

## The relationship between petrol theft and petrol prices

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*In NSW there has been a sharp increase in the incidence of fraud at service stations in recent years. More than four out of five of these incidents are related to petrol theft. Typically, a person fills a car's tank with petrol and then drives off without paying. Over the same period, the price of petrol has also increased considerably. This paper shows that there is a strong correlation between higher petrol prices and the increase in petrol theft. Also associated with the increased theft of petrol is an increase in the incidence of number plate theft.*

### INTRODUCTION

In the 24 months to June 2006 there was a significant increase in the incidence of fraud recorded at service stations in New South Wales.<sup>1</sup> Over this period the number of such incidents recorded by police rose by 33 per cent from 9,163 incidents in 2004/05 to 12,201 incidents in 2005/06. Figure 1 shows the incidence of service station fraud over the eight years from April 1998 to June 2006. This figure shows that the offence has increased considerably over this period, and that the increase accelerated in the twelve months to June 2006. See appendices for information on who the perpetrators are (Appendix 1), when the offences occur (Appendix 2) and which areas of NSW have high rates of service station fraud (Appendix 3).

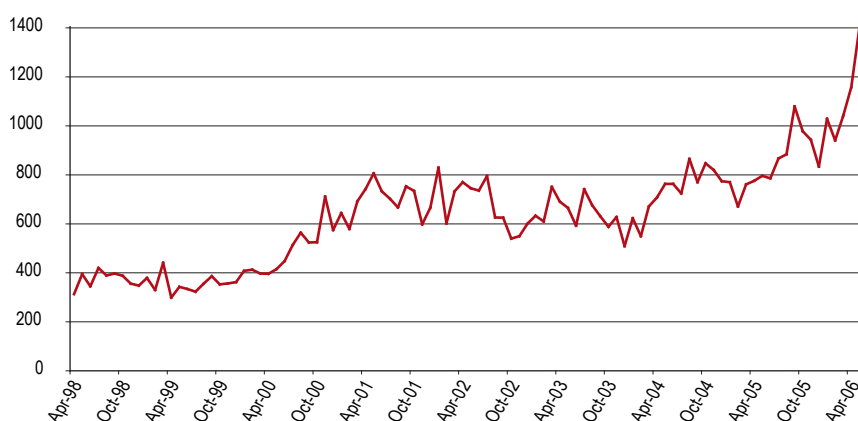
In 2002 Chilvers found that fraud occurring at service stations overwhelmingly involved the theft of petrol. We have confirmed that this is still the case by reviewing the objects described by police as involved in recent incidents of service station fraud. Among

incidents of service station fraud occurring in 2005, 83 per cent involved petrol or another fuel. In a typical incident a person fills up a car with petrol, having no intention to pay for it, and then drives away. The 17 per cent of service station fraud incidents not related to petrol are predominantly associated with credit card fraud.

The upward trend in the theft of petrol is contrary to the general downward trend in other property crimes. In the five years to June 2006 NSW recorded significant decreases in the incidence of robbery, break and enter, motor vehicle theft and stealing offences (NSW Bureau of Crime Statistics and Research 2006).

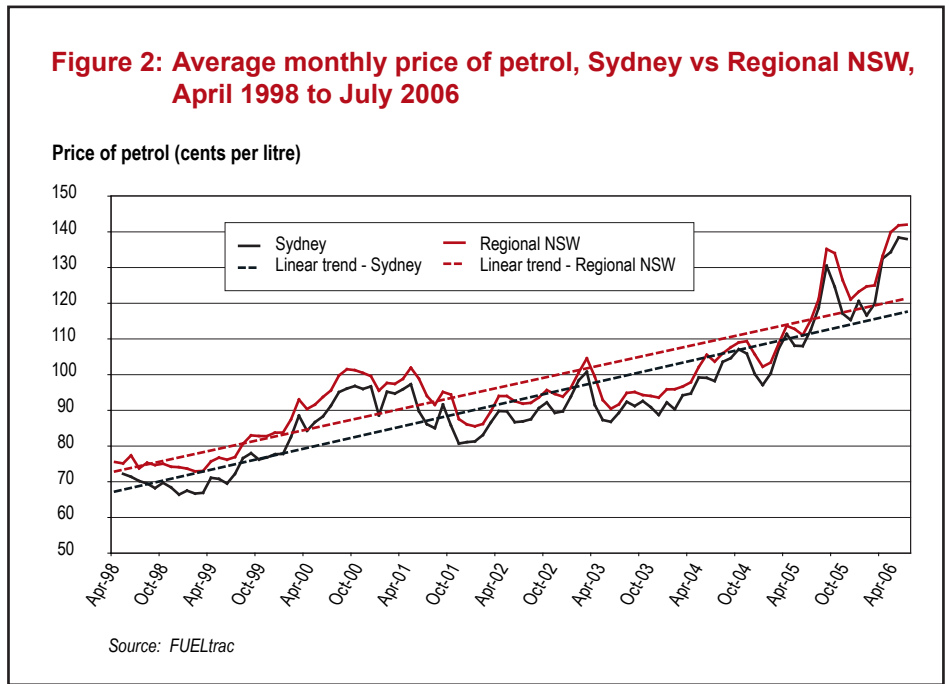
**Figure 1: Recorded incidents of service station fraud, NSW, April 1998 to June 2006**

Number of incidents of service station fraud



Source: NSW Police recorded crime data held by the NSW Bureau of Crime Statistics and Research

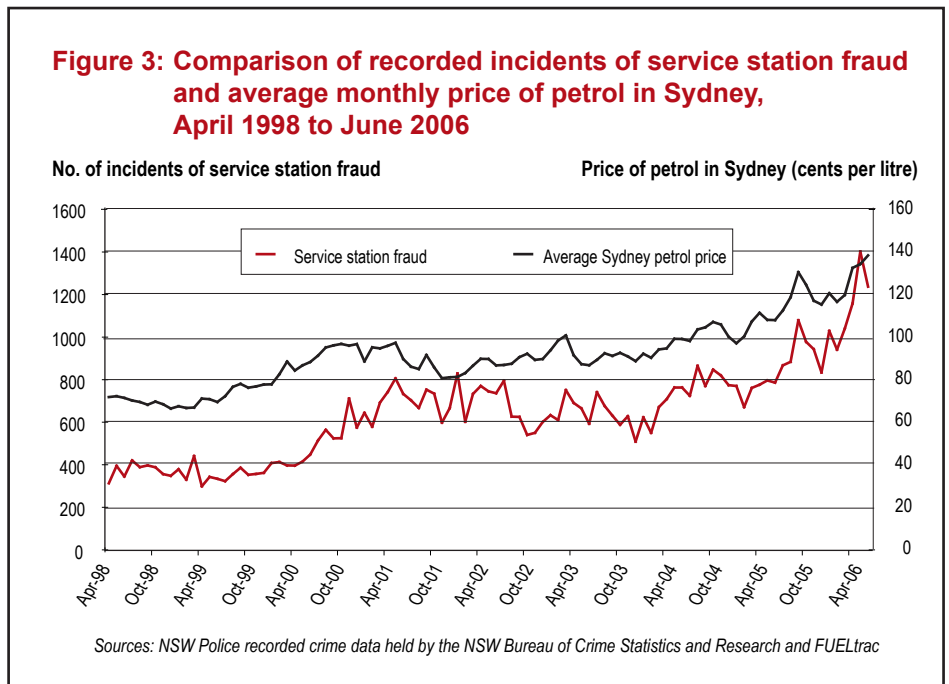
This raises the question of why the theft of petrol is increasing while other types of theft are falling. A relevant consideration here is the fact that the price of petrol has increased considerably since 1998. Figure 2 shows the average price of petrol in Sydney and the rest of NSW from April 1998 to June 2006. It can be seen that the average monthly price of petrol<sup>2</sup> has nearly doubled since 1998 with the sharpest rises recorded in early 2000, early 2003, the first three quarters of 2005 and the second quarter of 2006. The linear trend lines show that the regional monthly price remains on average five to ten cents a litre above the Sydney metropolitan monthly price and a correlation coefficient around 0.99 suggests the two series track each other very closely.



This paper will consider the relationship between the increase in the cost of petrol and the incidence of petrol theft.

**COMPARING PETROL PRICES AND PETROL THEFT**

Figure 3 shows the number of recorded incidents of service station fraud by month and the average monthly price of petrol in Sydney on the same figure. The two series appear to mirror each other closely and the same upward and downward patterns are reflected. In some cases, isolated monthly peaks are represented on both series; see for instance the parallel spikes in both series in September 2005. The strong association between the series is supported by the correlation coefficient of 0.90.



A simple linear predictive model suggests that for every extra 10 cents per litre added to the average monthly petrol price, we can expect up to 120 extra reported incidents of service station fraud for that month in NSW.

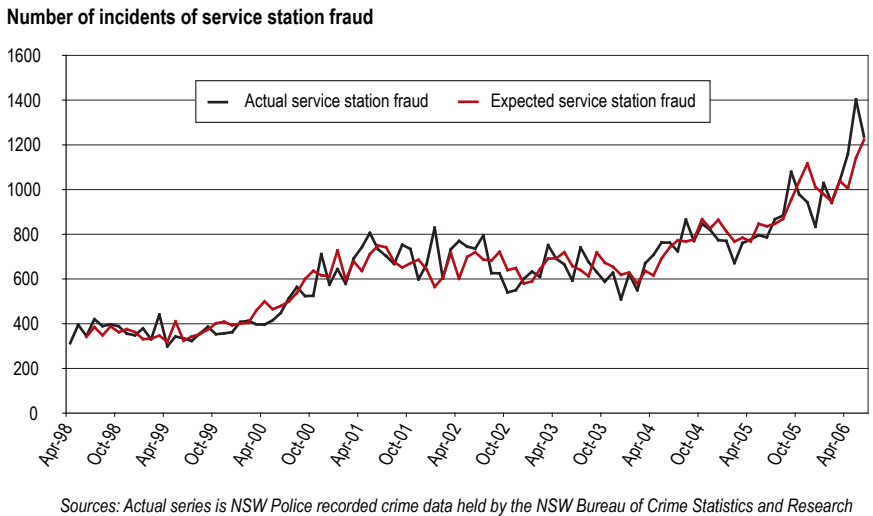
Figure 4 shows a basic predictive model for expected service station fraud plotted against the actual incidence of the offence. This simple model shows that service station fraud in any given month can be predicted from the average price

of petrol one month earlier.<sup>3</sup> The model predicts the incidence of petrol theft very closely. In fact using this technique we can explain around 90 per cent of the variability in reported incidents of service station fraud. The model predicts that if average monthly petrol prices reach \$1.70 per litre we can expect reported incidents of service station fraud to move close to 1,600 incidents per month for NSW.

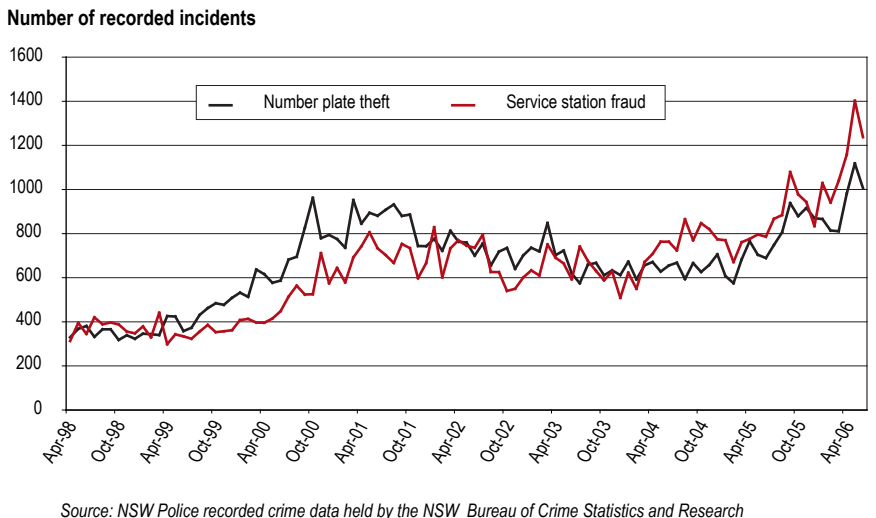
**THEFT OF NUMBER PLATES**

It is quite common for service stations to monitor their bowsers by CCTV. This can be a valuable tool in identifying vehicles that are filled up with petrol and driven off without paying. One method used by offenders to avoid detection when stealing petrol is to attach stolen plates to their vehicle. The theft of number plates recorded by police has also increased

**Figure 4: Actual and expected number of recorded incidents of service station fraud, April 1998 to June 2006**



**Figure 5: Recorded incidents of number plate theft and service station fraud, April 1998 to June 2006**



significantly in the 24 months to June 2006 from 7,943 in 2004/05 to 10,752 in 2005/06, an increase of 35 per cent.

Figure 5 shows reported incidents of service station fraud and number plate theft on the same scale. It is clear from the graph and the correlation statistic of 0.80 that the association between the two offences is very strong.

## DISCUSSION

This brief look at the relationship between petrol prices and petrol theft suggests that the two are closely associated. For most people petrol is a necessary commodity for daily life. While a portion of petrol theft may be perpetrated by individuals who always steal their petrol, our analysis suggests that there is component of

petrol theft that is discretionary and is committed in response to external factors such as cost. The study suggests that high petrol prices present an increased incentive to steal which some members of the community succumb to rather than absorbing the extra expense. Similarly, it appears that these individuals are prepared to purchase petrol legitimately when prices fall. It seems, therefore, that at least a proportion of the people who perpetrate petrol theft variously buy and steal petrol at different times.

The connection between petrol theft and the theft of number plates is another noteworthy issue. It is easy to understand why acquiring stolen number plates would facilitate the untraceable theft of petrol. It is interesting, therefore, to see that that connection is well supported in statistics recorded by NSW Police. While number plates can be stolen for various reasons, the high correlation between the two crimes suggests that a component is directly related to petrol theft.

## RESPONDING TO PETROL THEFT

It has been suggested that petrol theft could be reduced by requiring customers to pay for their petrol before they fill their tanks (e.g. Chilvers 2002). In August 2006 NSW Police announced the introduction of a pre-paid fuel scheme to be trialled at selected service stations in Bankstown and Liverpool.

A potentially simple strategy exists for reducing the opportunity for number plate theft. Number plates can be affixed by special anti-theft number plate screws which cost less than five dollars. Once tightened, these screws cannot be removed using conventional tools.

## ACKNOWLEDGEMENTS

Our thanks to Victor Korabelnikoff and Derek Goh for assistance in the collection and validation of data for this publication.

**NOTES**

1. The incidence of fraud at service stations was measured by considering the number of criminal incidents of fraud recorded by NSW Police that occurred on the premises types service station or supermarket servo. The NSW Bureau of Crime Statistics and Research's fraud category includes the following police incident categories: deception offence, fail to pay, fraudulent misappropriation, make/use false instrument, larceny clerk/servant/bailee, counterfeit currency, possess false instrument, embezzlement, misappropriate cheque / funds, receiving (fraud related) and other fraud. The most common fraud incident category occurring at service

stations is fail to pay (66%) followed by deception offences (22%) and other fraud (10%).

2. Petrol prices referred to in this study relate to unleaded petrol. Prices for Sydney are the average monthly prices for the Sydney metropolitan area compiled by FUELtrac <[http://www.fueltrac.com.au/fuel\\_prices\\_1.cfm](http://www.fueltrac.com.au/fuel_prices_1.cfm)> and commissioned by the Australian Automobile Association <<http://www.aaa.asn.au/contact.htm>>. The Regional NSW prices were computed from FUELtrac data by taking the average of the mean monthly price in 58 NSW regional centres.

3. The complete prediction model was:  
 $SSF_{(t)} = a_0 + a_1Av. Sydney Petrol Price_{(t-1)} + a_2SSF_{(t-2)} + \epsilon_{(t)}$

SSF is the recorded incidence of service station fraud. The incidence of service station fraud two months earlier was included in the model to control for autocorrelation.

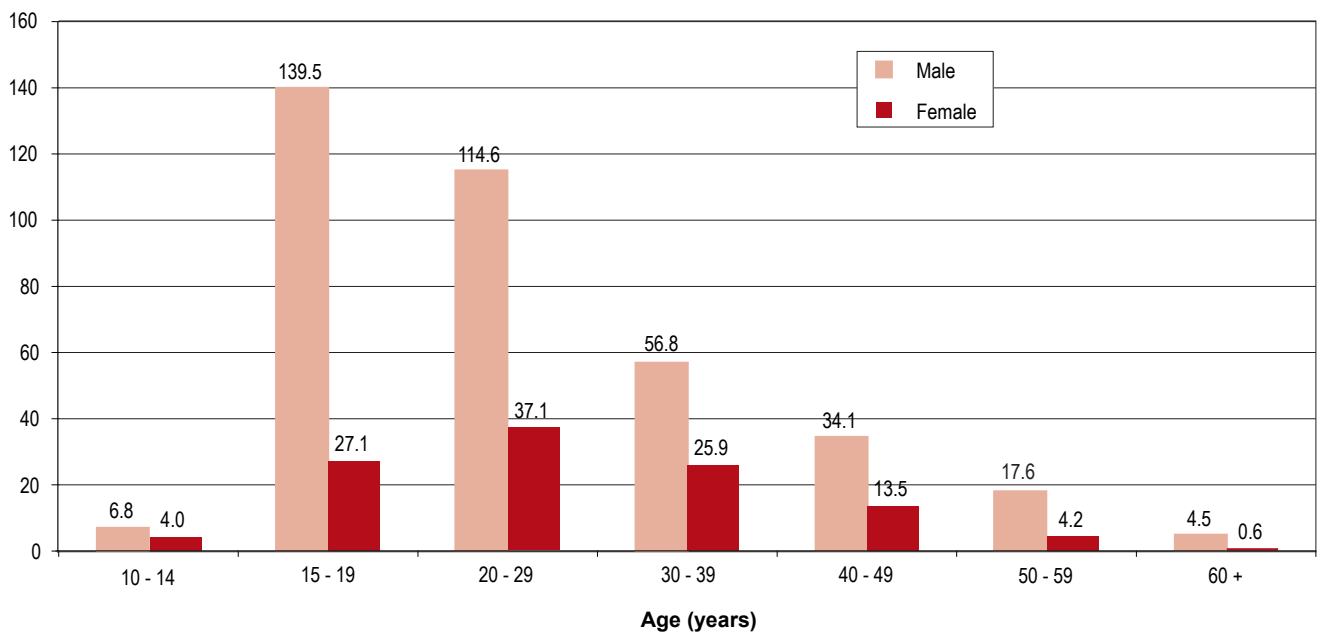
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Chilvers, M 2002, *What lies behind the growth in fraud?* Crime and Justice Bulletin Number 71, NSW Bureau of Crime Statistics and Research, Sydney.

NSW Bureau of Crime Statistics and Research 2006, *NSW Recorded Crime Statistics Quarterly Update June 2006*, NSW Bureau of Crime Statistics and Research, Sydney, <[http://www.lawlink.nsw.gov.au/lawlink/bocsar/ll\\_bocsar.nsf/vwFiles/NSW\\_SD\\_SSD\\_2006Qrt2.pdf/\\$file/NSW\\_SD\\_SSD\\_2006Qrt2.pdf](http://www.lawlink.nsw.gov.au/lawlink/bocsar/ll_bocsar.nsf/vwFiles/NSW_SD_SSD_2006Qrt2.pdf/$file/NSW_SD_SSD_2006Qrt2.pdf)>.

**Appendix 1: Persons of interest recorded by police in association with service station fraud, by age and gender, 2005/2006**

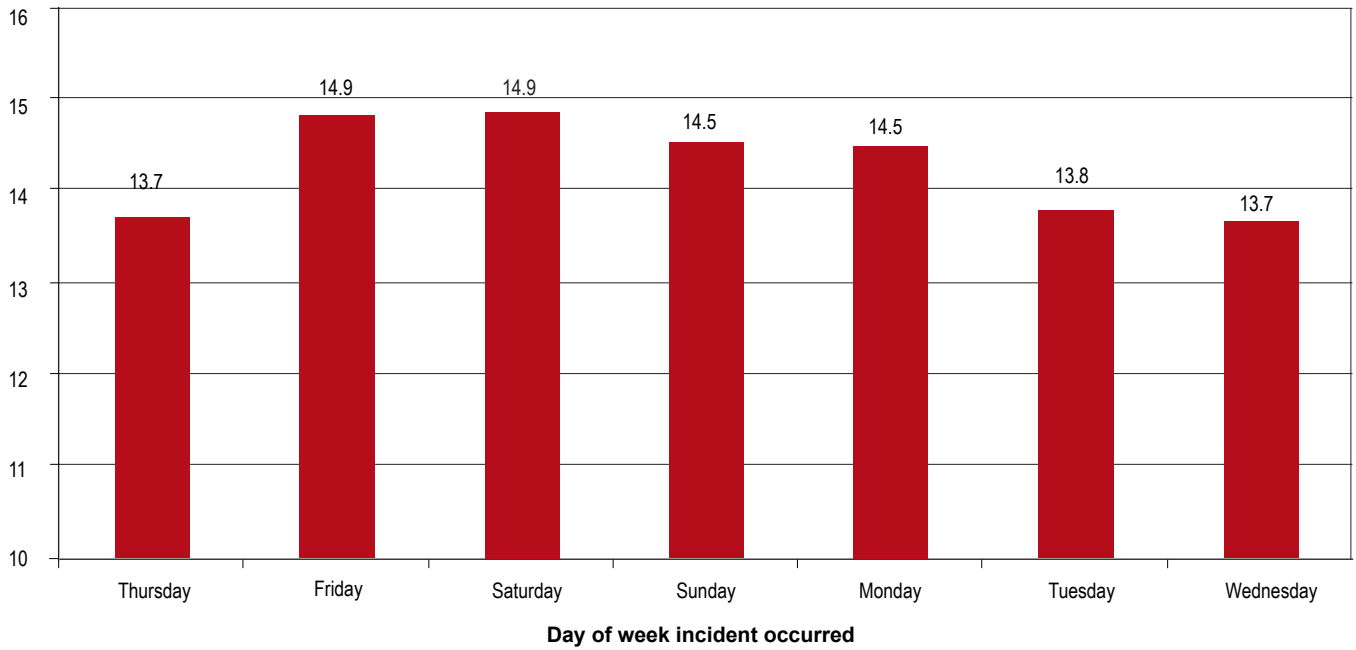
Rate of detection per 100,000 population



Source: NSW Police recorded crime data held by the NSW Bureau of Crime Statistics and Research

**Appendix 2a: Recorded incidents of service station fraud by day of week, 2005/06**

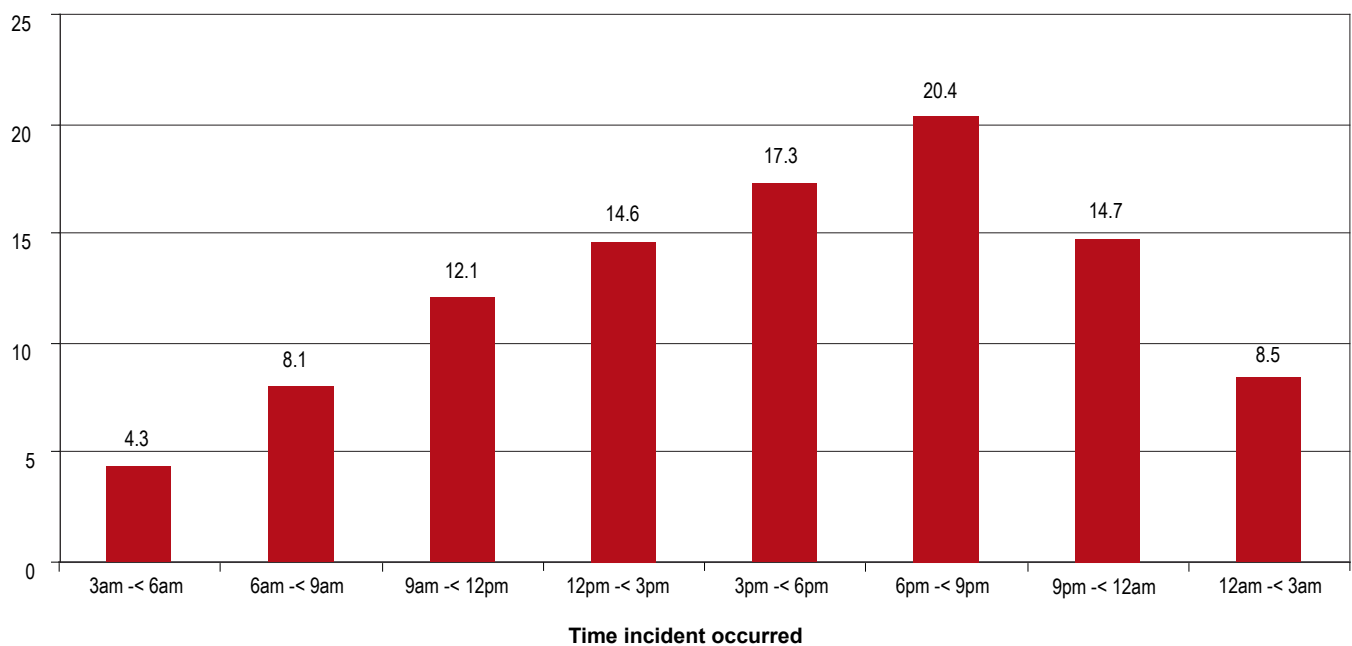
Percentage of incidents



Source: NSW Police recorded crime data held by the NSW Bureau of Crime Statistics and Research

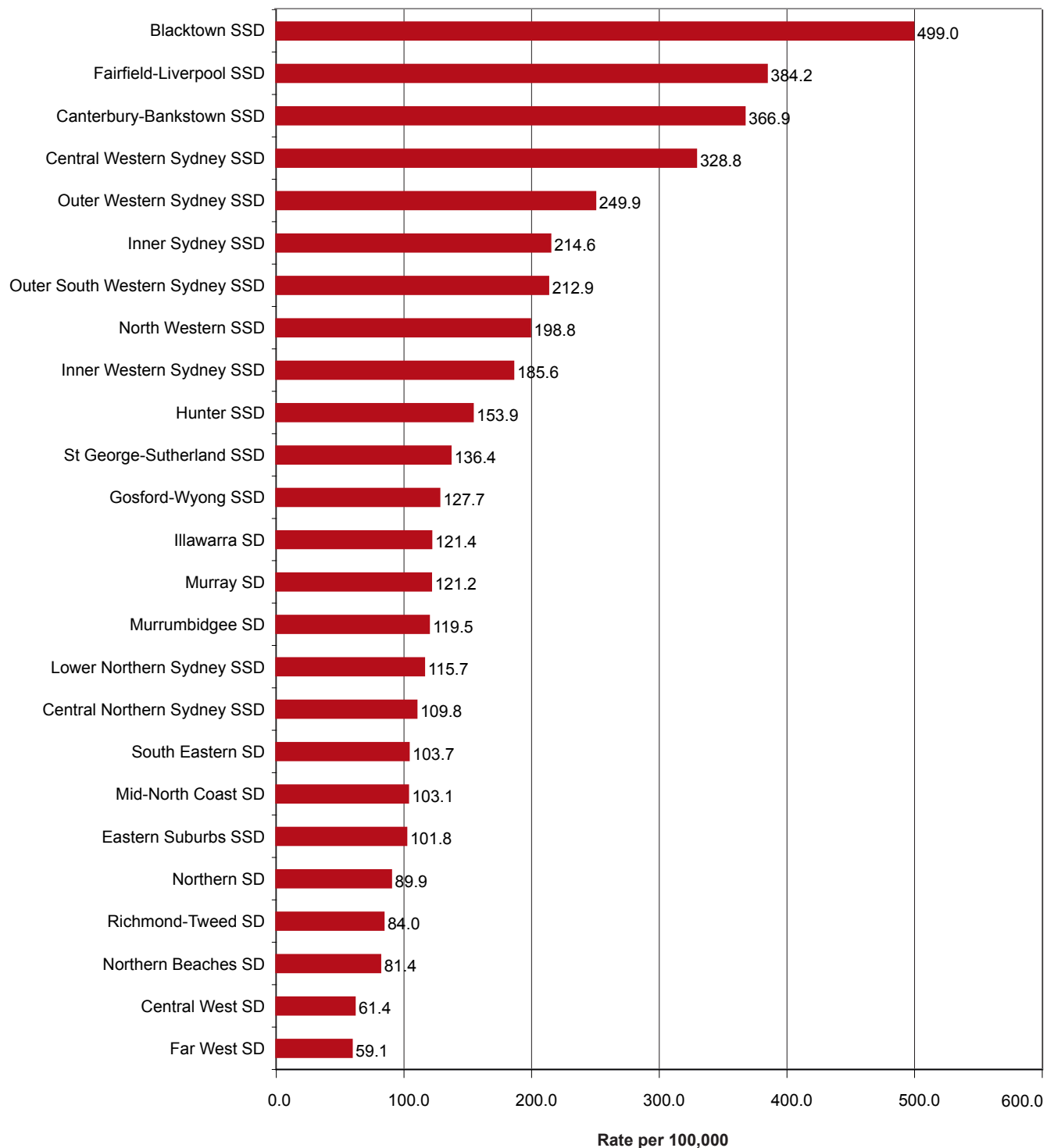
**Appendix 2b: Recorded incidents of service station fraud by time of day, 2005/06**

Percentage of incidents



Source: NSW Police recorded crime data held by the NSW Bureau of Crime Statistics and Research

**Appendix 3: Recorded incidents of service station fraud, rate per 100,000 population by region, 2005/06**



Note: This table shows Statistical Subdivisions (SSD) in Sydney and Statistical Divisions (SD) in the rest of NSW  
 Source: NSW Police recorded crime data held by the NSW Bureau of Crime Statistics and Research