

IPRO 351 Opportunity Assessment

Combating Underage Drinking and Driving

Fall 2010

Executive Summary (Alex)

75% of seniors in high school report they have consumed alcohol in their high school career and 60% of juniors and seniors claim to have been a passenger in a vehicle driven by an intoxicated teenager. It is also apparent that parents do not know their children are drinking and driving or using alcohol at all. Most importantly, 48% of the teens reporting to have consumed alcohol in the past year were said to be 'nondrinkers' by their parents (as reported by the National Highway Traffic Safety Administration)

IPRO 351, (an Interprofessional Projects Program at the Illinois Institute of Technology established in the Fall of 2009) was designed to culminate the expertise of students from various technical and business-related disciplines to reduce the prevalence of underage drinking and driving in the United States. During IPRO 351's first two semesters of operation, the participating students performed extensive research on the available technology designed to detect and measure impairment associated with alcohol consumption and how it could be used to reduce drinking and driving while creating a profit for those invested in the project.

After considering the technologies available to solve the nation's problem and the available market research, the Fall 2010 semester of IPRO 351 has decided to improve the communication between parents and their children through an iPhone app. By reporting a teen's activities to a parent and using the technology of the iPhone to detect intoxication, our application will provide a deterrent for teens to drink and drive while nurturing a more involved parent-child relationship. Additionally, this app would be able to detect unsafe impairments of the user that could decrease their ability to properly operate a vehicle.

The decision to create an iPhone application was made after research was performed on the current methods of testing for physical and mental impairment, some of which included infrared and trans-dermal sensors, breathalyzers, and retinal scanners. Making such technology available for parents concerned about their child's well-being and safety would be too expensive. To bypass this issue, IPRO 351 will use the camera and motion-recording components of the iPhone to detect physical and mental impairment (a method being tested). These components (along with the screen itself) will be used to detect impairment through tests aimed at measuring physical coordination, mental dexterity, and short-term memory. The front-facing camera will be used to verify the identity of the teen taking the test to eliminate the possibility of a fraudulent result.

By following a subscription-based model for our app, we can gain customers who wish to keep track of their child for a year. In the financial portion of this opportunity assessment, the complete financial projections can be found. To summarize, however, we believe that we will incur \$80,000, \$90,000, and \$120,000 in years one, two, and three (respectively) and retain a profit of \$18,000, \$99,000, and \$230,000.

Problem and Opportunity

As listed in the executive summary, underage drinking and driving is an issue that affects many high school students. 60% of juniors and seniors in high school have admitted to riding in a car with an impaired driver.

The consequences of underage drinking and driving not only affect high school students but their parents and loved ones as well. Parents of teens that drink and drive run the risk of incurring catastrophic financial loss due to their child's poor choice to drink and drive through property damage costs, legal representation fees and any lawsuits as a result of the crash.

Most surprisingly, we found that 48% of all high-school seniors that do drink have parents that believe they are non-drinkers (National Highway Traffic Safety Administration). About half of the teens we are trying to stop have parents who do not know that they are at risk for catastrophic financial loss. Because of this, we believed that there was a communication error between the parent and child. Teens may be lying to their parents when they go out or parents may not be receptive to the signals being sent to them by their teen. Either way, some error in the communication between the parent and child is occurring.

Our belief was shared by the Surgeon General, who in their *Call to Action* report found that parents are the best resources to prevent drinking and driving. Because of this, IPRO 351 began looking for a solution to society's problem of underage drinking and driving through improving the parent-child relationship.

The available solutions to society's problem of underage drinking and driving deal mainly the biological detection of alcohol impairment through blood tests, urine tests, or breathalyzers. Although these methods do detect impairment, we require a solution that will increase the communication between parents and children while detecting impairment.

Solution

IPRO 351's solution to the problem is to develop an iPhone app that will improve the communication between the parent and child while testing the teen for impairments that will inhibit their ability to operate a motor vehicle.

Before the teen begins their evening plans, they will disclose who they're going with, what they're doing, and where they plan on going into the app on the iPhone. This information will be sent to the parent via text message and stored for later use. At the end of the night before the teen operates a motor vehicle, the teen will take a test on the iPhone that will determine if they are too impaired to drive. The results of this test will be sent to the parent who will then determine if further action is required.

It is beneficial to note that this app will not stop the child from operating a motor vehicle in any way as the legal ramifications of such an app could be immense if a false positive or negative is reported. As such, IPRO 351's app focuses solely on improving the parent-child relationship which will ultimately decrease the prevalence of underage drinking and driving in society. The results of the impairment test will only note to the parent if the teens' behavior is *indicative* or alcohol impairment.

Target Market Size

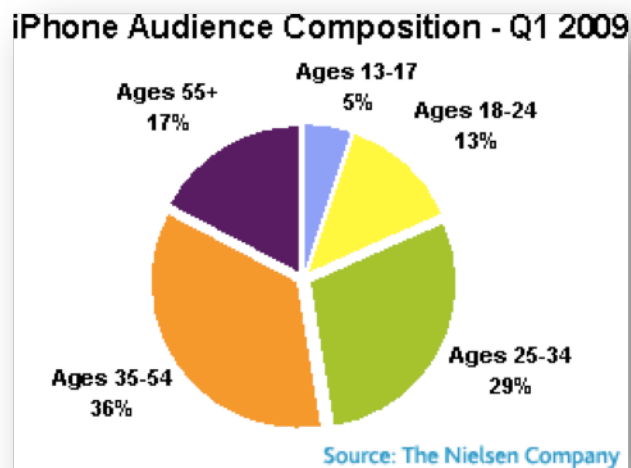
The Clue-Me-In app (with the included sobriety tests) will seek to effectively attract parents in the iPhone and Apple App Store Markets but will be utilized on their teen's iPhone. Because Clue-Me-In will be offered at a highly competitive price compared to the other available solutions in the market, our program will attract consumers seeking the core benefits of our solution (a deterrent for drinking and driving) and those app users who purchase our product due to their curiosity.

In the following sections, we will define our target market by describing the specific sub-categories of our target market we are trying to attract from each market and then determine how large our opportunity is in USD.

The iPhone Market

IPRO 351 has decided to release the Clue-Me-In application exclusively for the iPhone due to the amount iPhone users are willing to pay per-month for apps (see App Store Market analysis below). Additionally, the Clue-Me-In application will include technology in the future incorporating the iPhone 4's front-facing camera. Because Clue-Me-In will be initially released only for the iOS operating system, the amount of iPhone users in the United States will serve as our limiting factor for determining a proper market size.

A study conducted by The Nielsen Company in the first quarter of 2009 found that there are 6.4 million active iPhone users in the U.S., up from 2.1 million a year prior ^[1]. Of those participating in the study, Nielsen found that 36% of iPhone users are between the ages of 35-54, 29% of users are 25-34, 13% are 18-24, and 5% are from 13-17.



Because our application will appeal to parents, our target market will be the 35-54 year old age range, 36% of the market, or 2.3 million users (according to the Nielsen 2009 data).

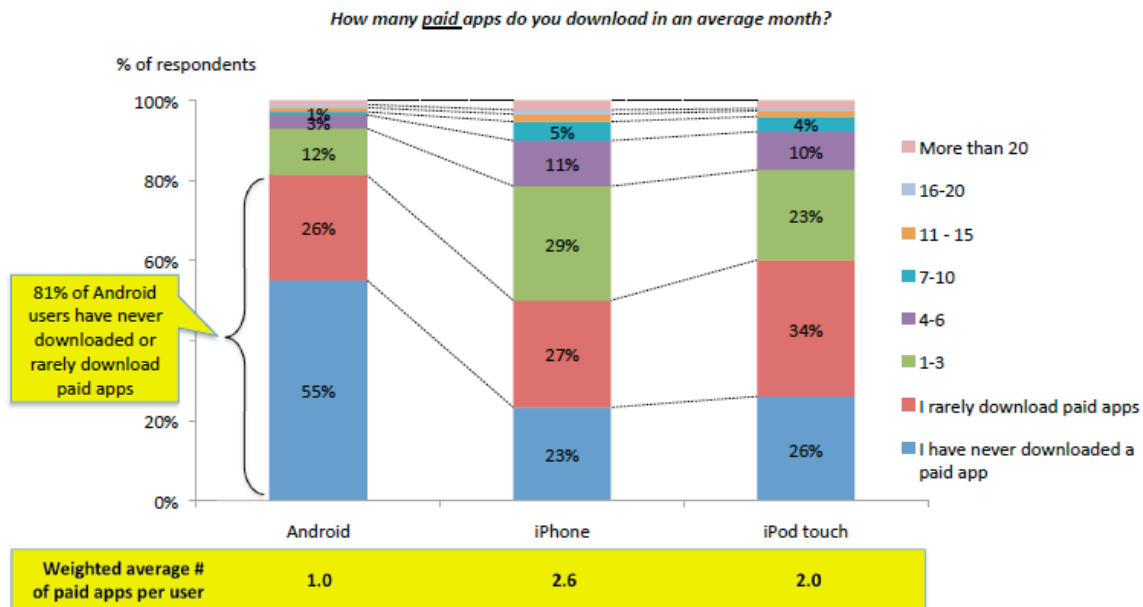
Smartphone usage is growing throughout the United States (our target market) and will continue to see growth through 2015. A recent study found that the United States and the Caribbean currently have a latent demand of \$6,410.69 million (latent demand is the industry earnings of a market when the market becomes accessible and attractive to be served by competing firms) ^[2]. The same study determined the growth rate of the market, which resulted in a projected latent demand of \$7,161.66 million by 2015 (a 12%

increase). The study did not project what operating systems will be prevalent in the future due to the current battle for market share between the Android, iOS, and Windows Mobile operating systems.

It can be seen from the reported data that the use of smartphones will continually increase during the coming years. Assuming the amount of iPhone users will increase by the same rate as the smartphone market in the next five years, we believe that our target market (for iPhone users specifically) will increase by 12% by 2015.

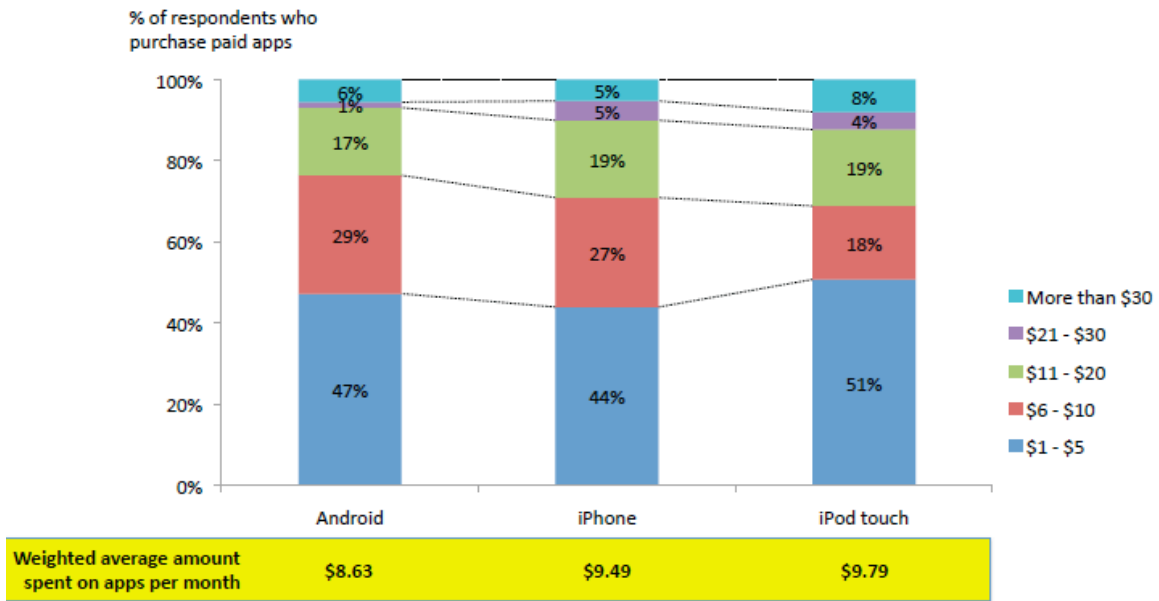
iPhone App Market

The iPhone App Store is the online marketplace where iOS users can sell and purchase apps. Many of these applications are programs that provide information to the user about news, locations of stores and attractions nearby, or games that can be played in the user’s free time. The app stores for the Android and Windows Mobile operating systems provide similar programs, but the users of operating systems other than iOS do not treat or use apps nearly the same as was found in an AdMob study:



AdMob performed a survey on users of both the Android and iPhone smartphone operating systems and found that many more iPhone users than Android users purchase apps (*Mobile Metrics*, Admob Mobile Metrics, May 2010). Because of these findings, we have decided to develop Clue-Me-In exclusively for the iPhone until the consumer purchasing behavior of the other smartphone operating systems becomes more favorable. Additionally, the amount paid per month on apps was found by AdMob as well:

In total, how much do you spend on paid apps in an average month?



Because of these findings, we have found that the amount iPhone customers are usually willing to spend on apps per month is \$9.49.

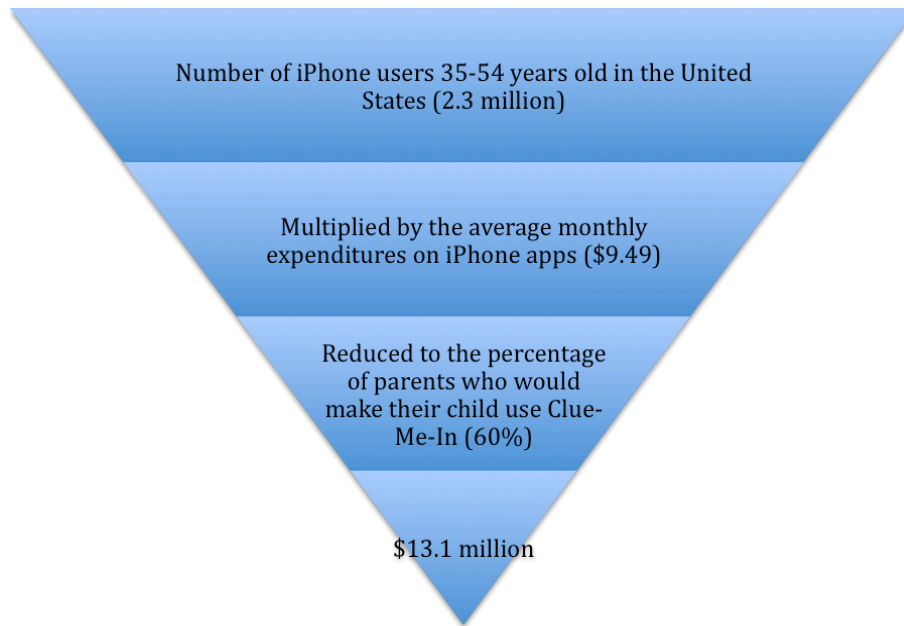
Primary Market Research

In order to determine the scale of our target market’s needs and wants, IPRO 351 had to conduct primary market research through electronic surveys. By having parents conduct electronic exploratory surveys, we were able to collect the data necessary to determine our market need.

The results found that parents were very concerned about underage drinking and driving and that 60 percent of respondents would require their child to use an application that informed parents of their plans and their level of intoxication during the night.

Breakdown of Market Size

By looking at the statistics found above, we can finally break down our market size. By taking the number of 35-54 year old iPhone users in the US, multiplying that number by the average amount spent on iPhone apps (\$9.49), and reducing that number by 40 percent (only 60% said they would actually require their teens to use Clue-Me-In), we are left with a market size of \$13.1 million.

**Limitations**

There are some limitations to this market analysis, particularly that we cannot tell how many of the iPhone users in this age group have children or not. This estimate is very liberal in the sense that there could be many people in this age range that do not have children, making our service useless to them.

Value Proposition

Parents should expect peace of mind, a possible insurance discount, and a solution to problem—Clue-Me-In incorporates both communication between parent and child. Clue-Me-In's technological, cellphone based system allows for parents to easily communicate with their child regardless of the their location. Additionally, both the parent and child can develop their own approach to solve problem and avoid legalities/economic costs.

Clue-Me-In is a non-invasive test: current solutions such as blood tests, urine tests, and breathalyzers are invasive. Clue-Me-in looks like a game and not test and is a fun approach to invasive testing methods.

Clue-Me-In is easy to adopt: Clue-Me-In's ease of use and commercial availability makes our solution easily attainable for the targeted voluntary market. An iPhone test is a more acceptable method for testing and reporting impairment when compared with other solutions.

Measures impairment: underage drinkers are not allowed to drink at all so we do not need to calculate an accurate BAC (which is what sometimes causes alternative methods to be expensive). Impaired cognitive and physical behavior is what makes an intoxicated individual a poor driver, so Clue-Me-In is reporting the most important aspect of a child's behavior to the parent.

Cost effective: cell phone apps are extremely cost effective as many other solutions in our target market are extremely expensive—good breathalyzers cost \$50-100 and actual interlock devices to stop the car are over \$1000.

Competitive Advantage

Direct Competitors

There are very few iPhone applications that test for impairment due to alcohol consumption. These applications - "r u drunk", "ShouldIDial", "DUI Test", etc. - take the user through a series of games designed to test for cognitive and dexterous functions. These games include but are not limited to:

- balancing the phone on one hand while standing on one foot
- holding the phone in one hand while walking in a straight line
- rolling a marble ball through a maze
- watching a sequence of colored balls and repeating the same sequence
- tapping moving targets on the screen

Most of these applications also include a blood alcohol content calculator. "DUI Test" has the most extensive calculator, taking into account, gender, weight, height, drinks consumed, and duration of time the drinks have been consumed. The calculator will then give an output of what the predicted blood alcohol content is and a recommendation based on the output.

Benefits

The testing methods of these other iPhone applications are non-invasive and non-intrusive. They take an alternative, fun approach to impairment testing.

Additionally, most applications are free or only 99 cents to download. This solution is cost effective and also easily adopted and integrated into an already existing hardware technology.

Also, just like the solution we propose, although these applications are intended for teenagers and young adults, individuals of all ages may use the application.

Drawbacks

The largest difference between these existing applications and our product is this: these applications were meant for entertainment purposes only. Although they are marketed as an impairment-measuring tool, in reality, there is no scientific significance behind the applications. Since these applications do not validly measure any form of impairment, parents would receive no peace of mind from their child using the application.

Indirect Competitors

Siemens Hearing Test Application

Aside from the aforementioned applications, there are other iPhone applications that measure non-alcohol related impairments. Scientifically developed by audiology experts at Siemens, the "Hearing Test" application examines how well you can detect words in background noise. This hearing test proves the validity of impairment testing through iPhones.

Benefits

Again, this hearing test is a non-invasive and non-intrusive hearing test that can be used for individuals of all ages. The test can be administered in the comfort of your own privacy. Siemens guarantees that the application has a 96% accuracy rating. With an iPhone, this application is easy to use and easily attainable. Additionally, this application is free.

Drawbacks

Although Siemens has created a valid hearing impairment test application, it does not test for impairments due to alcohol.

Standard Field Sobriety Test

A standard field sobriety test is conducted by a police officer when a driver is suspected of driving under the influence or while intoxicated. This test is a collection of 5-10 small tasks including walking in a straight line heel-to-toe, balancing on one foot for half a minute, etc.

Benefits

Since this test is standardized, it measures impairment accurately. Additionally, there are no up front costs associated with being put through a field sobriety test. This service is also available for drivers of all ages, not only teenagers.

Drawbacks

Since a only a police officer has been trained to conduct a standard field sobriety test, an officer would need to be present and willing to test every individual before they drive. It is not feasible to have an officer present at every time a teenager wants to drive. This testing process is extremely intrusive and may be considered an invasion of privacy.

Pupil Scanners

PassPoint has created eye pupil scanners which use a series of cameras and computers to measure involuntary eye movement and analyze whether or not an individual has been using alcohol or other drugs.

Benefits

These machines effectively and accurately measure the severity of impairment due to alcohol. Individuals of all ages can also use this machine.

Drawbacks

A pupil scanner machine is large, bulky, and costly, making it extremely difficult to be used as a portable product.

Near-infrared scanning and finger printing.

TruTouch Technologies develops and markets noninvasive intoxication near-infrared measuring systems. Near-infrared scanning analyzes the unique vibration and intensity of each molecule present in and under the skin.

Benefits

TruTouch devices and technologies have an Equal Error Rate of ~1%, making it the most accurate BAC measurement tool currently on the market. If integrated into a car, it would be a moderately non-intrusive measurement tool, which would easily and quickly test the driver's BAC. Additionally, Trutouch devices can be used for individuals of all ages, not only teenagers.

Drawbacks

Since TruTouch devices are intended for employers to test their employees for alcohol, the near-infrared technology is heavily protected by patents, and is extremely difficult to incorporate into any other technology. Additionally, each Trutouch testing device is extremely expensive, ranging from the low to mid and high thousands of dollars.

Breathalyzers and Interlock Systems

Breathalyzers and breathalyzer interlock systems measure an individual's BAC level by taking a breath sample. Interlock systems lock the ignition of a car. The driver must unlock the system by testing negative for alcohol in their system.


























Benefits

Breathalyzers are compact, portable, accurate, and fit for a driver of any age to use. Interlock systems integrate a breathalyzer into the ignition of the car, and will not allow the driver to start the engine without testing sober. This lock will guarantee that no individual with any alcohol in their system will be allowed to drive the car. This guarantee will give parents the peace of mind that their child will always be a safe driver.

Drawbacks

This system has a monthly maintenance cost, and over time, these costs can total over \$1000. Additionally, breathalyzers in any form are intrusive and unpopular, especially among teenage drivers. Additionally, interlock systems and breathalyzers only measures the blood alcohol content of an individual, not their impairment levels.

Creating a standard impairment testing through an iPhone application is the most practical and feasible way to combat underage drinking and driving.

	Clue-Me-In	Other Phone Apps	Breathalyzer	Field Sobriety Test	Near-infrared
Cost					
Ease of Adoption					
Intrusiveness					
Measure multiple impairments					
Scientific support					

Marketing Strategy& Business Model

Product

The Clue-Me-In iPhone app will serve two distinct purposes:

1. To detect the user's level of intoxication through tests using the technological capabilities of the iPhone
2. To inform parents of their child's intoxication level and evening plans by reporting the necessary information to parents through email or a text message.

By providing these solutions to our target market, Clue-Me-In will serve as a deterrent for teens to drink and drive while providing a method of legal adults to gauge their level of intoxication before driving.

The service will be provided in the Apple App Store and will be available for all iPhone users to download. The interface will include data entry points where children can report their evening plans to their parents. By accessing the user's personal information on the iPhone, contact information of the child's friends and acquaintances could be sent to parents as well as the location of the child's planned destination using GPS technology.

Price

After speaking with a professional in the field (the CEO ProOnGo), we have decided to provide the Clue-Me-In app for free in the app store and then charging a monthly fee of \$0.99 after the trial period has expired. By initially attracting parents with a less-functional version of our product first and then asking them to pay for the premium version later, we can gain more customers than if we asked them to pay initially. By providing Clue-Me-In as a subscription service, we can expect higher revenue per customer than if they were to pay a flat fee of \$1.00.

Promotion

Driver's Education Programs

Clue-Me-In could potentially be promoted in Driver's Education programs not only because of its ability to detect intoxication but to build a trusting relationship between teenage drivers and their parents. Cooperating driver's education schools have yet to be contacted.

Alcohol Companies

Companies producing alcoholic products could benefit from endorsing Clue-Me-In. By teaching parents to foster a more responsible relationship with their children, an alcohol company could possibly increase their sales by attracting consumers who believe in this marketing move.

Mothers Against Drunk Driving

The MADD program in the Chicagoland area has expressed interest in endorsing our product through their website or blogs, which may increase the sales or trials we get through the App Store.

Automobile Insurance Discounts

Ultimately, Clue-Me-In will decrease the prevalence of teenage drinking and driving if used properly. Because of this effect, automobile insurance companies may be able to provide a policy discount to parents who use Clue-Me-In and report their teen's driving information to their insurance agent. By using this promotion method, we can get more parents to purchase Clue-Me-In.

Place

Due to the nature of iPhone apps, the only place the Clue-Me-In app can be provided is in the Apple App Store. iPhone apps cannot be purchased anywhere else.

Customer Retention

By assuring our customers that Clue-Me-In will work for as long as they use it and that the functional capabilities of the app will improve over time, we hope to retain customers on a monthly basis.

Business Model

As described in the price section of the marketing strategy, our app will be \$0.99 a month after the trial period expires or a flat fee of \$6.99 a month. Clue-Me-In has the same business model as every other app on the market with the exception that can be bought for a yearly contract and not a one-time fee.

Financial Analysis

	Year 1	Year 2	Year 3
Price (Annual Subscription)	\$6.99	\$8.99	\$9.99
# of Active Subscribers	20,000	30,000	50,000
Gross Sales	140,000	270,000	500,000
Apple Commission	<u>42,000</u>	<u>81,000</u>	<u>150,000</u>
Net Sales	\$98,000	\$189,000	\$350,000
Operating Costs			
General/Administrative	\$10,000	\$10,000	\$10,000
Sales and Marketing Expense	60,000	60,000	60,000
Research and Development	<u>10,000</u>	<u>20,000</u>	<u>50,000</u>
Net Costs	<u>\$80,000</u>	<u>\$90,000</u>	<u>\$120,000</u>
Net Income	<u>\$18,000</u>	<u>\$99,000</u>	<u>\$230,000</u>

Before Year 1, we hope to get an underwriter to fund our initial app development. We have already been in contact with several organizations that are interested in our product, including a liquor distributor and Draeger Safety Diagnostics. Our goal is to receive \$50,000 which will fund both the development as well as clinical testing to ensure the apps accurately measure impairment.

From our research, we found that there are 9.3 million teenage drivers. We also found that 10% of them own an iPhone. That gives us 900,000 for our market size. We hope to bring in about 2% of that market for our first year of sales which will include the parental informant and three impairment apps. We plan to price on an annual subscription basis at \$6.99. This is in comparison to iZup's yearly subscription fee which is \$19.95 annually. iZup has more functionality than ours at this point, which is why we chose a lower price point. Apple will also take a 30% commission from our sales.

Moving past year one, we expect to add additional features to our product, as described in our business model, which would allow us to increase the annual subscription fee. From Year 1 to Year 2 we expect to retain 75% of our users and double that number because of increased functionality and awareness. We know that we will lose some customers due to children leaving the house for college. We expect to increase our user base even more in Year 3 since there will be even more functionality and additional product awareness.

Phil Leslie, app business expert, was able to help us compute our operating costs. The app store business is relatively simple and our start up costs are very

conservative. General and Administrative costs will include things like printing, supplies, etc. Leslie told us to allot an entry level marketing salary for the amount to put in our Sales and Marketing expenses. We found from the Bureau of Labor Statistics this amount was \$43,000 and we added an additional \$17,000 for trade shows and travel. Leslie said it is extremely important to attend trade shows relevant to your app to increase awareness. As you will see, the research and development costs increase each year. This is because the additional features of our app, along with the launch onto additional platforms, will amplify our app development costs.

References

Hingson and Kenkel, 2003. *Social and Health Consequences of Underage Drinking*. In press. As quoted in Institute of Medicine National Research Council of the National Academies. Bonnie, Richard J. and Mary Ellen O'Connell, eds. *Reducing Underage Drinking: A Collective Responsibility*. Washington, DC: The National Academies Press, 2003.

Admob Mobile Metrics, May 2010. *Metrics Highlights*. Accessed at <http://metrics.admob.com/>.