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# EFFICACY OF PROPERTY MARKING AS A SITUATIONAL CRIME PREVENTION STRATEGY

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## Abstract

*Burglary and stealing are crimes that have a significant impact and cost on its victims and society. To mitigate such crimes, property marking is a situational crime prevention strategy that attempts to prevent through dissuasion. There are many forms of property marking, yet there is limited research of its efficacy. Where there have been such studies, there has been some indications of success. Therefore, the study assessed the efficacy of property marking to reduce burglary and stealing crimes. The study undertook a quantitative approach using non-equivalent control groups to assess the geo-spatial impact of property marking when applied at a saturation level. Three housing groups were established (N878), comprising an experimental (n278), adjacent (n300) and control (n300) groups, with significance measured using a Wald Chi-square method. Results indicated that when property marking is applied at saturation levels ( $\geq 80\%$ ), both burglary and stealing crimes decreased significantly. Furthermore, that displacement for both burglary and stealing occurred in the adjacent area. Recommendations suggest that property marking should not be used in a sporadic manner; instead, targeted at an optimal saturation level. Such targeting should have the aim to target burglary and stealing hotspots and saturate these areas for property marking to work effectively.*

## Keywords

Property marking, burglary, stealing, situational crime prevention, effectiveness, saturation

## INTRODUCTION

Burglary is one of the most common and far reaching forms of crimes in Australia (Gately, Fleming, Scott, & McGinty, 2014). Furthermore, statistics indicate that individuals are more likely to be the victim of burglary or theft within their home than any other type of crime (AIC, 2011). In approximately 20 percent of burglary cases, the trauma experienced is extensive (Waller, 1984) through the violation of the victim's property (Brown & Harris, 1989). In addition, a significant proportion of distress can result from the loss of sentimental and irreplaceable items (Beaton et al., 2007).

An increase in burglary and property theft has several impact factors across society. These include stress for the persons burgled, pressure on the local economy, an increase in insurance premiums, degradation of suburbs, the perceived increase in feeling unsafe and the general unsettling nature that crime brings to a given area. The social cost of burglary can significantly impact on the psychological health, wellbeing and perceived safety of victims and the community (Waller, 1984; Thornton, Walker & Erol, 2003). In addition expenses include increasing law enforcement resources, the justice system in regard to courts, community management and the incarceration of offenders.

## Study Aim

The aim of the study was to gain a better understanding of the efficacy of property marking, with the following research hypotheses:

1. Property marking reduces the incidence of property crime.
  - a. Property marking reduces the incidence of burglary.
  - b. Property marking reduces the incidence of stealing.
2. Property marking, within a domestic environment, does not displace property crime to another domestic area.

## **PROPERTY MARKING**

It is well accepted that one of the fundamental tenets of a capitalist society is ownership, supported by the security of personal property. Yet the State lacks the necessary resources to protect against the prevalence of all theft crimes. It is well established that police resources alone cannot protect against the breadth of burglary opportunities (Clarke, 1980, p. 142).

Burglary is one of the most common forms of crime, where individuals are more likely to be the victim than any other type of crime (AIC, 2011). Therefore responsibility for the protection of property is multifaceted, including the State and its proxies, as well as owners and private parties contracted for services and the designers of the built environment (Lab, 2010, p. 26). Consequently, property owners need to provide a degree of self-protection that can be defined as private security (Smith & Brooks, 2013, pp. 10-11). Property marking forms one such private security strategy.

### **Property Marking in Crime Prevention**

A considerable amount of resources are expended with the aim to reduce property theft, as burglary engenders both financial and emotional impact (Grabosky, 1995, p. 1). The mitigation of such crime falls under what is collectively termed as 'crime prevention', expressed by Lab (2010) as "any actions designed to reduce the actual level of crime and/or the perceived crime" (p. 26).

Any viable method of property theft prevention, through dissuasion or ensuring its swift recovery once stolen, is arguably beneficial to society. Such mitigation must include options that address situational features within the problem environment. Thus, drawing focus to the immediate circumstances, situations or factors influential within the commission of specific types of offences (White and Haines, 2004, p. 12).

Situational Crime Prevention (SCP) is specifically focused towards the nature of interactions between local environmental factors and the decision by offenders to engage in contextually deviant behaviours. SCP is specifically focused on opportunity reduction measures that are (1) directed at highly specific forms of crime, (2) involve the management, design or manipulation of the immediate environment in as systematic and permanent way as possible, (3) so as to increase the effort and risks of crime, and reduce the rewards as perceived by a range of offenders (Clarke, 1992, p. 4).

Within the SCP paradigm a number of preventive or mitigation measures are used to alter situational factors supportive of deviant actions, used to counter an array of property theft offences (Lab, 2010, p. 205). These include the marking of property using various techniques to reduce the rewards of theft actions (Lab, 2010, p. 196), making it less attractive for offenders due to the property being readily identifiable (Australian Institute of Criminology, 2012). Property marking is far from a new technique (Laycock, 1984, p. 1) and most police services promote such initiatives through their crime prevention offices. For example, the West Australian Police promote property marking (Office of Crime Prevention, 2013, p. 7) as a core strategy in property protection.

### **The Efficacy of Property Marking**

Despite a significant number of property marking programs globally (Lab, 2010, p. 63), there is no robust research platform supported by SCP theory for the application of property marking. The central premise within property marking studies is that marking increases the difficulty of disposing of stolen property through the supply chain vendors. However, few studies can demonstrate significant reduction in reported burglary, an increased return of stolen property (Laycock, 1984, p. 14) or an impact on arrests or convictions (Lab, 2010, p. 64).

A review of the research evidence based upon previous property marking studies does indicate a reduction in burglaries (Forrester and Britain, 1990; Tilley and Webb, 1994). Lab (2010) refers to three significant studies (Laycock, 1985; Heller, 1975; Rhodes, Johnston and McMullen, 1999) within the property marking domain. For example, Laycock (1985) found a significant reduction in burglary of 40 percent in the first year of property marking.

Nevertheless, there was no significant effect on the supply chain with no stolen property returned. Rhodes, et al., (1999) study investigated the efficacy of property marking in the reduction of vehicle theft in the United States in relation to changes in the Anti-Car Theft Act of 1992. The Act compelled car manufacturers to property mark a number of component parts of selected high theft vehicles. Results, with caution, indicated that theft rates decreased as a greater number of vehicles had their parts marked. However, theft trends were already on their way down prior to intervention, the authors noted that as a greater number of high theft vehicles were marked,

fewer were stolen (p. 11), adding support towards property marking as an effective intervention (p. 17) and indicating that saturation is a key factor.

## METHODOLOGY

The study investigated the use of property marking as a situational crime prevention measure to gauge the statistically significant effect on the recorded incidents of dwelling burglary and property theft. In addition, to gauge any statistically significant effect this may have on the adjacent or control groups.

### Study Design

The study used a geo-spatial quantitative analysis, using a non-equivalent control group design with a pre-test and post-test analysis procedure. The analysis incorporated an experimental group (site 1) with an uptake rate of 79 percent (N278), an adjacent group (site 2) and a control group (site 3) of domestic dwellings (total N878). Selection of areas considered similarity factors such as socioeconomics, spatial design, green open space, public transport routes and major arterial road access. The design employed pre-test and post-test (Figure 1) crime statistics for the past five years and following one year intervention, based on regular yearly intervals for each group. Data were used to establish a pre-test grand mean for each group; thus, identifying a burglary and theft base-line (pre-test) across the three groups prior to the property marking intervention.

$$\begin{array}{r} E - 0_1 0_2 0_3 0_4 0_5 X 0_6 \\ \hline A - 0_1 0_2 0_3 0_4 0_5 \quad 0_6 \\ C - 0_1 0_2 0_3 0_4 0_5 \quad 0_6 \end{array}$$

Figure 1 Experimental test design

### Procedure

Prior to the commencement of the study, the three selected areas had their past five year crime statistics analysed to establish a pre-test grand mean for each. Thus, identifying a burglary and theft base-line (pre-test) across the groups prior to the property marking intervention. At the commencement of the study, the experimental group area was saturated using MicroDOT as the property marking technique, with uptake rates recorded by dwelling.

The pre-test base-line enabled a comparison to be drawn from the supplied West Australian Police crime statistics for reported burglary and theft, available at the street level, over the project's time-line of 12 months. Data was analysed using the SPSS package, drawing on Wald Chi-square to test for statistical significance between pre-intervention and post-intervention effects (Painter & Farrington, 1999).

### Sampling

To overcome the traditional sampling biases of non-equivalent control group design (internal validity), the project drew on three defined sample groups consisting of domestic dwellings (N878) within the City of Joondalup, Western Australia. These dwellings were considered demographically similar in many aspects, yet physically separated (Table 1). Demographic factors may influence burglary and theft rates across the selected groups. Therefore, such an aspect was controlled by selecting groups which are considered equivalent from the outset of the project.

Table 1 Experimental, adjacent and control areas

Demographic and Crime Rate Data	Experimental and Adjacent	Control
Theft (2011)	13	22
Burglary (2011)	58	36
Population (2006)	6,882	4,647
Median house price (2011)	405,000	478,000
Number of occupied dwellings (2006)	2,505	1,609
% of occupied dwellings: owned (2006)	21%	34%
% of occupied dwellings: being purchased (2006)	53%	49%
% of occupied dwellings: rented (2006)	25%	17%

The total population size comprise of 4,114 dwellings, where a non-random selection of 878 dwellings across the groups was applied (21.88%). Such a sample size was considered a purposively selected and valid sample within the population chosen based on characteristic similarities, such as access routes, parks nearby and public transport routes.

The experimental sample consists of 300 homes, from a suburb which included 2,505 domestic dwellings. The sample group was supported by a standby sample of 50 dwellings to account for refusal rate within the primary experimental group. The uptake was 242 dwellings from the primary sample and 42 dwellings from the standby group (N278). The adjacent sample consists of 300 domestic dwellings, next to the experimental sample. The control sample consisted of 300 domestic dwellings, from a suburb with 1,609 domestic dwellings (REIWA, 2006).

**Study Tool**

Study volunteers, primarily, Neighbourhood Watch members, visited the experimental area households. During their visit, they informed the participants of the study and asked if they would participate. If a positive response was achieved, the household was provided a MicroDOT© property marking kit. If necessary, they were assisted in its application to general household effects, such as televisions, laptops, bikes, etc. The study used MicroDOT as the property marking tool, supported with window signs and property stickers.

**STUDY ANALYSIS**

The study considered the pre-five year average against the treatment period, using Wald Chi-square statistical analysis.

**Pre Research Trial Results**

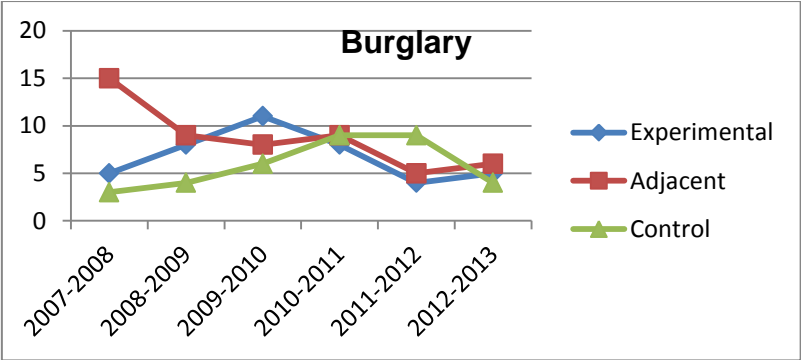
Table 2 presents the extent to which the experimental, adjacent and control areas were comparable for burglary and stealing offences before the study.

*Table 2 Comparability 5 Year Mean*

Experimental N=278		Adjacent N=300		Control N=300	
Burglary	7.2	Burglary	9.2	Burglary	6.2
Stealing	7.8	Stealing	8.6	Stealing	5.8

The experimental area five year burglary average was 7.2. It must be acknowledged that this was due to a higher incident of burglaries in the year 2009-2010, where 11 incidents of burglary were recorded by West Australian Police. However, in the year 2011-2012 there were four incidents of burglary, representing a downward trend from the 2009-2010 data period.

Pre-treatment five year crime data for burglary and stealing, and post treatment offence data are shown in Figures 2 and 3. These figures, using the West Australian Police crime statistics, display the mean levels of burglary or stealing across the three groups over the six years study period.



*Figure 2 Pre and post treatment burglary data*

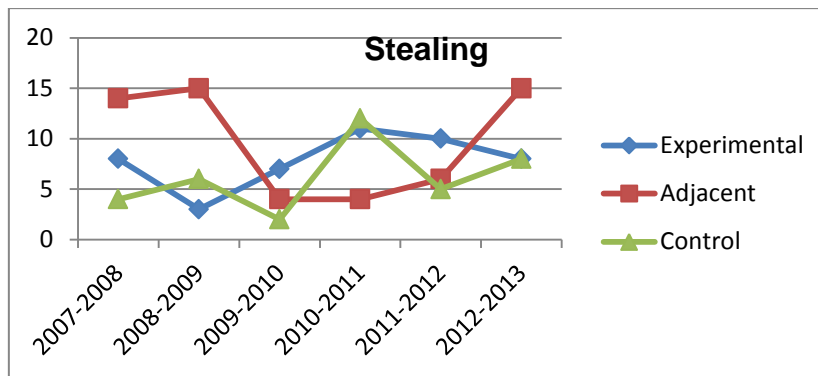


Figure 3 Pre and post treatment stealing data

### Post Research Trial Results

As a situational crime prevention treatment strategy, the efficacy of property marking was measured using a Wald Chi-square statistic. Wald Chi-square statistic was used to calculate the significance in the reduction of burglary and stealing after property marking was applied (with  $\alpha=.05$ ) when compared to a control group.

### PROPERTY MARKING FINDINGS

The study found a significant change in the incident of burglary and stealing crimes. Results indicated that for both reported burglary and stealing offences, incidence decreased significantly in the experimental area when compared to the control area ( $X^2=50.025$ ,  $p<.05$  with  $df =1$ ) after property was marked. For instance, the reduction in the average incidents of burglary of 7.2 to 5 in the experimental area was significantly different from the change in burglary in the control area ( $X^2= 4.112$ ,  $p<.05$  with  $df=1$ ).

The reduction in stealing in the experimental area was significantly different from the change in stealing in the control area ( $X^2=46.989$ ,  $p<.05$  with  $df =1$ ). Therefore, hypothesis 1, that property marking reduced the incidence of property crime is supported by the study.

Hypothesis 1 was further supported by the acceptance of both hypothesis 2 and 3. Hypothesis 2, Property marking reduced the incidence of burglary ( $p<.05$ ) and hypothesis 3, Property marking reduced the incidence of stealing ( $p<.05$ ).

Furthermore, hypothesis 4, Property marking in a domestic environment does not displace property crime to another domestic setting was also tested. Results indicated that recorded displacement was significant for both burglary ( $X^2=13.666$ ,  $p<.05$  with  $df=1$ ) and stealing ( $X^2=50.053$ ,  $p<.05$  with  $df =1$ ) and for the model as a whole ( $X^2=63.594$ ,  $p<.05$ ). Therefore, hypothesis 4 was rejected, which indicated that saturation property marking in one domestic environment does displace crime to an alternative area.

The study's findings are consistent with other property marking studies (Laycock, 1985; Heller, 1975; Rhodes, Johnston and McMullen, 1999), which demonstrate saturation is essential for optimal crime prevention effect. Therefore, those crime prevention groups who promote property marking have to understand what makes property marking effective, namely its application at saturation. The effective use of signs and stickers provides the reinforcement to the potential offender of the presence of property marking.

The outcomes of the study have provided a greater understanding of property marking efficacy, leading to research informed policy, improved planning and allocation of resources. Agencies and groups that support and promote property marking must have a better understanding of the benefits and limitations of such marking. Property marking needs to be applied in a more strategized approach, with a concerted effort to gain as high a cluster of marked property as possible. Where resources are used to support property marking, these should be applied to support the application of clustering to gain property marking saturation.

### Recommendations

The study provides the following recommendations:

1. The current practice of sporadic property marking does not provide an effective crime prevention strategy.

2. Property marking must be applied in saturation ( $\geq 80\%$  uptake rate), in which property marking can be an effective crime prevention strategy.
3. Property marking needs to be clear and evident to the potential offender
4. Displacement of crime must be considered when planning the protection strategy, as saturated property marking in one concentrated area results in displacement of burglary and stealing to non-saturated property marked areas.

### **Limitations**

There were a number of study limitations, primarily from a statistical perspective. Such limitations included the low number of incidents, count data as opposed to the data spread and the limited study period limited of 12 months. The number of reported incidents was relatively low for a data size, being under 10 incidents per test area. The effort within the study of other non-property marking crime prevention initiatives, such as window stickers, has to be better understood. Finally, there was some limited local media coverage of the study.

### **FURTHER RESEARCH**

The aim of the project was to gain an understanding of the efficacy of property marking using a quantitative method. Therefore, future research is planned to extend the period (to a total of 8 years) and type (qualitative interviews) of data collection to investigate if:

1. In the test area, has there been any degree of decay in property marking that has reduced the level of saturation?
2. Participants still property mark and if so, what methods are they using?
3. If participants do mark their property, what are their current views of this crime prevention technique?

Nevertheless, further research also needs to extend beyond this approach to investigate the stolen property supply chain, define stakeholders and their views of property marking to form a better understanding of the holistic nature of property marking. The intrinsic community value, if any, of property marking needs to be better understood.

### **CONCLUSION**

Burglary and to a lesser degree, stealing, has a significant impact on its victims and to a lesser degree, the community and its businesses. Therefore, as a society we expend a considerable amount of resources to counter such crime. One method, amongst many, is property marking. Property marking, as a crime prevention strategy, has been used for decades with vary degrees of success. The few studies that have been carried out, which isolated the effect of property marking have found that it has proved beneficial in significantly reducing crime. However, current crime prevention groups take a sporadic approach to the application of property marking.

The study found that when property marking was applied at saturation levels ( $\geq 80\%$ ), both burglary and stealing crimes decreased significantly. Furthermore, displacement of both burglary and stealing crimes occurred in the adjacent area. Therefore, the study recommends that property marking should be marketed and applied at targeted crime hot spots and applied at an optimal saturation level in these areas as opposed to a sporadic manner, as the sporadic approach produces very limited crime reduction benefits. Findings indicated that saturated property marking application can produce a significant reduction in crime for minimal use of crime prevention resources.

### **Supporting Partners**

The study acknowledges the strong and vital support of the study's partners: City of Joondalup, West Australian Police, RAC Insurance, MicroDOT Australia, Neighbourhood Watch and Participating City of Joondalup residents. Without these supporting organisations and groups, the study and its results could not have been achieved.

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