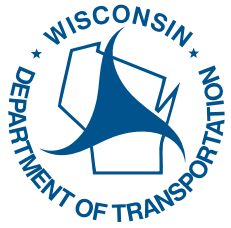

Identifying Costs and Funding Alternatives for Equipping Operating While Intoxicated (OWI) Offenders with Ignition Interlock Devices (IIDs)

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WISCONSIN DOT
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Wisconsin Department of Transportation Research, Development & Technology Transfer

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16. Abstract

From 2005-2009 there were over 200,000 arrests for Operating while intoxicated (OWI) in the State of Wisconsin. The project had three primary goals. First, data on OWI offenders were analyzed to determine if there existed any driver characteristics which were more likely to be associated with OWI offenders who had a subsequent arrest within 1 or 2 years of the initial arrest. The intent of this was to determine if there was a statistically support means for identifying those drivers for whom an ignition interlock device (IID) should be a priority. Second, data on overall arrest levels during these 5 years were analyzed in an effort to determine future OWI arrests levels in order to predict potential demand for IIDs over the next 10 years. Third, costs for IIDs and options for financing the purchase of IIDs was studied by conducting phone interviews with IID manufacturers and studying IID financing programs in other states. The goal was to understand the feasibility of generating sufficient revenues to improve installation rates by addressing cost.

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EXECUTIVE SUMMARY

Background

From 2005-2009 there were over 200,000 arrests for Operating while intoxicated (OWI) in the State of Wisconsin. The project had three primary goals. First, data on OWI offenders were analyzed to determine if there existed any driver characteristics which were more likely to be associated with OWI offenders who had a subsequent arrest within 1 or 2 years of the initial arrest. The intent of this was to determine if there was a statistically support means for identifying those drivers for whom an ignition interlock device (IID) should be a priority. Second, data on overall arrest levels during these 5 years were analyzed in an effort to determine future OWI arrests levels in order to predict potential demand for IIDs over the next 10 years. Third, costs for IIDs and options for financing the purchase of IIDs was studied by conducting phone interviews with IID manufacturers and studying IID financing programs in other states. The goal was to understand the feasibility of generating sufficient revenues to improve installation rates by addressing cost.

Methods

Analysis of the demographic characteristics of repeat OWI offenders was conducted using a logistic regression model. The dependent variable was a repeat offense occurring in either 1 or 2 years from the original offense. Independent variables studied included gender, age group, rural or urban residence, blood alcohol level, income, and time of arrest.

In order to forecast the number of future OWI arrests, a exponential smoothing model with trend and seasonality adjustment was used. Monthly arrests were tracked. Based on this data, a linear regression model was also created to predict the number of arrests on a monthly basis based on vehicle miles travelled and unemployment levels. Ultimately, the linear regression model was chosen as it allowed for a range of forecasts that could be based on a range of possible future employment levels.

In order to establish the annual cost of an IID, interviews were conducted with the three approved IID manufacturers for Wisconsin, as well as manufacturers serving other states. This data was combined with public information from the National Highway Traffic Safety Administration (NHTSA), state government information for a variety of states, and cost information available for manufactures who were not phone interviewed. Similarly, funding options were identified based on existing programs in the other 49 states, and applied specifically to Wisconsin (considering factors such as number of arrests and Wisconsin specific liquor tax rates). Final recommendations were based on a combination of funding alternatives.

Findings

Analysis of OWI offenders revealed that several demographic characteristics differed significantly between offenders who had subsequent arrests in a 1 or 2 year time period, and those who did not. Male offenders, younger offenders, and offenders residing in rural areas were more likely to have a repeat arrest. Blood Alcohol Content (BAC) at the time of arrest was not significantly different between repeat offenders and non-repeat offenders. Those arrested for OWI on early weekday mornings were more likely to have a subsequent arrest in the short term, while those arrested on weekend evenings were less likely to become repeat offenders in less than two years.

The number of OWI arrests is related to several variables, including the level of travel among the drinking population as well as the level of enforcement of OWI laws. In developing a forecast of future OWI arrests, economic conditions also became a critical factor. Vehicle miles travelled (by all drivers) and unemployment rate account for nearly 2/3 of the variation in monthly OWI arrest levels. It is forecasted that over the next ten years, there will be between 31,000 and 43,000 OWI arrests annually in Wisconsin.

The current cost for installation and monthly service fees for an IID in Wisconsin is $910. This is slightly below the national average. Based on the forecasted arrests, the cost for IIDs for all OWI offenders is projected to be between $28 million and $39 million annually. Of the many options studied, revenue generation through court fees for OWI offenders and increases in liquor tax appear to be the most promising. These measures could fund IIDs for up to 30% of the OWI offenders while keeping IID costs (including new court fees) below the national average.

ACKNOWLEDGE MENTS

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- Laura Andreasson, Reginald Paradowski and John Sobotik who formed the technical advisory committee at the Wisconsin Department of Transportation

- Jonathan Salzman who did a substation portion of the statistical analysis and telephone interviews with IID manufacturers.

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IDENTIFICATION AND CHARACTERIZATION OF TARGET DRIVERS

Wisconsin drivers with arrests for OWI were identified for five years from 2005-2009. The base dataset contained information on driver gender, birth date, county and city of residence and date of arrest. This data was combined with additional data from the Department of Revenue (DOR) regarding average incomes for various sub-groups of arrested drivers. These groups were defined based on the rural/urban nature of the county of residence using a 9 point scale found in a literature review of other socio-economic studies in Wisconsin (1=most urban, 9= most rural). The groups were also defined based on driver gender, age at time of arrest, and the duration of time until the next arrest. The age at time of arrest was calculated by subtracting the birth date from the arrest date. Ages were categorized as <21, 21-30, 31-50 and 50+. Initially, there were a larger number of groups, however the limited number of drivers less than 21 and greater than 50, required the use of larger subgroups in order to have sufficient data points in each group to meet DOR requirements for anonymity.

The duration until next arrest was calculated by matching driver id numbers and subtracting arrest dates between successive arrests. Again, this information was categorized. Those drivers, who had a repeat offense within 1 year, were identified for the first 4 years of data. There was no way of determining which drivers had repeat offenses within a year for arrests in year five. Similarly, drivers who had a repeat offense within 2 years were identified for the first 3 years. These two categories, along with those drivers who did not repeat within 1 year for the first 4 years or within 2 years for the first 3 years were the four categories used. In all, there were 160 different driver groups for which revenue data was received.

Table 1 shows the breakdown of OWI arrests for 2005-2009 by year. Gender, age group, type of county (rural vs. urban) and repeating offenders are shown. A majority of offenders are male, do not repeat, and live in urban areas. On a per year-of-age basis, drivers between the ages of 21 and 30 are most heavily represented. In most cases, OWI arrests decline significantly in 2008 and 2009 and are well below 2005 levels. The one exception is among drivers age 50 and over. While there was a decline in 2009, arrest that year were still greater than the arrests made in 2005. The same declining trend is seen in how many offenders arrested in each year were arrested again in 1-2 years. The trend is shifted up in time and reflects the fact that the decrease in total arrests in 2008 and 2009 included a decrease in arrests of previous offenders. Figure 1 shows the trend in arrests over time.

Table 1: OWI arrests for each of the 5 years studied by gender, age, location, and repeat offenders

	2005	2006	2007	2008	2009	Totals by Category
Male	32972	32697	32232	31086	27390	156377
Female	9037	9457	9638	9627	9128	46887
Age < 21	4374	4514	4125	3737	3254	20004
Age 21-30	16905	17517	17660	17041	15473	84596
Age 31-50	17020	16332	16214	15842	13996	79404
Age 50+	3710	3791	3871	4093	3795	19260
Urban (RC 1-3)	28956	29164	28772	28174	26036	141102
Quasi-Rural (RC 4-6)	9678	9604	9704	9326	7790	46102
Rural (RC 7-9)	3375	3386	3394	3213	2692	16060
Repeated within 1 yr	3659	3491	3398	3064		13612
Repeated within 2 yr	6113	5866	5560			17539
Totals by Year	42009	42154	41870	40713	36518	**203264**

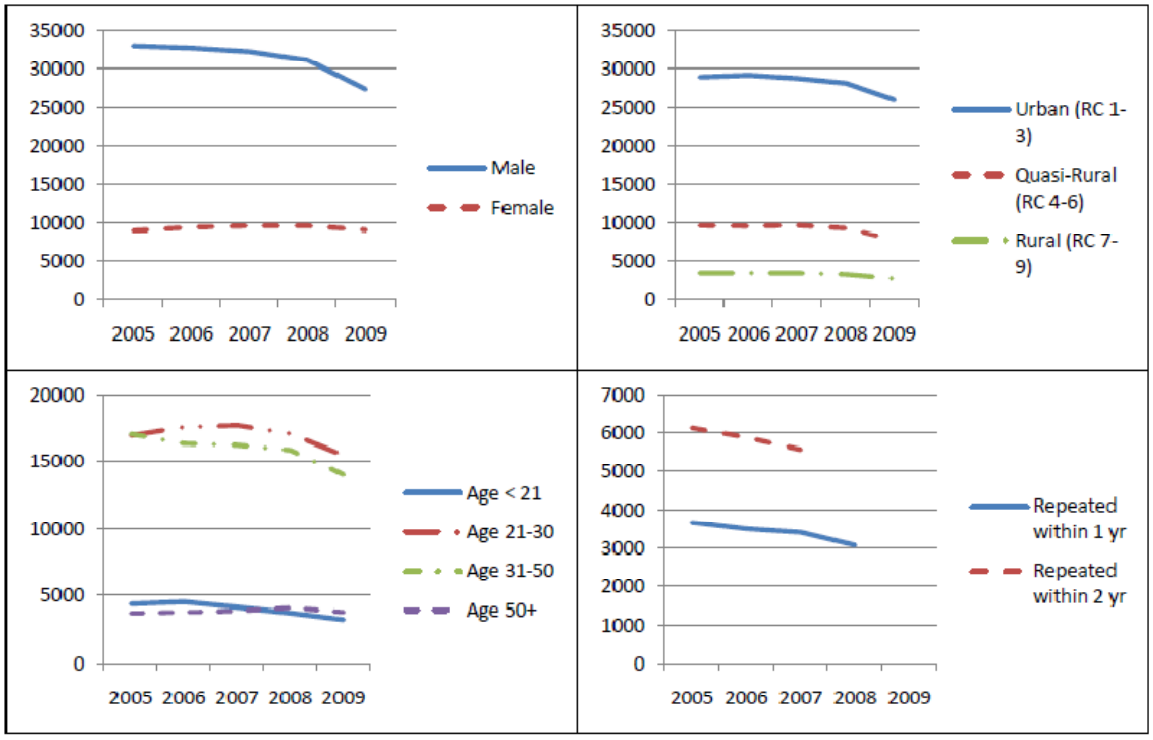

Figure 1: Arrest trends from 2005-2009

DEMOGRAPHIC INFORMATION ON TYPICAL OWI DRIVERS AND REPEAT OFFENDERS

Once the sizes of the various sub-groups were calculated to determine the demographics associated with OWI offenders in this five year period, logistic regression models were created to predict the likelihood of a driver having another offense within either one or two years, based on the information at the time of the first arrest. The statistical significance of each variable was used to narrow down the list of possible predictors for future offenses.

The logistic regression model shows which driver characteristics are more likely to be associated with repeat offenders. To interpret tables 2 and 3, if the parameter estimate is greater than 0, then the variable shown is more likely to be associated with a repeat offender. Likewise, variables with odds ratios greater than 1 are more likely to be associated with a repeat offender. Only variables or combinations of variables which had a p-value less than 0.01 were included in the results.

Several factors were shown to be significantly associated with repeat offenders. Tables 2 and 3 show the characteristics at the time of the first arrest (in the data set) that were associated with a second arrest occurring within the time studied. Two models were run. The first model (Table 2) predicts the likelihood of repeating within one year of an arrest. The second model (Table 3) predicts the likelihood of repeating within two years of an arrest.

Table 2 shows that female drivers are significantly less likely to have a repeat offense. Male drivers are 1.19 times more likely to have another offense within a year. Younger drivers are more likely to have a repeat offense within a year than older drivers. Drivers age 31-50 served as a baseline (consistent with literature in driver safety) and the parameter estimate was calculated based on the other three age values. Drivers under the age of 21 or between 21 and 30 are more likely to repeat compared with the baseline drivers. Drivers over the age of 50 are less likely to repeat than the baseline drivers. Offenders repeating within one year are also much more likely to live in a rural area than in an urban area. The most rural counties served as the baseline for this comparison, and as seen, drivers in rural counties are 7 times more likely to have a repeat offense within a year than drivers in one of the other 7 county types (no observations for county type 5). Drivers in the most urban counties were least likely to have a repeat offense.

Table 2: Parameter estimates for gender, age, income and rural/urban counties and associated odds ratios predicting the likelihood of a repeat offence within a year of an arrest.

Variable	Estimate	Odds of Repeat Offense	p-value
Intercept	-2.1599		< 0.0001
Female	-0.1698	0.84	< 0.0001
Male	0.1698	1.19	< 0.0001
Rural Code 1 (Most Urban)	-0.4275	0.65	< 0.0001
Rural Code 2	-0.2364	0.79	0.0003
Rural Code 3	-0.2244	0.80	0.0004
Rural Code 4	-0.1923	0.83	0.0038
Rural Code 5	No counties in Wisconsin		
Rural Code 6	-0.2646	0.77	< 0.0001
Rural Code 7	-0.3375	0.71	0.0001
Rural Code 8	-0.2764	0.76	0.0002
Rural Code 9 (Most Rural)	Baseline		
Age < 21	0.214	1.24	<0.0001
Age 21-30	0.1452	1.16	<0.0001
Age 31-50	Baseline		
Age > 50	-0.2438	0.78	<0.0001
Female Under 21	-0.2438	0.82	0.0011
Number of Observations			166746

Table 3: Parameter estimates for gender, age, income and rural/urban counties and associated odds ratios predicting the likelihood of a repeat offence within two years of an arrest.

Variable	Estimate	Odds of Repeat Offense	p-value
Intercept	-1.5362		< 0.0001
Female	-0.1892	0.83	< 0.0001
Male	0.1892	1.21	< 0.0001
Rural Code 1 (Most Urban)	-0.5207	0.59	< 0.0001
Rural Code 2	-0.3341	0.72	0.0003
Rural Code 3	-0.293	0.75	0.0004
Rural Code 4	-0.2726	0.76	0.0038
Rural Code 5	No counties in Wisconsin		
Rural Code 6	-0.3226	0.72	< 0.0001
Rural Code 7	-0.3644	0.69	0.0001
Rural Code 8	-0.2875	0.75	0.0002
Rural Code 9 (Most Rural) (baseline)	2.3949	10.97	
Age < 21	0.4066	1.50	<0.0001
Age 21-30	0.2221	1.25	<0.0001
Age 31-50 (baseline)	-0.2617	0.77	
Age > 50	-0.367	0.69	<0.0001
Female Under 21	-0.3192	0.90	0.0011
Number of Observations			108494

The results shown in Table 3 for repeating offenses within two years of an arrest are similar to those for repeating within one year. Fewer observations are included in this model, since there were only 3 years of data for which repeat offenses for the following two years could be analyzed. When considering a two year period, male offenders are still more likely (1.21 times) than females to repeat. This is almost identical to the 1 yr prediction. Younger drivers are still more likely to repeat than older drivers. And rural areas are still more likely to be associated with repeat offenses than urban areas when looking at a longer period of time.

In both models, there was an interaction between age and gender. As seen in figure 2, male drivers under the age of 21 at the time of the first arrest are most likely to have a repeat offense. The risk of a repeat offense declines consistently with age. For female drivers, the higher risk age group is 21-30. This suggests a different outcome on the part of underage females who are arrested for DUI and their male counterparts. Specifically, it suggests that means used for addressing DUI for underage drivers may be more effective for female drivers than male drivers.

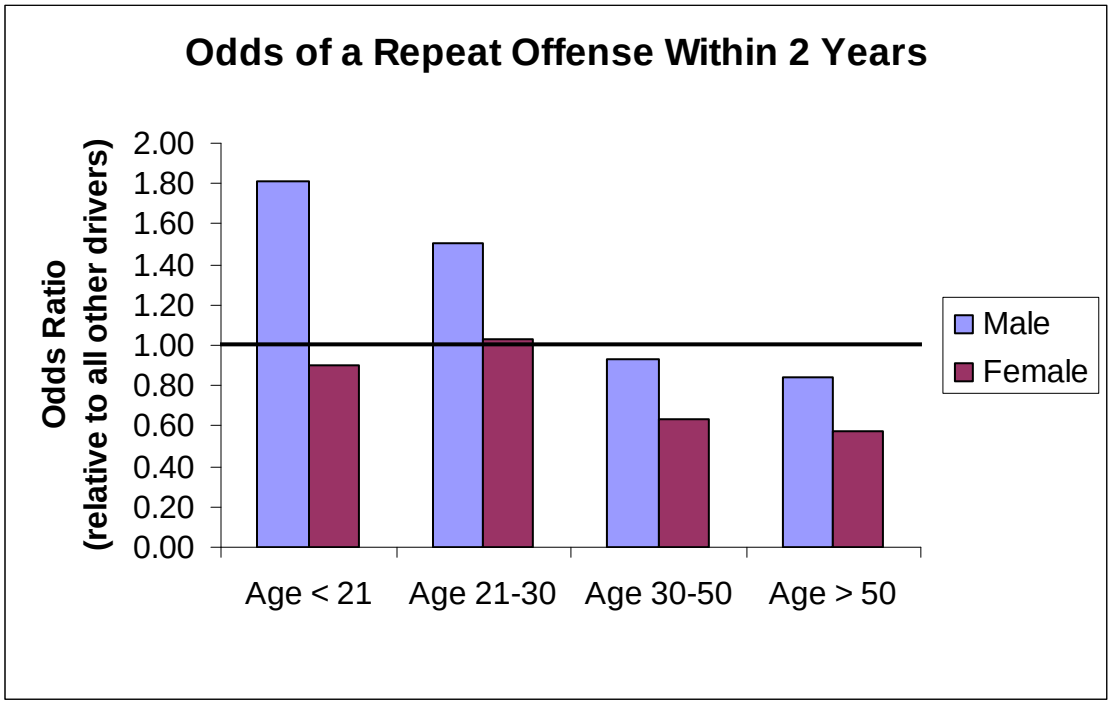

Figure 2: Odds of drivers for each gender in each age group having a repeat offense within 2 years. Male drivers have a continuous decrease in recidivism with age, whereas females are more likely to repeat if they are age 21-30.

The relationship between income and recidivism was also studied. Because income data was collected as averages for subgroups of drivers as described in the procedural section, this information could not be included in the regression model. This is because the variation within these groups was very large. As a result, assigning the average income level for each group to each person in that group would not reflect the actual income for a vast majority of individuals in the data set. In many cases, the standard deviation of

income for the group was greater than the average income level. Assigning average group incomes to individuals would result in inflation of statistical significance.

An analysis of variance (ANOVA) which compares the mean income level of each of these groups as well as the variation in data for each group was conducted to determine if any of the various groups within a particular age, gender, and location of residence would have significant differences in household income between repeat offenders during the time frame studied. Due to the high variation of income in each group, no significant results were found. It was noted that average income values across repeating offender groups were lower than for non-repeating groups. This suggests that a future analysis including driver-specific income levels in the analysis may provide significant results. Income would be an important variable to study since affordability is a key issue for this research project. If it turns out that lower income individuals were also more likely to be repeat offenders, the issue of income-related non-compliance with IID orders becomes much more critical.

The relationship between Blood Alcohol Concentration (BAC) and repeat offenses was also studied. The results show that there is no statistically significant relationship between the BAC at the time of arrest, and the likelihood of a repeat arrest within 1 or 2 years. Based on this finding, a series of follow up studies were conducted to investigate the significance of various BAC level thresholds of interest. This included an analysis of the BAC level of 0.17 which is the threshold for requiring IID installations based on a recently passed Wisconsin State law.

BAC thresholds of 0.10, 0.15, 0.17 and 0.20 were studied for likelihood of repeat offenses within 1 year and within 2 years. P-values for each level were 0.91, 0.99, 0.96, and 0.35. These results demonstrate that the BAC levels studied are not only insignificant, but fail to indicate any trend whatsoever. These results are on par with random data, meaning that the relationship between BAC level and repeat offenses is no stronger than that of repeat offenses and variables which would be completely unrelated to repeat offenses.

The final variable studied was time of arrest. A separate analysis of times of day and days of the week was conducted to determine when arrests of future repeat offenders are most likely to take place. Times categories were defined based on weekdays and days on the weekend, relative to traditional 5 day work schedules. For example, the time period of 12am – 7am on Monday-Friday was included as one category, and Saturday and Sunday mornings were considered separately as non-work days. Likewise, 7pm-12am included data from Sunday – Thursday as evenings before work days. Friday and Saturday from 7pm-12am were each analyzed separately. Table 4 shows the groupings of arrest times and the likelihood that a driver arrested during those times would have a repeat offense within another 2 years.

Table 4: Likelihood that drivers arrested during various times of the day will have another offense within 2 years.

Time and Day	Time	Parameter Estimate	Odds of Repeating	p-value
Monday - Friday	12am - 6:59am	0.1237	1.13	<0.0001
Monday - Friday	7am - 6:59pm		statistically insignificant	
Sunday - Thursday	7pm - 11:59am		statistically insignificant	
Friday	7pm - 11:59pm		statistically insignificant	
Saturday	12am - 6:59am		statistically insignificant	
Saturday	7am - 6:59pm		statistically insignificant	
Saturday	7pm - 11:59pm	-0.1345	0.87	0.0006
Sunday	12am - 6:59am	-0.1048	0.90	0.0012
Sunday	7am - 6:59pm		statistically insignificant	
Observations				83808

The results of this analysis shown in Table 4 shows that drivers arrested during the early morning on weekdays are 13 percent more likely to have a future arrest than drivers arrested during other times of the day and week. Drivers arrested Saturday nights, or early Sunday morning are least likely to become repeat offenders in the next two years. The drivers in this last group are likely social drinkers, and as such, spend less time on the road drunk than those who are drinking and driving during the week.

The difference in repeating offenses between urban and rural areas may provide an opportunity to target policy. Installing IID devices in rural offenders may also help to deal with some of the challenges of enforcing drunk driving laws in large, sparsely populated areas. The effect of age suggests that younger drivers should be given priority for IID installations, particularly male drivers under the age of 21. Among females, the increase the proportion of future offenders among arrestees age 21-30 should be investigated further. This could be the result of female drivers who are more likely to wait until they are of age to drink, or a function of where and when female drivers drink before and after they are of age.

Conspicuous by its absence is the relationship between blood alcohol content (BAC) and the likelihood of a repeat offense. Drivers with higher blood alcohol levels are no more likely to have a repeat offense than those with low levels. This is not to say that requiring offenders with high BAC levels to install IID devices will not reduce repeat offenses, but that this reduction is only a function of having additional IID devices in use. Based on the results of the analysis in Tables 2 and 3, for a fixed number of additional IIDs financed, more repeat offenders would be stopped through IID usage if the units were given based on age (specifically younger drivers) and to offenders in rural areas, than if the same number of additional IIDs were given to drivers based on BAC level.

DEMAND FORECAST FOR IIDs OVER THE NEXT TEN YEARS

In order to determine demand for IIDs over the next decade, both monthly and yearly forecast models were created. The yearly forecast models were based on arrest data from the Wisconsin Department of Administration. The monthly forecast model was created by combining arrests from the DOT-provided data set. The yearly forecast model utilized a moving average model with trend. The monthly forecast model was a moving average model with trend and seasonality. Upon completion of the models, macroeconomic and transportation factors were considered to determine the cause of significant cyclicality and shifts in the data. A linear regression model was developed to determine how changes in these factors would affect the demand forecast.

The analysis of annual DWI arrests in Wisconsin shows a steady increase over the past 20 years. This is seen in Figure 2. After a steep decrease in the late 1980s, arrests held relatively constant until 2002 despite a constant increase in vehicle miles travelled. The increase in 2002 came despite a leveling off of vehicle miles travelled, and lasted until 2008, when both vehicle miles travelled and arrests decreased. An even sharper decrease is seen in 2009. The forecast predicts a gradual increase in arrests going forward. Whether or not this increase results in levels higher than those seen in the mid 2000s depends on whether the effects seen in 2008 and 2009 are temporary or permanent. This will be discussed further as part of the monthly forecast model.

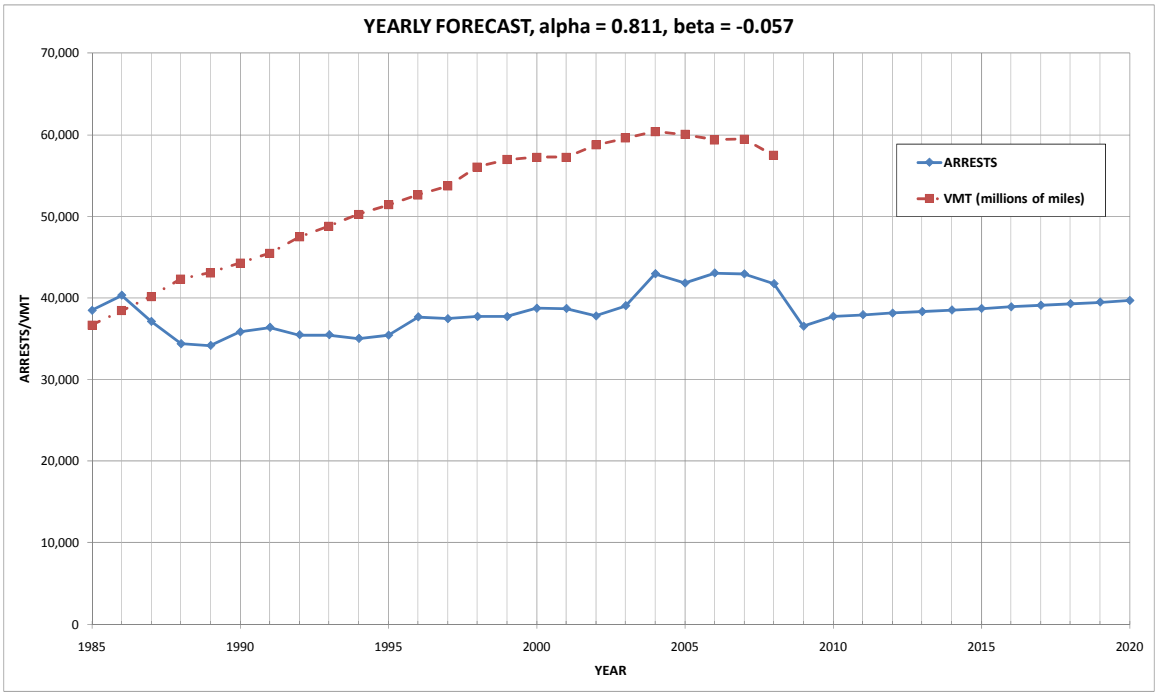

Figure 3: Forecasted annual OWI arrests for the State of Wisconsin

The second forecast model was created using the monthly OWI arrest data provided by the Wisconsin DOT. This data is shown in Figure 3. The first five years shown represent the data from 2005-2009. Since the forecast for future years was significantly lower than for the past 5 years, due to the sudden drop in OWI arrests in 2009, a linear regression model was developed to determine if economic conditions could explain this lower level of arrests. Additionally, it was noted that vehicle miles driven on a monthly basis seemed to coincide with the seasonality of the OWI arrests. This was also included in the regression model. As seen in table 4, both vehicle miles driven and unemployment rate were highly significant predictors of OWI arrests. As a result, the forecast model was run for various levels of unemployment. This will allow for a more accurate prediction based on future economic conditions and not just past OWI arrest rates.

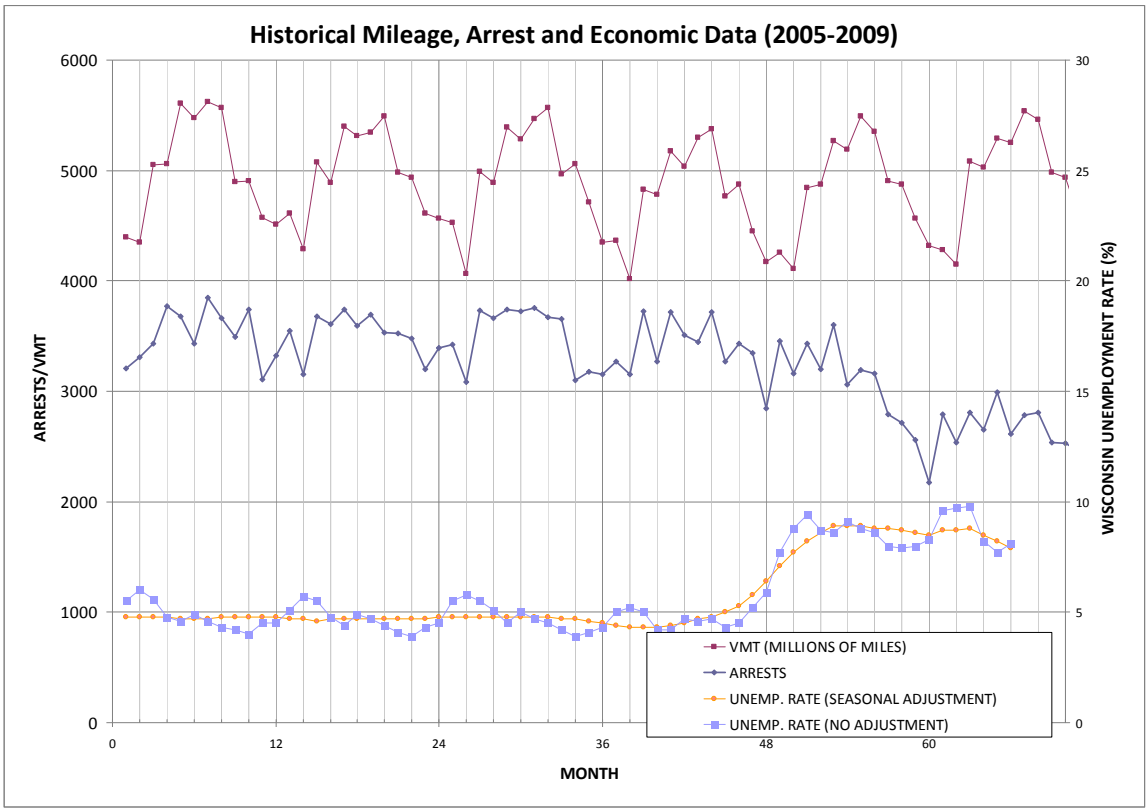

Figure 4: Historical mileage, OWI arrests and economic data through April 2010.

Table 4: Linear regression model showing short term (VMT) and long term (unemployment rate) effects on OWI arrests

Variable	parameter estimate	t-value	p-value
Intercept	2200.64	6.95	< 0.0001
Unemployment rate	-132.83	-8.49	< 0.0001
Vehicle miles travelled	0.3889	6.45	< 0.0001
R-Squared	0.6664		
Adj R-Squared	0.6556		

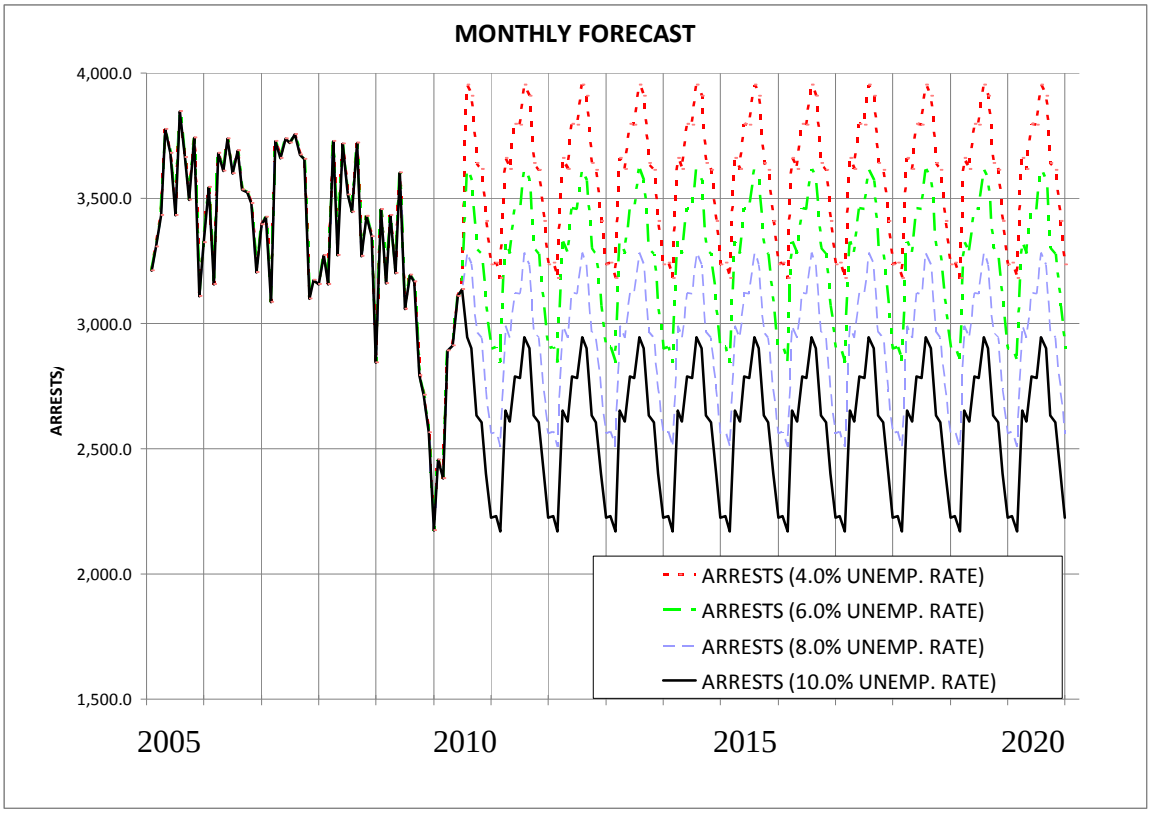

Figure 5: Forecast of future arrests based on unemployment levels and vehicle miles travelled

At current rates of unemployment (8%-10%), annual OWI arrests are predicted to be between 34,200 and 35,900 arrests for 2010. At those levels of unemployment, by 2020, the forecasted arrests are between 32,800 and 36,200 annually. If unemployment were to drop to 4%, by 2020, the forecasted number of arrests would be 42,800.

It is also important to be able to identify exactly when significant shifts in data occur. This can be difficult with cyclical data. Figure 4 shows the points at which there are significant shifts in OWI arrests. 2005 was used as a baseline year to determine the month specific seasonality in the data. Each month's totals were then scaled by the inverse of the seasonality in order to determine if that month's data were significantly

different than arrest totals for that month in prior years. November 2007 had a significantly lower number of arrests. After that point, arrests returned to the normal range until December 2008 and January 2009. After April 2009, arrests fell drastically and have not return to the normal range. This date corresponds with the point at which the seasonally adjusted unemployment rate stabilized at 9 percent. This further supports the idea that there is a relationship between economic activity and OWI offenses.

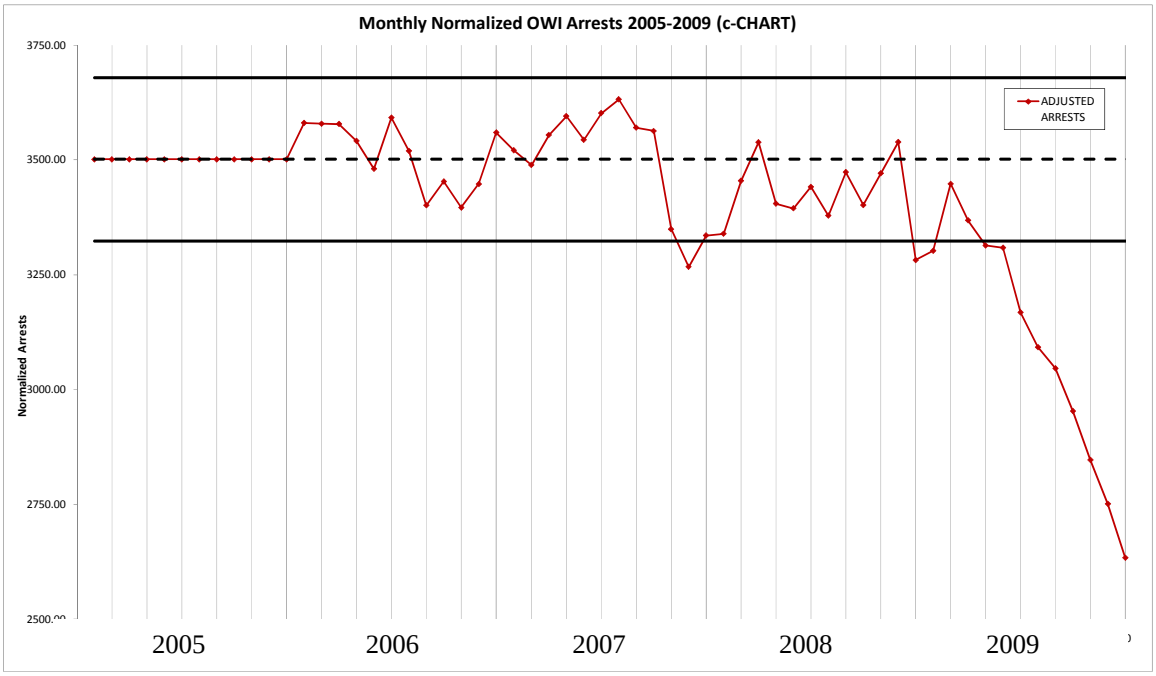

Figure 6: Normalized monthly OWI arrests showing significant downward trend in data starting at the end of 2007 and a permanent shift outside of the control limits starting April 2009

There is a clear relationship between vehicle miles travelled and the number of OWI arrests. The relationship between economic conditions and OWI arrests requires further analysis. It is clear that when unemployment rises, OWI arrests fall significantly. What cannot be assessed from this analysis is causality. There are two primary possibilities. On the one hand, it may be that poorer economic conditions result in less drinking at bars and taverns and more drinking at home. On the other hand, the lack of arrests could also be a result of less enforcement resulting from tighter state budgets. An examination of the data in figure 1 supports the first hypothesis. If the reduction in arrests were a function of enforcement, similar trends would have been seen across all age and gender groups. This is because the probability arresting an individual from a particular age or gender group is dependent on that group's proportion of the drunk driving population. The fact that the same number of older drivers were arrested in 2009 as in the prior 4 years, suggests that enforcement has been constant and the decrease in arrests among middle aged adults is a function of fewer drunk drivers from those age groups being on the road.

COST OF IID INSTALLATIONS IN WISCONSIN AND NATIONALLY

All three companies approved by the State of Wisconsin for manufacture of IIDs (Consumer Safety Technology, Draeger Safety Diagnostics, and Lifesaver Interlock) were interviewed by phone. They were asked questions regarding the cost structure of the IID devices, how offenders go about installing these devices, and the manner in which the devices operate. After this, cost structures for IID installations in other States were investigated to determine how the cost of these devices in Wisconsin compared nationally. The national cost data was collected through phone interviews with other manufacturers not servicing Wisconsin, and data available from the National Highway Traffic Safety Administration, State governments, manufacturers, and third party sources such as legal firms and service organizations.

There are many costs associated with IID installations. These include the installation, monthly service fees, various reset fees if the device is triggered, and removal fees. For this report, installation fees, service fees, and removal fees are considered. Fees to reset the system due to triggering the device are not included as this is dependent on individual driver behavior, and the effect of covering this cost on the incurrence of these fees is not known. Further, most other states offering financial support for IID installations leave the fees for these system resets to the driver.

Table 5 contains a summary of the cost structures for each manufacturer providing IIDs in Wisconsin. Prices are quite consistent. Generally, installation charges are equal to one month's payment. The monthly payments vary between $65 and $75 per month. Payments are made on either a monthly or bi-monthly basis. There is a charge for both installation and removal. Additionally, there may be service charges for system resets if violations occur. These service charges are not included in the cost analysis as the frequency is unknown and if the offender is complying with the law, should not be incurred at all.

Table 5: Installation and monthly rental charges for approved IID devices in Wisconsin

Company	Installation and Removal Charges	Monthly Fee	Payment Schedule
Consumer Safety Technology, Inc	$80-$100	65.00	Install payment plus 2 months up front, monthly thereafter
Draeger Safety Diagnostics	60.00	74.85	Install payment plus first month up front, monthly thereafter
Lifesafer Interlock	75.00	66.00	Install payment plus 2 months up front, bi-monthly thereafter

Costs for IID installations are rather consistent nationally. The data given in tables 6 and 7 are for estimated annual cost including installations and removal of the system. Because these are annual estimates, some may include additional fees not included in our analysis of the three Wisconsin approved systems. According to the NHTSA[1] provided data, the minimum annual cost is $770.00 in Mississippi and the highest annual cost is $2640.00 in Hawaii, although it should be noted that data provided by the State of Hawaii lists the annual cost at $1000.00. The next highest annual cost reported by NHTSA is $2630.00 in New York (which is still an outlier among the NHTSA data, and over $1000.00 more than the manufacturer reported cost) and $1690.00 in Rhode Island, which is much more in line with other northeastern states. Among Midwestern states, Wisconsin IID costs are comparable.

Table 6: Estimated Annual Costs of IID installations and service by State

	NHTSA[1]	GOVT/STATE		MANUFACTURER		THIRD PARTY	
STATE	Given	Low	High/Given	Low	High/Given	Low	High/Given
Alabama	$840.00						
Alaska	$1,430.00						
Arizona	$960.00					$1,000.00	$1,021.64
Arkansas	$1,200.00						
California	$1,320.00			$874.95	$970.00		
Colorado	$1,110.00	$800.00	$1,000.00				$1,100.00
Connecticut	$1,440.00				$1,335.50		
Delaware	$1,110.00		$1,000.00				
Florida	$950.00	$964.00	$1,024.00				
Georgia	$980.00			$879.00	$914.00		
Hawaii	$2,640.00		$1,000.00				
Idaho	$870.00						
Illinois	$1,160.00						$1,400.00
Indiana	$860.00						
Iowa	$870.00		$830.00	$990.00			
Kansas	$900.00						
Kentucky	$820.00						
Louisiana	$900.00						
Maine	$1,170.00						
Maryland	$920.00			$897.00	$932.00		
Massachusetts	$1,660.00	$1,120.00	$1,520.00	$813.00	$1,335.50		
Michigan	$1,020.00						
Minnesota		$860.00	$1,650.00	$945.00	$980.00		
Mississippi	$770.00						
Missouri	$880.00						$880.00

Table 7: Estimated Annual Costs of IID installations and service by State

STATE	NHTSA[1] Given	GOVT/STATE Low	GOVT/STATE High/Given	MANUFACTURER Low	MANUFACTURER High/Given	THIRD PARTY Low	THIRD PARTY High/Given
Montana	$940.00						
Nebraska	$890.00			$830.00	$990.00		
Nevada	$1,110.00						
New Hampshire	$1,190.00						
New Jersey	$1,630.00			$969.00	$1,347.50		
New Mexico	$990.00			$753.00	$788.00		
New York	$2,630.00				$1,563.50		
North Carolina	$930.00				$841.00		
North Dakota	$870.00						$870.00
Ohio	$990.00			$801.00	$1,004.00		
Oklahoma	$800.00						
Oregon	$1,110.00			$830.00	$990.00		
Pennsylvania	$1,160.00		$1,000.00	$849.00	$884.00		
Rhode Island	$1,690.00						
South Carolina	$900.00						
South Dakota	$880.00						
Tennessee	$830.00						
Texas	$870.00			$789.00	$1,064.00		
Utah	$990.00						
Vermont	$1,050.00						
Virginia	$970.00		$1,115.00				
Washington	$1,120.00			$830.00	$990.00		
West Virginia	$870.00						
Wisconsin	$920.00			$942.00	$1,018.20		
Wyoming	$920.00						

AFFORDABILITY OF IID DEVICES

While individual household income levels were not made available due to concerns about anonymity, it has been shown in literature (Dragulescu and Yakovenko 2001) that income levels in the United States follow an exponential distribution. A review of the Department of Revenue (DOR) data does indeed show that the standard deviation of incomes within each subgroup of offenders is not significantly different than the average incomes for each group. As a result, a distribution of incomes for each of these subgroups (or any combination thereof) can be computed. This distribution was plotted and compared to the annual cost of an IID. Based on this distribution, it can be determined what proportion of their income offenders would need to commit to the annual expense of an IID device. This is shown in Figures 6-8 based on an annual cost of $910. Similarly, the graphs also show what proportion of the population will pay more than a particular percentage of their income in making this purchase (and therefore the proportion of the population for whom IIDs are not affordable). Finally, these figures also allow for an estimation of the effect of subsidizing the purchase of the IID devices on overall affordability.

Based on Figures 6-8, at a cost of $65 each for installation and removal and $65 per month, the total annual cost exceeds 20 percent of annual household income for 45% of offenders under the age of 21, 25% of offenders age 21-30, 15% of offenders age 31-50 and 10% of offenders age 50+. There is no significant difference in the proportion of income required for male and female offenders. The proportion of income required is slightly more for rural residents than for urban residents.

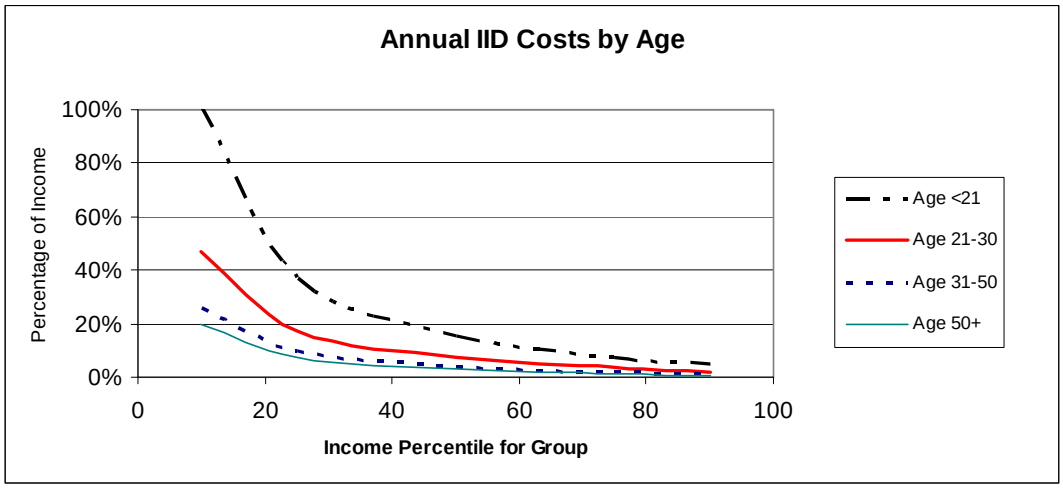

Figure 7: Percentage of income which offenders of each age group will pay for IIDs annually based on an annual cost of $910.

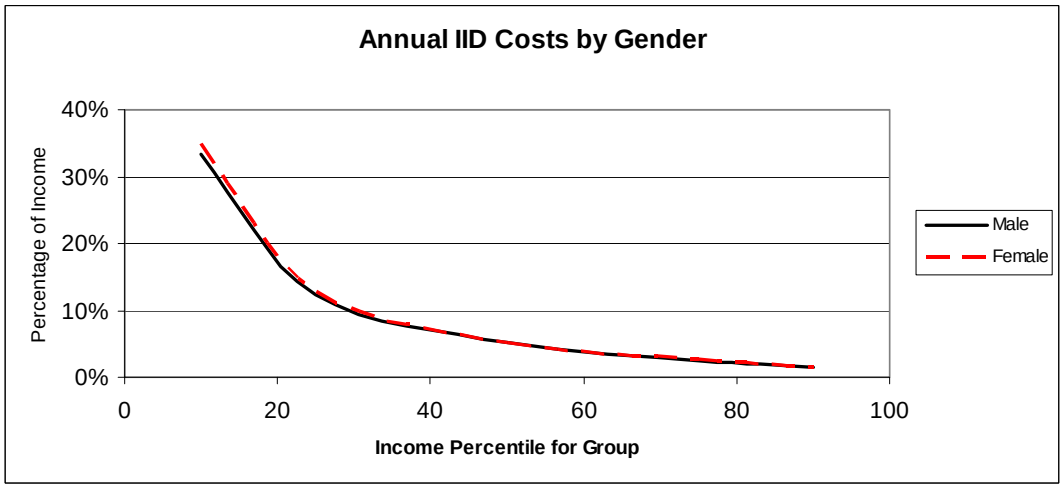

Figure 8: Percentage of income which offenders of each gender will pay for IIDs annually based on an annual cost of $910.

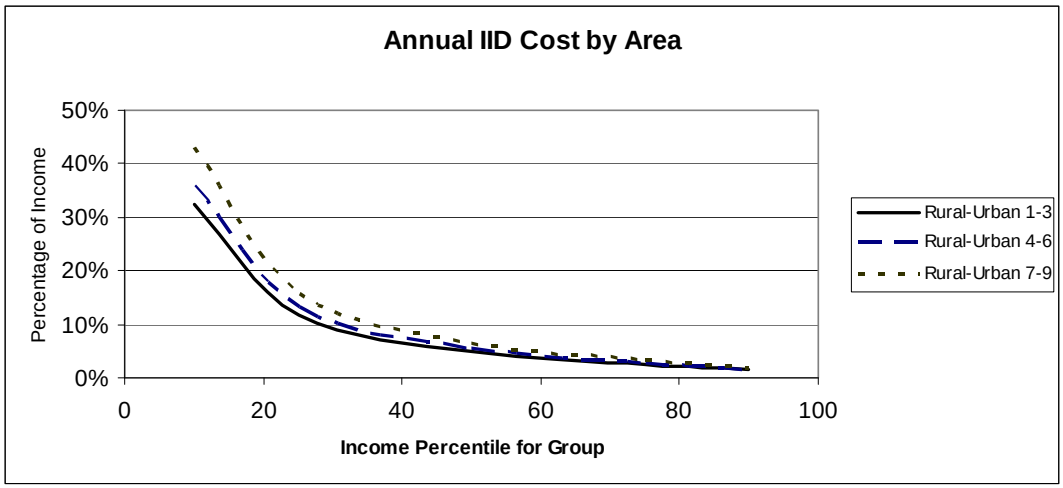

Figure 9: Percentage of income which offenders of each area will pay for IIDs annually based on an annual cost of $910. Rural Urban Continuum codes range from most urban = 1 to most rural = 9.

An estimate of the effect of subsidizing the cost of IID devices can also be developed from these figures. If IID costs are cut in half, the percentage of income used would also be cut in half. As an example, if the new cost of IIDs (to the offender) was reduced to $455 per year, the proportion of offenders for whom IID costs exceed 20% of household income is equivalent to the prior proportion for which the cost exceeded 40% of income. In other words, those offenders who would have had to use up to 40% of their income to cover the cost, now only use up to 20% of the income because the cost is half as much. If this were the case, then 25% of offenders under the age of 21 (instead of 45%), 15% of offenders age 21-30 (instead of 25%), <5% of offenders age 31-50 (instead of 15%) and <1% of offenders age 50+ (instead 10%) would pay more than 20% of their income for the IID device. The table below shows additional examples.

Table 8: IID affordability (based on 10% and 20% of income) for various age groups

Annual IID	Proportion using more than 10% of income				Proportion using more than 20% of income			
cost	Age <21	Age 21-30	Age 31-50	Age 50+	Age <21	Age 21-30	Age 31-50	Age 50+
$400	38%	20%	11%	9%	22%	12%	< 1%	< 1%
$600	50%	25%	20%	14%	27%	17%	7%	5%
$800	65%	40%	22%	20%	38%	20%	11%	9%
$1,000	75%	45%	25%	22%	47%	25%	18%	12%

OVERALL COST FOR IIDs OVER THE NEXT 10 YEARS

Forecasts from task one were combined with costs provided by the Wisconsin approved IID manufacturers. Based on the identification of characteristics of offenders most likely to repeat, separate cost estimates for some of these groups were also identified. The forecast demonstrated that anticipated offenses are relatively level over the next ten years, and that any general trend over time is far outweighed by the effect economic

conditions. As a result, cost estimates over the next ten years were presented for varying levels of unemployment, consistent with the results of the forecast analysis. There are two assumptions in this model. The first is that all installations are for one year. The second is that the cost of installation, removal and monthly charge are each $65. Since there is only one installation fee and one removal fee, regardless of the length of the installation, the cost of a two year sentence is 86% greater than a one year sentence. Conversely, a six month sentence would be 57% of the cost. The ten year cost estimates assume that unemployment rates are constant over that period of time. If projections differ from this, annual estimates can be summed for anticipated future unemployment levels.

Table 5 shows the cost to equip all vehicles annually and over the next ten years. This is shown in the Annual and 10-year Forecast columns. The numbers shown are in 2011 dollars. Each of the next 7 columns show the cost associated with that particular subgroup. Urban areas and the age group of 50+ were shown in task one to be the most likely to have a repeat offense. The total cost to equip all vehicles is just over $28 million dollars per year at current unemployment rates. Over the next ten years, this cost varies from $281 million to $390 million depending on economic conditions used in the forecast. Equipping vehicles of older offenders comprises only 10%-15% of the cost of equipping every vehicle. Equipping vehicles in counties with rural-urban continuum codes of 1-3 (urban areas) comprises about 70% of the total cost.

Table 9: Cost (in $1,000) to equip vehicles with IID devices annually and over the next ten years.

Unemployment Rate	Annual Forecast	Urban (Codes 1-3)	Sub-Urban (Codes 4-6)	Rural (Codes 1-3)	Age <21	Age 21-30	Age 31-50	Age 50+
4%	$39,037	$27,326	$8,978	$2,733	$3,252	$16,602	$14,764	$4,415
6%	$36,004	$25,203	$8,281	$2,520	$2,999	$15,312	$13,617	$4,072
8%	$32,970	$23,079	$7,583	$2,308	$2,746	$14,022	$12,469	$3,729
10%	$28,160	$19,712	$6,477	$1,971	$2,346	$11,976	$10,650	$3,185

Unemployment Rate	10-year Forecast	Urban (Codes 1-3)	Sub-Urban (Codes 4-6)	Rural (Codes 1-3)	Age <21	Age 21-30	Age 31-50	Age 50+
4%	$390,369	$273,258	$89,785	$27,326	$32,518	$166,024	$147,638	$44,151
6%	$360,037	$252,026	$82,808	$25,203	$29,991	$153,124	$136,166	$40,720
8%	$329,704	$230,793	$75,832	$23,079	$27,464	$140,223	$124,694	$37,290
10%	$281,595	$197,117	$64,767	$19,712	$23,457	$119,762	$106,499	$31,848

Identifying subgroups with higher likelihood of repeat offenses is an effective way of increasing the odds that an IID device is installed in the vehicle of someone who would otherwise have a future OWI conviction. As these groups are more specifically identified, the investment in IIDs becomes more efficient (efficiency is defined as the proportion of IIDs installed for offenders who would otherwise have committed a repeat offense). However, in order to make significant reductions in overall repeat offenses, a wide portion of the offending population must be covered. In other words, if resources are extremely limited, individuals should be compared against the results of the regression model in task one to determine if they are at a high risk for a repeat offense. However, the upper bound on the number of repeat offenses is still the number of

installed IID devices. The highest risk groups are small (i.e. male offenders over the age of 50 in urban areas), and to make a significant impact, more widespread installations will be required. It may be more effective to look at which low risk offenders to not address, and to find a way to fund installations for the rest of the offenders. As an example from this report, this might mean not installing devices in vehicles of drivers under the age of 21 in rural areas, since it appears that other factors (perhaps suspended licenses or penalties for underage drinking) seem to be very effective in limiting repeat offenses.

POTENTIAL FUNDING SOURCES FOR IID IMPLEMENTATION

A survey of various approaches to financing the installation of IIDs in other states was used as a starting point for this analysis. Once programs in other states were evaluated, they were grouped into similar approaches. Table 8 shows the various types of programs currently used in other States to address issues of affordability and noncompliance with IID installation orders. The cost burden in these various programs falls in one of three categories: Offenders, manufacturers, and tax payers.

Table 10: Funding methods used in other States to improve affordability of IID devices for indigent offenders

Funding Method	States using Method		
1. Increase the cost of IIDs to create an indigent fund	New York		
2. Increase the cost of an intiial drunk driving offense. Extra revenues can be place in an indigent fund.	Colorado Hawaii Idaho	Nebraska New Mexico Ohio	Oregon Washington
3. Liquor Tax	New Mexico		
4. Application fees for IID manufacturers to receive annual licenses	Ohio		
5. Reduction in court fines if an IID is installed (or conversely, increase court fines until an IID is installed and use this extra money to fund IID installations)	Alaska Florida		
6. Percentage of total gross revenue of IID manufacturer goes into an indigent fund	Illinois Tennesee Virginia	South Carolina	
7. Limitations on the amount charged to indigent offenders by IID providers	Maryland Michigan		
8. Limit the number of vehicles IIDs are installed on for indegent offenders	New Mexico Pennsylvania		
9. IID manufacturers are proportionally responsible for providing indigent offenders IIDs at no cost	New York		
10. Increase license reinstatement fee to contribute to indigent fund	Ohio		
11. Offender specific technologies. Low tech, low cost IIDs to low risk offenders	New York		
12. Part of the State Highway Fund used towards funding IIDs	Colorado		

Programs that are primarily rely on offenders to finance IID purchases include plans 1, 2, 5 and 10 shown in table 10. The first plan creates a financial structure which makes installation costs somewhat proportional to income (although not on a continuous scale). The results of this are seen in table 7 which shows that New York has one of the highest costs for installations. Plans 2, 5 and 10 are integrated with the court system to link fines and license fees to IID installations. In some respect, plan 3 also relies on offenders to fund assistance for IID costs, in that drunk drivers are by definition consumers of alcohol. However, this cost is also spread across drinkers who are not arrested for DUI.

Programs which rely on manufacturers to help support the financing of IIDs include plans 4, 6, 7 and 9. These options range from charges to manufacturers in order to let them into the market, to limiting prices that can be charged to certain offenders. Charges include upfront fees such as in plan 4 or what amounts to an annual fee in plan 6. The passing of these costs to the manufacturers will ultimately result in higher cost to the consumer. The States using these methods are Ohio, Illinois, Tennessee, South Carolina, Virginia, Maryland, Michigan and New York. The average annual cost among these states is $1200.00. Even discounting New York which is an outlier in terms of annual cost, and utilizes several other methods including increasing overall costs to finance IID financial assistance programs as discussed above, the average annual cost of the remaining 6 states is $970.00, which is $100.00 above the national average.

Programs that rely on taxpayers to finance IID costs include plans 3 and 12. The tax on liquor, as discussed previously spreads the cost among the population of tax payers who consume alcohol, and in proportion to this consumption. Plan 12 utilizes a State Highway fund to help cover the cost of IIDs for indigent users. This is the one plan that addresses the driving aspect of drunk driving to cover the cost of IIDs rather than the drinking aspect. The cost of IID installations in Colorado, where plan 12 is utilized is above the national average at $1110.00 according to NHTSA.

Finally, plans 8 and 11 limit the overall number of IIDs used to control costs. New Mexico and Pennsylvania limit the number of IIDs installed for indigent offenders. The cost of installations for users in these states is still above the national average. New York provides for differing levels of technology for indigent users and those who can afford the systems. The effect of this approach on affordability is difficult to assess because New York employs a wide variety of strategies.

Ultimately, those states which are most aggressive in providing programs to improve compliance with IID orders among offenders are utilizing multiple strategies. States such as New York, Ohio, and New Mexico use at least three different strategies which spread the cost among offenders and manufacturers. In the case of New York and New Mexico, they also exert some control over the level of demand for IIDs, thus controlling overall cost. Clearly no one strategy is effective in providing wide scale assistance without increasing costs for all users. The lowest annual cost for IIDs is among States not represented in table 10. Ultimately, funding IID financial assistance through offenders or manufacturers will result in higher overall cost. In the case of New Mexico, which has

one of the lower annual IID costs among those states in table 10, the use of court costs and a liquor tax seems to have the least effect on IID costs for offenders.

FEASIBILITY OF VARIOUS FUNDING OPTIONS FOR WISCONSIN

Feasibility of funding options is dependent upon the nature of the program. Clearly, funding requirements to cover only indigent offenders is substantially less burdensome than programs which would seek to finance all IID installations. The forecasted annual cost for IIDs over the next ten years is between $28 million and $37 million. The annual cost for funding an indigent fund is dependent on the definition of low income relative to the cost of IIDs. Based on the income data provided by DOR, 18 percent of offenders will use more than 20 percent of their income to pay for an IID if the cost were $910 annually. Complicating matters further, is that an increase in IID costs are used to establish an indigent fund would affect the overall affordability of IIDs, thus creating a greater need for indigent funds. For example, if the cost of the IID were to grow to $1000, 23% of offenders would pay more than 20% of income in IID costs annually based on the data from table 1 and table 8.

For the purposes of this feasibility analysis, this report will evaluate covering the cost of all IID installations as well as covering 20% of installations. The matter of what constitutes financial hardship regarding IID charges is a matter of frequent debate. The use of 20% of the population was chosen for the purpose of showing the cost of a reasonable indigent fund size. Many factors affect opinions on this matter, including consideration of how much money these drivers spend annually on alcohol compared with IID costs, suggesting that more discretionary income exists for these drivers than is necessarily assumed. Analyses of various funding options are included below.

1. Increased IID costs to create an indigent fund

By definition, this method is not sufficient to cover the cost of all IID installations. As seen in figure 10, the cost per IID to fund greater proportions of other OWI offenders is exponential. The closest situation is one where the single wealthiest offender would be charged $28 - $39 million dollars in order to cover the costs of all IIDs each year. However, the figure does provide insight into the point at which IIDs become prohibitively expensive to those drivers not in the indigent fund.

Alternatively, a fixed fee system such as those which create court fees for offenders has a linear relationship to the size of an indigent population. This fee would be in addition to the current annual cost of the IID for non-indigent offenders, and would also be a fee paid by those receiving the “free” IID. Because this fee is spread across the entire population of offenders, it has a much smaller effect on the cost of IIDs. The other advantage of the court fee method is that it is independent of the proportion of OWI offenders who are ordered to install an IID. In other words, if it is determined that only portion of OWI offenders need to have an IID installed, then collecting $200 in court fines from all offenders would result in the ability to finance a much greater percentage of ordered IID installations.

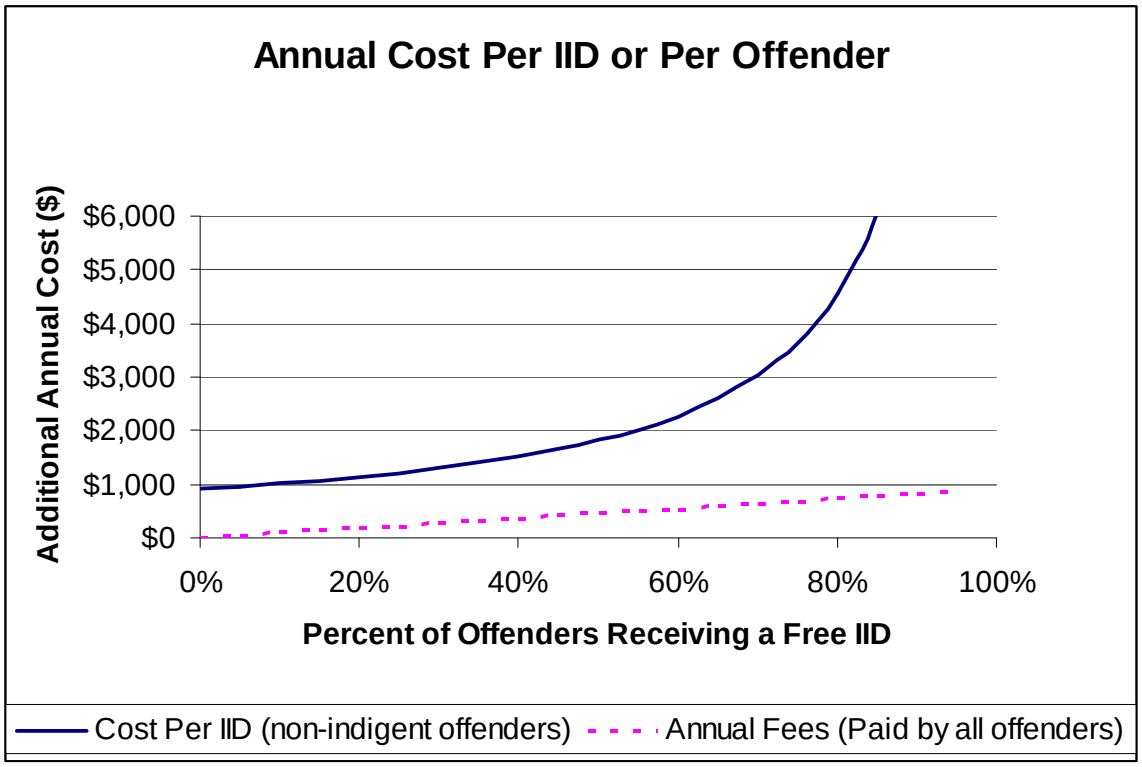

Figure 10: Annual Cost Per IID for paying offenders to Support an Indigent Fund for a Given Percentage of Offenders or alternatively, the size of an annual fee (such as a court fee or increased installation fee) paid by all offenders to support an indigent fund. This figure assumes a forecasted annual cost of $37 million.

2. Manufacturer supported funds

Ultimately, this methodology results in similar outcomes to price adjustments methods for subsidizing IID costs. Licensing fees and obligations to provide a certain number of free units will increase the cost of IIDs for those sold. A license fee approach would basically mimic the cost effect in Figure 10 of the dashed line. This is because the cost of the license fee would be spread across IIDs for all offenders, and funds from the license fee would be used to purchase the units for indigent offenders. The approach of requiring the manufacturer to provide free IIDs to a certain percentage of low income offenders would mimic the solid line, since sales of the remaining units would have to cover this cost. The main drawback of this approach is that it requires 100% compliance with IID orders in order to generate enough revenue. Lack of compliance is one of the main reasons for evaluating the financing of IIDs. This method also raises funds in proportion to the number of drivers who install an IID. This means that if IIDs are only required for a segment of the OWI offender population, as is now the case, the overall funding level will fall in proportion. Therefore, unlike the court fine model, if IID orders are restricted to a subset of OWI offenders, there will still only be enough funding to cover the same proportion of IID installations.

3. Liquor taxes

Using a tax based approach for supplementing IID costs has the advantage of spreading the cost of IIDs across a much larger population, as well as eliminating the issue of exponentially increasing IID costs as the number of offenders receiving financial assistance increases. The other advantage of this approach is that liquor tax revenue is expected to be proportional to IID demand. In other words, when liquor sales fall, resulting in less tax revenue, OWI offenses are also likely to fall since fewer people are drinking liquor. Likewise, if OWI offenses increase due to increased consumption, tax revenues will also rise. Table 11 shows the current liquor consumption and tax revenues for Wisconsin. In looking at the total revenues, it is clear that tax revenues fall far short of the forecasted total annual cost of IIDs. This means that the taxation approach us sufficient only to create an indigent fund to support a subset of offenders.

Table 11: Liters of taxable liquor and resulting tax revenue for 2009 and 2010

Year		SPIRITS	WINE UNDER 14%	WINE OVER 14%	CIDER UNDER 7%	TOTALS
2010	Taxable Liters	48,405,054	41,593,853	2,721,830	937,584	93,658,322
2009	Taxable Liters	49,617,685	39,932,664	2,715,788	664,995	92,931,131
	Taxes per liter	$0.01704	$0.06605	$0.11890	$0.01710	
2010	Revenue	$824,984	$2,747,274	$323,626	$16,033	$3,911,917
2009	Revenue	$845,652	$2,637,552	$322,907	$11,371	$3,817,483

Figure 11 shows that if liquor taxes were to double across all four categories, enough revenue would be generated to cover the cost of ten percent of IIDs. In order to cover the entire forecasted annual IID cost using liquor tax revenue alone, liquor taxes would need to increase by 700%-900% based on the cost for forecasted OWI offenders in table 9. As an example, this would correspond to a tax of $.59 per liter (compared to $0.066) on wine under 14% alcohol and $1.07 per liter (compared to $0.119) on wine with greater than 14% alcohol. This estimate is likely an upper bound depending on the price elasticity of liquor. Price elasticity refers to the extent to which price effects demand. Past studies have shown that increases in alcohol excise taxes can have an effect on alcohol related crashes, presumably from a drop in OWI drivers (Chaloupka, Saffer et al. 1993).

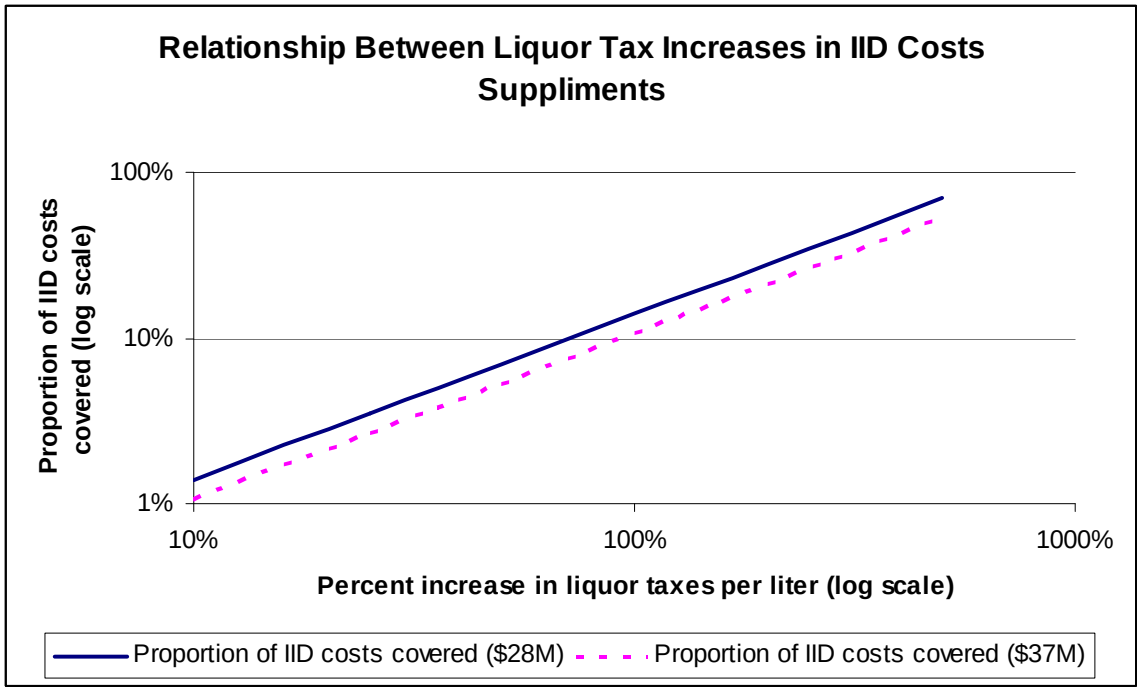

Figure 11: The proportion of IID costs which can be covered by corresponding increases in liquor tax rates.

4. Reduced service level for indigent offenders

The remaining strategies fall in the category of using less complex IID technologies and reducing or eliminating monitoring for indigent offenders. The feasibility of this option is dependent upon how the importance and use of monthly monitoring data. If the data is not being actively used, then reducing or eliminating monthly monitoring and service fees for indigent offenders (or offenders altogether) would have limited consequences. This may also be a situation where the information on which offenders are most likely to have a repeat offense could help identify which drivers should be actively monitored.

IMPLEMENTATION STRATEGIES

While there are a variety of approaches to financing IIDs in order to increase usage rates, it is clear that no one solution is entirely sufficient to support the cost of all IIDs installed for all OWI offenders in Wisconsin on an annual basis. As seen in the analysis of other states, multiple strategies must be used together. The first step is to address options for increasing revenue from the offending population. There are two primary options. The first is IID pricing, which will require coordination with manufacturers and distributors of IIDs. The second is through court fines, which will require coordination with the court system. The most straight-forward option is to work with the courts. As shown in figure 10, this means of raising funds to finance IIDs has the least effect on overall IID/court costs. The cost can be spread across all offenders, including those who would receive a "free" IID. Currently, the average cost of an IID nationally is $1100.00. This is almost $200.00 greater than the average cost in Wisconsin. Creating a court fee of this amount

would raise sufficient funds to pay for IIDs for 22% of the offending populations. As mentioned, this method is independent of compliance rates or the proportion of offenders who are ordered to have an IID. In fact, if only 22% of offenders are required to have an IID installed, collecting these court fees from all OWI offenders would be sufficient to finance all ordered IID installations annually.

Alternatively, manufacturers could be required to set aside the same $200.00 per installation for such a fund. This cost would then be passed onto offenders in the form of higher installation fees or monthly service fees. However, if this were done, a separate means would be needed to collect the $200.00 annually from those assisted through the indigent fund. This could be done by requiring indigent offenders to pay for the installation which would include this $200.00, and then have the fund cover the monthly service. However, as mentioned in the prior discussion, this method is only effective if all offenders who are required to install an IID, comply. The court fee option and the manufacturer supported option are mutually exclusive if the total cost to the non-indigent offender is to be kept at or below the national average. Ultimately, a court fee option is a more effective means of capturing revenue from a larger percentage of OWI offenders, particularly if this method is to be combined with a strategy of only requiring IIDs for a sub-population of offenders.

Liquor taxes provide an opportunity to supplement the financing of IIDs. The potential for financial support is limited however. The doubling of current liquor taxes on a dollar per liter basis will result in less than $4 million in additional revenue. This would support financing IIDs for only 10% of OWI offenders annually. However, this method is independent of court fines and IIDs, so implementing a tax along side of a court fee or manufacturer fee would provide a completely new source of revenue. In this case, doubling of liquor taxes and increasing court or manufacturer fees by $200.00 per offender would together provide financial support sufficient to cover over 30% of OWI offenders.

Developing a strategy to finance IIDs costs to have a 100% installation rate among OWI offenders is infeasible if relying solely on higher IID prices. However, combinations of liquor tax, court fees or manufacturer fees can result in generation of sufficient revenue to pay for a significant number of IID installations. If high risk Past research has suggested that only 10% of OWI offenders required to install an IID actually do so. This analysis shows that the use of an increased liquor tax in combination with a court fee for all OWI offenders would be sufficient to cover the cost of IIDs for 30% of all OWI offenders while keeping overall costs for OWI offenders at the national average for annual IID costs. This would result in a much greater IID compliance rate than shown in past studies.

REFERENCES

Affordable_Ignition_Interlock. "FAQ & myths." Retrieved January 31, 2011, from http://www.affordableignitioninterlock.com/faq.html

Alaska_Department_of_Administration. "General information ignition interlock limited licenses (AS 28.15.201)." Retrieved January 31, 2011, from http://doa.alaska.gov/dmv/reinst/PDFS/Limited_IID.pdf.

Chaloupka, F., H. Saffer, et al. (1993). "Alcohol-control policies and motor vehicle fatalities." Journal of Legal Studies 22(1): 161-186.

Connecticut_Department_of_Motor_Vehicles. "Ignition interlock device program overview." Retrieved January 31, 2011, from http://www.ct.gov/dmv/cwp/view.asp?a=813&q=309844.

Delaware_General_Assembly. "1203 Ignition interlock device installation, removal and monthly monitoring and calibration fees." Retrieved January 31, 2011, from http://regulations.delaware.gov/AdminCode/title2/1000/1200/1203.shtml.

Dragulescu and Yakovenko (2001). "Evidence for the exponential distribution of income in the USA." The European Physical Journal 20(4): 585-589.

Drive_Right_Interlock_Systems. "Drive Right ignition interlock systems price list." Retrieved January 31, 2011, from http://driverightofcalifornia.com/pricing.html.

Florida_Highway_Safety_and_Motor_Vehicles. "Ignition interlock program." Retrieved January 31, 2011, from http://www.flhsmv.gov/ddl/iid.html.

Frisman, P. (2010). "Ingnition interlock laws." Retrieved January 31, 2011, from http://www.cga.ct.gov/2010/rpt/2010-R-0141.htm.

Guardian_Interlock. Retrieved January 31, 2011, from http://www.guardianinterlock.com/locations.php.

Massachusetts_Department_of_Transportation. Retrieved January 31, 2011, from http://www.mass.gov/rmv/melanie/ouiBrochure.pdf

Minnesota_Department_of_Public_Safety. Retrieved January 31, 2011, from http://www.minnesotaignitioninterlock.org/cost.shtml.

Monitech_Ignition_Interlock_Systems. Retrieved January 31, 2011, from http://www.monitechnc.com/models1.html.

NHTSA. (2009). "Ignition interlocks - what you need to know." Retrieved January 31, 2011, from http://www.nhtsa.gov/staticfiles/nti/impaired_driving/pdf/811246.pdf.

Pennsylvania_Department_of_Transportation. "Ignition interlock "the law" frequently asked questions." Retrieved January 31, 2011, from http://www.dmv.state.pa.us/pdotforms/fact_sheets/fs-pub7214.pdf.

Sens_o_Lock. Retrieved January 31, 2011, from http://www.sens-o-lock.com/product_info.php

Virginia's_Legislative_information_System. (2008). "Department of planning and budget 2008 fiscal impact statement." from http://lis.virginia.gov/cgi-bin/legp604.exe?081+oth+HB1442F122+PDF.

Washington_Department_of_Licensing. "Driver licensing fees." Retrieved January 31, 2011, from http://www.dol.wa.gov/driverslicense/fees.html#iil.

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