 0.079	3,547	32,205	35,752
From 0.08 to 0.159	1,309	9,310	10,619
0.16 or higher	187	1,496	1,683
Total	12,516	132,142	144,658

Table 5-32 shows the recorded AC value and number of failed rolling retests for all program participants during their first month and all subsequent months combined. There were 24,173 enrollments over the study period. On average, each enrollee experienced 5.98 failed startup tests and 1.39 rolling re-test failures. Again the highest number of failed rolling re-test tests was within the 0.021–0.039 AC level range.

Table 5-32: Number of Failed Rolling Retests

AC Level	First Month	After the First Month	Total
Under 0.02	49	862	911
From 0.021 to 0.039	1,937	25,133	27,070
From 0.04 to 0.079	382	3,894	4,276
From 0.08 to 0.159	84	883	967
0.16 or higher	25	290	315
Total	2,477	31,062	33,539

As noted earlier, on average participants stay in the program for 412 days (almost 14 months). In the aggregate, any single month should account for 7.69% of the total test failures. The first month accounted for 8.65% of startup test failures indicating a small familiarization effect for startup testing. The rolling retests, conversely, do not show evidence of a familiarization effect—the first month accounted for 7.38% of total rolling retest failures.

5.13 How many times did participants use the device while in the program? What was the mileage driven during participation?

This analysis also relies on vendor data. Most of the vendor records do not include mileage readings. As an alternative, the analytic team developed a method for tracking individual trips using the interlock device event data (successful engine start and ignition off). The data were

cleansed of records when the engine was started and immediately turned off (a start and engine off within two minutes and no intervening events). For analytic purposes, trips of greater than two hours' duration were also excluded. This resulted in exclusion of 2.4 million trips (just under 9%) out of a total of over 27 million trips. Table 5-33 shows the distribution of trip duration over all participants. The median trip lasted about 14 minutes.

Table 5-33: Participants' Trip Durations

Trip Duration	Number of Trips	Percent
Under 5 min	3,197,791	12.86%
From 5 min to 14 min and 59 sec.	9,382,334	37.73%
From 15 min to 29 min and 59 sec.	7,235,075	29.09%
From 30 min to 59 min and 59 sec.	4,051,933	16.29%
From 60 min to 120 min	1,002,940	4.03%
Total	24,870,073	100%

5.14 What was the rate of failed AC tests over the program?

On average, each enrollee completed 1,028 trips using the interlock, which amounts to 2.5 trips per enrollee per day over the average of 412 days on the program. Comparing the total number of failures (shown in Table 5-31 and Table 5-32) to the total number of trips, the probability of a failure on any given trip is 0.007, or less than 1% of trips including any failure (startup failure or rolling retest failure).

5.15 Who supplies failed AC tests?

Even though startup and rolling re-test failures were rare events, the distribution of failures among participants is important. Most participants experience very few failures throughout the entire time on the program while others experienced multiple failures (with some participants having 100 or more). Table 5-34 through Table 5-39 show the startup and rolling retest failures by age group, by sex, and by rural/urban county. Table 5-40 and Table 5-41 show the test failures as a function of AC level upon qualifying arrest. For all groupings, the most frequent number of failures is fewer than 5. Just under 30% of startup failures were committed by drivers who committed 10 or more. Those with 10 or more rolling retest failures accounted for 10% of all rolling re-test failures.

Table 5-34: Start up Failure by Age

Age Group	Under 5 Fails	5 to 9 Fails	10 to 19 Fails	20 to 49 Fails	50 to 99 Fails	100 or More Fails	Total
Under 21	2	0	1	0	0	0	3
21–24	176	84	61	34	10	3	368
25–34	2,199	1,096	804	557	122	32	4,810
35–44	1,763	791	584	372	69	20	3,599
45–54	1,646	668	491	290	56	21	3,172
55–64	971	375	275	186	26	12	1,845
65 and Older	273	84	69	37	6	4	473
Total	7,030	3,098	2,285	1,476	289	92	14,270

Table 5-35: Rolling Retest Failure by Age

Age Group	Under 5 Fails	5 to 9 Fails	10 to 19 Fails	20 to 49 Fails	50 to 99 Fails	100 or More Fails	Total
Under 21	2	0	0	0	0	0	2
21–24	119	25	6	1	2	0	153
25–34	1,834	440	187	54	4	0	2,519
35–44	1,483	351	149	43	3	0	2,029
45–54	1,310	293	124	40	5	1	1,773
55–64	750	188	105	26	3	0	1,072
65 and Older	227	39	24	2	2	0	294
Total	5,725	1,336	595	166	19	1	7,842

Table 5-36: Start up Failure by Sex

Sex	Under 5 Fails	5 to 9 Fails	10 to 19 Fails	20 to 49 Fails	50 to 99 Fails	100 or More Fails	Total
Male	5,332	2,205	1,636	1,022	185	58	10,438
Female	1,686	887	647	453	104	34	3,811
Others/ Unknown	12	6	2	1	0	0	21
Total	7,030	3,098	2,285	1,476	289	92	14,270

Table 5-37: Rolling Retest Failure by Sex

Sex	Under 5 Fails	5 to 9 Fails	10 to 19 Fails	20 to 49 Fails	50 to 99 Fails	100 or More Fails	Total
Male	4,313	1,007	453	115	12	1	5,901
Female	1,405	328	141	51	7	0	1,932
Others/ Unknown	7	1	1	0	0	0	9
Total	5,725	1,336	595	166	19	1	7,842

Table 5-38: Start up Failure by County Type

County Type	Under 5 Fails	5 to 9 Fails	10 to 19 Fails	20 to 49 Fails	50 to 99 Fails	100 or More Fails	Total
Rural	3,141	1,217	815	492	98	34	5,797
Urban	3,889	1,881	1,470	984	191	58	8,473
Total	7,030	3,098	2,285	1,476	289	92	14,270

Table 5-39: Rolling Retest Failure by County Type

County Type	Under 5 Fails	5 to 9 Fails	10 to 19 Fails	20 to 49 Fails	50 to 99 Fails	100 or More Fails	Total
Rural	2,465	560	219	58	5	1	3,308
Urban	3,260	776	376	108	14	0	4,534
Total	5,725	1,336	595	166	19	1	7,842

Table 5-40: Start up Failure by AC Level at Time of Arrest

AC Level	Under 5 Fails	5 to 9 Fails	10 to 19 Fails	20 to 49 Fails	50 to 99 Fails	100 or More Fails	Total
0.08–0.16	1,706	693	490	295	52	16	3,252
0.16 and over	4,134	1,924	1,436	948	190	63	8,695
No AC	1,190	481	359	233	47	13	2,323
Test refusal	*911*	*377*	*291*	*186*	*41*	*12*	*1,818*
Drug	*71*	*28*	*20*	*14*	*0*	*1*	*134*
Total	7,030	3,098	2,285	1,476	289	92	14,270

Table 5-41: Rolling Re-test Failure by AC Level at Time of Arrest

AC Level	Under 5 Fails	5 to 9 Fails	10 to 19 Fails	20 to 49 Fails	50 to 99 Fails	100 or More Fails	Total
0.08–0.16	1,419	309	141	39	3	0	1,911
0.16 and over	3,302	770	322	91	11	0	4,496
No AC	1,004	257	132	36	5	1	1,435
Test refusal	*788*	*198*	*112*	*30*	*4*	*1*	*1,133*
Drug	*67*	*22*	*4*	*3*	*0*	*0*	*96*
Total	5,725	1,336	595	166	19	1	7,842

5.16What program factors predict success?

Table 5-42 shows Cox-proportional hazard model estimation using the dataset of 24,173 interlock program enrollments of which 11,641 completed. This model reveals the various factors that affect the likelihood of a driver completing the program.

Table 5-42: Cox Proportional Hazard Model Parameters for Program Completion Analysis

Variable	Description	Hazard Ratio	Std. Error	P-value
bac_016	Indicator for AC value at time of arrest (=1 if AC at 0.16 or higher, =0 otherwise)	0.596	0.014	0.00
refused	Indicator for refused test at time of arrest (=1 if test refused, =0 otherwise)	0.492	0.019	0.00
drug	Indicator for drug use at time of arrest (=0 if used drug, =1 otherwise)	0.836	0.098	0.13
viol_20	Indicator for second DWI offense in 10 years (=1 if second DWI in 10 years, =0 otherwise)	0.431	0.010	0.00
viol_03	Indicator for third DWI offense on record (=1 if third DWI on record, =0 otherwise)	0.411	0.018	0.00
viol_30	Indicator for third DWI offense in 10 years (=1 if third DWI in 10 years, =0 otherwise)	0.152	0.005	0.00
viol_04	Indicator for fourth DWI offense on record (=1 if fourth DWI on record, =0 otherwise)	0.063	0.006	0.00
viol_40	Indicator for fourth DWI offense in 10 years (=1 if fourth DWI in 10 years, =0 otherwise)	0.046	0.003	0.00
viol_05	Indicator for fifth or more DWI on record (=1 if fifth or more DWI on record, =0 otherwise)	0.008	0.001	0.00
age	Driver's age (years)	0.998	0.001	0.02
male	Indicator for driver's sex (=1 if male, =0 otherwise)	1.034	0.021	0.10

Variable	Description	Hazard Ratio	Std. Error	P-value
urban	Indicator for urban/rural (=1 if driver from urban county, =0 otherwise)	0.893	0.017	0.00
terminate	Indicator for program termination (=1 if driver is terminated from program, =0 otherwise)	0.384	0.099	0.00
startup_percent	Percent of failed ignition interlock startup test over total startup attempts	0.964	0.006	0.00
roll_fail_refuse	Percent of total failed and refused rolling re-tests over total rolling retest requests	0.941	0.007	0.00
extension	Indicator for program extension during enrollment (=1 if extended, =0 otherwise)	0.863	0.020	0.00
startover	Indicator for program startover during enrollment (=1 if started over, =0 otherwise)	0.084	0.011	0.00

Some key highlights of these findings include:

- An estimated hazard ratio of 0.596 for “bac_016” indicates that people who had a AC level of 0.16 or higher at the time of arrest are 40.4% less likely to complete the program, compared to people who blew a AC level of less than 0.16. The estimate is statistically significant at 99 percent confidence level.
- Estimated hazard ratios of 0.492 and 0.836 for “refused” and “drug”, respectively indicate that people who refused test or used drug at the time of arrest are 50.8% and 16.4% less likely to complete the program. The estimates are statistically significant at 99 confidence levels for “refused”. The result for and “drug” did not reach significance.
- The results also indicate that qualifying level of violation is also a good predictor of success. The more severe the DWI violation at the time of arrest, the less likely the driver will complete the program. With estimated hazard ratios of 0.431, 0.411, 0.152, 0.063, 0.046 and 0.008, people who had the second DWI in 10 years, third on record, third in 10 years, fourth on record, fourth in 10 years and fifth or more on record are 56.9%, 58.9, 84.8%, 93.7%, 95.4%,

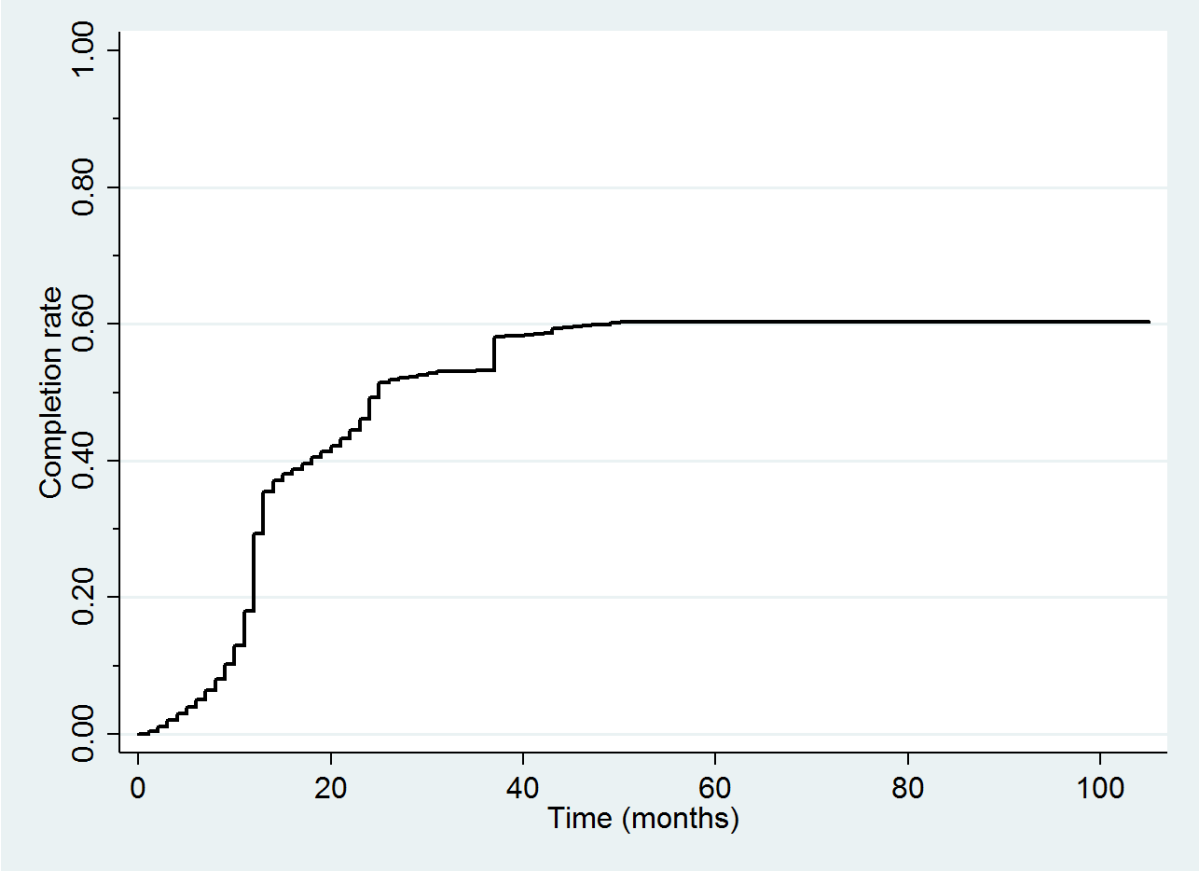
and 99.2% less likely to complete the program, compared to the first time offender. The estimates are statistically significant at the 99 percent confidence level.

- Age is also a predictor of success. Drivers who are older are more likely to complete the program. The estimate is statistically significant at 95 percent confidence level.
- Male drivers are about 3.4% more likely to complete the program than females. The estimate is statistically significant at 90 percent confidence level.
- Drivers who live in urban counties are 10.7% less likely to complete the program. The estimate is statistically significant at 99 percent confidence level.
- Percentages of failed startup tests, failed and refused rolling re-tests are all good predictors of success. People who have higher percentages of these failures among all recorded events are less likely to complete the program. Similarly, people whose enrollments were extended or started over are also less likely to complete the program. All estimates are statistically significant at 99 percent confidence level.

5.17 What is the program completion rate?

The observed completion rate was 48.2% during the course of this study. That is based on 11,641 completions versus 24,173 enrollments. This does not tell the whole story because some of the individuals currently in the program will eventually complete it given sufficient time. Figure 5-5 shows the long-term probability based on a Kaplan-Meier estimation. Long term, 60% of interlock participants can be expected to successfully complete the program.

Figure 5-5: Probability of Interlock Program Completion Over Time



5.18 How many continue to use ignition interlock after successfully completing the program?

Overall, 7.17% of participants who completed the program kept the device active on their vehicle for at least one month after completion. Of those who keep the device at least one month after completion, 3.72% kept it at least a year. The answer to this question is based on driver records and the vendor-supplied event records. Removal dates recorded by the vendors do not always match with completion dates in the driving records. This analysis sets a 14-day window for completion date to match to the vendor's recorded device removal date. If these dates are within 14 days of each other, they are not considered actual use of interlock device after completion. The assumption is that within that window, it just took some time for the driver to get the device removed after receiving approval/confirmation from DMV that all program requirements were satisfied. Table 5-43 through Table 5-46 show the number of completions and continued use of the device after completion as a function of age, sex, county type, and AC level.

Table 5-43: Device Retention as a Function of Age

Age Group	Not Retained	Up to 1mo.	1–2mo.	2–3mo.	3–6mo.	6–12mo.	More than 1yr.	Total Retained
Under 21	4	-	-	-	-	-	-	-
21–24	340	28	3	-	2	2	-	35
25–34	3,839	254	45	15	23	8	10	355
35–44	2,723	128	38	4	8	3	8	189
45–54	2,195	80	24	1	4	5	5	119
55–64	1,335	37	14	3	4	3	3	64
65 and older	426	9	1	-	4	-	3	17
Total	10,862	536	125	23	45	21	29	779

Table 5-44: Device Retention as a Function of Sex

Sex	Not Retained	Up to 1mo.	1–2mo.	2–3mo.	3–6mo.	6–12mo.	More than 1yr.	Total Retained
Male	7,620	374	87	18	27	14	19	539
Female	3,226	161	38	5	17	7	10	238
Unknown	16	1	-	-	1	-	-	2
Total	10,862	536	125	23	45	21	29	779

Table 5-45: Device Retention as a function of County Type

County Type	Not Retained	Up to 1mo.	1–2mo.	2–3mo.	3–6mo.	6–12mo.	More than 1yr.	Total Retained
Rural	4,639	225	65	13	24	9	14	350
Urban	6,223	311	60	10	21	12	15	429
Total	10,862	536	125	23	45	21	29	779

Table 5-46: Device Retention as a Function of AC Level at Time of Arrest.

AC level	Not Retained	Up to 1mo.	1–2mo.	2–3mo.	3–6mo.	6–12mo.	More than 1yr.	Total Retained
0.08–0.16	2,531	137	37	4	7	1	6	192
0.16 and over	7,305	348	72	18	31	16	20	505
No AC	1,026	51	16	1	7	4	3	82
Test refusal	*789*	*42*	*11*	*1*	*7*	*3*	*2*	*66*
Drug	*63*	*6*	*4*	-	-	-	*1*	*11*
Total	10,862	536	125	23	45	21	29	779

5.19 How successful is the ignition interlock program in bringing program participants to completion within the expected time frame?

Table 5-47 shows the number and percentage of completions and the time frame for those successful completions. Of all drivers who completed the program, more than 78% completed within the prescribed time frame. Of the remaining drivers, 97.7% were extended without having to start over. The extensions are a part of the program designed to allow drivers to stay in the program after a violation (for example failed test, missed calibration).

Table 5-47: Completion Timeframes for Participants who Successfully Completed the Program

Description	Number of Drivers	Percent	Percent
Completed within time frame	9,093	78.1%	
Not completed within timeframe	2,548	21.9%	
Extended	*2,489*		*97.7%*
Start over	*52*		*2.0%*
Both	*7*		*0.3%*
Total	11,641	100%	*100%*

5.20 What is the number of canceled drivers' licenses and who is cancelled-inimical to public safety?

Table 5-48 shows the number of participants who were cancelled inimical to public safety, while in the program, by age, sex, and county type. Cancelled participants are ejected from the program. They can re-enroll but no credit is given for time completed.

Table 5-48: Cancelled-IPS Participants by Age, Sex and County Type

Group/Subgroup	Number
Total	3,217
Age	
Under 21	1
21–24	19
25–34	800
35–44	798
45–54	918
55–64	568
65 and older	113
Sex	
Male	2,606
Female	609
Unknown	2
County	
Rural	1,468
Urban	1,749
Unknown	0

Table 5-49 shows the AC level of at the time of arrest for the 3,217 cancelled drivers.

Table 5-49: Number of Cancelled Drivers' by AC Levels at Time of Arrest

AC Level	Cancelled Participants	Number of Enrollees	Percentage Rate
0.08–0.16	914	5,831	15.7%
0.16 and over	1,393	13,927	10%
No AC	910	4,415	20.6%
Test refusal	*694*	*3,382*	-
Drug	*67*	*278*	-
Total	3,217	24,173	13.3%

5.21What are the reasons for cancellation?

Table 5-50 shows the reasons for license cancellations. Overall, 13.3% of participants have been cancelled from the interlock program. The majority (72%) were cancelled for violations of program provisions. DWI arrests (violations resulting in arrest by a law enforcement officer) resulted in 18% of participant cancellations. Cancelled participants can reenroll in the program but no credit is given for time completed.

Table 5-50: Number of Licenses Cancelled, by Reason for Cancellation

Reason for Cancellation	Number of Enrollees
Program violation	2,324
DWI arrest	591
AC under 0.08	*4*
AC 0.08–0.159	*100*
AC 0.16 and over	*131*
Test refusal	*161*
Drug	*35*
Unknown	*160*
Moving violation/Others	15
Unknown	287
Total	3,217

5.22How many re-apply?

Table 5-51 through Table 5-53 show the number of interlock program participants who re-applied, and the number of times they re-applied, by age, sex, and county type. Those who re-applied could include previous program graduates or participants who were disqualified from the

program for various violations. The data indicates that at 12% of participants have re-applied to the program at least once. Although the majority of people who re-apply do so only once (77%), 17% re-applied twice and 6% re-applied 3 or more times.

Table 5-51: Number of Drivers who Re-applied, by Age Group and Number of Re-applications

Age Group	Re-apply Once	Re-apply Twice	Re-apply Three Times or More	Total
21–24	37	3	1	41
25–34	674	116	39	829
35–44	550	125	47	722
45–54	545	142	49	736
55–64	344	95	30	469
65 and Older	74	20	10	104
Total	2,224	501	176	2,901

Table 5-52: Number of Drivers who Re-applied, by Sex and Number of Re-applications

Sex	Re-apply Once	Re-apply Twice	Re-apply Three Times or More	Total
Male	1,762	405	137	2,304
Female	460	96	39	595
Unknown	2	-	-	2
Total	2,224	501	176	2,901

Table 5-53: Number of Drivers who Re-applied by County Type and Number of Re-applications

County Type	Re-apply Once	Re-apply Twice	Re-apply Three Times or More	Total
Rural	981	230	66	1,277
Urban	1,243	271	110	1,624
Total	2,224	501	176	2,901

5.23 What are the numbers of citations and crashes of those in the program?

Driver history data supplied by DVS was used to tally the DWI and moving violations of the program participants and the comparison group. Table 5-54 shows the violations for the participants and Table 5-55 shows the same data for comparison group members. The time period is the same for both tables. As expected based on the recidivism analysis, the distribution of DWI violations differs between participants and the comparison group, with comparison group members having more DWI violations. The distribution of moving violations is similar between the two groups, although, again, the comparison group members have more moving violations than the program participants.

Table 5-54: Number of Enrollees who had DWI Violation, Moving Violation or Either During Enrollment

Number of Violations	Enrollees with DWI Violation	Enrollees with Moving Violation	Enrollees with Either
0	23,636	21,520	21,135
1	499	2,112	2,357
2	37	373	479
3	1	106	131
4 or more	0	62	71
Total	24,173	24,173	24,173

Table 5-55: Number of Drivers from the Comparison Group, by Number DWI Violations, Moving Violations or Either During Comparable Period

Number of Violations	DWI Violations	Moving Violations	Either DWI or Moving Violation
0	16,477	20,657	14,979
1	6,275	2,610	6,003
2	1,181	595	2,036
3	201	172	714
4 or more	39	139	441
Total	24,173	24,173	24,173

Paired t-tests were performed to compare the average number of violations for DWI, moving and those who committed either between the program participants and the comparison group. Table 5-56 shows the mean numbers of each violation category, and the 95% confidence intervals. All differences between the participants and comparison group were significant at the $p<0.05$ level.

Table 5-56: Pairwise Comparisons of Participants and Comparison Group on Numbers of Violations

Comparison Item	Participant Group (24,173 Enrollees)	Comparison Group (24,173 Drivers)
Average number of DWI violations *[95% confidence interval]*	0.024 [0.022, 0.026]	0.389 [0.381, 0.397]
Average number of moving violations *[95% confidence interval]*	0.144 [0.138, 0.150]	0.207 [0.199, 0.215]
Average number of either DWI or moving violations *[95% confidence interval]*	0.168 [0.161, 0.175]	0.596 [0.583, 0.608]

5.24 What is the effectiveness of the program in reducing DWI re-offenses?

This question has been answered two ways in preceding sections. The preceding analysis showed that in the short term, *while in the program,* participants experienced fewer arrests for DWI and moving violations. Depending on violation type the difference is between 30% (for moving violations) and 94% for DWI violations.

The ignition interlock program participation reduces the long-term risk of recidivism by 39% overall as presented in Section 5.10. Those for whom this was a first DWI violation see a further 12% reduction in risk of recidivating

5.25 What other variables are affected by participating and do they influence the program graduate's perception and intent of repeating the act of impaired driving?

This analysis makes use of survey data to model the impact of self-reported demographic, attitudinal and life circumstances on successful completion of the program. Readers are cautioned that this analysis was performed on the limited sample of those participants who completed a survey and also provided personally identifying information and their permission to use that information to link driver history to vendor device data. The analysis is in the form of a survival analysis akin to the others presented in earlier questions. For many of the results presented here, the significance levels have been relaxed from the norm because of the small number of observations. The reader is further cautioned to interpret this results carefully because of the small numbers of observations, and

the self-selected nature of the persons whose data is included. The model results are presented in Table 5-57. Highlights of the modeling results are:

- High AC, test refusals, cancelled-IPS status, test failures (startup failures and refused/missed rolling retests), and starting the program over are all factors that reduce the likelihood of completion.
- An estimated hazard ratio of 0.738 for “ms_divorced” indicates that divorced people are 26.2% less likely to complete the program. The estimate is statistically significant at 90 percent confidence level.
- An estimated hazard ratio of 1.280 for “Family_obligation” indicates that people who participated in the program for reasons related to their family obligation reasons are 28% more likely to complete the program. While the significance level for this result is not at the 95% confidence level or better, the result points to an interesting relationship that is worth further exploration.
- An estimated hazard ratio of 0.833 for “License_back_faster” indicates that people who cited “get license back faster” as a reason for program participation are 16.7% less likely to complete the program. The estimate is statistically significant at 75 percent confidence level.
- An estimated hazard ratio of 1.401 for “near_1” indicates that people who said they “have no doubts” in their ability to avoid DWI in the *near* future are 40.1% more likely to complete the program. The estimate is statistically significant at 90 percent confidence level.
- An estimated hazard ratio of 0.748 for “long_hi_conf” indicates that people who said they “have no doubts” or are “very confident” in their ability to avoid DWI in the *long term* future are 25.2% less likely to complete the program. The estimate is statistically significant at 85 percent confidence level.

Table 5-57: Risk Ratios for Estimating the Probability of Completing Program

Variable	Description	Hazard Ratio	Std. Error	P>z
bac_016	Indicator for AC value at time of arrest (=1 if AC at 0.16 or higher, =0 otherwise)	0.558	0.099	0.001
refused	Indicator for refused test at time of arrest (=1 if test refused, =0 otherwise)	0.361	0.098	0.000
cancelled_ IPS	Indicator for cancelled-IPS at time of arrest (=1 if third DWI in 10 years, fourth or more on records, =0 otherwise)	0.053	0.011	0.000
fail_plus_ refuse	Percent of total failed and refused rolling retests over total rolling retest requests	0.848	0.080	0.081
startover	Indicator for program startover during enrollment (=1 if started over, =0 otherwise)	0.281	0.117	0.002
ms_ divorced	Indicator for marital status at time of device removal/taking survey (=1 if divorced, =0 otherwise)	0.738	0.130	0.085
Family_ obligation	Indicator for survey question on decision to participate in the program (=1 if answer is “to meet family obligations”, =0 otherwise)	1.280	0.223	0.158
License_ back_ faster	Indicator survey question on decision to participate in the program (=1 if answer is “to get my license back faster”, =0 otherwise)	0.833	0.121	0.208
near_1	Indicator for very high level of confidence in the ability to avoid DWI in the near term (=1 if answer is “I have no doubts”, =0 otherwise)	1.401	0.245	0.054
long_ hi_conf	Indicator for high level of confidence in the ability to avoid DWI in the long term (=1 if answer is “I have no doubts” or “very confident”, =0 otherwise)	0.748	0.141	0.124

5.26 What is the impact of the ignition interlock program on public safety?

This question is answered by analyzing the overall number of crashes, fatalities and the number of alcohol-related deaths since the statewide pilot program was introduced in July 1, 2009. The data extracted from the annual Minnesota crash facts report and the record of interlock program enrollment is tabulated below.

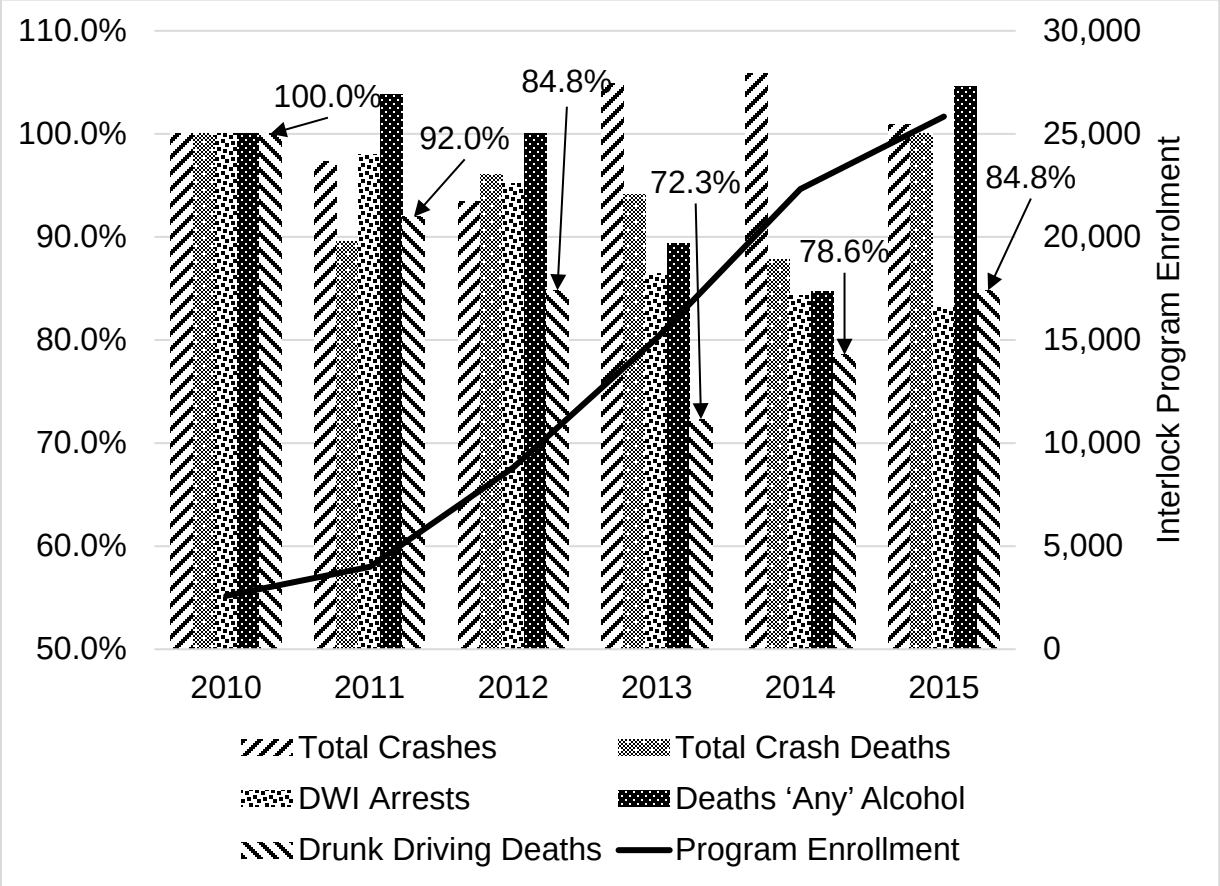
Table 5-58: Total Crash, DWI Arrests, Fatalities and Program Enrollment: Years 2010–15

Year	Total Crashes	Total Deaths	DWI Arrests	Deaths 'Any' Alcohol	Deaths 0.08 + Alcohol	Program Enrollment
2010	74,073	411	30,099	131	112	2,490
2011	72,117	368	29,504	136	103	1,407
2012	69,236	395	28,658	131	95	4,820
2013	77,707	387	26,032	117	81	6,280
2014	78,396	361	25,386	111	88	7,222
2015	74,772	411	25,027	137	95	3,521

Source: 2015 Minnesota Crash Facts

The data shows that total crashes and deaths have stayed at the same level from 2010 to 2015, with a slight dip in between. In contrast, DWI arrest have steadily decreased. This decrease is even more pronounced for impaired driving related deaths (i.e., where a driver with AC level over 0.08 is involved), from 112 in 2010 to 95 in 2015, a reduction of 15%. The graph below illustrates this trend using 2010 values as the base.

Figure 5-6: Total Crash, DWI Fatalities and Program Enrollment 2010–15



The graph shows a more significant reduction in DWI-related deaths compared to total crash deaths since the interlock program was started, indicating a positive contribution to public safety. These changes are taking place in a context of changing numbers of crashes and deaths in Minnesota. It is interesting to observe that even when crash frequency increased (as it did in 2013 and 2014) and when fatalities rose in 2015, the proportion of deaths in DWI crashes has decreased from the baseline year of 2010 and remained lower. Whether this improvement is entirely due to the impacts of the program is unclear. The research team does not wish to read that much into the data. The contribution of the interlock program is, however, undeniable. The thousands of drivers who completed the program have demonstrably reduced risk of recidivating as compared to their non-participating peers (other DWI violators with similar histories and demographics). Both while people are actively in the program, and for the long term after they complete the program, their risk of DWI recidivism is lowered. That translates directly to fewer DWI events than would otherwise be expected. The link to crash reductions is always more difficult to make as crashes are rare events with some

random variability and dependence on other factors besides the driver's level of intoxication. We do know from research conducted by NHTSA (DOT HS 812 117, February 2015) that crash risk rises to almost 4 times the baseline crash risk at 0.08 AC. At 0.16 AC—the most common alcohol level reported upon arrest for the program participants—crash risk is almost 15 times the baseline. It is not unreasonable to expect, then, that reduced DWI risk for interlock program participants translates into reduced crash risk.

6 Conclusions and Recommendations

6.1 Conclusions

The Minnesota Ignition Interlock Device Program is improving public safety by reducing recidivism among those who have driven while intoxicated. This evaluation examined participation and outcomes for interlock program participants and compared it with eligible drivers who did not participate in the program. The summary results are presented in the following two subsections.

6.1.1 Participation Evaluation

The overall participation rate of 21% compares favorably to evaluations in other states. As in the prior studies, this overall participation rate is a mix of those who joined the program voluntarily and those for whom the program is mandatory. Among those for whom the program is mandatory, 40.1% participated. Participation rates varied with age, sex and type of county (urban/rural) in which the person resides. The highest participation rates were for men, those in urban counties, and drivers over 45 years of age. Lowest participation rates were for women, those in rural counties, and drivers below 34 years of age (especially those below 24 years of age). As age increases; however, the opportunity to meet the criteria for mandatory program participation also increases. As a result, the age effect on participation may be partly due to those older drivers having a long-enough driving history to have accrued qualifying violations to the point where participation is mandatory for a greater proportion.

It is interesting, and a concern, that so many drivers choose not to join the interlock program in order to drive legally (albeit limited and tracked). The majority of those for whom the program is mandatory decide not to participate. For some of these individuals, their lack of participation may be due to incarceration and eventually they will join the program once they are released. For the majority, however, they are choosing to forgo the program entirely. The concern is that they are still driving, but doing so without the controls that the interlock program provides. If caught, they face severe penalties in Minnesota, but it is not known how many continue to drive or how much they drive. This was not part of the scope of this evaluation, except in-so-far as it was uncovered as part of the recidivism analysis.

While there is a consensus among researchers that license sanctions such as suspension or revocation can serve as effective countermeasures for driving-related offenses, notably alcohol-impaired driving (e.g., Nichols and Ross 1990; Siskind 1996; Voas and Tippetts 1997; Voas and Fisher 2001), it also has been long established that many unlicensed drivers

continue to drive, with some studies showing as many as 75% of suspended or revoked drivers (DeYoung et al. 1997). Similarly, an observational study of first-time impaired driving offenders who were suspended in Wisconsin and New Jersey for impaired driving reported that the prevalence of driving while suspended among first-time offenders was high, the prevalence of driving while suspended across jurisdictions varies widely, license suspension does affect driving patterns and perceptions of risk of detection and consequences are important factors that influence the magnitude of the problem (McCartt et al.2002). As a result, these license sanctions have inadvertently contributed to the creation of a particularly difficult problem in the road transportation system. Interlock devices have been identified and shown to be highly effective as an alternative measure to license revocation (e.g., Vanlaar et al. 2015, Beirness and Robertson 2003, Voas and Marques 2003, Vezina 2002, Tippetts and Voas 1997, Coben and Larkin 1999, Willis et al. 2005, Marques et al. 2010, McCartt et al. 2012, Casanova Powell et al. 2014).

6.1.2 Outcome Evaluation

Interlock program participation reduces recidivism. Program participants are less than half as likely to commit a new DWI offense than a matched group of non-participants. The differences appear to grow over time. One possible explanation is that participants are self-selected and are the more motivated from among the pool of candidates who are eligible for the program. This self-selection explanation says that at least some of the difference is due to the people who join the interlock program truly wanting to succeed and, as quickly as possible, drive legally without restrictions.

The findings from this study are consistent with other national interlock evaluations with regard to recidivism. A study of New Mexico's interlock program found that offenders who participated in the program had a 61% lower recidivism rate while the device was installed and a 39% lower recidivism rate following the removal of the interlock compared to offenders who never had the device installed (Marques et al. 2010). Similar reductions were found by Vanlaar et al. (2014) when evaluating Nova Scotia's interlock program. A meta-analysis of interlock programs conducted in 2005 found an average reduction of recidivism of 64% (Willis et al. 2005). It is clear from the research that interlocks have a positive impact on road safety because of the reductions in recidivism and alcohol-related crashes when installed.

But this is not the whole story. Within the participant group, there are predictive factors for success over the long term. Those who avoid failures during the program (failed start-up and rolling-retests) are more likely to avoid recidivating after the program. First-time offenders and

those found with lower AC values are also more likely to avoid recidivating after completing the program. The record of breath tests logged into an ignition interlock has been effective in predicting the future DWI recidivism risk. A study by Rauch in 2010 shows any alcohol-impaired driving violation, not just convictions, is a marker for future recidivism. In addition, a recent NHTSA study shows offenders with higher rates of failed AC tests have higher rates of post-ignition interlock recidivism (Mayer 2014).

Retention of participants within the interlock program also allows for increased participation rates. Interlock extensions in lieu of interlock removal have been identified as a viable alternative with regard to public safety and has been considered a “best practice” or recommendation for alcohol ignition interlock programs by several organizations. The NHTSA Ignition Interlock Institutes report included a number of recommendations for alcohol ignition interlock programs, including the compliance-based removal approach for interlocks, reinforcing compliance while imposing negative sanctions for non-compliance”. MADD published a follow-up report released February 2016, “How Technology Has Stopped 1.77 Million Drunk Drivers; A State by State Guide To Creating A Future of No More Victims,” which states that Arizona has had some of the highest interlock installation rates in the U.S. which includes a compliance-based removal component, which “has undoubtedly contributed to Arizona’s success in reducing drunk driving fatalities by 50 percent from 2007 to 2014.” In addition, the American Association of Motor Vehicle Administrators (AAMVA) released the Ignition Interlock Program Best Practices Guide which states that “although compliance based removal is a recommended best practice, more research is needed to determine the optimal amount of time for the designated period.”

6.2 Recommended Future Actions

Mandate all offenders to participate in the ignition interlock program

A recent NHTSA study by Casanova Powell et. al. (2015) provided “potentially promising practices” to increase interlock program participation. The strongest correlation found to increase program participation was a strong requirement or incentive for first offenders to install an interlock device. Several studies show that laws requiring all offenders to install an interlock device increased program participation, and in some cases significant increases were noted. A California DMV study based on a pilot program involving four counties showed that ignition interlocks are 74% more effective than license suspension alone in preventing repeat offenses for first-time offenders during first 182 days of use. During days 183 to 365 after installation, interlocks are 45% more

effective in preventing a repeat DWI incidence when compared to license suspension alone. The average time for those who successfully completed the interlock program in Minnesota is 412 days, however the majority of those enrolled in the program are repeat offenders. Legislative changes to mandate all offenders to participate in the program could lead to significant increases in participation in addition to reductions in recidivism.

Research has shown that drunk drivers can drink and drive more than 200 times before being apprehended (Beck et al. 1999). So, many drunk drivers who are arrested for the first time are, in fact, repeat drunk drivers who have previously avoided detection. Also, many first offenders frequently drive at high ACs that are more than twice the legal limit. They often also have some degree of alcohol abuse or dependency, as do repeat offenders (Rauch 2005). Interlocks have been proven to reduce recidivism among this population.

To further strengthen the rationale for implementing an all offender law, a study conducted in 2010 showed that recidivism rates among first offenders more closely resembles that of second offenders than of non-offenders. The study further illustrated that men and women are at equal risk of recidivating once they have had a first violation documented. (Rauch et.al 2010).

Mandating interlock orders for all first DWI convictions has also proven to reduce recidivism. A study conducted in Washington State showed that implementing an all offender law was associated with reductions in recidivism, even with low interlock use rates, and reductions in crashes (McCartt et.al.2013). This study also recommended that jurisdictions should reconsider permitting reductions in DWI charges to other traffic offenses without interlock order requirements.

Regarding the impact of ignition interlocks on crashes, recent studies have found significant reductions in alcohol-related crashes when programs implement an all offender law. Kaufman and Wiebe (2016) investigated the impact of state ignition interlock laws on alcohol-involved crash deaths in the U.S. using FARS data for 1999 to 2013 and found that requiring ignition interlocks for all drunk-driving convictions was associated with 15% fewer alcohol-involved crash deaths, compared to states with less-stringent requirements. Further evidence from the National Traffic Safety Board (NTSB) concludes that the installation of alcohol ignition interlocks on the vehicles of all DWI offenders would reduce crashes caused by alcohol-impaired drivers.

Enhance vendor monitoring of program participants and streamline vendor reporting

Effective monitoring of offenders has also shown to increase program participation (Casanova Powell et. al. 2015). Although it can be difficult for administrative interlock programs to monitor offenders, vendor monitoring of offenders can aid in the retention of program participants. Streamlining vendor reporting to allow consistency between vendors and increase vendor data accuracy is critical in the overall monitoring of offenders. Minnesota's recent efforts to require wireless transmittal of device data will help meet this objective. Having near real time data will help identify participants with high failed test rates early and provide time for additional intervention as they are less likely to successfully complete the interlock program.

Reduce program barriers

Removal of program barriers (such as delinquent child support payments and expired registration) linked to the license status and developing strategies to facilitate offender entry into the interlock program may also increase participation. The benefits of interlock program participation can be emphasized in relation to other alternatives, for example requiring in-home alcohol monitoring or vehicle impoundment that may be imposed on offenders who refuse to install an interlock. Linking the renewal of the registration of the vehicle to proof of interlock installation may increase notification of offenders who do not install an interlock device as required.

In addition, ejecting canceled IPS drivers who have a breath test fail from the program and then requiring them to re-enroll in the program may deter them from continuing and lead to an increased public hazard, as they may continue to drive without an interlock or other monitoring. Retaining these participants would not only increase participation but would also enhance public safety.

Research clearly indicates that offenders with ignition interlocks on their vehicles are at a substantially lower risk of re-offending, compared to offenders who have had their licenses suspended. The Cochrane Review (Willis et al. 2004) reported that when ignition interlock devices are used on the vehicles of convicted DWI offenders, recidivism is reduced by approximately a two-thirds for both first-time and repeat offenders. Elder et al. (2011) found similar results in a community guide which reviewed the data from many of the studies, which estimated the median effect as a reduction of 67 percent (range −85 to −50%) in recidivism. The above-mentioned Rauch study in 2010 and McCartt study in 2013 echoed these results.

Increase the role of treatment

Research has shown that programs which included treatment have higher success rates with participants and lower recidivism rates. Although Minnesota requires treatment for some offenders, expanding the treatment options to all interlock participants may not only improve retention and participation rates, but may also result in lowering recidivism rates. A recent study conducted by the Centers for Disease Control (CDC) (Voas, et.al 2016) showed results where the ignition interlock plus treatment group experienced 32% lower recidivism following the removal of the interlock during the 12–48 months when compared with the non-treatment group. It was estimated that this decline in recidivism would have prevented 41 rearrests, 13 crashes, and almost nine injuries in crashes involving the 640 treated offenders over the period following interlock removal. This study also provided strong support for the inclusion of treatment for offenders in interlock programs not only as a result of a risk assessment, but also based on the number of times they are “locked out.” Those offenders who were required to attend treatment reported a one-third lower DWI recidivism following their time on the interlock compared to similar untreated offenders. Implementing appropriate treatment in tandem with the interlock period will also maximize the benefit of the interlock program.

Greater stakeholder involvement

Ensuring that all agencies involved in the interlock program are educated about all aspects of the program is critical to an effective interlock program. Close cooperation and regular communications are necessary to keep the program operating effectively and efficiently. Even with administrative programs, involving the judiciary through an interlock judicial liaison or interagency taskforce can improve program communications and logistics between all agencies and increase stakeholder involvement. Judicial education can aid in improving interlock program outcomes in Minnesota. Outreach to judicial colleges and to state judicial educators is needed to encourage the inclusion of interlocks in educational programs. Sessions should focus on providing judges with an opportunity to learn about the research on device effectiveness, dispelling myths/misconceptions about interlocks, improving understanding of device technology, and highlighting ways that these devices are best applied. Greater awareness among judges about the availability and the importance of the interlock condition as an effective tool to prevent drunk driving may increase judicial support and encourage more consistent usage of these devices.

Although current stakeholder involvement is good, there is always room for improvement. It seems that the lines of communication and

communication protocols exist, however time restraints, readily available data and program resources may impede the ability for program agencies to be most efficient.

Improve data availability

Accurate, timely and accessible data is critical to the effectiveness of interlock programs (Casanova Powell et.al.). Data limitations are a common concern for most interlock programs. Several data elements needed to adequately evaluate the interlock program were available for this study; however, the timeliness of data availability can be improved. Electronic data systems and central repositories specific to interlock programs are helpful in this matter.

The implementation of real-time data reporting would allow program staff to monitor participants more closely to allow for identification of repetitive positive alcohol events which has proven to be a predictor of recidivism. Real-time data reporting is essential to applying immediate and appropriate penalties for these violations. As stated previously, research has shown that early intervention with regard to frequent interlock violations is substantially more effective in behavior change, i.e. correcting the drinking and driving behavior and lowering recidivism. This may also be an indication that those participants who continue to attempt to drive after drinking who are not enrolled in treatment may also be in need of treatment.

In addition, improving the automation and linkages of the data reporting process would increase the efficiency of the overall program. While the improvements to the existing system, and development of additional linkages, will require time and careful planning as well as resources, it can have many benefits including streamlining activities, reducing staff workload, improving communication, and enhancing offender tracking. Minnesota is a state with multiple interlock vendors and several agencies involved in the delivery of the interlock program, so the ability of different agencies to interface with the existing system could substantially improve communication among them. These benefits can lead to increased efficiency and savings in the long-term. Increased automation of data collection can provide solid data to identify where and why weaknesses in its interlock program are occurring and what strategies can be used to address these problems. The creation of an automated reporting system could also facilitate future interlock program evaluation efforts.

Enhance education effort

Ongoing public education is critical to increasing interlock program participation. This is particularly important for Minnesota's interlock program where legislation does not require first offenders to install an

interlock unless the first offender chooses to reduce their hard revocation period. A grassroots approach may be considered to entice offenders to participate in the program through efforts to change public perception of the program from a punitive measure to a positive mechanism to continue to allow driving privileges.

Improved communication regarding interlock program eligibility, specifically, increased awareness about the availability of the program, how offenders can participate or enroll in the program and the availability of indigency funding. It may be worthwhile to underscore the benefits of program participation to offenders. In this regard, the DTS may wish to explore opportunities to highlight the benefits of and incentives for participation. For example, offenders are able to maintain employment and access to better job opportunities because they can drive legally, earn more money, and have more time. In addition, offenders that opt into the program can avoid subsequent penalties associated with driving while suspended or revoked for DWI.

Finding additional venues to disseminate program information may increase participation. Interlock information can also be distributed through publicly accessible forms of communication including the use of a website, video or mobile application. Educational booths at state fairs, festivals and concerts where alcohol is likely to be consumed, would not only reach a large audience to distribute this information, but may also act as a deterrent to drinking and driving for event participants. Liquor enforcement agents may also be used to disseminate information when performing underage drinking operations. Research shows that college-age drinking is a national issue. Universities and colleges, in conjunction with treatment programs, are excellent venues to promote social norming campaigns regarding impaired driving and interlocks while targeting this population

7 References

K H Beck, W J Rauch, E A Baker, and A F Williams. Effects of ignition interlock license restrictions on drivers with multiple alcohol offenses: a randomized trial in Maryland. American Journal of Public Health November 1999: Vol. 89, No. 11, pp. 1696-1700. doi: 10.2105/AJPH.89.11.1696

Beirness, D.J., and Marques, P.R. (2004). Alcohol ignition interlock programs. Traffic Injury Prevention, Vol. 5, pp. 299-308.

Casanova Powel, T.D., Vanlaar, W.G.M., Robertson, R.D. (2016). Annual Ignition Interlock Survey: United States. Connecticut: Traffic Injury Research Foundation USA, Inc.

Casanova-Powell, T., Hedlund, J., W.A. Leaf, and Tison, J. (July 2015) Evaluation of State Ignition Interlock Programs-Interlock Rate Analysis of 28 States. Final Report, National Highway Traffic Safety Administration; Governors Highway Safety Association; Center for Disease Control. Contract DTNH22-H-11-00316

CDC (2012). The Community Guide: Reducing Alcohol-Impaired Driving: Ignition Interlocks www.thecommunityguide.org/mvoi/AID/ignitioninterlocks.html (accessed 10/23/13).

Compton, R. P. & Berning, A. (2015, February). Drug and alcohol crash risk. (Traffic Safety Facts Research Note. DOT HS 812 117). Washington, DC: National Highway Traffic Safety Administration.

Elder R.W., Voas R., Beirness D., et al. (2011). Task Force on Community Preventive Services. Effectiveness of ignition interlocks for preventing alcohol-impaired driving and alcohol-related crashes: a Community Guide systematic review. American Journal of Preventive Medicine Vol. 4(3), pp. 362–376.

FBI Uniform Crime Reports (2015). www.fbi.gov/about-us/cjis/ucr/crime-in-the-u.s/2015/crime-in-the-u.s.-2015/tables/10tbl29.xls (accessed 1/2016).

Fieldler, K., Brittle, C., and Stafford, S. (2012). Case Studies of Ignition Interlock Programs. DOT HS 811 594. Washington, DC: National Highway

Traffic Safety Administration.
www.nhtsa.gov/staticfiles/nti/pdf/811594.pdf

IIHS (2013). Highway Safety Laws in the U.S. Arlington, VA: Insurance Institute for Highway Safety. http://www.iihs.org/laws/default.aspx (accessed 1/2016).

Kaufman, E.J. and D.J. Wiebe. Impact of State Ignition Interlock Laws on Alcohol-Involved Crash Deaths in the United States. American Journal of Public Health: May 2016, Vol. 106, No. 5, pp. 865-871.

Marques, P.R., Voas, R.B., Roth, R., & Tippetts, S.A. (2010). Evaluation of the New Mexico Ignition Interlock Program. Report No. DOT HS 811 410. Washington, D.C.: National Highway Traffic Safety Administration.

Marques, P.R., and Voas, R.B. (2010). Key Features for Ignition Interlock Programs. DOT HS 811 262. Washington, DC: National Highway Traffic Safety Administration.
www.nhtsa.gov/staticfiles/nti/impaired_driving/pdf/811262.pdf

Mayer, R. (2014). Ignition Interlocks – What You Need to Know: A Toolkit for Policymakers, Highway Safety Professionals, and Advocates (2nd Edition). DOT HS 811 883. Washington, DC: National Highway Traffic Safety Administration.
www.nhtsa.gov/staticfiles/nti/impaired_driving/pdf/811883.pdf

McCartt, Leaf, Farmer, and Eichelberger. Washington State's Alcohol Ignition Interlock Law: Effects on Recidivism Among First-Time DUI Offenders. Traffic Injury Prevention, 2013.

National Highway Traffic Safety Administration (2014). Fatality Analysis Reporting System (FARS). http://www-fars.nhtsa.dot.gov/States/StatesAlcohol.

National Highway Traffic Safety Administration (2011). Countermeasures That Work. Publication No. DOT HS 811 444. Washington, DC: National Highway Traffic Safety Administration.
www.nhtsa.gov/staticfiles/nti/pdf/811444.pdf

National Transportation Safety Board "Highway Special Investigation Report Wrong-Way Driving", 2012.

Rauch, Zador, Ahlin, Howard, Frissell, and Duncan. “Risk of Alcohol-Impaired Driving Recidivism Among First Offenders And Multiple Offenders.” American Journal of Public Health, May 2010, Vol 100, No. 5.

Robertson, R.D., Holmes, E.A., and Vanlaar, W. (2013). Alcohol Interlock Programs: Data Management System Implementation. Ottawa, Ontario: Traffic Injury Research Foundation. http://tirf.ca/publications/PDF_publications/NHTSA_Tech_Assistance_DataManagement_9.pdf

Vanlaar, W., Mainegra Hing, M., Robertson, R. (2016). Nova Scotia Alcohol Ignition Interlock Program: Outcome Evaluation, Executive Report. Update of Report Prepared for the government of Nova Scotia. Ottawa, Ontario: Traffic Injury Research Foundation.

Voas, R.B., Tippetts, S., Bergen, G., Grosz, M., and P. Marques. Mandating Treatment Based on Interlock Performance: Evidence for Effectiveness. Alcoholism: Clinical and Experimental Research Vol. **, No. *
** 2016

APPENDIX A

Definition of Terms

Alcohol Concentration or AC – Describes the amount of alcohol in a person's blood, expressed as weight of alcohol per unit of volume of blood expressed in grams per deciliter (g/dL). For example, 0.08 percent AC indicates 80 mg of alcohol per 100 ml of blood. If measured using exhaled breath, corresponds to the number of grams of alcohol per 210 liters of breath. Also referred to as alcohol concentration.

Cancelled as inimical to public safety (IPS) – If the Commissioner of Public Safety has good cause to believe that the operation of a motor vehicle on the highways by a person would be inimical to public safety or welfare, the Commissioner has the authority to cancel driving privileges. A person is defined as inimical to public safety after three impaired driving arrests in ten years or four impaired driving arrests in a life time.

Device – Means an ignition interlock device.

DWI Incident – An alcohol-related offense associated with an implied consent and/or a DWI conviction. A person may have an implied consent incident on their driving record with no associated DWI conviction or a DWI conviction with no associated implied consent revocation. Either situation is considered a DWI incident. If a person has an implied consent violation and a conviction from the same incident, it is considered one incident.

Early recall – A condition, signaled by a visual and or audible indication on the device, that requires the participant to return the vehicle to the service provider for an unscheduled monitoring check.

Expungement - The process of going to court to ask a judge to seal a court record. The police, FBI, immigration officers, and other public officials may still see sealed court files for certain purposes.

Failed tests – A test result indicating that AC level equals or exceeds the startup set point value of 0.02.

Hard revocation – Revocation of driving privileges for which a limited license is not issued.

Hazard Ratio – Output parameter from Cox-proportional hazard model. The hazard ratio indicates how a given factor affects the likelihood of an

outcome, in terms of direction and magnitude of the effect. A hazard ratio of one means that element does not affect the outcome one way or another. A hazard ratio larger than one suggests that the element of interest is associated with an increase in the likelihood and a hazard ratio smaller than one means the opposite. The difference between the estimated hazard ratio and one indicates the magnitude of the effect.

Ignition interlock device – A breath alcohol analyzer that is connected to a motor vehicle ignition. In order to start the motor vehicle engine, a driver must blow an alveolar breath sample into the analyzer which measures the alcohol concentration. If the alcohol concentration exceeds the startup set point on the interlock device, the motor vehicle engine will not start.

Ignition Interlock Restricted License – Driver license issued that only allows the person to drive a vehicle only if an ignition interlock device is installed.

Interlock – A mechanism which prevents the motor vehicle from starting when the breath alcohol concentration exceeds a preset value.

Limited license – A paper license issued to a person while their driving privileges are revoked. Limited licenses allow driving to work, school, and abstinence based programs.

Participant – Means a participant in the ignition interlock program.

Program – Means the ignition interlock program.

Recidivism – An act of a person re-offending for an offense of driving while impaired.

Revocation – Loss of driving privileges.

Running retest – After passing the test allowing the engine to start, the device requires follow-up testing within random intervals.

Startup test – The initial breath test undertaken by the driver to start the car. The device must record a AC level below the pre-set level of 0.02 before the vehicle will start.

Service provider – The person or entity representing the manufacturer(s) of an approved device and responsible for the day-to-day operations of a service center

APPENDIX B

Minnesota Ignition Interlock Device Program Guidelines

MINNESOTA IGNITION INTERLOCK DEVICE PROGRAM

PROGRAM GUIDELINES

Table of Contents

Minnesota Ignition Interlock Device Program Guidelines

Scope

The purpose of this document is to establish program guidelines pursuant to Minnesota Statute section 171.306 Subd. 3 for participation in the Minnesota Ignition Interlock Device Program. These program guidelines do not apply to any probation or court requirements, nor is the State involved in any agreements with probation and/or the courts regarding use of the ignition interlock device. The Minnesota Ignition Interlock Device Program is administered by the Department of Public Safety (Department) Driver and Vehicle Services (DVS). The State reserves the right to change these guidelines as necessary.

What is an Ignition Interlock Device

An ignition interlock is a small device with a camera that is installed in a vehicle to measure an individual's alcohol concentration level. The device is installed near the steering wheel and connected to the engine. The camera, which is part of the ignition interlock device, is located on the windshield. When a person blows into the device his/her alcohol concentration level is detected and a photo is taken. If the device detects alcohol, the vehicle will not start. The device is also designed to collect random breath samples while the vehicle is being driven. When the person is driving, the device signals with a beep for the driver to breathe into it. If any alcohol is detected during a breath sample, the device will record the violation and DVS will be notified.

The length of time a participant must be on the ignition interlock device program depends on the number of prior offenses on the driving record and the length of time the participant has lost their driving privilege. This time period may be extended for any additional ignition interlock violations.

Options for Reinstatement

First Alcohol Offense

Alcohol concentration level under 0.16 or test refusal
Available options:

Option 1	An ignition interlock restricted license with full class D driving privileges
Option 2	After a 15 day waiting period of no driving, a limited license will be issued
Option 3	No driving for the revocation period

Alcohol concentration level of 0.16 or greater
Available options:

Option 1	An ignition interlock restricted license with full class D driving privileges.
Option 2	No driving for the revocation period

Second Alcohol Offense in 10 Years/Third on Record

Available options:

Option 1	An ignition interlock restricted license with full class D driving privileges
Option 2	No driving for the revocation period

Third Alcohol Offense in 10 Years/Four or More on Record

Ignition interlock required.

Criminal Vehicular Operation (CVO) Conviction involving alcohol (non-fatal)

Ignition Interlock required.

Length of Withdrawal

First Implied Consent or DWI	**Under 0.16 – 90 days/180 days if under age 21** **0.16 or over – 1 year** **Test refusal – 1 year**
Second Implied Consent or DWI in 10 Years or Third on Record	**Under 0.16 – 1 year** **0.16 or over – 2 year** **Test refusal – 2 year**
Third Implied Consent or DWI in 10 Years/Four or More on Record	**3 years (first year on a limited license)**
Fourth Implied Consent or DWI in 10	**4 years (first year on a limited license)**
Fifth or Subsequent Implied Consent or	**6 years (first year on a limited license)**
CVO – Bodily Harm	**2 to 6 years depending upon prior offenses**
CVO – Substantial Bodily Harm	**2 to 6 years depending upon prior offenses**
CVO – Great Bodily Harm	**6 to 10 years depending upon prior offenses**

Enrollment Procedures

Eligibility Requirements

To enroll in the ignition interlock device program, the driver must meet the following requirements:

- ✓ Must be at least 18 years old and eligible for a class D driver's license.
    - A canceled-IPS driver may enroll with an instruction permit.
- ✓ Own/drive a vehicle with valid insurance. The device can be installed on cars, pickup trucks and vans that can be operated with a class D license requiring no further endorsements. It cannot be installed on recreational vehicles, motor homes, motorcycles, mopeds, scooters or commercial vehicles.
- ✓ Have no outstanding withdrawals.
- ✓ If driving privilege was revoked prior to age 18, must not be subject to Vanessa's Law.
- ✓ If license plates have been impounded, go to the Deputy Registrar to purchase special plates. For questions regarding special registration plates, contact the plate impound unit at (651) 297-5034.
- ✓ If applicable, a Waiver of Rights form may be required for offenses under old statutes.

Application Materials

Please submit the following application materials. Application materials can be found on the Department's website at www.minnesotaignitioninterlock.org or by calling (651) 296-2948. *An interview with a driver evaluator is not required.*

- ✓ Pass the DWI knowledge test (MN residents only)
- ✓ Pay the $680 reinstatement fee and submit the receipt
- ✓ Apply for a new class D driver's license or instruction permit, pay the application fee and submit the receipt (MN residents only)
    - Commercial Driving License (CDL) privileges are not allowed while participating in the ignition interlock device program. Any CDL class holders must submit a signed statement to drop to a class D driver's license or apply for a class D license. To avoid having to retest, you must reapply for CDL privileges within one year of the date of class D application. For more information, please call (651) 297-5029.
- ✓ Special Review Awareness form (if required)

- ✓ Ignition Interlock Participation Agreement
- ✓ Submit a certificate of insurance for the vehicle(s) to be equipped with the ignition interlock device.
    - The submitted documentation must specify the name of the participant, if the participant is not the registered owner. The Department must be able to verify that the certificate of insurance is from the insurance company (not the insurance agent) by either the display of a company stamp or by a direct fax from the company.
- ✓ Canceled-IPS drivers only – Application for Ignition Interlock Limited License (see page 9 for more details)
- ✓ Canceled-IPS drivers only – Complete a chemical use assessment and comply with the recommendations if any. Proof of the chemical use assessment or proof of enrollment in treatment or other programs must be faxed directly to DVS at (651) 797-1738 by the assessor or treatment/program counselor. A Minnesota driver's license number or full name and date of birth must be included for verification purposes.
- ✓ Canceled-IPS drivers only – Last Use Statement
- ✓ If the offense is not yet displayed on the driver's record, the Department will require a copy of the 7-day temporary license (Notice and Order of Revocation) the driver received from law enforcement to verify the offense.

Submit application materials to:

Mail:	Minnesota Department of Public Safety Driver and Vehicle Services Ignition Interlock Unit, Suite 177 445 Minnesota St. St. Paul, MN 55101
Fax:	(651) 797-1299
E-mail:	dvs.ii@state.mn.us
Drop off:	Visit dvs.dps.mn.gov for a list of exam locations.

Installation of the Ignition Interlock Device

Please Note: While the device may be installed at any time during the process, a participant CANNOT legally drive until receiving a limited or restricted driver's license from DVS. If the application is ineligible or incomplete, there is no credit for installing the device. All fees associated with this program are the responsibility of the participant.

After successfully submitting all application materials, DVS will send a letter authorizing the installation of the ignition interlock device with camera. Upon receiving this authorization, select an ignition interlock manufacturer from the following list. The Department does not regulate cost. Each manufacturer will be able to answer questions regarding cost and location.

Draeger Safety Diagnostics, Inc.
www.dsdi4life.com
Ph: (800) 332-6858

ALCOLOCK
www.alcolockusa.com
Ph: (855) 855-4542

LifeSafer Interlock, Inc.
http://www.lifesafer.com
Ph: (800) 745-0331

Guardian Interlock Systems
http://www.guardianinterlock.com
Ph: (800) 499-0994

Smart Start MN
http://www.smartstartmn.com
Ph: (952) 224-7050 or (866) 966-5245

Intoxalock
http://www.intoxalock.com
Ph: (877) 777-5020

- ✓ Once a manufacturer has been selected, set up an appointment to have the device installed.
    - The participant must have someone drive them to and from the installation appointment, since the participant does not have a valid license.
- ✓ The manufacturer's service center will install the ignition interlock device on the vehicle(s).
    - The Vehicle Identification Number (VIN) of the vehicle(s) installed with the ignition interlock device MUST match the VIN on the certificate of insurance.
- ✓ During the installation appointment, the service center will provide training on how to use the device. Other persons who may be driving the vehicle(s) such as a spouse or child should attend the training session. ***Anyone driving the vehicle(s) will be required to blow into the ignition interlock device.***
- ✓ Once the ignition interlock device has been installed and DVS has received notice of the installation, DVS will issue the participant's limited or restricted license and enroll the individual in the ignition interlock device program.
    - The manufacturer will send the installation to DVS within 72 hours.
    - A participant can check their driving status by visiting dvs.dps.mn.gov. However, a person on a limited status cannot legally drive until the limited license is in their possession.

Participation Requirements

Scheduled Service and Monitoring Visits

Service appointments must be scheduled every 30 days. For a participant who chooses to install a wireless ignition interlock device, service appointments must be scheduled every 60 days. A participant is required to take their vehicle to a service center for regularly scheduled service appointments for the entire length of the ignition interlock device program. Skipping a calibration appointment is a program violation (see Violations and Administrative Sanctions section for more details).

The ignition interlock device records data on the breath tests and any violations, as well as information about how often the vehicle is used. Information from the device is downloaded by a computer program for analysis. A calibration check is also performed to verify the device is working as intended. The manufacturer sends a report to DVS with the data.

Early Recalls

There may be times when it is required to visit the service center before the 30 or 60 days have passed. This is called an early recall. An early recall will happen in the following situations:

- ✓ Six (6) initial start lockouts due to alcohol readings above the startup set point during a 30 day period;
- ✓ Three (3) reportable rolling retest violations of a positive alcohol reading;
- ✓ One (1) illegal start violation; or
- ✓ Any equipment malfunctioning.

When the device goes into an early recall, there is a five (5) day grace period to return to the service center. After five (5) days, the device will enter into a permanent lockout condition and the participant may be required to pay for towing. An early recall allows the vendor to reset the device.

Service and Monitoring Fees

The State of Minnesota does not collect any fees from the ignition interlock manufacturer or service center. The participant is responsible for all costs associated with participation in the ignition interlock device program. Costs are set by the ignition interlock manufacturer. The participant must still pay fees associated with reinstatement of the driver's license.
Contact each manufacturer for a list of their prices. Please remember there may be separate fees for installation, security deposits, monthly monitoring, lockouts, early recalls and removal. Also, some manufacturers may require a lease. It may be a yearly lease or a month-to-month lease.

Reduced Fee

A participant may qualify for reduced fees associated with the service and monitoring of the ignition interlock device. To apply for reduced service and monitoring fees, the participant must complete the Reduced Fee for Ignition Interlock Service and Monitoring form available on the Department's website at http://dvs.dps.mn.gov . After DVS reviews the application, the participant will be notified if he/she is eligible for the reduced service and monitoring fees. A participant is allowed to apply for the reduced service and monitoring fees once per tax year and must reapply yearly. The reduced fee is effective on the date of approval. It is not retroactive to the date of installation or any other service and monitoring fees. The reduced fee applies to only one vehicle.

Limited Licenses/Work Permit (Canceled-IPS drivers only)

A limited license is a paper license that is issued to a person while their driving privilege is withdrawn. Limited licenses allow driving to work, school and abstinence-based support programs. In addition, a program participant may also drive to and from a service center for ignition interlock servicing and calibration.

If the participant's license has been canceled and denied, the participant must be on a limited license for a minimum of one year with no program violations (see page 12) before receiving a restricted license on ignition interlock. A limited license can only be used 6 days a week and no more than 60 hours. ***You must pick a day that you do <u>not</u> drive.***

Rehabilitation Requirements

Treatment or other programs (if applicable) must be completed in order to be eligible for the restricted driver's license with ignition interlock. If the participant has been on a limited license for a minimum of one year but is still attending treatment or other programs, the participant must remain on the limited license until treatment or other programs are completed. Once complete, the treatment center, assessor, or alcohol/drug counselor must fax verification of successful completion of treatment or other programs directly to DVS at (651) 797-1738. If no treatment was necessary, a chemical use assessment stating that treatment was not required must be on record at DVS. After reviewing the verification of successful completion of treatment or other programs and the participant's monitoring reports, a driver's license with the ignition interlock restriction will be issued.

Verification of Abstinence

Revoked Status

During the last 90 days on the ignition interlock device program, a person whose driver's license is revoked must not have any failed breath tests (see page 10) recorded on the device. A failed breath test may extend the end of the program by 90 days from the date of the failed recorded breath test.

Canceled Status

A person whose driving privilege is canceled and denied must not have any failed breath tests recorded on the device during the length of the program. A failed breath test will require the participant to reenroll in the program and start their revocation time over.

In addition, a person whose driving privilege is canceled and denied must demonstrate abstinence by regular and consistent use of the ignition interlock device. The Department defines regular and consistent use as evidenced by 30 successful initial breath tests per month[1] (Minnesota Rule 7503.1725, Subp. 5(B)). This does not include rolling retests. If a participant's license is withdrawn for an unrelated offense during the time on the ignition interlock device program, the participant can continue to meet this requirement by blowing into the device but not driving the car. ***Failure to provide 30 initial breath tests per month will result in an extension of the program.***

If the participant is incarcerated, deployed by the military or out of the state for more than 30 days or if the vehicle becomes inoperable the following options are available:

1. The participant may voluntarily withdraw from the program (no driving privileges) and reenroll after the leave of absence. This may require signing new enrollment documents. The participant will receive credit for the time in the program until the withdrawal.
2. If the participant's manufacturer has a service center in another state, the participant may calibrate out-of-state. Monitoring reports must be sent to Minnesota DVS and the device must be set to Minnesota device standards. It is the participant's responsibility to notify the service center to send the reports to Minnesota.

Breath Tests

The ignition interlock device requires the driver to blow into the device. These breath tests are required and cannot be ignored. The service center will demonstrate how to blow into the device at the installation appointment. Before leaving the service center, make sure all drivers understand how to provide a breath test and can use the device. Please keep these things in mind:

- ✓ The device will have a specific blow pattern. The blow pattern may include a hum or it may involve an exhale/inhale pattern.
- ✓ The device is equipped with a camera. The camera will take a picture during all breath tests and any violations.
- ✓ A canceled driver is required to show proof of abstinence by providing 30 initial start breath tests during each month.

[1] A month is considered a 30-day period.

IMPORTANT: The participant is presumed to have provided all breath samples. Any indication of use of alcohol detected by the device will be ***considered use of alcohol*** by the participant and will be taken into consideration by the Department.

Initial Starts

The vehicle cannot be started legally without a breath test. The driver must blow into the device in order to start the car, and the device must record an alcohol concentration level below the pre-set level of 0.02 before the vehicle will start.

- ✓ If a failed initial breath test is recorded, the device will lock out for 5 minutes. After 5 minutes, the device will allow another breath test. The driver has 10 minutes to supply a passing breath test. Failure to provide a passing breath test is a violation.
- ✓ The driver should always rinse out their mouth with water before blowing into the device. If the device registers a failed test, it is very important to take a second test once the device allows. Without a confirming blow, the failure will be considered a violation.

Rolling Retests

A participant is required to submit breath tests while the vehicle is running. These are called rolling retests. After blowing into the device and passing the initial test to start the vehicle, the device will require a second random test within five (5) to seven (7) minutes. The device will continue to require additional rolling retests at random intervals between 15 and 45 minutes for the duration of travel. A warning light and/or tone will be activated to alert the driver that a rolling retest is required.

- ✓ When the device signals for a rolling retest, the driver will have ten (10) minutes to provide a passing breath test. Failure to provide a passing breath test is a violation.
- ✓ Use CAUTION when conducting a rolling retest. While it is not difficult to do a rolling retest while driving, DVS encourages participants to find a safe and legal area to pull over to take the rolling retest.
- ✓ Once the vehicle is started, it will signal for rolling retests. The driver must take these rolling retests. It is not an excuse that the driver was not in the vehicle, had to run into the house for something, or was just warming up the vehicle.

Skipped Rolling Retests

Skipping or ignoring a rolling retest is recorded and will activate an audible signal inside the vehicle. Failure to take three (3) rolling retests within a seven (7) day period will result in an extension of the ignition interlock device program.

Violations and Administrative Sanctions

Violation	Administrative Sanction
Tampering, circumventing or bypassing the device (MN Stat. 171.306 Subd. 5)	1st Offense – 180 days added to length of program 2nd Offense – 1 year added to length of program 3rd and Subsequent Offenses – 545 days added to length of program
Operating a vehicle not equipped with a certified ignition interlock device (MN Stat. 171.306 Subd. 5)	
Violation of the ignition interlock limited license (MN Stat. 171.306 Subd. 5)	
For canceled drivers, the failure to provide no fewer than 30 initial breath tests each month (verification of abstinence) (MN Rule 7503.1725 Subp. 5(B))	
Failure to bring the vehicle in for a service appointment every 30 days (or 60 days if the device is wireless) (MN Stat. 171.306)	
Three (3) failures to take a rolling retest within a seven (7) day period (MN Stat. 171.306 Subd. 5)	
For revoked drivers, an alcohol reading at or greater than .02 (MN Stat. 171.306 Subd. 4(e))	An additional 90 days from the date of the violation is added to the revocation period (only applies to the last 90 days of the program)
For canceled drivers, an alcohol reading at or greater than .02 (MN Stat. 171.306 Subd. 4(d))	The participant must reenroll in the program and start the revocation period over; new enrollment forms must be submitted

Tamper/Circumvent/Bypass

The following are examples of tampering, circumventing or bypassing the device:

- Having anyone other than an authorized service center remove the device
- After failing a breath test, having another person provide a passing breath test
- Moving, adjusting or blocking the camera from direct and unobstructed view of the driver's seat so that the face of the person providing the breath test is not visible
- Standing outside of the vehicle to take the breath test in order to avoid the camera
- Push starting the vehicle
- Disconnecting or cutting any wires which would interfere with the normal operation of the ignition interlock device
- Removing tamper-proof seals

These are considered violations and will result in an extension of the program. Contact your service center prior to having work done on your vehicle. The service center can work with your mechanic to avoid any tamper violations.

Administrative Reviews

If a participant disagrees with action taken by DVS on a violation, the participant may request an administrative review. DVS will review the participant's driving record only upon written request. The written request must include the participant's name, date of birth, driver's license number and signature. In addition, the request must include a detailed explanation of the incident(s) including any additional information that will assist DVS in making a decision. A copy of the withdrawal notice should be included. All administrative review decisions are final.

Requests for an administrative review can be sent by mail or faxed to (651) 282-2463.

Non-Ignition Interlock Related Withdrawals

The participant is still subject to all laws pertaining to maintaining their driving privilege.

If a participant's driver's license is withdrawn for an unrelated non-alcohol offense during the participant's time on the ignition interlock device program, the participant can continue to receive credit on the program. Although the participant cannot drive, the participant must continue to have the ignition interlock device serviced and calibrated to meet program requirements. However, because the participant cannot legally drive during withdrawal, a legally licensed person must drive the vehicle to and from service and calibration appointments. If the participant does not calibrate, it is a violation. A participant who does not want to calibrate the device may voluntarily withdraw from the program.

A person whose driving privilege has been canceled and denied must continue to demonstrate abstinence by regular and consistent use of the ignition interlock device. The participant can continue to meet this requirement by blowing into the device, but not driving the vehicle. If during the time of withdrawal the vehicle is parked on a public street, please be advised that you may be violating your withdrawal notice by operating a vehicle on a public street.

Vehicles

The ignition interlock device must be installed on any class D vehicle the participant will be driving. The device may be installed on multiple vehicles.

One Vehicle/Multiple Drivers

Anyone can drive the vehicle equipped with the ignition interlock device; however, anyone who drives the vehicle must be able to pass the breath tests. The participant is responsible for all readings registered by the ignition interlock device. Anyone who will be driving the vehicle with the ignition interlock device should attend the training session during the installation appointment.

Multiple Program Participants/One Vehicle

If more than one person driving the vehicle is on the Ignition Interlock Device Program, each participant must have their own device. This will require a vehicle for each participant.

Switching Vehicles

If the participant switches the device to a different vehicle, DVS may require a new certificate of insurance. The VIN of the vehicle and the VIN on the certificate of insurance must match. If the participant is not the registered owner of the vehicle, the certificate must reference the program participant by name. The Department must be able to verify that the certificate of insurance is from the insurance company (not the insurance agent) by either the display of a company stamp or by a direct fax from the company.

Special Registration Plates

If the participant is subject to license plate impoundment, the participant will be required to display special registration plates. For questions regarding special registration plates, contact the plate impound unit at (651) 297-5034.

Insurance

The participant must provide evidence that the vehicle is insured for 12 months; if the policy is a six month policy, the certificate must be provided for each six month period. If the device is switched to a different vehicle, a new insurance certificate for that vehicle must be provided.

Regardless of any ignition interlock requirements, the participant will continue to be subject to Minnesota no-fault insurance laws.

Please remember:

- ✓ It must be a certificate of insurance submitted by the home office of the insurance company. Proof of insurance is not acceptable.
- ✓ The Department must be able to verify that the certificate of insurance is from the insurance company (not the insurance agent) by either the display of a company stamp or by a direct fax from the company.
- ✓ The certificate must include a vehicle identification number (VIN).
- ✓ The VIN on the certificate must match the VIN on the installation report from the ignition interlock manufacturer.
- ✓ The submission documents must specify the name of the participant, if the participant is not the registered owner.

The certificate of insurance must be faxed to (651) 797-1299.

Employment Exemption

A participant may drive an ***employer-owned*** vehicle not equipped with an ignition interlock device while in the normal course and scope of employment duties (Minnesota Rule 7503.1775). The employer must apply for an employment exemption variance with DVS and provide written consent. The employment exemption variance will not be granted to:

- A participant who is self-employed; or
- A participant who wholly or partially owns an entity that owns an employer owned motor vehicle

A participant, who is granted an employment exemption variance, shall not drive, operate or be in physical control of any of the following:

- A Type III vehicle within the meaning of Minnesota Statute 169.011, for transporting children under age 18 or vulnerable adults within the meaning of Minnesota Statute 626.5572, Subd. 21;
- An employer-owned motor vehicle for personal use; or
- A rental car in the normal course and scope of employment duties

The participant must notify DVS within 15 days of changing or terminating employment.

If the employment exemption is granted, the participant must still install a device on their personal vehicle. Driving a vehicle equipped with the ignition interlock device is a requirement of the program. If applicable to your program, you must continue to supply 30 breath tests each month to verify abstinence.

Low Lung Capacity Issues

Upon written direction from the Department, manufacturers may adjust the ignition interlock device to accommodate participants with diminished lung capacity. The Department grants permission on a case-by-case basis. To be considered, the participant must submit a written request to the Department which includes the following:

1. Participant's name
2. Participant's address
3. Participant's driver's license number
4. Name of device manufacturer
5. Documentation from a licensed physician verifying and explaining the extent of the participant's diminished lung capacity. The letter must include the participant's lung capacity and Forced Vital Capacity.

The Department will contact the vendor directly to authorize an adjustment to the device.

Removing the Device

DVS will send a letter prior to the end date of the program to remind the participant to set up an appointment for a final calibration; however, the device ***should not be removed***. You may schedule your final calibration on or after your program end date. Upon successful completion of the program, a full reinstatement letter will be issued to the participant authorizing the removal of the device.

Once the participant receives a full reinstatement letter, the participant must:

- ✓ Schedule an appointment to remove the device
- ✓ Apply for a new or duplicate driver's license without the ignition interlock restriction
    - Note: The ignition interlock restriction will not be removed from the driving record until a new or duplicate license is applied for.

Voluntary Withdrawal

If the participant wishes to voluntarily withdraw from the ignition interlock device program, the person must sign the Voluntary Withdrawal form which can be found on the Department's website. Credit will be given for time spent on the program. Voluntarily withdrawing from the ignition interlock program does not stop violations from incurring. Until the driver's license has been re-revoked or re-canceled, the driver is responsible for all program violations and may be subject to program extensions or cancellation.

A revoked driver may sit out the remainder of the revocation with no driving privileges.
A canceled driver must complete the ignition interlock program and will have to reenroll in order to become a valid driver.

Frequently Asked Questions

Why does the device have a camera?

The camera will take a picture (or a series of pictures) during the initial breath test to start the car, during any rolling retests, and during any violations. This allows DVS to verify who is using the device and prevent the participant from using someone else to provide the breath tests. Although the participant is responsible for all breath samples provided, the photos will allow DVS to review photos if necessary.

In extreme weather, can I start my car and let it run until the car warms up or cools down?

No. The device will ask for random rolling retests while the vehicle is running. Failure to provide a breath sample will be considered a skipped rolling retest.

Who should I contact if I am having problems with my ignition interlock device?

If you have a complaint or concern regarding the service you are receiving from a certified ignition interlock manufacturer or service center, please contact that provider directly and request to speak to a manager or supervisor in their central office. If, after contacting the provider, you are still not satisfied with their response, please email your concerns to DVS at dvs.ii@state.mn.us. Please make sure to include your contact information including your name, driver's license number, date of birth, current interlock manufacturer, and a brief description of the issue.

Can the passenger blow into the device for the driver?

The driver of the vehicle should be the one providing all the breath tests.

Can I apply for an identification card?

You may apply for an identification card while on a limited license. However, the identification card must be invalidated before your plastic driver's license can be issued.

Who do I contact regarding special registration plates?

Contact the plate impound unit at (651) 297-5034.

Am I eligible to get off the program early for good behavior?

No. There is no reduction in the length of your enrollment.

What if I am enrolled in the partial pay program?

You will be allowed to participate in the ignition interlock device program after you have complied with the requirements of the partial pay program and have paid your first installment. If you fail to make the second payment, you are no longer eligible to participate in the program.

What if I am on the Minnesota ignition interlock device program and I move to another state?

You can continue to have the ignition interlock device calibrated by an ignition interlock manufacturer in another state. The ignition interlock manufacturer must be certified by the State of Minnesota and set to Minnesota device standards. Monitoring reports should be sent to Minnesota in order to continue receiving credit in the program.

Will the interlock shut off my engine or stop my vehicle?

No. The ignition interlock device will not shut off your engine if you fail a breath test. It is designed to prevent the car from starting without a passing breath test. If you fail a test while driving, the device records a violation but will not stop your car.

What if I need more training on how to use and blow into the device?

Contact your service center for additional training.

Can I switch vendors?

Yes. DVS allows participants to change manufacturers at any time. Check your service contract to determine if there are any early termination fees.

What if the ignition interlock device is destroyed or stolen?

In the event the device is either destroyed in a car accident or stolen, DVS will allow the participant 7 days to reinstall the device. The participant should notify DVS of the situation as soon as possible.

What if I remove my device before the end of my program?

Removing the device before completing the program will result in revocation of your driver's license. If you decide to reenroll in the program, you will get credit for the time you were previously on the program.

How can I become an installer of the ignition interlock device?

Please contact one of the certified manufacturers on the DVS website for more information.

How can I become a certified manufacturer in Minnesota?

Please send an email to dvs.ii@state.mn.us with your inquiry.

Contacts

Minnesota Department of Public Safety
Driver and Vehicle Services
Ignition Interlock Unit
445 Minnesota St., Suite 177
St. Paul, MN 55101

Phone: (651) 296-2948

Fax: (651) 797-1299

E-mail: dvs.ii@state.mn.us

Website: www.minnesotaignitioninterlock.org

APPENDIX C

Minnesota Ignition Interlock Device Program Guidelines

Ignition Interlock Service Center Survey

12) How confident are you of your ability to avoid driving under the influence of alcohol or drugs in the future? (check one in each column)

Near Term: In the next week or month	Long Term: the next 10 years
❑ I Have No Doubts	❑ I Have No Doubts
❑ Very Confident	❑ Very Confident
❑ Somewhat Confident	❑ Somewhat Confident
❑ Neutral/No Idea	❑ Neutral/No Idea
❑ Somewhat Not Confident	❑ Somewhat Not Confident
❑ Not Very Confident	❑ Not Very Confident
❑ I Have No Confidence	❑ I Have No Confidence

13) Which of the following statements apply to you (check as many as apply)?

❑ I know the consequences of drinking and driving	❑ In general, I believe I should follow the law	❑ I have successfully completed a treatment program
❑ I strongly believe that drinking and driving is wrong	❑ I warn others not to drive while impaired	❑ I have friends or relatives who have experienced the consequences of impaired driving
❑ I personally have experienced the consequences of drinking and driving	❑ I believe that there is a high likelihood of being caught if I drive impaired	

14) Since joining the program, which of the following have you had? (check as many as apply)?

❑ Training and/or public information about DUIs	❑ Probation officer interactions.	❑ Employee assistance program at work
❑ Court-ordered consequences (fines, jail, probation, etc.)	❑ Participation in a substance abuse treatment program	❑ Revoked or cancelled driving privileges after a DUI

15) Which of the following are present as a positive influence in your life? (check as many as apply)?

❑ Supportive friends	❑ Employment	❑ Social norms
❑ Medical or health improvements	❑ Spouse or other family members	❑ Formal support group (such as AA)

16) Tell us about your experiences with the Ignition Interlock Device and the vendor's program. (Please give us any suggestions you have for improving the program)

Ignition Interlock Service Center Survey

In accordance with the Minnesota Government Data Practices Act, the Minnesota Department of Public Safety, Office of Traffic Safety (OTS) is required to inform you of your rights as they pertain to the information collected below. The personal information collected from you is private. Access to this information is available only to you, OTS, their contractor performing research, and other statutorily authorized agencies, unless you or a court authorizes its release.

The OTS is requesting this information in order to obtain feedback about your experiences in the Minnesota Ignition Interlock Program. The information provided will be used to evaluate the effectiveness of the program. The evaluation will contain no personally-identifiable information about you.

Furnishing the requested information is voluntary, but refusal to supply the requested information will make evaluating the effectiveness of the Minnesota Ignition Interlock Program more difficult.

ALL INFORMATION YOU GIVE US IS CONFIDENTIAL

YOUR NAME, DL NUMBER, AND PERSONAL DETAILS WILL NOT BE REPORTED OR SHARED

YOUR INDIVIDUAL IDENTITY AND ANSWERS WILL NOT BE SHARED WITH ANYONE

The details are requested in order to match records. The personally identifying information will be deleted when the study is completed.

SERVICE CENTER INFORMATION

Device Brand	Name	
Service Center Address	Street Address 1:	
	Street Address 2:	
	City Name:	
	State & Zip Code:	State: Zip Code:
	County Name:	

OTS Use Only:

Ignition Interlock Service Center Survey

ALL ANSWERS ARE CONFIDENTIAL. YOUR NAME AND OTHER PERSONAL INFORMATION WILL NOT BE INCLUDED IN ANALYSIS AND REPORTING.

PERSONAL INFORMATION

(The information provided below will not be used in analyses or reports)

NAME	Prefix: First: MI: Last: Suffix:	
Date of Birth	MM/DD/YYYY:	
Driver's License Number	STATE (e.g., MN)	DL Number
ADDRESS	Street Address 1:	
	Street Address 2:	
	City Name:	
	State & Zip Code:	State: **Zip Code*:**
	County Name*:	

*Zip code and County Name are required

✂✂- - - - - - - - - - - - - - - - - **Information above for OTS use only. Tear off here** ✂✂ -

1) How many vehicles do you own (sole ownership or jointly with any other person(s))?

BEFORE joining the interlock program: _________________

TODAY: _______________. Of these _______ was/were fitted with an interlock device.

2) What is your race/ethnicity?

- ❑ One Race
- ❑ Two or More Races

Check all that apply below:

- ❑ White
- ❑ Black or African American
- ❑ American Indian or Alaska Native
- ❑ Asian
- ❑ Native Hawaiian or Other Pacific Islander
- ❑ Other Race

Check if applicable:

- ❑ Hispanic, Latino, or Spanish Origin (of any race)

3) Current marital status:

- ❑ Married
- ❑ Single
- ❑ Divorced
- ❑ Other
- ❑ Decline to Answer

Status at time of DWI offense:

- ❑ Married
- ❑ Single
- ❑ Divorced
- ❑ Other
- ❑ Decline to Answer

4. What type of area do you live in? (check one)

- ❑ Urban
- ❑ Rural
- ❑ Suburban
- ❑ Other: (explain):

5) Your Age: _________ years

6. Your Sex: ❑ Male ❑ Female

Ignition Interlock Service Center Survey

7) Number of Children:

______ Number of children of ages 0 -18

______ Number of children ages 0-18 living with you

______ Number of adult children (over 18 years of age) whether living with you or not

8) Highest education level achieved (check one):

- ❑ Elementary School
- ❑ Some High School (none graduate)
- ❑ High School Graduate or G.E.D.
- ❑ Some College or University credits
- ❑ Technical Certificate Professional Program Completed
- ❑ 2-year College Degree
- ❑ 4-year College Degree
- ❑ Some post-graduate education credits
- ❑ Masters Degree
- ❑ M.D., J.D., Ph.D. or other advanced academic or professional degree

9) Household* Income (check one):

- ❑ Below $10,000 per year
- ❑ $10,000 - $19,999 per year
- ❑ $20,000 - $29,999 per year
- ❑ $30,000 - $39,999 per year
- ❑ $40,000 - $49,999 per year
- ❑ $50,000 - $59,999 per year
- ❑ $60,000 - $69,999 per year
- ❑ $70,000 - $79,999 per year
- ❑ $80,000 - $89,999 per year
- ❑ $90,000 - $99,999 per year
- ❑ $100,000 - $249,999 per year
- ❑ $250,000 - $999,999 per year
- ❑ $1,000,000 or more per year
- ❑ Decline to answer

*Include income from all household members ages 15 and above, regardless of relationship.

<u>QUESTION 10 FOR DEVICE REMOVAL APPOINTMENTS ONLY</u>

10) Why are you having the ignition interlock device removed today? (check one):

- ❑ I have successfully completed the program
- ❑ I am having the device transferred to another vehicle
- ❑ I am voluntarily leaving the program (opting out) because: (please explain):
  ____
- ❑ I have been terminated from the program because: (please explain reason for dismissal):
  ____
- ❑ Other reason (please explain):
  ____

11) Why did you decide to participate in the ignition interlock program (check as many as apply)?

- ❑ To keep my job
- ❑ To meet family obligations
- ❑ Attorney's advice
- ❑ To get my license back faster
- ❑ I had no choice/It was mandatory
- ❑ To keep driving legally
- ❑ Other (Please Describe:

Data Request for Ignition Interlock Program Evaluation

Requested by the Office of Traffic Safety
Hal Campbell
hal.campbell@state.mn.us

Requested Information

Descriptive Name of Data Element or Data Element Group	Definition	Sub-Elements? (separate data elements)	Notes
Name	Participants' Name	First Name Middle Name Last Name	• Personally Identifying Information (PII)-will be stripped, stored separately
DL_NUMBER	Drivers License Number		• Standard MN format. • MN drivers only • PII-will be stripped, stored separately
Participant_ID	Unique ID assigned by Vendor		• Will be treated as PII if supplied by vendors
DOB	Date of birth		
Event	Event information	Event Identifier Event Date Event Time Event Type (Report Messages) Reason for event BAC value	• The same date format should apply to any report of date • One standard time format • Event type codes are listed in the data definition following this table)
DVS reportable events	Flag & date for events reported to DVS	Y/N Flag Reported to DVS? Date of report (is there a date for each report)	Reported to DVS? Yes or No
Miles Driven	Total Miles driven per week or month by participant	Aggregate of mileage for trips taken	If this information is collected

Data File and Format Notes:

Wherever possible, we have adopted the existing data formats/definitions used in the vendor's daily reports to DVS. The differences are noted below:

a. We need data for the full duration (to date) of a participants time in the IID program.
b. Filename: VendorName_YYYYMMDD.<ext>
c. File type preferred:
    1. Tab or space delimited
    2. .txt file with fixed record length
    3. Excel
    4. SAS

File Formats

Separate PII and Event files must be delivered to the designated secure upload site. Files will contain at a minimum the following fields:

PII FILE:

Item	Format	Description
Name of program participant	Char(96)	[First, Middle, Last] [First Char(32)] [Middle Char(32)] [Last Char(32)]
Participant ID	Char(20)	Vendor-assigned unique ID (if any)
DL number	Char(13)	[A999999999999]
DOB	Numeric	YYYYMMDD (same format as any standard date field)

EVENT REPORTS FILE.

Item	Format	Description
Participant ID	Char(20)	Vendor-assigned unique ID (if any) This must be in BOTH files (PII and EVENT). IF no unique ID is assigned, then provide full name or DL number in each record of the Event Reports File. If this code or DL number is PII, we will strip it out after replacing with a new unique identifier that we create.
Event Date	Numeric	YYYYMMDD
Event Time	Numeric	HH:MM:SS (use 24-hour clock)
Report Messages	Char(500)	[Alpha/Numeric] NOTE: Supply same info/notes you would give to DVS (this may be superseded by "Event Type" variable defined below). No private identifying information.

Item	Format	Description
Event Type[1]	Numeric	01 Start (Participant's initial entry into the IID program. Should be used once per participant) 02 Installation of IID 03 Removal: for successful completion of the program 04 Removal: for installation in new vehicle 05 Removal: Failure—participant is dropped from the program 06 Removal: Cancellation—participant voluntarily quits program 07 Removal: Other reason (explain in Reason for Event) 08 Successful breath test at Start Up (Not rolling re-test) 09 Successful vehicle start (actual ignition engine start up) 10 Successful rolling re-test 11 Failed Test at Start Up (blew BAC=>.02)[2] 12 5-minute lockout 13 Failed Rolling Re-Test (blew BAC=>.02) [2] 14 Missed calibration 15 Not enough tests in a 1-month period (provide info in Reason for Event) **16 Rolling Retest Requested (time when device initiates a rolling retest request)** 17 Missed rolling retest 18 Illegal start, bypass, circumvent, or tamper **19 Vehicle "ignition off/trip end"** **20 Early Recall (provide info in Reason for Event)[3]** **21 Device Reset (provide info in Reason for Event)[3]** 99 Other (Explain in Reason for Event)
Reason for event	Char(500)	[Alpha/Numeric] (This is a second "Notes" field for explaining any of the events. Blank okay.)

Item	Format	Description
DVS Reportable?	Numeric	1= Yes; 0 = No Is there a date ?
BAC value	Numeric	.## blood alcohol content in grams per deciliter Leave blank if not relevant to Event Code. Must be present if Event Code = 08, 10, 11, or 13
Mileage	Numeric	Mileage reporting period start date (use date field format) Mileage reporting period end date (use date field format) Total miles driven (#####)

1. Every record in the EVENT file must include one Event Type. Missing/blank not allowed.

2. We want data on every failure, not aggregated as reported to DVS, so failures (BAC => .02) should be reported even if they pass on retest after the 5 min. lockout.

3. For event code 20 and 21 anticipated reasons include:

    a. Six (6) initial start lockouts due to alcohol readings above the startup set point during a 30 day period;
    b. Three (3) reportable rolling retest violations of a positive AC use;
    c. One (1) illegal start violation; or
    d. Equipment malfunctioning

Transmittal Notes:

a. Vendors are requested to adhere to above format but we are also available for consultation should they have an alternative method or data layout they wish to discuss.

b. All records from participant enrolment to March 31, 2015 are requested by April 30, 2015.

c. OTS has established a secure FTP for data transfer. Vendors are requested to provide Personal Identifying Information (PII) in a separate file. A username and password have been provided to each vendor. Instructions on how to log in and transfer data have also been provided by an OTS research analyst. Vendors are requested to provide contact details to OTS Researchers, Danile Lynch-Jones and Lisa Elliott.

Danile Lynch-Jones
Research Analyst
danile.lynch-jones@state.mn.us
(651) 201-7081

Lisa Elliott
Research Analyst
lisa.elliott@state.mn.us
(651) 201-7066

Descriptive Name of Data Element or Data Element Group	**Definition**	**Sub-Elements? (separate data elements)**	**Notes**	**Driver License Record Element**
	Participants' Name	Prefix First Name MI Last Name Suffix	• **PII for OTS use only**	NAME-USER-DEPT
DL_NUMBER	Drivers License Number and Class		• Standard MN format. • MN drivers only • **PII for OTS use only**	ID-NBR-PRSNL-INIT ID-NBR-PRSNL-NBR CODE-CLASS-LICENSE
CONTACT INFORMATION	Address/Phone/other	Street Address 1 Street Address 2 City Name State Zip Code	• **PII for OTS use only** • We will use address information to determine urban/rural	ADDR-USER-DEPT CITY-USER-DEPT *MN (only)* ZIP-AMERICAN
Vehicle Registered Owner Info	Information on registered owner for each vehicle used by participant in the IID program	Owner1 full legal name Owner2 full legal name (if present) Registered Address VIN Plate Number Owner2 relationship to Owner1	• **PII for OTS use only** • Assume up to two owners • List IID participant as owner 1	*Derive from vehicle records?*
Participant Identifier Number	Substitute participant ID for the project		• Include identifier for: o Eligible people who participate(d) in the IID program o Eligible people who have not participated in the IID program o Random selection of drivers based on specific demographic selection criteria	

Descriptive Name of Data Element or Data Element Group	**Definition**	**Sub-Elements? (separate data elements)**	**Notes**	**Driver License Record Element**
Demographic Information	Personal demographics, NON-PII	Age County of Residence Sex Race/Ethnicity	• We will develop urban/rural indicator based on County.	DATE-BIRTH-USER-DEPT CODE-CO-USER-DEPT TRAT-SEX-PRSNL *n/a*
Arrest information	Details about the arrest that qualified the individual for the IID program	Date of Arrest BAC Level OR Test Refusal Code Number of prior DWI offenses Revoked/Cancelled IPS		Derive from CONVICTION-DATE CONVICTION-CODE
License Type and Effective Dates	Type of license participant operates under while in the IID program, and their license history after leaving the program. Also effective dates for their license type/status change	Limited or Restricted Reinstated after IID New license after Cancelled IPS Effective Date	• We want to use "effective date" as the start date for IID program participation. Must check that this will work based on DVS understanding of records. • End date of program participation may not coincide with a license status change	*Derive from IID Program Records?*
IID program Status	Captures each change in status under the IID program (and afterwards)	Start date End date Reason for End	• See data element on License type and effective dates. We need a way to tell when someone starts & stops their participation in the IID program, and the reasons for their end-of-program event (successful completion, dropped out, kicked out of program, others?)	*Derive from IID Program Records?*
DWI and related Violations after eligibility for/entry into IID program	Details of subsequent DWI violations/arrests and DVS actions	Date of arrest/citation Offense type (code/category) DVS Action(s) resulting from the arrest/citation	• This information will be used for recidivism and survival analysis both DURING and AFTER participation in IID program, and for those who did NOT enter the IID program.	Derive from CONVICTION-CODE CONVICTION-DATE

Descriptive Name of Data Element or Data Element Group	Definition	Sub-Elements? (separate data elements)	Notes	Driver License Record Element
Driver Past History of crashes and violations	Totals in categories for a 10 year past history of each individual	Total # crashes Total # moving violations Totals within sub-categories of moving violations	• We may request sub-totals for categories of moving violations: o Speed o Careless/reckless o DWR or Cancelled	Derive from CONVICTION-CODE CONVICTION-DATE
Driver history of violations during the IID program	Information on traffic violations	Total # moving violations Totals within sub-categories of moving violations	• We may request sub-totals for categories of moving violations: o Speed o Careless/reckless	Derive from CONVICTION-CODE CONVICTION-DATE

NOTES:

1) Inclusion criteria vary depending on the analysis. We have identified the following groups for which we may need data. In particular, we may need demographic and driver conviction/crash histories for each of the following, as well as more detail for the IID-eligible (participants and non-participants):

- **Eligible people who participate(d) in the IID program**
- **Eligible people who have not participated in the IID program**
- **Random selection of drivers based on specific demographic selection criteria**

2) DVS driver history files are said to have "reason codes" for why a person exited the IID program.

Interlock Program Evaluation Data Structure