

The Feasibility of Voluntary Ignition Interlocks as a Prevention Strategy for Young Drivers



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16. Abstract Young drivers in the United States are at greater risk for alcohol-related crash deaths than any other age group of drivers in the general population. Though efforts have been made to reduce drinking and driving among young drivers (especially teens), there has been only limited progress. One innovative possibility that has not yet been tried for most young drivers is the implementation of a voluntary alcohol ignition interlock program as a preventative approach. The objective of this study was to examine the feasibility of a voluntary ignition interlock program for young drivers as a prevention measure. Feasibility here implies the acceptability of ignition interlocks to parents and their teenage and young adult children and the extent to which ignition interlock providers are willing to accommodate this at-risk population. This study involved free-flowing discussions conducted in 2010 with a select number of ignition interlock manufacturers and service providers, insurance companies, and representatives of community groups. Additionally, informal meetings were held with a select number of parents, teens and young adults to gain their input on the development of such a program. Finally, ignition interlock recorder data (which included voluntary and involuntary users age 16 to 26 years old) were examined, and an independently conducted web survey with parents of voluntary users and voluntary users themselves was administered and analyzed. The information was used to help assess the extent to which ignition interlock vendors, insurance companies, and community groups may be willing to become involved in a voluntary program, what is needed to recruit participants (teenagers, young adults and their parents) into such a program and, ultimately, the feasibility and acceptability of a voluntary ignition interlock program for young drivers.					
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Executive Summary

This study's objective was to examine the feasibility of a voluntary ignition interlock program for young drivers. Researchers conducted a series of discussions in 2010 with a select number of ignition interlock providers, insurance companies, and representatives of community groups. In addition, they held informal meetings with a select number of parents, teens and young adults to gain their input into developing such a program. Finally, researchers examined recorder data from one ignition interlock company and data from independently conducted internet surveys with parents of voluntary users and other voluntary users.¹ Most often, this data was for 18- to 26-year-old users, but some of the data included older users. The study included all users to help in our understanding of the potential use of voluntary ignition interlocks with young drivers.

Ignition Interlock Companies

The project was initiated through free-flowing telephone discussions with a select number of ignition interlock companies on topics relevant to the potential for successful young driver ignition interlock programs. These ranged from items relating specifically to the ignition interlock hardware (modifications, installation, usage, etc.) to marketing devices to families with teens or young adults. Regarding the hardware issues, none of the company representatives saw the need for any specific hardware changes to the ignition interlock device, and most indicated that software changes are easy and generally inexpensive. Many indicated that disabling the post-start retest was possible and easily done, but not all supported the idea. Further, only half would consider an override code for parents. Most companies had the flexibility to provide data recorder results to parents through a variety of methods (mail, e-mail, facsimile, etc.), and many offered several training options and resources to parents.

Researchers also discussed the use of ignition interlocks as a primary prevention strategy with ignition interlock vendors, and some indicated that they have provided ignition interlocks for non-offender populations in other nations, mainly for commercial vehicles. In general, only a small number of clients in the United States request the ignition interlock voluntarily; most ignition interlock users are court ordered or required by a department of motor vehicles as the result of a driving-while intoxicated (DWI) offense. Interestingly, a few company representatives indicated they had unsuccessfully attempted to market a voluntary young driver ignition interlock to high schools. One company offered free installation, no contract, and a reduced monthly fee and still could not recruit families to participate. Respondents indicated that parents who were approached often believed their teens or young adult children were not at risk. Further, the device was viewed as inconvenient, and teens and young adults felt it would be an embarrassment. One representative noted that if the device were to be marketed as a preventive technology, it would be important to de-stigmatize the device (as its use is associated with DWI offenders) and emphasize its safety aspects.

Insurance Companies

Among insurance company representatives, researchers discussed topics related to whether a voluntary ignition interlock program (or similar program using other types of monitoring devices) has been considered and/or would be supported. Of the seven representatives, all indicated they either supported or know companies that supported programs that used monitoring devices (such as

¹ These surveys were conducted by PIRE, outside of this contract.

speed detection devices via global positioning systems, black boxes, and in-vehicle cameras); however, only two insurers indicated that they had considered an ignition interlock program, but if it were to be supported, its use would be in a less traditional way (i.e., sensors that passively detect alcohol).

Another topic discussed with insurance company representatives was the potential use of insurance policy discounts for young adult ignition interlock users and other incentives that might be used to recruit families. Some of the companies offered incentives to families to install certain kinds of monitoring devices, such as GPS controlled monitors for location, speed, and other behaviors, and a couple indicated that, although they did not offer incentives for such programs, it could be done. Generally, these possible discounts included lower premiums or reduced costs on the devices. Creating incentives for an ignition interlock, however, was generally seen as needing greater evidence for their potential benefits compared to other safety devices. In addition to potential insurance discounts, most insurance representatives felt the device itself would have to be free or subsidized to entice clients to install an ignition interlock. Respondents expressed that parents often reported that monitoring devices are a violation of trust between them and their teens or young adult children and that an ignition interlock device would be far too intrusive. Many parents do not believe their teens or young adult children needs such a device (e.g., they do not drink alcohol or wouldn't drink and drive), a dominant theme noted by ignition interlock companies and community groups as well. Importantly, one insurance representative expressed concern over issues of liability: "Who is responsible if the young driver circumvents the device and then gets into a collision?"

In all, three of the insurance representatives indicated their companies might be willing to support some kind of a program but first would need to learn more about how it might work through a pilot or demonstration project. Regarding offering insurance discounts, one dominant theme was that any discount would have to be "actuarially justified." Company representatives indicated that research is needed that indicates such a device lowers risk, changes behavior, and makes young drivers safer. Further, when a discount or new program is introduced, insurance companies have to file it with each State in which they do business, and the State regulators would then have to approve the change. One company noted that young driver safety programs offering insurance discounts generally show a 20 to 30 percent lower crash rate than for young drivers not participating in the program.

Community Groups

The final discussions were conducted with representatives from community groups (including parent-teacher associations, safety advocacy groups, youth education organizations) who provided input on how a program could be sponsored and promoted and how families could be recruited and how such a program might operate. The eight community groups were all experienced with young driver safety issues. Most of the groups had access to parents and young drivers, and all felt that some parents might be willing to participate in a voluntary young driver ignition interlock program. However, many of the group members indicated that, although some parents would be interested, other parents and young drivers would likely view the device as being too intrusive and overly policing. Further, some parents felt that their teens or young adult children did not "need" such a program (e.g., don't believe their teen drinks or that their teen or young adult children would drink and drive).

Community support for a voluntary young driver ignition interlock program was seen as generally necessary for it to work. One participant suggested that parents would respond to peer pressure,

similar to young driver responses to peer pressure. If parents see other parents participating in the program to keep their teens or young adult children safe, they might be more willing to participate. It also was suggested that parents might be more inclined to install ignition interlock devices if schools and driver education classes promoted them. Several representatives noted that, for the ignition interlock to become socially acceptable, the perception of the ignition interlock would have to be altered and the device “rebranded” so that it is viewed as a benefit rather than a punishment.

These community groups suggested that a government agency or nonprofit organization could be charged with developing a young driver ignition interlock program. It was suggested that the administrative aspects might be handled at the national level by a granting agency, but could also be maintained at the State or community level. The majority of community participants believed their community group would be willing to play a role in supporting such of program and that their preference for startup would be through a pilot or other small-scale initiative before attempting to implement a State or national program.

Parent and Young Driver Discussion Groups

In addition to telephone discussions with insurance groups, ignition interlock companies, and community groups, researchers held in-person discussion groups with a select number of parents, teens and young adults to learn more about the program’s potential acceptability. One set of parent-young driver discussion groups were recruited from a high school, and the other from a community center. Both groups included low- to middle-income families.

A few key features of ignition interlocks were discussed with the parent and young driver discussion groups, including the startup requirement, post-start retests, and device override options. Among parents, requiring a breath test to start the ignition interlock device was not viewed as a problem; however, both parents and young drivers indicated that young drivers might find ways to circumvent the device. The use of post-start retests received mixed reactions among parents: one group indicated no concern, and another group indicated concern that the device would be a distraction, with safety implications for their novice drivers. One group of parents felt an override option was not necessary.

Regarding potential program participation (or device installation), social stigma (i.e., embarrassment) was generally not expressed as a concern by parents, nor was the issue of “trust.” Some indicated that young drivers would question the decision, but parents indicated that their child’s safety was of primary importance. Many felt, however, it would take large financial incentives to get parents onboard. Young drivers, particularly in one group, had strong opinions about parents installing the device on their vehicles, indicating that it was unfair to have these devices if they had not done anything to deserve it (i.e., not caught drinking). Most of the young drivers were resistant to the idea and would need a significant incentive to volunteer without parental coercion. Most of the young participants from the community center group neither drove nor had access to a vehicle. Thus, these participants indicated that, although young driver drinking occurred in their community and in their schools, they did not consider drinking and driving to be a big issue, and other community problems were more urgent.

The potential benefits of an ignition interlock as a preventative measure were not clear to all parents. One group of parents had favorable reviews; however, the second group felt that young drivers would simply circumvent the device. Further, some parents indicated concern that young drivers might choose drugs other than alcohol because it could not be detected by the device. As a potentially effective device, one group of parents indicated it would be reasonably effective and that

any improvements in reducing impaired driving among young drivers would be worth the cost although they did not think that many parents in their community would take advantage of the option if offered. Interestingly, young drivers seemed to hold views similar to their parents. They acknowledged the potential effectiveness of the device, but they, too, expressed concern that young drivers would use other drugs and could circumvent the device. Only a few of the young drivers felt that their parents might install an ignition interlock, and most felt that cost would be a big concern for their parents.

Ignition Interlock Recorder Data of Voluntary and Involuntary Users

To understand the potential use of voluntary ignition interlocks with families of young drivers, the researchers examined existing archival recorder data from one ignition interlock company.² Almost 1,000 voluntary users and more than 6,000 involuntary users were included in the analysis. Of the voluntary ignition interlock users, only 74 were firmly identified as being between the ages of 16 to 26. The researchers were informed, however, that parents often lease the devices in their names for their children; therefore, the ignition interlock company felt most of these voluntary users were young drivers. Unfortunately, it was impossible to determine how many of the voluntary cases were parents of young ignition interlock users or other adults who were voluntarily on an ignition interlock.

Age, gender, and duration of ignition interlock use were analyzed separately for voluntary and involuntary ignition interlock users. Then, the researchers compared the two groups for overall and monthly average breath alcohol concentration (BrAC) test intervals, based on startup tests only and based on all tests.

They found that voluntary users were more likely to have higher startup BrAC tests than involuntary users. This could be related to the differential risk of further sanctioning. For voluntary users, if no one is receiving or accessing monthly data results from the ignition interlock company, they naturally will be less concerned than involuntary users about their attempts and failures to start their vehicles.

Independently Conducted PIRE Survey of Parents and Voluntary Ignition Interlock Users

Independent of this NHTSA study, PIRE conducted a small web survey to collect pilot data on the reasons why parents decide to voluntarily place ignition interlocks on the vehicles of their children (16 to 26 years old). In collaboration with an ignition interlock company, invitation letters were mailed to approximately 400 voluntary ignition interlock customers (not on ignition interlock by court order or DMV requirement) who had leased an ignition interlock device within the last 3 years. Both parents of young ignition interlock users and young ignition interlock users themselves were encourage to participate.

When a young person had a “voluntary ignition interlock,” often the parent was the actual customer or ignition interlock lessee. Consequently, when providing the mailing list of voluntary customers, the ignition interlock company could not distinguish young voluntary ignition interlock users from offenders who opted to keep the ignition interlock on after the required court order or DMV order had expired, or from spouses, parents, or adult children of alcoholics who had an ignition interlock

² All personally identifying information was removed from the files.

installed on the family vehicle for safety reasons. Even though the invitation letter requested young drivers and questions on the survey were geared for young voluntary ignition interlock users and their parents, some additional voluntary ignition interlock users completed the survey.

Thirty-nine parents and 91 voluntary ignition interlock users responded to the survey. Reasons for having the voluntary ignition interlock device were similar among parents and users who noted alcohol-incidents and safety. Even among responses categorized as “other,” both parents and voluntary users reported issues with previous drinking and driving, general alcohol problems, and belief in safety because of using the device voluntarily.

Most parents were not receiving or accessing the monthly ignition interlock data reports. As evident from the ignition interlock recorder data (which indicated greater test failures among voluntary users), monitoring is an area that would need improvement in a program for voluntary use of ignition interlock devices.

Differences between parent and voluntary ignition interlock user results were primarily noted in their stated concerns regarding the effectiveness of the device when installed in the vehicle and the potential of voluntary ignition interlock devices in vehicles to reduce drinking and driving. Most parents felt strongly that the ignition interlock device is an effective strategy in reducing drinking in general and drinking and driving in particular, whereas users themselves were fairly mixed in their opinions on this topic.

Objective

The objective of this study was to examine the feasibility of a voluntary ignition interlock program for young drivers as a measure to prevent impaired driving. Researchers accomplished this through a series of discussions in 2010 with a select number of ignition interlock manufacturers and service providers, insurance companies, and representatives of community groups. Additionally, they held informal meetings with a select number of parents, teens and young adults to gain their input into the development of such a program.

The focus of this report is on young drivers; including teens as well as young adults (age 18 to 26 years, or even older).

These research mechanisms were used to identify the steps necessary to develop and implement a voluntary alcohol ignition interlock program for young drivers, to learn what is needed to recruit participants (youth and their parents) into such a program, and ultimately to determine its feasibility and acceptability.

Background

Despite sanctions for people younger than 21, young drivers in the United States are at greater risk for alcohol-related crash deaths than any other driver age group in the general population (NHTSA, 2016a). In 2014, 26 percent of young drivers 15 to 20 years old, involved in fatal crashes had been drinking and 81 percent of those young drivers had blood alcohol concentrations (BACs) of .08 g/dL or higher (NCSA, 2016). Though efforts have been made to reduce drinking and driving among young drivers, there has been only limited progress. One method that remains untested is the preventive use of the ignition interlock.

An ignition interlock device (or breath-alcohol ignition interlock device) is a mechanism, like a breath testing device, which is installed onto a motor vehicle's dashboard. Before the vehicle's motor can be started, the driver first must provide a sample (e.g., exhale) into the device. If the breath-alcohol concentration (BrAC) is greater than the programmed limit (usually equivalent to .02 g/dL for young drivers), the device prevents the engine from being started or operated.

Ignition interlock devices generally use an ethanol-specific fuel cell for a sensor. A fuel cell sensor is an electrochemical device in which alcohol undergoes a chemical oxidation reaction at a catalytic electrode surface (platinum) to generate an electric current. This current is then measured and converted to an alcohol equivalent reading.

The ignition interlock device is designed to require another breath sample at random times (once the engine has been started and while the vehicle is being operated). This is to prevent another person (e.g., friend) from providing a sample into the device and allowing the intoxicated person to get behind the wheel and drive. It also prevents a person from starting a vehicle and then consuming alcohol and continuing to drive. If the sample is not provided or the sample exceeds the ignition interlock's preset blood alcohol level, the device will log the event and warn the driver, and it may sound an alert (e.g., lights flashing, horn honking) until the ignition is turned off or a clean breath sample is provided. The devices are designed to keep a record of activity (time of starts and stops, BrAC readings) on the device and the ignition interlock vehicle's electrical system. This record, or log, is generally printed or downloaded each time the device's sensors are calibrated (generally at 30-60 day or 90-day intervals) by an ignition interlock service provider.

Since its introduction in a California pilot program approximately 25 years ago, the use of ignition interlocks to prevent impaired driving by adults in the United States has steadily increased. A 2015 survey of installed ignition interlock devices found that approximately 328,000 (Powel, Vanlaar, & Robertson, 2016) were in service, up from about 101,000 in 2006 (Roth, 2006). This represents nearly 23 percent of the estimated 1.4 million alcohol arrests per year.

Ignition Interlock as a Preventative Measure

Using ignition interlocks as a preventative measure for young drivers has been a topic of interest among ignition interlock providers and safety advocates for some years. Despite this interest, there have been no trials or pilot studies of the concept because of the difficulty in implementing such a program—although several ignition interlock providers have informally investigated this possibility for young drivers. It has been unknown how acceptable this idea would be for young drivers or their parents. For the young driver, it is important to consider the issues of being perceived as penalized before “committing any crime” and the embarrassment of having to use the device, as well as the young drivers' views of parental trust and control. For parents, it is important to consider time and

cost, their views of fairness to their teenagers and young adult children, and the possible inconvenience to other family members versus the peace of mind that an ignition interlock could potentially provide.

Although the researcher team was aware of no examples of voluntary ignition interlock programs for young drivers in the United States, Sweden has provided an example of a voluntary program for adults and commercial vehicle companies. In 1999 Sweden launched the first primary prevention approach in the world to prevent impaired driving in a large-scale population of drivers who were not previously identified as having alcohol problems. The approach (9,614 drivers over 6 years) was first used with various transport businesses that voluntarily installed ignition interlock devices in commercial vehicles (Bjerre & Kostela, 2008).

The challenges and successes of implementing a voluntary ignition interlock installment program for parents of young drivers may be similar to those in the Swedish project. For example, among employers who participated in the study, 64 percent reported previous suspicion of alcohol problems, 35 percent suspected drunk driving, and 28 percent reported known DWI offenses. Researchers noted that between 73 and 76 percent of the participating companies had a policy to address those issues before the program began; after having the ignition interlock program, 90 percent of the participating companies had a policy for handling alcohol and drug problems (Bjerre & Kostela, 2008). Further, one main reason for companies installing vehicles with ignition interlocks initially was considered “the goodwill effect,” as few companies reported the known alcohol problems among their drivers. There are, however, potential cultural differences between Sweden and the United States, particularly regarding alcohol control. Also, many parents do not recognize their children’s alcohol use. They may be aware that many youth experiment with alcohol, but parents do not always know the extent to which their own children drink, drink and drive, or ride with others who drink alcohol. Ignition interlock devices can potentially address these issues before a tragedy occurs. Cost, inconvenience, and the potential denial of drinking among youth are serious challenges that will need to be addressed if such a program were to be launched. Ultimately, the Swedish study found that 82 percent of respondents reported a positive attitude among the employees toward the use of ignition interlocks, and 70 percent answered that the attitude had become more positive over time. The investigators claimed that the ignition interlock program had a preventative effect in that drivers avoided drinking or drank less.

More than half (61%) of the Swedish companies without ignition interlocks reported that one main reason for not installing them was cost. Another 16 percent believed the devices were too troublesome, and about a fourth of the companies found no reason to install them, as they had not experienced any alcohol problems among their drivers.

Parental Management of Teen and Young Adult Driving

Parents are an integral part of the lives of their teens and young adult children. According to a study conducted by the American Automobile Association (AAA), parents and youth both feel that parents are important factors in motivating youth to drive safely (AAA Foundation for Traffic Safety, 2006). Results of this AAA study determined that both young drivers and parents realize that young drivers have a high crash risk during the first 6 months after obtaining their licenses. As a result, many parents place restrictions on their young drivers’ driving. These restrictions often are in line with graduated driver’s license (GDL) laws, such as driving curfews and passenger limitations.

When parents of collision-involved young drivers were surveyed (AAA Foundation for Traffic Safety, 2006), they imposed more protective or disciplinary actions on their young drivers' driving privileges than were imposed on collision-free young drivers. However, this response resulted not only from their teens and young adult children being involved in a crash, but also when these young drivers engage in risky driving or other problem behaviors. Collision-involved young drivers were more often found to breach GDL restrictions; receive tickets and convictions; and engage in illegal, risky, and health-compromising driving behaviors. Interestingly, parents of collision-involved young drivers also were less likely than were parents of collision-free young drivers to report having "excellent" or "very good" communications with their teens or young adult children on driving issues. The AAA Foundation for Traffic Safety (2006) report noted that improving parental communication skills and providing them with tools to manage their young drivers' driving more effectively might reduce collision involvement among high-risk young drivers. Parents of collision-involved young drivers might be particularly amenable to initiatives designed to reduce the likeliness of their young driver being in another collision.

Use of Vehicle Telematic Devices

Although not specifically related to alcohol and drinking and driving, currently there are several technologies (other than ignition interlocks) available that can monitor driving behavior. Often referred to as vehicle telematic devices, these mechanisms integrate the use of telecommunications and informatics to send, receive, and store information and include GPS technology, integrated with computers and mobile communications technology in automotive navigation systems. Telematics refer to automation in automobiles, such as the emergency warning system for vehicles, GPS navigation, integrated hands-free cell phones, wireless safety communications, and automatic driving assistance systems, among others.

Currently, there are several telematic devices available that monitor speeding, aggressive driving behavior (e.g., hard breaking, sudden acceleration), and seat-belt use. These range from GPS-type devices, to on-board cameras to "black boxes" or event data recorders that record aspects of driver performance. Many of these devices are marketed to help parents monitor their young drivers' driving destination, driving speeds, time of day and, in some cases, their actual driving behavior. Research evaluating the effectiveness of these devices is now emerging. McGhee, Raby, Carney, Lee, and Reyes (2007) studied a small sample of young drivers who had video-based monitoring devices installed in their vehicles. Accelerometers in the vehicles triggered forward and interior-facing cameras whenever readings exceeded a given threshold. Videos were captured each week, and families were mailed reports. Overall, the reports were associated with a 58 percent reduction in safety-related events and a 15 percent increase in seat belt usage. Similarly, Farmer, Kirley, and McCartt (2010) also found encouraging results in their study, in which devices were installed on young driver vehicles that monitored sudden breaking/acceleration, speeding, and seat-belt use. Drivers were randomly assigned to four conditions: in-vehicle alert with immediate web site notification to parents; in-vehicle alert, but conditional web site notification to parents; no alert, only web site notification; and no alert and no web site access (comparison). Researchers found consistent reductions in speeding when young drivers received alerts about their speeding, when young drivers believed their speeding behavior would not be reported to parents if corrected, and when parents were notified of such behavior by report cards.

However, the effectiveness of these and similar devices, such as voluntary alcohol ignition interlocks, cannot be estimated without voluntary participation. A significant challenge to telematic devices is gaining parental interest. In the study (Farmer et al., 2010; IIHS, 2009), participation was

found to be a problem. Participation requirements for the study were that young drivers must be the primary drivers of the monitored vehicles and parents must have access to the Internet. Recruitment took almost a year (May 2007 to March 2008), with a final count of only 85 families. Efforts to form a sample were wide ranging. Initial recruitment strategies included letters, posters, and advertisements distributed through a variety of outlets, including community and parent listservs/forums, bulletin boards in community centers, community newspapers, PTA web sites and e-mail lists, county fairs, and other local ventures. Yet these initial efforts yielded only a few subjects. The researchers then approached a local DMV to help recruit at offices where youth were seeking licensure. Flyers were distributed and recruitment improved, but still only about half of the total sample was secured. Initially, participants were not compensated; but because of the low recruitment, a decision was made to pay families \$500 (with \$250 paid upon enrollment and the remainder when the family completed the study). The compensation improved recruitment. However, compensation likely makes the sample unrepresentative of how the program ultimately would have to work.

The problem forming a study sample reported above (Farmer et al., 2010; IIHS, 2009) is noteworthy, given the potential of telematic devices to reduce young drivers crash risk. Reasons for parents' lack of interest may be related to cost, inconvenience, and/or trust issues between parent and youth. These same challenges are likely to be met in marketing young driver ignition interlock devices.

Farmer et al. (2010) ultimately reported that, once families were recruited, parents were enthusiastic about the devices and believed they helped their young drivers become better drivers and would increase safety. Nearly all the parents would recommend the device or a similar one to other parents. These results suggest that proper marketing of telematic devices is important (at least for some families), and a change in parental norms may be needed to gain participation successfully.

Methods

The researchers examined the feasibility of an ignition interlock program for young drivers through discussions with a select number of ignition interlock providers, insurance companies, representatives of community groups, and informal meetings with a select number of parents, teens and young adults. The general requirements of this study, as specified by NHTSA, were to examine:

1. The development and maintenance of an ignition interlock program for young drivers;
2. The recruitment of young drivers (and their parents) and to learn about the feasibility and acceptability of an ignition interlock program for young drivers.

This project did not entail the actual implementation of a young driver ignition interlock program or the determination of its effectiveness.

Discussions With Ignition Interlock Vendors, Insurance Companies, and Community Groups

To address the first requirement, the researchers conducted informal telephone discussions with a small number of (a) ignition interlock manufacturers and vendors, (b) insurance companies, and (c) representatives of community groups. These discussions explored the feasibility of a program, and the steps required for implementation (see Appendices A, B, and C).

Ignition Interlock Vendors

The researchers contacted ignition interlock manufacturers and installers to aid in our understanding of the viability of a volunteer young drivers ignition interlock program. Among the topics were items relating specifically to the ignition interlock hardware: the disabling of the post-start retests, override switches, and identification systems. Additionally, the discussions included ideas to lower the cost for ignition interlock device installation and service fees, monthly service requirements, how results would be provided to parents and potential issues with interpreting results.

The researchers also addressed several program-related items. For example, they covered the vendors' experiences with the ignition interlock as a prevention strategy (i.e., used by clients other than those meeting the requirements for an administrative license revocation [ALR] or criminal-driving offense), their perspectives on how a voluntary young driver ignition interlock program might be supported, and what types of community groups might support such an endeavor. Further, ignition interlock vendors were asked about their potential funding ideas for the program, their suggestions for monitors of such a program, and their estimates of the number of participants required to have a viable program (to provide device discounts, etc.). The discussions concluded with the vendors' reactions to the development of a volunteer young driver ignition interlock program and the barriers to successful implementation. The discussion guide of topics is included in Appendix A.

Insurance Companies

The researchers contacted seven insurance companies for discussion of a young driver ignition interlock program. Virtually all insurance companies had programs that supported safe driving for young drivers. Among the topics discussed with the representatives were whether such a program has been considered and whether they were aware of other insurance companies that supported such a program (or a similar program).

A significant topic of the discussion was the potential use of insurance discounts for young driver ignition interlock users and other incentives that might be used to recruit families into a program. Finally, they asked representatives about their potential collaboration in promoting a volunteer young driver ignition interlock program and potential barriers. The discussion guide of topics is included in Appendix B.

Community Groups

The final set of discussions was conducted with members of eight community/advocacy groups. The discussion guide is included in Appendix C.

Group Discussion Meetings With Teens, Young Adults and Parents

To address the second aim of this study—to learn about feasibility and acceptability of a program—the researchers held informal group discussions with teens, young adults and parents. The discussions included identifying issues or obstacles that would impede participation by young drivers and parents, as well as incentives that might mitigate these obstacles.

The discussions took place at a suburban high school that included middle- and low-income families and at a local community center in a low-income area.

For each discussion group, they attempted to recruit up to nine parents and nine teens or young adults. A flyer offering \$25 cash and pizza for each individual (parents and young drivers) to participate voluntarily in a 1.5-hour discussion related to a young driver safe-driving study was distributed at the high school and a community center. The flyer noted that the study was seeking the opinions of parents and young drivers on possible in-vehicle technological approaches to prevent alcohol-related crashes. Separate parent and young driver meetings (different rooms, but at the same location and time in order to obtain parental consent for youth participation) were arranged so that each group would be more inclined to speak freely. The meetings involved free-flowing discussions on various topics related to possible ignition interlock use by young drivers. One research staff member led the discussions, while another took notes. The researchers avoided recording the meetings to promote openness of opinions. The names of the participants were not recorded to protect anonymity. The meeting discussions are summarized in this report. The discussion guide is in Appendix D.

Ignition Interlock Recorder Data of Voluntary and Involuntary Users

The researchers obtained existing de-identified ignition interlock recorder data from one ignition interlock company on all of its voluntary customers over the past 3 years. They also obtained data on a sample of involuntary customers 16 to 26 years old for analysis and comparison. Specifically, three sets of samples were received:

- Involuntary Users (that is, the ignition interlock was required by the court). These were teen- and young adult (16 to 26 years old) ignition interlock users. These are the traditional court- or DMV-ordered clients.
- Voluntary Users - All. Parents often lease the devices in their names for their children. Unfortunately, this makes it impossible to determine how many of the voluntary cases are parents of young ignition interlock users or other adults who are voluntarily on ignition interlock.

- Voluntary Users - Teen and young adult (16 to 26) ignition interlock users who lease the device themselves. Everyone in this group is a voluntary ignition interlock user and is 16 to 26 years old. This group is a subset of the “Voluntary Users – All” group.

The research team analyzed the ignition interlock event-recorder data to examine the BrACs of startup tests and other BrAC tests (including overall BrAC and average monthly BrAC) and to compare voluntary users to involuntary users. Almost 1,000 voluntary user records of all ages and more than 6,000 involuntary user (16 to 26) records were studied. Of the voluntary users, 74 were confirmed as 16- to 26-year-olds.

Details regarding data management and analysis are provided in the “Ignition interlock Recorder Data” section of this report.

PIRE’s Survey of Parents and Voluntary Ignition Interlock Users

Independent of this NHTSA study, PIRE conducted a small web survey to collect pilot data on the reasons why parents decide to place ignition interlocks voluntarily on the vehicles of their children (16 to 26). In collaboration with an ignition interlock company, invitation letters were mailed to approximately 400 voluntary ignition interlock customers (not on ignition interlock by court order or DMV requirement) who had leased an ignition interlock device within the last 3 years. Both parents of young ignition interlock users and young ignition interlock users themselves were encouraged to participate. Thirty-nine parents of voluntary ignition interlock users completed the “parent” version of the survey, and 91 voluntary ignition interlock users responded to the “youth” version of the web survey.

The parent survey consisted of approximately 20 questions. The first few items asked the parents for information about their child (age during ignition interlock use; whether their child lived at home, attended school, and/or worked). These were followed by questions on their ignition interlock device experience (how long it was installed, why it was installed, set up and operational issues) and their perception of the effectiveness of the ignition interlock device. Demographic items also were collected (age, gender, race). The youth survey consisted of items similar to those on the parent survey, such as personal characteristics, experience with the ignition interlock device, and their opinion about the effectiveness of the ignition interlock device both for them and, in general, for other youth.

Discussions With Ignition Interlock Vendors

The researchers conducted telephone discussions with a select number of ignition interlock manufacturers that do business in the United States. There are dozens of installers around the county, who regularly install the devices from each manufacturer. Some are franchisees; some are independent.

Discussion topics with ignition interlock vendor representatives ranged from experiences marketing voluntary ignition interlocks, to software adaptations that might be needed for a young driver ignition interlock, to discounts and incentives that might be necessary to motivate families to participate in such a program.

Preventative Uses

Ignition Interlock Vendor Experience With a Voluntary Program for Young Drivers

Four ignition interlock companies have tried unsuccessfully to market voluntary young driver ignition interlocks to high schools, mostly through PTAs, PTSAs, or both. One ignition interlock representative stated that young drivers do not want ignition interlocks, and parents can be a problem. Specifically, he commented, “the first time the ignition interlock presents a problem for the parents (for example, if they needed to move the car and could not for whatever reason or could not do the breath test), they say, “Take it off.” One company offered free installation, no contract, \$30 monthly service fee, and free removal, but had zero participation. All the board members of one company had teens and an option for a free ignition interlock, but there were no takers even amongst them. The responses are, “My kid is a good kid,” or “It is embarrassing.” One ignition interlock company CEO participated in a radio program on drinking and driving annually, and offered discounts on ignition interlocks and preliminary breath testing devices (PBTs) at cost and free calibration, but there were no takers. Another company tried to market actively the voluntary young driver ignition interlocks and created a brochure and DVD, but did not garner support. This company’s representative felt strongly about the need for young driver ignition interlocks and was willing to sell them at cost.

Although not marketed to the parents of college students, two ignition interlock companies reported having a significant number of voluntary ignition interlocks on the vehicles of college students, with the parent as the paying customer. One company estimates having 200 college students with ignition interlocks and uses a “direct exchange” procedure whereby the students exchange their sampling head handsets³ for a new handset every 60 days using United Parcel Service. Seven days before the end of the 60-day period, a new handset with a pre-labeled UPS box for return of the old handset is mailed to each customer. Once the old handset is received, the data are then downloaded and e-mailed to parents. The ignition interlocks are serviced by the direct exchange of handsets for \$65 per month. The second company sells its devices (but would not reveal the cost) and charges only \$25 to \$50 every 3 months for download and calibration. As the customer, the parents have a right to see the downloaded data. These devices do not lockout for a violation, and there is only one random post-start retest. This company signs a waiver so that they are not obligated to send the results to the State.

³ The interlock device is made of two primary parts: the under-the-dashboard control unit that gets wired to the ignition circuit and the sampling head handset piece (size of a cell phone) that contains the alcohol sensor. It has a mouthpiece that the driver provides a sample into to capture a breath sample and record the BrAC.

Five ignition interlock vendors have not actively tried to promote ignition interlocks for young drivers, but each said they receive calls occasionally from parents who express interest but usually do not follow through due to cost. One representative noted that the biggest reason for not much success is that parents do not want to comply with the rules themselves by not drinking, and they get frustrated when they cannot start the vehicle.

Other Preventative Uses

Some of the U.S. companies provide voluntary ignition interlocks in Scandinavia where ignition interlocks are used extensively for commercial drivers.

In general, the ignition interlock vendors who do business in the United States have a small number of “walk-ins.” Most said less than 1 percent; however, one company’s voluntary market was estimated to be 3 to 5 percent of its business.

The definition of voluntary is vague, however. It could include offenders who voluntarily install an ignition interlock in an effort to demonstrate good faith to the courts. Some spouses want ignition interlocks installed for use by their alcoholic partners, or offenders want them installed on their vehicles longer than the mandated time.

Adaptations for a Voluntary Young Driver Program

Startup Test Only and Override Option

All but one company representative said that disabling the post-start retest was possible and easily done with software changes. Five ignition interlock representatives were against the idea, mainly because they explained that doing so goes against the main reason for having an ignition interlock. One company cited liability as a concern. Five companies had no problem with the idea of disabling or changing the timing requirements for the post-start retest. It was noted that some States mandate that flashing lights, honking horn, or both be activated if no post-start retest is completed within 30 minutes of the request. If ignition interlocks were used as a preventive measure, this requirement would need to be addressed.

Six company representatives said that they absolutely would not or were uncomfortable with providing parents with an override option (i.e., a code number or switch used to override the system allowing the vehicle to start without a breath sample) citing liability concerns and “setting a bad example.” Most ignition interlock units are already programmed for a one-time use emergency override option. If used, the ignition interlock then requires a service visit to reset the unit. The ignition interlock device will not work without being reset if there has been a positive breath test within the last 24 hours.

Two company representatives explained their custom option overrides, such as a service station option that can be activated and recorded for single- or multiple-use, time-based or event-based overrides, and permanent override until disabled.

Another representative said that a voluntary unit could have an on-off lock for the override function with a non-duplicating key. This same company has an override switch for offenders so they can leave quickly in an emergency, but the unit still requires a breath sample within 2 minutes. If the driver ignores the 2-minute warning, then the horn and lights are activated, and a real-time message is sent to the local 911 if the BrAC is high.

User Identification System

Several ignition interlock companies now offer ignition interlocks with photo capabilities in response to requests by the criminal justice system for better information on who is providing the BrAC test. The photo ID system captures a photograph of the ignition interlock user with each breath test taken. One representative said that his company has an ignition interlock model such as this which takes a photograph of the driver and captures part of the back seat and part of the passenger. Another company is currently working on facial recognition technology to verify the identification of the ignition interlock user which it hopes to have on the market soon. Four company representatives thought that a photo ID system is not needed, and two companies mentioned the prohibitive cost of adding this feature.

Device Changes Needed

All the ignition interlock companies agreed that customization of the ignition interlock device for a young driver program could be accomplished with software programming changes. Most companies indicated that software changes to adjust the post-start retest and override options are easy and inexpensive, although as mentioned, some would object to changes in these features for a voluntary young driver program.

One company has been working on the development of a passive sensor feature that samples the ambient air; if alcohol is detected, within 2 minutes, a buzzer signals the driver to take a breath test. This involves a unit design change; not a software change. None of the other companies reported having this feature.

One company hoped to see a change in the laws to demand “real-time” data transmission (ignition interlock data recorder results available by web or telephone *while* the ignition interlock is in use) from every certified ignition interlock. This company reportedly has offered its real-time technology free of charge to other companies with a licensing agreement, but none of them has accepted the offer.

Possible Use of Semiconductor Ignition Interlock Devices

Four companies offer an older model—a less expensive, but sturdy semiconductor ignition interlock device. These sit on shelves for the most part, having been replaced by the newer fuel cell devices. Semiconductor devices are nonspecific and react to things other than alcohol (for example hydrocarbons), do not hold calibration as well as the fuel cell devices, and are sensitive to altitude changes. Fuel cell devices are specific to alcohol, can hold calibration for up to 6 months, and are not affected by altitude. Two companies indicated that semiconductor ignition interlock units could be made available at a reduced rate because they are not currently being used. Six companies (one of which has semiconductors available) pointed to the problems with false-positives (a sample is interpreted as being positive for alcohol when it is not) and unreliability.

Requirements for a Voluntary Young Driver Program

Endorsement of Ignition Interlock Companies and Service Centers

Most of the ignition interlock representatives were enthusiastic about the idea of participating in a hypothetical pilot voluntary young driver program and willing to offer limited discounts, such as \$10 to \$25 off their monthly service fees and/or a reduced installation fee.⁴ Four companies thought

⁴ These discussions were hypothetical in nature. NHTSA is not aware of such a program in practice.

that all of their service centers (where ignition interlocks are installed and regularly scheduled downloads of data and unit calibrations take place) would be on board. One company noted that because some of the ignition interlock service centers are independent franchisees, participation would have to be under an optional agreement, and they would need to be convinced that it was good a business decision. After a successful pilot, it was suggested that the best option may be to implement a young driver program at a few service centers before offering it to all centers. It was noted that the service centers eventually would be looking for financial profit for long-term participation and that managing a program at the State level might work better than trying to do it at the national level.

Minimum and Maximum Number of Participants

Most of the ignition interlock companies were flexible about the idea of a minimum and maximum number of young driver ignition interlock participants needed for a viable program. The range suggested by the companies was wide: 50 to 250 participants, depending on the level of reduced service fees needed for a voluntary program and whether it would be worth it for an ignition interlock vendor to be involved. Further, ignition interlock vendors would need to monitor their inventory in order to have enough ignition interlock devices on hand to provide services for their offender programs as their first priority. One company estimated that *if* all the voluntary ignition interlocks were in one center exclusively, it would take 300 participants to make it worthwhile.

Cost for Installation and Service

The current fees that ignition interlock companies charge for installation range from \$40 to \$125, with an average of \$80. Fees for regular monthly service appointments range from \$42 to \$90 per month, with an average of \$62 per month. Most of the companies were willing to explore ways to reduce the service appointment fees (e.g., a 60- or 90- day reporting period, rather than monthly). There is, however, the question of financial responsibility for the device. If it is destroyed, one vendor noted it would cost \$1,200 to replace it (devices are usually rented, not purchased). The company requires offenders to sign a financial responsibility statement.

Financial Incentives for Parents

Four of the ignition interlock company representatives who participated in telephone discussions for this study did not think that insurance discounts could be offered for installing an ignition interlock. Comments included “insurance is regulated by a board,” “good luck with that,” and “see the Insurance Institute for Highway Safety (IIHS) research.” (See the Background section of this report that discusses the IIHS study and its challenges recruiting families to install a young driver vehicle-monitoring device: IIHS, 2009, and Farmer et. al, 2010). One ignition interlock company suggested an insurance discount similar to the GDL programs and safe driver education programs. Another stated that insurance discounts would not drive the number of installs, but parental acceptance and overcoming the stigma might.

Service Visits

Once installed, most ignition interlock devices require regular visits to an ignition interlock vendor facility for download of data and/or calibration. Calibration involves a comparison between measurements - between one device, which is the standard or known to be correct; and the second, which is being tested against it – that is, the driver’s ignition interlock. Ignition interlock calibration for fuel cell units usually remains accurate for 6 months, although there is a limit on the amount of data that can be stored in a unit. Two representatives suggested 90-day intervals, so as not to exceed

the data storage limit and to minimize the inconvenience for parents. The average time required for a service visit to an ignition interlock vendor facility is 15 minutes for data download, with one representative noting that his company has drive-through service. However, when calibration is needed, the service appointment may take longer than 15 minutes. As described above, two companies use a direct exchange program of the sampling heads via a shipping company, eliminating the requirement to bring the vehicle in for download of data or calibration.

Training and Reporting Results to Parents

The ignition interlock companies offered several training and assistance options for parents to understand how the ignition interlock device works and to interpret the report results: toll-free number, DVD, web link, “Go To” meeting online (web conferencing), and a very simple user-specific manual. They did not think it would be a problem for parents to interpret the results as they are fairly self-explanatory. There was some wariness expressed by a couple of the ignition interlock vendors who experienced parents who argue, “It is not possible” when a failed test occurs (meaning that alcohol was present on the driver’s breath). Alternatively, there are concerns about parents “coming down too hard” on their young driver after a single failed test, especially if the post-start retest function is turned off. The ignition interlock companies train offenders to make a record for themselves, such as retesting shortly after a failed test, in case there is a false-positive result. A single failed test could be from perfume, mouthwash, or recent drink or food.⁵

Most of the companies have the flexibility to provide results to parents at whatever interval is desired, through a variety of methods: mail, facsimile, e-mail, web accessible, or paper copy given to parents if they came in for service. The results are in the form of a list of dates and times of vehicle starts and stops, any tests failed (generally .02 BrAC or higher), and tests “passed” (generally .00, .01 BrAC). Ignition interlock devices are usually set to fail at or above .02 to allow for substances that could generate a false low positive, such as recent use of mouthwash, exposure to perfume, or consumption of food or drink. The report also would identify any instances of attempted tampering with the device.

Incentives for Young Drivers to Participate

Incentive ideas to encourage young drivers to participate included college scholarships, an indigent program fund for volunteers who can’t afford it, a free trial period, corporate sponsor, free pizza, or tickets to events as rewards.

Community Support

Need for Community Support

Three ignition interlock representatives thought it would be useful to have a community group conduct education, training, and counseling. One vendor cautioned about the need to keep the data logs (results from the ignition interlock device that indicate whether a breath sample was positive for alcohol) private. If someone else in the community knew the details of a young driver’s drinking-and-driving habits, it could create privacy issues.

Four of the ignition interlock companies noted that support from high schools would be helpful, and one mentioned that some colleges might want to limit their liability by telling students, “You can

⁵Users should not eat or drink within 15 minutes of a test.

have a car on campus if you have an ignition interlock.” One company advised that any community group involvement should be used to spread the word, rather than recruiting. Having a community group conduct recruiting might appear that the company was just trying to make money.

One suggestion for community involvement was to “cut out the middleman” and lower costs by recruiting a local mechanic or stereo installer to do installations at a location in the community, possibly using just an overhang shelter to perform the work. This vendor would lend the equipment, train installers, and provide reporting. All that would be needed for calibration and download of data is the Internet, and the company would provide the software. This approach would lower the cost to \$35 per month. The representative would be willing to prepare a recruiting brochure as well.

Community Groups

Some of the ignition interlock companies noted that it would be helpful to have the support of an advocacy group. Representatives also mentioned student groups, churches, PTSAs, YMCA/YWCA, the National Partnership on Alcohol Misuse and Crime, and the sponsors of driver’s education classes.

Marketing

One suggestion was to market the ignition interlock as a tool for young drivers to avoid peer pressure. That is, a young driver could tell their friends they couldn’t drink because they had an ignition interlock on their car. In this way, the ignition interlock provides an “out” for the young driver to avoid drinking when feeling pressured to drink by friends. Another ignition interlock representative said it would be important to de-stigmatize the ignition interlock and emphasize the safety and social context for prevention and awareness. The ignition interlock representative suggested that these concepts could be disseminated through the media frequented by teens or young adults, such as social networks, light reading, sports and music spokespersons, television, gaming, etc.

Discussions With Insurance Company Representatives

The researchers contacted seven insurance companies. Discussion focused on the companies' consideration of a voluntary ignition interlock program for young drivers or other similar programs that use vehicle telematic devices to monitor young driver practices, as well as incentives for families who might participate in such programs. They also discussed the level of interest in such a program, including barriers to overcome if such a program were implemented.

In-Vehicle Safety Devices

Prior Consideration of a Young Driver Ignition Interlock Program

Of the seven insurance companies contacted, five indicated they had not considered a young driver ignition interlock program. One representative indicated that such a program would appear "penalizing." Two representatives had considered such a program; one of these described informal discussions with an advocacy group's representatives regarding the use of voluntary ignition interlocks for young drivers, but they were interested in its use in a less traditional way (e.g., use of "sniffers" or sensors that passively detect alcohol, a technology that is being developed). Another insurance representative indicated that the company is supportive of technological devices, and they currently market reduced insurance rates for several; however, the ignition interlock is not one of them.

Support for Telematic Devices

All seven insurance representatives indicated that they were aware of in-vehicle device programs (such as the use of speed-detection devices via GPS, "black boxes," and in-vehicle cameras) that were currently being supported and marketed by insurance companies (either by themselves or others). They listed several devices that have various features, including tracking location, mileage, speed, hard braking/accelerating, sharp turns, and other erratic driving behaviors. Also mentioned were geo-fencing devices that prevent a vehicle from leaving a defined radius. One company is working on signals to ban cell-phone usage while driving. Many of these devices allow parents to monitor the driving of their teens or young adult children via the telephone or the web, and some of these devices can be programmed to issue warnings or alerts to the young drivers while in motion.

Four of the insurance representatives indicated they have offered incentives to families to install telematic devices. Two indicated that, although they did not offer incentives, they thought it could be done. One representative felt strongly that no incentive would be large enough to persuade families to have such devices installed. Parents were very "polarized" about the issue of telematic devices (they either were open and supportive of the device or absolutely disliked the concept of using such a device). Among those insurance companies that indicated they offer incentives to families or know of companies that do, the majority indicated that insurance discounts (to lower premiums) were offered (ranging from 5% to 15%), and others subsidize or temporarily cover the cost of the device to incentivize participation.

The initial cost of purchasing one of the monitoring devices currently on the market was reported to be a barrier. However, one company offers a speed monitoring device for young drivers free for one year, plus an insurance discount, but acceptance by parents has been unexpectedly low.

One company currently has a voluntary telematics device program for existing customers. The device records drivers' behaviors and is used to determine insurance rates.

Young Driver Ignition Interlocks

Support for a Young Driver Ignition Interlock Program

When asked about interest in participating in a hypothetical voluntary young driver ignition interlock program, three of the seven insurance representatives indicated that their companies would not be interested. One representative reported that parent clients already struggle with the decision to use monitoring devices that are fairly noninvasive, and the ignition interlock would be too extreme. Parents often report feeling that monitoring devices are a violation of trust between them and their teens or young adult children. Similarly, another representative reported that their in-house marketing research indicated that the drive-cam devices it markets are already presenting issues of privacy and trust between parents and teens and young adult children. Additionally, two representatives felt the ignition interlock (as currently designed) is simply too intrusive. With advanced technology such as passive alcohol sensing and transdermal sensing (via touch of the skin), however, one representative felt there was potential for future success by enrolling young drivers with a less intrusive device. Of the representatives who expressed a possible interest in such a program, most felt their companies were open to new programs and enhancements that increased safety. All, however, reported potential barriers for the ignition interlock. Two of the representatives were concerned about parental response. One reported that many parents do not think their teens or young adult children need such a device (e.g., do not drink alcohol or do not drink and drive) and another reiterated (similar to those who would not be interested in the program) the concern that parents may be hesitant due to a fear of violating the trust between them and their teens or young adult children. The obtrusiveness of the device (visually) was identified as a potential barrier to acceptance by one representative. Two other representatives reported that the price of the device must be reasonable for parents to be open to its installation. Although the monthly charges may not be problematic, the upfront cost of the device is likely to be high (if the cost is comparable to other devices currently on the market). Privacy was another issue. One representative reported that the company would need to reassure its clients that their information would be confidential and private (i.e., not shared with others). Importantly, one representative expressed concern about liability: "Who is responsible if a young driver circumvents the device and then gets into a collision?"

Three of the representatives indicated that their companies might be willing to help overcome some of these barriers in the insurance industry, but they first would need to learn more through a pilot program. Some did not feel such a program would be widely accepted. One noted, "We don't believe in giving discounts to drivers when it should be expected that they will not drink and drive." A smaller company felt they were not well situated to play as big a role as larger companies. Another company felt the device and the program were too "big brother."

Discounts

The majority of the insurance companies offer discounts for driver's education and additional supervised driving time. One company indicated that it strongly supports additional supervised driving experience, which is identified as an "actuarially justified" program that aligns with and supports GDL.

In addition to driver education, one company has a "good driver" program, and another has grant programs for education and service learning in the schools and communities. Finally, one company

offers a voluntary telematics program that is free for one year. A camera is mounted near the rearview mirror that captures data and provides coaching tips to the driver. Parents then can log onto a web site to view results.

Six companies felt it was hypothetically possible to offer some type of incentive to install an ignition interlock. One predominant theme was that such a discount would have to be “actuarially justified,” indicating that research is needed to obtain some knowledge about whether such a device lowers risk, changes behavior, and makes young drivers safer drivers. Further, when a discount or a new rating program is introduced, insurance companies must file it with each State in which they do business, for regulators to approve it. One representative noted that a program that lowers premiums and helps young drivers become safer drivers would be much easier to sell with numbers and data. Generally, programs that offer discounts show a 20 to 30 percent lower crash rate than for average young drivers not participating in such a program.

One representative felt that, even with a discount, it would not be widely accepted as currently designed. With more advanced technology, devices that are preinstalled in vehicles and are less intrusive, will likely result in discounts for drivers. It was noted that a successful program would have to provide incentives for young drivers as well.

Incentives for Participation

Incentives for installing an ignition interlock were generally seen as needing to be much higher than other telematic devices. Largely, a higher incentive was indicated because of the requirement that the young driver must provide a sample by “blowing into the device” to start the vehicle and for the retests, which might be construed as inconvenient or unsafe. One company indicated that the telematic devices it currently markets (not alcohol related) should be an “easy sell,” but they are getting much lower participation than anticipated. Regardless, if incentives were offered, most representatives felt that an ignition interlock device would have to be free or subsidized *and* insurance discounts granted for it to be used by customers.

Discussions With Community Group

The researchers contacted eight community/advocacy groups: five representatives of national organizations and three representatives from State groups. Discussion items focused on young driver safety and driving activities/programs, their perspective on parents' and young drivers' willingness to participate in a young driver ignition interlock program, incentives and barriers to participation, the need for community support for such a program, and their possible participation and role in establishing and maintaining such a program.

Young Driver Safety

Involvement of Young Drivers and Traffic Safety Issues

Of the eight community groups contacted, all eight indicated they had been involved with or were currently involved with young driver safety issues. One community group is involved in a parent initiative program called “The Power of Parents” that focuses on parents as the most influential people in the young person’s life. Two other groups, which have received funding from NHTSA, run national campaigns. The first group offered \$250,000 in awards and prizes to youth for their efforts on peer-to-peer education on youth traffic safety. The other group implements safe young driver initiatives at the community chapter level. It is involved with a young driver program focusing on underage drinking, called “Mobilizing the Community—Youth Taking the Lead.”

One community group was involved in a research project that studied young drivers and driving in California. They surveyed more than 2,000 high school students from Central Valley County and Los Angeles County. Their findings included youth driving without licenses; youth driving while talking on a cell phone; youth driving amid social distractions (music, yelling, dancing), youth driving with other youth in their cars despite the graduated licensing prohibition and, in some instances, youth driving with alcohol onboard. This group found that parents play an important role in teaching their young drivers how to drive.

Another community group sponsored programs on college campuses and high schools during the lunch hour called “Click-It Races,” in which a car dealership provided a car on campus and set up obstacle course races to see how fast each person can click their seat belts. In addition, this group worked collaboratively with an automotive group by launching a young driver safe driving program called, “Mindless Driving. Keep It Out of Cars,” to help raise awareness and educate young drivers and parents about the dangers faced by young drivers.

One group promotes the enforcement of particular laws for drivers younger than 21 years. In the past, they advocated that young drivers whose licenses have been suspended for a first-time offense should be categorized as a class 1 misdemeanor. This group also has youth programs that increase awareness in the schools about underage drinking and driving.

Access to Parents, Teens and Young Adults

All eight community groups indicated that they have access to parents, teens and young adults. Avenues for reaching them included town hall meetings and other media events, newsletters, their web sites and other social media, including Facebook. Two groups mentioned that their local chapters work directly with youth.

Parental Involvement

Parental Endorsement

All eight community groups indicated that some parents might be willing to have an ignition interlock installed to prevent their young drivers from drinking and driving. Two groups thought that about 50 percent of the parents would be willing to install an ignition interlock on their young drivers' cars once they were educated about the device and its goal. Two others believed that the majority of parents would find the ignition interlock device to be too intrusive, feeling like it involved "policing" their young drivers. Two representatives predicted that parents would oppose the device because they have an unrealistic belief that their young drivers are "going to be okay" or that they just need to trust their young drivers. Two other groups thought that parents from low income families would be discouraged by the cost.

One participant explained there would likely be three groups of parents; (1) a small group of parents who absolutely oppose the idea; (2) a larger group of parents who would not like the cost and inconvenience but could potentially be swayed to support it; and (3) a smaller group of parents who would see the value and importance of young driver ignition interlocks and would participate.

Parental Costs and Commitment

All eight community groups indicated that some parents would be willing to pay a monthly fee for an ignition interlock device, an average of \$25 per month, with the more affluent families perhaps willing to pay \$75-\$150 per month.

The consensus by the community groups was that hassle-free training and servicing are important and that the ignition interlock device should be easy to use and interpret. Training should be no more than 45 to 60 minutes and could perhaps be delivered using a webinar. Three groups noted that parents might find it unreasonable and burdensome to travel to a service center to service the device. It was suggested that servicing should take no more than 15 minutes every 2 to 3 months, like an oil change.

Community Support

Need for Community Support

Community support for a voluntary young driver ignition interlock program was generally seen as necessary. One representative thought that parents responded to peer-pressure in a manner that is similar to that of youth. If parents see other parents using the program to keep their young drivers safe, then they will be more likely to use it. The parents would also be more inclined to try the ignition interlock device if schools and driver's education classes promoted its use.

Community support could create strong peer-to-peer alliances among parents and young drivers. Three representatives indicated that, for the young driver ignition interlock to become socially acceptable among peers, the perception of the ignition interlock must be changed so that it is viewed as a benefit and a norm for the community. One explained the need to "rebrand" the ignition interlock as a safety device for young drivers to keep them alive, versus the current view that it is for criminal DUI offenders. Further, getting the media involved would be easy once reliable data and correct information is available that supports a preventative young driver ignition interlock program.

Community Group Role

Seven of the representatives indicated that their community groups would be willing to play a role in implementing an ignition interlock program for young drivers. Of those willing to participate, one group preferred beginning at the State level where local chapters could be involved. Data from test sites could be used to first demonstrate the success of the program and ultimately to support a national launch of the program. However, another representative felt that starting at the national level would make it easier to communicate the idea down the chain, through the States and then to local chapters.

One community group would support legislation introduced to educate the public. Another participant felt they could promote ignition interlock devices in an effort to improve the social acceptability for young drivers. It was noted that due to the increase in social media networking, it is now easier and quicker to get information out to the youth community.

Help for Parents From Community Groups

Four representatives indicated that a set of rules, parental expectations, or a parent-youth contract should be established before installing an ignition interlock. There was agreement that there should be consequences for the young driver once a parent received an ignition interlock report of alcohol use. All suggested that taking away driving privileges would be the first and most effective method of disciplining after conversing with their young driver about the actual events.

Putting themselves in the role of parent, six representatives would consider talking through youth drinking issues with a community group, but one would not seek outside assistance because it would interfere with the parent-youth relationship. Of the six representatives that ascribe to community group involvement, five preferred support groups, presentations, and meetings as alternative or additional methods of reaching youth. One group advocated peer-to-peer interaction, without parents in attendance “preaching” to them.

Specific Community Groups

Those interviewed favored Mothers Against Drunk Driving (MADD), Students Against Destructive Decisions (SADD) and schools as good community groups for involvement in a young driver ignition interlock program. Groups that were supportive also included 4-H, Washington Regional Alcohol Program (in the Washington, DC area), and the National Organization for Youth Safety (NOYS).

Other suggestions for potentially supportive community groups included the Boys and Girls Clubs, car dealerships, police, rotary groups, and a Maryland diversion program for people with DUI or aggressive driving citations.

Viability

Funding and Program Management Ideas

When asked about how an ignition interlock program for young drivers could be funded, six of the representatives indicated the government, at the Federal, State, or county level, in combination with other nongovernmental sources. Some of the Government agencies mentioned included NHTSA; the Department of Public Health, Health and Human Services; State Offices of Traffic Safety, and county behavioral health departments. Nonprofits mentioned as possible funding sources included MADD, Kiwanis, and the Rotary Club. The majority of representatives mentioned that insurance

companies could play a big role by providing a substantial discount on insurance premiums to offset the cost of the device and the installation fee. Other possibilities for discounts or subsidies included auto manufacturers, ignition interlock manufacturers, and driving schools. Suggested young driver incentives included a raffle to win a scholarship, gas cards, and any type of gift card.

When asked who could monitor the administrative duties of an ignition interlock program, the suggestions were similar to those suggested as funding sources listed above. One group suggested that the ignition interlock companies themselves were the best suited to handle the administrative aspects of a program.

Target Ages

Five representatives indicated that the ignition interlock program should include young drivers as young as 16 (or the State's driving age) because they are still under the authority of their parents. Answers regarding the top age range for a voluntary ignition interlock included 18, 19, 21 and 24. Two participants suggested the ignition interlock should remain on the car if the young driver is *no longer* under parental control, for example, while away at college.

Types of Families Likely to Participate

When asked what type of family would be most likely to participate, the predominant answer was middle- or upper-class families. For the lower-income families, three representatives raised concerns about the affordability of the program and noted it must have good monetary incentives. Families that have a lower income would need an advocate in the community who were aware of the program and assist in getting support for participation.

Most participants indicated that a parent who is concerned about their young drivers' behavior and safety is most likely to participate in an ignition interlock program. These parents either want to be proactive to protect their young drivers by taking precautionary measures or have experienced drinking-and-driving issues with their young drivers. Families that have friends who lost a teen or young adult child in an alcohol-related crash or received a DUI citation are more aware of the dangers of drinking and driving as it relates to young drivers. One representative, in particular, gave a well thought-out response by suggesting that a family educated on the risks of driving will most likely be more protective of their young drivers. Further, parents who are already protective (such as parents who ensure that their young drivers are wearing helmets while riding their bikes) are predisposed to safety issues. Ignition interlocks would just be a transition for the young drivers as they grow. Finally, families that are good role models for their young drivers (e.g., do not drive after drinking alcohol) are more likely to get the ignition interlock device than families that drink and drive.

Reaching High-Risk Young Drivers

Several places were proposed for recruiting families with at-risk youth including juvenile detention centers, high schools, police department diversion programs, and community groups or coalitions that provide community services or family support. One representative said that going through a driver education program that incorporates GDL rules would be a good way to recruit families.

Parent and Young Driver Discussion Groups

A discussion group was held in March 2010 at a community center in Prince George’s County, Maryland. Families were invited to participate by a community police officer, through word of mouth, and with a flyer. Adult attendees included six African-American parents, including one community police officer. In a separate room, six young males and one young female participated in the discussion. The youth were 15 to 22 years old.

Another discussion group was held in April 2010 at a high school in Montgomery County, Maryland. Families were invited to participate with a flyer and by e-mail to the students of an Urban Studies class at a local high school. Adult attendees included nine parents: five were African American; one was Hispanic, and three were White. Their nine children—six males and three females—participated as well. The youth were 14 to 18.

Both groups included lower to middle-income families.

Parent Discussion Groups

Young Driver Laws

Community Center Parents (Prince George’s County)

Parents seemed to feel that youth would do “whatever youth want to do” and are not particularly swayed by laws. Many indicated that their teens and young adult children are putting off driving because of the GDL law and that they can usually find other ways to get to places or find things to do. Because youth are not as motivated to drive, many of the parents felt that sanctions while under a provisional license would not be a big concern. If they lose their license, they will just go back to doing what they did before they received their license (bum rides, etc.). They noted that the cost of taking a driver education course is a disincentive.

The parents seemed to agree that minimum legal drinking age (MLDA), GDL, and zero-tolerance laws were a good idea, but they were not sure whether their young drivers would care much about the laws. Most of the participants felt that their young drivers were not drinking but acknowledged that underage drinking did happen. One person said he thought athletes were particularly prone to drinking, as it is part of the sports culture. Others mentioned athletes they knew who were very unlikely to drink because they place priority on their athletic performance.

High School Parents (Montgomery County)

Parents mostly felt that youth would find ways around laws. They believe that youth may not be aware of the zero-tolerance level and might not care about it because they feel they will not be caught. They do not believe many of the laws relating to GDL are being enforced. It was mentioned that youth obtain licenses in other States to get around the GDL law. They pointed out that youth are waiting much longer to obtain their license due to GDL. Some parents expressed the belief that putting off applying for their license is not necessarily making their youth safer drivers because they will still be inexperienced drivers inclined to make mistakes whenever they start driving. It was suggested that driving is more complex these days, with more traffic and a faster pace, so today’s youth would have a hard time dealing with it.

Voluntary Use of Ignition Interlocks

Community Center Parents (Prince George's County)

- *Breath test to start.* Parents did not think this would be a problem. There was some concern that young drivers would get around the initial sample and retests by having someone else provide a sample. The participants discussed pattern blowing, which is learned through initial training on the device and is designed to make it difficult for someone else other than the intended driver to do the start-up breath test. They were a little concerned that they would be unable to do the pattern themselves, should they need to start their young drivers' car.
- *Post-start retests.* Parents were leery of retests because young drivers just learning to drive would not have the skill to avoid having their driving affected by the distraction. They had safety and security concerns (if in a bad neighborhood) about the idea of pulling over for the retest. They felt that young drivers with more driving experience would have an easier time with it. They mentioned other distractions competing with driving and blowing (telephone conversations, texting). They were concerned because they have seen their young drivers freeze up due to too much stimuli and uncertainty while behind the wheel.
- *Parental override option.* All of the parents in this group had, or were planning to have, a separate car for their young drivers. Parents did not want their young drivers learning in (and denting) their cars. This rendered the parent override option somewhat moot. When asked if they would want an override option for times they drove their young drivers' cars or if they had to share, some said yes—sometimes they drink a little before driving and do not want to be locked out. Others said no—that would be perceived as hypocritical by the young drivers and parents need to practice what they preach.
- *Monthly reports to parents.* Parents liked the idea of reports; the more frequent the better, whether by e-mail or by postal service or via a web page.
- *Requirements/convenience.* Overall, parents did not seem to be bothered by the requirements described, such as bringing the vehicle in for service. They believed their young drivers might not like some of the requirements but would put up with them if they wanted to drive.
- *Potential benefits as a preventative measure.* It did not seem that any of the parents were preventing their young drivers from driving out of concern that they would drink and drive. Youth were avoiding driving more than parents were preventing them from driving. Parents liked the idea of preventing an impaired young driver from starting the car, and they liked the idea of reports. If the ignition interlock was available to them and affordable, they would likely use it, even if young drivers complained about it.
- *Stigma.* Parents were not planning to have it in their own cars, so their own embarrassment was not an issue. They thought it would not be a big deal for their young drivers.
- *Trust.* The trust issue did not seem to be a big one for these parents. They understood it but said they would not be swayed by it. Some thought their young drivers would question the decision to make them use an ignition interlock. Parents would respond that they were just doing what they had to do to keep their young drivers safe.
- *Cost.* Parents expressed the belief that they would be willing to pay for the device, under the philosophy that their young drivers' safety is invaluable, but an insurance discount would be a major incentive to use an ignition interlock. One parent said that she was paying more than \$500 a month for insurance since putting a young male on the policy. She mentioned other

responsible driver discounts, such as those for good students, but said they were far too small (e.g., 5%) to relieve the burden of her high insurance costs.

- *Other issues.* Parents were concerned that young drivers who were inclined to become impaired and drive would simply avoid alcohol in favor of some other drug that could not be detected by the ignition interlock but would be equally bad as far as they were concerned. Examples mentioned included marijuana, PCP, crack, ecstasy, and inhalants. Given limited funds, some parents expressed the opinion that they preferred using a GPS-based device, rather than an ignition interlock device, because it monitors driving behavior and reports the location. The idea of knowing the young drivers' location was very attractive to some parents, largely for security reasons.

High School Parents (Montgomery County)

- *Breath test to start.* Because their young drivers tend to travel short distances, parents believed that young drivers might easily find someone to provide a sample for them initially and that drinking drivers would reach their destination before a required retest. They believed that some features, such as hum tones and blow-suck patterns designed to make it difficult for someone else other than the intended driver to do the startup breath test, might be easily learned by young bystanders but may be too difficult for parents.
- *Post-start retest.* Parents in this group were not as concerned about young driver distraction related to the post-start retest as the community center group.
- *Parental override option.* Parents did not discuss this much, other than in the context of using it to start a car if it had been disabled due to a breath sample with alcohol. Some parents expressed the desire that any positive BrAC sample should result in the vehicle being disabled for a minimum time, forcing young drivers to call parents so that parents can come out and assess the situation. Parents did not like the ability to retest after a few minutes, in case the failure was due to something other than breath alcohol. Someone suggested a system that sends text messages to parents when a car has been locked out due to a positive reading. Another idea was a remote reset by parents who could use it after they have talked to their young drivers and determined (to their satisfaction) that the youth is not impaired.
- *Monthly reports to parents.* Some parents were concerned that any data kept on breath tests could be used against the young driver and/or parents. Some were concerned about the security of information sent over the Internet. Others were concerned that discounts provided by insurance companies could be rescinded based on ignition interlock data.
- *Potential benefits as a preventative measure.* It was difficult to discuss this issue because parents were primarily of the opinion that the ignition interlock would not prevent impaired driving or that putting an ignition interlock on the car of one driver would not prevent that driver from being hit by an impaired driver in a non-ignition interlock-equipped car. One parent suggested that the device would best be limited to young drivers who have a history of drinking.
- *Age.* These parents thought there would be different benefits at different ages. Young drivers who are younger may not be as inclined to drink and drive and may have problems using the device while driving, making them (arguably) not the best candidates. Conversely, using an ignition interlock early on would help establish good habits in these young drivers. Older teens or young adult drivers would benefit because they are more likely to be in potential drinking-driving situations.

Expected Effectiveness

Community Center Parents (Prince George's County)

Parents seemed to think that the ignition interlock would be reasonably effective and that any improvement would be worth it, though they were concerned about circumvention, including finding a friend who had access to a non-ignition interlock-equipped vehicle. They felt that modern technology (Facebook, Twitter, cell phones) would make it easy to identify such a young driver. They thought their youth would not want to ride with an impaired driver but believed that other youth might ride with an impaired driver. Even with the potential for circumvention, they believed it would do some good and were positive about the idea.

High School Parents (Montgomery County)

Parents seemed to downplay the potential effectiveness of ignition interlocks, essentially claiming they would not be very effective without discussing why. One parent mentioned a recent news story in which youth had hacked into the school's grade database, suggesting that youth had superior technical skills that would allow them to circumvent ignition interlocks. Parents seemed unwilling to accept the possibility that ignition interlocks could work for their young drivers. The potential for circumvention was perceived as high. Some parents thought ignition interlocks would be at least partially effective. The overall opinion expressed by some of the more vocal parents was that young drivers who needed it most really needed much more than the ignition interlock. The possibility that the ignition interlock would still be useful in these cases was downplayed.

Community Support

Community Center Parents (Prince George's County)

People agreed that it would take a "sales job" to persuade many parents to participate, but which community group might assist was not discussed. They all felt positive about it, partially because they were discussing it and believed they understood the issues pretty well, and agreed it would be beneficial for their young drivers' safety. Simply offering an ignition interlock program to the wider community would not work well, however, due to the diversity of attitudes toward drinking and driving and the relative apathy of some parents. Some parents who are more of a problem themselves in terms of drinking and/or taking drugs would be more likely to take advantage of a parental override. One father said he thought the community center could easily get 20 families onboard, but not hundreds.

High School Parents (Montgomery County)

The likelihood of finding a sponsor in their community was considered very low. It was suggested that only 10 to 20 parents might voluntarily participate in the program. Someone suggested that such a program might be more useful in a more rural community where young drivers are more reliant on driving to get around.

Program Costs and Incentives

Community Center Parents (Prince George's County)

They all seemed to say that money would not be a big issue for them, though the discussion did not include exact figures (\$20 per month was mentioned as feasible). All attendees agreed that money would be a big issue for others until or unless they understand the advantages. The main incentive would be financial. Most of the discussion centered on the high cost of insurance and whether having a discount due to the ignition interlock could save a significant amount of money.

Short-term incentives, such as free parking at school, were not accepted. They did not think the young drivers would want anything that made them stand out and appear to be different from their peers. Gas cards and other incentives that were essentially financial were mentioned as possibly effective. Long-term incentives, such as substantially reduced insurance costs, were most important. If the use of an ignition interlock were required to be licensed and/or to drive, youth would probably go along with it and not put off driving, *if* they are motivated to drive. Keep in mind, however, that youth are not as drawn to driving as they once were, and things that make it harder for them to obtain a license may cause them to go without a license.

High School Parents (Montgomery County)

The primary incentive discussed as being potentially effective was some sort of financial incentive. Parents seemed to believe that systems would have to be very inexpensive or free to be attractive. Some parents, however, would not have used them even if they were free. One parent suggested that a free installation trial period would be attractive. There was a concern that insurance discounts would result in insurance companies wanting access to ignition interlock data and that future insurance rates would be based on access to the ignition interlock data.

Young Driver Discussion Groups

Young Driver Laws

Community Center (Prince George's County)

This group had youth younger and older than 18, so the responses about drinking-related laws were mixed. Those younger than 18 thought the Minimum Legal Drinking Age (MLDA) should be 18. The two youths older than 18 noted that when you are young, you just want to be part of the group and have not yet developed a tolerance level for drinking, so the MLDA should remain at 21.

No one in the group seemed to know much about GDL or ZT laws, thinking that the the illegal *per se* driving limit was .08 for everyone.

High School Youth (Montgomery County)

A few of the youth were aware of the GDL provisions but did not know all the specifics. One student was on some type of license restriction due to a violation. Some thought it was not fair to punish all when only a few are irresponsible. "If they keep pushing the age back, we're going to have less experience driving." Most thought the MLDA should be 18, although one participant thought there should be harsher penalties because adolescents do "stupid stuff" until they are 21.

Voluntary Ignition Interlocks

Community Center (Prince George's County)

Although a recent youth drunk-driving tragedy was mentioned, the discussion topics were difficult for this group because driving anytime in the immediate future seemed remote for most in the group, with only one youth with current driving privileges. One of the older youths in this group pointed out that "you can't just look at statistics about drunk driving because there are much bigger problems in this community." The younger teens indicated a high level of drinking alcohol at school during school hours. Their backpacks are searched for knives, guns, and alcohol. They noted that hardly anyone drives to school (maybe 30 total), let alone drives at all.

They thought there were ways that the ignition interlock could be circumvented by having another person provide the sample. They did not think that parents should have an override option, but if

their parent wanted them to have an ignition interlock, that would end the discussion. It was suggested that it was appropriate only that those with a DUI offense should receive an ignition interlock.

The group thought that ages 15 to 21 would be appropriate for an ignition interlock but concluded that it was all just too much trouble and that it was better not to drink and drive. Two of the youth thought that a passive sensor type of device would provide more safety so that no one in the car could be drinking and causing a distraction to the driver.

High School Youth (Montgomery County)

When the topic of ignition interlocks was introduced, they immediately started talking about circumvention by having a friend provide a sample. They were surprised to hear about a possible hum-code requirement, which they thought was funny, and they believed they could get around it. They thought the post-start retest would be hazardous.

Most of the youth thought it would be unfair to require an ignition interlock unless the person had a DUI. Only one or two thought their parents would be willing to have it installed and possibly a couple more if they were charged with a DUI. Most thought their parents would not want to spend the money, even if the fee was as low as \$10 per month. If it was free, they thought that only a few people who drive to school would have it installed, primarily those who did not need it. If caught driving drunk by parents, they would be punished in other ways, like having the vehicle taken away.

Other comments included:

- “If my mom put it on, I would take the bus; I don’t like having things forced on me.”
- “It would not be voluntary because some parents would force it upon their teens. If you don’t have a history of drunk driving, having it would be a waste.”
- “Some parents don’t care if their teen drinks and drives. Those are the ones that die. Those are the ones that raise statistics. The teens that need it won’t get it because the parents don’t care.”
- “My mom thinks I’m too smart to drive drunk.”
- “Try putting it on all teen cars for a trial period; if no problems, then they don’t need it.”
Response: “We could get around it; we are geniuses at it.”
- “My mom would (get an ignition interlock). She’d get everyone to do it. My brother was a partier, and she’d put it on mine.”
- “I don’t even drive yet because my parents are too lazy (to help get GDL). But I think driving drunk is stupid.”

There was no consensus on the stigma associated with having an ignition interlock. Two indicated it would be embarrassing. Another said it would be annoying. One thought it might be cool, indicating rebelliousness. Most were strongly resistant to the idea of an ignition interlock for themselves.

Three of the youth said they thought that freshman year in college would be a good age for the ignition interlock. Another mentioned 17 through the first year of college. Two mentioned any age after you have had your first or second drunk-driving offense.

There were some mixed feelings about the new speed/location monitoring devices that send real-time messages to parents, but generally, there was a strong dislike for the idea of parents having so much involvement and control over their driving.

Expected Effectiveness

Community Center (Prince George's County)

It was suggested a couple of times that having a camera in the vehicle would more effectively prevent circumvention of an ignition interlock. It was also mentioned that many parents in the community are not good parents and would not care, so the program could not be effective for them. Several mentioned that youth would just use other drugs if the ignition interlock prevented them from drinking; all kinds of drugs were listed as possibilities. One youth said that he believed ignition interlocks would save lives, so an ignition interlock program could be effective.

High School Youth (Montgomery County)

A couple of the participants acknowledged that, if forced on all youth, drunk driving would go down, but youth would drive less. They generally did not think that youth would smoke marijuana instead of drinking to avoid ignition interlock violations, saying "the smell of pot makes it too risky."

Community Support

Community Center (Prince George's County)

If free ignition interlock installation was offered at the community center, most participants said that some parents would follow up with it.

High School Youth (Montgomery County)

The youth did not think that recruitment by the PTA would help; parents do not read e-mails. Suggestions for sponsorship included the Montgomery County Police Department, MCA (a Christian group), and BASS (Brother and Superstar Scholars). It was noted that anyone could join BASS.

Program Costs and Incentives

Community Center (Prince George's County)

The responses regarding the cost of an ignition interlock were mixed. Some indicated that cost would be an issue and, even if free, their parents would not participate. Two participants said their parents would participate if it were free. When prodded for a maximum monthly amount their parents would pay, the responses ranged from \$30 to \$60 per month. One youth noted, "That's a cell phone bill," indicating that keeping your child safe should be as important as the cost of a cell phone.

Possible incentives mentioned included insurance discounts, a new car, cash for vehicle upkeep, college scholarship money, and assistance in finding a place to live after high school, paying for driving school and less strict GDL restrictions.

High School Youth (Montgomery County)

A majority of the youth mentioned insurance discounts and cash incentives from \$500 to \$1,000. A couple indicated that they would not want it, even for \$1,000. Others mentioned a gas card or a college scholarship, and two mentioned a tax rebate. Some noted that it would have to be free, plus an incentive, to get participation.

Ignition Interlock Recorder Data of Voluntary and Involuntary Users

Introduction/Background

During discussions with representatives from ignition interlock providers, some providers indicated that they currently had voluntary customers. They include family members, such as parents who had the device installed on their child's (or some other family member's) vehicle or individuals who voluntarily extended their court or DMV orders or continued to use the ignition interlock on their vehicle as a safety precaution. One ignition interlock company provided e-identified ignition interlock recorder data on all of their voluntary customers over the past 3 years and a sample of involuntary customers 16 to 26 for analysis and comparison. Specifically, three sets of samples were received.

- Involuntary Users (required) teen- and young adult (16 to 26 years old) ignition interlock users. These are the traditional court- or DMV-ordered clients.
- Voluntary Users - All. Parents often lease the devices in their names for their children. Unfortunately, this makes it impossible to determine how many of the voluntary cases are parents of young ignition interlock users or other adults who are voluntarily on ignition interlock.
- Voluntary Users - Teen- and young adult (16 to 26) ignition interlock users who lease the device themselves. Everyone in this group is a voluntary ignition interlock user and is 16 to 26. This group is a subset of the "Voluntary Users – All" group.

The ignition interlock event-recorder data included time and date of all attempts to start the vehicle and the results of all BrAC tests.

Data Cleaning and Management

To ensure data accuracy and consistency, data were cleaned. First, duplicate log events were eliminated from the data set. Second, abnormal log events were removed including:

- Events occurring before date of installation;
- Too frequent BrAC tests (i.e., occurring less than 5 minutes apart); and
- Too frequent test refusals (i.e., occurring less than 10 minutes apart).

Furthermore, for analytic purposes, BrAC tests were categorized into, (1) Startup tests, and (2) Retests, based on marked patterns in the distributions of lag times between tests that showed sudden drop-offs at 45 minutes. Initial tests were counted as startup tests, and tests occurring within 45 minutes of the initial startup tests were considered as retests.

The study closely examined the data patterns and had to rely on informed judgment and experience to detect abnormal events, and to differentiate the initial startup tests from retests. Too frequent log events, thought to be common electronic errors in the ignition interlock device, were excluded. Such events are usually caused by things like voltage spikes and vehicle service or repair activities.

Analysis

Age, gender, and duration of ignition interlock use were analyzed for voluntary and involuntary ignition interlock users separately. Then overall and monthly average BrAC test intervals were compared between the two groups (voluntary and involuntary). This was initially calculated on startup tests only, and then based on all tests. The rate was calculated as the number of tests over a specified BrAC level divided by the total number of BrAC tests. Because States have different lockout points, the count of failed tests is not a stable criterion for comparison. Accordingly, three cumulative BrAC levels were used as the threshold (i.e., $\geq .02$, $\geq .04$, and $\geq .08$, respectively) to allow for better across-State comparisons. The primary focus was on the BrAC test intervals of the initial startup tests because most of the user’s behavior is reflected in them, as each retest is always preceded by a startup test that was negative for alcohol. Prior ignition interlock research has routinely focused on the initial startup test as the target for comparison because these have a higher density of BrAC positive tests relative to retests (which are always preceded by a passed startup test).

Results

Demographics

Table 1 presents the age distribution of ignition interlock users in the dataset from the ignition interlock company. As expected, the majority of involuntary users were 18 to 26 years old (because the specific request was for data on users younger than 26). As indicated in Table 1, a large number of voluntary ignition interlock users are identified as older than 26. These volunteers were included because the age of the parent who leased the voluntary ignition interlock for their child often is recorded by the ignition interlock company rather the age of the young user; thus, it was important to consider them in the analyses. Further, as results below indicate, the full voluntary group and the <26-year-old voluntary group look virtually identical, and our statistical tests revealed no significant differences between them.

Table 1: Age distribution of the two groups of ignition interlock users

Group	Age Groups						Total
	<18		18 - 26		>26		
Voluntary	0	(0%)	74	(7.5%)	910	(92.5%)	984
Involuntary	8	(0.1%)	6,617	(99.9%)	0	(0%)	6,625

Most voluntary and involuntary users were male (67.5% and 75.7%, respectively). The percent of males is higher among involuntary users, as compared with voluntary users.

Table 2: Gender distribution of the two groups of ignition interlock users

Group	Gender				Total
	Male		Female		
Voluntary	661	(67.5%)	318	(32.5%)	979
Involuntary	4,987	(75.7%)	1,604	(24.3%)	6,591

When examining duration of ignition interlock usage (Table 3), the study found that the average number of days the device was installed for the voluntary user group was 359 (almost 1 year) compared to 222 days (slightly more than 6 months) for the involuntary group. It was possible to

infer that these lengths of time are in line with the leasing arrangements for voluntary users (typically a year) and sanction periods for involuntary users (typically 6 months). Sanctioning periods, however, vary by law, prior convictions, and BAC (or BrAC) levels at time of arrest. Unfortunately, this information is not included in the dataset.

Table 3: Duration of use distribution of the two groups of ignition interlock users

Group	N	Number of Days
Voluntary	984	359
Involuntary	6,625	222

BrAC Test Intervals: Startup Tests Only

As Table 4 shows, the average number of startups per month is nearly the same for voluntary and involuntary ignition interlock users, equaling roughly two starts per day. This suggests that the frequency of ignition interlock usage is similar between the two groups.

Table 4: Frequency of startup tests

Group	N	Average # of Startups per Month
Voluntary	981	67
Involuntary	6,622	64

An examination of the average BrAC test intervals of startup tests for the identified voluntary 18- to 26-year-old users and the involuntary 18- to 26-year-old users (Table 5), shows that voluntary users were far more likely to have higher BrACs on their startup tests. On the other hand, 92.9 percent (i.e., 100%-7.1%) of all startup tests for the voluntary group are in the range of 0-.01999, suggesting that most tests were passed (as there are currently no lockout points below .02 in any State). Further, it shows a virtually identical pattern of BrAC test intervals (Table 6) for the full voluntary group as for only the specifically identified “young” users (18- to 26-year-olds).

Table 5: Average cumulative BrAC test intervals of startup tests: Age 18 to 26

Group	N	BrAC≥.02	BrAC≥.04	BrAC≥.08
Voluntary	74	7.1%	4.8%	2.2%
Involuntary	6,614	1.6%	0.9%	0.3%

Table 6: Average cumulative BrAC test intervals of startup tests: Age 18+

Group	N	BrAC≥.02	BrAC≥.04	BrAC≥.08
Voluntary	977	7.2%	4.6%	2.2%
Involuntary	6,614	1.6%	0.9%	0.3%

It is possible to speculate that this finding is caused by the involuntary users’ fear of sanctioning if they attempt to use the device with alcohol present. Voluntary users, on the other hand, may have less concern beyond their parents (or other family members), reprimanding them if they “fail” the test, without other more serious consequences.

An additional hypothesis is that voluntary users may have the goal of staying under the illegal *per se* level of .08 rather than trying to remain alcohol free. As indicated in Tables 5 and 6, the

proportion of startup tests for voluntary users with BrACs at or higher than .08 is more than 2 percent, as compared with BrACs higher than .02 at more than 7 percent of the tests. These levels of elevated tests are much higher than was found with the involuntary group.

Similar to the overall average BrAC test intervals, average monthly BrAC test intervals of startup tests for young (18 to 26 years) voluntary users (Table 7) and all voluntary users (Table 8) have higher rates than for involuntary users.

Table 7: Monthly average cumulative BrAC test intervals of startup tests: Age 18 to 26

Group	N	BrAC≥.02	BrAC≥.04	BrAC≥.08
Voluntary	74	7.3%	4.8%	2.3%
Involuntary	6,614	1.6%	0.9%	0.3%

Table 8: Monthly average cumulative BrAC test intervals of startup tests: Age 18+

Group	N	BrAC≥.02	BrAC≥.04	BrAC≥.08
Voluntary	977	7.3%	4.7%	2.2%
Involuntary	6,614	1.6%	0.9%	0.3%

BrAC Test Intervals: All BrAC Tests

For the final analyses of the ignition interlock recorder data, the study examined BrAC test intervals based on all BrAC tests (including startup and retests).

Similar to results for startups only, the average number of tests per month for both voluntary and involuntary users was very similar, equaling roughly 5.6 total tests per day. Again, this reflects a similar frequency of ignition interlock usage between the two groups.

Table 9: Frequency of all BrAC tests

Group	N	Average # of BrAC Tests per Month
Voluntary	981	168
Involuntary	6,622	167

A comparison of the average elevated BrAC test intervals of young (age 18 to 26) voluntary users and same-age involuntary users by BrAC (Table 10), once again, shows that the voluntary users are more likely to provide breath samples positive for alcohol than involuntary users, specifically 5.7 percent compared to 1 percent with BrAC tests ≥.02. For the voluntary group, 94.3 percent (i.e., 100 - 5.7%) of all BrAC tests are in the range of 0-.01999, indicating that most tests were passed (as there were no lockout points lower than .02 in any State). A nearly identical pattern emerges when all the voluntary users (Table 11) are included. There are no statistically significant differences between the 18- to 26-year-olds and 26-plus-year-old voluntary users for BrAC test intervals higher than .02, .04, or .08, based on startup tests only or all BrAC tests. Consequently, Table 11 combines the two groups and displays the data for Ages 18+.

Table 10: Average cumulative BrAC test intervals of all BrAC tests: Age 18 to 26

Group	N	BrAC≥.02	BrAC≥.04	BrAC≥.08
Voluntary	74	5.7%	3.5%	1.4%
Involuntary	6,614	1.0%	0.5%	0.2%

Note: The differences between voluntary and involuntary users are all statistically significant ($p<0.05$).

Table 11: Average cumulative BrAC test intervals of all BrAC tests: Age 18+

Group	N	BrAC≥.02	BrAC≥.04	BrAC≥.08
Voluntary	981	5.7%	3.3%	1.3%
Involuntary	6,614	1.0%	0.5%	0.2%

Note: The differences between voluntary and involuntary users are all statistically significant ($p<0.05$).

The study also examined monthly average BrAC test intervals among voluntary and involuntary users (Tables 12 and 13). Similar to the results presented with startup BrAC test intervals, voluntary users are more likely to have attempts to start their cars with higher BrACs than involuntary users. Not surprisingly, the differences between the voluntary and involuntary groups are statistically significant ($p<0.05$), whether looking at 18- to 26-year-olds only or all ages.

Table 12: Monthly average cumulative BrAC test intervals of all BrAC tests: Age 18 to 26

Group	N	BrAC≥.02	BrAC≥.04	BrAC≥.08
Voluntary	74	5.8%	3.4%	1.4%
Involuntary	6,614	1.0%	0.5%	0.2%

Note: The differences between voluntary and involuntary users are all statistically significant ($p<0.05$).

Table 13: Monthly average cumulative BrAC test intervals of all BrAC tests: Age 18+

Group	N	BrAC≥.02	BrAC≥.04	BrAC≥.08
Voluntary	981	5.9%	3.4%	1.4%
Involuntary	6,614	1.0%	0.5%	0.2%

Note: The differences between voluntary and involuntary users are all statistically significant ($p<0.05$).

BrAC Test Intervals: Gender Analysis

The study compared the average BrAC test intervals based on startup tests on male and female users separately. Results from young ignition interlock users (i.e., 18 to 26) are presented in Tables 14 and 15. Table 16 shows the behaviors of voluntary users older than 26 by gender.

Table 14: Overall average cumulative BrAC test intervals of startup tests: Males from 18 to 26 years

Group	N	BrAC≥.02	BrAC≥.04	BrAC≥.08
Voluntary	60	8.1%	5.4%	2.6%
Involuntary	4,976	1.7%	0.9%	0.3%

Note: The differences between voluntary and involuntary users are all statistically significant ($p<0.05$).

**Table 15: Overall average cumulative BrAC test intervals of startup tests:
Females from 18 to 26 years**

Group	N	BrAC≥.02	BrAC≥.04	BrAC≥.08
Voluntary	14	2.9%	2.0%	0.6%
Involuntary	1,604	1.3%	0.7%	0.3%

Note: The differences between voluntary and involuntary users are all statistically significant ($p<0.05$).

**Table 16: Overall average cumulative BrAC test intervals of startup tests:
Voluntary users older than 26 years**

Gender	N	BrAC≥.02	BrAC≥.04	BrAC≥.08
Male	599	7.4%	4.7%	2.2%
Female	303	7.0%	4.5%	2.1%

Note: The differences between voluntary and involuntary users are all statistically significant ($p<0.05$).

As shown in Tables 14 and 15, young male voluntary users are far more likely to have higher BrACs at startup than young female volunteers (e.g., 8.1% versus 2.9% in the .02+ interval) and the differences are statistically significant ($p<0.05$). In comparison, the gender difference is much smaller among young involuntary users and was not statistically significant (e.g., 1.7% versus 1.3% in the .02+ interval). Overall, voluntary users still tend to have higher BrACs at startup than involuntary users for both genders, but the group difference is much more striking among males. The sample size of young female voluntary users, however, is very small in our data ($N=14$), so the results should be interpreted with caution.

On the other hand, Table 16 suggests that male and female voluntary users who are older than age 26 tend to have similar behaviors during startup tests. When comparing young female voluntary users in Table 15 with older female voluntary users in Table 16, the older females are far more likely to have higher BrACs at startup (e.g., 7.0% versus 2.9% in the .02+ interval). In contrast, the difference between older and younger male voluntary users is much smaller (e.g., 7.4% versus 8.1% in the .02+ interval).

It is possible that many of the users in the age 26-plus group include parents who lease the devices in their names for their children. It is possible to infer that some older female voluntary users might actually be the mothers of young male users who tend to have higher BrAC rates. The study was unable to verify this conjecture, however, because of limitations with the current data.

Ignition Interlock Recorder Data Conclusions

Voluntary users were more likely to have higher startup BrAC tests than involuntary users. When comparing voluntary and involuntary users of any age groups (i.e., 18-to-26 only or 18+) all tests in this section of the report were statistically significant ($p<0.05$), using startup tests only or all BrAC tests (overall rates or monthly rates.)

Voluntary users *might* suffer the wrath and restrictions of a parent or spouse, whereas involuntary users may have to face court or DMV officials who have the authority to impose additional sanctions and/or to revoke their driving privileges. For voluntary users, if no one is receiving or accessing monthly data results from the ignition interlock company, they will not be as concerned about their attempts and failures to start their vehicles. This suggests that among the possible definitions of who might constitute the voluntary group, it seems less likely to contain very many offenders who decided to install an ignition interlock preemptively to curry favor with a judge

before a hearing. The PIRE web survey, indicated that a good portion of voluntary users report not receiving or accessing ignition interlock data results. For most involuntary users, a system is established for court or DMV review of the monthly data log results and a process is in place to impose sanctions for repeated positive BrAC failures. This is consistent with recently published work by Zador, Ahlin, Rauch, Howard, and Duncan (2011) who showed that closer monitoring of ignition interlock-stipulated offenders improves compliance with program expectations. The voluntary sample here may be an example of the complete absence of a monitoring authority, assuming there is less (or perhaps no) parental or governmental oversight.

PIRE Survey of Parents and Voluntary Ignition Interlock Users

Background and Methods

Independent of this NHTSA study, PIRE conducted a small web survey to collect pilot data on the reasons why parents decide to voluntarily place ignition interlocks on the vehicles of their children (16 to 25.) Discussion of the pilot results are provided here to add to the discussion on voluntary ignition interlocks for teen and young adult drivers.

In collaboration with an ignition interlock company, invitation letters were mailed to approximately 400 voluntary ignition interlock customers (not on ignition interlock by court order or DMV requirement) who had leased an ignition interlock device within the last 3 years. Both parents of young ignition interlock users and young ignition interlock users themselves were encouraged to complete a two-page confidential web survey or to call PIRE to complete the survey by phone; both youth and parents could complete surveys, but their submissions were not linked for this study.

The invitation letter, on the participating ignition interlock company letterhead and signed by the company's chief executive officer, encouraged participation in the web or telephone survey and explained that their personal information (name and address) would be deleted from PIRE records within 3 weeks after the mailing date. A PIRE web link and an 866 call-in telephone number were provided. Telephone survey participants had an additional opportunity to add any additional information about their ignition interlock experiences. Web survey participants were also invited to call into the 866 number to share additional information. Both web and telephone participants were mailed \$25 (in the form of a gift card) for completing the survey.

To discourage fraudulent submission of multiple surveys by the same person, the invitation letters included a random case number to be entered by the participant when logging into the survey site or to be provided when calling in to complete the survey by telephone.

When a young person had a "voluntary ignition interlock," the parent often was the actual customer or ignition interlock lessee. Consequently, when providing the mailing list of voluntary customers, the ignition interlock company could not distinguish a young voluntary ignition interlock user from offenders who opted to keep the ignition interlock on after the required court order or DMV order expired, or from spouses, parents, or adult children of alcoholics who had an ignition interlock installed on the family vehicle for safety reasons. Even though the questions were geared for young ignition interlock users and their parents, some additional voluntary ignition interlock users completed the survey.

The parent survey consisted of approximately 20 questions and took no more than 10 minutes. The first items asked the parents for information about their child (age during ignition interlock use, whether their child lived at home, attended school, and/or worked). These were followed by questions related to the ignition interlock device (how long it was installed, why it was installed, set up and operational issues) and their perceived effectiveness of the ignition interlock device. Demographic items were also collected (age, gender, race). The youth survey consisted of items similar to the parent survey, including living and work status, length of time on the ignition interlock device and ignition interlock operational questions (programmed for retesting, availability of results, etc.), and any issues or problems they may have experienced with the device. The youth

were also asked their opinion about the effectiveness of the ignition interlock device both for them and, in general, for other youth.

The following sections present the survey results of both the parent-completed and youth-completed surveys. Because this was a convenience sample with small sample sizes, no statistical analyses were conducted; the findings are exploratory.

Parent Survey Results

Thirty-nine parents of voluntary ignition interlock users responded to the survey.⁶ Most of these respondents reported being in the age category of 41 to 60 years or older than 60 years. Of these, the majority had children under the age of 26 years (56.4%). Most parental respondents were female (59%), with slightly more female respondents reporting having a child under 26 years old. All parents who participated reported being White, and one reported being of Hispanic origin.

Background of Voluntary Ignition Interlock User (as reported by the Parental Respondent)

Among parental respondents, most (61.5%) indicated that their child (the voluntary ignition interlock user) still lived at home. As indicated in Table 17, slightly more respondents reported their child/voluntary ignition interlock user was 26 and younger (68.2%) compared to those with older children/voluntary ignition interlock users (52.9%). In four cases, the ignition interlock user was actually a spouse (two cases), a parent (whose adult child required the parent to have the ignition interlock), and a sibling for whom the “parent” was the legal custodian. Given the small sample in this survey and our interest in learning more about voluntary ignition interlock users, their responses were included in the results.

Table 17: Voluntary ignition interlock users’ living status by age category (“Does your child live at home?”)

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
No	5	22.7	5	29.4	10	25.6
Yes	15	68.2	9	52.9	24	61.5
Part time	1	4.5	0	0.0	1	2.6
Other	1	4.5	3	17.6	4	10.3
N	22		17		39	

As indicated in Table 18, approximately 41 percent of the ignition interlock users were reported by their parents to have worked part time, 33 percent currently did not work, and 18 percent worked full time. Table 18 displays this information by age group.

⁶ It is difficult to calculate response rates as parents and their children were invited to participate. In some cases, both responded, and in others only one or the other. Further, it is unknown how many did not respond because they were not a parent of a young interlock user.

Table 18: Voluntary ignition interlock user's work status by age category ("Does your child work?")

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
No	6	27.3	7	41.2	13	33.3
Part time	12	54.5	4	23.5	16	41.0
Full time	4	18.2	3	17.6	7	17.9
Other	0	0.0	3	17.6	3	7.7
N	22		17		39	

More than half (56.4%) of the parents indicated their child was attending some form of school (high school, college, trade school, etc.). Most of these children were 26 or younger (Table 19).

Table 19: Voluntary ignition interlock users' school status by age category ("Does your child attend school?")

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
No	5	22.7	12	70.6	17	43.6
High school	5	22.7	0	0.0	5	12.8
Technical school	2	9.1	1	5.9	3	7.7
4-year college	4	18.2	2	11.8	6	15.4
Community college	5	22.7	1	5.9	6	15.4
Other	1	4.5	1	5.9	2	5.1
N	22		17		39	

Ignition Interlock Use

When asked how long the voluntary ignition interlock had been used (or will be used if recently started on the ignition interlock), the majority of parental respondents (56.4%) indicated a year or less; however, 15.4 percent indicated they were unsure how long the device had been on the vehicle. Table 20 shows the duration of ignition interlock use by age group. Slightly more of the younger voluntary ignition interlock users had the device installed for a year or less.

Table 20: Duration of voluntary ignition interlock use by age category ("How long was the ignition interlock installed or will be installed?")

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
<1 year	7	31.8	6	35.3	13	33.3
1 year	6	27.3	3	17.6	9	23.1
2 years	1	4.5	4	23.5	5	12.8
3+ years	4	18.2	1	5.9	5	12.8
Not Sure	4	18.2	2	11.8	6	15.4
Other	0	0.0	1	5.9	1	2.6
N	22		17		39	

Some of the parental respondents' reasons as to why the ignition interlock was installed included "because youth had been involved in an alcohol-related incident," "felt it was an important safety precaution to have," or "other." Of these responses, the majority of parental respondents (56.4%) installed the ignition interlock because of an alcohol-related incident, and the majority (68.2%) of these were parents with children (voluntary ignition interlock user) younger than 27. As indicated in

Table 21, among parental respondents with children (voluntary ignition interlock user) older than 26, the greatest response was “other” (76.5%), which mostly included reasons similar to items categorized as an “alcohol incident,” such as a family member who had a previous drinking problem or had driven after drinking alcohol (12 of 18 cases including 2 who had a child 26 or younger) or “safety,” including generally wanting to assist their child in being a responsible driver (6 of 11 cases for which 3 had a child 26 or younger).

Table 21: Reason for installment by age category
 (“Why did you have the alcohol ignition interlock device installed on you youth’s vehicle?”)
 (Check all that apply)

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
Alcohol incident	15	68.2	6	35.3	21	53.8
Safety	6	27.3	5	29.4	11	28.2
Other	5	22.7	13	76.5	18	46.2
N	22		17		38	

Regarding ignition interlock functions, almost all (94.7%) parental respondents in both age groups indicated that the ignition interlock installed was set to do post-start retests (Table 22).

Table 22: Voluntary ignition interlock device required post-test retests by age category
 (“Is the ignition interlock set to require retests?”⁷)

Count	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
No	1	4.5	0	0.0	1	2.6
Yes	20	90.9	16	100.0	36	94.7
Other (please specify)	1	4.5	0	0.0	1	2.6
N	22		16		38	

Surprisingly, ignition interlock monthly report results were sent to or made available to only 17.9 percent of parental respondents. Most (68.4%) indicated they did not receive any results, although the ignition interlock company noted that this was probably by choice. (This issue is confirmed in Table 25 where only one respondent listed “Accessing results” and only one respondent listed “Service provider problems” as issues of concern.) Parents of younger children/voluntary ignition interlock users were slightly more likely to have reported that they did not receive any results (Table 23). One phone survey participant indicated that she did not realize that she could have access to the monthly results, even though she was the device lessee. It is noted that some ignition interlock companies have the option for customers not to receive regular reports on ignition interlock performance in exchange for a reduced monthly fee.

⁷ In this report, these retests are known as “post-start retests.”

**Table 23. Results were made available for review by age category
("Did you have the results sent to you or made available to you to review?")**

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
No	16	72.7	10	62.5	26	68.4
Yes, regularly	3	13.6	2	12.5	5	13.2
Yes, sometimes	2	9.1	0	0.0	2	5.3
Not applicable	0	0.0	0	0.0	0	0.0
Other (please specify)	1	4.5	4	25.0	5	13.2
N	22		16		38	

Of those parents who responded to the question "Did your child have any issues with the ignition interlock device?" (n=36), over half (55.6%) indicated that their child (voluntary user) had had issues (Table 24). Respondents were asked to elaborate on the types of issues experienced by their youth/the voluntary user (see Table 25).

**Table 24: Issues with the ignition interlock device or service provider by age category
("Did your youth have any issues with the ignition interlock device?")**

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
No	9	42.9	7	46.7	16	44.4
Yes	12	57.1	8	53.3	20	55.6
N	21		15		36	

**Table 25: Issues experienced with the ignition interlock device by age category
as reported by parents ("If yes to issues, please check all that apply")**

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
Startup	4	19.0	3	20.0	7	19.4
Retest	0	0.0	1	6.7	1	2.8
Feel unsafe w/ retest	3	14.3	3	20.0	6	16.7
Lock outs due to test failure	3	14.3	1	6.7	4	11.1
Difficult to keep calibrated/serviced	1	4.8	2	13.3	3	8.3
Accessing results	0	0.0	1	6.7	1	2.8
Interpreting results	0	0.0	0	0.0	0	0.0
Added service fees	0	0.0	0	0.0	0	0.0
Added car maintenance costs/trouble	2	9.5	0	0.0	2	5.6
Affordability of monthly fees	2	9.5	2	13.3	4	11.1
Embarrassment	5	23.8	4	26.7	9	25.0
Inconvenience	6	28.6	2	13.3	8	22.2
Service provider problems	0	0.0	1	6.7	1	2.8
Other	6	28.6	7	46.7	13	36.1
N	21		15		36	

The two issues reported by parental respondents most often included their child (voluntary ignition interlock user) "feeling embarrassed about having the device" (25% n=9) and the "inconvenience" of the device (22.2% n=8). Some respondents indicated that their child (voluntary user) had problems with the device startup (19.4% n=7) and felt unsafe with the post-start retest (16.7% n=6). However, only one parental respondent indicated that their youth (voluntary user) had an actual problem with the retest. There do not appear to be differences by voluntary ignition interlock user

age groups. Interestingly, as indicated in Table 25, parents of older voluntary ignition interlock users/children reported that their child (voluntary user) felt somewhat more unsafe about the retest than parents of the younger voluntary ignition interlock user/children younger than 27 (20% versus 14.3%).

Virtually all parental respondents reported their child (voluntary user) had no issues with the service provider or with accessing and interpreting results (although, as indicated earlier, few parents reported receiving results). The service fees were not reported as a problem by users as reported by the parents, but a little more than 11 percent indicated their child had issues with the affordability of the monthly fees.

Most (73%) parental respondents indicated that their child (voluntary user) had no issues personally with the device or the provider. Slightly more parental respondents of older ignition interlock users reported having problems (Table 26).

Table 26. Parental issues with the ignition interlock device or the provider by age category (“Did you yourself have any difficulties with the ignition interlock?”)

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
No	17	77.3	10	66.7	27	73.0
Yes	5	22.7	5	33.3	10	27.0
N	22		15			

Table 27 shows that issues experienced by parent respondents were varied by age of ignition interlock user. No particular problem emerged as a dominant issue.

Table 27: Issues the parent had with the ignition interlock device or provider, by age category (“If yes to issues, check all that apply.”)

	Age ≤26		Age ≥27		All Ages	
	Count	Percent	Count	Percent	Count	Percent
Startup	0	0.0	1	6.7	1	2.7
Retest	1	4.5	0	0.0	1	2.7
Feel unsafe w/ retest	1	4.5	0	0.0	1	2.7
Lock outs due to test failure	1	4.5	0	0.0	1	2.7
Difficult to keep calibrated/serviced	0	0.0	1	6.7	1	2.7
Accessing results	0	0.0	2	13.3	2	5.4
Interpreting results	0	0.0	0	0.0	0	0.0
Added service fees	0	0.0	0	0.0	0	0.0
Added car maintenance costs/trouble	1	4.5	1	6.7	2	5.4
Affordability of monthly fees	1	4.5	0	0.0	1	2.7
Embarrassment	0	0.0	0	0.0	0	0.0
Inconvenience	1	4.5	0	0.0	1	2.7
Service provider problems	1	4.5	2	13.3	3	8.1
Other	3	13.6	2	13.3	5	13.5
N	22		15		37	

When asked whether the voluntary ignition interlock user/child had ever provided a sample into the device and the result failed (indicating alcohol presence), 44.7% (n=17) indicated “yes.” Most of those that indicated “yes” (62.5%) (n=10) were parents of older voluntary ignition interlock users/children (Table 28).

**Table 28: Test indicated presence of alcohol by age category
("Has there been any occurrence when positive BrAC results were found?")**

	Age ≤26		Age ≥27		All Ages	
	Count	Percent	Count	Percent	Count	Percent
No	15	68.2	6	37.5	21	55.3
Yes	7	31.8	10	62.5	17	44.7
N	22		16			

Effectiveness Beliefs

All parental respondents agreed that they should do whatever it takes to prevent their child from drinking alcohol and driving. In addition, all parental respondents with children 27 and older and nearly all (90% of) parental respondents with children 26 and younger strongly agreed with the statement (Table 29).

Table 29: Parents should do whatever they can to prevent drinking and driving, by age category ("I believe that parents should do whatever they can to prevent their youth from drinking and driving")

	Age ≤26		Age ≥27		All Ages	
	Count	Percent	Count	Percent	Count	Percent
Strongly agree	20	90.9	15	100.0	35	94.6
Agree	2	9.1	0	0.0	2	5.4
Neutral	0	0.0	0	0.0	0	0.0
Disagree	0	0.0	0	0.0	0	0.0
Strongly disagree	0	0.0	0	0.0	0	0.0
N	22		15		37	

More than half of parental respondents (61.1%) strongly agreed that the ignition interlock decreased their child’s (voluntary ignition interlock user) drinking and 27.8 percent agreed. Only 5.6 percent disagreed or strongly disagreed. These responses were fairly equally distributed by age of ignition interlock user (Table 30).

Table 30: Believes the ignition interlock device decreased drinking while installed by age category ("I believe the alcohol ignition interlock decreased my youth’s drinking while installed")

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
Strongly agree	12	57.1	10	66.7	22	61.1
Agree	8	38.1	2	13.3	10	27.8
Neutral	0	0.0	2	13.3	2	5.6
Disagree	1	4.8	0	0.0	1	2.8
Strongly disagree	0	0.0	1	6.7	1	2.8
N	21		15		36	

All parental respondents strongly agreed or agreed that the ignition interlock device prevented their child (voluntary ignition interlock user) from drinking and driving. This was evident in both ignition interlock user age groups (Table 31).

Table 31: Believes the ignition interlock device decreased drinking/driving while installed by age category (“I believe the alcohol ignition interlock decreased my youth’s drinking/driving while installed”)

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
Strongly agree	18	90.0	13	92.9	31	91.2
Agree	2	10.0	1	7.1	3	8.8
Neutral	0	0.0	0	0.0	0	0.0
Disagree	0	0.0	0	0.0	0	0.0
Strongly disagree	0	0.0	0	0.0	0	0.0
N	20		14		34	

When asked if the ignition interlock should be installed on all vehicles driven by persons age 21 years or younger, 56.7 percent of parental respondents agreed or strongly agreed; 21.6 percent of parental respondents disagreed or strongly disagreed. As indicated in Table 32, almost 70 percent of parents with ignition interlock users younger than 27 agreed or strongly agreed, versus 40 percent of parents with children older than 26.

Table 32. Believes ignition interlock devices should be installed on all vehicles driven by persons age ≤21 years old by age category (“I believe that alcohol ignition interlock devices should be installed in the cars driven by all youth under 21 as a safety feature”)

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
Strongly agree	11	50.0	5	33.3	16	43.2
Agree	4	18.2	1	6.7	5	13.5
Neutral	5	22.7	3	20.0	8	21.6
Disagree	0	0.0	3	20.0	3	8.1
Strongly disagree	2	9.1	3	20.0	5	13.5
N	22		15		37	

Voluntary Ignition Interlock User Survey Results

The youth version of the web survey hoped to attract teen or young adult voluntary ignition interlock users. As previously described, however, when a young person had a “voluntary ignition interlock,” the parent often was the actual customer or ignition interlock lessee. Consequently, it was not possible to distinguish a young voluntary ignition interlock user from offenders who opted to keep the ignition interlock on after the required court order or DMV order expired, or from spouses, parents, or adult children of alcoholics who had an ignition interlock installed on the family vehicle for safety reasons. Even though the questions were geared for young ignition interlock users, additional voluntary ignition interlock users completed the web survey and are included in the results.

Ninety-two voluntary ignition interlock users participated in the “youth” version of the web survey.⁸ Most of these respondents (84.6% (n=77) of the 91 respondents who answered this question) were age 27 and older. All but one respondent indicated they were White (one respondent indicated mixed race), and three respondents indicated they were Hispanic. Fifty-five percent of respondents were male. As indicated in Table 33, most voluntary users reported that they live at home (81.3%)

Table 33: Voluntary ignition interlock participants’ living status by age category (“Do you live at home?”)

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
No	3	21.4	8	10.4	11	12.1
Yes	11	78.6	63	81.8	74	81.3
Other (please specify)	0	0.0	6	7.8	6	6.6
N	14		77		91	

Among voluntary ignition interlock participants, 52.6 percent 26 and older indicated they worked part time. Younger participants were equally distributed between working part time, full time, or not at all (Table 34).

Table 34: Voluntary ignition interlock participants’ work status by age category (“Do you work?”)

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
No	5	35.7	16	20.5	21	22.8
Yes	5	35.7	10	12.8	15	16.3
Part time	4	28.6	41	52.6	45	48.9
Other (please specify)	0	0.0	11	14.1	11	12.0
N	14		78		92	

Most of the older voluntary user participants reported not being in school (66.7%) or being in college (14.1%), whereas 64.3 percent of the younger voluntary ignition interlock users were in high school, technical school, or college (Table 35).

Table 35: Voluntary ignition interlock participants’ school status by age category (“Do you attend school?”)

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
No	5	35.7	52	66.7	57	62.0
High school	2	14.3	2	2.6	4	4.3
Technical school	2	14.3	1	1.3	3	3.3
4-year college	2	14.3	11	14.1	13	14.1
Community college	3	21.4	5	6.4	8	8.7
Other	0	0.0	7	9.0	7	7.6
N	14		78		92	

⁸ It is difficult to calculate response rate as parents and their children were both invited to participate in the survey. In some cases, both responded, and in others, only one of them responded. Further, it is unknown how many did not respond because they were not a young interlock user.

Ignition Interlock Use

The majority of younger voluntary ignition interlock users (57.2%) reported having the device installed on their vehicles for a year or less, as opposed to the older voluntary ignition interlock users, of whom 40.9 percent reported having the device installed for 2 or 3 years. Many of the ignition interlock users were unsure about how long they had the device installed (Table 36).

Table 36: Length of time device installed by age category
 (“How long was the ignition interlock installed/or will be installed?”)

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
<1 year	4	28.6	12	15.6	16	17.6
1 year	4	28.6	13	16.9	17	18.7
2 years	2	14.3	12	15.6	14	15.4
3+ years	1	7.1	21	27.3	22	24.2
Not sure	3	21.4	7	9.1	10	11.0
Other	0	0.0	12	15.6	12	13.2
N	14		77		91	

When examining reasons why the ignition interlock device was voluntarily installed on the users’ vehicles (Table 37), a similar percentage of both age groups of voluntary users reported that their family felt it was an important general safety precaution. The majority of younger participants reported having been involved in an alcohol-related incident, and was requested by a family member to have the ignition interlock installed. The majority of older respondents indicated “other.” Most of the “other” responses were previous drinking and driving (20 cases), for which users noted they were initially court-ordered to have an ignition interlock device installed and decided to maintain it after the sentence expired. The remaining “other” reasons for voluntary use were previous alcohol problems (15 cases) and belief in personal safety (11 cases).

Table 37: Reason for installment by age category
 (“Why did you have an alcohol ignition interlock device installed on your vehicle? Check all that apply.”)

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
Alcohol incident	9	64.3	29	37.2	38	41.3
Safety	5	35.7	28	35.9	33	35.9
Other	5	35.7	41	52.6	46	50.0
N	14		78		92	

Most voluntary ignition interlock user respondents indicated that their devices were set to perform retests (Table 38). Only two younger respondents indicated that the device was not set to do a retest. One respondent noted that the unit was set to require retests; however, the voluntary unit just set off a loud, continuous, audible alarm if the breath test failed; it would not cause a lockout (i.e., return for recall).

**Table 38: Ignition interlock set to do post-test retests by age category
("Was the ignition interlock set to require retests?")**

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
No	2	15.4	0	0.0	2	2.2
Yes	11	84.6	76	98.7	87	96.7
Other (please specify)	0	0.0	1	1.3	1	1.1
N	13		77		90	

Most ignition interlock user respondents indicated that the results were not made available to them (Table 39). The majority of respondents who indicated "other" specified that they did not wish to have the results; one respondent indicated that the results had been requested, but never were made available.

**Table 39: Results sent or made available by age category
("Did you have the results sent to you or made available to you to review?")**

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
No	12	85.7	59	76.6	71	78.0
Yes, regularly	2	14.3	5	6.5	7	7.7
Yes, sometimes	0	0.0	3	3.9	3	3.3
Not applicable	0	0.0	3	3.9	3	3.3
Other (please specify)	0	0.0	7	9.1	7	7.7
N	14		77		91	

Most ignition interlock users reported that the results were not reviewed, or they did not answer the question (Table 40). Likely, these responses are because the results were not available to them or they did not receive the results.

**Table 40: Review the results if available by age category
("If yes, did your parents review the ignition interlock results/reports made available to them?")**

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
No	7	50.0	24	31.2	31	34.1
Yes, regularly	1	7.1	2	2.6	3	3.3
Yes, sometimes	0	0.0	0	0.0	0	0.0
Other (please specify)	2	14.3	17	22.1	19	20.9
No answer	4	28.6	34	44.2	38	41.8
N	14		77		91	

Many ignition interlock users (71.1%) reported having some issues with either the ignition interlock device or the provider (Table 41). Most users who reported experiencing issues were the older group of ignition interlock users.

**Table 41: Issue(s) with the ignition interlock device or provider by age category
("Did you have any issues with the ignition interlock device?")**

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
No	6	50.0	20	25.6	26	28.9
Yes	6	50.0	58	74.4	64	71.1
N	12		78		90	

Problems or issues reported by voluntary ignition interlock users ranged considerably in both user age groups (Table 42). The most common for younger users were issues related to startup and feeling unsafe with post-start retests. Among the older group of users, the most common issue identified was embarrassment, followed by inconvenience and "other". The majority of "other" issues that were identified was providing a sample into the device/breath tests (device sensitivity to breath sequence, not enough air in lungs due to asthma, etc.). "Other" issue responses also included the device being set much lower than the illegal *per se* limit (.08 grams per deciliter), the device causing electrical issues with the vehicle, the device depleting the vehicle's battery, difficulty obtaining general service for the vehicle, and weather conditions causing malfunctions.

**Table 42: Types of issues experienced, by age category
("If yes to issues, check all that apply")**

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
Startup	4	28.6	17	21.8	21	22.8
Retest	3	21.4	13	16.7	16	17.4
Feel unsafe w/ retest	4	28.6	19	24.4	23	25.0
Lock outs due to test failure	2	14.3	15	19.2	17	18.5
Difficult to keep calibrated/serviced	1	7.1	4	5.1	5	5.4
Accessing results	1	7.1	2	2.6	3	3.3
Interpreting results	1	7.1	1	1.3	2	2.2
Added service fees	1	7.1	2	2.6	3	3.3
Added car maintenance costs/trouble	3	21.4	7	9.0	10	10.9
Affordability of monthly fees	1	7.1	8	10.3	9	9.8
Embarrassment	3	21.4	31	39.7	34	37.0
Inconvenience	3	21.4	30	38.5	33	35.9
Service provider problems	1	7.1	8	10.3	9	9.8
Other	1	7.1	29	37.2	30	32.6
N	14		78		92	

More than 50 percent of all the voluntary ignition interlock user respondents noted experiencing the device detecting alcohol (Table 43). The majority of these respondents were in the older age category.

**Table 43: Test indicated alcohol was present by age category
("Did you have an occurrence when positive BrAC results were found?")**

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
No	10	71.4	33	42.9	43	47.3
Yes	4	28.6	44	57.1	48	52.7
N	14		77		91	

Effectiveness Beliefs

A large majority of voluntary ignition interlock users of all ages (93.5%) agreed or strongly agreed that parents should do whatever is necessary to prevent drinking and driving (Table 44). Only a handful of respondents were neutral, and none disagreed with the statement.

Table 44: Parents should do whatever they can to prevent drinking and driving ("I believe that parents should do whatever they can to prevent their children from drinking and driving.")

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
Strongly agree	7	50.0	57	73.1	64	69.6
Agree	6	42.9	16	20.5	22	23.9
Neutral	1	7.1	5	6.4	6	6.5
Disagree	0	0.0	0	0.0	0	0.0
Strongly disagree	0	0.0	0	0.0	0	0.0
N	14		78		92	

Almost three-fourths (73.6%) of voluntary ignition interlock users of all ages agreed or strongly agreed that the ignition interlock device decreased their drinking while it was installed (Table 45). About 16 percent of users in the older age group indicated that they disagreed or strongly disagreed that the ignition interlock reduced their drinking while it was installed.

**Table 45: I believe the ignition interlock device decreased my drinking while installed
("I believe the alcohol ignition interlock decreased my drinking while installed")**

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
Strongly agree	7	50.0	35	45.5	42	46.1
Agree	5	35.7	20	26.0	25	27.5
Neutral	2	14.3	10	13.0	12	13.2
Disagree	0	0.0	9	11.7	9	9.9
Strongly disagree	0	0.0	3	3.9	3	3.3
N	14		77		91	

Nearly all voluntary ignition interlock users of all ages (93.4%) reported that they agreed or strongly agreed that the ignition interlock device decreased their drinking and driving while it was installed. Four older respondents gave a neutral response and two older respondents indicated that they disagreed or strongly disagreed. None disagreed in the younger group (Table 46).

Table 46: I believe the ignition interlock device decreased my drinking/driving while installed (“I believe the alcohol ignition interlock decreased my drinking/driving while installed”)

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
Strongly agree	11	78.6	59	76.6	70	76.9
Agree	3	21.4	12	15.6	15	16.5
Neutral	0	0.0	4	5.2	4	4.4
Disagree	0	0.0	1	1.3	1	1.1
Strongly disagree	0	0.0	1	1.3	1	1.1
N	14		77		91	

Responses to the statement that an ignition interlock device should be required on all cars by persons younger than 21 were varied. Only 40.2 percent of users reported they agreed or strongly agreed to this statement. Nearly one-third of users were neutral; more than one-quarter disagreed or strongly disagreed with this statement. Most users who disagreed were in the older age group (Table 47).

Table 47: Ignition interlock devices should be required on all cars driven by persons age <21 Years (“I believe that alcohol ignition interlock devices should be installed in the cars driven by all youth under age 21 as a safety feature.”)

	Age ≤26		Age ≥27		ALL Ages	
	Count	Percent	Count	Percent	Count	Percent
Strongly agree	4	28.6	26	33.3	30	32.6
Agree	0	0.0	7	9.0	7	7.6
Neutral	8	57.1	22	28.2	30	32.6
Disagree	2	14.3	17	21.8	19	20.7
Strongly disagree	0	0.0	6	7.7	6	6.5
N	14		78		92	

Survey Conclusions

Reasons for having the voluntary ignition interlock device were very similar among parents and users who noted alcohol incidents and safety. Even among responses categorized as “other,” both parents and users reported issues with previous drinking and driving, general alcohol problems, and belief in safety as reasons to use the device voluntarily.

Parents did not report as many issues with the device or the service provider as the users, but the general themes identified were similar to those of the users. These included concerns about problems experienced starting the vehicle, the safety of post-start retests, and embarrassment caused by having to use the device.

It was surprising to learn that most parents and voluntary users were not receiving or accessing the ignition interlock data results. Perhaps their philosophy is “let the device do its job.” However, 68 percent of the parents with young ignition interlock users reported receiving no test results indicating the presence of alcohol. This begs the question, if parents are not reviewing the results, how do they know there were no alcohol-positive readings for their children?

Differences between parent and voluntary ignition interlock user results were evident primarily in the beliefs concerning the effectiveness of the device when installed in the vehicle and the potential of voluntary ignition interlock devices in vehicles to reduce drinking and driving. Most parents felt strongly that the ignition interlock device is an effective strategy in reducing drinking in general and drinking and driving, whereas users themselves had mixed opinions on this topic.

Conclusions

The objective of this study was to examine the feasibility of a voluntary alcohol ignition interlock program for young drivers and to address several potential issues related to the hypothetical development and implementation of such a program.

Recruitment efforts would depend on outreach. Whether by community, State, or region, efforts would be needed to find willing and interested parents. School PTAs/PTSAs, DMVs, community groups, community diversion programs, driving schools, and community centers are all potential recruiters. There was a general consensus among all the groups' discussions conducted for this study that efforts would be needed to first de-stigmatize use of the device as a punishment and promote it as a safety benefit.

The discussions with ignition interlock companies revealed that they would be willing to consider offering a discount for a voluntary young driver ignition interlock program, especially if there were a significant number of users to make the effort financially worthwhile. Several ignition interlock companies had previously attempted to market voluntary young driver ignition interlocks at a reduced rate, but were unsuccessful; the audiences included mostly parents involved in PTA and PTSA groups. Parent issues included inconvenience and the belief that their kids were not at risk. Regarding the question of post-start retest safety for young drivers, some of the companies had concerns about hypothetically disabling this feature of the ignition interlock as this would negate the effectiveness of the device. An important safety feature of the ignition interlock device is that it requires the driver to take additional breath tests after the start up breath test in order to discourage other individuals from providing a sample into the device for the driver or drivers from consuming alcohol once they begin to operate the vehicle.

. If requested, only half of the ignition interlock companies would agree to provide a device override code for the convenience of parents. The belief was that this feature could easily be abused by young drivers or parents who drink.

One ignition interlock company representative indicated that, although his company had not attempted to market a voluntary ignition interlock, several hundreds of its clients had voluntarily sought these devices for family members, especially parents with college students. This anecdotal evidence may suggest that, if properly marketed, specific populations may be interested in such a device and/or program such as young drivers with past alcohol-related incidents and/or the parents of college students.

Representatives of the insurance companies generally did not support voluntary ignition interlock devices for young drivers, but there was some support for a less intrusive device such as a passive sensing device. Based on their experiences, they believe parents think their kids don't drink, so the device is not needed. If some parents would be willing to install the device, they believe it would not happen without a highly subsidized or free device. If marketed, the insurance representatives noted the need to de-stigmatize the device as a punishment. They noted that some companies offer discounts for other monitoring devices such as GPS monitors (for speed, location and aggressive driving), "black boxes," and in-vehicle cameras, but a discount for ignition interlock installation would have to be "actuarially justified" which would require research indicating that it lowers risk, changes behavior, and makes young drivers safer. There was also a liability concern if a young driver circumvented the device and crashed.

Reactions from community groups were more favorable, stating that they would be willing to play a role in a hypothetical program if done initially on a small scale and if other agencies or groups assisted in the administration of the program. The community groups thought that some parents would be willing to participate in such a program and pay a monthly fee for the device, but other parents would think the device is too intrusive or would be overly policing of their teens or young adult drivers. To gain parental commitment, the device should be simple to use and interpret, and ignition interlock companies would need to provide hassle-free servicing. Community support for this type of program would be essential, particularly because efforts would be needed to make the device more socially acceptable. It was also noted that community support could help enroll parents because they too respond to peer pressure

Based upon informal discussions with parents and youth, their reactions to the device were not necessarily as expected. Although some parents voiced some concerns over the ignition interlock device such as the safety of retests, “trust” and “embarrassment” themes did not surface among the two parent groups that participated in discussions. Rather, parents expressed greater concern about teens and young adults circumventing the ignition interlock device, using other drugs instead of alcohol, and about the cost. Youth noted these same issues: circumvention, other drug use to avoid detection, and the cost for their parents. Youth also decried the unfairness of a voluntary ignition interlock if they had done nothing wrong. The youth from a lower income area who participated in discussions pointed out that only a few youth at their high schools even had access to vehicles and that there were much bigger alcohol-related problems in their community than drinking and driving. Parents noted that if ignition interlocks were required for a license to drive, young drivers would probably “go along with it.” These remarks led to a theme that continually arose: the need for a social norm change in the attitude toward ignition interlocks, and the need for a shift toward viewing ignition interlocks as a preventive measure rather than as a stigma for punitive measures.

The parents who completed the PIRE web survey on voluntary users felt that their child’s (the voluntary user) biggest issue with the device was embarrassment and/or inconvenience; however, the users were more apt to report issues with the device itself (problems with starting the vehicle, the safety of post-start retests, etc.). Older voluntary users were more apt than younger users to report issues of embarrassment or inconvenience. Youth acknowledged the potential effectiveness of an ignition interlock device and virtually all parents who responded to the web survey strongly agreed that they should do whatever it takes to prevent their child from drinking and driving. Every parent surveyed strongly agreed or agreed with the statement that the device decreased his/her young driver’s drinking and driving while it was installed.

As to incentives for participation, suggestions for short-term incentives involving young drivers included scholarships, gas cards, other gift cards and reduced or free driving classes. Most representatives of ignition interlock companies suggested long-term incentives, such as insurance discounts. As noted, however, the insurance companies said they would not consider a discount until the program was actuarially justified. Most ignition interlock representatives felt their company would be willing to explore options for reduced service fees, but ultimately, it would have to be worth the effort as ignition interlock franchisees need to make some level of profit. Some of the parents in the discussion groups noted that reasonable ignition interlock fees would not be a problem, but there would need to be a significant financial incentive, such as discounted insurance rates.

Research has shown that monitoring is an important feature of any ignition interlock program (Zador et al., 2011). In looking at the sample ignition interlock data, they study found that voluntary users were more likely to have higher startup BrAC tests than involuntary users. It is possible that

this is related to the differential risk of further sanctioning. For voluntary users, especially if no one is receiving or accessing monthly data results from the ignition interlock company, they may be less concerned than involuntary users about their attempts and failures to start their vehicles. This is particularly interesting in light of the surprising web survey results which indicated that most parents of voluntary users and the ignition interlock users themselves did not access or receive their ignition interlock data results. Perhaps they are content to let the device separate drinking and driving, but there is value in reviewing the reports to detect patterns of problem drinking or circumvention attempts. The web survey included only a small sample of parents of voluntary ignition interlock users, so the question about reviewing ignition interlock data results warrant further investigation.

Ignition interlock companies can easily share the results of monthly or bimonthly data reports with their customers via mail, e-mail, fax, and web access. To reduce the administrative burden, parents could be informed on an exception basis (if there were negative results); however, it might be better to provide the information, even if it is just a simple one-page summary of starts per week, BrAC test results, and procedural violations (e.g., circumvention attempts) so that parents can stay informed and acknowledge safe-driving habits.

If a program were run through a community program, to use problem reports constructively, a staff counselor/liaison could review with parents any drinking evidence. Obviously, the staff person would need to be trained in ignition interlock data interpretation and feedback. Parents can be trained as well, incorporating appropriate responses to negative ignition interlock reports.

Although this study has focused on private nongovernmental programs for young driver ignition interlocks, it is worth noting that State legislation could play a role in incentivizing young driver ignition interlocks by providing additional driving privileges based on the installation of devices. All States and the District of Columbia have enacted GDL laws that provide for a period of restricted driving privileges (e.g., limited driving at night and/or with young passengers) during the period between having a learner's permit (driving under the supervision of an adult) and full licensure. Though these restrictions are well supported by research, they are difficult for the police to enforce; consequently, enforcement generally falls to parents. For some parents and young drivers, this can present a hardship when a young driver is engaged in nighttime employment or extracurricular activities or must transport younger siblings. The installation of an ignition interlock could raise a "trust" issue with parents because their young driver would be monitored (date and time recorded) while driving, and it would reduce embarrassment for the young driver if it could be offered widely as an incentive for additional driving privileges. It is recognized that most parents enforce the GDL limitations poorly. The provision of an active, objective monitoring system, such as an ignition interlock, might improve overall compliance to GDL laws.

The market for voluntary ignition interlock use may be small for youth who have shown no risk factors for drinking and driving. It may be limited to at-risk youth and/or individuals previously apprehended for alcohol-related incidents, such as a DUI. Expanding a hypothetical program to a larger audience (e.g., college age, young adult population) may yield larger participation. If such a program were to be implemented and evaluated, the evaluation would benefit from examining the longitudinal effects of having a voluntary ignition interlock device installed. It is clear both from the current offender data reported in the literature and from PIRE's web survey, that participants feel the device is effective "while installed;" however, it is not clear if these effects would be sustainable. One could hypothesize that addressing alcohol problems early on with younger populations using an ignition interlock device, may increase the odds of reducing future risks related to drinking alcohol and driving, but this would need to be studied.

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Appendices

for

The Feasibility of Voluntary Ignition Interlocks as a Preventative Strategy For Young Drivers

- A. Ignition Interlock Vendors Discussion Guide
- B. Insurance Companies Discussion Guide
- C. Community Groups Discussion Guide
- D. Parents and Young Drivers Discussion Group Guide

Appendix A.

Ignition Interlock Vendors

Discussion Guide

The Feasibility of Voluntary Ignition Interlocks as a Preventative Strategy for Young Drivers

Hardware specific

- Could the rolling retest be disabled? Can the device be programmed to conduct a startup test only (as opposed to running tests that may be dangerous for young drivers to perform)?
- Would an override switch be required for safety reasons? (Especially so that others can use the vehicle.) How would that work? Can the device be turned ON and OFF by parents only?
- Could the less expensive semiconductor sensor be used rather than the fuel cell sensor? Benefits? Drawbacks?
- Would a user identification system be required?
- What other hardware changes would you recommend, if any?
- Have you tried this approach with young drivers and their families before? What hardware changes were needed?
- How difficult, and how expensive would it be, to adapt current devices for a young drivers ignition interlock program?
- What else might you recommend needs to be done to the devices to make such a program successful? Do you see any barriers?

Device-related items

- How much, if anything, might parents expect to have to pay for the installation such a device? How much, if anything, for regular monthly maintenance?
- Mode of providing parents with results (e-mail, mail, etc.). Can reports be e-mailed weekly or bimonthly to parents?
- Are there any concerns for the time involved for downloading data?
- How could parents be trained to interpret results of ignition interlock reports and to use them constructively?
- How often would the vehicle need to be brought in for service?

Program-related items

- Have you seen much use of ignition interlocks as a preventative measure (i.e. used by people other than those meeting the requirements for an ALR or criminal driving offense)?
- Is community support needed? (e.g. to recruit young drivers/ parents, or to help pay) If so, in what ways and to what extent?
- What community groups do you think could be involved in such a program?
- Do you have any funding ideas on how a program could be made more affordable for families, including the cost of:
 - Installment of the devices
 - Maintenance of devices
 - Training and monthly reporting
 - Incentives for families to participate? Short-term/Long-term?
- Where could a program be housed? Would some or all of your service centers be willing and able to participate?
- Who could monitor such a program and handle administrative duties? Would it work to have a community group be a liaison so that ignition interlock reports could be sent to the liaison who would then email with parents and answer their questions and concerns?
- Would all participants (young drivers and their parents) need to be from the same community?
- How many participants would be required to have a viable program? Is there a minimum number of participants for a program to exist (i.e., to be sponsored, funded, manage)?
- Is there a limit to the number of drivers who could participate?
- What ages should be included? Do you have any concerns about ignition interlock use by young drivers in the 16-19 year old age group?
- Do you have any suggestions for recruiting the families of high-risk teens and young adults?

Concluding questions/notes

- Is there any other question I should have asked you?
- Our overall objective is to examine the feasibility of an ignition interlock program for young drivers as a preventative measure.

Appendix B.

Insurance Companies Discussion Guide

The Feasibility of Voluntary Ignition Interlocks as a Preventative Strategy for Young Drivers

Insurance Companies

- Have you considered such a program before?
- Do you know of a company that has considered or implemented an ignition interlock program?
- Do you have or know of any other similar programs (such as the use of speed detection devices via GPS, black boxes, in vehicle cameras etc.)?
- If so, are there any incentives you or others you know could provide to families to install these monitoring devices?
- What kind of incentives do you think families would need to participate in a young driver ignition interlock program?
 - Short-term/Long-term?
- Would your company be interested in participating in such a program? Why or why not? Could barriers be overcome? How?
- Do you think other insurance groups might be interested in (or able to participate) in such a program? Why or why not? Could barriers be overcome? Could your company play a role in overcoming barriers?
- Does your company provide a discount for participation in a driver education program?
 - Is it possible that (the same/a) discount for an ignition interlock program could be provided as long as the ignition interlock was on the vehicle?

Appendix C.

Community Groups Discussion Guide

The Feasibility of Voluntary Ignition Interlocks as a Preventative Strategy for Young Drivers

- (If applicable:) Has your group been involved with young driver safety issues in the past or currently? Please describe.
- (If applicable:) Do you have access (ways to communicate) with parents and young in your area?
- Do you think parents would be willing to have an ignition interlock placed on a family vehicle to prevent a possible impaired driving event by their young driver?
- What monthly fee do you think parents would they be willing to pay for an ignition interlock?
- What time commitment from parents would be reasonable in terms of training on use of the device, interpreting reports, and servicing of the ignition interlock device?
- Do you think that community support for a voluntary young driver ignition interlock program needed? If so, in what ways and to what extent?
- (If applicable) If you as a parent received an ignition interlock report of alcohol use, how would you respond? Would you like some kind of liaison (like a community group) to talk through the issues with you? What kind of help could you use?
- What community groups do you think could be involved in such a program?
- How could a program be funded?
- Installment of the devices
- Maintenance of devices
- Training and monthly reporting
- Incentives for families to participate? Short-term/Long-term?
- Who could monitor it and handle administrative duties?
- Would your group be willing or able to play a role?
- Would all participants (young drivers and their parents) need to be from the same community?
- What ages should be included and why? Should a program include 16- to 17-year-olds or 18- to 19-year-olds, etc.
- What type of family is most likely to participate?
- How would you propose recruiting families with “at risk” teens and young adults?

Appendix D.

Parents and Young Driver Groups

Discussion Guide

The Feasibility of Voluntary Ignition Interlocks as a Preventative Strategy for Young Drivers

Moderator's Guide:

- Moderator welcomes participants and introduces self and colleagues.
- Explain Pacific Institute and NHTSA sponsor. Explanation of project; purpose of group discussion.
- Preview what will happen during the next 1.5 hours.
- We are interested in participants' views and experiences regarding voluntary ignition interlocks for young drivers. There are no right or wrong answers. Your participation is completely voluntary.
- We will be splitting into two groups; one for parents and one for young drivers. Parents we need ask your verbal permission for your teens ages 15-17 to participate in a discussion group in another room.
- Views will be kept confidential; no names are recorded to keep the information provided anonymous. We expect participants to keep what they hear during the discussion group confidential as well; please don't repeat anything you hear in here.
- We value the information you will share with us today and want to make sure we capture all of it. So we will be taking notes but no names will be recorded.
- GROUND RULES: informal; up to an hour and a half; feel free at any time to get up and stretch or use the bathroom; would like only one person to talk at a time by raising their hand, but hope everyone will speak up.
- Each person will receive \$25 cash at the end of the meeting.
- Please turn off cell phones or set them to vibrate. Any questions?

TOPICS FOR DISCUSSION

Parents

Laws

- Opinions of effectiveness on crash risk of:
 - minimum legal drinking age
 - graduated driver licensing laws
 - zero tolerance laws
- Restrictiveness – too much? Not enough?

Voluntary Use of Ignition Interlocks

Present nature of ignition interlock – describe as necessary

Describe volunteer young driver ignition interlock program:

- breath test to start,
- no rolling re-test ,
- parent override option,
- monthly reports go to parents,
- requirements for parents and young drivers,
- potential benefits - parents that wouldn't otherwise allow their teens and young adults to drive mightnow with this preventive measure.

Discuss parents interest in participation & reasons

Important issues in considering use:

- Convenience
- Stigma
- Trust
- Others

Expected teen and young adult acceptance – under various conditions:

- Likely effectiveness
- Potential for circumvention
- Methods of circumvention
- Likelihood of partial effectiveness even with some circumvention
- Situations most likely to benefit

Ideal age for benefit?

Community Program

In order to get people involved, it might be necessary to get a program started to sponsor it.

- Likelihood of finding sponsor in their community
- Necessary features
- Getting participation
- Likely outcome for participants' families, other families
- Availability of help available to understand issues
- Issues most requiring assistance

Inconveniences

- Young driver car vs. family car
- Potential problems
- Inconvenience vs. benefits

Program Costs/Incentives

- Costs – maximum amounts “considered worth it.” Initially/monthly
- Incentives
 - Effect on willingness to participate
 - Type of incentives that would be effective
 - short-term incentives (i.e., parking at schools, gift cards for gas, etc.)
 - long-term incentives (i.e., reduced insurance costs, licensing privileges, etc.)

Teens and Young Adults

Laws

- Opinions of effectiveness on crash risk of:
 - minimum legal drinking age,
 - graduated driver licensing laws and
 - zero tolerance laws
- Restrictiveness – too much? Not enough?

Behaviors

- Parents feelings regarding teen and young adult drinking (specifically participants’ parents)

Voluntary Use of Ignition Interlocks

Discuss nature of ignition interlock – describe as necessary.

Describe volunteer youth ignition interlock program:

- breath test to start,
 - no rolling re-test,
 - parent override option,
 - monthly reports go to parents, and
 - Requirements for parents and teens and young adults.
-
- Potential benefits
 - Parents that wouldn’t otherwise allow teens and young adults to drive might now with this preventive measure.
 - Others

Important issues in considering use

- Convenience
- Stigma
- Trust
- Others

Expected effectiveness

- Likely effectiveness
- Potential for circumvention
- Methods of circumvention
- Likelihood of partial effectiveness even with some circumvention
- Situations most likely to benefit

Ideal age for benefit?

Community Program

In order to get people involved, it might be necessary to get a program started to sponsor it.

- Likelihood of finding sponsor in their community?
- Necessary features
- Getting participation
- Likely outcome for participants' families, other families

Incentives

Discuss incentives necessary to get participation from teens and young adults, e.g., if a community decided to start a volunteer program and needed to encourage a certain number of teens and young adults to participate.

Possible incentives:

- None needed
- Monetary
- Gifts-in-kind
- Preferential parking at school
- Elicit suggestions from participants

