Evaluation of Minnesota's Vehicle Plate Impoundment Law for Impaired Drivers

U.S. Department of Transportation
National Highway Traffic Safety Administration

NHTSA
www.nhtsa.gov

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
DOT HS 811 351		

4. Title and Subtitle	5. Report Date
Evaluation of Minnesota's Vehicle Plate Impoundment Law for Impaired Drivers	October 2010
	6. Performing Organization Code

7. Author(s)	8. Performing Organization Report No.
W.A. Leaf and D.F. Preusser	

9. Performing Organization Name and Address	10. Work Unit No. (TRAIS)
Preusser Research Group, Inc. 7100 Main Street Trumbull, CT 06611	11. Contract or Grant No. DTNH22-02-D-35121 Task Order 05

12. Sponsoring Agency Name and Address	13. Type of Report and Period Covered
U.S. Department of Transportation National Highway Traffic Safety Administration 1200 New Jersey Ave SE. Washington, DC 20590	Final Report August 2005 – May 2006
	14. Sponsoring Agency Code

15. Supplementary Notes

The Contracting Officer's Technical Representative for this project was Dr. Marvin Levy.

16. Abstract

Vehicle sanctions – such as vehicle impoundment – have been found to be effective in reducing recidivism among drivers arrested for DWI; however, their application is cumbersome and generally infrequent. A far less cumbersome strategy is to seize the vehicle license plate while leaving the actual vehicle in the owner's hands. Beginning in 1998, Minnesota implemented license plate impoundment for first-offense drivers whose blood alcohol concentration (BAC) was .20 or higher. DWI recidivism and Driving While Suspended violations were compared for first offenders with BACs of .17-.19 (no plate impoundment) and first offenders with BACs of .20-.22 (very similar BACs but with plate impoundment). The results indicated substantial reductions in DWI recidivism and Driving While Suspended violations for those drivers whose vehicle license plates were impounded. Effects were strongest among younger drivers (ages 21-34) during the period of plate impoundment (up to one year). Some effects persisted for as much as three years. Vehicle plate impoundment was seen as an effective means to reduce DWI recidivism and reduce driving by suspended drivers during the term of their license suspension.

17. Key Words			18. Distribution Statement
Alcohol	Impaired driving	Countermeasures	Document is available to the public from the National Technical Information Service www.ntis.gov
Vehicle sanctions	Administrative actions		
DWI	Plate impoundment		
Minnesota	Recidivism		

19. Security Classif.(of this report)	20. Security Classif.(of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	60	

Form DOT F 1700.7 (8-72) **Reproduction of completed page authorized**

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DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

TECHNICAL SUMMARY

CONTRACTOR	CONTRACT NUMBER
Preusser Research Group, Inc.	DTNH22-02-D-35121 Task Order 05
REPORT TITLE	**REPORT DATE**
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REPORT AUTHOR(S)	
W.A. Leaf and D.F. Preusser	

Alcohol-impaired-driver traffic fatalities in the United States decreased 40% from 1982 through 1999 despite a 56% increase in vehicle miles driven. Alcohol-impaired-driver fatalities declined from 48% of all traffic fatalities in 1982 to just 30% of the total in 1999. However, progress stalled, and new initiatives are needed. Since dropping to about 12,550 in 1998 and 1999, alcohol-impaired-driver fatalities remained over 13,000 per year through 2007. All traffic fatalities fell nearly 10% between 2007 and 2008, but the 11,773 impaired-driver fatalities remained at 32% of the total.

Research has indicated that license suspension/revocation serves as an effective specific and general deterrent for drinking and driving (Preusser, Blomberg, and Ulmer, 1988) and that immediate administrative license action reduces alcohol-involved fatalities (Wagenaar and Maldenado-Molina, 2007). Currently, nearly all driving while intoxicated (DWI) or driving under the influence (DUI) offenders have their licenses suspended or revoked for at least some period of time.

Many suspended drivers still drive, a fact that has led many States to take actions targeting the vehicles of DWI offenders such as vehicle forfeiture, vehicle impoundment, vehicle plate markings, and vehicle plate impoundment. A review by Voas and DeYoung (2002) indicated that some vehicle actions have produced positive changes such as reduced recidivism and decreased crashes and moving traffic violations.

Actions against vehicles such as impoundment and forfeiture have proven difficult to implement. Impounding and storing vehicles requires space, equipment, and personnel. Courts need to evaluate the rights of a spouse, other family members, and lien holders as well as the DWI case against the offender. In some jurisdictions, no more than 10% of eligible offenders actually lose their vehicles. Recently, attention has turned to administrative vehicle plate impoundment. Vehicle license plates are much easier to take and much easier to dispose of while the legal issues are being decided. The current study examines the implementation and effectiveness of administrative Vehicle Plate Impoundment (VPI) for first-time offenders at the time of DWI arrest in Minnesota.

Vehicle Plate Impoundment in Minnesota

Since 1998, there have been nearly 22,000 first-offender DWI arrests each year in Minnesota. First-time offenders comprise nearly two-thirds of the drivers arrested or convicted of DWI each year. Approximately 16% of first offenders, over 3,300 cases per year, tested at blood alcohol concentrations (BACs) of .20 grams per deciliter (g/dL) or higher, the level at which the plate impoundment action takes effect.

The mechanism for VPI in Minnesota begins with the arresting police officer, who physically removes the license plates, which are then destroyed. The vehicle is handled as usual for DWI arrests, typically towed and stored at a private facility to be released when the owner or suitable representative claims it and pays the accumulated fees, but it can't be driven beyond a week-long appeal period. Minnesota's Driver and Vehicle Services division then sends a letter to the offender requiring that plates for all vehicles owned or leased by the offender be turned in.

There have been three distinct periods in the evolution of first-offender VPI law in Minnesota:

<1998	no plate impoundment
1998-2000	180-day plate impoundment for BAC ≥ .20 (60 days with guilty plea)
2001 and later	one year plate impoundment for BAC ≥ .20

The objective of the current study is to examine the effects of VPI on recidivism for DWI and on driving while suspended (DWS) offenses for first-time DWI offenders.

METHODS

Driver history data for all drivers with at least one DWI violation were extracted from State data files in May 2005. DWI offenses occurring 1995-2003 were examined. The 2003 cutoff was selected to allow time for adjudication and subsequent activity during 2004 and 2005. The full driver history was examined to determine whether the offense was a first offense, second offense, etc., and whether there was a subsequent DWI offense or a subsequent DWS offense; if so, the lags between offenses were coded. Data are analyzed for DWI incidents occurring in the last 3 years prior to first-time offender VPI (1995-1997); the 3 years under the intermediate condition (1998-2000); and 3 years under the more severe condition (2001-2003). Drivers under the age of 21 were excluded since laws covering these drivers differ from those covering drivers over age 21.

Alcohol test results, if known, were available in the driver records beginning in 1998. BAC values were categorized as .16 or less, .17-.19, .20-.22, .23 or more, refused BAC testing, and unknown BAC level (tested but results unknown, accounting for about 1% of cases). The .17-.19 category versus .20-.22 allows for comparisons between first-time offenders who were just under, and just over, the VPI BAC limit.

VPI is documented through paper impoundment orders initiated by the arresting police officer at the time of the arrest. The paper records are retained in Minnesota Driver and Vehicle Services offices. The paper records were coded and matched to the driver records. Paper records verified that about half to two-thirds of eligible drivers had their vehicle license plates impounded. The remaining eligible drivers may or may not have had their vehicle plates impounded, though most likely did not.

RESULTS

Table S-1 shows the overall results from this study with respect to DWI recidivism during the first year following the first-offense arrest. Recidivism, both for the period 1998-2000 and for the period 2001-2003, was greatest for those drivers who refused the BAC test. These drivers were not subject to plate impoundment. The offenders who were second most likely to recidivate were those testing at BACs of .17 to .19, also not subject to plate impoundment.

In the absence of VPI, it would be expected that the number of recidivists for the BAC .20-.22 group would be slightly higher than for the BAC .17-.19 group. This was not the case. The BAC .20-.22 group showed lower recidivism at 1 month, 3 months, 6 months, 9 months, and 12 months. Results were stronger among those drivers for whom plate impoundment was verified in the paper record (Impnd) than among those for whom plate impoundment was not known (Not/Unkn). The effect was seen both for the 1998-2000 and the 2001-2003 time periods.

Table S-1. Cumulative Recidivism by Alcohol Test Results and VPI, Minnesota, First Offenders Age 21 and Older

Lag to (first) next DWI (cumulative)	Alcohol Test Results by Impoundment						
	≤ .16	.17-.19	.20-.22		.23+		Refused
			Impnd	Not/Unkn	Impnd	Not/Unkn	
1998-2000							
≤ 30 days	0.5%	0.7%	0.5%	0.9%	0.7%	0.5%	0.7%
≤ 3 months	1.5%	2.1%	1.2%	1.9%	1.7%	2.1%	2.4%
≤ 6 months	3.0%	4.0%	2.5%	3.5%	3.3%	3.7%	4.9%
≤ 9 months	4.5%	5.9%	3.9%	5.1%	5.2%	5.6%	6.7%
≤ 1 year	6.0%	7.8%	5.7%	7.2%	7.4%	7.6%	8.8%
Total N	29,794	10,284	2,820	2,803	2,052	2,081	5,879
2001-2003							
≤ 30 days	0.4%	0.6%	0.1%	0.5%	0.4%	1.1%	0.8%
≤ 3 months	1.4%	1.6%	0.8%	1.8%	1.2%	1.9%	2.7%
≤ 6 months	2.8%	3.3%	2.1%	3.3%	2.5%	3.6%	4.7%
≤ 9 months	4.2%	5.1%	3.4%	4.7%	3.8%	5.4%	6.5%
≤ 1 year	5.5%	6.8%	5.0%	6.5%	5.7%	7.2%	8.0%
Total N	27,922	8,889	2,314	2,271	1,681	1,803	5,463

Excludes Sex = Unknown.

Survival analysis indicated that the strongest effects of VPI were found for drivers ages 21-34. There was no apparent differential gender effect of plate impoundment, though, overall, females were less likely to recidivate than males.

Table S-2 shows the results with respect to Driving While Suspended (DWS) violations. The number of violations, both for the period 1998-2000 and for the period 2001-2003, was greatest for those drivers who refused the BAC test. Again, these drivers were not subject to plate impoundment. The offenders who were second most likely to be cited for a DWS violation were those testing at BACs of .16 or less, followed by .17 to .19, also not subject to plate impoundment.

Table S-2. Cumulative DWS by Alcohol Test Results and VPI, Minnesota, First Offenders Age 21 and Older

Lag to DWS (cumulative)	Alcohol Test Results by Impoundment						
	≤ .16	.17-.19	.20-.22		.23+		Refused
			Impnd	Not/Unkn	Impnd	Not/Unkn	
1998-2000							
≤ 30 days	1.5%	1.2%	0.9%	0.2%	0.3%	0.3%	2.1%
≤ 3 months	4.3%	3.4%	2.1%	2.4%	1.1%	1.2%	5.4%
≤ 6 months	6.6%	5.4%	3.1%	4.5%	2.4%	2.5%	8.5%
≤ 9 months	8.2%	6.5%	4.0%	5.6%	3.0%	3.3%	10.5%
≤ 1 year	9.3%	7.5%	4.8%	6.8%	3.6%	4.0%	12.1%
Total N	29,794	10,284	2,820	2,803	2,052	2,081	5,879
2001-2003							
≤ 30 days	1.4%	1.0%	0.5%	0.4%	0.4%	0.3%	1.6%
≤ 3 months	4.4%	3.1%	1.9%	1.6%	1.4%	1.8%	4.9%
≤ 6 months	6.8%	5.1%	3.2%	2.9%	2.4%	3.3%	7.4%
≤ 9 months	8.1%	6.2%	3.8%	3.8%	3.0%	3.7%	9.5%
≤ 1 year	9.2%	7.2%	4.5%	4.9%	3.6%	4.4%	11.0%
Total N	27,922	8,889	2,314	2,271	1,681	1,803	5,463

Excludes Sex = unknown

Groups with the lowest rate of DWS violations were those with BAC levels .20-.22 and .23 and higher. Effects were seen both for the 1998-2000 time period and 2001-2003 time period. Survival analysis indicated that DWS violations were more common among younger drivers and among males.

DISCUSSION

Minnesota has gone through three iterations of vehicle plate impoundment. As implemented, plate impoundment is relatively easy to accomplish – it is an administrative action initiated by the arresting police officer – and places only a limited burden upon the State, since impounded plates are simply destroyed. Since 1998, the action has been applicable to about half of all DWI arrestees in the State – all first-time offenders with BACs of .20 or higher and all repeat offenders.

The study is limited by the fact that the paper records on plate impoundment were likely not complete. Thus, for some drivers, it could not be precisely determined whether or not

impoundment was implemented. Also, the program was evaluated in only one State. To the best of our knowledge, no other jurisdiction has yet followed this lead.

That said, this study confirms that the plate impoundment laws in Minnesota have been effective in reducing DWI recidivism. The difference was greatest in the months immediately after the DWI incident, when the plates were removed, but positive effects remained over time.

One possible explanation for the difference in recidivism rates is that drivers who don't recidivate, don't drive, but that does not seem to be the case. While VPI reduced both DWI recidivism and subsequent DWS offenses in this study, the relationship between driving and DWI recidivism seems complex. As the BACs of DWI offenders increased from the lowest violation levels, DWI recidivism increased but the rate of DWS offenses decreased. For both offenses, however, the highest rates were for DWI offenders who refused an alcohol test.

The very high effectiveness of VPI for first offenders ages 21-34, compared to smaller effects for older offenders, was not anticipated. It is a very positive finding since these younger offenders are seen as the ones most critical to reach in order to achieve long-term safety goals.

Plate impoundment, as implemented in Minnesota, works. It significantly reduces DWI recidivism, and many of the effects continue beyond the statutory length of the impoundment. VPI also reduces the number of DWS violations, suggesting that, at least in part, recidivism is reduced through less driving by those suspended because of alcohol.

TABLE OF CONTENTS

List of Tables

List of Figures

Page

I. INTRODUCTION

Background

Alcohol-impaired-driver traffic fatalities in the United States decreased 40% from 1982 through 1999 despite a 15% increase in the population, a 20% increase in the number of licensed drivers, and a 56% increase in vehicle miles driven. The decrease is even more meaningful in the context of a 27% increase in the number of other traffic fatalities during the same period. Alcohol-impaired-driver fatalities declined from 48% of all traffic fatalities in 1982 to just 30% of the total in 1997-1999.

However, progress stalled and new initiatives are needed. Since dropping to about 12,550 in 1998 and 1999, alcohol-impaired-driver fatalities remained over 13,000 per year through 2007. All traffic fatalities fell nearly 10% between 2007 and 2008, but the 11,773 impaired-driver fatalities remained at 32% of the total.

Research has indicated that license suspension/revocation serves as an effective specific and general deterrent for drinking and driving (Preusser, Blomberg, and Ulmer, 1988). Virtually all driving while intoxicated (DWI) or driving under the influence (DUI) offenders have their licenses suspended or revoked. There were 1.46 million people arrested for DWI or DUI in 2006 (FBI, 2007). Administrative license suspension (ALS) was found to reduce alcohol-related traffic fatalities by about 5% (Wagenaar and Maldonado-Molina, 2007), though the authors found no such effect for post-adjudication suspensions.

The deterrent value of license suspension and license revocation is diminished by the low probability of arrest for driving while suspended (DWS). Some studies have indicated that up to 75% of suspended drivers continue to drive to some extent (e.g., Ross, 1991; Ross & Gonzales, 1988). A more recent study of first-time DWI offenders indicated that 88% of first-time offenders with suspended licenses, observed unobtrusively in Milwaukee, Wisconsin, continued to drive, while 36% of first-time offenders observed in Bergen County, New Jersey, continued to drive while suspended (McCartt, Geary, and Nissen, 2002). Observations were made in 2000-2001. Only 5% of first-time offenders in Milwaukee reinstated their licenses, while 78% of those in Bergen County reinstated their licenses. Though laws were similar, the perceived risk of apprehension and punishment, based on focus groups with first-time offenders in summer 2001, was much higher in Bergen County than in Milwaukee.

Administrative license revocation (ALR) is in place in 41 States and the District of Columbia (IIHS, 2010). This widespread use of license suspension for DWI offenders, accompanied by a low probability of arrest for DWS, has led to a large number of drivers with suspended licenses on the roads, compromising the purpose and effect of those actions. The large number of suspended drivers on the road has led States to consider actions targeting the vehicles of DWI offenders in their efforts to reduce DWI recidivism and ultimately alcohol-related crashes. Vehicle actions include vehicle forfeiture, vehicle impoundment, vehicle plate markings, and vehicle plate impoundment.

A review of research on the effects of vehicle actions by Voas and DeYoung (2002) indicated that some vehicle actions have produced positive changes such as reduced recidivism and decreased crashes and moving traffic violations. The authors noted several issues with vehicle impoundment and forfeiture that tend to make these two vehicle actions more difficult to implement than license plate actions, such as third-party vehicle ownership, difficulties with storing and disposing of vehicles, and poor recovery of costs.

Vehicle plate markings produced significant decreases in DWS offenses, moving traffic violations, and crash involvement by those suspended for DWI in Oregon (Voas, Tippets, and Lange, 1997). Another promising vehicle action, vehicle plate impoundment, has been used in Minnesota (Rodgers, 1994).

One of the major problems reported with vehicle actions is their low level of use, often on the order of 10% or less among eligible offenders. There has been a reluctance to use most vehicle sanctions due to logistics, family impact, cost, and other issues. Also, most of these sanctions have been directed at repeat DWI or DUI offenders rather than the more numerous first offenders (Fell, Voas, McKnight, & Levy, 2007). If a less cumbersome vehicle sanction could be found that may be used with first offenders, the benefits could be substantial. Towards this goal, first offenders have been subjected to vehicle plate impoundment in Minnesota.

Vehicle Plate Impoundment in Minnesota

Over the years in Minnesota, legislation involving vehicle plate impoundment (VPI) has been enacted that increases the penalties for DWI for first-time offenders. There have been three distinct periods in the evolution of Minnesota law as it applies to first-time offenders. In the 1990s through 1997, first-time offenders were subject to administrative license revocation (ALR) for 90 days at any BAC over .10 g/dL and for 1 year for refusing to take a BAC test; however, there was no vehicle plate impoundment for first offenders. Beginning January 1, 1998, for first-time offenders with BACs of .20 or higher, Minnesota doubled the length of ALR to 180 days and added administrative VPI. The laws and administrative actions were adjusted, effective January 1, 2001, to increase the length of VPI and eliminate some mechanisms by which offenders could reduce the length of the administrative actions.[1] Over the same time period, all repeat offenders were subject to VPI.

Since 1998, there have been nearly 22,000 first-offender DWI arrests each year in Minnesota. Over 10% of them have refused to take an alcohol test. Approximately 16% of first offenders, over 3,300 cases per year, tested at .20 or higher, the level at which the plate impoundment sanction takes effect. First-time offenders comprise nearly two-thirds of the drivers arrested or

[1] The effects on drivers who are cited for DWI fall into two categories. Administrative actions are ones that the Minnesota Driver and Vehicle Services department implements based on the DWI arrest. They include administrative driver license revocation (ALR) and vehicle plate impoundment. Administrative actions generally occur at the time of the arrest, with a brief built-in delay for an appeal period, and are occasionally modified by subsequent judicial outcomes (e.g., dismissal of charges would result in cancellation of the administrative actions). Judicial sanctions occur as a result of court activities and may be significantly delayed from the time of the original arrest; guilty outcomes to the original or to revised charges do not affect the prior administrative actions.

convicted of DWI each year, and they are of particular interest. Results from a study of DUI offenders in California (Marowitz, 1996) indicated that first-time offenders with high BACs were more likely to recidivate than first-time offenders with lower BACs.

Effective January 1, 1998, through 2000, Minnesota implemented an administrative license and vehicle plate impoundment law which applied to repeat DWI offenders and to first offenders with "enhanced circumstances": BAC ≥ .20 and/or a child (≤ age 16 and 3 years younger than the driver) in the vehicle at the time of the offense. In practice, almost all enhanced-circumstances charges were for high BAC levels.

Plate impoundment was initiated by the arresting officer, who removed the vehicle's plates at the time of the arrest and had them destroyed. Plate impoundment applied to the vehicle in which the offense was committed, whether or not it belonged to the offender (as long as the owner had allowed use). Plate impoundment also applied to all (other) vehicles owned by, registered to, or leased by the offender (alone or with others); for these vehicles, a letter was sent by the Minnesota Driver and Vehicle Services department directing the owner to turn in the plates. Plates were impounded for the same length of time that the license was revoked. In those years, violators could plead guilty to DWI and have the license reinstated after only 30 days (licenses and plates returned at 60 days for high-BAC offenses), a procedure informally called "turnaround."

Effective January 1, 2001, turnaround was no longer allowed for high-BAC or repeat offenders, and all vehicle plates were impounded for a full year plus the length of time to the next regular plate renewal date, i.e., from 12+ months to nearly 24 months.

There were additional sanctions for offenders convicted of high-BAC DWI, such as jail or community service time, higher fines and penalties, and more stringent chemical use assessment and treatment requirements.

McCartt and Northrup (2003) examined driver records in Minnesota for administrative actions and conviction sanctions for the years 1998-2000. Of the approximately 16 percent of first offenders who were at those high BACs, Minnesota actually implemented the high-BAC charges in about 80 percent of the applicable cases. In 43 percent of all high-BAC cases, offenders took advantage of the "turnaround" weakness in the law which allowed offenders to plead guilty and have their revocation period reduced to 30 days (revocation and plate impoundment reduced to 60 days under the high-BAC charges). McCartt and Northrup, in their study of tiered sanctions, found a statistically significant though modest reduction in DWI re-arrests for Minnesota first-time offenders with BACs above .20, versus "similar" offenders with BACs of .17-.19. They could not directly confirm the application of the administrative plate impoundment action, which is not indicated in driver records.

Several studies of VPI have focused on the evolution of the Minnesota law and its effects. Minnesota began VPI in 1988. At first, it was a judicial sanction for repeat DWI offenders and was applied infrequently. In the early 1990s, it became an administrative sanction applying to repeat offenders; in 1998, it was applied to first offenders with high BACs; and in 2001 the details and procedures were adjusted to make the law work more uniformly. Rodgers (1994)

reported that repeat offenders who had their plates impounded were less likely to recidivate than comparable offenders with no plate actions. The effects on recidivism were more pronounced after the impoundment was handled administratively rather than judicially. Subsequently, Ross, Simon, and Cleary (1996) examined the procedures behind implementing the law and recommended improvements based on interviews with police, prosecutors, judges, and offenders; some of the recommendations were implemented in subsequent law changes.

The major objectives of the current study were as follows:

1. Examine and describe the implementation of the law, including the current expanded version of the law.
2. Examine the effects of increased administrative actions and judicial sanctions, especially VPI, on recidivism for DWI and on driving while suspended (DWS) offenses for first offenders.
3. Compare the findings of first offenders who were tested for alcohol levels to multiple DWI offenders and those who refused to take the test for BAC.
4. Based on the results, make recommendations for improving the existing law and procedures and applying them to other jurisdictions.

Report Contents

The remainder of this report contains three sections:

Section II. Methods – a brief overview of the types of data collected, data collection methods, and evaluation approach.

Section III. Results – descriptions of DWI arrest characteristics in Minnesota; and comparison of the effects on recidivism and DWS for first offenders due to the introduction of vehicle plate impoundment for high-BAC (.20+) offenders in 1998-2000 and then further enhancing the penalties in 2001.

Section IV. Discussion and Recommendations – including suggestions for designing and implementing vehicle plate actions in other jurisdictions.

II. METHODS

Changes to the Minnesota vehicle plate impoundment law over time provided an opportunity for a natural experiment studying first offenders under increasing action severity. Data are analyzed for the last 3 years under the first condition, 1995-1997; the three years under the intermediate condition, 1998-2000; and the first 3 years under a more severe condition, 2001-2003.

The administrative vehicle actions were applied in conjunction with administrative driver license actions. Relevant features of both, as they apply to first and second offenses, are given in Table 1. The Appendix presents the information in a timeline format and also provides information for third and fourth and higher offenses.

Table 1. Minnesota Administrative License Revocation (ALR) and Vehicle Plate Impoundment (VPI) Conditions for First and Second Offenses

Offense/ BAC Test	**1997 and prior**		**1998-2000**		**2001 and later**	
	ALR	VPI	ALR	VPI	ALR	VPI
1st Offense						
≤ .19	90 days	None	90 days *	None	90 days	None
≥ .20	90 days	None	180 days **	180 days **	180 days	≥ 1 year***
Refused	1 year	None	1 year *	None	1 year *	None
2nd Offense						
≤ .19	180 days	None	180 days	≥ 1 year***	180 days	≥ 1 year***
≥ .20	180 days	None	1 year	≥ 1 year***	1 year	≥ 1 year***
Refused	1 year	None	1 year	≥ 1 year***	1 year	≥ 1 year***

* By pleading guilty, offenders could reduce the ALR period to 30 days.
** By pleading guilty, offenders could reduce the ALR and plate impoundment period to 60 days.
*** As implemented, plates were impounded for one year but could only be reinstated at the next regular renewal date, resulting in actual impoundments of 12 – 24 months.

For the purposes of this research, the State of Minnesota made available complete driver history data for all drivers with at least one DWI violation. Records were extracted from the Minnesota data files in May 2005 and included DWI violation data up to mid-May. The data included:

- Driver date of birth and gender;
- Driver license number, for linking related records (personal identification information was not provided);
- All violations and convictions;
- County (or out-of-State jurisdiction) in which the offense occurred; and
- For most DWI cases beginning with January 1, 1998, BAC test results (results were not available for offenders who refused to be tested or for about 1% of all cases in which tests were performed but results had not been posted).

Primary focus was on DWI offenses occurring in 1995 and later and occurring in Minnesota. Processing for prior offenses allowed determination of whether the 1995 and later offenses were first, second, third, etc. offenses. Offenses occurring outside of Minnesota, which routinely are posted to the records of Minnesota drivers and may result in Minnesota administrative actions, were included in determining repeat offender status and identifying recidivism. In the time periods reviewed, Minnesota had two definitions of prior offense. Through 2000, drivers were judged to have committed a first offense if the records showed no prior DWI offense within five years and no more than one prior DWI within 15 years. Beginning in 2001, drivers were determined to have committed a first offense if they had no prior DWI within 10 years. For the 9 years examined, the definitions produced similar results, with 93 percent of cases coded the same, 6 percent that would have been considered repeat under the 2001+ definition but not under the older definition, and 1 percent first offenses under the 2001+ definition but repeats under the older definition.

It should be noted that a DWI offense is used here as Minnesota defines it, as a combination of the initial charge and subsequent judicial occurrences. Specifically, a DWI offense is an incident that subsequently appears on the offender's driver record as a DWI implied-consent violation and/or conviction. It is estimated that about 1 to 2% of DWI arrests fail to meet this criterion, due to rescission of the implied-consent violation or failure of the officer to invoke implied consent at the arrest, coupled with a failure to convict the offender of an alcohol violation.

For each offense from 1995 on, driver records for the remainder of the time up to mid-May 2005, the end of available data, were examined to determine if there had been any subsequent DWI offenses, i.e., whether there was recidivism. The occurrence of any subsequent DWI was noted for each offense from 1995 on along with the time lag between the initial and the subsequent DWI.

Finally, the driver history records also showed any arrests for "driving while suspended" (DWS), that is, driving while the operator's license was suspended or withdrawn (for DWI or another qualifying offense). The occurrence of DWS any time after a DWI offense was coded along with the lag between the DWI and the subsequent DWS.

DWI offenders in Minnesota showed a wide range of measured BAC values. While most had BACs below .20, the cutoff for the high-BAC actions, a substantial number had BACs above .20 and many had much higher BACs. The key comparison made was between offenders who were eligible to receive the high-BAC actions and "similar" offenders at slightly lower BACs who received reduced actions and were not eligible to receive plate impoundment. In order to facilitate comparisons, BAC values were categorized as follows:

- .16 or less, i.e., low BACs (virtually all between .10 and .16);
- .17-.19, offenders with relatively high BACs who qualified for standard actions;
- .20-.22, offenders with the lowest levels of high BACs who qualified for enhanced licensing actions including vehicle plate impoundment;
- .23 or higher, offenders with BAC levels well above the minimum needed to qualify for enhanced actions including plate impoundment;

- Refused BAC testing, offenders who received more severe license suspension actions but no plate impoundment actions; and
- Unknown BAC levels, offenders who were tested, often via blood or urine procedures, but whose BAC value was not known in time for immediate plate impoundment (and whose BAC value was not recorded in the history database). All offenders in 1995-1997 who were tested had unknown BAC levels (for the purposes of this study) because BAC values were recorded in the history database only beginning in 1998. From 1998 on, only about 1% of Minnesota DWI violations had unknown BACs.

For high-BAC offenses, the categories were often divided according to whether the offenders had been subject to VPI or not.

Initial analyses were cross-tabulations to document the numbers of offenders in each category and identify characteristics (such as age and gender) which further described them. Survival analyses were performed to determine the effects of differences in administrative actions on DWI recidivism rates and on DWS violations.

Additionally, vehicle plate impoundment records were manually coded for many of the DWI cases. Vehicle plate impoundments are documented through paper impoundment orders initiated, in almost all cases, by the arresting police officer at the time of the arrest. The paper records are retained in Minnesota Driver and Vehicle Services offices for a minimum of 2 years. We accessed the paper records in two coding sessions. In the first, in summer 2003, records for 1998 through 2002 were coded. In the second, in June 2005, records for the earlier years had been purged; records for 2003 and 2004 were coded.

Due to limited resources, it was not possible to code every plate impoundment record at either session. The paper impoundment records included reason(s) for the plate impoundment. Nearly all were coded as either "Repeat offense" or "BAC of .20 or more" or both. These codes were used to determine which forms to code, with the overall focus intended to be on first offenders. We selected forms for coding according to three distinct schemes.

1. Summer 2003: High-BAC-only forms. In the first session, covering years 1998 – 2002, every form was coded that showed "BAC of .20 or more" and did not show "Repeat offense" as the reason for plate impoundment. Primary data recorded included violation date, violator driver license (DL) number, date of birth, and (inferred from name) gender.

After the first session, concerns were raised that the procedures might have missed significant numbers of first-offense plate impoundments, for example if forms were miscoded as repeat offenses or if coders misread the forms. If this had been the case, then estimates of the percentage of qualified cases for which plate impoundment had occurred would be lower than actual percentages. Because the 1998-2002 forms had been purged before the second coding session, it was not possible to directly evaluate this possibility. Therefore, procedures for the second coding session were altered to provide indirect estimates of the degree to which qualified plate impoundment forms might have been overlooked in the first session.

2. June 2005: All high BAC forms, alone or in combination with any other reason for VPI. For many of the 2003-2004 forms, the coding criterion was expanded to cover all forms coded as high BAC, including those with repeat offender checked. All 2003 forms, except those whose DL numbers began with A, B, G, or V, and all 2004 forms with DL numbers beginning with T and W were coded if they met this criterion.[2]
3. June 2005: All VPI forms. For 2003 and 2004, all VPI forms whose DL numbers began with A, B, G, or V were coded.

The first June 2005 coding criterion tested the extent to which high-BAC first offenders were also coded as being repeat offenders. The second June 2005 coding criterion tested the extent to which high-BAC first offenders were not coded as high-BAC at all.

The second June 2005 criterion provided the best overall estimate of actual impoundment percentages for first offenders and also for multiple offenders for 2003 and 2004.

The results of the impoundment codings were merged with the primary DWI case dataset, so that impoundment or not could be integrated into the analyses. Most records were matched with exact correspondence of DL number and violation date. The unmatched records were compared manually with the primary DWI records, and they were considered matched if DL numbers matched, or were identical except for one or two character mismatches, and violation dates were no more than one day off, or if birth dates matched and violation dates were no more than one day off.

[2] The specific combinations of letters were chosen in consultation with DVS staff to provide a relatively large percentage of all cases and to include representatives of significant minority groups. (At that time, DL numbers began with a character which was the first letter of the driver's last name.) Though the intent was to code 2004 forms according to the same screening procedures as the 2003 forms, limited resources allowed coding only the indicated subset of 2004 forms.

III. RESULTS

Characteristics of DWI Offenders

Between 1995 and 2003, Minnesota recorded 293,748 DWI violations, more than 30,000 per year. The numbers rose gradually from 30,436 in 1995 to a peak of 35,053 in 2000 before declining to 32,207 in 2003. The overall results are shown in Table 2.[3] Because of the large numbers of cases, nearly all of the distinctions in the tables in this section show statistical significance, both ones that are meaningful from a practical standpoint and ones that represent minor variations.

Table 2. DWI Violations/Convictions Occurring in Minnesota, 1995 – 2003

	Repeat *	Pre-Impound Law			Plate Impound Law (1)			Plate Impound Law (2)			Total
	Offense?	1995	1996	1997	1998	1999	2000	2001	2002	2003	
	First	**19,508**	**20,042**	**20,629**	**21,779**	**23,645**	**24,237**	**21,875**	**21,936**	**21,486**	**195,137**
		64.1%	64.8%	65.7%	67.1%	68.3%	69.1%	65.2%	66.3%	66.7%	66.4%
	Second	**6,741**	**6,760**	**6,739**	**6,817**	**7,246**	**7,222**	**7,540**	**7,357**	**7,286**	**63,708**
		22.1%	21.8%	21.5%	21.0%	20.9%	20.6%	22.5%	22.2%	22.6%	21.7%
	Third or Higher	**4,187**	**4,138**	**4,037**	**3,859**	**3,710**	**3,594**	**4,132**	**3,811**	**3,435**	**34,903**
		13.8%	13.4%	12.9%	11.9%	10.7%	10.3%	12.3%	11.5%	10.7%	11.9%
Total		**30,436**	**30,940**	**31,405**	**32,455**	**34,601**	**35,053**	**33,547**	**33,104**	**32,207**	**293,748**
		9.3%	9.4%	9.6%	9.9%	10.5%	10.7%	10.2%	10.1%	9.8%	100.0%
* Based on Minnesota definition, 1 prior in 5 years or 2 in 15 (1995-2000) or 1 prior in 10 (2001-2003).											

All tables use the Minnesota definition of "repeat offense," though this changed in 2001 and later. For 1995 – 2000, the criterion for a repeat offense was 1 prior in 5 years or 2 in 15 years; for 2001 – 2003, the criterion was 1 prior within 10 years. The 1995-2000 criterion classifies about 5% more cases as first offenses than does the 2001-2003 criterion.

As indicated in Table 2, the proportion of first offenses rose gradually and consistently over that time, from about 64% in 1995 to about 69% in 2000, then from 65% in 2001 to 67% in 2003. Second offenses declined slightly, from about 22% to about 21% (2000) and then steady at about 22.5% from 2001 to 2003. Third and higher offenses declined by about one-third, from approximately 14% to about 10% (2000) and again from 12% (2001) to just under 11% (2003).

Overall, males committed about 75% of all first and repeat DWI offenses, females about 19%, and unknown-gender offenders (mostly out-of-State offenders) the remaining approximately 6%. The percentage of males dropped over time, from 77% to 71%, while females (18% to 20%) and unknown-gender offenders (5% to 8%) increased their involvement.

[3] The numbers reported here may differ slightly from the figures previously published by the State of Minnesota (e.g., Minnesota Impaired Driving Statistics, 2001). We developed our results from the Minnesota driver history records, which is the same source used by the State. However, driver history records are continuously updated with new violation, administrative action, and judicial outcome information, so the records analyzed here are somewhat different than the records previously analyzed by the State.

Table 3 presents gender separately for first and repeat offenders. Females made up a larger portion of the first offenders, just over 21%, as compared to about 14% of repeat offenders. The proportion of female repeat offenders increased gradually from 1995 (12%) through 2003 (16%). Five out of six repeat offenders (84%) were male.

Table 3. Gender of DWI Offenders by First/Repeat Offense, 1995-2003

Gender		Pre-Impound Law 1995	1996	1997	Plate Impound Law (1) 1998	1999	2000	Plate Impound Law (2) 2001	2002	2003	Total
First Offenders *											
	Male	**13,949**	**14,559**	**14,823**	**15,492**	**16,768**	**16,856**	**15,047**	**14,868**	**14,286**	**136,648**
		71.5%	72.6%	71.9%	71.1%	70.9%	69.5%	68.8%	67.8%	66.5%	70.0%
	Female	**4,090**	**4,052**	**4,406**	**4,668**	**4,987**	**5,252**	**4,669**	**4,776**	**4,824**	**41,724**
		21.0%	20.2%	21.4%	21.4%	21.1%	21.7%	21.3%	21.8%	22.5%	21.4%
	Unknown	**1,469**	**1,431**	**1,400**	**1,619**	**1,890**	**2,129**	**2,159**	**2,292**	**2,376**	**16,765**
		7.5%	7.1%	6.8%	7.4%	8.0%	8.8%	9.9%	10.4%	11.1%	8.6%
	Total	**19,508**	**20,042**	**20,629**	**21,779**	**23,645**	**24,237**	**21,875**	**21,936**	**21,486**	**195,137**
		10.0%	10.3%	10.6%	11.2%	12.1%	12.4%	11.2%	11.2%	11.0%	100.0%
Repeat Offenders *											
	Male	**9,406**	**9,322**	**9,186**	**9,041**	**9,226**	**9,051**	**9,562**	**9,114**	**8,726**	**82,634**
		86.1%	85.5%	85.2%	84.7%	84.2%	83.7%	81.9%	81.6%	81.4%	83.8%
	Female	**1,360**	**1,394**	**1,410**	**1,463**	**1,522**	**1,545**	**1,879**	**1,786**	**1,698**	**14,057**
		12.4%	12.8%	13.1%	13.7%	13.9%	14.3%	16.1%	16.0%	15.8%	14.3%
	Unknown	**162**	**182**	**180**	**172**	**208**	**220**	**231**	**268**	**297**	**1,920**
		1.5%	1.7%	1.7%	1.6%	1.9%	2.0%	2.0%	2.4%	2.8%	1.9%
	Total	**10,928**	**10,898**	**10,776**	**10,676**	**10,956**	**10,816**	**11,672**	**11,168**	**10,721**	**98,611**
		11.1%	11.1%	10.9%	10.8%	11.1%	11.0%	11.8%	11.3%	10.9%	100.0%

* Based on Minnesota definition, 1 prior in 5 years or 2 in 15 (1995-2000) or 1 prior in 10 (2001-2003).

Age distributions of first and repeat offenders are shown in Table 4. The highest concentration of first offenders was 21-24 years old (21% of all first offenders in this 4-year age grouping), followed by those 25-34 (30% over 10 age years) and 35-44 (23% over 10 age years). Repeat offenders were generally older, with 37% between 25 and 34 years of age and 30% between the ages of 35 and 44.

Over the years studied, the proportion of DWI offenders between ages 21 and 24 and between 45 and 54 increased, and the proportion between 25 and 34 decreased. The pattern was similar for first and repeat offenders.

Table 4. Age of DWI Offenders by First/Repeat Offense, 1995-2003

Age	Pre-Impound Law			Plate Impound Law (1)			Plate Impound Law (2)			Total
	1995	1996	1997	1998	1999	2000	2001	2002	2003	
First Offenders *										
16-17	**344**	**421**	**377**	**388**	**388**	**432**	**380**	**410**	**376**	**3,516**
	1.8%	2.1%	1.8%	1.8%	1.6%	1.8%	1.7%	1.9%	1.8%	1.8%
18-20	**1,734**	**1,945**	**1,985**	**2,139**	**2,385**	**2,418**	**2,218**	**2,267**	**2,311**	**19,402**
	8.9%	9.7%	9.6%	9.8%	10.1%	10.0%	10.1%	10.3%	10.8%	10.0%
21-24	**3,687**	**3,618**	**3,603**	**4,001**	**4,814**	**4,991**	**5,061**	**5,228**	**5,295**	**40,298**
	18.9%	18.1%	17.5%	18.4%	20.4%	20.6%	23.2%	23.9%	24.7%	20.7%
25-34	**6,729**	**6,554**	**6,604**	**6,597**	**6,900**	**6,925**	**5,864**	**5,768**	**5,737**	**57,678**
	34.5%	32.7%	32.0%	30.3%	29.2%	28.6%	26.8%	26.3%	26.7%	29.6%
35-44	**4,445**	**4,690**	**4,939**	**5,401**	**5,564**	**5,714**	**4,942**	**4,710**	**4,331**	**44,736**
	22.8%	23.4%	24.0%	24.8%	23.6%	23.6%	22.6%	21.5%	20.2%	22.9%
45-54	**1,689**	**1,891**	**2,114**	**2,224**	**2,508**	**2,670**	**2,435**	**2,499**	**2,382**	**20,412**
	8.7%	9.4%	10.3%	10.2%	10.6%	11.0%	11.1%	11.4%	11.1%	10.5%
55-64	**586**	**636**	**694**	**728**	**795**	**779**	**694**	**749**	**762**	**6,423**
	3.0%	3.2%	3.4%	3.3%	3.4%	3.2%	3.2%	3.4%	3.6%	3.3%
65+	**273**	**272**	**290**	**283**	**269**	**295**	**265**	**288**	**266**	**2,501**
	1.4%	1.4%	1.4%	1.3%	1.1%	1.2%	1.2%	1.3%	1.2%	1.3%
Total	**19,487**	**20,027**	**20,606**	**21,761**	**23,623**	**24,224**	**21,859**	**21,919**	**21,460**	**194,966**
	10.0%	10.3%	10.6%	11.2%	12.1%	12.4%	11.2%	11.2%	11.0%	100.0%
Repeat Offenders *										
16-17	**12**	**20**	**8**	**19**	**14**	**25**	**20**	**16**	**18**	**152**
	0.1%	0.2%	0.1%	0.2%	0.1%	0.2%	0.2%	0.1%	0.2%	0.2%
18-20	**323**	**310**	**315**	**356**	**400**	**397**	**390**	**338**	**345**	**3,174**
	3.0%	2.8%	2.9%	3.3%	3.7%	3.7%	3.3%	3.0%	3.2%	3.2%
21-24	**1,386**	**1,357**	**1,321**	**1,334**	**1,556**	**1,677**	**1,818**	**1,800**	**1,831**	**14,080**
	12.7%	12.5%	12.3%	12.5%	14.2%	15.5%	15.6%	16.1%	17.1%	14.3%
25-34	**4,678**	**4,502**	**4,217**	**3,928**	**3,875**	**3,775**	**4,165**	**3,884**	**3,665**	**36,689**
	42.8%	41.3%	39.1%	36.8%	35.4%	34.9%	35.7%	34.8%	34.2%	37.2%
35-44	**3,164**	**3,287**	**3,396**	**3,469**	**3,554**	**3,347**	**3,412**	**3,216**	**2,946**	**29,791**
	29.0%	30.2%	31.5%	32.5%	32.4%	30.9%	29.2%	28.8%	27.5%	30.2%
45-54	**1,010**	**1,045**	**1,173**	**1,191**	**1,197**	**1,217**	**1,482**	**1,456**	**1,459**	**11,230**
	9.2%	9.6%	10.9%	11.2%	10.9%	11.3%	12.7%	13.0%	13.6%	11.4%
55-64	**291**	**277**	**268**	**285**	**281**	**287**	**297**	**359**	**371**	**2,716**
	2.7%	2.5%	2.5%	2.7%	2.6%	2.7%	2.5%	3.2%	3.5%	2.8%
65+	**64**	**100**	**78**	**93**	**79**	**90**	**88**	**98**	**86**	**776**
	0.6%	0.9%	0.7%	0.9%	0.7%	0.8%	0.8%	0.9%	0.8%	0.8%
Total	**10,928**	**10,898**	**10,776**	**10,675**	**10,956**	**10,815**	**11,672**	**11,167**	**10,721**	**98,608**
	11.1%	11.1%	10.9%	10.8%	11.1%	11.0%	11.8%	11.3%	10.9%	100.0%

* Based on Minnesota definition, 1 prior in 5 years or 2 in 15 (1995-2000) or 1 prior in 10 (2001-2003).

DWI offenses were also tracked by area of the State in which they occurred. Areas were divided by county into four categories: the two counties with Minneapolis and St. Paul; surrounding populous counties plus the counties with St. Cloud and Brainerd; other counties cited by the 2000 U.S. Census as having a mixture of rural and urban enclaves; and rural counties.

The distribution of DWI events over the urban/rural breakdown is shown in Table 5. There were minor differences over the years 1995 to 2003. Minneapolis-St. Paul contributed about one-third of all cases in 1995-1998, about 30% in the years after that. Over the same time period, the proportion of cases from other urban areas increased by about 2%, and the proportion from mixed areas increased by about 1%.

Table 5. Urban/Rural Distribution of DWIs by First/Repeat Offense, 1995-2003

	Urban/ Rural	Pre-Impound Law 1995	1996	1997	Plate Impound Law (1) 1998	1999	2000	Plate Impound Law (2) 2001	2002	2003	Total
First Offenders *											
	Mnpls/ St Paul	**6,172**	**6,493**	**6,792**	**6,831**	**6,926**	**6,787**	**6,202**	**6,303**	**6,454**	**58,960**
		33.0%	34.1%	34.5%	32.9%	30.6%	29.1%	29.6%	30.0%	31.3%	31.6%
	Other urban	**5,211**	**5,042**	**5,260**	**5,980**	**6,645**	**7,132**	**6,365**	**6,125**	**6,048**	**53,808**
		27.9%	26.4%	26.7%	28.8%	29.4%	30.6%	30.4%	29.2%	29.4%	28.8%
	Mixed	**4,209**	**4,356**	**4,445**	**4,525**	**5,089**	**5,399**	**4,941**	**4,975**	**4,931**	**42,870**
		22.5%	22.8%	22.6%	21.8%	22.5%	23.2%	23.6%	23.7%	23.9%	23.0%
	Rural	**3,085**	**3,178**	**3,192**	**3,429**	**3,963**	**3,975**	**3,444**	**3,593**	**3,159**	**31,018**
		16.5%	16.7%	16.2%	16.5%	17.5%	17.1%	16.4%	17.1%	15.3%	16.6%
	Total	**18,677**	**19,069**	**19,689**	**20,765**	**22,623**	**23,293**	**20,952**	**20,996**	**20,592**	**186,656**
		10.0%	10.2%	10.5%	11.1%	12.1%	12.5%	11.2%	11.2%	11.0%	100.0%
Repeat Offenders *											
	Mnpls/ St Paul	**3,544**	**3,258**	**3,347**	**3,180**	**3,071**	**2,947**	**3,092**	**3,003**	**2,944**	**28,386**
		34.0%	31.5%	32.4%	31.2%	29.2%	28.3%	27.6%	28.0%	28.6%	30.1%
	Other urban	**2,893**	**2,996**	**2,801**	**2,838**	**3,121**	**3,044**	**3,277**	**3,184**	**3,024**	**27,178**
		27.7%	28.9%	27.1%	27.9%	29.7%	29.2%	29.2%	29.7%	29.4%	28.8%
	Mixed	**2,238**	**2,251**	**2,281**	**2,267**	**2,406**	**2,393**	**2,739**	**2,542**	**2,438**	**21,555**
		21.5%	21.7%	22.1%	22.3%	22.9%	23.0%	24.4%	23.7%	23.7%	22.8%
	Rural	**1,755**	**1,853**	**1,898**	**1,901**	**1,915**	**2,036**	**2,111**	**1,985**	**1,875**	**17,329**
		16.8%	17.9%	18.4%	18.7%	18.2%	19.5%	18.8%	18.5%	18.2%	18.3%
	Total	**10,430**	**10,358**	**10,327**	**10,186**	**10,513**	**10,420**	**11,219**	**10,714**	**10,281**	**94,448**
		11.0%	11.0%	10.9%	10.8%	11.1%	11.0%	11.9%	11.3%	10.9%	100.0%

* Based on Minnesota definition, 1 prior in 5 years or 2 in 15 (1995-2000) or 1 prior in 10 (2001-2003).

Alcohol Test Results

BAC values were included in the driver history records beginning in 1998, when more serious administrative actions were first applied to first offenders with BACs of .20 or more. Distributions of test results are shown in Table 6. Repeat offenders refused the test (about 24%) more than twice as often as first offenders (about 11%) across all 9 years. The rate of refusal did not increase once enhanced actions were added for high-BAC readings; in fact, it declined somewhat from 1995 through 2003 for both first and multiple offenders.

Most first offenders (55% in 1998-2003) registered BACs of .16 or lower. Another 17% had BACs of .17 – .19, 9% had BACs of .20 – .22, and nearly 7% had BACs of .23 or higher. Repeat offenders showed higher BACs, on average. Thirty-eight percent had BACs of .16 or less, 16% had BACs from .17 – .19, 11% had BACs from .20 – .22, and 10% had BACs of .23 or greater.

About 2-3% more males refused BAC testing than did females; the difference was smaller for first-time offenders than for repeat offenders (not shown). Of those having reported BACs, females showed slightly higher percentages of higher BACs, both as first and as repeat offenders.

Table 6. Alcohol Test Results/Refusals by First/Repeat Offense, 1995-2003

	Test/ Results	Pre-Impound Law			Plate Impound Law (1)			Plate Impound Law (2)			Total **
		1995	1996	1997	1998	1999	2000	2001	2002	2003	
First Offenders *											
	≤ .16				**11,562**	**12,699**	**13,266**	**12,159**	**12,114**	**11,832**	**73,632**
					53.1%	53.7%	54.7%	55.6%	55.2%	55.1%	0%/54.6%
	.17-.19				**3,785**	**4,230**	**4,273**	**3,729**	**3,727**	**3,633**	**23,377**
					17.4%	17.9%	17.6%	17.0%	17.0%	16.9%	0%/17.3%
	.20-.22				**2,167**	**2,282**	**2,192**	**1,789**	**1,939**	**1,883**	**12,252**
					9.9%	9.7%	9.0%	8.2%	8.8%	8.8%	0%/9.1%
	.23 or higher				**1,529**	**1,619**	**1,567**	**1,373**	**1,367**	**1,373**	**8,828**
					7.0%	6.8%	6.5%	6.3%	6.2%	6.4%	0%/6.5%
	Refused	**2,619**	**2,573**	**2,464**	**2,401**	**2,443**	**2,493**	**2,331**	**2,349**	**2,253**	**21,926**
		13.4%	12.8%	11.9%	11.0%	10.3%	10.3%	10.7%	10.7%	10.5%	11.2%
	Unknown BAC	**16,889**	**17,469**	**18,165**	**335**	**372**	**446**	**494**	**440**	**512**	**55,122**
		86.6%	87.2%	88.1%	1.5%	1.6%	1.8%	2.3%	2.0%	2.4%	87.3%/1.9%
	Total	**19,508**	**20,042**	**20,629**	**21,779**	**23,645**	**24,237**	**21,875**	**21,936**	**21,486**	**195,137**
		10.0%	10.3%	10.6%	11.2%	12.1%	12.4%	11.2%	11.2%	11.0%	100.0%
Repeat Offenders *											
	≤ .16				**3,813**	**3,970**	**4,135**	**4,577**	**4,423**	**4,155**	**25,073**
					35.7%	36.2%	38.2%	39.2%	39.6%	38.8%	0%/38.0%
	.17-.19				**1,798**	**1,817**	**1,699**	**1,925**	**1,757**	**1,767**	**10,763**
					16.8%	16.6%	15.7%	16.5%	15.7%	16.5%	0%/16.3%
	.20-.22				**1,215**	**1,239**	**1,193**	**1,251**	**1,140**	**1,128**	**7,166**
					11.4%	11.3%	11.0%	10.7%	10.2%	10.5%	0%/10.9%
	.23 or higher				**1,153**	**1,219**	**1,073**	**1,103**	**1,105**	**1,000**	**6,653**
					10.8%	11.1%	9.9%	9.4%	9.9%	9.3%	0%/10.1%
	Refused	**2,917**	**2,840**	**2,589**	**2,541**	**2,556**	**2,533**	**2,589**	**2,505**	**2,420**	**23,490**
		26.7%	26.1%	24.0%	23.8%	23.3%	23.4%	22.2%	22.4%	22.6%	23.8%
	Unknown BAC	**8,011**	**8,058**	**8,187**	**156**	**155**	**183**	**227**	**238**	**251**	**25,466**
		73.3%	73.9%	76.0%	1.5%	1.4%	1.7%	1.9%	2.1%	2.3%	74.4%/1.8%
	Total	**10,928**	**10,898**	**10,776**	**10,676**	**10,956**	**10,816**	**11,672**	**11,168**	**10,721**	**98,611**
		11.1%	11.1%	10.9%	10.8%	11.1%	11.0%	11.8%	11.3%	10.9%	100.0%

* Based on Minnesota definitions, 1 prior in 5 years or 2 in 15 (1995-2000) or 1 prior in 10 years (2001+).

** Where two percentages are shown, the first is for 1995-1997 and the second is for 1998-2003.

The distribution of BAC test results by age, for first and repeat offenders, is given in Table 7. The pattern was quite similar for first and repeat offenders, though the latter showed consistently more high-BAC values at all ages. For both groups, refusals peaked between ages 35 and 54. Also for both groups, those between 35 and 64 showed the highest numbers of high-BAC values.

Table 7. Age of DWI Offenders by Alcohol Test Results by First/Repeat Offense, 1998-2003

	Age	Alcohol Test Results						Total
		≤ .16	.17-.19	.20-.22	≥ .23	Refused	Unknown	
First Offenders *								
	16-17	**1,629**	**265**	**92**	**28**	**200**	**160**	**2,374**
		68.6%	11.2%	3.9%	1.2%	8.4%	6.7%	1.8%
	18-20	**8,885**	**2,076**	**873**	**324**	**1,025**	**555**	**13,738**
		64.7%	15.1%	6.4%	2.4%	7.5%	4.0%	10.2%
	21-24	**18,387**	**5,076**	**2,438**	**1,140**	**1,844**	**505**	**29,390**
		62.6%	17.3%	8.3%	3.9%	6.3%	1.7%	21.8%
	25-34	**20,781**	**6,880**	**3,415**	**2,222**	**3,870**	**623**	**37,791**
		55.0%	18.2%	9.0%	5.9%	10.2%	1.6%	28.0%
	35-44	**14,259**	**5,353**	**3,174**	**2,843**	**4,540**	**493**	**30,662**
		46.5%	17.5%	10.4%	9.3%	14.8%	1.6%	22.7%
	45-54	**6,589**	**2,594**	**1,592**	**1,674**	**2,062**	**207**	**14,718**
		44.8%	17.6%	10.8%	11.4%	14.0%	1.4%	10.9%
	55-64	**2,113**	**825**	**507**	**478**	**541**	**43**	**4,507**
		46.9%	18.3%	11.2%	10.6%	12.0%	1.0%	3.3%
	65+	**902**	**301**	**159**	**117**	**176**	**11**	**1,666**
		54.1%	18.1%	9.5%	7.0%	10.6%	0.7%	1.2%
Total		**73,545**	**23,370**	**12,250**	**8,826**	**14,258**	**2,597**	**134,846**
		54.5%	17.3%	9.1%	6.5%	10.6%	1.9%	100.0%
Repeat Offenders *								
	16-17	**63**	**22**	**4**	**4**	**15**	**4**	**112**
		56.3%	19.6%	3.6%	3.6%	13.4%	3.6%	0.2%
	18-20	**1,163**	**397**	**206**	**86**	**309**	**65**	**2,226**
		52.2%	17.8%	9.3%	3.9%	13.9%	2.9%	3.4%
	21-24	**4,924**	**1,912**	**1,047**	**631**	**1,328**	**174**	**10,016**
		49.2%	19.1%	10.5%	6.3%	13.3%	1.7%	15.2%
	25-34	**9,395**	**3,909**	**2,496**	**2,049**	**5,033**	**410**	**23,292**
		40.3%	16.8%	10.7%	8.8%	21.6%	1.8%	35.3%
	35-44	**6,269**	**2,932**	**2,191**	**2,366**	**5,792**	**394**	**19,944**
		31.4%	14.7%	11.0%	11.9%	29.0%	2.0%	30.2%
	45-54	**2,374**	**1,192**	**930**	**1,180**	**2,192**	**134**	**8,002**
		29.7%	14.9%	11.6%	14.7%	27.4%	1.7%	12.1%
	55-64	**646**	**297**	**243**	**281**	**390**	**23**	**1,880**
		34.4%	15.8%	12.9%	14.9%	20.7%	1.2%	2.8%
	65+	**237**	**101**	**49**	**56**	**85**	**6**	**534**
		44.4%	18.9%	9.2%	10.5%	15.9%	1.1%	0.8%
Total		**25,071**	**10,762**	**7,166**	**6,653**	**15,144**	**1,210**	**66,006**
		38.0%	16.3%	10.9%	10.1%	22.9%	1.8%	100.0%

* Based on Minnesota definitions, 1 prior in 5 years or 2 in 15 (1998-2000) or 1 prior in 10 (2001+)

Vehicle Plate Impoundment

Nearly 15,000 vehicle plate impoundment forms were coded in the two sessions at the Driver and Vehicle Services offices. Of them, about 95% were successfully matched to DWI incident records from the driver information and driver record history files. Some of the failures to match individual records were likely due to coding errors, either by the police who filled out the forms in the field or by our data entry persons. The task was made slightly more difficult because early in 2005 Minnesota began replacing all DL numbers as a security measure. Old computer records were updated, but the DL numbers on paper records were not. By the time we obtained computer records in May of 2005 and coded paper plate impoundment forms in June, about one-tenth of the computer DL numbers no longer corresponded to the paper impoundment form DL numbers.

The goal of manually coding forms was to determine how often the vehicle plates were actually impounded for first offenders at high BAC levels. The ideal situation would have been to code all paper forms. However, since project resources were not adequate for that approach, three different sampling schemes, described in detail above, were used. The different approaches were used in the two coding sessions to satisfy different concerns.

In both sessions, coding was limited to offenders age 21 and above; younger offenders may be charged under zero tolerance laws, which presents extra complications that can't be accounted for in these analyses.

After the forms were coded, their data were matched with qualifying DWI offenses from the driver record data. The results of the manual coding and data matching are shown in Table 8. "Total N" is the number of offenders; "Percent" is the percent of the Total N for which VPI forms were found and coded. Note that, except as discussed below, these are not presented as the extent to which Minnesota implemented plate impoundment; actual rates may be higher than many of the numbers in the table might be interpreted to suggest.

Table 8. Percent Qualifying DWI Violations with Coded Vehicle Plate Impoundment Forms

	First Offense High BAC		Repeat Offense High BAC		Repeat Offense Low BAC		Refuse	
Year	Percent	Total N	Percent	Total N	Percent	Total N	Percent	Total N
Code forms listing only High BAC reason								
1998	49.2%	3,224	12.9%	2,278	1.5%	5,262	1.7%	2,451
1999	49.8%	3,329	16.7%	2,366	2.5%	5,404	3.8%	2,434
2000	50.8%	3,203	18.7%	2,168	3.4%	5,448	4.0%	2,402
2001	43.9%	2,656	9.6%	2,257	1.1%	6,113	1.3%	2,475
2002	42.8%	2,767	4.8%	2,144	0.3%	5,818	0.4%	2,384
Code all forms listing High BAC reason (and possibly others)								
2003 [1]	61.6%	2,140	40.6%	1,628	6.9%	4,473	8.5%	1,856
2004 [2]	55.5%	256	41.4%	174	15.8%	530	13.8%	188
Code all VPI forms								
2003 [3]	64.6%	506	66.8%	395	70.1%	1,055	69.1%	444
2004 [3]	62.1%	541	67.4%	380	68.0%	1,069	64.5%	456

Based on offenders of known-gender and age 21 or older.

[1] DL numbers beginning with all letters except A,B,G,V

[2] DL numbers beginning with T,W

[3] DL numbers beginning with A,B,G,V

The percentage of first-offense high-BAC violations for which VPI forms were found varied from 42.8% in 2002 to 64.6% for the segment of 2003 forms. There are significant differences in the proportions of VPI implementations that were captured in the various coding schemes, from the top five rows to the next two rows to the bottom two rows. The differences are consistent with the differences in the coding schemes.

The numbers shown in the top five rows of Table 8, which ranged from 42.8% to 50.8%, reflect the most conservative approach to VPI data coding. Only forms for which High BAC was the only reason listed were coded. This resulted in relatively few VPI forms coded for repeat offenders but also the fewest matching forms coded for first offenders with high BACs.

The values in the next two rows, for the segment of 2003 and 2004 when all VPI forms listing high BAC as a reason were coded, identified significantly more VPI implementations, 61.6% and 55.5% for first offenders with high-BAC values. The difference between these two rows and 1998 – 2002 coding is that these 2003 – 2004 rows reflect coding forms listing high-BAC alone or with repeat offense as a second coded reason (these two codes made up almost all of the reasons cited on the forms). The number of VPIs coded for repeat offenders was much higher in these rows, as would be expected with the change in coding criteria. The number of VPIs coded for first offenders was also significantly higher than in the earlier years.

The values from the segment of 2003 and 2004 when all VPI forms were coded provide the highest estimate of the rate of vehicle plate impoundment in qualifying offenses. In those cases, VPI was implemented in about two-thirds of cases, with the rate for high-BAC first offenses

(64.6% and 62.1%) nearly as high as for all repeat offense categories (VPI is appropriate for all repeat offenses).

Also shown in Table 8, far fewer qualifying VPI forms were found for 2001 and 2002 than for 1998 – 2000. In 2001, the penalty reflected in VPI went up, from a minimum of 60 days' plate impoundment to a minimum of 1 year. The reduction, which continued in 2002, occurred for all categories of offenses shown, suggesting a general decrease in plate impoundment.

In analyses presented later in this report (e.g., Table 16), we distinguish between offenders (high BAC or repeat) who did receive VPI and offenders may not have received VPI. As Table 8 and the discussion of the coding schemes make clear, while we believe that most of those who may not have received VPI did not, in fact, have their plates impounded, some of them did receive VPI but our coding did not reflect that. We refer to the two groups as "Impounded" and "Not impounded or unknown impoundment" to indicate the uncertainty.

Table 9 shows variations in impoundment rate across characteristics of the offenders (sex, age) and the area of the State. The rate of impoundment did not vary by offender sex. However, the rate of impoundment gradually declined with increasing age and was distinctly lower for offenders over age 65 for BACs of .20-.22 and for offenders age 55 and older for BACs of .23 or more. Impoundment rates were much higher in Minneapolis, St. Paul, and other urban areas than in the mixed-use counties; rates in rural counties were the lowest recorded.

Table 9. Rate of Vehicle Plate Impoundment for First Offenses, by Sex, Age, and State Region

Factor	Values	.20 - .22 BAC		≥ .23 BAC	
		Impnd	Not/Unkn	Impnd	Not/Unkn
Gender	Male	3,790	3,806	2,768	2,908
		49.9%	50.1%	48.8%	51.2%
	Female	1,344	1,268	965	976
		51.5%	48.5%	49.7%	50.3%
Total		5,134	5,074	3,733	3,884
		50.3%	49.7%	49.0%	51.0%
Age	21-24	1,141	1,049	501	503
		52.1%	47.9%	49.9%	50.1%
	25-34	1,536	1,520	967	982
		50.3%	49.7%	49.6%	50.4%
	35-44	1,456	1,419	1,268	1,311
		50.6%	49.4%	49.2%	50.8%
	45-54	720	752	772	759
		48.9%	51.1%	50.4%	49.6%
	55-64	227	240	188	257
		48.6%	51.4%	42.2%	57.8%
	65+	54	94	37	72
		36.5%	63.5%	33.9%	66.1%
Total		5,134	5,074	3,733	3,884
		50.3%	49.7%	49.0%	51.0%
Urban/ Rural	Mnpls/ St Paul	1,747	1,270	1,301	961
		57.9%	42.1%	57.5%	42.5%
	Other urban	1,521	1,218	1,061	968
		55.5%	44.5%	52.3%	47.7%
	Mixed	1,040	1,224	755	935
		45.9%	54.1%	44.7%	55.3%
	Rural	619	1,171	464	903
		34.6%	65.4%	33.9%	66.1%
Total		4,927	4,883	3,581	3,767
		50.2%	49.8%	48.7%	51.3%

First offenders, known gender, age 21 and older.

Recidivism

Driver record information was examined to identify whether or not the driver had a subsequent DWI. If so, the time to the recidivism was recorded. Excluded from this evaluation were drivers under 21, who can fall under zero tolerance laws, and drivers with unknown gender, who were largely out-of-State drivers and whose history files were likely to be incomplete. Data were extracted from Minnesota driver record files in mid-May, 2005, and included information up to that date. Thus drivers whose initial offense was in 1995-1997 had from 10 ½ years to 7 ½ years to record a subsequent DWI; drivers whose initial offense was in 1998-2000 had 7 ½ to about 4 ½ years to record a subsequent DWI; and drivers with initial offenses in 2001-2003 had 4 ½ years to nearly 18 months for recidivism.

Cumulative recidivism is summarized in Table 10 for all DWI offenders regardless of VPI status. Only time to the first subsequent DWI is tracked. Data are cumulative, i.e., "≤ 30 days" includes all first reoffenses within the first 30 days, "≤ 3 months" includes all first reoffenses within the first 90 days including those within the first 30 days, etc. "Ever" refers to any first reoffense regardless of the length of time from the primary offense. Results are shown separately for the three time periods that correspond to different laws and actions, including plate impoundment actions, and for first offenders and repeat offenders.

Shaded areas in the table are time periods for which data are likely incomplete due to the shorter time available in the data records for recidivism to occur. For example, for 2001-2003, for the period ≤ 2 years, persons whose initial offense was in the last half of 2003 had less than the full two years to reoffend before the data extraction in May 2005. Also, "Ever" covered a shorter period for people whose initial offense was in 1998-2000 than those whose initial offense was in 1995-1997, shorter still for those whose initial offense was in 2001-2003.

Across all years, recidivism was about 2% within the first 90 days, 3-6% within 6 months, and 6-10% within 1 year. In 1995-2000, first offenders showed lower rates of recidivism than did repeat offenders in all time periods. For both first and repeat offenders recidivism rates declined over the 9-year period. In 2001-2003, recidivism was virtually identical for first and repeat offenders through the first year, though repeat offenders showed more recidivism after 1 year had passed.

Table 10. Cumulative Recidivism, Time to Subsequent DWI, Initial Offense 1995-2003, by Year and VPI Condition

Lag to (first) next DWI	1995-1997		1998-2000		2001-2003	
	First Offense	Repeat Offense	First Offense	Repeat Offense	First Offense	Repeat Offense
≤ 30 days	0.8%	1.3%	0.6%	0.8%	0.5%	0.6%
≤ 3 months	2.1%	3.4%	1.8%	2.3%	1.6%	1.7%
≤ 6 months	3.9%	5.7%	3.5%	4.1%	3.1%	3.1%
≤ 9 months	5.5%	7.7%	5.1%	5.8%	4.6%	4.5%
≤ 1 year	7.2%	10.0%	6.8%	7.6%	6.1%	6.1%
≤ 2 years	12.8%	18.2%	12.3%	15.4%	10.9%	12.1%
≤ 3 years	17.7%	25.0%	16.6%	21.4%	13.4%	15.7%
Ever	31.7%	43.8%	24.5%	32.6%	14.5%	17.1%
Total N	49,433	31,115	56,449	30,676	51,278	31,696

Shaded areas represent incomplete data due to time limitations.
Excludes Age ≤ 20 and Sex = Unknown; see text for discussion.

Recidivism differed for males and females, as shown in Table 11, and across age groups, as shown in Table 12. Males showed consistently higher rates of recidivism than did females, in the three periods, for first and repeat offenders, and at each time lag. This table and Table 12 combine all offenders regardless of alcohol test results (or refusal) and VPI status.

Table 11. Gender and Cumulative Recidivism, Time to Subsequent DWI, Initial Offense 1995-2003

Lag to (first) next DWI	1995-1997		1998-2000		2001-2003	
	Male	Female	Male	Female	Male	Female
First Offenders						
≤ 30 days	0.8%	0.6%	0.7%	0.4%	0.6%	0.4%
≤ 3 months	2.2%	1.6%	1.9%	1.2%	1.7%	1.2%
≤ 6 months	4.2%	2.9%	3.7%	2.6%	3.4%	2.4%
≤ 9 months	5.9%	4.3%	5.4%	4.0%	5.0%	3.7%
≤ 1 year	7.7%	5.8%	7.2%	5.4%	6.5%	4.8%
≤ 2 years	13.5%	10.6%	13.2%	9.6%	11.7%	8.4%
≤ 3 years	18.6%	14.5%	17.6%	13.1%	14.4%	10.5%
Ever	33.3%	26.3%	26.0%	19.8%	15.5%	11.4%
Total N	38,062	11,371	43,113	13,336	38,514	12,764
Repeat Offenders						
≤ 30 days	1.3%	1.4%	0.9%	0.6%	0.6%	0.5%
≤ 3 months	3.5%	3.1%	2.4%	1.8%	1.7%	1.4%
≤ 6 months	5.9%	4.8%	4.3%	2.8%	3.2%	2.4%
≤ 9 months	8.0%	5.9%	6.1%	4.0%	4.7%	3.6%
≤ 1 year	10.3%	7.8%	8.0%	5.2%	6.3%	5.0%
≤ 2 years	18.7%	14.3%	16.1%	11.7%	12.5%	10.1%
≤ 3 years	25.7%	20.3%	22.2%	17.0%	16.2%	12.9%
Ever	44.5%	39.2%	33.5%	27.3%	17.7%	14.1%
Total N	27,043	4,072	26,293	4,383	26,489	5,207

Shaded areas represent incomplete data due to time limitations.
Excludes Age ≤ 20 and Sex = Unknown; see text for discussion.

A consistent decline in recidivism was observed for increasing ages (Table 12). Within both first offenders and repeat offenders, the highest rates of recidivism were observed among the youngest age group (ages 21-24), and the lowest rates of recidivism among the oldest offenders, age 65+.

Table 12. Age and Cumulative Recidivism, Time to Subsequent DWI, Initial Offense 1995-2003

Lag to (first) next DWI	Violator Age						Total
	21-24	25-34	35-44	45-54	55-64	65+	
First Offenders							
≤ 30 days	0.7%	0.7%	0.7%	0.5%	0.6%	0.5%	0.6%
≤ 3 months	2.0%	1.9%	1.8%	1.4%	1.5%	1.1%	1.8%
≤ 6 months	4.2%	3.7%	3.3%	2.6%	2.2%	1.7%	3.5%
≤ 9 months	6.3%	5.3%	4.6%	3.8%	3.3%	2.5%	5.1%
≤ 1 year	8.4%	7.0%	6.1%	5.2%	4.1%	3.5%	6.7%
≤ 2 years	15.2%	12.3%	11.1%	9.4%	7.1%	6.2%	12.0%
≤ 3 years	19.9%	16.3%	14.7%	12.5%	9.5%	8.1%	15.9%
Ever	28.5%	24.8%	22.1%	18.0%	13.6%	10.4%	23.5%
Total N	36,739	52,341	40,953	18,833	5,948	2,346	157,160
Repeat Offenders							
≤ 30 days	0.8%	0.9%	1.0%	1.0%	0.8%	0.5%	0.9%
≤ 3 months	2.4%	2.5%	2.6%	2.2%	2.2%	1.3%	2.4%
≤ 6 months	4.6%	4.5%	4.4%	3.5%	3.2%	2.0%	4.3%
≤ 9 months	6.6%	6.2%	6.1%	4.9%	4.7%	2.2%	6.0%
≤ 1 year	8.9%	8.2%	8.0%	6.4%	5.6%	3.3%	7.9%
≤ 2 years	17.6%	15.4%	15.4%	12.5%	11.3%	7.4%	15.2%
≤ 3 years	24.1%	21.1%	20.7%	17.0%	15.0%	9.9%	20.7%
Ever	35.1%	32.8%	30.9%	24.5%	21.2%	14.3%	31.1%
Total N	13,796	35,978	29,243	11,049	2,660	761	93,487

Excludes Age ≤ 20 and Sex = Unknown; see text for discussion.

Recidivism differences across alcohol test differences are shown in Table 13 for the period 1998-2003, the years when test results were available. Offenders who refused to be tested showed consistently higher recidivism rates than offenders who were tested; the effect was consistent for first offenders and for repeat offenders. Repeat offenders showed consistently higher recidivism rates than first offenders across all BAC levels. Of those with known BACs, those with BACs of .16 or lower showed the lowest recidivism rates.

Among first offenders, those with BACs of .20-.22 showed less recidivism over the first year than offenders with BACs of .17-.19. This is roughly the period of time when increased license and vehicle plate actions were applied to those with BACs over .20. During the first year, the recidivism rates for those with BACs between .20 and .22 were nearly the same as for those with BACs of .16 or less, the lowest recidivism rates observed. After the first year, after license and vehicle plate actions were generally no longer in effect, the recidivism rates for first offenders with BACs between .20 and .22 were still lower than offenders whose BACs were between .17 and .19 but the differences in rate declined over time. After 1 year the differences were about 20%, after 2 years 10%, and after 3 years 5%. Similar patterns were seen for repeat offenders: after 1 year, offenders with BACs between .20 and .22 recidivated about 16% less than offenders

with BAC = .17-.19; after 2 years there was a 9% difference, and after 3 years the difference narrowed to 4%. Interestingly, first offenders with BACs of .23+ recidivated about as often as those whose BACs were between .17 and .19. For repeat offenders, rates were similar for the first year; after that repeat offenders with BACs of .23+ recidivated more often than those with BACs between .17 and .19.

Table 13. Alcohol Test Results and Cumulative Recidivism, Time to Subsequent DWI, Initial Offense 1998-2003

Lag to (first) next DWI	Alcohol Test Results						Total
	≤ .16	.17-.19	.20-.22	≥ .23	Refused	Unknown	
First Offenders							
≤ 30 days	0.5%	0.7%	0.5%	0.7%	0.8%	1.4%	0.6%
≤ 3 months	1.5%	1.9%	1.4%	1.7%	2.5%	2.9%	1.7%
≤ 6 months	2.9%	3.7%	2.9%	3.3%	4.8%	4.5%	3.3%
≤ 9 months	4.4%	5.5%	4.3%	5.1%	6.6%	5.6%	4.9%
≤ 1 year	5.7%	7.3%	6.1%	7.0%	8.4%	6.8%	6.5%
≤ 2 years	10.5%	13.0%	11.8%	12.9%	14.4%	11.0%	11.6%
≤ 3 years	13.6%	16.7%	15.8%	16.8%	18.4%	13.9%	15.1%
Ever	17.8%	21.9%	21.2%	22.1%	23.4%	16.9%	19.7%
Total N	57,716	19,173	10,208	7,617	11,342	1,671	107,727
Repeat Offenders							
≤ 30 days	0.7%	0.6%	0.6%	0.7%	0.9%	1.5%	0.7%
≤ 3 months	1.7%	1.8%	1.6%	2.0%	2.5%	4.3%	2.0%
≤ 6 months	3.2%	3.4%	2.9%	3.7%	4.4%	7.3%	3.6%
≤ 9 months	4.6%	4.9%	4.5%	5.0%	6.2%	9.3%	5.2%
≤ 1 year	6.2%	6.6%	5.7%	6.7%	8.4%	11.6%	6.9%
≤ 2 years	12.4%	13.3%	12.2%	14.5%	16.2%	17.1%	13.7%
≤ 3 years	16.7%	18.1%	17.4%	19.6%	21.6%	21.7%	18.5%
Ever	22.1%	24.2%	24.6%	26.6%	28.4%	26.5%	24.7%
Total N	23,417	10,156	6,830	6,406	14,446	1,117	62,372

Excludes Age ≤ 20 and Sex = Unknown; see text for discussion.

The effect of the administrative actions was not the same across age groups. Table 14 shows recidivism for first offenders ages 21-24, 25-34, 35-44, and 45-54 – the ages with the greatest numbers of DWI offenses. This table combines all offenders; from the VPI form coding described earlier, we know that at least half to two-thirds of offenders eligible for VPI actually received it. In general, higher BAC levels for the first offense corresponded to higher recidivism rates. This was not the case, however, in the key comparison of .17-.19 versus .20-.22 BAC levels. For offenders at BACs of .20-.22, half or more of whom received VPI, recidivism was no higher over the first year than that for those with BACs of .17-.19, who were not subject to VPI. This reduction in recidivism with possible VPI was greatest for the youngest offenders; for them, recidivism was much lower for the higher BAC level, about 30% less over the first year. The reduction persisted for 3 years. For older age groups, the reduction was much smaller. For ages 25-34, for example, the reduction was about 15% over the first year, but it was nearly gone by the third year.

Table 14. Alcohol Test Results and Cumulative Recidivism by Age,
First Offenders with Initial Offense 1998 – 2003

Lag to (first) next DWI	Alcohol Test Results ≤ .16	.17-.19	.20-.22	≥ .23	Refused	Total
Age 21-24						
≤ 30 days	0.5%	0.7%	0.2%	1.0%	1.3%	0.6%
≤ 3 months	1.7%	2.2%	1.2%	2.3%	3.4%	1.9%
≤ 6 months	3.6%	5.1%	2.9%	4.0%	7.0%	4.0%
≤ 9 months	5.5%	7.6%	4.8%	5.7%	9.7%	6.1%
≤ 1 year	7.4%	10.3%	7.7%	8.1%	12.3%	8.3%
≤ 2 years	13.7%	18.2%	15.8%	15.6%	20.6%	15.2%
≤ 3 years	17.7%	23.2%	20.7%	20.4%	27.1%	19.6%
Ever	22.7%	29.1%	27.9%	24.9%	32.7%	25.0%
Total N	16,725	4,599	2,190	1,004	1,613	26,131
Age 25-34						
≤ 30 days	0.5%	0.9%	0.4%	0.8%	0.8%	0.6%
≤ 3 months	1.5%	2.1%	1.7%	1.9%	2.8%	1.8%
≤ 6 months	3.0%	3.7%	3.3%	4.1%	5.7%	3.5%
≤ 9 months	4.5%	5.8%	4.6%	5.7%	7.7%	5.1%
≤ 1 year	5.9%	7.6%	6.5%	7.9%	9.5%	6.7%
≤ 2 years	10.3%	13.2%	12.4%	14.1%	15.7%	11.8%
≤ 3 years	13.4%	16.8%	16.7%	18.4%	19.5%	15.2%
Ever	17.9%	22.7%	22.3%	25.0%	25.2%	20.3%
Total N	18,953	6,182	3,056	1,949	3,284	33,424
Ages 35-44						
≤ 30 days	0.5%	0.6%	0.8%	0.5%	0.7%	0.6%
≤ 3 months	1.4%	1.8%	1.4%	1.5%	2.3%	1.6%
≤ 6 months	2.6%	3.1%	2.9%	3.0%	4.2%	3.0%
≤ 9 months	3.8%	4.5%	4.2%	4.7%	5.8%	4.4%
≤ 1 year	5.0%	5.9%	5.8%	6.6%	7.5%	5.8%
≤ 2 years	9.2%	10.8%	10.6%	12.7%	13.3%	10.5%
≤ 3 years	11.9%	14.3%	14.3%	16.6%	17.6%	13.8%
Ever	16.0%	19.4%	19.5%	22.4%	22.4%	18.5%
Total N	13,136	4,948	2,875	2,579	3,954	27,492
Ages 45-54						
≤ 30 days	0.3%	0.5%	0.7%	0.5%	0.5%	0.4%
≤ 3 months	0.9%	1.5%	1.4%	1.6%	2.1%	1.3%
≤ 6 months	1.6%	2.9%	2.6%	2.9%	3.5%	2.4%
≤ 9 months	2.6%	4.1%	3.9%	4.6%	5.0%	3.6%
≤ 1 year	3.7%	5.4%	5.0%	6.6%	6.7%	4.9%
≤ 2 years	7.0%	9.7%	9.4%	11.2%	11.3%	8.8%
≤ 3 years	9.3%	12.2%	12.6%	14.6%	14.2%	11.5%
Ever	12.1%	15.7%	16.6%	19.0%	18.3%	14.9%
Total N	6,100	2,401	1,472	1,531	1,843	13,347

Excludes Sex and BAC test outcome = Unknown; see text for discussion.

These differences are graphically displayed in Figures 1 and 2 as the percent difference in recidivism from the .17-.19 "baseline" to .20-.22 (negative numbers show reductions). Figure 1 shows effects for high-BAC offenders for whom VPI was confirmed in coding. Figure 2 shows effects for high-BAC offenders for whom VPI was not confirmed. As noted earlier, it is likely that most of those for whom VPI was not confirmed indeed did not receive VPI.

In Figure 1, with VPI, the youngest offenders with higher BACs (ages 21-24) showed about 50% less recidivism than similar offenders with BACs of .17-.19 for 6 months. Over 1 year, they showed about 30% less recidivism; by 3 years, the difference was still 15%. Offenders ages 25-34 showed a similar decrease in recidivism, .20-.22 with VPI versus all .17-.19, about 40% less recidivism through 9 months, 33% through 1 year, and 15% through 3 years. Older first offenders showed less decrease in recidivism at all time periods, though decreases exceeded 10% for the first year. Values for ages 21-24 and for ages 25-34 for ≤ 3 months through ≤ 3 years are significantly less than zero ($p < .05$); the value for ages 35-44 ≤ 3 months is nearly significant ($p = .08$); other values are not.

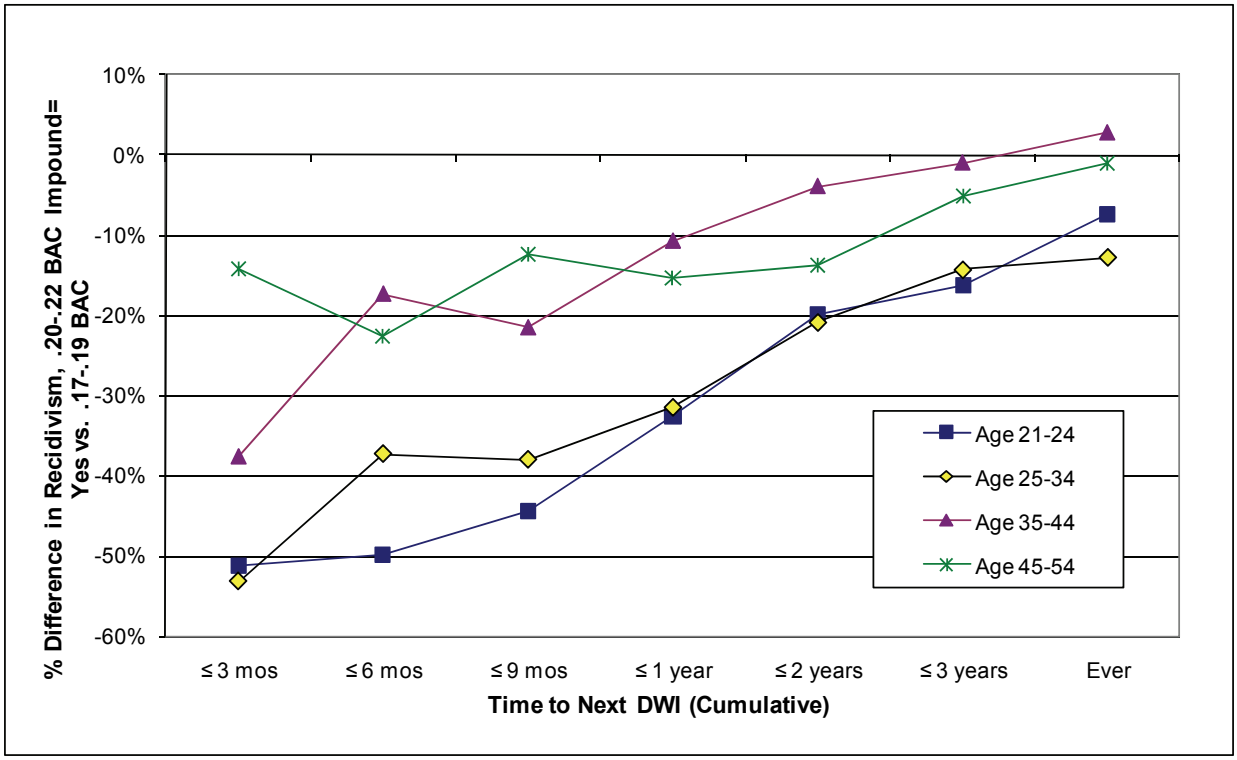

Figure 1. Percent Difference in Recidivism, (.20-.22 BAC with VPI) versus (.17-.19 BAC), First Offenders, by Age

Figure 2 shows the same comparison but for offenders with BACs of .20-.22 who were not coded as having received VPI. In that group, the youngest offenders with higher BACs (ages 21-24) still showed a large decrease in recidivism, about 33% less recidivism than similar offenders with BACs of .17-.19 for 6 months. Over 1 year, they showed less than 20% less recidivism; by

2 years, the difference was just 5%. All older high-BAC offenders, however, on average showed slightly more recidivism than the comparison group with BACs of .17-.19. This is markedly different than the pattern shown in Figure 1. Values for ages 21-24 through ≤ 9 months are significantly less than zero ($p < .05$); the value for ≤ 1 year approaches significance ($p = .07$); all other values do not significantly differ from zero.

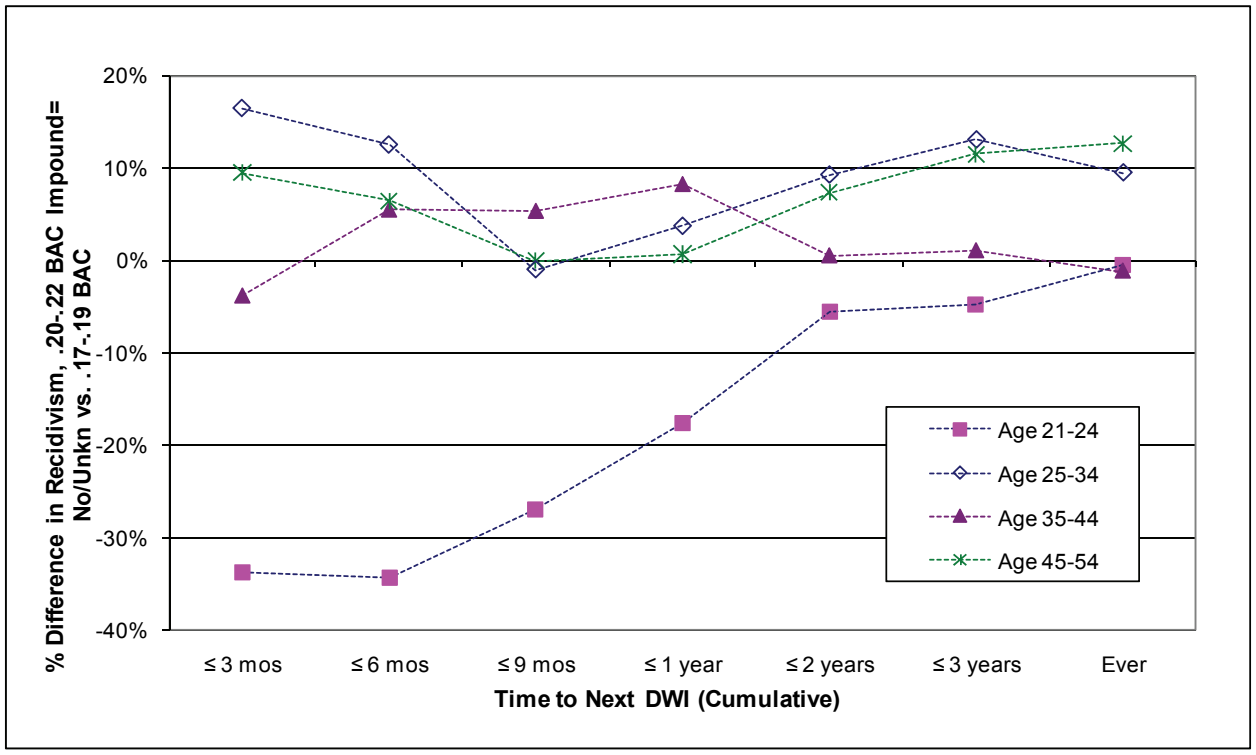

Figure 2. Percent Difference in Recidivism, (.20-.22 BAC, No/Unknown VPI) versus (.17-.19 BAC), First Offenders, by Age

Recidivism Across Impoundment Variations, 1998-2000 versus 2001-2003

Additional analyses were done to examine the size of the effect in 1998-2000, when the less stringent plate impoundment action was in effect, versus 2001-2003, when the more stringent limits were in effect, and recorded vehicle plate impoundment in both periods. Comparisons focused on drivers ages 21-34, who showed the greatest reduction in recidivism when they receive VPI.

Table 15 compares recidivism rates by BAC test results, for drivers ages 21-34, for first offenses between 1998-2000 and 2001-2003. Compared with drivers with BACs of .17-.19, drivers with BACs of .20-.22 showed lower recidivism through 1 year in both time periods. For 1998-2000 their recidivism increased to match that of offenders with BACs of .17-.19 after 3 years, while for 2001-2003 the preliminary data suggest their drop in recidivism persisted even after 3 years. Compared with lower-BAC drivers, drivers with BACs of .23 or higher showed a modest decrease in recidivism through the first year but an increase after that for 1998-2000; their

recidivism rate in 2001-2003 was as low as that for drivers with BACs of .20-.22 at all time periods.

Table 15. Alcohol Test Results and Cumulative Recidivism, First Offenders Ages 21-34, Initial Offense 1998-2000 and 2001-2003

Lag to (first) next DWI	Alcohol Test Results						Total
	≤ .16	.17-.19	.20-.22	≥ .23	Refused	Unknown	
1998-2000							
≤ 30 days	0.5%	0.9%	0.5%	0.9%	1.0%	1.2%	0.7%
≤ 3 months	1.6%	2.5%	1.6%	2.3%	2.9%	2.3%	1.9%
≤ 6 months	3.5%	4.7%	3.3%	4.3%	6.0%	4.7%	4.0%
≤ 9 months	5.1%	7.1%	4.9%	6.2%	8.4%	6.5%	5.8%
≤ 1 year	6.8%	9.2%	7.1%	8.8%	10.5%	8.6%	7.7%
≤ 2 years	12.5%	15.9%	14.6%	16.5%	18.2%	13.7%	14.0%
≤ 3 years	16.7%	20.7%	20.3%	22.1%	24.5%	18.6%	18.7%
Ever	24.9%	30.7%	30.7%	31.6%	34.2%	25.6%	27.6%
Total N	18,239	5,724	2,873	1,597	2,546	430	31,409
2001-2003							
≤ 30 days	0.5%	0.7%	0.1%	0.8%	0.9%	1.6%	0.5%
≤ 3 months	1.5%	1.7%	1.3%	1.8%	3.1%	3.2%	1.7%
≤ 6 months	3.1%	3.9%	2.9%	3.8%	6.2%	4.4%	3.5%
≤ 9 months	4.9%	5.9%	4.6%	5.2%	8.3%	4.8%	5.3%
≤ 1 year	6.3%	8.2%	6.9%	6.9%	10.4%	5.7%	7.0%
≤ 2 years	11.4%	14.6%	12.9%	12.4%	16.3%	9.7%	12.5%
≤ 3 years	14.1%	18.2%	16.1%	15.6%	19.3%	11.3%	15.4%
Ever	15.1%	19.5%	17.3%	17.3%	20.6%	12.2%	16.6%
Total N	17,439	5,057	2,373	1,356	2,351	566	29,142

Shaded areas represent incomplete data due to time limitations.
Excludes Age ≤ 20 and Sex = Unknown; see text for discussion.

Table 16 divides the two high-BAC columns from Table 15 for those for whom impoundment was coded versus those for whom impoundment was not coded. First offenders with BACs of .20-.22 who had their vehicle plates impounded showed much less recidivism than their counterparts, most of whom did not have their plates impounded. This was the case in both time periods. For both time periods, the difference in recidivism for impounded versus not/unknown remained significant as time after the offense increased.

For those with BACs of .23 or higher, there was little or no decrease in recidivism for drivers with plate impoundment coded for offenses in 1998-2000. By contrast, for offenses in 2001-2003, there was as much or more reduction in recidivism related to plate impoundment for the highest BAC offenders as for those at the slightly lower BAC levels. The lower rate of recidivism for the 2001-2003 highest BAC drivers with VPI coded persisted over time.

Table 16. Alcohol Test Results by Impoundment and Cumulative Recidivism, First Offenders Ages 21-34

Lag to (first) next DWI	Alcohol Level by Impoundment				All, BAC ≥ .20
	.20-.22		≥ .23		
	Impnd	Not/Unkn	Impnd	Not/Unkn	
1998-2000					
≤ 30 days	0.3%	0.6%	1.0%	0.9%	0.6%
≤ 3 months	1.2%	2.1%	2.0%	2.6%	1.9%
≤ 6 months	2.6%	4.0%	4.2%	4.3%	3.6%
≤ 9 months	4.0%	5.7%	6.1%	6.3%	5.3%
≤ 1 year	6.1%	8.2%	8.5%	9.2%	7.7%
≤ 2 years	12.8%	16.5%	16.4%	16.6%	15.3%
≤ 3 years	18.5%	22.1%	22.1%	22.1%	20.9%
Ever	29.1%	32.4%	30.9%	32.2%	31.0%
Total N	1,464	1,409	792	805	4,470
2001-2003					
≤ 30 days	0.0%	0.3%	0.6%	1.0%	0.4%
≤ 3 months	0.7%	2.0%	1.6%	1.9%	1.5%
≤ 6 months	2.2%	3.6%	3.7%	4.0%	3.2%
≤ 9 months	3.6%	5.5%	4.4%	5.9%	4.8%
≤ 1 year	5.8%	8.0%	6.2%	7.6%	6.9%
≤ 2 years	11.4%	14.4%	10.9%	13.8%	12.7%
≤ 3 years	14.2%	18.1%	14.2%	16.9%	15.9%
Ever	15.3%	19.4%	15.4%	19.1%	17.3%
Total N	1,213	1,160	676	680	3,729

Shaded areas represent incomplete data due to time limitations.
Excludes Sex = Unknown.

Next, the patterns of recidivism across BAC levels were examined separately for male and female first offenders (all ages). The pattern of recidivism for male first offenders is shown in Table 17. In both time periods, recidivism is lower for high-BAC offenders than for those with BACs of .17-.19, consistent with overall effectiveness of the higher administrative actions for high-BAC offenders. Among the high-BAC offenders, those with VPI coded had consistently lower recidivism rates than those without VPI coded.

Results for female first offenders are shown in Table 18. The pattern of effects is similar to those for male first offenders, except that the overall levels of recidivism are about 1/4 lower than shown by males. Coded plate impoundment, versus no or unknown impoundment, is associated with lower recidivism in both time periods, with larger differences seen for 2001-2003 offenders. For females, as for males, the reduction in recidivism associated with plate impoundment is least pronounced for very high BACs (.23 and more) for 1998-2000 offenders.

Table 17. Alcohol Test Results, Plate Impoundment, and Cumulative Recidivism, Male First Offenders

Lag to (first) next DWI	Alcohol Test Results by Impoundment							Total
	≤ .16	.17-.19	.20-.22		≥ .23		Refused	
			Impnd	Not/Unkn	Impnd	Not/Unkn		
1998-2000								
≤ 30 days	0.7%	0.7%	0.5%	0.9%	0.8%	0.9%	0.9%	0.7%
≤ 3 months	1.8%	2.2%	1.5%	2.0%	2.3%	2.4%	2.7%	2.1%
≤ 6 months	3.5%	4.2%	2.9%	3.8%	4.3%	4.1%	5.2%	3.9%
≤ 9 months	5.0%	6.1%	4.2%	5.5%	6.1%	5.9%	7.0%	5.6%
≤ 1 year	6.7%	8.1%	5.9%	7.4%	7.7%	8.0%	9.4%	7.5%
≤ 2 years	12.8%	15.1%	12.0%	14.4%	14.7%	16.0%	17.5%	14.3%
≤ 3 years	17.2%	20.3%	17.5%	20.1%	19.5%	21.8%	23.7%	19.3%
All	25.7%	30.2%	28.2%	31.1%	29.0%	32.3%	34.3%	28.8%
Total N	32,597	11,928	2,582	4,537	1,902	3,890	10,987	68,423
2001-2003								
≤ 30 days	0.5%	0.6%	0.0%	0.6%	0.4%	0.6%	0.8%	0.6%
≤ 3 months	1.5%	1.6%	0.9%	1.7%	1.1%	1.9%	2.4%	1.7%
≤ 6 months	2.9%	3.4%	2.4%	3.2%	2.4%	3.5%	4.3%	3.2%
≤ 9 months	4.4%	5.1%	3.7%	4.7%	3.7%	4.9%	6.3%	4.8%
≤ 1 year	5.8%	6.9%	5.3%	6.3%	5.6%	6.6%	8.0%	6.4%
≤ 2 years	10.9%	12.5%	10.9%	12.6%	10.2%	13.4%	14.4%	12.0%
≤ 3 years	13.8%	15.7%	13.5%	16.4%	13.2%	17.4%	18.1%	15.1%
All	14.9%	17.0%	14.5%	17.8%	14.3%	19.0%	19.6%	16.4%
Total N	31,265	10,899	2,269	3,868	1,703	3,401	10,346	63,751

Shaded areas represent incomplete data due to time limitations.

Excludes Age ≤ 20

Table 18. Alcohol Test Results, Plate Impoundment, and Cumulative Recidivism, Minnesota, Female First Offenders

Lag to (first) next DWI	Alcohol Test Results by Impoundment							Total
	≤ .16	.17-.19	.20-.22		≥ .23		Refused	
			Impnd	Not/Unkn	Impnd	Not/Unkn		
1998-2000								
≤ 30 days	0.3%	0.6%	0.4%	0.9%	0.8%	0.2%	0.6%	0.4%
≤ 3 months	1.0%	1.7%	1.2%	1.1%	1.4%	1.7%	2.2%	1.4%
≤ 6 months	2.2%	3.0%	2.0%	2.3%	3.2%	3.2%	3.4%	2.6%
≤ 9 months	3.4%	4.6%	3.5%	3.7%	4.6%	4.6%	4.9%	4.0%
≤ 1 year	4.5%	5.9%	4.7%	5.2%	7.5%	6.3%	6.7%	5.3%
≤ 2 years	8.2%	11.1%	9.9%	10.0%	12.9%	14.0%	13.2%	10.1%
≤ 3 years	11.2%	15.0%	14.5%	15.4%	17.7%	20.3%	18.6%	14.1%
All	17.5%	22.7%	22.6%	24.7%	26.9%	31.1%	27.7%	21.6%
Total N	8,303	3,364	832	1,160	651	1,014	2,179	17,503
2001-2003								
≤ 30 days	0.3%	0.5%	0.5%	0.2%	0.4%	0.6%	0.5%	0.4%
≤ 3 months	1.0%	1.3%	0.7%	1.1%	1.1%	1.2%	2.3%	1.2%
≤ 6 months	2.1%	2.4%	1.4%	1.9%	2.1%	2.7%	3.7%	2.3%
≤ 9 months	3.3%	3.9%	2.3%	3.0%	3.2%	4.0%	5.3%	3.7%
≤ 1 year	4.4%	5.0%	3.3%	4.3%	4.7%	5.4%	7.1%	4.8%
≤ 2 years	7.9%	9.6%	7.3%	8.3%	9.5%	11.0%	11.9%	8.9%
≤ 3 years	9.8%	12.8%	9.8%	11.3%	10.8%	13.0%	14.4%	11.2%
All	10.6%	13.8%	10.8%	12.5%	11.3%	14.4%	15.7%	12.2%
Total N	8,968	3,138	738	1,052	529	933	2,276	17,634

Shaded areas represent incomplete data due to time limitations.
Excludes Age ≤ 20

Survival Analysis of Factors Influencing Recidivism

Cox Regression tests (multivariate survival analyses) were performed on the recidivism data in order to test the effects of high-BAC actions, in particular vehicle plate impoundment. Data analyzed were for the 6 years 1998 through 2003. These years had similar license withdrawal and vehicle plate impoundment actions, they were the years for which enough time had elapsed from the initial offense for recidivism data to be (nearly) complete, and they were years for which BAC data were available. Separate analyses were performed for first offenders, as a test of the primary hypothesis, and for repeat offenders, for comparison purposes.

Five factors were included in the analyses. For first offenders: BAC level or test refusal and impoundment (≤ .16, .17-.19, .20-.22 without impoundment, .20-.22 with impoundment, ≥ .23 without impoundment, ≥ .23 with impoundment, and refused; gender; age categories (21-24, 25-34, 35-44, 45-54, 55-64, and 65 or older); urban/rural (Minneapolis-St. Paul, other urban counties, counties with mixed urban clusters and rural areas, and rural), and year category (1998-2000 and 2001-2003). For repeat offenders, the coding of VPI was done in very few cases, so the

BAC level or test refusal variable had only five categories. Analyses were performed on offenders age 21 and older with known gender.

The various actions affected drivers (and their vehicles) for relatively short periods of time, but it is important to also look at longer periods of time to determine if there are any longer-lasting effects. Therefore, Cox Regressions were performed for recidivism occurring within 1 month of the initial event, within 3 months, within 6 months, within 12 months, within 2 years, and within 3 years.

The primary independent variable for each of these analyses was BAC. As shown earlier, higher BACs at the time of arrest were generally associated with a higher likelihood of recidivism. However, stronger actions, including plate impoundment, were applied for first offenders for BACs of .20 or higher. Would these stronger actions reduce recidivism rates below that which would be expected based on BAC?

The primary tests of this hypothesis are based on comparisons among first offenders, those with BACs of .17-.19 versus those with BACs of .20-.22 with vehicle plate impoundment versus those with BACs of .20-.22 without evidence of impoundment. Hypothetically, it might be expected that the .17-.19 group would show slightly less recidivism than the other groups since their BAC at time of arrest was slightly lower. Alternatively, if the enhanced actions were effective, then the .20-.22 group with impoundment would show less recidivism (see also McCartt and Northrup, 2003).

Findings for BAC/Impoundment are summarized in Table 19. Statistically significant findings for the other factors are discussed in the text. The anchor value for BAC/Impoundment (i.e., the category set to 1.00 to which other categories are compared) was established as the category .20-.22 with impoundment. Values given in the table are odds ratios (ORs). Values above 1.0 mean that the likelihood of recidivism is higher for offenders in the specific BAC/Impoundment category than for offenders in the category of .20-.22 with impoundment. Odds ratios below 1.0 mean that the likelihood of recidivism is lower than in the category of .20-.22 with impoundment.

Following each OR are its 95% confidence limits. For example, for first offenders at the 3-month cutoff, offenders with BACs of .16 or less were 1.451 times as likely to have recidivated than offenders with BACs of .20-.22 whose plates were impounded. The 95% confidence interval, from 1.090 to 1.930, is broad, but since it does not include 1.0 the effect is statistically significant. All odds ratios that are statistically significant ($p < .05$) are shown in bold type.

Recidivism rates for first-time offenders with BACs of .20-.22 and plate impoundment were lower than all other groups, with most differences statistically significant. Recidivism for low-BAC offenders was similar but showed higher recidivism early and lower by the end of 3 years; odds ratios from 1.7 after 1 month to 0.9 after 3 years. Odds ratios for offenders with similar BACs (.17-.19) but who did not qualify for enhanced actions declined from 2.3 after 1 month to nearly 1.4 after 1 year and 1.1 after 3 years, all statistically significant. Odds ratios for offenders with BACs of .20-.22 without impoundment were similar, 2.5 after one month declining to 1.3 after 1 year and nearly 1.2 after 3 years, all statistically significant.

Odds ratios for offenders with higher BACs, .23 and above, were very high for those without impoundment, from 2.7 after 1 month to 1.5 after 1 year and 1.3 after 3 years, all significant; for offenders with very high BACs and plate impoundment, odds ratios were somewhat less but still elevated, ranging from 1.9 after 1 month to 1.3 after 1 year and nearly 1.2 after 3 years. Offenders who refused the tests were most likely to recidivate; their odds ratios were 2.7 for the first month and gradually declined to 1.7 for the first year and more than 1.3 after 3 years; all were significantly greater than 1.0.

Results for the factors not shown in Table 19 are straightforward. Females showed lower recidivism than males, with odds ratios increasing from 0.61 to 0.73 from 1 month to 3 years, all significantly less than 1.0. Recidivism gradually declined with age; after 1 year, odds ratios declined from 1.3 for offenders ages 21-24 to 0.43 for offenders age 65 and older. There were no differences in recidivism across areas of the State. Recidivism was less during 2001-2003 than 1998-2000, with the odds ratios for 2001-2003 steady at about 0.89 across the four time periods; due to the shortened data retrieval period for 2001-2003, comparisons between the years beyond 1 year are not valid.

For repeat offenders, there was less difference in actions for those above .20 and those below .20; all repeat offenders could have their vehicle plates impounded, but those with lower BACs or who refused the test had an administrative license removal (ALR) period of 6 months while those with higher BACs had an ALR period of 12 months. Odds ratios across BAC categories were much closer to 1.0 than those seen for first offenders. Offenders with BACs of .17-.19, with the shorter ALR period, were slightly but significantly more likely to recidivate at 1 year. Again, repeat offenders who refused the test had the highest recidivism odds ratios, averaging about 1.5 for the first four cutoff periods, dropping to 1.3 after 3 years, statistically significant for all but the 1-month cutoff.

As with first offenders, male repeat offenders showed higher rates of recidivism than females for all cutoff time periods, with the odds ratio for female repeat offenders 0.73 after 1 year. The youngest repeat offenders had the highest recidivism odds ratios, there was a steady decline in odds ratios with increasing age, and the oldest offenders had the lowest rates of recidivism. Odds ratios after 1 year ranged from 1.2 for offenders age 21-24 to 0.27 for those age 65 and older.

Table 19. Multivariate Survival Analysis – Recidivism: DWI to Subsequent DWI, 1998-2003

First Offenders		1-Month Cutoff			3-Month Cutoff			6-Month Cutoff		
	Total	Events: 608			Events: 1,757			Events: 3,414		
BAC-Refuse	Cases	OR	95% Limits		OR	95% Limits		OR	95% Limits	
≤ .16	55,078	1.669	0.993	2.807	**1.451**	1.090	1.930	1.192	0.990	1.437
.17-.19	18,400	**2.329**	1.365	3.975	**1.918**	1.426	2.578	**1.532**	1.261	1.861
.20-.22, impnd	**4,927**	--			--			--		
.20-.22, not impnd	4,883	**2.521**	1.383	4.596	**1.941**	1.377	2.737	**1.465**	1.158	1.853
≥ .23, impnd	3,581	1.898	0.971	3.709	**1.522**	1.034	2.241	**1.343**	1.035	1.741
≥ .23, not impnd	3,767	**2.731**	1.468	5.080	**2.259**	1.587	3.215	**1.731**	1.358	2.207
Refused	10,823	**2.748**	1.590	4.748	**2.688**	1.990	3.630	**2.184**	1.791	2.664
	101,459									

First Offenders (cont'd)		1-Year Cutoff			2-Year Cutoff			3-Year Cutoff		
	Total	Events: 6,613			Events: 11,884			Events: 15,319		
BAC-Refuse	Cases	OR	95% Limits		OR	95% Limits		OR	95% Limits	
≤ .16	55,078	1.037	0.915	1.175	0.926	0.848	1.012	**0.881**	0.816	0.951
.17-.19	18,400	**1.356**	1.189	1.547	**1.180**	1.074	1.295	**1.125**	1.038	1.220
.20-.22, impnd	**4,927**	--			--			--		
.20-.22, not impnd	4,883	**1.305**	1.111	1.533	**1.188**	1.059	1.334	**1.156**	1.046	1.277
≥ .23, impnd	3,581	**1.325**	1.113	1.578	**1.190**	1.048	1.350	**1.168**	1.047	1.303
≥ .23, not impnd	3,767	**1.518**	1.284	1.796	**1.372**	1.216	1.548	**1.296**	1.166	1.440
Refused	10,823	**1.678**	1.464	1.923	**1.409**	1.278	1.554	**1.341**	1.232	1.460
	101,459									

Repeat Offenders		1-Month Cutoff			3-Month Cutoff			6-Month Cutoff		
	Total	Events: 415			Events: 1,164			Events: 2,094		
BAC-Refuse	Cases	OR	95% Limits		OR	95% Limits		OR	95% Limits	
≤ .16	22,348	1.099	0.780	1.548	1.066	0.862	1.317	1.077	0.920	1.261
.17-.19	9,762	0.952	0.640	1.416	1.092	0.861	1.386	1.151	0.965	1.372
.20-.22	6,608	--			--			--		
≥ .23	6,191	1.020	0.663	1.569	1.233	0.955	1.593	**1.260**	1.040	1.525
Refused	13,843	1.389	0.978	1.973	**1.569**	1.267	1.944	**1.514**	1.289	1.778
	58,752									

Repeat Offenders (cont'd)		1-Year Cutoff			2-Year Cutoff			3-Year Cutoff		
	Total	Events: 4,022			Events: 8,092			Events: 10,858		
BAC-Refuse	Cases	OR	95% Limits		OR	95% Limits		OR	95% Limits	
≤ .16	22,348	1.069	0.954	1.198	1.007	0.932	1.089	0.950	0.889	1.016
.17-.19	9,762	**1.159**	1.021	1.315	1.087	0.995	1.186	1.052	0.977	1.133
.20-.22	**6,608**	--			--			--		
≥ .23	6,191	**1.220**	1.061	1.401	**1.241**	1.128	1.364	**1.185**	1.093	1.284
Refused	13,843	**1.523**	1.356	1.710	**1.383**	1.276	1.498	**1.309**	1.223	1.401
	58,752									

Offenders age 21 and older, known gender. Odds Ratios in bold type are statistically significant, $p < .05$.

Driving While License Suspended

Also examined was the occurrence of "driving while (license) suspended" violations (DWS) for DWI offenders. DWS violations within the first months after a DWI are evidence that offenders were driving, without a valid license, while the lack of such violations could indicate that the offenders significantly reduced their driving – or at least were driving in ways less likely to draw the attention of law enforcement.

Cumulative DWS offenses (the first DWS offense tabulated following a DWI offense) by offender sex and DWI violation years are shown in Table 20. Males were more likely to commit DWS violations at all time periods. About 9% of males were cited for DWS within a year after a first DWI offense, compared to about 6% of females; values were consistent across the 9-year data analysis period. DWS "recidivism" for repeat DWI offenders, by contrast, decreased over the 9 years. More than 13% of male repeat offenders were cited for DWS within a year after their DWI in 1995-1997; this dropped to less than 10% in 2001-2003. For females, the comparable figures were nearly 11% in 1995-1997 and just over 7% in 2001-2003.

Table 20. Gender and Cumulative "Recidivism" to Subsequent Drive-While-Suspended, Initial DWI Offense 1995-2003

Lag to (first) next DWS	1995-1997		1998-2000		2001-2003	
	Male	Female	Male	Female	Male	Female
First Offenders						
≤ 30 days	1.2%	0.8%	1.5%	0.8%	1.3%	0.9%
≤ 3 months	3.9%	2.5%	4.2%	2.7%	4.0%	3.1%
≤ 6 months	6.4%	4.3%	6.5%	4.4%	6.3%	5.0%
≤ 9 months	8.0%	5.6%	8.1%	5.4%	7.8%	5.9%
≤ 1 year	9.4%	6.3%	9.3%	6.1%	9.0%	6.7%
≤ 2 years	12.7%	8.7%	12.5%	8.1%	11.7%	8.5%
≤ 3 years	14.9%	10.2%	14.6%	9.5%	12.9%	9.3%
All	20.9%	14.8%	17.9%	11.9%	13.2%	9.5%
Total N	38,062	11,371	43,113	13,336	38,514	12,764
Repeat Offenders						
≤ 30 days	1.6%	1.1%	1.2%	0.8%	1.0%	0.6%
≤ 3 months	4.9%	3.8%	3.8%	2.5%	3.0%	2.2%
≤ 6 months	8.3%	6.7%	6.7%	4.9%	5.7%	4.3%
≤ 9 months	10.9%	9.0%	8.8%	6.5%	7.8%	5.9%
≤ 1 year	13.5%	10.8%	10.9%	8.1%	9.7%	7.3%
≤ 2 years	20.7%	15.0%	17.2%	12.1%	14.2%	10.5%
≤ 3 years	25.8%	18.5%	21.9%	14.5%	16.3%	12.2%
All	38.8%	29.8%	29.1%	19.8%	16.9%	12.8%
Total N	27,043	4,072	26,293	4,383	26,489	5,207

Shaded areas represent incomplete data due to time limitations.
Excludes Age ≤ 20 and Sex = Unknown; see text for discussion.

DWS violations occurred at about the same frequency as DWI recidivism violations, with one significant difference. DWS violations occurred more frequently soon after the initial DWI violation and became less frequent over time, while DWI recidivism occurred less often immediately after the first DWI but continued at a steady rate for as long as the data were tracked. This makes sense: DWS violations require that the offender's license is not valid, which is the case immediately after a DWI violation, when ALR withdrawal is in effect. On the other hand, the longer the period of time after the initial DWI, the more likely it is that the offender's license may have been reinstated, removing the opportunity for additional DWS violations.

DWS violations occurred at about the same rate for first and repeat DWI offenders during the first year, but after that they were more frequent for repeat offenders, possibly because the repeat offenders may have longer periods without a valid license or may be more likely to commit another offense which results in additional license suspension periods.

Table 21. Alcohol Test Results, Plate Impoundment, and Cumulative Subsequent DWS, Male First Offenders

Lag to (first) DWS	Alcohol Level by Impoundment							Total
	≤ .16	.17-.19	.20-.22		≥ .23		Refused	
			Impnd	Not/Unkn	Impnd	Not/Unkn		
1998-2000								
≤ 30 days	1.7%	1.3%	0.9%	0.3%	0.4%	0.4%	2.4%	1.5%
≤ 3 months	4.7%	3.5%	2.3%	2.7%	1.3%	1.4%	5.9%	4.2%
≤ 6 months	7.2%	5.7%	3.3%	5.0%	2.7%	2.4%	9.1%	6.5%
≤ 9 months	8.9%	6.8%	4.5%	6.1%	3.3%	3.5%	11.1%	8.0%
≤ 1 year	10.2%	8.0%	5.4%	7.5%	4.2%	4.2%	12.8%	9.3%
≤ 2 years	13.5%	10.6%	7.6%	9.9%	6.1%	6.5%	17.1%	12.4%
≤ 3 years	15.6%	12.3%	9.1%	12.1%	7.1%	8.1%	20.0%	14.4%
All	19.0%	15.0%	12.0%	15.2%	9.4%	11.6%	24.2%	17.7%
Total N	22,934	7,728	2,086	2,104	1,502	1,554	4,611	42,519
2001-2003								
≤ 30 days	1.6%	1.1%	0.6%	0.4%	0.5%	0.4%	1.8%	1.3%
≤ 3 months	4.7%	3.1%	1.9%	1.6%	1.7%	2.0%	5.2%	4.0%
≤ 6 months	7.2%	5.3%	3.2%	3.1%	2.6%	3.6%	7.8%	6.3%
≤ 9 months	8.7%	6.4%	3.8%	4.1%	3.2%	4.1%	10.1%	7.7%
≤ 1 year	9.9%	7.4%	4.7%	5.2%	3.9%	5.1%	11.8%	8.9%
≤ 2 years	12.6%	9.6%	6.2%	7.8%	5.7%	6.9%	15.3%	11.5%
≤ 3 years	13.8%	10.6%	7.3%	8.8%	6.2%	7.5%	17.3%	12.7%
All	14.2%	10.9%	7.5%	9.2%	6.3%	7.7%	17.6%	13.0%
Total N	20,900	6,625	1,704	1,702	1,266	1,354	4,255	37,806

Shaded areas represent incomplete data due to time limitations.
Excludes Age ≤ 20

Cumulative DWS offenses are shown by BAC/refused status in Table 21 for male first offenders and in Table 22 for female first offenders. DWS violations were most frequent for DWI violators who refused BAC testing. After that, offenders with the lowest BACs were most likely to be charged with DWS; the occurrence of DWS violations steadily decreased as the BAC level rose.

Harsher penalties including vehicle plate impoundment were associated with the lowest levels of subsequent DWS violations for male first offenders throughout the 6 years. Females also seemed to have fewer DWS violations after plate impoundment in 1998-2000, but the effect disappeared in 2001-2003.

Table 22. Alcohol Test Results, Plate Impoundment, and Cumulative Subsequent DWS, Female First Offenders

Lag to (first) DWS	Alcohol Test Results by Impoundment							Total
	≤ .16	.17-.19	.20-.22		≥ .23		Refused	
			Impnd	Not/Unkn	Impnd	Not/Unkn		
1998-2000								
≤ 30 days	0.9%	1.0%	0.8%	0.0%	0.0%	0.0%	0.9%	0.8%
≤ 3 months	2.9%	2.9%	1.8%	1.6%	0.5%	0.8%	3.6%	2.7%
≤ 6 months	4.7%	4.5%	2.5%	3.0%	1.6%	2.5%	6.6%	4.4%
≤ 9 months	5.8%	5.4%	2.7%	4.0%	2.0%	2.7%	8.2%	5.4%
≤ 1 year	6.5%	6.1%	3.3%	4.7%	2.0%	3.2%	9.4%	6.1%
≤ 2 years	8.6%	7.8%	5.3%	6.6%	3.3%	4.2%	11.3%	8.0%
≤ 3 years	10.0%	9.3%	6.5%	7.4%	4.0%	4.7%	13.0%	9.4%
All	12.5%	11.7%	8.3%	9.6%	6.5%	6.5%	15.9%	11.8%
Total N	6,860	2,556	734	699	550	527	1,268	13,194
2001-2003								
≤ 30 days	1.1%	0.8%	0.3%	0.4%	0.2%	0.2%	1.2%	0.9%
≤ 3 months	3.5%	2.9%	1.8%	1.6%	0.5%	1.1%	3.6%	3.1%
≤ 6 months	5.5%	4.5%	3.1%	2.3%	1.7%	2.2%	6.0%	4.9%
≤ 9 months	6.4%	5.7%	3.8%	3.2%	2.2%	2.4%	7.2%	5.8%
≤ 1 year	7.2%	6.5%	4.1%	3.9%	2.7%	2.4%	8.2%	6.6%
≤ 2 years	8.9%	8.4%	5.6%	5.6%	3.6%	3.8%	11.3%	8.3%
≤ 3 years	9.7%	9.3%	6.1%	6.2%	3.9%	4.5%	11.8%	9.1%
All	9.9%	9.6%	6.4%	6.5%	4.1%	4.5%	11.9%	9.3%
Total N	7,022	2,264	610	569	415	449	1,208	12,537

Shaded areas represent incomplete data due to time limitations.

Excludes Age ≤ 20.

As shown in Table 23, younger drivers had the greatest incidence of DWS violations. DWS violations decreased steadily with increasing age of drivers, both within first offenders and within repeat DWI offenders. Levels of DWS were somewhat higher among repeat DWI offenders.

Table 23. Age and Cumulative Subsequent DWS, First DWI Offense 1995-2003

Lag to first DWS	Violator Age						Total
	21-24	25-34	35-44	45-54	55-64	65+	
First Offenders							
≤ 30 days	1.9%	1.4%	1.0%	0.7%	0.5%	0.4%	1.3%
≤ 3 months	5.6%	4.2%	3.0%	2.1%	1.4%	0.8%	3.8%
≤ 6 months	8.6%	6.6%	4.9%	3.4%	2.1%	1.3%	6.0%
≤ 9 months	10.4%	8.2%	6.1%	4.0%	2.5%	1.7%	7.4%
≤ 1 year	12.0%	9.5%	7.0%	4.7%	2.9%	1.8%	8.5%
≤ 2 years	15.6%	12.6%	9.3%	6.2%	3.9%	2.4%	11.2%
≤ 3 years	17.6%	14.2%	10.7%	7.0%	4.3%	3.1%	12.7%
Ever	19.7%	16.4%	12.5%	7.9%	4.7%	3.5%	14.5%
Total N	26,604	33,947	27,930	13,538	4,148	1,560	107,727
Repeat Offenders							
≤ 30 days	1.4%	1.1%	1.0%	0.6%	0.5%	0.8%	1.0%
≤ 3 months	4.3%	3.5%	3.0%	2.1%	1.5%	2.1%	3.2%
≤ 6 months	7.8%	6.4%	5.6%	4.1%	2.4%	2.9%	5.9%
≤ 9 months	10.4%	8.6%	7.4%	5.7%	3.6%	4.2%	8.0%
≤ 1 year	12.4%	10.8%	9.3%	7.1%	4.6%	5.0%	9.9%
≤ 2 years	17.8%	16.5%	14.6%	10.8%	7.1%	7.1%	15.0%
≤ 3 years	21.3%	19.8%	17.9%	13.3%	8.7%	8.2%	18.2%
Ever	24.7%	24.0%	21.9%	16.1%	9.8%	8.6%	21.9%
Total N	9,807	22,779	19,558	7,867	1,837	524	62,372

Excludes Age ≤ 20 and Sex = Unknown.

Survival Analysis of Factors Influencing Driving While Suspended

Cox Regression analyses of the time lag from the initial DWI event to the first subsequent DWS event were performed. BAC/refused and plate impoundment, driver gender and age, and urban/rural area were included in the analyses in the same manner as the survival analyses for DWI recidivism. The results are shown in Table 24. As before, odds ratios that are statistically significantly higher or lower than 1.0 are shown in bold type.

Among first offenders, drivers who refused BAC testing had the highest rate of DWS violations, with an odds ratio of 2.7 for the 1-year cutoff and 2.5 at 3 years (compared to BACs of .20-.22 with impoundment). Of those with measured BACs, DWS was most frequent at BACs of .16 or less (odds ratio of 1.9 at 1-year cutoff, 1.7 at 3 years), then at BACs of .17-.19 (odds ratio of 1.6 at the 1-year cutoff), then .20-.22 not impounded, and, least likely, offenders with BACs of .23 or higher. Results were similar for repeat offenders, except that offenders with BACs of .20-.22 had very low incidence of DWS in the first month, inflating the odds ratios for each other group for the 1-month cutoff analysis.

For first offenders, vehicle plate impoundment led to fewer DWS occurrences, both for offenders with BACs of .20-.22 and, to a lesser degree, of .23 and higher.

The analyses also showed: females had consistently lower incidence of DWS citations than males, with odds ratios near 0.7 for all time periods for first and repeat DWI offenders. DWS violations were at their greatest for drivers age 21-24 (odds ratios 1.2 – 1.3 for first and repeat offenders, compared to ages 25-34) and dropped consistently with increasing age. The decrease was greater for DWI first offenders. For ages 65 and above, first offenders had an odds ratio after 1 year of just 0.18, while repeat offenders had an odds ratio of 0.45. DWS violations were slightly but significantly less likely for 2001-2003 offenders than for 1998-2000 offenders.

Table 24. Multivariate Survival Analysis – "Recidivism": DWI to Drive-While-Suspended, 1998-2003

First Offenders		1-Month Cutoff			3-Month Cutoff			6-Month Cutoff		
	Total	Events: 608			Events: 1,757			Events: 3,414		
BAC-Refuse	Cases	OR	95% Limits		OR	95% Limits		OR	95% Limits	
≤ .16	55,078	**1.977**	1.422	2.748	**2.029**	1.666	2.472	**2.082**	1.772	2.446
.17-.19	18,400	**1.589**	1.121	2.251	**1.552**	1.259	1.913	**1.699**	1.433	2.014
.20-.22, impnd	**4,927**	--			--			--		
.20-.22, not impnd	4,883	0.586	0.340	1.011	1.103	0.841	1.446	**1.339**	1.083	1.655
≥ .23, impnd	3,581	**0.529**	0.281	0.996	**0.657**	0.463	0.933	0.845	0.650	1.100
≥ .23, not impnd	3,767	0.540	0.287	1.017	0.877	0.637	1.206	1.041	0.813	1.332
Refused	10,823	**2.846**	2.008	4.035	**2.735**	2.217	3.373	**2.807**	2.365	3.332
	101,459									

First Offenders (cont'd)		1-Year Cutoff			2-Year Cutoff			3-Year Cutoff		
	Total	Events: 6,613			Events: 11,884			Events: 15,319		
BAC-Refuse	Cases	OR	95% Limits		OR	95% Limits		OR	95% Limits	
≤ .16	55,078	**1.909**	1.674	2.177	**1.785**	1.597	1.996	**1.721**	1.552	1.907
.17-.19	18,400	**1.560**	1.357	1.792	**1.464**	1.301	1.647	**1.431**	1.283	1.596
.20-.22, impnd	**4,927**	--			--			--		
.20-.22, not impnd	4,883	**1.353**	1.140	1.606	**1.327**	1.147	1.535	**1.321**	1.155	1.511
≥ .23, impnd	3,581	0.835	0.674	1.035	0.866	0.724	1.036	**0.844**	0.714	0.997
≥ .23, not impnd	3,767	1.032	0.844	1.261	1.047	0.884	1.239	1.035	0.886	1.211
Refused	10,823	**2.705**	2.352	3.111	**2.552**	2.266	2.874	**2.503**	2.242	2.795
	101,459									

Repeat Offenders		1-Month Cutoff			3-Month Cutoff			6-Month Cutoff		
	Total	Events: 415			Events: 1,164			Events: 2,094		
BAC-Refuse	Cases	OR	95% Limits		OR	95% Limits		OR	95% Limits	
≤ .16	22,348	**3.347**	2.259	4.961	**2.116**	1.757	2.547	**1.938**	1.697	2.214
.17-.19	9,762	**2.247**	1.462	3.453	**1.560**	1.267	1.920	**1.400**	1.204	1.627
.20-.22	6,608	--			--			--		
≥ .23	6,191	1.202	0.711	2.031	0.854	0.655	1.112	0.846	0.701	1.021
Refused	13,843	**3.094**	2.061	4.643	**1.882**	1.548	2.289	**1.708**	1.484	1.966
	58,752									

Repeat Offenders (cont'd)		1-Year Cutoff			2-Year Cutoff			3-Year Cutoff		
	Total	Events: 4,022			Events: 8,092			Events: 10,858		
BAC-Refuse	Cases	OR	95% Limits		OR	95% Limits		OR	95% Limits	
≤ .16	22,348	**1.551**	1.408	1.708	**1.381**	1.279	1.492	**1.358**	1.266	1.456
.17-.19	9,762	**1.150**	1.028	1.285	1.047	0.958	1.144	1.054	0.972	1.143
.20-.22	**6,608**	--			--			--		
≥ .23	6,191	**0.791**	0.689	0.907	**0.819**	0.736	0.911	**0.832**	0.756	0.915
Refused	13,843	**1.511**	1.364	1.673	**1.519**	1.402	1.646	**1.554**	1.445	1.671
	58,752									

Offenders age 21 and older, known gender. Odds Ratios in bold type are statistically significant, $p < .05$.

IV. DISCUSSION

Reducing impaired driving and related crashes and injuries has been one of the most important highway safety goals. Measures, such as universally raising the minimum drinking age to 21, establishing per se laws with uniform cutoff levels (.10 and, now, .08), introducing administrative license suspension, and educating the public to view impaired driving as an unacceptable choice, have reduced impaired-driving fatalities while overall driving has been increasing.

Some efforts to reduce impaired driving and the crash and injury consequences have focused on vehicle-related penalties. Many drivers who have had their licenses taken away continue to drive. Removing their vehicles, however, is seen as adding a major obstacle to their continued driving and one which, perhaps, will cause drivers to choose alternatives to driving while impaired.

How to sanction vehicles has been addressed in different ways. Vehicle impoundment and forfeiture have practical limitations; the vehicle must be taken, stored, and accounted for. Ignition interlocks require an alcohol breath test prior to starting the vehicle. Equipment must be affixed to the vehicle, and the costs are substantial. A common problem with these kinds of vehicle sanctions is that the usage rates for eligible offenders historically have been approximately 10%, though research for ways to increase interlock usage is currently in progress.

Minnesota has gone through three recent iterations of vehicle plate impoundment. As implemented, plate impoundment is relatively easy to accomplish – it is first an administrative action initiated by the arresting police officer – and places only a limited burden upon the State, since impounded plates are simply destroyed. Since 1998, the sanction has been applicable to about half of all DWI arrestees in the State – all first-time offenders with BACs of .20 or more and all repeat offenders – and likely has been applied in about two-thirds of these cases.

The process in Minnesota is straightforward. When a DWI suspect is apprehended, arresting officers can check immediately by their in-vehicle computer whether the suspect is a repeat offender; in that case, plate impoundment applies. If the suspect is a first offender but takes a breath test which shows a BAC of .20 or greater, plate impoundment also applies. When vehicle plate impoundment is initiated, it is done by the arresting officer. At the time of the arrest, the officer physically removes the vehicle's plates and gives the suspect a paper form which allows a short time for driving while the suspect may appeal the impoundment. The plates are turned in and destroyed. In the rare case of a successful appeal, new plates are issued.

The current study examined driver records for all Minnesota drivers who had recorded a DWI offense. These records provided basic information on offenders, whether an offense was a first offense or repeat, and allowed linking to subsequent offenses to identify recidivism or, for these analyses, subsequent driving while the driver's privileges were suspended or revoked. Also examined, in a large sampling of cases, were paper records of vehicle plate impoundments; those records were linked to the driving records to identify exactly which DWI offenses included the implementation of vehicle plate impoundment.

There were several limitations to the study and its general applicability. First, there was a lack of precise information on the implementation of vehicle plate impoundment. The paper forms provided information about the initial impoundment action. There were no records available to track the length of time the vehicle was without plates, which is important because owners could get limited plates or dispose of the vehicle entirely. Although plate impoundment applied to all vehicles in which the offender had ownership interest, there is no information about whether plates were ever surrendered from those other vehicles. Also, not all plate impoundment forms could be coded, and the coding selection strategies used for most years unintentionally missed perhaps one quarter of the forms for first offenders and deliberately bypassed almost all forms for repeat offenders. Finally, the study examined the experiences in one north-midwest State, which had developed the plate impoundment laws effective during the study years over several preceding years, gradually getting key elements such as the legislature and the police to support the system. To the best of our knowledge, no other jurisdiction has yet followed this lead.

That said, this study confirms that the plate impoundment laws in Minnesota have been effective in reducing DWI recidivism. Between 1995-1997, before plate impoundment applied to some first and all second offenders, and 1998-2000, when it did, recidivism declined somewhat for all first offenders and by about 25% for repeat offenders over the first year after the DWI offense; the difference decreased but was still evident for at least 2 more years. In 2001-2003, when law changes extended the period of plate impoundment, recidivism continued to decline. Across all first offenders, recidivism in the first year dropped by more than 10% in 2001-2003 from 1998-2000. For repeat offenders, recidivism dropped by about 20% in that period.

Among first-time offenders, plate impoundment applied to those with BACs over .20. First offenders with BACs of .17-.19, the highest BACs without plate impoundment, had rates of recidivism about 20% higher (over 1 year) than first offenders with BACs of .20-.22, the lowest BACs with plate impoundment. This is counter to the overall pattern of increasing recidivism with increasing BAC values for the initial offense.

The difference was greatest in the months immediately after the DWI incident, when the plates had been removed. It decreased over time, though; cumulative recidivism beyond 3 years was virtually identical for the two groups. Thus it seems that plate impoundment is effective in reducing recidivism because it throws an immediate roadblock in the way of the offenders from repeating the impaired driving. When the roadblock of impoundment was removed, the .20-.22 BAC offenders reoffended at similar or slightly higher rates than did the .17-.19 BAC offenders.

One explanation for the difference in recidivism rates could have been that groups of drivers who don't recidivate, don't drive. We examined the frequency with which these DWI offenders received subsequent citations for driving while their licenses were withdrawn (DWS). There was not a direct, or one-to-one, relationship between DWI recidivism and DWS. Even though their licenses were withdrawn for shorter lengths of time, low-BAC first offenders were cited for DWS much more often than high-BAC offenders. Across categories of increasing BAC, the frequency of DWS steadily declined.

The effectiveness of the high-BAC actions varied by offender age. For first offenders ages 21-34, the enhanced high-BAC actions had a major impact on reducing their DWI recidivism. The high

actions had a much less pronounced effect, if any at all, on their frequency of DWS violations. For these younger offenders, their response to the enhanced actions seemed to be a reduction in driving while impaired but less reduction in overall driving, if any, than for any older age group. The significant impact of enhanced actions including plate impoundment is a very positive finding, for these younger offenders are seen as the ones most critical to reach for long-term safety benefits. The youngest offenders, those 21-24, also showed reduced recidivism if their plates had not been impounded; they received longer ALR and stronger post-adjudication sanctions. One possible explanation for the age differences is offered by Laapotti and Keskinen (2008). Examining fatal drink-driving and non-alcohol-related crashes in Finland, they concluded that most alcohol-involved younger male drivers had a risky driving style, while most alcohol-involved middle-aged males had a risky lifestyle and drinking problems. For this study, this suggests that VPI could result in the younger DWI offenders modifying their drink-driving behaviors even though they continued driving (resulting in less DWI recidivism along with the higher rate of DWS incidents), while older DWI offenders were less able to modify their behavior (resulting in relatively little impact of VPI).

Through direct coding of administrative plate impoundment records and linking them to DWI offenses, we estimate that the plates were actually impounded in about two-thirds of the cases where they should have been, possibly higher in 1998-2000, about equally to high-BAC first offenders and to repeat offenders. The administrative action was applied equally across offenders regardless of gender and, except for the oldest offenders, age. The overall likelihood of impounding qualified plates seems to be sensitive to the severity of the plate impoundment action. When the plate withdrawal period rose in 2001, there was a simultaneous drop in plate impoundments of about 10%.

Finally, one group of DWI offenders stood out in these analyses: Offenders who refused to take an alcohol level test. Their DWI recidivism rate was higher than all groups who took BAC tests, as first offenders and as repeat offenders. Among first-time offenders, “refusers” received fewer actions than did high-BAC offenders (longer license suspension, 1 year versus 180 days, but no plate impoundment), but their increased recidivism persisted for several years. For repeat offenders, those who refused testing received essentially the same actions as offenders who were tested; their level of recidivism was still higher, and it remained higher over several years. Test refusers also stood out for their very high rates of subsequent DWS violations, as first offenders and as repeat offenders.

Plate impoundment, as implemented in Minnesota, works. While the plate impoundment was in effect for high-BAC categories of offenders, it led to reduced DWI recidivism. It also led to reduced subsequent DWS violations, suggesting that drivers whose plates had been impounded drove somewhat less and drove after drinking somewhat less. Vehicle plate impoundment should be considered by other jurisdictions seeking a practical and effective way to reduce drinking and driving.

It is important to ensure that administrative actions that are authorized are actually carried out. Minnesota has implemented it in about two-thirds of applicable cases, a ratio that seems to have been relatively stable over time, though somewhat sensitive to the length of the plate impoundment period. This rate of use is much, much higher than the rate of application, in other

jurisdictions, for other vehicle actions such as vehicle impoundment or forfeiture or ignition interlocks. Minnesota has been careful in designing the program to make it easy for officers to determine whether the action is applicable and for them to administer. The State has also included appeal procedures and hardship alternatives in the program. However, the result is still less than 100% application. It would be useful to determine what factors have kept the program from being implemented in all cases. This kind of analysis would identify conditions under which impoundment presents an extreme burden, as well as examine how individuals and families cope with the impoundment order. It would also result in improved procedures for obtaining higher degrees of application, and serve as support and practical guidelines for other jurisdictions to consider such a program.

DWI recidivism returns to a pattern somewhat independent of the actions after the periods of license withdrawal and plate impoundment are over. Offenders with higher BACs tend to recidivate more, and offenders who refuse to be tested recidivate most. More needs to be done, perhaps something like permanent ignition interlock devices, to maintain a continuing intervention with DWI offenders as they resume licensed driving. Offenders who refuse to be tested already receive somewhat greater ALR actions, yet as a group they are still the most likely to recidivate; applying plate impoundment actions to them would be a reasonable next step.

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APPENDIX. DWI DRIVER LICENSE AND LICENSE PLATE ACTION TIMELINE

The table on the next page summarizes administrative vehicle plate and driver's license actions specified in Minnesota law for 1998 through the period of this study. Any changes to the law which may have occurred since that time are not reflected. Values are given by offense (first, second, etc.) and the results of the BAC test (or refusal).

Columns refer to the sequence of events that may take place, i.e., ALR and VPI at the time of the DWI incident and arrest, followed by when limited-use plates and license may become available, when the "turnaround" option is available after a guilty plea to restore the full vehicle plates and driver's license, when the drivers license may be restored absent "turnaround," and when vehicle plates may be restored.

Individual cells include the length of time after the DWI incident when the action or option happens or is first available to happen and some information about the event. For example, in the top left cell (ALR for a first offender with a BAC $\leq$ .19), ALR happens on the day of the event (Day 1) and lasts for 90 days. In that same column, a limited license (for driving to and from work, for example) is available after 15 days. After a guilty plea, the full license could be restored after only 30 days ("turnaround"). Absent "turnaround," the full license could be restored after the 90 day ALR period expired; restoring the license cost $250 plus a surcharge which varied from $40 to $430 over the years covered.

Several of the "Plate reinstatement available" cells include the time specification of "Day 365+lag"; this refers to the fact that, under this condition, plates may be reinstated the first time after a full year in the month when the plates would ordinarily be scheduled for renewal. This can be any time from the month when the year expires, in which case the plates could be reinstated exactly 1 year after the DWI incident, to the month before the year expires, in which case the reinstatement could be reinstated 1 year plus 11 months after the incident. Plate reinstatement carries a fee of $50.

Table A-1. Administrative Actions and Related Events, by DWI Number and Condition, Minnesota, 1998+

Sanction/ Event	First Offenders (65 %) [1]			Second Offenders (23 %) [1]		
	BAC <= .19%	BAC >= .20%	Refused	BAC <= .19%	BAC >= .20%	Refused
ALR	Day 1 (90 days) [2]	Day 1 (180 days)	Day 1 (1 year)	Day 1 (180 + rehab)	Day 1 (1 year + rehab)	Day 1 (1 year + rehab)
VPI (adminis-trative)	na	Day 1 (180 days 1998-2000/ 1 year+ 2001+)	na	Day 1 (1 year+)	Day 1 (1 year+)	Day 1 (1 year+)
Limited plate available	na	Day 1 ($50)	na	Day 1 ($50)	Day 1 ($50)	Day 1 ($50)
Limited license available	Day 15	Day 30	Day 15	Day 90	Day 180	Day 180
"Turnaround" available [3]	Day 30	Day 60 (1998-2000 only)	Day 90	na	na	na
License reinstatement available	Day 90 ($250 + surcharge) [4]	Day 180 ($250 + surcharge) [4]	Day 365 ($250 + surcharge) [4]	Day 180 (+ rehab) ($250 + surcharge) [4]	Day 365 (+ rehab) ($250 + surcharge) [4]	Day 365 (+ rehab) ($250 + surcharge) [4]
Plate reinstatement available	na	Day 180 (1998-2000)/ Day 365+ lag (2001+) ($50)	na	Day 365+lag ($50)	Day 365+lag ($50)	Day 365+lag ($50)

Sanction/ Event	Third Offenders (8%) [1]			Fourth+ Offenders (4%) [1]		
	BAC <= .19%	BAC >= .20%	Refused	BAC <= .19%	BAC >= .20%	Refused
ALR	Day 1 (1 year + rehab)	Day 1 (2 years + rehab)	Day 1 (1 year + rehab)	Day 1 (2 year + rehab)	Day 1 (4 years + rehab)	Day 1 (2 years + rehab)
VPI (adminis-trative)	Day 1 (1 year+)	Day 1 (1 year+)	Day 1 (1 year+)	Day 1 (1 year+)	Day 1 (1 year+)	Day 1 (1 year+)
Limited plate available	Day 1 ($50)	Day 1 ($50)	Day 1 ($50)	Day 1 ($50)	Day 1 ($50)	Day 1 ($50)
Limited license available	Day 90	Day 180	Day 180	Day 90	Day 180	Day 180
"Turnaround" available [3]	na	na	na	na	na	na
License reinstatement available	Day 365 (+ rehab) ($250 + surcharge) [4]	2 years+1 day (+ rehab) ($250 + surcharge) [4]	Day 365 (+ rehab) ($250 + surcharge) [4]	2 years+1 day (+ rehab) ($250 + surcharge) [4]	4 years+1 day (+ rehab) ($250 + surcharge) [4]	2 years+1 day (+ rehab) ($250 + surcharge) [4]
Plate reinstatement available	Day 365+lag ($50)	Day 365+lag ($50)	Day 365+lag ($50)	Day 365+lag ($50)	Day 365+lag ($50)	Day 365+lag ($50)

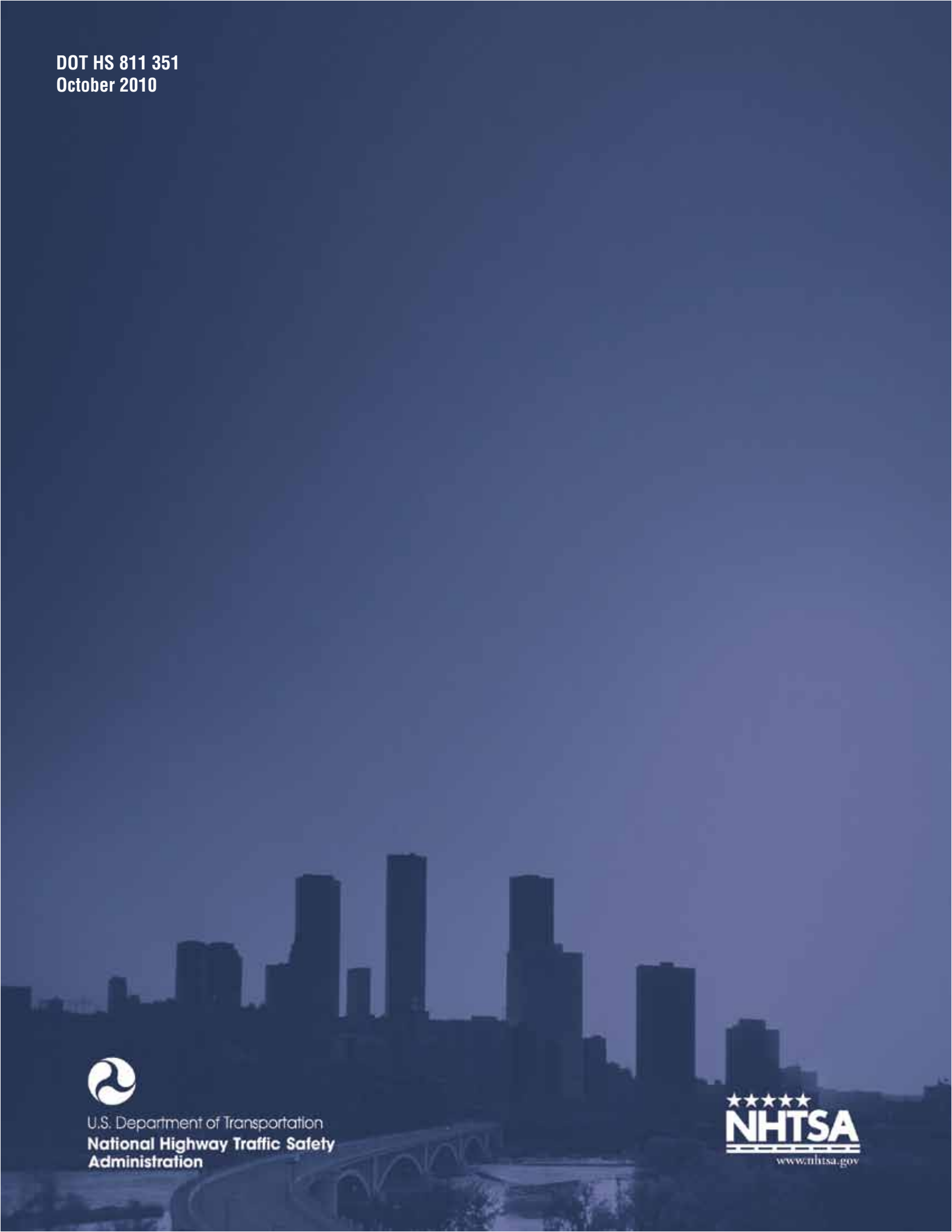
[1] Proportions of Minnesota DWIs, 1998-2002.

[2] Cell entries are length of time after the offense when the sanction/event becomes possible and event features.

[3] "Turnaround" was a conviction feature which allowed license and plate reinstatement earlier than the end of the administrative suspension periods.

[4] The surcharge went from $40 to $145 on July 1, 2001, and to $430 on July 1, 2002.

DOT HS 811 351
October 2010



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