Arson on the Increase: Motor Vehicle Theft and Arson in South Australia

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Data published recently by the Arson Prevention Bureau (1998) in the United Kingdom reported a large increase in the incidence of stolen vehicles being recovered burnt from 1986 to 1996. In 1986 3.0% of all stolen vehicles were recovered burnt, and by 1996 this figure had increased to 8.3% making vehicle arson a significant problem to law enforcement agencies, emergency services and insurance companies in the UK. This extraordinary growth in motor vehicle (MV) arson represents a significant cost to the community in both financial and social terms and yet research examining the problem is scarce. This paper presents a detailed analysis of the problem in South Australia and forecasts the likely growth in the problem over the next five years. Characteristics of vehicle arson, including vehicle characteristics, temporal patterns and spatial patterns, are discussed, the relevant literature is reviewed and the motivations of offenders discussed.

1   Overall Rates

Table 1 shows the incidence of MV theft and arson in South Australia and the estimated value of these vehicles from 1995 to 1999. The data show that the number of motor vehicle arsons has more than doubled in the five years listed and was shown to account for 3.8% of all stolen vehicles in 1999. While the figures are not as high as those seen in the UK, the increase is large and if the trend continues the total will reach 8.0% of all stolen vehicles being recovered burnt by 2006.

Table 1:   The incidence of motor vehicle theft, arson and estimated cost in South Australia, 1995 – 1999.

	Number of vehicles stolen	Number of vehicles recovered burnt	Percentage of vehicles recovered burnt	Estimated total value of vehicles stolen & burnt[1] ($)
1995	9,495	188	2.0	1,317,932
1996	8,032	217	2.7	1,632,345
1997	7,645	240	3.1	1,739,342
1998	10,487	342	3.3	2,636,370
1999	11,325	433	3.8	3,385,820

Table 2 shows the number of vehicle fires attended by the Metropolitan Fire Service (MFS) and the Country Fire Service (CFS) in financial years from 1994-95 to 1998-99. While it is difficult to draw conclusions on the basis of data from 1995 – 1997 because of the lack of CFS records, the figures in 1998 and 1999 imply that the arson of stolen vehicles accounted for approximately 27% of vehicle fires attended in 1998 and 37% in 1999. Clearly, more than one quarter, and now over one third, of all vehicle fires were deliberately lit by car thieves making the cost to the community even larger due to the pressure on fire services. The CFS attends nearly half of all vehicle fires in the state and this would

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[1] Estimated value is that taken from police records, where owners are asked to estimate the value of their vehicle. Totals do not include any other costs.

partly be the result of the preference of car thieves for quiet country areas so that their arson activities can be carried out with relative impunity.

Table 2: The incidence of vehicle fires attended by the MFS & CFS in South Australia, 1995 – 1999[2].

	Metropolitan Area (MFS)	Large Provisional Towns (MFS)	Country Areas (CFS)[3]	Total	Estimated % of stolen vehicle arsons
1994-95	487	66	NA	553	NA
1995-96[4]	452	116	NA	568	NA
1996-97	573	60	NA	643	NA
1997-98	584	104	560	1248	27.0
1998-99[3]	587	96	487	1170	37.0

2   Vehicle Characteristics

The six most popular makes that vehicle arsonists seek out are shown in Table 3. The total of all these vehicles makes up approximately 87% of all stolen vehicles recovered burnt from 1995 to 1999. The figures for burnt out vehicles are compared to those for stolen vehicles that are not burnt or not recovered at all.

Table 3: Make specifications of vehicles recovered burnt and those not burnt in South Australia, 1995 – 1999.

Make	Stolen vehicles recovered burnt 1995-1999		Stolen vehicles not burnt 1995-1999		Statistical Significance	
	N	%	N	%	z	prob.
Holden	518	36.7	19,110	41.8	-4.18	<.001
Ford	343	24.3	10,765	23.5	0.60	.550
Toyota	144	10.2	5,202	11.4	-1.43	.152
Mitsubishi	104	7.4	1,671	3.7	7.20	<.001
Mazda	60	4.3	2,055	4.5	-0.47	.641
Nissan	53	3.8	637	1.4	7.26	<.001

Using the overall theft rates of given makes of vehicle as the expected rate of burnt out vehicles the data show that Holdens were burnt at a significantly lower rate than would be expected. While Holden vehicles accounted for over 35% of vehicles recovered burnt, this figure did not meet the 41.6% figure for all Holden vehicles stolen. Motor vehicles manufactured by Ford, Toyota and Mazda were all burnt by thieves as often as the overall theft rates predicted. Both Mitsubishi and Nissan vehicles, on the other hand, were burnt by thieves significantly more often than the overall theft rates predicted. For both of these makes of vehicle the rate at which they were burnt was more than double what would have been expected from overall theft patterns. While these vehicles were much less likely to be stolen, making up only 5.3% of the total number of vehicles stolen, they were much more likely to be burnt by thieves when stolen.

[2] It is possible that not all stolen vehicle arsons were attended by the MFS or CFS so estimated percentages could be inaccurate.

[3] The CFS only recorded data beginning at 1/7/97.

[4] Industrial bans at the MFS meant no data recorded from 1/12/95 to 29/5/96, 15/12/98 to 28/4/99 and 12/5/99 to 28/5/99 so averages have been used to estimate yearly sub-totals.

Figure 1:   Mean age of stolen motor vehicles burnt and not burnt, 1995 – 1999.
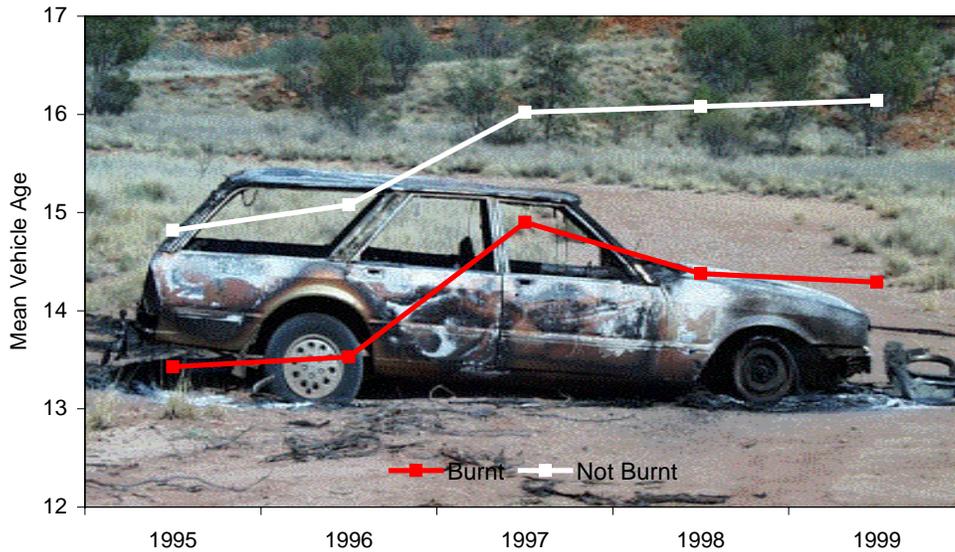

Figure 1 shows the average age of stolen vehicles each year from 1995 to 1999 that were burnt and those that were not burnt. The graph shows that all stolen vehicles were quite old, but vehicles that were burnt were significantly newer than those that were not burnt. Overall vehicles recovered burnt were 1.81 years newer than those that were not burnt.

Figure 2:   Mean estimated value of stolen motor vehicles burnt and not burnt, 1995 – 1999[5].

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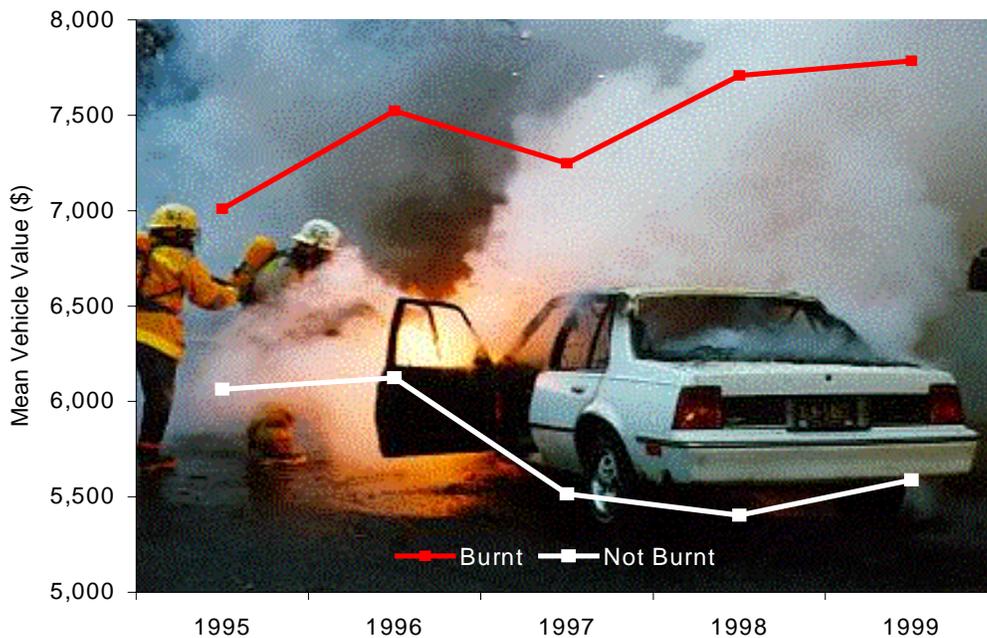
[5] The estimated value of a vehicle is generated by the owner's estimate and documented on police records.

Figure 2 shows the mean estimated value of stolen vehicles that were burnt and those not burnt from 1995 to 1999. A similar pattern to that for car age emerges in this analysis with burnt vehicles estimated to be worth significantly more than those not burnt. Overall, vehicles that were burnt had an estimated value almost $1800 higher than vehicles that were not burnt.

Figure 3: **Mean estimated value of stolen motor vehicles burnt and not burnt for the six makes most frequently burnt out, 1995 – 1999.**
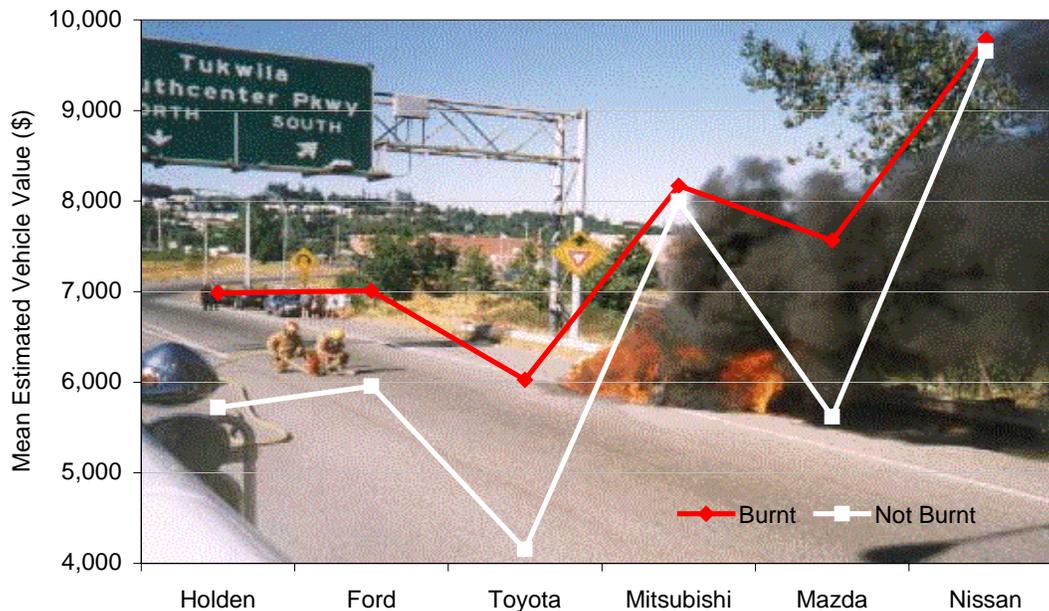

Figure 3 shows the mean estimated value of stolen vehicles burnt and not burnt for the six makes most frequently burnt out during the 1995 to 1999 period. Burnt stolen vehicles manufactured by Holden, Ford, Toyota and Mazda were all estimated to have significantly greater value (at the time of reporting the theft to police), than non-burnt stolen vehicles by the same manufacturer. Vehicles manufactured by both Mitsubishi and Nissan showed no difference in estimated value between those burnt and those not burnt. Interestingly, these two makes of vehicle were also burnt at a rate significantly greater than expected (see Table 3).

The finding that burnt out vehicles were estimated to be of significantly grater value than those that were not burnt is likely due to two reasons. The preference of people making fraudulent insurance claims to use arson to destroy their vehicles would undoubtedly contribute to the difference. The second explanation relates to what Canter and Fritzon (1998) identify as expressive arson directed at an object. Here, the arsonist would view the more expensive vehicles as a symbol worthy of destruction. Perhaps a symbol of material wealth that they feel they may never attain. To burn a cheap vehicle provides no benefit to the arsonist as it probably does not symbolise a group deserving of anguish. A closer examination of arson preferences within these makes supports this contention. Holden Camiras and Commodores both were burnt out at a rate higher than expected based on overall theft patterns, while the older EK to HZ models were all burnt at expected rates or less. A similar pattern was found for Ford vehicles with the Cortinas burnt at significantly less than expected rates and Fairlanes at a significantly higher than expected rate. Toyota vehicles were more likely to be burnt

if they were Camrys but less likely to be burnt if they were the older Coronas. There was no discernible pattern for vehicles made by the other three manufacturers.

The finding that Mitsubishi and Nissan vehicles were burnt more often than expected from overall theft patterns could also be due to a number of reasons. It is possible that vehicle arsonists prefer cars manufactured by these companies, although this is unlikely. It is more likely that the characteristics of the pool of vehicles available to thieves determined the difference. The fact that there was no difference in the estimated value of burnt and not burnt Mitsubishi and Nissan vehicles suggests that there were less old vehicles available to thieves. The fact that these types of vehicles were not common on Australian roads until the early 80s. This, coupled with the possible motivations discussed above would then predict higher rates of burnt out vehicles manufactured by these two companies.

3   Temporal Characteristics

Figure 4 displays the incidence of motor vehicle theft and arson by the month of the year for the five years examined. No clear pattern emerged from this analysis except that the months of May, June and July were consistently higher than the other months of the year. The only consistently low month appeared to be April.

Figure 4:   **Incidence of stolen motor vehicles recovered burnt by month of year, 1995 – 1999.**
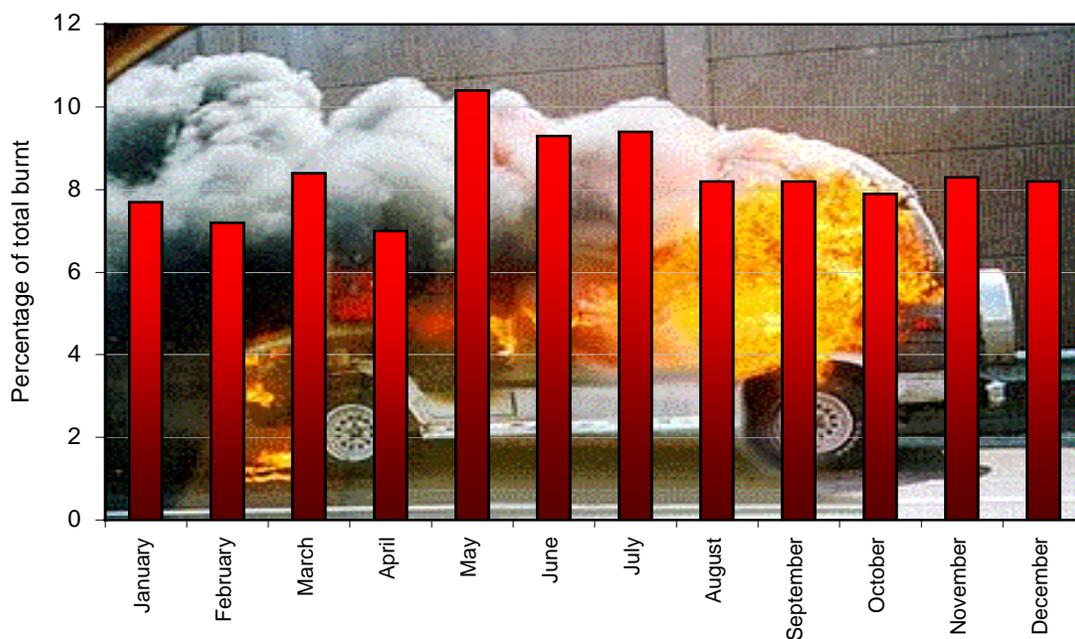
Figure 5 shows the incidence of burnt out vehicles by which day of the week they were stolen. The figure clearly shows that vehicles that were recovered burnt were much more likely to be stolen from Thursday to Saturday in all the five years listed. The quietest days of the week were Monday to Wednesday. There was little variation between individual years in these patterns. The configuration is very similar to that seen for all stolen vehicles suggesting that thieves who burn vehicles have comparable temporal patterns to the offenders who do not burn vehicles.

There are a number of possible explanations for the preference for weekends among vehicle arsonists including the possibility that it merely reflects the larger number of possible targets on weekends, or the greater activity of joyriders who like to burn vehicles on weekends. Another possibility is that alcohol consumption is greater on weekends and this has often been associated with arson activities (Inciardi, 1970 and Canter & Fritzon, 1998). These explanations will be discussed in more detail in later sections as the whole picture emerges.

Figure 5: Incidence of stolen motor vehicles recovered burnt by day of the week, 1995 – 1999[6].
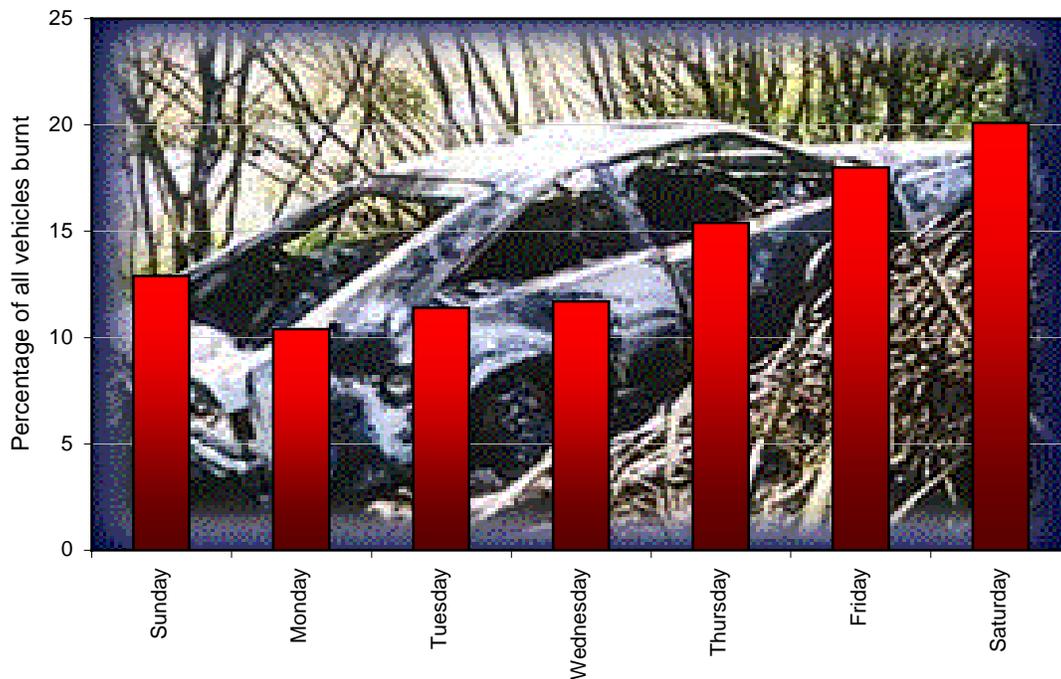
Examination of the time of the day vehicles recovered burnt were stolen showed some different patterns to the overall view. A consistent pattern emerges from this analysis indicating that vehicle thieves who like to burn vehicles operate mainly at night[7] with 73.8% of offences occurring at night across the five years studied. Only 62.5% of vehicles recovered not burnt were stolen at night revealing a significant preference for night thefts by vehicle arsonists ($z=7.18$, $p<.001$). It is likely that vehicle arsonists, particularly those who '*burn for the thrill of it*' prefer night-time as it makes the show more spectacular. Those who burn vehicles for other reasons probably prefer the night for the relative impunity it offers.

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[6] Day of the week was defined according to the earliest possible time of theft.

[7] Cars stolen between 6.00am and 6.00pm (inclusive) were defined as daytime thefts. All other times were classified as night.

4　　Spatial Characteristics

The location of thefts that result in a vehicle being burnt (left) and the percentage of all thefts that result in arson (right) are shown in Figure 7. The map on the left shows that the location of thefts of burnt vehicles closely resembles that seen for thefts overall. Thefts of vehicles recovered burnt from 1995 to 1999 were very common in Noarlunga, Adelaide, the Western Suburbs and the Northern suburbs.

The second map (right) shows that while the majority of vehicles were stolen in metropolitan areas only a very small percentage of them (2-3%) were recovered burnt. While thefts were less frequent in the outer regions of Adelaide, they were far more likely to be recovered burnt. This was particularly evident in the Northern Statistical Local Areas (SLAs). For example, while Mallala had only 10 vehicles stolen that were recovered burnt over the five-year period, this represented almost 10% of all vehicles stolen in the area over the same period. A similar pattern is seen in both Gawler and Barossa in the north and Yankalilla in the south. Munno Parra seems to be the exception as it had a large number of total thefts and those that were recovered burnt accounted for 8.5% of the total.

Figure 8 shows the recovery location (SLA) and number of vehicles burnt out (left) and the percentage of all recoveries that were burnt out (right) from 1995 to 1999 The pattern for recoveries was quite different from that seen for the overall configuration. There were a particularly high number of recoveries occurring in both Munno Para and Mallala. While very few vehicles were stolen in Mallala and a large number were stolen in Munno Para suggesting no common characteristics, they both seem to be preferred locations for the arson of motor vehicles. This assertion is also supported by the fact that a high percentage of thefts in these SLAs resulted in arson.

The fact that burnt out vehicles are recovered in predominantly isolated areas suggests that more than one offender was usually involved. Clearly a second vehicle would be required in many cases to transport the offenders away from the recovery location. This also suggests that the offence was commonly premeditated.

More detailed maps of the Mallala and Munno Para SLAs can be seen in Appendix 2. These maps plot recoveries of burnt vehicles by collector district within these areas.

Figure 7: Location of theft (Statistical Local Areas – SLA) for vehicles recovered burnt (left), and percent of vehicles stolen recovered burnt, 1995 – 1999.
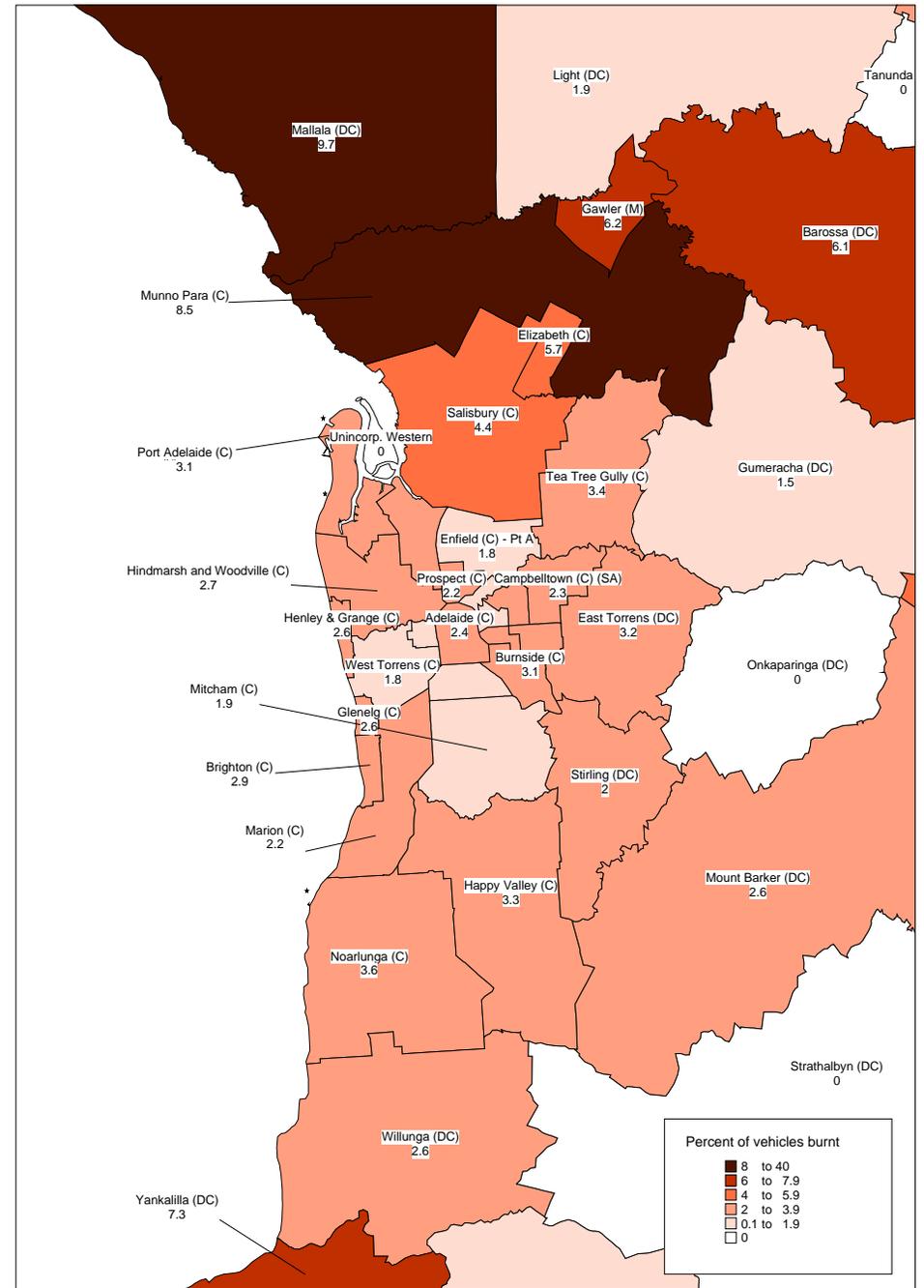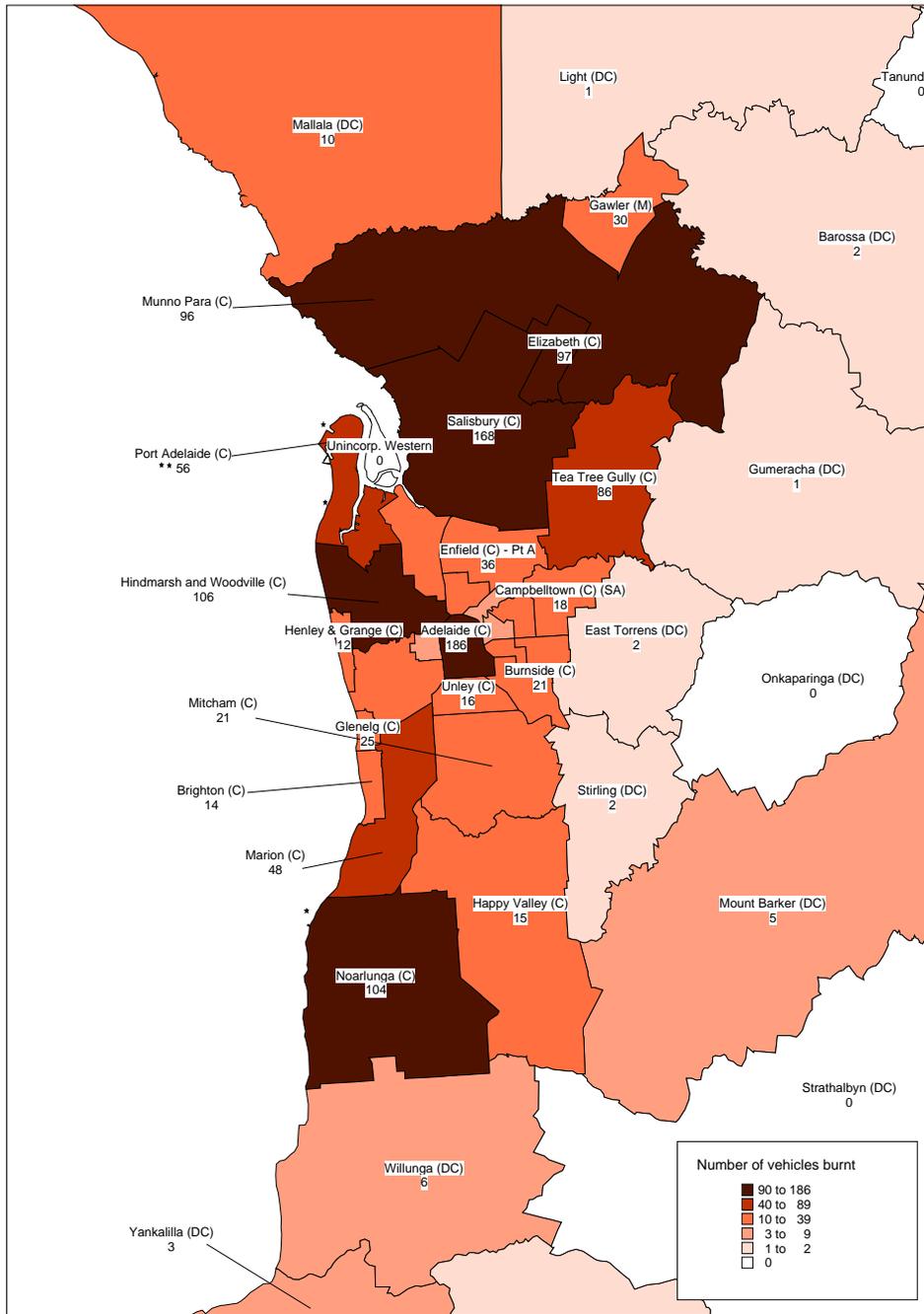
Figure 8:   **Location of recovery (SLA) for stolen vehicles burnt, number (left) and percentage of all recoveries (right), 1995 – 1999.**

Left map — Number of vehicles recovered:

Light (DC) 42
Tanunda 1
Mallala (DC) 161
Gawler (M) 26
Barossa (DC) 10
Munno Para (C) 165
Elizabeth (C) 34
Salisbury (C) 87
Unincorp. Western 6
Port Adelaide (C) 94
Tea Tree Gully (C) 33
Gumeracha (DC) 45
Enfield (C) - Pt A 44
Hindmarsh and Woodville (C) 74
Prospect (C) 6
Campbelltown (C) (SA) 21
Henley & Grange (C) 2
Adelaide (C) 14
East Torrens (DC) 19
West Torrens (C) 5
Burnside (C) 9
Onkaparinga (DC) 0
Mitcham (C) 15
Glenelg (C) 1
Brighton (C) 5
Stirling (DC) 7
Marion (C) 29
Happy Valley (C) 28
Mount Barker (DC) 14
Noarlunga (C) 92
Strathalbyn (DC) 1
Willunga (DC) 18
Yankalilla (DC) 8

Number of vehicles recovered
■ 80 to 165
■ 30 to 79
■ 15 to 29
■ 5 to 14
□ 1 to 4
□ 0

Right map — Percent of recoveries burnt:

Light (DC) 33.6
Tanunda 10
Mallala (DC) 33.8
Gawler (M) 7.3
Barossa (DC) 16.9
Munno Para (C) 10
Elizabeth (C) 2.6
Salisbury (C) 2.4
Unincorp. Western 20.7
Port Adelaide (C) 4.9
Tea Tree Gully (C) 1.9
Gumeracha (DC) 16.1
Enfield (C) - Pt A 1.8
Hindmarsh and Woodville (C) 2.1
Prospect (C) 0.9
Campbelltown (C) (SA) 2.7
Henley & Grange (C) 0.5
Adelaide (C) 0.4
East Torrens (DC) 13.3
West Torrens (C) 0.8
Burnside (C) 1.6
Onkaparinga (DC) 0
Mitcham (C) 1.5
Glenelg (C) 0.2
Brighton (C) 1.3
Stirling (DC) 4.6
Marion (C) 1.5
Happy Valley (C) 5.9
Mount Barker (DC) 6.3
Noarlunga (C) 3.3
Strathalbyn (DC) 2.3
Willunga (DC) 5.7
Yankalilla (DC) 14

Percent of recoveries burnt
■ 15 to 33.9
■ 8 to 14.9
■ 5 to 7.9
□ 2 to 4.9
□ 0.1 to 1.9
□ 0

Table 4:   Theft location of vehicles recovered burnt and those not burnt in South Australia, 1995 – 1999.

|	Stolen vehicles recovered burnt 1995-1999		Stolen vehicles not burnt 1995-1999		Sig.	
	N	%	N	%	Z	prob.
Street	602	42.7	21396	46.8	-3.02	<.01
Residence	389	27.6	9705	21.2	5.75	<.001
Car-park	368	26.1	11850	25.9	0.16	ns
Other	51	3.6	2794	6.1	-3.87	<.001

The type of theft locations for stolen vehicles recovered burnt and those not burnt from 1995 to 1999 are presented in Table 4. Vehicles which were recovered burnt were significantly more likely to be stolen from a residence than vehicles not burnt, and significantly less likely to be stolen from the street or a car park. The larger than expected number of thefts from residences suggests that many of those specific vehicles may be targeted for either insurance fraud or revenge arson. Vehicles stolen from the street or a car park are much more likely to be random events mostly defined by opportunity, while vehicles stolen from a private residence are, to some extent, more likely to be targeted specifically.

5   Police Apprehensions

Table 5 reveals the number of police apprehensions for arson of a motor vehicle involving a charge of *illegal use/larceny of a motor vehicle*. Average age of people apprehended is also reported.

Table 5:   Police apprehensions for arson of a motor vehicle and average age, 1995 – 1999.

	Number of apprehensions (counts) – arson of motor vehicle[8]	Number of unique alleged offenders	Mean age and standard deviation (years)	
1995	3	3	18.97	(2.22)
1996	1	1	17.30	(-)
1997	1[9]	1	30.30	(-)
1998	19	18	20.26	(4.60)
1999	29	22	16.95	(2.61)
Total	53	45	18.51	(3.04)

The most striking feature about Table 5 is the increase in apprehension numbers from 1995 to 1999. While the numbers of arsons committed has also increased over the same period the increase does not match the escalation in apprehensions over the same period.

The second important fact to note in the Table relates to the age of offenders. Clearly, the arson of a motor vehicle is a younger person's offence with the average age of alleged offenders at 18.51 years. This finding suggests that joyriders were predominantly responsible for the arson of motor vehicles during this period. However, it is possible that only the less experienced younger joyriders are being apprehended. Given the large number of occurrences, and correspondingly small number of

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[8] For an event to be counted there must have been an apprehension categorised as larceny of a motor vehicle, or illegal use of a motor vehicle associated with the arson report. It is possible that police may not have linked the arson report with the theft report, so counts could be underestimated.
[9] This case was an insurance fraud so the illegal use/larceny of a motor vehicle charge was not listed.

apprehensions over the five-year period it is a very real possibility. It is also important to note that of the 45 unique alleged offenders there were no females.

The 53 charges of arson of a motor vehicle recorded from 1995 to 1999 represents only 3.7% of all stolen vehicle arson incidents documented over the same period. This percentage of incidents resulting in charges was extremely low and compares to 15.9% for *illegal use/larceny of a motor vehicle* generally (eg. 7,466 charges of illegal use/larceny of a motor vehicle laid from 46,984 incidents). These figures demonstrate that vehicle arsonists seem to be able to operate with relative impunity compared to vehicle thieves overall.

6   Offender Motivation

While theoretical discussions of the arson of motor vehicles do not exist in the current literature, there are many explanations of more general forms of arson. For example, in a recent paper Canter & Fritzon (1998) characterise four forms of arson as defined by motivations and targets. Three of them can be applied to motor vehicle arson. The first of these has been described as:

> *An arson which is instrumentally motivated and directed at an object is an attempt to change aspects of the object where the change will be of direct benefit to the firesetter. A burglar who sets fire to a residence to hide clues to his theft, or the car thief who burns a stolen car for similar reasons are both examples of this type of firesetting* (Canter and Fritzon, 1998, p – 75).

Examples of this type of motor vehicle arson would include the professional thief who seeks to cover their tracks, the joyrider who also seeks to cover their tracks, and insurance fraudsters seeking compensation for destroyed property. There are a number of facts evident in the presented data and police records that support these explanations of motor vehicle arson.

1. While it is difficult to make assertions about the motivations of an offender from the investigator's diary in police records, when apprehensions were executed and full and frank admissions to the crime made by offenders it was possible to make tentative conclusions about possible motivations. One reason given to police for the arson of a motor vehicle was the desire to remove fingerprints. Of 19 apprehension reports which contained enough information to make conclusions about offender motivations four of them reported burning the vehicle to remove fingerprints. This reason was particularly popular for offenders who were joyriders.

2. 11.1% of motor vehicles that were burnt out (1995 – 1999) were also stripped, compared to 5.0% of motor vehicles that were not burnt, suggesting professional theft for parts is common among vehicles that are burnt. However, it is likely that owners who burn their own vehicles for insurance fraud would also remove any items of value from the vehicle. Three incidences of this kind of activity were found among 19 apprehension reports with enough information to make motivational inferences.

3. Of all the insurance claims for stolen vehicles reported to the CARS database from 1995 to 1998[10] 12.2% of them involved cars that had been burnt. 24.1% of vehicles that had been burnt were flagged as possible frauds by the insurers while only 7.5% of vehicles that had not been burnt were flagged as possible frauds. While these figures suggest that insurance

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[10] 1999 data was unavailable at time of publication.

fraud was a large contributor to the incidence of motor vehicle arson in South Australia, it is likely that the presence of arson was used as a fraud indicator making the fraud figures an overestimate. It is also worth noting that if a fraudulent claim was made, and the claim later withdrawn, the insurance data does not make it to the CARS database so many unsuccessful cases of insurance fraud would not be accounted for in the present data. Another indicator of insurance fraud contributing to the incidence of motor vehicle arson comes from the type of insurance policy claimants had covering their vehicles. It is often agreed that agreed value policies overestimate a vehicle's value more often than a market value policy and therefore are more likely to entice fraudulent arson claims than vehicles covered by market value policies. Table 6 shows the incidence of burnt vehicles and their policy type from 1995 to 1998.

Table 6:   Incidence of vehicles burnt by policy type, 1995 – 1998.

Type of Policy	Burnt %	Not Burnt %
Agreed Value	15.0	85.0
Market Value	11.1	88.9
Sum Insured	13.9	86.1
Total	12.2	87.8

Table 6 shows clearly that claimants who held agreed value policies were significantly more likely to have their vehicles burnt than those who held market value policies, $z=2.74$, $p<.01$. The finding implies that insurance fraudsters are more likely to have an agreed value policy than a market value policy and the evidence appears to suggests that insurance fraud may motivate a considerable proportion of motor vehicle arson.

Canter and Fritzon's (1998) second category of arson that applies to motor vehicle theft is:

Arson which is expressive and directed at an object involves the demonstration of aspects of the arsonist on the external world. This accords with Geller's (1992) description of firesetting as a means of emotional acting out, but the desire to make an impact on the environment also draws attention to forms of arson in which the target has some symbolic, emotional significance to the firesetter (Canter and Fritzon, 1998, p – 75).

In this type of arson the object burnt has some symbolic meaning to the arsonist. In the case of motor vehicle arson it would usually be relevant to joyriders burning a vehicle that may symbolize a lifestyle held in low regard by the arsonist.

1. The difference in vehicle value and vehicle age seen in section 2 support this assertion. Vehicles that were recovered burnt were significantly newer and estimated to be more valuable than those recovered not burnt. Newer, more valuable vehicles could symbolize a lifestyle held in low esteem by thieves. However, it is possible that the differences could be entirely due to insurance fraud. As there is no way of differentiating between the two types the question will remain unanswered.

2. The extremely young average age of offenders apprehended shown in section 5 suggest a large number of joyriders are responsible for the arson of vehicles. Ten of the 45 unique individuals apprehended in the five year period examined were younger than 16 years of age and 28 were younger than 20 years of age.

3. In spite of the difficulty mentioned in (1 – page 11), the apprehension records do provide some evidence of this type of arson activity. Four of the 19 apprehension records mentioned earlier reported joyriders who could offer no reason for their arson activities. There were a further five instances of joyriders who burnt a vehicle because it became undriveable. It was almost like the arsonists were unhappy that their ride had finished too soon and decided to burn the vehicle as a sort of recompense.

The last form of arson that can apply to motor vehicle theft and arson Canter and Fritzon (1998) define as:

> *The final form of arson can be seen as a reaction to frustration by another person which the firesetter wishes to hurt or remove. In this sense the offence has some direct instrumental objective but that objective is focused on changing the emotional state of the firesetter him/herself* (Canter and Fritzon, 1998, p – 75).

Two of the 19 apprehension reports concern this type of arson. The arson of a motor vehicle for revenge was reported by alleged offenders. However, it is possible that these types of offences were easier for investigators to solve due to the relationship between the offender and victim.

While the above three categories of arson do apply to many instances of motor vehicle arson, they fail to account for the offenders who burn vehicles purely for the thrill. The first group concerns arsonists that burn for purely functional reasons (i.e. removing fingerprints or financial gain). The third category concerns arsonists that burn out of revenge. The second category concerns arsonists that burn because the target has some symbolic meaning. While this may be the case for many joyriders who burn vehicles, it is likely that many joyriders burn vehicles purely for the thrill of the burn. This group may well make up the majority of vehicle arson incidents and further work is required to accommodate this group into the overall theory.

7   Conclusion

There is little doubt that while the percentage of stolen vehicles burnt is low, the incidence of motor vehicle arson is on the increase in South Australia producing a significant financial burden to the community, law enforcement agencies, emergency services and insurance companies. While the figures are not as high as those seen in the UK, the pattern suggests that South Australia is following a similar trend.

The overall vehicle and temporal characteristics of motor vehicle arson suggest a pattern quite similar to that seen for overall thefts. Minor variations do not detract from this assertion but provide some valuable insight into the possible explanations of arson. The fact that burnt vehicles were newer and more valuable than those not burnt does support the assertions made about offender motivations in section 6. The overall patterns suggest that while insurance fraud does play a role, the majority of incidences of motor vehicle arson appear to be carried out by younger joyriders.

The spatial characteristics of motor vehicle arson also support the above assertion with theft patterns closely resembling those seen for vehicle theft overall. It is only in the spatial characteristics of the recovery of burnt vehicles that any meaningful difference is observed and these are readily explained by the nature of the crime. The fact that theft from private residences was higher than expected for vehicles recovered burnt out did to some extent suggest that specific vehicles were sometimes targeted, but nevertheless, the general pattern still suggests that it is a predominantly joyriders crime. Police apprehension reports also support this hypothesis with young offenders generally being apprehended on suspicion of this crime.

In order to effectively reduce the incidence of motor vehicle arson the focus needs to be kept on vehicle security. Simple precautions could do a great deal in achieving a reduction. Motorists need to keep unattended vehicles locked at all times, even when parked on private residences. Immobilisers should be fitted on all vehicles and keys never left in ignitions.

The apprehension reports suggest that police have already responded to the increase over the last two years and maintenance of this stance would be helpful in reducing the incidence of motor vehicle arson.

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Appendix 1:Number of burnt vehicles stolen and recovered by SLA, 1995 – 1999.

Statistical Local Area	Number of burnt vehicles stolen
Unspecified	10
Adelaide (C)	182
Angaston (DC)	1
Barmera (DC)	2
Barossa (DC)	2
Brighton (C)	14
Burnside (C)	21
Campbelltown (C) (SA)	26
Central Darling (A)	6
Central Yorke Peninsula (DC)	2
Coober Pedy (DC)	1
East Torrens (DC)	2
Elizabeth (C)	97
Enfield (C) - Pt A	36
Enfield (C) - Pt B	24
Eudunda (DC)	1
Franklin Harbor (DC)	1
Gawler (M)	32
Glenelg (C)	25
Gumeracha (DC)	1
Happy Valley (C)	15
Henley & Grange (C)	14
Hindmarsh (M)	1
Hindmarsh and Woodville (C)	90
Kensington & Norwood (C)	16
Light (DC)	1
Loxton (DC)	3
Mallala (DC)	10
Mannum (DC)	1
Marion (C)	47
Mitcham (C)	21
Morgan (DC)	1
Mount Barker (DC)	5
Mount Gambier (C)	14
Mount Gambier (DC)	3
Mount Pleasant (DC)	1
Munno Para (C)	96
Murray Bridge (RC)	2
Naracoorte (DC)	1
Noarlunga (C)	103
Northern Yorke Peninsula (DC)	4
Paringa (DC)	2
Payneham (C)	19
Pirie (DC)	1
Port Adelaide (C)	56
Port Augusta (C)	7
Port Elliot & Goolwa (DC)	1
Port Lincoln (C)	2

Statistical Local Area	Number of burnt vehicles stolen
Port Pirie (C)	3
Prospect (C)	19
Renmark (M)	4
Ridley-Truro (DC)	1
Roxby Downs (M)	1
Saddleworth & Auburn (DC)	1
Salisbury (C)	166
St Peters (M)	3
Stirling (DC)	2
Tatiara (DC)	1
Tea Tree Gully (C)	86
Thebarton (M)	7
Unincorp. Far North	1
Unley (C)	16
Victor Harbor (DC)	4
Waikerie (DC)	2
Walkerville (M)	4
West Torrens (C)	16
Whyalla (C)	14
Willunga (DC)	6
Woodville (C)	15
Yankalilla (DC)	3
Total	1399

Location of recovery

Statistical Local Area	Number of burnt vehicles recovered
Unspecified	32
Adelaide (C)	14
Barmera (DC)	1
Barossa (DC)	10
Berri (DC)	1
Brighton (C)	5
Burnside (C)	23
Campbelltown (C) (SA)	21
Central Darling (A)	6
Central Yorke Peninsula (DC)	4
Coober Pedy (DC)	1
Crystal Brook-Redhill (DC)	1
East Torrens (DC)	19
Elizabeth (C)	35
Enfield (C) - Pt A	43
Enfield (C) - Pt B	45
Eudunda (DC)	2
Gawler (M)	27
Gumeracha (DC)	44
Happy Valley (C)	28

| Statistical Local Area	Number of burnt vehicles recovered	Statistical Local Area	Number of burnt vehicles recovered
Henley & Grange (C)	2	Victor Harbor (DC)	3
Hindmarsh and Woodville (C)	79	Waikerie (DC)	2
Kapunda (DC)	2	Wakefield Plains (DC)	5
Karoonda East Murray (DC)	3	Walkerville (M)	6
Kensington & Norwood (C)	3	West Torrens (C)	4
Light (DC)	42	Whyalla (C)	12
Loxton (DC)	2	Willunga (DC)	21
Mallala (DC)	172	Yankalilla (DC)	8
Mannum (DC)	3	Total	1399
Marion (C)	30		
Millicent (DC)	1		
Minlaton (DC)	1		
Mitcham (C)	15		
Morgan (DC)	3		
Mount Barker (DC)	16		
Mount Gambier (C)	4		
Mount Gambier (DC)	6		
Mount Pleasant (DC)	4		
Mount Remarkable (DC)	2		
Munno Para (C)	165		
Murray Bridge (RC)	8		
Noarlunga (C)	97		
Northern Yorke Peninsula (DC)	4		
Onkaparinga (DC)	1		
Paringa (DC)	5		
Payneham (C)	9		
Penola (DC)	2		
Peterborough (DC)	1		
Port Adelaide (C)	98		
Port Augusta (C)	6		
Port Elliot & Goolwa (DC)	1		
Port Lincoln (C)	2		
Port MacDonnell (DC)	3		
Port Pirie (C)	1		
Prospect (C)	6		
Renmark (M)	3		
Ridley-Truro (DC)	7		
Riverton (DC)	1		
Roxby Downs (M)	1		
Salisbury (C)	93		
St Peters (M)	1		
Stirling (DC)	7		
Strathalbyn (DC)	1		
Tanunda (DC)	1		
Tatiara (DC)	1		
Tea Tree Gully (C)	35		
Thebarton (M)	9		
Unincorp. Far North	1		
Unincorp. Western	6		
Unincorp. Whyalla	2		
Unincorp. Yorke	2		
Unley (C)	6		

Appendix 2: Number of burnt vehicles recovered in Munno Para and Mallala by CD, 1995 – 1999.

Munno Para Collector District (CD)	Number of burnt vehicles recovered
4140301	12
4140302	14
4140303	0
4140304	1
4140305	3
4140306	1
4140307	0
4140308	0
4140309	19
4140310	2
4140311	3
4140312	10
4140313	7
4140401	13
4140402	10
4140403	15
4140404	1
4140405	2
4140406	1
4140407	0
4140408	1
4140409	1
4140410	12
4140411	0
4140412	0
4140413	0
4140414	0
4140501	0
4140502	0
4140503	0
4140504	3
4140505	1
4140506	2
4140507	0
4140508	2
4140509	1
4140510	0
4140511	1
4140512	7
4140513	0
4140514	0
4140515	0
4140601	3
4140602	1
4140603	3
4140604	2
4140605	0
4140606	1
4140607	2
4140608	1

Munno Para Collector District (CD)	Number of burnt vehicles recovered
4140609	2
4140610	0
4140611	1
4140612	0
4140613	3
4142901	0
4142902	0
4142904	0
4142906	1
4142907	0
4142908	0
4142909	0
4142911	0
4142912	0
4142913	0
4142914	0
4142915	0
Total	165

Mallala Collector District (CD)	Number of burnt vehicles recovered
4031501	29
4031502	34
4031503	1
4031504	0
4031505	10
4031506	3
4031507	14
4031508	68
4031509	1
4031510	7
4031511	3
4031512	1
4031513	0
4031514	1
4031515	0
Total	172

Appendix 3: Number of burnt vehicles recovered by CD in Mallala, 1995 – 1999.

Wakefield Plains (DC)

4031504
0

4031511
3

4031502
34

4031503
1

Light (DC

4031512
1

4031501
29

Mallala (DC)

4031505
10

4031507
14

4031509
1

4031515
0

4031513
0

4031510
7

4031508
68

4031506
3

4031514
1

Munno Para (C)

Number of vehicles recovered

■ 40 to 70
■ 25 to 39
■ 10 to 24
■ 3 to   9
□ 1 to   2
□ 0

Salisbury (C)
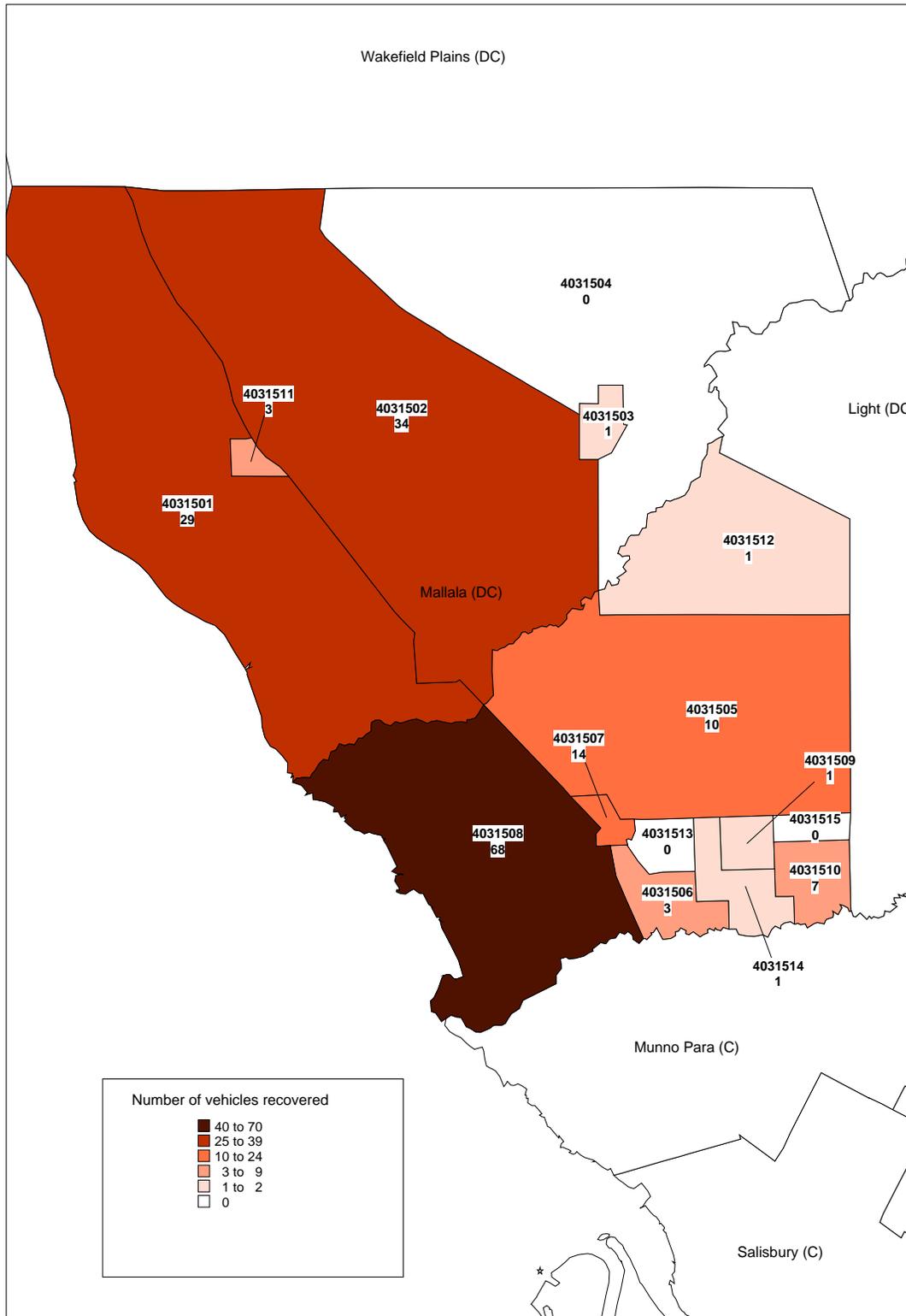
Appendix 4: Number of burnt vehicles recovered by CD in Munno Para, 1995 – 1999.

Mallala (DC)

Light (DC)

Barossa (DC)

4140311
3

4140503
0

4140411
0

4140312
10

4140305
3

4140310
2

4140302
14

4140307
0

4140306
1

4140308
0

4140401
13

4140304
1

4140612
1

4140303
0

4140501
4140507

4140313
7

4140613
3

4140512
7

4142910
1

4140309
19

4140506
2

4142903
2

4140301
12

4142901
0

4140403
15

4142904

4140402
10

4140409
1

4140410
12

4140404
1

Elizabeth (C)

4140406
1

Salisbury (C)

4140413
0

Gumeracha (DC)

Tea Tree Gully (C)

Number of vehicles recovered

14 to 19
9 to 13
4 to 8
2 to 3
1
0