

# Trends & issues

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**Foreword** | *The incidence of service station armed robbery has steadily increased over the past decade. Using the Australian Institute of Criminology's National Armed Robbery Monitoring Program (NARMP) data, this paper examines the incidence of armed robbery at service stations and profiles the offenders involved. The NARMP data shows that about one in ten armed robberies in Australia were of service stations, and that these were more likely to be targeted at night by lone offenders using knives. The most common item stolen was cash, with an average value of \$643. The relative youth of the offenders—on average 23 years old—and infrequent use of firearms suggests the armed robberies involved little if any planning. This opportunistic targeting of service stations has been attributed to their extended opening hours, their sale of cigarettes and other exchangeable goods, their high volume of cash transactions and their isolation from other businesses. Widespread adoption of crime prevention measures by service stations, such as transfer trays, could help reduce their risk of being robbed, but the paper cautions that displacement effects should be considered prior to the implementation of new countermeasures.*

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## Service station armed robbery in Australia

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Since the late 1980s, there has been a steady increase in the rate of armed and unarmed robbery in Australia (Taylor 2004). The increase in armed robbery has been identified by law enforcement, media and the general public as being of concern due to the possibility of members of the public becoming incidental victims during an armed robbery occurrence. Armed robbery is defined as *the unlawful taking of property, with the intent to permanently deprive the owner of the property, from the immediate possession of a person, or an organisation, or control, custody or care of a person, involving the use of a weapon* (ABS 2007:51).

The National Armed Robbery Monitoring Program (NARMP) conducted by the Australian Institute of Criminology (AIC), identified commercial outlets as being particularly vulnerable to armed robbery. In 2005, almost half (45%) of all armed robberies occurred in these outlets (Borzycki 2008). Between 1993 and 2000, the incidence of armed robbery of service stations increased by 214 percent (AIC 2002). This trend has continued, with a 31 percent increase in the number of incidents in the three years from 2004–06. Service stations are generally deemed to be at a high risk of armed robbery due to extended opening hours (South Australian Police 2006), their sale of cigarettes and other readily exchangeable goods, their high volume of cash transactions (Australian Institute of Petroleum 2002) and their isolation from other businesses (AIC 2002). Research indicates that convenience stores and service stations are comparable in relation to victimisation and their vulnerability can be partly attributed to a lack of adequate security measures (AIC 2002).

Prior research indicates that crime prevention measures such as target hardening, comprising measures employed to make a location more difficult to target e.g. introducing closed circuit television (CCTV), are effective in preventing service station armed robbery (Mouzos & Carcach 2001). This paper presents an overview of trends in service station armed robbery. It discusses issues relevant to this type of offence, including an offender profile, and offers a review of target-hardening measures open to service station employees and franchisees.

## Service stations as targets

Research on the prevalence of service station armed robbery has been intermittent. Comparable locations such as convenience stores, which have similar characteristics to service stations (i.e. late trading hours and easy access to merchandise), are also frequent targets of armed robbery attacks (Petrosino & Brensibler 2003). In the United States, prisoners interviewed as part of a study investigating armed robbery indicated that they viewed convenience stores as particularly easy targets, referring to them as 'stop and robs' (Petrosino & Brensibler 2003). Service stations have also consistently recorded high levels of armed robberies, with approximately 80 percent of robberies involving a weapon (Taylor 2002).

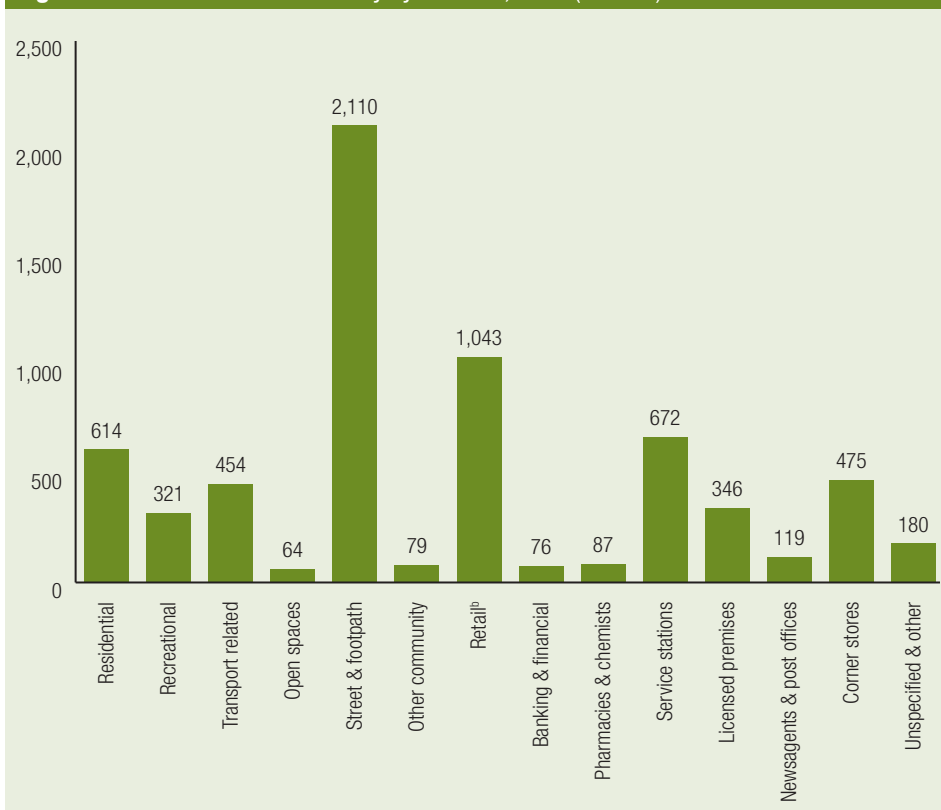
Several changes have occurred in the service station industry since the late 1990s which may have contributed to their susceptibility to armed robbery. These include:

- longer trading hours (many now operate 24 hours)
- fewer on-site operators late at night and in the early hours of the morning
- lone staff undertaking duties away from the counter
- large amounts of on-site cash to supply extended trading hours
- stocks of goods attractive to offenders such as cigarettes and painkillers
- the use of less durable construction materials such as glass and aluminium (Barron 1998).

Typically, service station armed robberies occur between 6 pm and 6 am (Mouzos & Borzycki 2003). However, one study found that 28 percent of service station armed robberies occurred between 12 am and 3 am (AIC 2002).

Previous studies indicate that robbery offenders choose commercial targets because cash is easily accessible and targets are often staffed by few employees, where one employee is often seen as an acceptable risk, while two employees may be considered too risky (Matthews 2002; Petrosino & Brensibler 2003). Offenders

**Figure 1** Incidence of armed robbery by location<sup>a</sup>, 2006 (number)



a: Other includes warehouse and administrative locations

b: not further defined

Source: AIC NARMP Collection 2006 [computer file]

were more likely to choose targets using less visible security measures and targets in which customers do not pose a risk to apprehension (Matthews 2002). Customers could potentially be at physical risk from the offender, but could also act as witnesses (AIC 2006).

## Methodology

To examine service stations as targets of armed robbery and profile offenders, this paper analysed 2006 NARMP data. The analysis used incident-based data only.

Information from these incidents relates to the first victim recorded in the incident. Information provided by subsequent victims from the same incident was not included. This prevented duplication of incidents and offenders. Data examined were based upon 6,640 known incidents of armed robbery in Australia in 2006.

The descriptive data results presented in this paper focus only on service station armed robberies. For comparative purposes, a polynomial logistic regression model was

used to compare armed robberies at service stations with those at other commercial locations and those in residential and public locations.

## Incidents of service station armed robbery

### Location and weapons

In 2006, service station armed robberies constituted 10 percent of all armed robberies in Australia, with 672 incidents recorded (see Figure 1). The only locations with a higher number of incidents were streets and footpaths with 2,110 incidents (32%) and retail outlets (not further defined) with 1,043 incidents (16%). The next most common locations for armed robberies were residential locations and corner stores (including supermarkets and takeaway stores) of which there were 614 and 475 incidents (9% and 7% respectively) in 2006.

Approximately one-third of armed robbery victims at service stations who had property or cash stolen were individuals (i.e. staff, customers), with the remainder being the

**Table 1** Indicators for armed robbery between service stations, other commercial locations and non-commercial locations<sup>a</sup>

Factors	Residential and public locations <sup>b</sup>		Other commercial locations	
	Coefficient	Standard error	Coefficient	Standard error
Offender detected	-1.07*	0.13	-0.03	0.13
Offender under 21 years	0.17	0.15	-0.73*	0.15
Night-time	-0.97*	0.09	-1.56*	0.10
Knife (most serious weapon)	-0.35*	0.09	-0.39*	0.09
Multiple offenders	0.65*	0.15	0.24	0.16
Sunday	-0.15	0.16	-2.55	0.17
Monday	0.33	0.18	0.06	0.19
Wednesday	-2.94	0.17	-0.23	0.18
Thursday	0.78	0.18	-0.04	0.19
Friday	-0.43	0.17	-0.11	0.18
Saturday	0.21	0.17	-0.04	0.18
Constant	2.82*		2.47*	
Model chi square	550.96			
df	22			
Pseudo R square	0.05			
(n)	(6,156)			

\* statistically significant at  $p < 0.01$

a: Service Stations were used as the base outcome while Tuesday was randomly selected as the day of the week excluded from the model.

b: Residential and public locations include: residential; recreational; transport related; open spaces; street and footpath; educational, health, religious, justice and other community.

Source: AIC NARMP collection 2006 [computer file]

organisation itself (Smith & Louis 2009). Organisations were targeted at a higher rate than individual victims by both lone and multiple offenders.

In 2006, 57 percent of service station armed robberies involved a knife as the most serious weapon. Firearms were used in only 16 percent of incidents and syringes in two percent. This may indicate that service station armed robberies are committed by opportunistic offenders and knives are often used as a weapon of convenience. 'Other' weapons accounted for 15 percent of those used in service station armed robberies, while in nine percent of incidents no specific weapon type was recorded. The weapons which make up most of the category of 'other' include a club, baton or stick (19%), a machete or axe (15%), crowbars and metal pipes (8%), tools (7%), and blunt instruments (7%).

### Day and time of robberies

Eighty-nine percent of service station armed robberies occurred between 6 pm and 6 am. The most common time armed robberies occurred was between 12 am and 3 am (29%). Twenty-eight percent of incidents occurred between 9 pm and 12 am, with 19 percent of service station armed robberies taking place between 6 pm and 9 pm. These times are in contrast to the time that armed robbery takes place at other commercial locations. While service stations were more likely to be targeted just before or after 12 am (as they are often the only available target), banks, pharmacies and retail outlets were targeted more often during the day because of their hours of operation. Only 11 percent of service station armed robberies occurred during daytime hours (6 am to 6 pm), which is when locations such as newsagencies, post offices, banks, pharmacies and retail outlets are open.

Service station armed robberies were most likely to occur on Wednesdays and Sundays. In 2006, approximately 18 percent of service station armed robberies occurred on Sundays and 17 percent on Wednesdays. The lowest number of armed robberies occurred on Tuesdays (11%). The data did not provide any trends or patterns to indicate why certain days are targeted more than others.

### Property stolen and its value

The most common item of property stolen during a service station armed robbery was cash (83%). Alcohol and drugs accounted for five percent of property stolen. Cigarettes were the most targeted item within the 'alcohol and drugs' category.

Other stolen items included luggage, electrical equipment and negotiable documents (e.g. ATM/credit cards, cheques and money orders). The 2006 NARMP annual report showed that the average value of property stolen in service station armed robberies (including cash) was \$643 per robbery (Smith & Louis 2009).

### Service stations and other armed robbery locations

To compare service stations with other armed robbery locations, a regression model was devised (see Table 1). Service station armed robberies were compared with both residential and public locations, such as streets and public transport systems, and also with those occurring at other commercial locations such as corner stores, post offices and retail locations.

Results from the analysis reflected previous research regarding the differences between service station armed robberies and robberies of other location types. These differences included:

- Offenders who robbed service stations had a higher probability of being detected, particularly by comparison with offenders who targeted an individual in a public space or in a residential setting.

- Service stations were more likely to be targeted at night by lone offenders using knives.
- Robberies in residential and public locations were more likely to involve multiple offenders and occur during the day.
- Other commercial locations were targeted by a similar average number of offenders as service station robberies, however offenders targeting these locations tended to be much older.
- Other commercial locations were more likely to be targeted during the daytime rather than late at night.

Finally, there were also some non-significant differences among the days of the week when comparing all locations, although no pattern was evident (see Table 1).

Apart from differences by day of the week, where no pattern or explanation for these differences was apparent, there were some variations noted between locations. This model reinforces that service stations are relatively unique because they are mainly targeted at night, by lone offenders, with different age characteristics to other locations. Ultimately, crime prevention strategies used by service stations should focus on the unique combination of attributes associated with service station armed robberies.

## Profile of offenders

While the characteristics of offenders who commit armed robberies are varied, research indicates offenders demonstrate common characteristics:

- Armed robberies in Australia are committed primarily by men under the age of 35 years (Abru 2004; Borzycki 2008).
- Offenders target establishments where the victim/s are not known to them. This is in contrast to most violent crimes where there is a pre-existing relationship between victim and offender (Indermaur 1995; Willis 2006).

- As the 'professionalism' of the offender increases, the distance the offender is prepared to travel to commit armed robbery also increases. Most offenders usually select local targets unless the opportunity for greater rewards will result from travelling to commit an offence (Jansen & Van Koppen 1998).

Generally, offenders target service stations at a time when customer presence is minimal. This is often the result of offenders taking advantage of late trading hours, fewer customers and minimal staff. Security risks are less influential than potential gains for opportunistic offenders when they decide to commit armed robbery (Borzycki 2003). Evidence also suggests that offenders have lowered their expectations of the potential gains from armed robbery (Mouzos & Carcach 2001). This presents difficulties in terms of reducing financial motivations for offending behaviour.

The average age of offenders who committed service station armed robbery was 23 years old. Other locations that were targeted by offenders of a similar average age (24 years) included corner stores, supermarkets and takeaway restaurants. Younger offenders who are armed appear to target service stations more frequently than any other commercial location.

Males were found to have committed 89 percent of service station armed robberies, while female offenders committed only 11 percent of these offences.

Offenders acted alone in 70 percent of service station armed robberies. High numbers of lone offenders may be a result of offenders being opportunistic and disorganised. That offenders tend to be younger and use firearms infrequently reinforces the view that offenders who target service stations were more likely to be opportunistic offenders who undertake little, if any, planning.

## Preventing service station armed robbery

The findings in this paper reflect results from other studies on service station armed robbery undertaken during the past 15 years. There were also some unique findings not discussed in previous studies, such as the role of multiple offenders. Results highlight that service stations are vulnerable because of their extended trading hours and minimal staffing. Therefore, future crime prevention strategies should focus on the features specific to this type of armed robbery. The challenge still remains for any crime prevention strategy to be cost effective.

### Existing target hardening measures

There is an array of target hardening measures available to service stations to reduce the risk of being targeted by armed offenders. The risk of victimisation decreases when adequate levels of deterrent measures are implemented. Many service stations have implemented a range of security measures such as duress alarms, cash management procedures that ensure minimal cash is available, automatic doors that employees can lock at any time, time delay safes and CCTV (Hume 1996). CCTV provides police with the opportunity to view offences and identify offenders. Evidence from CCTV can be used in court and can therefore have a deterrent effect (Abru 2003). Natural surveillance can be increased by encouraging a heavier flow of customers late at night through the use of purchasing incentives (Mayhew 2000). This strategy should be considered when introducing target hardening measures.

Regular staff training is also seen as a crucial security measure (Hume 1996). Employees who are able to view the car park and can implement basic target hardening measures throughout their shift will reduce the opportunity for an armed

robbery incident. Different sites have different risks of victimisation and each business should view its security measures with the goal of securing its own individual environment to minimise potential losses.

### Emerging target hardening measures

Minimal staffing on night shift is seen to increase the risk of armed robbery victimisation for service stations (Queensland Police Service 2005). Because of financial considerations, service station proprietors may be reluctant to employ additional staff. However, the cost of employing additional staff may be lower than the losses incurred in an armed robbery incident.

Useful strategies exist for service stations to reduce the incidence of armed robbery. The first is the installation of 'transfer trays' that can be used during night shifts to avoid lone staff having to allow customers inside. This has already been implemented in a small number of service stations, but is not yet widely employed. While restricting customer access to the premises, transfer trays still provide access to the service station's goods and services without compromising staff safety. In addition, because a majority of service station armed robbery offenders carry knives, transfer trays may prove effective in preventing a majority of incidents. An additional feature of this countermeasure is that it is relatively inexpensive compared with other more complex target hardening measures such as CCTV. An increase in the use of transfer trays in '24 hour' service stations would assist in reducing the number of armed robbery incidents at these locations.

Bellamy (1996) noted that an effective countermeasure which has been employed occasionally in service stations focused on late-night customer flow. The research indicated that by offering discounted products to night shift workers, such as police and taxi drivers, customer flow may be improved to a point where it deters some armed robbers during their target selection (Bellamy 1996). Other industries not

considered by previous research, such as security guards and late-night pizza delivery drivers, should also be included in this target hardening measure. This countermeasure is able to be implemented Australia-wide.

### Consideration of displacement effect

One of the potential consequences of introducing target hardening measures is that rather than avoid offending altogether, offenders may change their patterns of behaviour to adapt to the new circumstances. This is known as displacement. Crime prevention theory (Felson & Clarke 1998) notes that there are five main ways in which displacement can occur:

- *geographical* displacement involves a change in location (i.e. the offender targets another service station that has not introduced the same target hardening measures);
- *temporal* displacement involves a change in time (i.e. the offender targets the service station during hours when the measures in place may not be as effective);
- *target* displacement involves a change in target type (i.e. the offender targets convenience stores that may not have target hardening measures in place);
- *tactical* displacement involves an alteration in the method of the offence (i.e. the offender arms themselves with a shotgun instead of a knife and is willing to use greater violence); or
- *crime type* displacement which involves a change in preference regarding the type of offence to be committed (i.e. the offender may turn to other offences such as fraud; Matthews 2002).

The displacement effect should be considered when deciding on the implementation of new countermeasures to reduce service station armed robberies. It is likely that any target hardening measure introduced by service station staff may have a displacement effect on offenders whereby they may target another service station

or late night convenience store, individuals entering or leaving the premises, or possibly employ firearms in the commission of the offence.

### Conclusion

Upon analysing the literature and available data and considering current and prospective armed robbery countermeasures for service stations, there appear to be some practical countermeasures not yet widely employed. Service station armed robberies are generally unique in that service stations are primarily targeted late at night when customer flow is low and staffing is minimal. They are targeted by younger, opportunistic offenders usually carrying knives. Data from NARMP also highlights that these offenders often act alone.

It is these types of characteristics that assist to shape any target hardening measures that might be developed for service stations to combat armed robbery. Many effective countermeasures already exist (e.g. CCTV and staff training), although many measures are not yet widely employed and could help further reduce service station armed robbery. These measures include installation of transfer trays for late night use by sole operators and discount product incentives for police, taxi drivers and other late night industry workers. These countermeasures could prove effective if implemented across the service station industry and they involve minimal financial costs to operators.

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