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PATTERNS OF MOTOR VEHICLE THEFT

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with the assistance of

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and

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PREFACE

Last year more than 39,000 residents of New South Wales had their vehicle stolen. While many stolen vehicles are recovered intact the offence obviously still causes considerable inconvenience and hardship to a large number of New South Wales residents. When a stolen vehicle is either not recovered or is recovered damaged in some way, the inconvenience and hardship caused by the theft is compounded by financial loss. The financial loss may be felt first by insurance companies. In the long run, however, the costs borne by insurance companies end up factored into the premiums paid by all those who insure their cars.

As with all offences, the causes of motor vehicle theft are highly variable. Some individuals steal vehicles simply as a form of transport. Some steal vehicles in order to obtain the valuables left in those vehicles. Some steal vehicles in order to strip them for parts or resale. Others fraudulently report vehicles stolen in order to claim on their insurance. Given the variety of motives among those who commit car theft, vehicle theft rates are best reduced with a combination of strategies rather than any single strategy. The ideal prevention policy is one which works to reduce the incidence of each of the various forms of vehicle theft rather than just one form.

This report represents a consolidation of recent research conducted by the Bureau on vehicle theft. The opening section considers a variety of explanations for the sharp fall in vehicle theft rates experienced in New South Wales over the last few years. The sections which follow characterize and attempt to estimate the magnitude of the various types of vehicle theft. The report then concludes with a discussion of the various options for prevention and their likely impact on vehicle theft rates. The report findings should make a valuable contribution to the further development of vehicle theft prevention policy in New South Wales.

Dr Don Weatherburn
Director

September 1993

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This report would not have been possible without the generous assistance provided by the NSW Police Service and the National Roads and Motorists Association (NRMA). Both these organisations provided data: the police provided data from their Stolen Vehicle Index and the NRMA provided information on a sample of 100,000 insured vehicles.

As is the case with all Bureau reports, many Bureau staff made contributions to the final report. In particular, Jeanette Packer and Bronwyn Lind made many helpful comments on early drafts, and Les Kery was responsible for desktop publishing.

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1. INTRODUCTION

Vehicle theft is a common offence in New South Wales (NSW). In a typical week in NSW around 750 vehicles are stolen.¹ In 1991, the police recorded over 46,000 instances of vehicle theft, or about 1.6 per cent of the fleet of registered vehicles in 1991.² These instances of vehicle theft represented a large percentage of all recorded offences: vehicle thefts or illegal use of a vehicle accounted for almost 11 per cent of all recorded offences in NSW in 1991 (NSW Bureau of Crime Statistics and Research 1992a).

The total value of all these stolen vehicles would be very large if none were recovered. However, because many stolen vehicles are recovered, and sustain varying amounts of damage, the actual costs to the community of motor vehicle theft are somewhat less than the total value of the vehicles stolen. The National Roads and Motorists' Association (NRMA 1991a) estimated that the direct cost of vehicle theft to the NSW community was 226 million dollars in 1990. This estimate does not include other costs, such as those borne by the police who must record and follow up incidents of vehicle theft reported to them, or incidental costs incurred by the owner while a vehicle is recovered and repaired or replaced. To these costs must be added the costs of prosecuting those offenders who are arrested, and accommodating those who are found guilty and sentenced to gaol.

This report examines a number of aspects of motor vehicle theft in NSW. First, the report examines trends in motor vehicle theft. Then the general characteristics of the offence are described, the numbers of vehicles stolen for different purposes are estimated and the characteristics of different types of vehicle theft are considered. The different types of theft examined here are fraudulent thefts, theft for the acquisition of the whole vehicle or parts, and theft for transport or other temporary use.

The report then briefly examines the characteristics of known motor vehicle theft offenders. The final section considers the implications for crime prevention and discusses various policies for the prevention of vehicle theft.

2. TRENDS IN MOTOR VEHICLE THEFT

2.1 TRENDS ACROSS AUSTRALIA

Although vehicle theft in NSW represents a significant proportion of the Australian total for that offence, NSW is the most populous State, and has the largest number of registered vehicles. A comparison of the prevalence of vehicle theft in the Australian States is given in Figure 1, which shows rates of theft per 100,000 registered vehicles in each State in 1991-92. NSW ranks fourth behind Western Australia, the Northern Territory and South Australia in terms of the rate of vehicle theft. While the rates for the top four States are quite similar, the rate of vehicle theft in Western Australia is more than four times that of Tasmania.

2.2 THE DOWNWARD TREND IN NSW

Vehicle theft in NSW represents a significant problem but it is one which has declined significantly in recent years. Figure 2 shows trends in the frequency of vehicle thefts per annum in a number of States between 1974 and 1992. (At the time of writing no data were available for Tasmania or the Australian Capital Territory for the financial year 1991-92.) The figure shows that vehicle theft in NSW has declined from a peak of more than 64,000 in 1986-87 to just over 40,000 in 1991-92, a decline of 33.3 per cent. In contrast, vehicle theft numbers continued to increase between 1986-87 and 1990-91 in the other States before declining between 1990-91 and 1991-92.

Figure 1: Number of recorded motor vehicle theft offences per 100,000 registered vehicles, Australian States, year ending 30 June 1991³

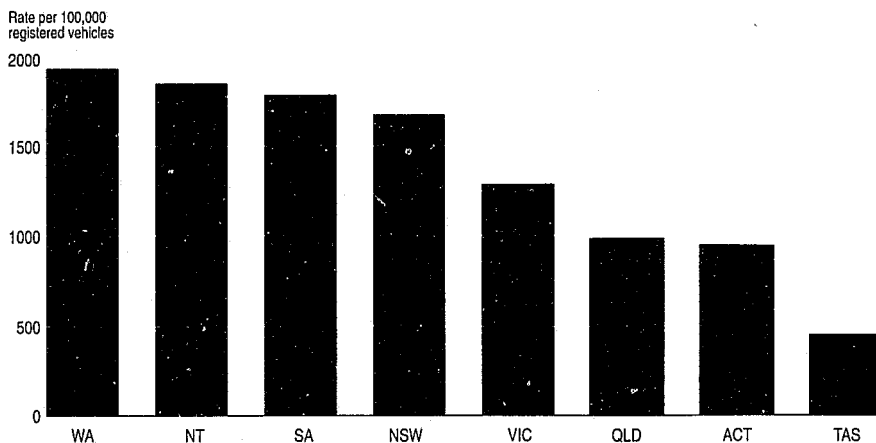
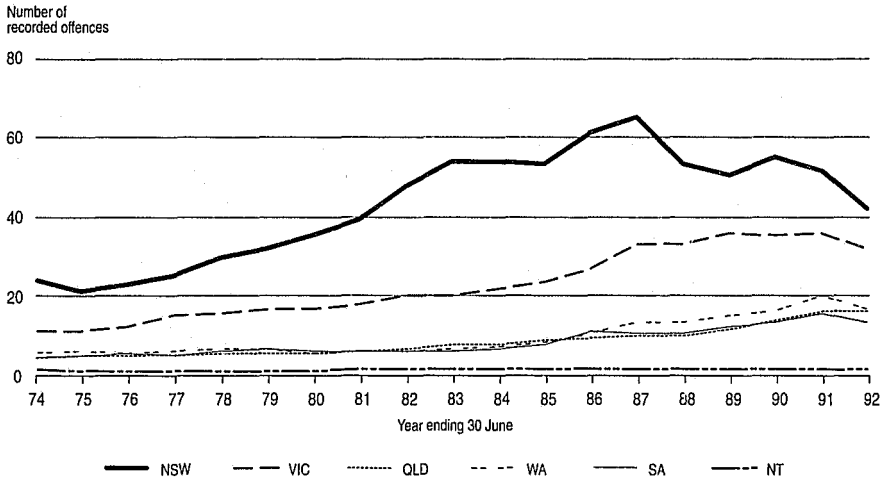


Figure 2: Number of recorded motor vehicle theft offences, Australian States, years ending 30 June, 1974 – 1992⁴



The extent of the downward trend for vehicle theft in NSW is further illustrated in Figure 3 which shows the monthly numbers of recorded motor vehicle theft offences between July 1986 and December 1992. The figure illustrates a statistically significant downward trend (Kendall's $\tau = -0.68$, $p < 0.001$) in vehicle theft in NSW over the period.

Figure 3: Monthly numbers of recorded motor vehicle theft offences, NSW, July 1986 to December 1992

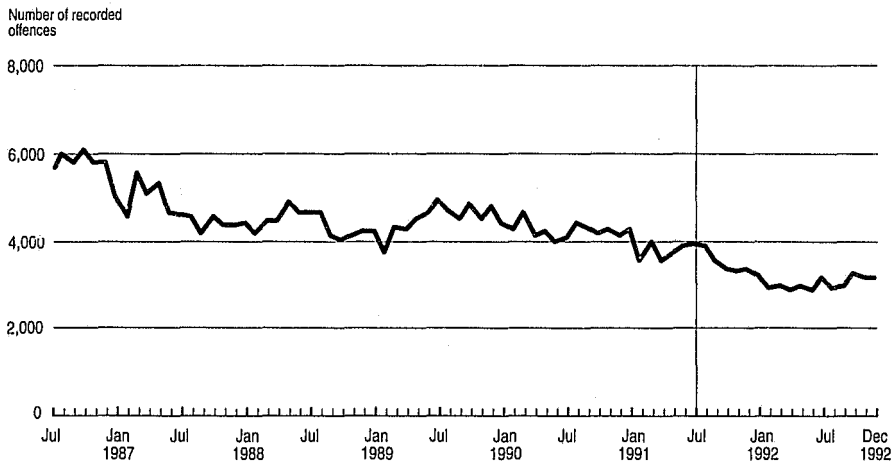


Figure 4: Monthly numbers of recorded motor vehicle theft offences, January 1989 to December 1992

Figure 4.1: Group A

Introduction of beat policing: 27 April 1990

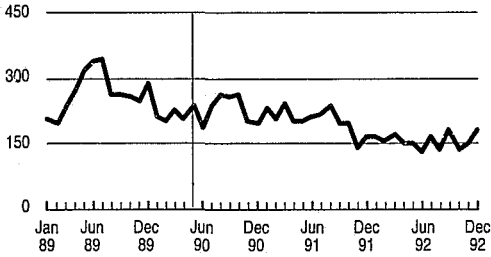


Figure 4.2: Group B

Introduction of beat policing: 26 July 1990

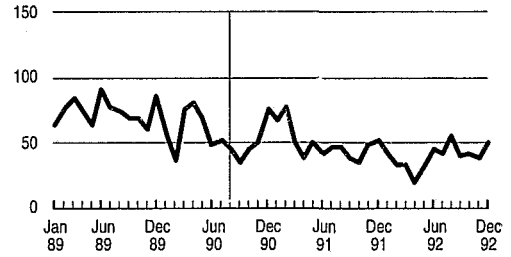


Figure 4.3: Group C

Introduction of beat policing: 24 October 1990

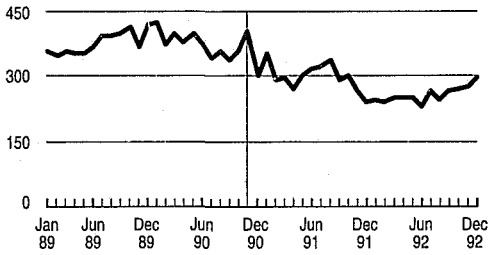


Figure 4.4: Group D

Introduction of beat policing: 22 January 1991

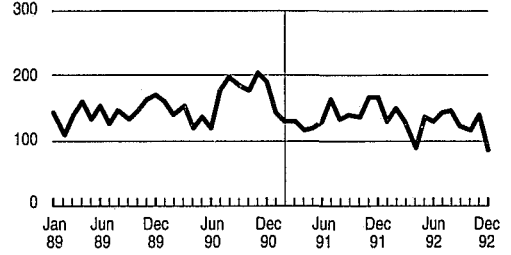


Figure 4.5: Group E

Introduction of beat policing: 22 April 1991

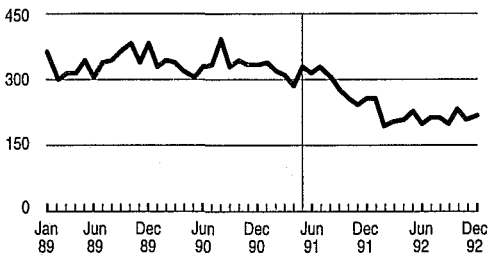


Figure 4.6: Group F

Introduction of beat policing: 21 July 1991

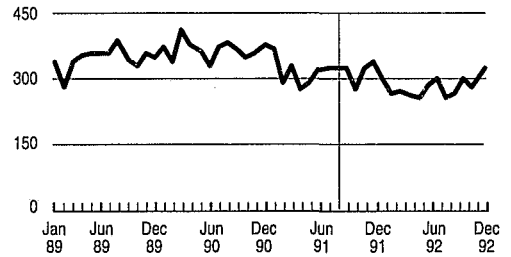


Figure 4.7: Group G

Introduction of beat policing: 19 October 1991

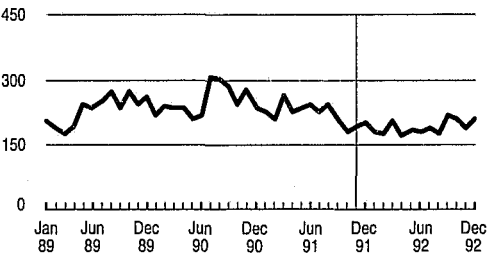
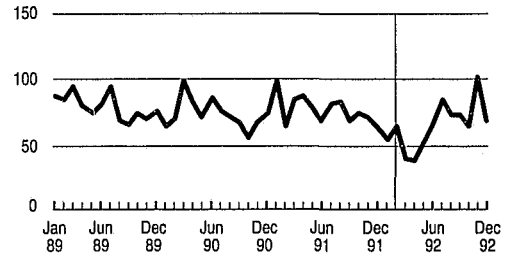


Figure 4.8: Group H

Introduction of beat policing: 18 January 1992



2.3 EXPLAINING THE DOWNWARD TREND: POLICING FACTORS

The substantial drop in the incidence of motor vehicle theft is welcome but also rather intriguing. A common police view is that the reduction in motor vehicle thefts throughout NSW is the outcome of new approaches to the prevention of vehicle theft and other property offences. Some commentators, for example, have suggested that motor vehicle theft rates have declined as a result of the Motor Vehicle Theft Forum held in July 1991 (shown by the vertical line in Figure 3). That Forum sought to bring together a variety of interested parties (e.g. vehicle insurers and manufacturers) in order to develop a multi-pronged strategy for preventing vehicle theft. Some have argued that the Forum itself attracted widespread publicity which alone might have increased the perceived risk of involvement in vehicle theft. Others have suggested that the reduction in vehicle theft can be attributed to the introduction of beat police. Beat policing involves the replacement of mobile police patrols with regular foot patrols by uniformed officers. Beat policing is considered both to increase the level of community co-operation in preventing crime and to have a greater deterrent effect. A close examination of the data on motor vehicle theft, however, lends little credence to either of these suggestions.

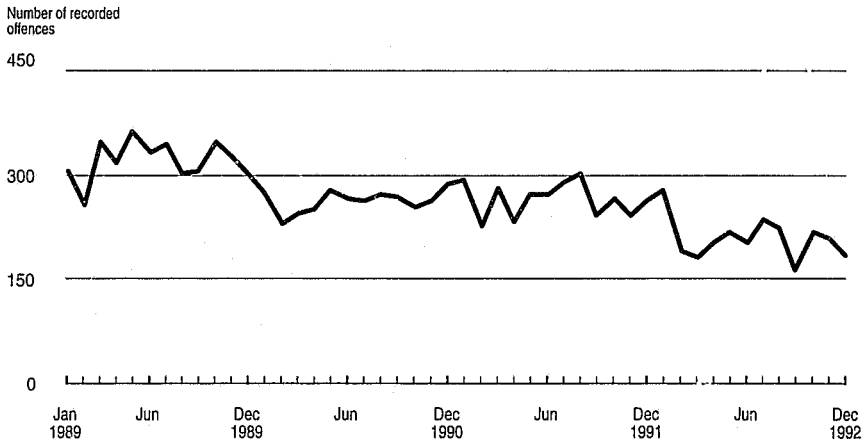
The total number of recorded motor vehicle theft offences for 1992 was almost 33 per cent lower than the total for 1989. The rate of decline, however, has been erratic. Between July 1989 and June 1990 recorded offences dropped by 20 per cent. A further 5 per cent drop occurred between July 1990 and June 1991, followed by a 27 per cent drop in the ensuing 12 months between July 1991 and June 1992. The accelerating rate of decline of motor vehicle theft during the financial year 1991-92 could be attributed to the various recommendations following the Forum. However, as the downturn in vehicle theft began well before the Forum was held, it cannot be said that the Forum was responsible for the initial downturn.

A comparison of the trends in motor vehicle theft in those patrols in which beat policing was introduced also provides little reason for believing law enforcement activity is responsible for the downward trend in motor vehicle thefts. Beat policing was introduced progressively over a period of time. Hence the date of beat police introduction varies for different police patrols. The 63 patrols which had introduced beat policing prior to December 1992 were divided into eight groups, A to H, according to the date on which they implemented beat policing. Collectively, these 63 patrols accounted for 42 per cent of all recorded motor vehicle theft offences in NSW over the period January 1989 to December 1992. Figure 4 shows the trends in recorded motor vehicle theft offences before and after the introduction of beat police for each of these eight groups of police patrols. The vertical lines in each of Figures 4.1 to 4.8 show the date of introduction of beat police.

As can be seen from Figure 4, most of the groups of patrols show a general downward trend in motor vehicle theft. In every group, however, the general downturn in motor vehicle theft commenced before the introduction of beat police.

Perhaps more importantly, there is no evidence that the decline in motor vehicle theft was limited to those patrols in which beat police was introduced. Figure 5 shows the frequency of motor vehicle theft from January 1989 to December 1992 for those police patrols which did not have beat police in this period. The figure shows a downward trend in motor vehicle theft for this group of patrols throughout the entire period from January 1989 to December 1992. The total number of recorded motor vehicle theft offences in the group in 1992 is 35 per cent lower than the total for 1989. It is also noteworthy

Figure 5: Monthly numbers of recorded motor vehicle theft offences for police patrols with no beat police, January 1989 to December 1992



that the figure indicates a downturn for this group of patrols occurring in late 1989, at least eighteen months prior to the Motor Vehicle Theft Forum.

2.4 EXPLAINING THE DOWNWARD TREND: OTHER FACTORS

The evidence reviewed so far suggests that motor vehicle theft has been declining for reasons not related to policing activity. What other factors, then, might account for the downward trend?

Several possibilities exist. Property crime rates have been shown in several studies to be related to unemployment (Chiricos 1987), although the nature of the relationship has been the subject of considerable debate. Some argue that unemployment always increases vehicle theft rates (Yeager 1978) and some argue that where unemployment occurs as part of a general downturn in economic activity, property crime rates fall because the opportunities for property crime decline (Cantor and Land 1985). These results suggest that it might be useful to examine both the impact of unemployment and the impact of economic activity on motor vehicle theft.

2.4.1 Unemployment

In order to test whether the level of unemployment has an effect on motor vehicle theft, an attempt was made to fit a statistical model which predicts motor vehicle theft from unemployment data. A time series of recorded motor vehicle theft offences for the 74 months from July 1986 to August 1992 was used for this purpose. Unemployment data for the same months were obtained from the Australian Bureau of Statistics.⁵

The methodology employed was time series modelling. Time series modelling was considered appropriate because it takes account of both trend and seasonal effects as

well as relationships within the series (that is, it takes account of current values of a series possibly being dependent on past values of the series). A model which predicts future values of a time series (the output series) on the basis of past values of the series, and on the basis of values of one or more related time series (the input series), is called a *transfer function model*. We attempted to fit transfer function models to the motor vehicle theft data using various series of unemployment data as the input series: the total number of unemployed persons; the number of unemployed males; the number of unemployed females; and the number of unemployed males in specified age groups (15-19, 20-24, 25-34, 35-44, 45-54, 55 and over).

For none of these input series was it possible to fit a transfer function model which fitted the data well. It was therefore concluded that the decreasing trend in recorded motor vehicle theft offences could not be explained by changes in the level of unemployment.

2.4.2 Other economic factors

Three measures of economic activity were chosen for examination. The measures chosen were new vehicle registrations, fuel sales and personal consumption. The data for fuel sales were obtained from the Australian Bureau of Agricultural and Resource Economics. The data for new vehicle registrations and personal consumption were obtained from the Australian Bureau of Statistics.⁶ In the case of personal consumption the data could only be obtained on a quarterly basis. However, this measure was included because research in the United Kingdom (Field 1990) found a relationship between motor vehicle theft and consumption. For this time series quarterly motor vehicle theft data were used for the period January 1979 to December 1992.

Using the same methodology as was used for the unemployment data an attempt was made to fit transfer function models to the motor vehicle theft data using, in turn, each of the economic indicator series as an input series. Again, it was not possible to construct models which provided a good fit to the data. It was concluded that changes in general economic indicators could not explain the downward trend in motor vehicle theft.

3. GENERAL CHARACTERISTICS OF MOTOR VEHICLE THEFT IN NSW

The time series analyses presented in the previous section do not give us any insight into the factors which control the incidence of motor vehicle theft. Another means by which to identify factors which influence the rate of this offence is to conduct a detailed analysis of motor vehicle theft patterns.

Because of the diversity of the offence, it is of interest to consider the different varieties of vehicle theft. People steal vehicles for many different reasons. Some offenders are involved in professional or semi-professional theft, which may or may not be organised. This type of theft involves the theft of vehicles for the acquisition of parts for resale, or the acquisition of the vehicle itself for re-identification and resale. Some offenders steal vehicles for the acquisition of parts for their own use. Some offenders arrange for vehicles to disappear and fraudulently report them stolen in order to facilitate a claim on their vehicle insurance policies. Others are seeking short-term transport or are merely seeking to alleviate boredom or to gain gratification or a temporary sense of prestige. The fact that vehicle theft is such a diverse offence means that explaining vehicle theft requires an attempt to delineate the different types of theft. Each type of theft is likely to have a more or less unique set of factors which explain its incidence and distribution, and a knowledge of these factors can inform our attempts to understand trends in the offence and to formulate effective crime control strategies.

Unfortunately, it is much easier to describe the reasons why vehicles are stolen than it is to measure the number of vehicles stolen for each purpose. McCaghy, Giordano and Kniceley Henson (1977) distinguish between theft for joyriding, theft for short-term and long-term transportation, theft for profit (which may be amateur theft for parts for personal use or professional theft where the aim is to acquire vehicles or parts for resale), and theft for the commission of another crime. To this list, most commentators add fraudulent theft which occurs when an owner causes a vehicle to disappear and reports it stolen in order to obtain an insurance claim (Clarke and Harris 1992).

These distinct categories are based upon the reasons given by offenders for stealing vehicles, on the knowledge acquired by police in the course of investigating motor vehicle theft, or on theoretical consideration of the reasons why vehicles might be stolen. Unfortunately, we cannot gauge the true incidence of each of these different types of vehicle theft because vehicle thieves are rarely caught, and even when caught do not always disclose their true motive for stealing a vehicle. In order to make sense of trends in vehicle theft, therefore, we must adopt a cruder classification scheme which relies on aspects of vehicle theft itself rather than on admissions by offenders of their reasons for stealing vehicles.

It is possible to proceed in this manner because whenever a vehicle is reported stolen in NSW information is kept indicating whether the vehicle was recovered, and, if recovered, what damage it had sustained. Whether or not a vehicle is recovered and its condition on recovery provide a basis from which to infer the reason why the vehicle was stolen. A vehicle recovered intact is unlikely to have been stolen for the acquisition of parts. Vehicles which are never recovered or recovered with stripping are likely to have been stolen either for resale of the whole vehicle, or resale at least of those parts which have been removed. It is the general experience of insurers and police that vehicles fraudulently reported stolen will often be recovered burnt or dumped in a body of water (i.e. immersed).

Of course in any particular case, neither the failure to recover a vehicle nor the condition of a vehicle on recovery provide certain indication of the motivation for its theft or reported theft. If, however, in most cases the facts do provide a reasonable basis on which to identify the motivation for the theft or reported theft it is still possible to describe the characteristics of vehicles stolen for different general purposes. If most stolen cars recovered with parts missing have been stolen in order to remove and re-sell the parts, for example, we can gain an understanding of the market for stolen car parts by examining which years, makes and models of vehicle are most often recovered with parts missing.

The present report uses information on the fate of vehicles reported stolen in order to describe the characteristics of vehicles stolen for different purposes. The report examines three types of vehicle theft: fraudulent theft, acquisitive theft and theft for short-term use. The category of fraudulent theft is defined as a proportion of insured vehicles recovered burnt and immersed. Acquisitive theft is defined as comprising those vehicles which remain unrecovered and those which are recovered with various panels, mechanical parts, accessories and other equipment missing. The category of theft for short-term use is defined as comprising all those vehicles recovered with parts intact.

These definitions provide the basic framework for the analysis. In discussing each category of theft, however, the report considers the adequacy of the definitions and what implications might flow if they are judged to be incorrect. This is important given the tentative nature of our classification scheme. Any error we make in classifying vehicle thefts will affect our estimate of the relative contribution made to the overall size of the vehicle theft problem by different groups of offenders. It may also create a distorted impression of the characteristics of each type of vehicle theft.

3.1 DATA SOURCES

The primary source of data for this report is the Stolen Vehicle Index (SVI). The SVI is maintained by the NSW Police Service and contains information on nearly all stolen vehicles reported to the police in NSW. In country areas some remote police stations do not have access to the SVI. In these areas vehicle theft is recorded on a standard crime incident report form and is counted as larceny. It is possible that some vehicle thefts in other areas are also counted as larcenies. The Bureau estimates that in NSW about 50 vehicle thefts per month are recorded as larceny. Other cases of vehicle theft which may not be recorded on the SVI include incidents where the police arrest persons who are driving a stolen vehicle before it has been reported as stolen by the owner. In this case the offence will be recorded as the illegal use or theft of the vehicle but it will not be recorded on the SVI. As a result the data from the SVI are not directly comparable with the data on the numbers of recorded motor vehicle theft offences published in the Bureau's *New South Wales Recorded Crime Statistics 1991* (1992a), which include both those vehicle thefts which are recorded as larcenies and those cases classified by police as the illegal use of a vehicle.

Data giving details of the insured value of a sample of 100,000 vehicles were supplied by the NRMA and are used in this report to examine the relationship between insured value, market value and fraudulent theft. Finally, data from the Children's, Local and Higher Courts in NSW are used to obtain information about persons convicted of vehicle theft.

Unlike many offences, vehicle thefts are particularly well reported. For example, a recent Australian Bureau of Statistics (ABS) Crime and Safety Survey indicated that 95.5 per cent of vehicle thefts in NSW were reported to the police (ABS 1992a). In contrast, only 35.5 per cent of assaults or sexual assaults were reported to the police. The high proportion

of vehicle thefts reported may be attributable to factors such as the size of the loss and inconvenience suffered as a result of the incident, the requirement that the incident be reported to the police for insurance purposes, the general feeling that reporting the offence might result in a positive outcome, and the lack of feelings of personal shame or guilt suffered by the victim (Gove, Hughes and Geerken 1985). Since the majority of vehicle thefts are reported to the police, official statistics on vehicle theft can be used to measure the incidence and extent of the offence.

3.2 OVERALL CHARACTERISTICS OF VEHICLE THEFT IN NSW

3.2.1 Types of vehicles stolen in NSW and recovery rates

Table 1 shows the types of vehicle recorded stolen on the SVI in 1991 and whether or not the vehicle was recovered.⁷ The SVI recorded 46,694 stolen vehicles in that year, with 83.3 per cent being recovered. The majority of stolen vehicles (92.8 per cent) were passenger vehicles (sedans, station wagons, hatchbacks, coupes, convertibles and sports cars) or light commercial vehicles (utilities, panel vans, and vans). Recovery rates were high for all categories of vehicle except plant or forklift and motorcycles.

Table 1: Number of vehicles recorded stolen on the SVI, 1991, vehicle type and whether recovered

Vehicle type	Not recovered		Recovered		Total		Vehicle type as a percentage of all vehicles
	No.	%	No.	%	No.	%	%
Passenger vehicles	5,655	14.6	33,182	85.4	38,837	100.0	83.2
Light commercial	845	18.8	3,647	81.2	4,492	100.0	9.6
Truck	225	26.3	630	73.7	855	100.0	1.8
Motorcycle	667	42.3	910	57.7	1,577	100.0	3.4
Bus	32	14.5	188	85.5	220	100.0	0.5
Plant or forklift	53	77.9	15	22.1	68	100.0	0.1
Unknown	308	47.8	337	52.2	645	100.0	1.4
TOTAL	7,785	16.7	38,909	83.3	46,694	100.0	100.0

3.2.2 Age of stolen vehicles

Figure 6 shows the year of manufacture of stolen vehicles recorded on the SVI in 1991. The figure shows that a fairly high proportion of stolen vehicles were around 10 - 12 years old. The year of manufacture with the highest frequency in Figure 6 was 1979, with 7.5 per cent of all vehicles stolen in 1991 having been manufactured in that year. The mean age of stolen vehicles was 10.3 years, and the standard deviation 5.4 years.

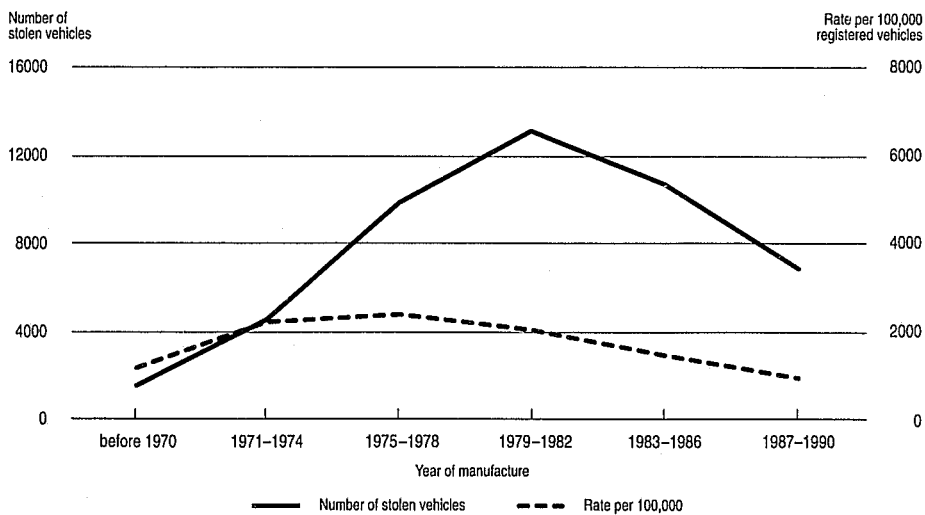
These data suggest that new vehicles have a much smaller risk of theft than do 5 to 15 year old vehicles. However, the data presented in Figure 6 do not give an accurate picture of the

Figure 6: Number of vehicles recorded stolen on the SVI, 1991, year of manufacture



risk of theft of vehicles manufactured in different years. To obtain such a picture it is necessary to calculate a rate of theft for vehicles of different years of manufacture, that is, to calculate the number of vehicles stolen for every thousand registered vehicles of each year of

Figure 7: Number and rate, per 100,000 registered vehicles, of vehicles recorded stolen on the SVI, 1991, year of manufacture



manufacture. The results of this calculation are shown in Figure 7, where vehicles are grouped into age classes consistent with registration data published by the ABS (1992b).

Figure 7 shows that the risk of vehicle theft is indeed greater for old vehicles than for new vehicles. But whereas vehicles manufactured in the years 1979-1982 represented the greatest number of thefts, the risk of vehicle theft was highest for vehicles manufactured in the period 1975-1978, closely followed by vehicles manufactured in 1971-1974. Vehicles manufactured in the years 1975-1978 had more than two and a half times the risk of theft of vehicles manufactured in 1987-1990. The NRMA (1991a) found that a vehicle is most at risk of theft when it is 10 years old, whereas the SVI data indicate greatest risk when vehicles are between 13 and 20 years old. Direct comparison of these data is somewhat confounded by the fact that newer vehicles may be more likely to be insured. As a result the NRMA's portfolio is likely to be biased in favour of newer vehicles, compared with the population of all registered vehicles.

Table 2: Number of vehicles recorded stolen on the SVI, 1991, make of vehicle

<i>Make of vehicle</i>	<i>Number of vehicles stolen</i>	<i>Percentage</i>
Ford	14,443	30.9
Holden	13,828	29.6
Toyota	6,362	13.6
Nissan/Datsun	2,267	4.9
Mazda	2,037	4.4
Mitsubishi	1,575	3.4
Honda	1,056	2.3
Chrysler	1,046	2.2
Suzuki	593	1.3
Yamaha	473	1.0
Volkswagen	250	0.5
Subaru	228	0.5
Kawasaki	213	0.5
Mercedes	211	0.5
Daihatsu	200	0.4
BMW	199	0.4
Volvo	170	0.4
Leyland	116	0.2
Porsche	113	0.2
Alfa Romeo	112	0.2
Other	1,007	2.2
Unknown	195	0.4
Total	46,694	100.0

3.2.3 Make and model of stolen vehicles

The frequency of theft for different makes of vehicles is shown in Table 2 in order of the frequency with which they are stolen. Only makes with at least 100 vehicles stolen recorded on the SVI in 1991 are shown in Table 2. The makes shown in the table accounted for 97.4 per cent of stolen vehicles, with Ford, Holden, Toyota, Nissan/Datsun and Mazda accounting for 83.4 per cent of stolen vehicles. Sixty per cent of stolen vehicles were manufactured by Ford and Holden.

Table 3 shows the rate of theft of passenger and light commercial vehicles for those makes in Table 2 for which registration data were available (ABS 1992b). From the table it can be seen that there is considerable variation in the risk of theft for vehicles made by different manufacturers. In 1991 Fords and Holdens had the highest risk of theft per 100,000 registered vehicles, while Daihatsus and Volvos were least at risk. Interestingly, it appears that makes which rank high in terms of numbers of registered vehicles also tend to rank high in terms of theft risk. The rank correlation (r) between the number of registered vehicles and the rate of theft for each manufacturer is 0.60 ($p = 0.01$). That is, popular makes tend also to be disproportionately popular theft targets.

Table 3: Number and rate, per 100,000 registered vehicles of each manufacture, of passenger and light commercial vehicles recorded stolen on the SVI, 1991^a

<i>Manufacturer</i>	<i>Number of vehicles stolen</i>	<i>Rate per 100,000 registered vehicles</i>
Ford	14,249	2266.46
Holden	13,527	2226.27
Mazda	1,971	1462.99
Chrysler	1,035	1319.33
Toyota	5,980	1184.67
Leyland	100	1091.82
BMW	187	1003.17
Honda	534	823.93
Mercedes	200	740.58
Nissan/Datsun	2,151	724.10
Volkswagen	230	708.46
Suzuki	226	707.93
Mitsubishi	1,472	648.52
Subaru	226	527.32
Daihatsu	160	464.48
Volvo	161	455.69

It is very likely that as well as variations in risk of theft for particular makes of vehicle there is also considerable variation in the risk of theft for particular models of vehicle.

When the frequency with which different models are stolen is considered 25.4 per cent of vehicle thefts involved only two models - the Ford Falcon and Holden Commodore

(see Table 4). These data do not, however, tell us anything about the relative risk of theft for different models. It is highly likely that the Falcon and the Commodore are the two most common models registered and for this reason alone would be expected to exhibit the greatest theft frequency. Unfortunately, it was not possible to obtain the numbers of registered vehicles of each make - model - year variant in NSW so rates of theft for cars of different models and years could not be calculated.

Data recently published by the NRMA (1993) indicate that, among insured vehicles, sports cars tended to have the highest theft rates. Notable was the Porsche 911 which was 15 times more likely to be stolen or broken into than the average car. Other models with high theft rates include the 1987 Ford Fairmont Ghia, 1982 - 1984 Holden Calais and Falcons manufactured prior to 1987. While some of these models were stolen in small numbers (Table 2 shows that the SVI recorded thefts of only 113 Porsches of all models in 1991), the cost of thefts of luxury vehicles can be high.

Table 4: Number of vehicles recorded stolen on the SVI, 1991, model of vehicle, for models where more than 400 or more were stolen

<i>Model of vehicle</i>	<i>Number of vehicles stolen</i>	<i>Percentage</i>
Ford Falcon	6,205	13.3
Holden Commodore	5,673	12.1
Toyota Corona	2,236	4.8
Ford Fairmont	1,811	3.9
Ford Cortina	1,696	3.6
Toyota Corolla	1,646	3.5
Holden Gemini	1,542	3.3
Ford Laser	1,327	2.8
Holden Torana	1,109	2.4
Mitsubishi/Chrysler Sigma	974	2.1
Holden HQ	953	2.0
Holden HZ	824	1.8
Ford Fairlane	746	1.6
Ford Escort	689	1.5
Holden HJ	684	1.5
Toyota Celica	584	1.3
Holden HX	486	1.0
Ford Telstar	468	1.0
Holden Camira	451	1.0
Mazda 626	405	0.9
Other	9,540	20.4
Unknown	6,645	14.2
Total	46,694	100.0

3.2.4 Type of damage sustained by stolen vehicles

The SVI provides information on whether vehicles are recovered, their condition on recovery, and what parts and accessories are missing. As Table 1 indicates, 83.3 per cent of stolen vehicles are recovered. The majority of recovered vehicles are classified as drivable, with the SVI recording 59.6 per cent of recovered vehicles in drivable condition, 29.1 per cent not drivable, and 11.3 per cent unknown.

Table 5: Number of vehicles recorded stolen on the SVI, 1991, type of damage sustained

<i>Type of damage</i>	<i>Number of vehicles stolen</i>	<i>Percentage of all stolen vehicles</i>	<i>Percentage of recovered vehicles</i>
No damage	15,770	33.8	40.5
Stripped	1,829	3.9	4.7
Burnt/immersed	4,034	8.6	10.4
Other damage	3,429	7.3	8.8
Damage not recorded	13,847	29.7	35.6
Subtotal recovered	38,909	83.3	100.0
Not recovered	7,785	16.7	na
Total stolen vehicles	46,694	100.0	na

Details concerning the type of damage sustained are presented in Table 5. The categories of damage in Table 5 are those which appear on the SVI. A stolen vehicle may sustain more than one kind of damage but the police classify each case into only one of the categories. Unfortunately, the type of damage sustained is not recorded for 35 per cent of recovered vehicles. Table 5 shows that 40.5 per cent of recovered vehicles are recorded as recovered with no damage. Only small proportions are recorded as stripped or burnt/immersed.

A variety of parts and property may have been removed from recovered vehicles. Table 6 shows the proportion of recovered vehicles with various categories of part missing. The most commonly recorded missing part was sound equipment (22.4 per cent of recovered vehicles), followed by accessories (16.3 per cent), while removal of body panels (6.8 per cent) or engines (1.5 per cent) was relatively uncommon. Along with the data indicating whether vehicles are recovered, these data are used to classify vehicles into the categories of acquisitive theft and theft for short-term use. Details of the specific categorisation used are given in the sections on these types of theft.

Table 6: Proportions of vehicles recovered with parts missing, vehicles recorded stolen on the SVI, 1991⁹

<i>Part</i>	<i>Percentage of recovered vehicles</i>		
	<i>Percentage with part missing</i>	<i>Percentage with part intact</i>	<i>Percentage unknown</i>
Accessories	16.3	66.8	16.9
Sound equipment	22.4	61.7	15.9
Personal effects	14.4	65.4	20.2
Mechanical parts	10.5	72.9	16.7
Trim and upholstery	11.0	72.5	16.5
Wheels and tyres	10.7	73.9	15.4
Body panels	6.8	77.0	16.3
Engine	1.5	97.7	0.8

4. FRAUDULENT VEHICLE THEFT

4.1 FRAUDULENT THEFT AND AGREED VALUE POLICIES

While elaborate professional vehicle theft fraud schemes have been described (Turner 1987)¹⁰, the most common type of fraudulent vehicle theft comes about when a person falsely reports that his or her vehicle has been stolen in order to make a claim for the loss to his or her insurance company.

An incentive for fraudulent theft exists when the insured value of a vehicle is greater than its realizable market value. It has been suggested that the existence of agreed value insurance policies in NSW may encourage fraudulent motor vehicle theft. In most States, motor vehicle insurance policies indemnify people for the retail market value of their vehicle at the time of loss. In NSW, where agreed value policies are the norm, policy holders are indemnified for an amount agreed on at the time of insurance, and, in principle, reviewed each year on renewal of the policy.

According to the insurance companies, agreed value policies offer the consumer protection against the often rapid depreciation of motor vehicles (NRMA 1991b). Depreciation is a particular problem for new vehicles, which can suffer considerable loss of value in the first few years of ownership. In the event of a total loss, the owner of a vehicle bought with borrowed funds and insured with a market value policy can be left owing money on a vehicle they no longer own. An agreed value policy would allow the debt remaining on a written-off vehicle to be paid in full, since the owner of a new car is paid an amount similar to the purchase price of the vehicle (Insurance Council of Australia 1991; NRMA 1991b). In addition, it has been argued that agreed value policies remove the potential for arguments over the retail market value of vehicles in the event of a total loss, and also allow insurers to set premiums more fairly, since insurers are better able to predict the payout for total loss claims (NRMA 1991b).

Agreed value policies, then, are partly justified on the basis that they protect policy holders against the decline in the market value of their vehicles due to depreciation. To the extent that this is the case, however, one result of agreed value policies is that the insured value of vehicles may be somewhat greater than the retail market value of the vehicle. This situation may provide an incentive for policy holders to dispose of their vehicle and fraudulently claim for the theft of the vehicle. While recognizing that agreed insured values may be greater than retail market values, insurance companies argue that in most cases the discrepancy between retail market value and agreed value is small, less than 10 per cent, or \$800 in the case of the NRMA (1991b). Given that someone making a claim for the total loss of a vehicle faces the payment of an excess, at least \$300 according to the NRMA (1991b) and loss of no claim bonuses, the insurance industry argues that the small difference between the insured and the retail market value does not provide an incentive for fraud.

This defence of agreed value policies depends on their being updated each year to reflect depreciation in the retail market value of vehicles as they age. If this happens, the maximum discrepancy between agreed values and retail market values will be one year's depreciation, and this will occur only towards the end of the yearly insurance contract. There is some reason for doubting that agreed values are always adjusted down each year. Indeed, it is not unknown for agreed values of ageing vehicles to be increased

over the term of the policy (General Insurance Claims Tribunal 1992). There is an obvious commercial incentive for this practice, since it can serve to maximize premium income.

At issue, then, is whether agreed value policies do provide an incentive for persons to perpetrate fraudulent thefts. According to the insurance industry, agreed value policies are determined according to values printed in *Glass's Guide*, a monthly industry survey of used car values (Insurance Council of Australia 1991; NRMA 1991b). *Glass's Guide* is compiled by examining prices of vehicles from a number of sources, including dealers, auctions and advertisements. According to the NRMA (1991b), *Glass's Guide* provides the most accurate and impartial reference from which agreed values can be calculated.

This report evaluates two aspects of agreed value policies. First we examine the claim that agreed values of insured vehicles are close to the retail market values of vehicles. Second, we examine whether agreed insured values are an accurate guide to the realizable market value of vehicles to the owner.

Data on a sample of 100,000 insured sedans, coupes, hatchbacks and station wagons were provided by the NRMA. The data set contains information on the insured values of vehicles, together with details of year, model, and equipment level. The data were extracted from the NRMA's portfolio of insured vehicles in September 1992.¹¹ These data allow very fine distinctions between different models and variants of the same model to be made. From this data set, models with at least 100 vehicles in any year, model and equipment level class were selected for analysis. There were 163 separate variants thus selected, accounting for 34,973 vehicles, or 35 per cent of the sample. The retail market value of each variant was determined from *Glass's Guide* for July 1992. The insured value for each individual vehicle in the sub-sample of 34,973 was then compared with the published retail market value. The results of the comparison are shown in Table 7.

Table 7: Frequency distribution of difference between insured value (NRMA September 1992) and retail market value (*Glass's Guide* July 1992)

<i>Difference between insured value and retail market value (\$)*</i>	<i>Number of vehicles</i>	<i>Percentage of vehicles</i>	<i>Cumulative percentage of vehicles</i>
less than -2,501	1099	3.1	3.1
-2,001 to -2,500	615	1.8	4.9
-1,501 to -2,000	1,195	3.4	8.3
-1,001 to -1,500	1,513	4.3	12.6
-501 to -1,000	2,303	6.6	19.2
-1 to -500	4,823	13.8	33.0
0 to 499	14,748	42.2	75.2
500 to 999	4,850	13.9	89.1
1,000 to 1,499	2,745	7.8	96.9
1,500 to 1,999	471	1.3	98.3
2,000 to 2,499	327	0.9	99.2
2,500 or more	284	0.8	100.0

* Positive values indicate that insured values are greater than retail market values.

From Table 7 it can be seen that there is a fairly wide range of insured values, both above and below the retail market value. It appears, therefore, that agreed values are not systematically greater than retail book values. The majority (76.4%) of vehicles had agreed values which were within \$1,000 of the *Glass's Guide* retail value. It is of interest that in the present sample, some 10.9 per cent of vehicles had insured values that were more than \$999 greater than the published retail market value for that model/year/equipment level variant. It also appears that relatively large numbers of vehicles are insured for considerably less than the nominal retail market value. This situation probably comes about when a vehicle is purchased for less than the nominal retail value because it is in less than average condition. In such cases it is likely that the agreed value reflects the purchase price rather than the retail market value for that type of vehicle.

In spite of the evidence in Table 7 that most insured vehicles are insured for agreed values close to the retail value quoted in *Glass's Guide*, it is arguable that many vehicles may still have insured values of such a magnitude as to provide a significant incentive for fraudulent activity. The retail value quoted in *Glass's Guide* is the average retail price achieved by dealers for a vehicle which has been cleaned, repaired, carries six months registration and has been otherwise prepared for sale. In other words *Glass's* retail value *includes* the retail profit margin to the dealer. *Glass's Guide* also quotes the trade value or 'on the lot' value of a vehicle prepared for sale by a dealer excluding the profit margin. The trade value is still likely to be higher than the realizable market value of a vehicle because it reflects the cost of work done by the dealer to prepare a car for sale. The trade value is, however, likely to be closer to the market value achievable by a person attempting to sell their car than the dealers' retail value.

Interestingly, some 83.4 per cent of vehicles had insured values that were more than \$999 greater than their published trade value. More than one-third of vehicles had insured values more than \$1,999 greater than their trade value.

Given the disparity between the realizable market value and the published retail value, there may well be an incentive for fraud, even for vehicles insured with market value policies, if the market value is based on the published retail value.

In summary, there is an incentive for fraud whenever the insured value of a vehicle is substantially greater than its realizable market value. This situation may occur, first, for a relatively new vehicle, insured with an agreed value policy, which might suffer rapid depreciation between the time it is insured and renewal of the policy. Second, some insured vehicles may not have their agreed value adjusted downwards in accord with a decline in the published retail market value of the vehicle. Third, as pointed out by the NRMA (1991b), some vehicles may be below average condition to the extent that they require expensive repairs. As a result their realizable market value will be much lower than their retail book value. In these cases it makes no difference whether the vehicle is covered by either an agreed value or a market value insurance policy.

Showing that there is a systematic incentive for fraudulent reporting of vehicle theft does not imply that abolishing agreed value insurance policies would have a marked effect on recorded rates of vehicle theft. It might, however, have a more substantial impact on the cost of vehicle theft, since the insurance companies, and ultimately the community, must bear the cost of claims involving the total loss of vehicles. The analysis in the next section indicates that, despite the incentives, fraudulent theft is most likely to be a small, albeit costly, component of the overall vehicle theft problem.

4.2 ESTIMATING THE EXTENT OF FRAUDULENT VEHICLE THEFT

According to the police (NSW Police Service n. d.) and the NRMA (1991a, 1991b), most fraudulent thefts involve vehicles which are either recovered burnt or immersed in water, or are not recovered at all. If fraudulent vehicle thefts make up a significant proportion of all thefts, and if indeed the fate of a majority of fraudulent thefts is fire or immersion, then, compared with uninsured vehicles, one would expect a higher proportion of insured vehicles to be recovered burnt or immersed. This expectation is confirmed by data shown in Table 8 indicating the condition of stolen vehicles according to whether or not they were insured.

Table 8: Number of vehicles recorded stolen on the SVI, 1991, condition of vehicle and whether vehicle insured

Condition of vehicle	Number of vehicles stolen			
	Not insured		Insured	
	Number	Percentage	Number	Percentage
Recovered:				
No damage	7,594	36.6	8,176	31.5
Stripped	619	3.0	1,210	4.7
Burnt/immersed	957	4.6	3,077	11.9
Other damage	1,529	7.4	1,900	7.3
Condition not recorded	6,976	33.6	6,871	26.5
Not recovered	3,075	14.8	4,710	18.2
Total	20,750	100.0	25,944	100.0

Table 8 shows that only 4.6 per cent of uninsured vehicles were recovered burnt or immersed in water. In contrast, 11.9 per cent of insured vehicles were recovered in this condition. Insured vehicles were burnt or immersed at more than 2.5 times the rate of uninsured vehicles. Compared with uninsured vehicles, insured vehicles were also more likely to be stripped, or to remain unrecovered, but these differences were relatively small. It is difficult to think of an explanation for the high rate of burning or immersion of insured vehicles other than fraudulent claims. Certainly, a car stolen in a genuine theft may be torched or abandoned in a body of water, perhaps by recreational users intent on providing a climax to their illegal adventure, or perhaps by strippers who aim to conceal any evidence, such as fingerprints. However, given that a genuine thief will not generally be aware whether or not a vehicle is insured, it is unlikely that the higher risk of fire or immersion of insured vehicles can be explained in terms of the 'normal' activities of genuine vehicle thieves.

If the increased risk of burning or immersion for insured vehicles compared with uninsured vehicles is due to insurance fraud, the data in Table 8 provide the basis for an estimate of the extent of fraudulent vehicle theft in 1991. The method used relies on the assumption that if there were no fraudulent theft in 1991, then it would be expected that the proportion of *insured* vehicles burnt or immersed would be equal to the proportion of *uninsured* vehicles burnt or immersed. Hence, an estimate of the number of fraudulently stolen vehicles, *N* say, is

obtained by assuming that if this number, N , were subtracted from the number of insured vehicles stolen (both those burnt or immersed and the total), then the proportion of insured vehicles recovered burnt or immersed would be equal to that for uninsured vehicles.

An estimate of the number of fraudulently stolen vehicles (N) is therefore given by solving the following equation:

$$(\alpha - N) / (\beta - N) = \gamma \quad (1)$$

where: α = Number of insured vehicles recovered burnt or immersed
 β = Total number of insured vehicles stolen
 γ = Proportion of uninsured vehicles recovered burnt or immersed.

The solution is given by:

$$N = (\alpha - \gamma\beta) / (1 - \gamma) \quad (2)$$

Substituting values from Table 8 in (2):

$$N = (3,077 - 0.0461 \times 25,944) / (1 - 0.0461)$$

Solving this gives $N = 1,971$, or 4.2 per cent of recorded stolen vehicles. This estimate is a minimum estimate of the extent of fraudulent theft because some vehicles fraudulently stolen may have fates other than burning or immersion. As discussed previously, insured vehicles were also more likely to be recovered stripped, or to not be recovered than were uninsured vehicles. On the assumption that the increased risk of these outcomes for insured vehicles was due to fraud, the estimation procedure outlined above was repeated for burnt or immersed, stripped and unrecovered vehicles. This resulted in an upper estimate of fraud of 4,101 vehicles, or 8.8 per cent of stolen vehicles.

One potential source of error in these estimates is mis-specification of insured and uninsured vehicles. On the SVI it can only be determined whether or not a vehicle is insured if the name of an insurance company is recorded. It is possible that some vehicles which were insured did not have this information recorded, so that a number of insured vehicles which were burnt or immersed were coded as uninsured. This seems likely given that the NRMA (1990) estimates that about 65 per cent of vehicles in NSW have comprehensive insurance, or other insurance indemnifying against theft,¹² while on the SVI only 55 per cent of vehicles had an insurance company recorded. As a consequence, the estimate of fraudulently stolen vehicles may be an underestimate. However, since older vehicles are more likely to be stolen and therefore to appear on the SVI, and may also be less likely to be insured than newer vehicles, the extent of the under-counting of insured vehicles on the SVI is difficult to estimate.

In order to set an upper limit for the size of the fraudulent vehicle theft problem, the data were re-analyzed to take into account the possible effect of mis-specification of insured vehicles as uninsured on the SVI. To produce a maximum estimate of fraudulent theft, it was assumed that the proportion of insured vehicles recorded on the SVI should be equal to the population estimate provided by the NRMA (1990). Under this assumption, 4,407 vehicles of the uninsured vehicles were re-assigned as insured vehicles. Then, the procedure used above to estimate the size of fraudulent theft was carried out. This resulted in a maximum estimate of 5,845 fraudulently stolen vehicles, or 12.5 per cent of vehicle theft.¹³

Fraudulent theft, then, is estimated to account for between 4.2 per cent and 12.5 per cent of stolen vehicles. These figures represent the probable lower and upper bounds of the problem, with the true figure likely to be somewhere in the middle of the range.

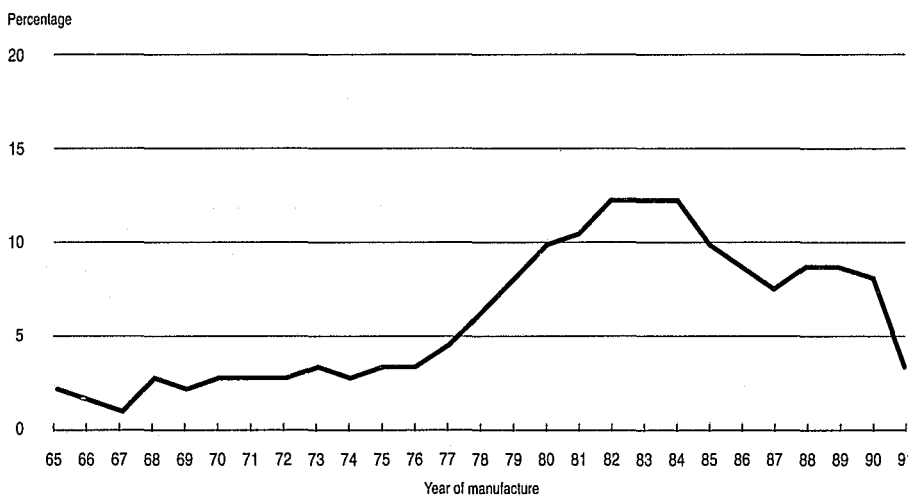
The upper and lower limits of fraudulent vehicle theft estimated in this report are somewhat narrower than recently published estimates, according to which, fraud accounts for between 2 and 15 per cent of stolen vehicles. According to the NRMA, fraudulent vehicle theft accounted for 2.0 per cent of theft claims in 1989 (NRMA 1990) and 3.2 per cent of theft claims in 1991 (NRMA 1993). These proportions, however, are of insured vehicles, not all stolen vehicles. In contrast, the lower estimate of theft determined in this report is 4.2 per cent of all stolen vehicles (7.6 per cent of insured vehicles). The NRMA's estimates seem to underestimate the size of the fraud problem by a significant margin compared with the estimates in this report. At the other end of the scale, the NSW Police Service (n. d.) has suggested that up to 15 per cent of stolen vehicles may be fraudulent thefts. The results of the analysis in this section suggest that this figure may overestimate the size of the fraudulent theft problem.

4.3 AGE OF VEHICLES RECOVERED BURNT OR IMMERSSED

In the previous section it was estimated that between 4.2 and 12.5 per cent of stolen vehicles are fraudulent thefts. The method used to estimate the numbers does not tell us which of the vehicles recovered burnt or immersed were fraudulently stolen. The method used assumed that the excessive number of insured vehicles recovered burnt or immersed, relative to uninsured vehicles, were fraudulently stolen. In this section, we examine the ages of all insured burnt or immersed vehicles to see whether cases of fraudulent theft tend to involve vehicles of a certain age.

In section 3.2.2 it was shown that the mean age of all stolen vehicles was 10.3 years, with a standard deviation of 5.4 years. Insured vehicles recovered burnt or immersed were, on

Figure 8: Insured vehicles recovered burnt or immersed as a proportion of all stolen vehicles of the specified year of manufacture, SVI, 1991



average, a little newer than this, with an average age of 8.9 years and a standard deviation of 4.1 years. Overall insured vehicles recovered burnt or immersed account for a small proportion of all vehicle thefts. However, as can be seen from Figure 8, vehicles aged around 7 to 9 years old appear to be more likely to be recovered in this condition than stolen vehicles of other ages, with the highest proportion of potential frauds being recorded among vehicles manufactured between 1982 and 1984. It is possible that these vehicles are the ones which may be most likely to be insured for more than their realizable market value.

5. ACQUISITIVE VEHICLE THEFT

5.1 DEFINING ACQUISITIVE VEHICLE THEFT

This section examines acquisitive theft defined as those vehicles which remain unrecovered, or which are recovered with damage due to the removal of parts. It is assumed that the fate of those vehicles which remain unrecovered is either re-identification and resale or dismantling for parts. Vehicles which are recovered with parts missing are assumed to have been stolen in order to acquire parts for sale or for personal use. What both types of vehicle theft have in common is that the motivation for the theft is financial gain - either directly through the sale of vehicle and parts, or indirectly because the theft of parts enables the thief to avoid having to buy parts.

Acquisitive theft may involve thieves who are very well organized and who gain significant income from their activities, thieves who carry out acquisitive vehicle thefts on a part-time basis and who gain varying degrees of financial benefit, and more or less amateur thieves who might steal a vehicle to obtain parts for their own use.

One estimate of the size of the professional theft problem is provided by the NRMA. The NRMA (1993) defines as professional theft those cases where the vehicle remains unrecovered or where recent models are recovered with significant degrees of stripping. In this classification, then, professional theft is delineated by the seriousness of the loss involved. On the basis of this classification the NRMA (1993) estimated that professional theft accounted for 29 per cent of theft in 1991. The NRMA note, however, that while professional theft is not as common as theft for short-term use or petty theft, it represents a much greater cost to the community. They estimate that professional theft accounted for 47 per cent of the cost of theft in 1991.

It is possible, however, that the classification used by the NRMA is misleading. Some professional thieves may make a living from fairly regular thefts of, say, sound equipment, while a person removing major parts like panels or engine from a recent model may not intend to sell such parts at all. According to the NRMA, the first case would be classified as petty theft and the second case as professional theft. Given these problems with any such classification, we do not attempt to divide acquisitive theft into professional and petty components in this report.

5.2 MEASURING THE EXTENT OF ACQUISITIVE THEFT

The data from the SVI concerning whether or not vehicles were recovered (see Table 5), along with data on whether vehicle parts were missing, form the basis for the estimation of the proportion of vehicle thefts which are acquisitive. Table 9 shows the number of vehicles not recovered or recovered with parts missing compared with those recovered with parts intact or for which information on parts was unknown.¹⁴ The combination of vehicles not recovered and those recovered with parts missing represents acquisitive theft. Note that insured vehicles which were recovered burnt or immersed were excluded from this analysis.

Table 9 shows that a total of 42.2 per cent of stolen vehicles can be classified as acquisitive thefts. This estimate is somewhat less than the NRMA's estimates of acquisitive theft as 63.0 per cent in 1990 (NRMA 1991a) or 70.6 per cent in 1992 (NRMA 1993). The NRMA

estimates are, however, calculated as a percentage of insured vehicles rather than all stolen vehicles.

Table 9: Number of vehicles recorded stolen on the SVI, 1991, type of theft

<i>Type of theft</i>	<i>Number of vehicles stolen</i>	<i>Percentage</i>
Not recovered	7,785	17.8
Recovered with parts missing	10,622	24.4
Sub total, acquisitive theft	18,407	42.2
Recovered with parts intact	25,061	57.5
Unknown	149	0.3
Total	43,617	100.0

Note: excludes 3,077 insured vehicles which were recovered burnt or immersed

5.3 AGE OF VEHICLES STOLEN FOR ACQUISITIVE PURPOSES

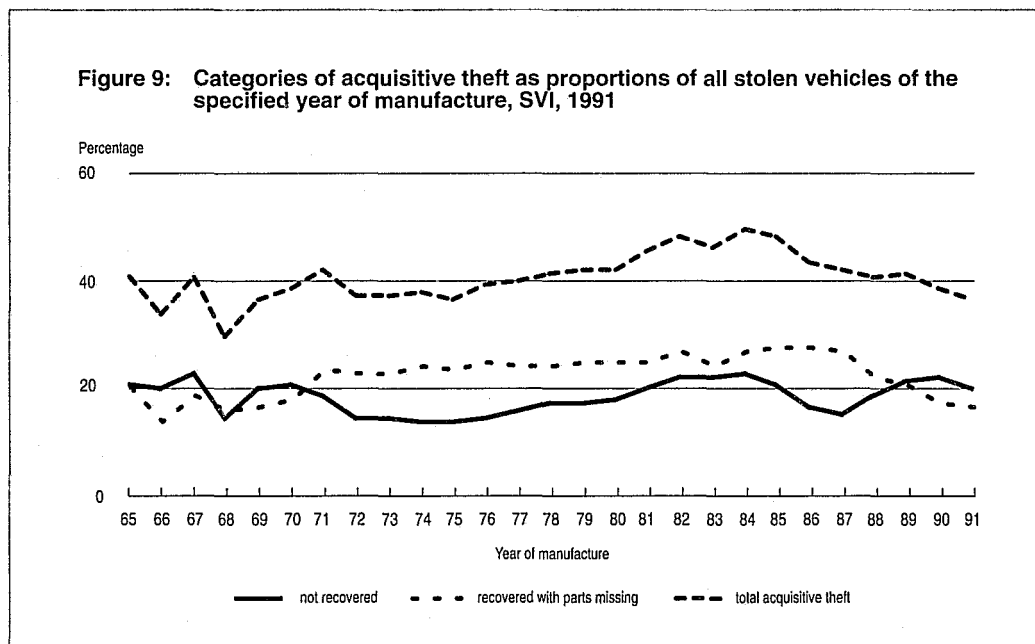
The mean age of vehicles stolen for acquisitive theft was 10.1 years with a standard deviation of 5.3 years. This compares with an overall mean age of stolen vehicles of 10.3 years with a standard deviation of 5.7 years.

The profitability of professional theft, and the incentive to steal parts for personal use, are dependent on the market for vehicles and the market for spare parts. It is likely that the market forces which influence the theft of vehicles for re-identification and resale create a demand for different types of vehicles than does the market for spare parts. It has often been argued, for example, that demand for spare parts is greatest for older vehicles because spare parts may not be available from manufacturers for older models. Without further evidence, the finding that 10 to 20 year old vehicles have the greatest risk of theft (see Figure 7) would tend to support this theory.

On the other hand, it is obvious that, for thieves contemplating the theft of vehicles for re-identification and resale, newer vehicles are more attractive than older ones. This is because newer vehicles offer higher resale value and a more ready market, and, therefore, a greater return for the risk and costs involved in this kind of activity.

The extent of the risks and costs of theft for re-identification and resale are made clear when one considers one of the methods used by professional thieves to carry out this kind of vehicle theft. The thieves or their associates purchase a wreck from an auction of written-off vehicles. In these auctions insurance companies sell vehicles which have suffered damage such that repair is uneconomic, though the vehicles may still be classified as repairable. Vehicles that are classified as repairable are sold in NSW with compliance plates and other identifying features intact. Having secured a suitable 'written-off' vehicle, the thieves steal a similar vehicle, exchange its identifying features, such as the compliance plates, with those from the wreck, and then sell the stolen vehicle

Figure 9: Categories of acquisitive theft as proportions of all stolen vehicles of the specified year of manufacture, SVI, 1991



with its new identity (NSW Motor Vehicle Theft Steering Committee 1992). The value of a vehicle thus sold must therefore be such as to justify the expense of the purchase of a suitable wreck, the work done to exchange identities, the cost of workshop facilities, the costs of transport interstate, if this is done, and the costs of re-registration. These factors would appear to limit the selection of vehicles for this activity to desirable new vehicles for which values are high and there is a ready market.

The numbers of acquisitive thefts, where the vehicle is not recovered, and the numbers recovered with parts missing, are shown as proportions of stolen vehicles of each year of manufacture in Figure 9. Over the range of years of manufacture from 1965 to 1991 there is a statistically significant increasing trend in the proportion of vehicles recovered with parts missing (Kendall's $\tau = 0.39$, $p < 0.01$). The trend is significant despite the fact that the proportion decreases for vehicles manufactured after 1987. The upward trend is also apparent in the trend for total acquisitive theft. The observed trend is inconsistent with the hypothesis that theft for parts is causing the high rates of theft observed for vehicles 10 to 20 years old. Vehicles manufactured in 1983 to 1987 are the most likely to be recovered with parts missing.

There is no upward or downward trend in the proportion of thefts which remain unrecovered (Kendall's $\tau = 0.19$, $p > 0.05$). Unrecovered thefts make up a relatively high proportion of thefts of new vehicles (about 20 per cent of thefts of vehicles manufactured in 1990), vehicles manufactured between 1982 and 1985 (20.2 - 21.1 per cent of thefts of vehicles manufactured in these years), and of older vehicles. This pattern may be because unrecovered thefts of newer vehicles tend to be the result of thefts for re-identification and resale, while unrecovered thefts of old vehicles tend to be the result of thefts for dismantling.

It may be that the economic forces driving the theft of vehicles for body panels and other parts are more subtle and complex than might be first supposed. It is possible that demand

for cheap spare parts and panels for older vehicles is largely satisfied by the large numbers of older vehicles which find their way to wreckers' yards through natural attrition. Faced with relatively expensive new parts and panels for newer vehicles, and greater shortages of such parts and panels in wreckers' yards, the market may indeed turn to stolen vehicles as an alternative source of these components. A significant proportion of vehicles which are never recovered may also be stolen primarily for parts and panels. This may be an explanation for the tendency of newer vehicles to remain unrecovered. Another factor which may influence the tendency of newer vehicles to remain unrecovered is the possibility that such vehicles are more attractive for criminals intent on resale of stolen vehicles after they are provided with new identities.

The results presented here are not conclusive. Similarly, one American study which examined whether demand for parts, cost for parts, or parts interchangeability were related to theft rates was unable to find convincing evidence for any such relationships (Harris and Clarke 1991). More detailed research is necessary before the size and nature of the professional and semi-professional sectors of vehicle theft can be adequately described.

6. THEFT OF VEHICLES FOR SHORT-TERM USE

The final type of vehicle theft to be examined here is theft for short-term use. This type of theft includes recreational use, or joyriding, theft for transport and theft for the commission of another crime, and is distinguished from acquisitive theft by the vehicle being recovered with parts intact.¹⁵ Joyriding is theft where the primary intention of the thief is simply fun or diversion. Where the motive of the theft is short-term transport, the circumstances of the theft are similar to joyriding but the primary intention is direct transport from one location to another (McCaghy et al. 1977). At times the journey may be a longer one, with the thief driving long distances (McCaghy et al. 1977), sometimes abandoning the vehicle when it is short of fuel and stealing another to resume the journey (Lay 1987). The final type of vehicle theft categorized as short-term use is the theft of a vehicle to be used in the commission of another crime. The kinds of offences involved include robberies, burglaries and other larcenies, rapes and abductions. In these offences the requirements of anonymity and mobility are well served by the use of a stolen vehicle (McCaghy et al. 1977).

6.1 ESTIMATE OF THE SIZE OF THE SHORT-TERM USE COMPONENT OF VEHICLE THEFT

According to the classification adopted in this report, short-term use accounted for 57.5 per cent of stolen vehicles.¹⁶ That is, 57.5 per cent of vehicles were recovered with parts intact (see Table 9). This estimate of the size of theft for short-term use is somewhat greater than estimates made by both the police and the NRMA. According to the NSW Police Service (n. d.), 40 per cent of vehicles are recovered intact and were stolen for transport or recreational use, while the NRMA (1991a) estimated that 34 per cent of vehicle theft claims in 1990 were attributable to theft for transport or recreational use. Since intact vehicles tend to be recovered a relatively short time after the theft, and a high proportion sustain no serious damage, it is probable that the NRMA's estimate is lower than the one presented here because claims may not be made for intact vehicles, or may be withdrawn on recovery. The relatively low estimate of the percentage of intact recoveries by the NSW Police Service may result from the high percentage of vehicles on the SVI for which condition on recovery was unknown.¹⁷

6.2 THEFT FROM TRANSPORT TERMINI

It is difficult to estimate the proportion of intact stolen vehicles used for transport as opposed to recreational use. However, if transport is an important motivation for theft, it would be expected that thefts from around transport termini would be relatively common. Indeed, railway station car parks have been identified as key locations for theft of vehicles for transport (NRMA 1991b). It has been suggested that some persons will use trains to travel to outlying stations late at night and then will steal a vehicle to complete their journey when faced with lack of public transport from train stations to surrounding suburbs. This type of vehicle theft is argued to be a response to poor availability of transport, particularly at certain times when public transport is not operating, or operates infrequently.

If railway station car parks are indeed important locations for vehicle theft for transport, it may be argued that vehicles stolen from these car parks should be more likely to be

recovered intact than vehicles stolen from other places. It appears, however, that vehicles stolen from railway stations are not appreciably more likely to be recovered intact. Table 10 shows the proportion of vehicles recovered intact for each of the locations coded on the SVI. The proportion of vehicles recovered intact was relatively constant across locations.

One problem with these data, however, is that the location categories are not precise enough to discriminate between transport termini and other locations. Only 2.5 per cent of vehicles were stolen from railway stations. A large proportion of thefts (41 per cent) involved the theft of a vehicle from a street. Many of these street locations may be in close proximity to a railway station, and potential thieves may be as likely to steal cars for transport in the general area of a railway station as they are to steal a vehicle from the railway station car park itself. More importantly, however, persons who are inclined to use stolen vehicles for transport may also tend to avoid a rail journey altogether and simply steal a car from any convenient location.

Table 10: Percentage of stolen vehicles recovered intact, SVI, 1991, place vehicle stolen from

<i>Place vehicle stolen from</i>	<i>Percentage of vehicles recovered intact</i>
Street	58.7
Car park	55.1
Private property	58.1
Shopping centre	54.4
Council car park	56.6
Other area	57.3
Club / hotel	52.7
Railway	58.1
Not recorded	57.4
All places	57.5

Many vehicles stolen for temporary use are recovered in the same general area from which they were stolen. Of all recovered vehicles which were recovered intact, 34.2 per cent were stolen and recovered in the same postcode and 50.0 per cent were stolen and recovered in the same Local Government Area. This tendency for fairly high proportions of recovered vehicles to be recovered in the same area that they were stolen from is consistent with vehicles tending to be used for relatively short-haul transport. It is also consistent with recreational users stealing vehicles from a convenient location, perhaps not far from where they live, and eventually abandoning them in the same locality. With the present data it is not possible to distinguish between vehicles stolen for recreational use as opposed to transport.

7. WHO ARE THE THIEVES?

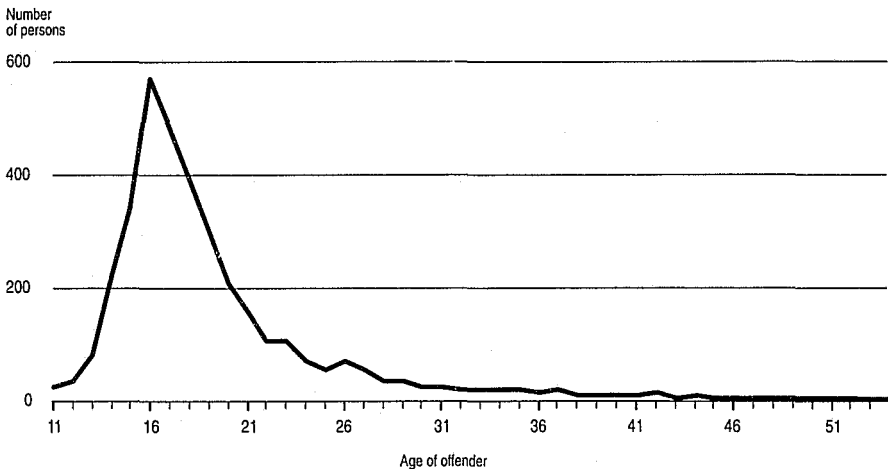
Motor vehicles are objects richly endowed with symbolism in western culture. They also generate millions of dollars across many different sectors of the economy. For some persons there are considerable financial or personal gains to be had through vehicle theft. Nonetheless, very different sets of factors are likely to influence different offenders.

A good example of the diversity of explanatory factors which have been canvassed are those which have been suggested to explain recreational short-term use of vehicles by young people. According to McCaghy et al. (1977) these include amusement, problems of adolescence, to achieve status and recognition, to prove masculinity, and oral deprivation! Undoubtedly, this is by no means a complete or mutually exclusive list. It is likely that many offenders are motivated by more than one of these factors. Many traditional social and psychological explanations of offending rely on assumptions about social or psychological defects in the backgrounds of offenders. Unemployment, for example, is argued to provide an economic incentive for crime, and to loosen bonds which tie persons to society and help prevent them offending (e.g. Thompson, Sviridoff and McElroy 1981).

Katz (1988), by contrast, has argued that there are inherently exciting aspects of criminality which make it a sensually compelling activity. According to Katz, the motivation for adolescent criminality is often not gain, but rather the thrilling, emotional experiences which deviance itself provides.

Indeed, it has been argued that much crime is the result of the reinforcing properties of sensory stimulation which are greatest during the late teens (Baldwin 1985). Baldwin (1985, p. 28) suggests that because of this fact 'teenagers should find it especially exciting

Figure 10: Frequency distribution of age of persons found guilty of motor vehicle theft as their principal offence, Children's, Local and Higher Courts, 1991²⁰



to plan, talk about, and commit adventurous, deviant activities and boast about their thrills'. Theories like those of Baldwin and Katz, which do not accommodate social background factors such as unemployment or poverty, fly in the face of a large body of evidence for the existence of relationships between such factors and offending (McCarthy and Hagan 1992; Braithwaite 1991; Devery 1991). However, theories such as those of Katz and Baldwin do appear to offer a compelling account of the socio-psychological dynamics of theft of vehicles for recreational short-term use, transport and petty theft. As Clarke and Harris (1992, p. 22) commented 'the excitement of theft and the status gained among peers must not be discounted as powerful sources of reinforcement of joyriding'. Despite the fact that Katz and Baldwin set their theories in competition to theories stressing the influence of economic or background factors, it is certainly possible that socially and economically marginalized youths are particularly vulnerable to the excitement or status offered by illegal activity, a situation which is compatible with both kinds of theory.

Unfortunately, although vehicle theft is well reported, it has a very small clear up rate. This means that a large proportion of vehicle thieves go unarrested. Police statistics indicate that in 1990 only 5.2 per cent of vehicle thefts were cleared.¹⁸ While arrest or conviction records can give us valuable information about offenders who have been arrested for vehicle theft, it is possible that offenders who have been arrested are not representative of offenders as a whole. This means that we must be wary about generalizing from what we know about the population of arrested vehicle offenders to those offenders who remain at liberty. This lack of information regarding motor vehicle theft in official statistics is compounded by the fact that there have been few ethnographic or self report studies of vehicle theft offenders.

The data that we do have from court records in NSW (NSW Bureau of Crime Statistics and Research 1992b; Office of Juvenile Justice, unpublished statistics) indicate that vehicle theft is predominantly a crime committed by young males. Of all offenders convicted of vehicle theft or illegal use of a vehicle in the Local and Children's Courts in 1991, over 91 per cent were male. The concentration of such offenders in court statistics, combined with the predominance of thefts for temporary use described in this report, suggests that the kinds of explanations of offending offered by Katz and Baldwin may be particularly relevant for vehicle theft.

As Figure 10 shows, convictions for vehicle theft peak at age 16 and tail off rapidly after age 19. According to Blackmore (1987), young people who appear before the Children's Courts charged with this offence are rarely involved in incidents connected with theft for gain. It is possible that older, professional or semi-professional car thieves, whose activities are concerned with theft for gain, are rarely arrested.

In spite of this possibility, however, similar age distributions are commonly observed for offenders who commit a wide range of crimes in a range of countries (Hirschi and Gottfredson 1983; Britt 1992).¹⁹ On this basis it would be expected that offenders involved in vehicle theft for gain are also likely to be aged less than 25 years.

Webb and Laycock (1992) have suggested that initially youngsters may be attracted to vehicle theft for the thrill and peer group status, but may increasingly be motivated by financial rewards as they become more experienced in the stealing of vehicles and disposing of stolen property. One British study quoted by Webb and Laycock indicates that 66.5 per cent of a sample of vehicle thieves had first taken and driven a vehicle by the age of 14 years.

It is often assumed that recreational vehicle thieves act on the spur of the moment, or in the terms of Challenger (1987) are opportunity takers rather than opportunity makers. Interestingly, in the British study quoted by Webb and Laycock (1992), 79 per cent of joyriders indicated that they planned to go out and steal a vehicle for recreational use. Other studies mentioned by Webb and Laycock also found a high degree of premeditation among vehicle thieves.

Nee (1993) reports that vehicle thieves can be very prolific offenders. It was estimated that the 100 vehicle thieves interviewed in England and Wales had stolen around 7,000 vehicles, and that about half the offenders claimed to be specialists whose criminal activity was more or less confined to vehicle thefts. The offenders who claimed to be specialists were characterized by a passion for cars from an early age along with an early desire to have car-related jobs, earlier illegal driving, higher rates of offending, and a longer experience of car crime (Nee 1993).

8. PREVENTION OF VEHICLE THEFT

Over the years there have been many proposals which aimed to reduce the incidence of vehicle theft (Clarke and Harris 1992; Webb and Laycock 1992; Insurance Council of Australia 1991; NRMA 1991b; Geason and Wilson 1990; Biles and Willing 1987; NSW Police Service, n. d.). Policies for the prevention of vehicle theft are either general policies which aim at reducing the risk of theft for all vehicles, or specific policies which focus on particular types of vehicle theft.

8.1 GENERAL POLICIES FOR THE REDUCTION OF VEHICLE THEFT

There are a number of general and specific strategies which have the potential to reduce the frequency and cost of motor vehicle theft. Any sensible vehicle theft reduction policy ought to utilize a range of strategies rather than relying solely on any one particular strategy. In choosing an appropriate mix of initiatives, however, it is important to appreciate the relative utility of each initiative considered in isolation.

The most substantial gains in the fight against vehicle theft are most likely to be achieved through improving the security of vehicles (Clarke 1987). This can be achieved in a number of ways. Manufacturers can be encouraged to increase the level of security built into new cars, persons can be encouraged to purchase and install security devices, and drivers can be educated to lock their cars properly when leaving them parked.

Stealing some vehicles is an easy undertaking. According to the NRMA (1989), some late model vehicles popular with thieves take only 10 seconds to enter and 20 seconds to start. It is sometimes said that there is no such thing as a theft-proof car. However, research carried out in the United Kingdom (Southall and Ekblom, 1985) suggests that significant and progressive reductions in vehicle theft could be achieved through designed-in car security. Southall and Ekblom found that relatively simple measures, which did not entail major redesign of vehicles, could result in the production of a vehicle immune from opportunistic theft. More sophisticated measures built into expensive vehicles could withstand even persistent, professional attempts at theft. Further details concerning the specific ways in which better security can be built into new cars can be found in Southall and Ekblom (1985) and Geason and Wilson (1990).

There can also be considerable gains from increasing the security of the existing fleet of vehicles. In the 1960s, vehicle theft in Germany declined by 60 per cent after the West German government made steering column locks compulsory in all vehicles, new and old (Mayhew, Clarke, Sturman and Hough 1976). In Britain and Australia although steering column locks are now standard in new vehicles, they were not required to be installed on old vehicles. In this case it has been suggested that there may simply be displacement of theft from new to old vehicles (Clarke and Harris 1992).

The requirement that anti-theft measures be installed on old as well as new vehicles might be achievable by making upgraded security a requirement of registration, but such measures may not be politically acceptable. Certainly there is evidence that in Australia vehicle manufacturers are heeding calls for more secure new vehicles (NRMA 1993; NSW Motor Vehicle Theft Steering Committee 1992), and it is to be expected that these measures will have a progressive effect on vehicle theft rates as the fleet of vehicles ages, and

vehicles with better built in security make up a greater proportion of vehicles on the road.

An important finding of this report is that there is little difference in the proportion of acquisitive theft types across vehicles of different ages. The reason why older vehicles are at greater risk of theft is not because these vehicles tend to be more likely to be stolen for parts. Older vehicles appear to be more likely to be stolen in every category of vehicle theft. This suggests that older vehicles may simply be more attractive to thieves because they are easier to steal. If true, this means that making such vehicles more difficult to steal should have an impact on all classes of vehicle theft.

Another initiative which has been suggested may have an effect on the risk of vehicle theft is the education of drivers to be aware of the risks of leaving their vehicles inadequately secured. Studies have suggested that about 10 - 15 per cent of vehicle thefts involve vehicles left unlocked (Mayhew 1990). According to Monaghan (1989) an NRMA campaign involving the distribution of leaflets to 1.5 million NRMA members, encouraging motorists to lock their cars, was followed by a drop in vehicle theft of about 20 per cent. However, as Clarke and Harris (1992) observed, it is impossible to attribute the drop in vehicle theft observed by Monaghan to such a campaign, given that it occurred at a time when a number of other well publicized initiatives were also introduced. Evaluation of similar publicity campaigns in other countries have failed to find any effect on motorists' security habits (Clarke and Harris 1992). As Clarke and Harris (1992) point out, the problem with campaigns to encourage people to lock their cars is that a large number of cars are locked, and that even if the proportion could be considerably increased it is unlikely that this alone could reduce opportunities for vehicle theft. Such campaigns may reduce the individual's chance of falling victim to vehicle theft, but do nothing to address the overall problem.

It is often suggested that tough penalties provide an effective deterrent to vehicle thieves. However, it is unlikely that heavy penalties for vehicle theft will act as an effective deterrent, partly because few vehicle thieves are caught. Recent British research (Light, Nee and Ingham 1993; Nee 1993) found that many offenders did not regard vehicle theft as a serious offence, did not think that they would be caught, and were not deterred by the risk of apprehension. Interestingly, the interviewed offenders tended to overestimate the chance of a custodial sentence compared with statistics on sentencing dispositions for the offence. Light, Nee and Ingham (1993) also found that vehicle thieves who had ceased stealing cars tended to cite increased responsibilities and maturity as reasons for desisting, rather than the threat of penal sanctions. There is little general evidence that lengthening gaol terms increases their deterrent value (Lipton, Martinson and Wilkes 1975), especially for an offence like motor vehicle theft which has such a low clear up rate. Even where very harsh, arbitrary penalties have been imposed for vehicle theft the offence persists. Webb and Laycock (1992) quote evidence from Belfast where in 1987 paramilitary organizations carried out 60 beatings and 124 shootings (knee-capping) as punishment for joyriders without seeming to influence the number of such offences.

8.2 SPECIFIC INITIATIVES TO ADDRESS DIFFERENT KINDS OF VEHICLE THEFT

This section examines specific ways in which fraudulent theft, acquisitive theft and theft for temporary use might be addressed.

8.2.1 Fraudulent vehicle theft

This report found that insurance fraud accounts for between 4 and 13 per cent of vehicle theft. If, say, fraud accounts for 10 per cent of all vehicle theft, halving the number of fraudulent thefts would result in a 5 per cent decrease in the numbers of recorded vehicle thefts. Such a reduction would produce cost benefits out of proportion to the number of vehicles involved, since undetected fraudulent thefts involve the total loss of the vehicle. As discussed in Section 3 of this report, an incentive for fraud exists when vehicles are insured for more than their realizable market value, and in some circumstances agreed value policies encourage this situation. However, to the extent that the retail market value used to calculate insured values tends to be greater than the realizable market value, both agreed and market value insurance policies are likely to provide an incentive for fraudulent theft. Prevention of insurance fraud, therefore, requires close attention to the discrepancy between the realizable market value of insured vehicles and their insured values, as well as to the investigation of suspicious insurance claims.

In general, insurance companies appear to have relatively efficient methods of detecting suspicious claims. However, at the present time suspicious claims may be withdrawn by claimants who are questioned by insurance companies over the circumstances of the claim and may not be referred to police. It is possible that a higher level of deterrence would result from the publication of a warning on insurance applications to the effect that all suspicious claims will be referred to the police for investigation. A secondary benefit of the gradual improvement of security of the fleet of registered vehicles is that it will become more difficult for owners wishing to fraudulently stage a theft, to manufacture evidence that the vehicle has been legitimately stolen.

8.2.2 Acquisitive vehicle theft

There have been many strategies proposed to address the problem of theft of vehicles for the acquisition of parts or for re-identification of the vehicle and resale. In general, these strategies address acquisitive theft where the vehicle or parts are sold. It is likely that the techniques for increasing vehicle security discussed above are the most effective means of deterring thieves who steal vehicles to acquire parts for their own use.

As discussed in Section 4 of this report, professional thieves are known to take advantage of the practice whereby vehicles which are classified as write-offs by the insurance companies, but which are repairable, are sold at auction with identifying marks intact. This practice maximizes the return to insurance companies because wrecks with compliance plates and other identification intact are much more valuable than the same wrecks without such identification. Ironically, at least some of this premium is due to demand created by thieves who sometimes bid up desirable wrecks to suspiciously high prices (NSW Motor Vehicle Theft Steering Committee 1992). The practice of selling wrecks with identification intact results in a ready supply of vehicle identities for professional thieves planning vehicle rebirthing operations.

There are a number of ways in which these activities could be addressed. As is the practice in some other States, the selling of written-off vehicles with identification intact could be banned. The insurance industry argues that the compliance plates are one of the few vehicle identifiers and destroying compliance plates would further remove the evidentiary trail (Insurance Council of Australia 1991). There seems to be general support for the introduction of a register of wrecked vehicles which records details of the identification of wrecks and the identity of persons purchasing the wrecks (NSW Motor Vehicle Theft Steering Committee 1992; Insurance Council of Australia 1991). More

generally, it is expected that the new registration system being developed by the Roads and Traffic Authority will significantly tighten registration procedures by requiring that provenance is proven for unregistered vehicles. This should make it more difficult to register vehicles which have been given new identities (NSW Police Service, n. d.).

At the present time it is a relatively simple matter for thieves to dispose of stolen vehicle parts through the network of wreckers yards in NSW. Stolen parts become impossible to identify once they are scattered among the millions of parts in these yards. One solution to the lack of identifiability of parts would be the introduction of component parts labelling. There has been considerable support for the introduction of component parts labelling among all parties except vehicle manufacturers (NSW Motor Vehicle Theft Steering Committee 1992; Insurance Council of Australia 1991). It is true that evidence concerning the efficacy of parts labelling schemes in the US has been equivocal (Harris and Clarke 1991, US National Highway Traffic Safety Administration 1991). However, many of the problems with the US system stem from the fact that only models identified as high risk were required to have parts labelled and the labels used to mark parts could be removed (US National Highway Traffic Safety Administration 1991). It is unlikely that a scheme which required universal, permanent labelling of parts, and where proper infrastructure was installed to keep registers of parts, would be subject to the same problems as the US scheme.

8.2.3 Theft of vehicles for short-term use

It is arguable that the best prevention for this kind of theft is improved vehicle security. Initiatives such as the provision of more secure parking, improved public transport, the targeting of high risk areas and youth education and public awareness campaigns have been suggested as possible policies (NSW Motor Vehicle Theft Steering Committee 1992). However, with the exception of youth education campaigns and the provision of better public transport, these initiatives may merely result in displacement of the problem, or may be not specific enough to address the problem. The provision of better public transport may be a partial solution, however as pointed out earlier, youths who are inclined to use stolen vehicles as transport may be just as likely to steal a car to avoid the inconvenience of public transport altogether.

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NOTES:

¹ Unpublished data from the NSW Police Service show that in June 1992 there 2,991 vehicles stolen in NSW, or approximately 750 per week.

² Data on registrations were obtained from Australian Bureau of Statistics 1992, *Motor Vehicle Registrations Australia, 1990-91*, Catalogue No. 9304.0, Australian Bureau of Statistics, Canberra.

³ Sources: Australian Institute of Criminology, unpublished data; NSW Police Service, unpublished data; Victoria Police 1992, *Statistical Review, 1991/92*, Victoria Police, Melbourne; Queensland Police Service 1992, *Statistical Review, 1991-1992*, Queensland Police Service, Brisbane; South Australia Police Department 1992, *Crime Statistics and Analysis: Supplement to the 1991-92 Annual Report*, South Australian Police Department, Adelaide; Northern Territory Police, Fire and Emergency Services *Annual Report 1991/92*, Northern Territory Police, Fire and Emergency Service, Darwin; The University of Western Australia Crime Research Centre, unpublished data; and Australian Bureau of Statistics 1992, *Motor Vehicle Registrations Australia, 1990-91*, Catalogue No. 9304.0, Australian Bureau of Statistics, Canberra.

⁴ Sources: see Note 3.

⁵ Unemployment data were obtained from two series of publications: *The Labour Force, Australia*, Catalogue No. 6203.0 and *The Labour Force, New South Wales*, Catalogue No. 6201.1. The first of these is a monthly publication and the second is a quarterly publication.

⁶ New vehicle registrations were obtained from the monthly publication series *Motor Vehicle Registrations, Australia*, Catalogue No. 9303.0. The personal consumption data were obtained from the National Accounts and Prices Branch of the Australian Bureau of Statistics. The data are estimates of household expenditure on consumer durables such as cars and furniture (excluding dwellings); semi-durables such as clothing, crockery and cutlery; single-use goods such as food, cigarettes and alcoholic drinks; and services of all kinds such as public transport, dry cleaning and hairdressing.

⁷ While information concerning trailers, caravans and semi-trailers is included in the SVI, these categories of vehicle are excluded from consideration in this report as they are not motor vehicles. Prime-movers are counted as trucks.

⁸ Data on numbers of different makes of vehicle from Australian Bureau of Statistics 1992b, *Motor Vehicle Census, Australia, 30 September 1991*, Catalogue No. 9309.0, Australian Bureau of Statistics, Canberra.

⁹ Any one vehicle may have more than one part missing. For example, a recovered vehicle may have body panels and accessories removed, and therefore be counted in both categories.

¹⁰ One such scheme described in Victoria involved criminal activity by the owner of a used car yard. The owner of the car yard would obtain a stolen vehicle. A phantom buyer using an assumed name would be arranged, and finance organized with the assistance of fake references. After a few payments were made to the finance company to allay suspicion, the car would disappear, be transported interstate and sold. The owner of the car yard would obtain the profit from the phantom sale of the vehicle as well as profit from the eventual sale of the vehicle interstate. The finance company would be unable to locate the phantom purchaser and would eventually have to write-off the loan. It was estimated that over 5 million dollars were obtained using this method.

¹¹ The NRMA were unable to provide a random sample of insured vehicles. In the sample provided vehicles manufactured in 1982 were somewhat over-represented.

¹² This estimate appears to be somewhat variable. In the following year's report the NRMA (1991a) estimated that 80 per cent of vehicles were insured against theft.

¹³ It was assumed that the 4,407 vehicles reclassified from uninsured to insured would have outcomes similar to those of the vehicles originally classified as insured. The 4,407 vehicles were therefore allocated to the categories shown in Table 8 in proportion to the original allocation of data to these categories. For example, Table 8 shows that 31.51 per cent of insured vehicles were recovered intact. It is assumed, therefore, that 31.51 per cent of the 4,407 reclassified vehicles (1,389 vehicles) were also recovered intact. These 1,389 vehicles were therefore subtracted from the

number of uninsured vehicles recovered intact and added to the number of insured vehicles recovered intact. This step was repeated for each of the categories of theft outcome in Table 8. The proportion of fraudulent thefts was then re-calculated on the basis of these data. When the estimate was based only on those thefts recovered burnt or immersed, the corrected low estimate of fraudulent theft was 2,870 vehicles, or 6.1 per cent of thefts. Calculating an estimate of fraud from vehicles not recovered, or recovered burnt or immersed or stripped, resulted in a corrected high estimate of fraud of 5,845 vehicles, or 12.5 per cent of stolen vehicles.

¹⁴ Cases were classified as recovered with parts missing when there was information on the SVI indicating that at least one category of part was missing on recovery. Cases where no parts were recorded missing, but there was some indication that the vehicle was recovered with all parts intact were classified as recovered with parts intact. Cases where there was no information about any category of part were coded as unknown.

¹⁵ Collision damage is, however, relatively common among vehicles stolen for recreational use (NRMA 1991a).

¹⁶ As in section 5, burnt or immersed insured vehicles are excluded from the analysis.

¹⁷ The condition of the vehicle on recovery was missing for 35.6 per cent of recovered vehicles (see Table 5).

¹⁸ Data on clear up rates for this offence were not available for 1991.

¹⁹ Britt (1992) argues that while the parameters of the age crime curve may vary, the mathematical form of the curve is constant, regardless of offence type.

²⁰ Source: NSW Bureau Of Crime Statistics and Research (1992), unpublished statistics; Office of Juvenile Justice, unpublished statistics.