

## Roadside Drug Testing in New South Wales

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### Abstract

Drug driving is widely acknowledged as an international challenge for road safety. In NSW, *per se* legislation introduced in December 2006 stipulates that a driver may be charged with an offence if the presence of delta-9-tetrahydrocannabinol (THC), methylamphetamine, or methylenedioxymethylamphetamine (MDMA) is detected in oral fluid during roadside testing by Police. Positive samples are confirmed by NSW Health Division of Analytical Laboratories. Between January 2007 and December 2010, 83928 roadside drug tests were conducted in NSW, resulting in 1645 positive results. This paper documents the trends in enforcement levels of roadside drug testing in NSW from 2007-2010. Characteristics of offenders including age, gender, licence class, and licence status are examined. Characteristics are reported for light vehicle drivers/riders and heavy vehicle drivers. Methylamphetamines were found to be the most frequently detected drug for the four years of roadside testing. The overall detection rate of drugs fell from 2.7% in the first year of operations and has remained constant at 1.9% in subsequent years. Results are discussed in terms of deterrence theory and future directions for roadside drug testing.

**Keywords:** drug, drug driving, drug testing

### Introduction

Driving under the influence of psychotropic drugs has emerged as a major concern for the safety of road users in most developed nations. This concern has resulted in the need for policy formulation and the development of legislation to protect road users and deter drug driving where possible. *Per se* Legislation banning the presence of specified drugs in bodily fluids of vehicle controllers was first adopted in Australia by Victoria in December 2003 to conduct an initial trial of random roadside drug testing. Legislation for roadside drug testing (RDT) was passed in NSW in December 2006 to supplement existing laws for driving under the influence of drugs (DUI). All Australian jurisdictions now have legislation allowing roadside drug testing, although in the Northern Territory this is restricted to heavy vehicle drivers. The Australian Capital Territory only recently commenced roadside drug testing in May 2011.

### Investigating the prevalence and impact of drug driving

Drug driving (i.e. drugs other than alcohol) has been studied using various methods to quantify:

- the prevalence of drug driving in the general population (e.g. roadside drug testing or self-report surveys);
- the prevalence of drug driving in drug user populations (e.g. self-report surveys);
- cognitive performance (e.g. effects on attention in experimental studies);

- driving / psychomotor performance (e.g. lane control in simulator studies, open road, or closed track driving);
- driver culpability for crashes (e.g. drug positive fatal crash cases vs drug-free fatal crash cases); or
- crash risk (e.g. case control studies).

An examination of 3398 road fatalities throughout New South Wales, Victoria, and Western Australia over a ten year period found that 23.5% of deceased vehicle controllers tested positive for drugs other than alcohol [1]. This included illicit drugs, prescription drugs, and over the counter medication. The study examined culpability for crashes (as determined from coronial data) for drivers with drugs in their system compared to those that were drug free. Drivers testing positive to Delta-9-tetrahydrocannabinol (THC, the active constituent in cannabis) at 5ng/ml or greater were found to be 6.6 times more likely to be culpable for the crash than drug free drivers. Other drugs such as prescription or over the counter medications were found to increase the culpability for a crash by 3.8 times. A mix of various drugs with alcohol was common, particularly the combination of THC and alcohol which had an additive effect on crash culpability. Of note is that 23% of truck drivers were found to have stimulants present in their bodies and were found to be 8.8 times more likely to be culpable for the crash than drug free cases. Across all drug and vehicle types, controllers aged under 25yrs or over 65yrs were found to represent the greatest risk. Similarly, younger and older drivers were found to represent the greatest risk from drug driving in a South Australian study of injured drivers [2].

The 2007 National Drug Strategy Household Survey [3] sampled 23356 participants aged 14yrs or older from the general population. It found that 2.9% of respondents indicated they had driven while under the influence of an illicit drug in the past 12 months. This is a decrease from the 2004 findings of 3.3%. For males, the 2007 finding was 4.2%, down from 4.8% in 2004. The Australian Drug Foundation found that the most common drugs used prior to driving (self-reported use) were cannabis, amphetamines, analgesics and benzodiazepines [4].

In 2008, the NSW Roads and Traffic Authority (RTA) conducted a study that examined the prevalence of drug driving among drug users (rather than the general population). The study also assessed how the introduction of roadside drug testing (RDT) legislation impacted on recreational drug users' knowledge, attitudes and behaviours [5]. The rate of self-reported drug driving decreased from 4 per cent in 2003 to 3.6% in 2008. This represented a considerable decrease in the number of drug users self-reporting drug driving. Eighty percent of recreational drug users surveyed were aware that police had the ability to conduct RDT and over 60 per cent of drug users indicated that it had decreased the likelihood they would drug drive. It was noted that a public education strategy in support of police roadside drug driving enforcement activities may enhance the deterrence effect, particularly for drivers 17-29 years of age.

#### Current NSW drug driving legislation and drug testing procedures

The NSW *Road Transport (Safety and Traffic Management) Act 1999* specifies that police may charge vehicle controllers or supervising drivers who:

- 1) test positive for the *presence* of a ‘prescribed illicit drug’ during roadside oral fluid testing, or when blood or urine is tested;
- 2) test positive to the presence of morphine or cocaine in blood or urine samples; or
- 3) are *under the influence* of any drug when driving (DUI – e.g. blood and urine samples are taken for all controllers involved in fatal crashes).

For roadside drug testing (RDT), a ‘prescribed illicit drug’ is defined as:

- Delta-9-tetrahydrocannabinol (THC), the active component of cannabis;
- Methylamphetamine, also known as speed, ice, crystal meth or base; or
- Methylenedioxymethylamphetamine (MDMA), also known as ecstasy.

For roadside testing, vehicle controllers are required to undertake an initial roadside screening test using the Securitec Drugwipe II twin oral fluid testing device. If positive to the screening test, a confirmatory roadside oral fluid test using Cozart RapiScan is conducted. Driving is immediately prohibited for up to 24 hours if the vehicle controller tests positive on the Cozart test or where any vehicle controller refuses or fails to provide an oral fluid sample. All positive roadside samples from the screening tests are sent to the NSW Health Division of Analytical Laboratories (DAL) for confirmation. Roadside testing for prescribed illicit drugs is usually undertaken by trained officers in specialist vehicles due to the conditions required to preserve evidence (samples must be stored under appropriate conditions). Penalties for the first offence are a maximum fine of \$1100 and disqualification from driving for a minimum of three months to a maximum of six months.

For DUI, a charge of “*use or attempted use of a motor vehicle under the influence of alcohol or any other drug*” is initiated. This may be when a driver shows signs of erratic driving and other behavioural signs of impairment in the absence of a positive breath test when stopped. The charge may also be initiated where police suspect that drug driving may have contributed to a crash. Under this charge police escort the suspect to a hospital for collection of blood and urine samples. All controllers in fatal crashes in NSW are also drug tested at a hospital.

### Research aims and scope

This paper aims to identify the characteristics of those who have tested positive at RDT operations and the proportion of particular drugs detected. These details are examined for heavy vehicle drivers and other vehicle driver/riders and trends in the data over the past four years identified. This paper *does not* include details of DUI offences or fatal crashes relating to drug driving.

### **Method**

Data relating to the number of RDT operations, tests conducted, and tests positive at the roadside (using Cozart) are provisionally reported to the RTA each month by NSW Police. Data for the period January 2007 to December 2010 (inclusive) was examined for this study.

In addition, a separate data set for roadside drug tests that were confirmed as positive at DAL for the same period was requested from NSW Police. Of those who tested positive at the state laboratory, the following data was provided:

- age;

- gender;
- licence status;
- licence class;
- state licensed issued;
- vehicle type;
- vehicle mass; and
- drug type.

The number of negative tests from those referred to the state laboratory (i.e. false positives) was not obtained. The data were de-identified before provision to the RTA to maintain the anonymity of offenders.

Police indicated that recidivist offenders were not specifically flagged in the data (i.e. no offence history recorded in the data set), therefore repeat offenders could not be identified. Other constraints with the data were the lack of postcode of residence (although licence state was provided in lieu) and whether offenders also tested positive to alcohol or not.

## Results

Findings presented in this section focus on details of roadside drug testing operations, the frequency of positive tests relating to each prescribed illicit substance (from DAL), and the characteristics of offenders.

### Numbers tested in RDT operations

Between January 2007 and December 2010, NSW Police conducted 355 specialist roadside drug testing operations across the state, resulting in 83928 roadside drug tests, with 1646 of these being positive (2%) at the roadside using Cozart. Tests were conducted for heavy vehicle drivers (18301 tests, 1.2% positive) and light vehicle drivers and riders (65627 tests, 2.2% positive). Notably, the percentage positive was lower for heavy vehicle drivers than for light vehicle drivers and riders.

As shown in Table 1, the number of tests performed increased substantially each year. The number of tests performed during 2010 represented a five-fold increase since 2007. In the first year of roadside drug testing operations the percentage of tests returning a positive result was the highest of all years, with the percentage then dropping and remaining stable through subsequent years.

Table 1. *Numbers of roadside drug tests and controllers testing positive at the roadside for any prescribed illicit substance for light vehicle (LV) and heavy vehicle (HV) controllers<sup>1</sup>*

Vehicle	2007		2008		2009		2010	
	Tests	Pos	Tests	Pos	Tests	Pos	Tests	Pos
LV	3552	114 (3.2)	16610	344 (2.1)	19977	432 (2.2)	25488	529 (2.1)
HV	2882	60 (2.1)	3754	47 (1.3)	4907	48 (1.0)	6758	71 (1.1)
<b>All</b>	<b>6434</b>	<b>174 (2.7)</b>	<b>20364</b>	<b>391 (1.9)</b>	<b>24884</b>	<b>480 (1.9)</b>	<b>32246</b>	<b>600 (1.9)</b>

<sup>1</sup>Figures in brackets denote percentages

The vast majority of roadside drug testing operations were conducted at night. For example, of the 122 specialist operations conducted in 2010, 18 were conducted in daylight hours and 104 were conducted at night.

Operations were conducted in country and metropolitan regions across the state. The proportion of each varied across the four years. For example in 2007, 28% of operations were in metropolitan areas compared to 61% in 2010. All targeted heavy vehicle operations were conducted in country regions, generally at RTA facilities such as heavy vehicle checking stations.

Frequency of each drug detected in laboratory testing

The frequency of drugs detected each year rose in accordance with the increase in the number of tests performed. For the entire sample, methylamphetamine was detected most frequently (44%), with THC detection only marginally lower (41%), and ecstasy detected the least (15%). However, during 2009-2010, THC was the most frequently detected substance (47%). It must be noted that some offenders tested positive to more than one drug in the laboratory tests (where the roadside tests are not as sensitive). Polydrug use was found to be present in 31% of cases.

Table 2 shows the detections for each drug each year for heavy vehicle controllers and light vehicle controllers. For light vehicle controllers, THC was the most frequently detected drug, followed by methylamphetamine, then ecstasy. For heavy vehicle drivers, methylamphetamine was most commonly detected, followed by THC, then ecstasy. This indicates that the use of stimulants remains the key issue for this group. These figures must be considered in the context of the increased number of tests performed each year. For example, 2882 roadside tests were performed for heavy vehicle drivers in 2007, while 6758 were performed in 2010. Therefore, with this in mind, there has been some success in reducing drug driving by heavy vehicle drivers.

Table 2. *Proportion of positive tests by drug type each year for light vehicle and heavy vehicle controllers*

	2007	2008	2009	2010	All years
<b>Heavy Vehicles</b>					
Methylamphetamine %	85	74	74	79	<b>78</b>
THC – cannabis %	10	12	15	20	<b>14</b>
MDMA – ecstasy %	5	14	11	1	<b>8</b>
	100	100	100	100	<b>100</b>
<b>Light vehicles</b>					
Methylamphetamine %	48	41	32	43	<b>40</b>
THC – cannabis %	33	35	47	52	<b>44</b>
MDMA – ecstasy %	19	24	21	5	<b>16</b>
	100	100	100	100	<b>100</b>

Characteristics of drug driving offenders

The age of offenders for the entire sample ranged from 16 to 64 years ( $M = 31$  years). Table 3 shows a breakdown of age by drug type each year for samples testing positive at DAL. Note, that each age category does not include the same amount of years. Comparisons across age groups must therefore keep this in mind. Overwhelmingly, the 16 to 25 year and 30 to 39 year age groups accounted for the highest proportion of drug driving offenders (31.9% and 29.8% respectively). There were very few drug driving offenders aged 60 years or over. The mean age for heavy vehicle drivers was 40 years. Three quarters of all heavy vehicle drivers were aged 30-50 years.

Across drug types, driving after taking ecstasy is more common among the younger age group (16 to 25yrs) than the other drugs. For 2007-2009 the youngest age group was responsible for half the offences for ecstasy. This pattern changed in 2010 with a sharp decline in the number of offences relating to ecstasy among this age group. For those testing positive to THC, more than one third of the sample was consistently aged 25 years or under, and more than half the sample aged under 30 years except for 2010 (46.6%). Those testing positive to methylamphetamine were generally marginally older than for the other drug types: only around a quarter were aged 25 years or younger, except for a slight rise in 2008 (29.3%). Around a third each year was found to be aged 30-39 years.

Table 3. *Percentage of offenders in each age category for each drug type each year*

Year	Drug	Age					
		16-25	26-29	30-39	40-49	50-59	60+
2007	Methylamphetamine	25.3	11.5	30.9	27.3	5.0	-
	THC – cannabis	42.5	12.1	30.2	15.2	-	-
	MDMA – ecstasy	51.4	18.9	18.9	10.8	-	-
2008	Methylamphetamine	29.3	20.4	31.3	15.1	3.9	-
	THC – cannabis	33.7	24.6	26.5	12.3	2.4	0.5
	MDMA – ecstasy	51.0	23.1	18.2	7.0	0.7	-
2009	Methylamphetamine	24.4	20.3	32.5	17.9	4.9	-
	THC – cannabis	34.7	21.1	30.2	11.7	2.3	-
	MDMA – ecstasy	53.7	19.7	22.0	3.8	0.8	-
2010	Methylamphetamine	23.5	16.4	34.3	21.1	4.1	0.6
	THC – cannabis	33.5	13.1	30.2	17.0	5.6	0.6
	MDMA – ecstasy	32.2	19.3	35.5	6.5	6.5	-

Males were considerably more likely to be detected drug driving than females, with 83% of all offences committed by males where gender was known. Table 4 shows the percentage of detections for males for each drug across the entire sample. There is a trend evident for the increasing proportion of offences by females for driving after using stimulants across the years, particularly ecstasy. Heavy vehicle drivers were all male except for one female.

Table 4. *Percentage of male offenders for each drug detected*

Drug	2007	2008	2009	2010
Methylamphetamine % male	88.6	81.7	82.6	77.4
THC – cannabis % male	82.5	84.5	88.3	81.8
MDMA – ecstasy % male	88.9	79.6	76.9	71.0

For licence status (where known), 94.5% of drug driving offenders had valid licences and 5.5% were unlicensed (disqualified, suspended, expired, or never licensed). Of the valid licence holders, 60% held an unrestricted (full) licence, 17% held a P2 provisional licence, 11% held a P1 provisional licence, and 1% held a learner licence<sup>1</sup>.

<sup>1</sup> 11% of licence class not recorded

Table 5 shows the proportion of active licences held by jurisdiction for drug driving offenders testing positive at DAL. While, as expected, the vast majority of licences held were from NSW, more than 10% were held in either Queensland or Victoria. Of the Queensland licence holders, 45% of the known types of vehicles were heavy vehicles (GVM 4.5 tonnes or over). Of the Victorian licence holders, 80% of the known types of vehicles were heavy vehicles (GVM 4.5 tonnes or over). This is in comparison to 5% of NSW licence holders that tested positive being heavy vehicles drivers (where vehicle mass was known). These results reflect the nature of NSW being a key national freight haulage link between states.

Table 5. *Jurisdiction of licensing*

NSW	ACT	QLD	VIC	SA	WA	TAS	NT	O'Seas
86.9%	1.0%	5.8%	4.7%	0.8%	0.3%	0.2%	nil	0.3%

While motorcyclists only represented 1% of the overall sample that tested positive at DAL, the data was interrogated to identify characteristics for this group. Overall, 17 motorcycle riders were identified as testing positive for drugs. From these 17 riders, 13 tested positive to methylamphetamine, 8 tested positive to THC, and one tested positive to ecstasy. As the roadside testing data does not identify how many tests were actually conducted for motorcyclists or other categories of light vehicle controllers, it remains unknown if they are detected (positive) at a lower or higher rate than drivers. The overall low numbers of motorcyclists detected possibly reflects that most motorcycling is undertaken during daylight hours when a lower proportion of roadside drug testing operations are conducted. The age of motorcyclists ranged from 23-52 years ( $M = 39$  years). They were all male.

## Discussion

Little has been previously reported by road transport agencies in Australia to show how many drug driving offences occur, or the nature of such offences. This is due to the relatively short time that roadside drug testing programs have been in operation in this country. Hence, findings of this study provide useful information for policy development in the area of drug driving throughout Australia.

This paper did not aim to compare which of the three prescribed illicit drugs results in greater risk for road users. However, the findings do indicate that methylamphetamine is detected more frequently in comparison to the other drugs, with cannabis detected at marginally lower levels. Stimulant users may be tempted to drive after taking the drugs as they may feel alert and not recognise specific signs of impairment while the drug is active. Additionally, the use of stimulants by long haul heavy vehicle drivers to work longer hours is well recognised in previous research. The findings from this study provide evidence that there has been a reduction in the detection rate of stimulants for heavy vehicle drivers since the commencement of RDT in NSW.

Ecstasy (MDMA) was generally detected in this study at a far lower rate than either methylamphetamine or cannabis. In particular, this appears to be the case in 2010 when a sharp decline occurred in the detection of ecstasy from RDT operations. It appears that this decline is mainly related to the 16-25 year old group. The decline is difficult to directly attribute to any particular factor. Upon follow-up, Police confirmed

that there was no distinct change in their approach to operations that should dramatically affect the detection rate of ecstasy. A report by the University of NSW National Drug and Alcohol Research Centre [7] indicated that ecstasy use and availability has only slightly declined in recent years among regular drug users (albeit with a limited sample size in their series of reports). However, the report does note that the purity of ecstasy in NSW has decreased recently and that 'caps' actually often contain methylamphetamine, or the purity of ecstasy is diluted with other substances. The report also noted that arrests in NSW for possession of ecstasy declined during 2010. Therefore, drug driving after using ecstasy may have decreased during 2010 due to a decrease in the use of the drug, with some potential that a minority of the detections for methylamphetamine during 2010 may have been from people using what they thought was ecstasy. Future drug driving data needs to be examined to determine if the 2010 findings are an anomaly or if the decline found for the detection rate for ecstasy is maintained.

Findings from this study can be compared to previous research from South Australia for the roadside drug testing operations conducted in that state [8]. The South Australian research presented on the first 12 months of operations, therefore smaller numbers were involved in that study. While the same drugs are tested for in both jurisdictions, a generally higher detection rate was found in the South Australian study than in this study (2.9% vs 2.0% respectively). However, some similarities in the data between studies are evident. The detection rate and pattern of detection for the three drugs in the South Australian study was strikingly similar to the first year of results presented in this study (i.e. 2007), with the exception of higher number of ecstasy cases in NSW. Specific targeting of areas of high cannabis use by NSW Police in subsequent years may have resulted in the higher proportion of cannabis detected after the first year. The proportion of polydrug detection was also similar across both studies. This is disconcerting as the effect of drugs may be additive in some cases.

A review of the first year of the Western Australia roadside oral fluid testing program was conducted in 2009 [9]. The same three drugs were tested for as in the current study. Additionally, similar to findings from this current study and the South Australian study, methylamphetamine was found to be the most frequently detected drug. They also found that around one third of positive tests at the state laboratory involved polydrug use. Overall, drugs were detected in just over 5% of all tests in Western Australia, a far higher rate than that found in the present study. Notably, they found that the confirmatory roadside device used, the Cozart DDS, lacked sensitivity compared to the laboratory testing.

Deterrence for drug driving is one aim of RDT, and deterrence effects arguably have the greatest potential for broad scale reductions in drug driving. General deterrence for drink driving, operationalised through random breath testing (RBT), has been extremely effective to date in Australia. This has been based on the principles of ubiquity (highly overt operations), uncertainty (e.g. anywhere, anytime), and the perception of meaningful penalties. Roadside drug testing operations in NSW similarly employ the principle of ubiquity, with highly visible drug testing vehicles. However, there are far fewer RDT operations than RBT. Additionally, promotion of RBT is relatively high through media campaigns. Research by the RTA in 2008 [5] found that 80% of drug users were aware of roadside drug testing and self-report

less drug driving following the first year of RDT operations in NSW. This is supported by the findings of this study that show a reduction in the detection rate from 2.7% in 2007 to 1.9% in 2008. Collectively, this information suggests that RDT has been effective to date in NSW. While the audience for drug driving messages is not as broad as drink driving, targeted education may increase the deterrence of drug driving in NSW.

### Limitations

The findings must be interpreted with several things in mind. Firstly, roadside drug testing is not conducted across all geographical locations in the state nor at all times of the day. The findings are therefore, to some extent, a reflection of the operational planning by police to detect drug driving offences. Secondly, not every person who is pulled over at RDT operations is tested for drugs. This is due to the cost of testing and police must exercise some discretion as to how resources are best allocated. Hence, the findings may partially reflect those who police suspect are more likely to be driving after taking drugs. Thirdly, if police find that a person returns a positive Blood Alcohol Concentration (BAC) if breath tested, they may not choose to conduct further testing for drugs. Hence, the rate of drug driving may be somewhat under-reported.

### Conclusion

The findings of this study show that roadside drug testing has been successful in NSW. Continued investment in enforcement efforts are needed to maximise the road safety benefits. While the detection rate has remained constant over the past three years, increased levels of testing are detecting more offenders each year. Hence, this provides support for further increased testing in the future. This should also result in increased deterrence, particularly if accompanied by targeted media campaigns. Additionally, future advances in technology may enable more sensitive testing for the current prescribed illicit drugs and, additionally, may allow testing for other drugs, resulting in greater road safety benefits.

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