Institute of Criminal Justice Studies
University of Portsmouth

The thesis is submitted in partial fulfilment of the requirements for the award of the degree of Doctor of Criminal Justice of the University of Portsmouth

Cooling hot property? An assessment of the impact of property marking on residential burglary crime reduction, crime displacement or diffusion of benefits and public confidence.

Submitted by: Iain Raphael– Student 36144

Declaration
Whilst registered as a candidate for the above degree, I have not been registered for any other research award. The results and conclusions embodied in this thesis are the work of the named candidate and have not been submitted for any other academic award

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Signed………………………………………………………………………………………………………..

Date…………22 October 2015…………………………………………………………
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Abstract

For the year ending March 2014 the Office for National Statistics (ONS) estimated there were 573,000 domestic burglaries in England and Wales. Using the Home Office Integrated Offender Management Value for Money Toolkit valuation (2011) the cost to society of this is £1.9 billion. The financial and resulting emotional cost is a heavy burden for the UK. Better understanding crime prevention approaches and their impact on reducing residential burglary is of obvious relevance to policing, government and society as a whole.

This study examined the wider impact of traceable liquid property marking strategies on reducing residential burglary and other acquisitive crime. It monitored levels of crime in trial areas. It observed if crime displacement or diffusion of benefits effects occurred to a distance of 750m, in 250m intervals, surrounding the trial areas. By doing so it added to the body of knowledge that surrounds situational crime prevention. It also surveyed households, which were participants of the trial, some 6 months following the deployment to measure any impact on their confidence in policing and on their fear of crime.

To do this, 10 x London trial sites, comprising of 500 households areas were purposively selected that had both a persistent and a long-term chronic residential burglary offence rate. Two such sites were selected on each of five London Boroughs. The residential homes within these areas were then visited by a police officer or a PCSO and occupants had their property marked using a unique traceable liquid property marking solution. This strategy was supported by stickers saying their property had been marked being placed on external display on front and back doors and windows, signs being put up on street furniture in the surrounding area telling people they were entering a property marked area and the use of press and media releases to wider market the approach to offenders. Trap cars and houses were utilised and arrests advertised to ‘prove’ the approach to offenders. Finally control areas of similar characteristics to the trial areas were identified and observed on each of the 5 x borough sites.
Once the marking had been implemented to the point of 85% saturation (where able), key data was observed over a 12-month period and compared against the previous year. These included:

- Residential burglary crime levels within the target area.
- Residential burglary crime levels in displacement zones of 250m, 500m, and 750m, surrounding the targeted area.
- Robbery, theft of motor vehicle (M/V), theft from motor vehicle and total notifiable offences (TNO's) offence levels within the target and displacement areas to measure displacement effects.
- An online survey of the trial households of police satisfaction and fear of crime levels.
- Interviews with key staff that implemented the trial.

The study deduces that the following effects occurred **within the trial areas**:

- A 45% reduction in residential burglaries, a 21% reduction in robberies, no significant change in M/V crime and 22% less TNO's.

Once offset against the control area performance the results indicated:

- Overall average residential burglary was reduced by 21% with the best BOCU achieving an 88% reduction.
- Personal robbery offences reduced by 16% and overall TNO’s by 20%.
- There was no statistically significant change in M/V crime offence levels.
- There was no significant crime or offence displacement within the target areas and indeed clear diffusion of benefits effects occurred.

When the trial areas were widened to include the 250m, 500m and 750m displacement zones the following results were found to 750m:
A 23% reduction in residential burglaries, a 15% reduction in robberies, a 3% reduction in theft of M/V, 1% reduction in theft from M/V and a 9% less TNO’s.

Once offset against the control area performance the results indicated:

- Residential burglary reduced by 12% in the 250m-displacement zones, increased by 7% in the 500m zones, decreased by 19% in the 750m zones and cumulatively resulted in a 17% reduction.
- Robbery increased by 8% in the 250m-displacement zones, decreased by 7% in the 500m zones, increased by 13% in the 750m zones and cumulatively resulted in a 5% increase.
- Theft of M/V increased by 27% in the 250m-displacement zones, increased by 4% in the 500m zones, increased by 5% in the 750m zones and cumulatively resulted in a 10% increase.
- Theft from M/V increased by 24% in the 250m-displacement zones, increased by 16% in the 500m zones, increased by 11% in the 750m zones and cumulatively resulted in a 15% increase.
- TNO’s increased by 3% in the 250m displacement zones, decreased by 4% in the 500m zones, increased by 5% in the 750m zones and cumulatively resulted in a 1% increase.

The results of the on-line survey found the following:

- 51% of householders felt safer in their area.
- 52% of householders felt safer in their home.
- 33% had an improved opinion of the police.

The study concludes that traceable liquid property marking is highly effective at reducing residential burglary. It found that when deployed with high levels of saturation to an area, diffusion of benefits effects for this crime type are likely to occur out to at least 750m from that area. This strategy led to a reduction in the
fear of crime and if distributed by the police family, leads to an increase in public confidence for at least 6 months after the distribution period.

However in achieving these positive impacts there will be offence displacement outside the targeted area, where offenders will move from residential burglary to other offences types. The most likely change is into theft of and from M/V crime. These crimes are arguably less harmful and impactive on crime victims and occurred at a lower rate than the residential burglary offences prevented.

Finally, the study concludes that the psychological effects of the strategy magnified the effectiveness of the approach in reducing offending and so significant was the importance of this that the author believes it should be specifically be added to the existing model of twenty-five techniques of situational prevention (D. B. Cornish & Clarke, 2003) in the following way:

<table>
<thead>
<tr>
<th>Make Physical Change or apply Psychological effects to</th>
</tr>
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<tbody>
<tr>
<td>Increase the Effort</td>
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<tr>
<td>1. Target harden</td>
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<tr>
<td>2. Control access to facilities</td>
</tr>
<tr>
<td>3. Screen exits</td>
</tr>
<tr>
<td>4. Deflect Offenders</td>
</tr>
<tr>
<td>5. Control tools/ weapons</td>
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<tr>
<td>Increase the Risks</td>
</tr>
<tr>
<td>6. Extend guardianship</td>
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<td>7. Assist natural surveillance</td>
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<td>8. Reduce anonymity</td>
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<td>Reduce the Rewards</td>
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<tr>
<td>11. Conceal targets</td>
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<tr>
<td>12. Remove targets</td>
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<tr>
<td>13. Identify property</td>
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<tr>
<td>Reduce Provocation</td>
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<tr>
<td>16. Reduce frustrations and stress</td>
</tr>
<tr>
<td>17. Avoid disputes</td>
</tr>
<tr>
<td>18. Reduce emotional arousal</td>
</tr>
<tr>
<td>Remove Excuses</td>
</tr>
<tr>
<td>21. Set rules</td>
</tr>
<tr>
<td>22. Post instructions</td>
</tr>
<tr>
<td>23. Alert conscience</td>
</tr>
<tr>
<td>24. Assist compliance</td>
</tr>
<tr>
<td>25. Control drugs and alcohol</td>
</tr>
</tbody>
</table>
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Finally a special mention to my brother James who has tirelessly helped me oversee the trial within the Metropolitan Police Service.

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List of abbreviations and glossary of terms

BCS – British Crime Survey
CRIS – Crime Report Information System
CSEW – Crime Survey of England and Wales
Displacement Area – the 250m, 500m or 750m mapped areas surrounding the target areas.
DCI – Detective Chief Inspector
FOI – Freedom of Information
HMIC – Her Majesty’s Inspectorate of Constabularies
HO – Home Office
HOCR – Home Office Counting Rules
MPS – Metropolitan Police Service
MSC – Metropolitan Police Special Constabulary
NCRS – National Crime Reporting Standards
ONS – Office for National Statistics
PAS – Public Attitude Survey
PASC – Public Administration Select Committee
PCSO – Police Community Support Officer
PRC – Police Recorded Crime
RSL – Registered Social Landlord
RTM – Regression to The Mean
Target Area – Just the area the traceable liquid was distributed within
TFL – Transport for London.
TNO – Total Notifiable Offences
UV Light – Ultra Violet Light
Chapter 1 - Introduction

This study explores the impact of traceable liquid property marking on reducing residential burglary and other acquisitive crime in London. It aims to add to the body of knowledge that surrounds situational crime prevention.

For the year ending March 2014 the Office for National Statistics (ONS) estimated there were 573,000 domestic burglaries in England and Wales. Using the latest Home Office integrated offender management value for money toolkit valuation (2011), the cost to society of this is estimated to be £1.9 billion. Clearly understanding better reduction approaches to minimising this crime type is of obvious relevance to policing, government and the wider society.

For policing, national funding changes have placed an even greater imperative on knowing what works in crime reduction. These monetary changes have meant that the wide scale implementation of untested initiatives is no longer tenable. Clarke (2005) noted that whilst the area of situational crime prevention is the fastest-growing form of crime control, ill thought out initiatives that have been implemented with little understanding of the research base have not worked. One reason for this may have been that for the last decade financial considerations in policing have taken a back seat to the attainment of crime reduction and detection rates. In 2008/09 the police services spent £13.7 billion a figure that was 47 per cent higher than in 1997/98 (Audit Commission, 2012). However, times have changed and policing is in financial crisis. In October 2010 the Chancellor George Osborne announced that police spending would reduce by 20% or some £2.4 billion in the four years between March 2011 and March 2015. For the Metropolitan Police Service (MPS), which is responsible for 25% of the entire policing budget, this carries national significance. In its 2012 report ‘Policing in austerity: One year on’ HMIC noted that there remained an existing funding gap for the MPS of some £233 million. In August 2015 the MPS is anticipating further budget reductions.
Despite the new and dramatic financial climate, the performance targets for the police have remained as challenging as ever. For the MPS the Mayors Office for Policing and Crime ((MOPAC), 2013) set a 20% reduction target for residential burglary to be achieved by March 2016. In this culture of doing more with less, improving our understanding of the impact of a model of situational crime prevention has obvious and direct relevance. As Loveday (2014) notes:

‘Future police management in an age of austerity should be ready to experiment with innovative developments that provide a level of service expected of it by the public.’

This study looks at assessing the positive and negative impacts of using a traceable liquid saturation strategy in areas experiencing high numbers of residential burglaries. For some time now there has been a body of evidence that by focusing on specific crime hotspots police can have an impact on offending in that area (see L. W Sherman et al. (1997) and Weisburd and Eck (2004)). However, within this field there has also been concern that the impact of this effort was merely to relocate the crime elsewhere. In times of diminished resource and the investment required to utilise this strategy, understanding if any effort is a wasted effort is of key significance.

A further challenge for burglary crimes investigated by the police is their often inability to identify recovered stolen property. The apparent anonymity of most items of property taken in a burglary has meant that an offender if stopped or if trying to sell on ill gotten gains can do so in relative safety. The use of traceable liquid solutions aims to change this position and to make offenders reconsider their risk of being caught if they commit an offence to a point where they will no longer offend.

Finally as a professional doctorate student there has been a direct alignment with my role as a Detective Superintendent in the MPS. In this case, I have been the trial lead for the organisational ‘proof of concept’ of this method of situational crime reduction. As a direct result of the 6-month trial findings the MPS has agreed to roll
the strategy out to some 440,000 homes in London (about 1 in 7 London residences) with an aspiration to further reduce some 70000 residential burglary crimes. Additionally the newly formed College of Policing has asked if the ultimate findings can be disseminated to them to inform policing nationally. Lastly I am the MPS burglary lead representative for and sit on the ACPO Burglary Reduction Working Group. Through this forum there is a further window to inform policing nationally of this trial’s outcomes.
Chapter 2 - Literature review

When reviewing this study in terms of existing literature there is a range of theoretical and actual practice areas that need to be considered in order to correctly situate the study. In the first instance it is useful to explore the concept of situational crime prevention and its key theoretical perspectives. Having done so and in order to frame the study we will then examine the classification of methods of crime prevention. This is useful as it links theory to practice and helps us better understand the possible impact of traceable liquid products.

Having done this we shall then examine the literature surrounding the concepts of ‘crime displacement’ and ‘diffusion of benefits’, which are explored in the study. Then the wider literature will be considered that has focused on residential burglary crime reduction and in particular any past studies that have explored property marking as a crime reduction technique. Next we will examine the accuracy of police recorded crime figures, as they are central to the study. Finally and as a result of having done this, the relevance of this new study will be provided in detail.

Situational crime prevention

In medicine, prevention has been broken down into the three typologies of primary, secondary and tertiary methods. P. J Brantingham and Faulst (1976) applied this model in describing approaches to crime prevention. They saw primary prevention as focusing on the physical and social environment that provides opportunities for or precipitate criminal acts. It focuses on existing conditions in the natural environment. Examples could include improving street lighting or providing improved security to vulnerable addresses. Secondary prevention focuses on the early identification of potential offenders and seeks to introduce means to divert them away from a criminal future. Finally tertiary prevention focuses on known offenders and aims to introduce measures to prevent future offending. Pease (2002) described the causes and prevention of crime as falling into the three broad categories of ‘structure, psyche and
circumstance’. Structural views see crime being reduced through economic or social change. Those focusing on the psyche would favour deterrence, incarceration or rehabilitation. Finally those focused on circumstance would seek to alter the more immediate causes of crime. It is the area of “primary” (P. J Brantingham & Faulst, 1976) situational crime prevention or specifically the removing of crime “rewards or opportunities” (Clarke, 2008) that this study is focused upon.

The general approach of situational crime prevention started in the 1970’s with research undertaken by the Home Office Research and Planning Unit and in particular with the work of Ron Clarke. It emerged as a range of small-scale initiatives or attempts to solve specific crime problems principally within the commercial world. These practical and real world initiatives were conceptualised by criminologists and out of this developed a ‘framework for some practical and common-sense thinking about how to deal with crime’ (Clarke (1995). Clarke (1997) provides a useful overview of what he sees as the key characteristics of situational crime prevention and how it departs radically from most criminology. He sees it as focusing on the prevention of crime as opposed to detecting and catching perpetrators. It is focused at specific crimes and their settings as opposed to offenders. It is concerned with manipulating the environment in which crimes occur so as to reduce the opportunities for those crimes. This focus on when and where a crime occurs is one of its key criticisms, as it is not concerned with whether a crime occurs. Criminologists are typically directed to establishing the causes of crime which they often see as being embedded in deprivation, stemming from social, cultural, racial and economic disparities which in turn are seen as drivers for criminal behaviour (Clarke, 2005, p40). They argue that without this theoretical understanding criminologists are oversimplifying the determinants of criminal behaviour. Gottfredson and Hirschi (1990) see this as criminologists being confused between explaining crime and explaining the criminal.

Within this area of situational crime prevention there are several key concepts that the literature review will explore in connection with the study.
Criminological theories

In order to understand how a crime may be prevented it is important to recognise some of the key theories that apply to this area of research. The first of these is routine activity theory. Cohen and Felson (1979) and Felson (1998) developed routine activity theory as an attempt to identify the supply of criminal opportunities and to understand crime patterns. It stemmed originally from research carried out to better understand the increase in direct-contact predatory crime in the USA following World War II. Criminal incidents are seen as physical acts set in time and space. It sees criminal incidents as physical acts that have as a minimum three key elements in order to occur:

- A ‘likely offender’ – anyone who might commit a crime.
- A ‘suitable target’ – an object or person likely to be taken or attacked by the offender
- The absence of a ‘capable guardian’ – someone who might intervene to stop or bear witness to an offence.

Felson (1995) developed the concept of ‘guardians’ further by distinguishing three types of individual who can stop a crime occurring. They included guardians who keep watch over potential victims, ‘handlers’ who supervise potential offenders and ‘managers’ who monitor places. Embedded within this theory is the concept of a ‘place’ (Cohen and Felson 1979; Sherman, Gartin and Buerger 1989). This encouraged the theory to focus on the distribution and clustering of crimes. This occurs when there is a convergence in time and space of a motivated offender, a suitable target and the lack of a suitable guardian. This is explored further in the next section.

Crime pattern theory seeks to explain how in their day-to-day lives offenders come across crime opportunities. P J Brantingham and Brantingham (2008) showed that using aggregate crime data, patterns emerge in connection with decision rules, places and crime concentrations (see Smith and Clarke, (2012) and S. D. Johnson (2010)). Crimes exhibit patterns both in the time of day they are committed
(Ratcliffe, 2002) and exhibit patterns according to seasonal variations (Farrell & Pease, 1994). More recently with the increasing emergence of studies into predicting future crime events (D. Johnson & Bowers, 2014) have found that when a crime occurs at a specific place, others are more likely to occur nearby. This applies strongly in cases of burglary and has been termed as near repeat victimisation. Further to this Bernasco (2008) found that burglaries that are committed close together in both time and space are more likely to be the work of the same offender. Ashton et al (1998) and Summers et al (2010) also found that offenders will return to the same location (or nearby) to commit an offence. S. Johnson, Summers, and Pease (2009) see the offender as an optimal forager who like a grazing cow exhausts rich pickings around a burgled home before moving to another part of the pasture. We have seen crime pattern theory used most notably with the researching of crime hotspots.

The third of the key theories is rational choice perspective, which was set out by Clarke and Cornish (1985) and portrays offenders as active decision makers who undertake a cost-benefit analysis of presented crime opportunities. They suggest that offenders will commit a crime when both the opportunity arises and they perceive that they will benefit from offending. More recent studies have taken this forward with Nee and Meenaghan (2006) characterising burglars as ‘rational, “expert” agent(s)’. D. Cornish and Clarke (1986) detailed how the amount of time available to an offender affects the degree of rationalising they could apply. So for an opportunist thief, they may focus on more immediate rather than remote costs and benefits. They may for example focus on their chances of escaping with sellable property rather then whether they would be sentenced to a prison sentence if captured. The criminal, who has time in advance to plan, may however consider the more distant benefits of how easy and for how much they may be able to sell the stolen property and whether the potential risk of having the property in their possession will increase their chances of arrest.

All of the outlined theories are central to understanding the impact of this study on crime levels. However it is also necessary to explore the classification of actual opportunity reducing techniques, as it is from here that theory can be turned into
practise. This is an area of almost constant change. Clarke (1992) outlines several reasons for this. Firstly as theory develops new techniques and approaches are developed. Secondly, as technology develops new opportunities to prevent crimes emerge. A recent example would be the so-called ‘kill switch’ which potentially stops a stolen mobile phone being sold on and used by another. Finally, as new forms of crime occur then so new practise will emerge to prevent or control it. We see this being constantly featured with online or Internet crime where new software is relentlessly developed to prevent crimes.

Classifications of methods of crime prevention

The classification of crime prevention measures has developed considerably since its inception in 1980 (see Hough, Clarke, and Mayhew (1980). For an overview of its development see M. J. Smith and R. V. Clarke (2012). As previously noted for the year ended March 2014 there were 573,000 domestic burglaries in England and Wales. It remains therefore a key concern for much of the developed world (Kesteren, Mayhew, & Nieuwbeerta, 2000). There is a broad body of work that deals with the prevention of burglary and techniques to limit offending (Lam Weisel, 2002). In placing this study within this area of the literature it is useful to consider the broad categories of crime prevention mechanisms. (D. B. Cornish & Clarke, 2003) as perhaps the leading exponents of this area developed 25 techniques for preventing offending which in turn were summarised under five headings:

- Increase the effort
- Increase the risks
- Reduce the rewards
- Reduce provocations
- Remove excuses

To situate this research we need to understand each of these headings and to focus on techniques used to prevent or reduce burglary crime.
The first category is to ‘increase the effort’. This means making it physically more difficult for an offender to commit an offence. In terms of residential burglary this could include improving door and window locks, improving fencing or using barrier plants to prevent access to rear gardens or even preventing access to the rear of properties by ‘alleygating’ communal pathways at the rear of properties. All of these measures have been shown to be effective in reducing offences (see Forrester et al. (1990) and C. Young (1999)).

The second category is to ‘increase the risks’. This focuses as the name suggests on changing the dynamic on the chances of an offender not being caught or discovered when the commit an offence. This change in risk can be real or perceived. There are ranges of measures that do this, burglar alarms, CCTV, street or security lighting or neighbourhood watch groups. A key component of all of these is the ability and capacity of the police to respond. Without this response the impact of these measures are likely to be diminished.

The third category is to ‘reduce the rewards’. What this means is the introduction of methods that potentially reduces the value of any criminal gains. In terms of reducing burglary the traditional method for doing this has been property marking and it is indeed conventionally where the use of traceable liquids sits. The central premise is that by marking property it makes ill-gotten gains more difficult to sell-on. Past studies on property marking are considered in more detail later in this section.

The fourth category is to ‘reduce provocations’. This means reducing or stopping the influences that encourage people to commit offences. It aims to remove the triggers of criminal events. This could take the form of educating young people as to the consequences of offending or by providing them with diversionary activity such as youth clubs or sports to steer them away from crime.

The final category is to ‘remove excuses’. This type of approach seeks to stop individuals not knowing that they were committing a crime or that they had no
alternative to offend. Examples would include police sending prolific offenders cards before seasonal crime increases, to remind them that they are watching them in the hope of deterring them from offending. Other examples could be signs in areas reminding people of the consequences of offending or even behavioural contracts linked to social rental agreements.

Having situated the traceable liquid property marking strategy within classifications of crime reduction, the next area to explore and understand are the competing theories of crime displacement and diffusion of benefits.

**Crime displacement versus diffusion of benefits**

One of the most significant criticisms of situational crime prevention is that it inevitably leads to crime displacement. Displacement in this context can be described as the relocation of prevented crime in one area to another place, time, target, or offender. Proponents of crime displacement argue that if an offender is prevented from carrying out an offence due to situational changes, they will continue to commit crime at the same rate. Despite many past studies on the comparative crime reduction effects of situational crime prevention (see Clarke 1982, 1992, 1995, 1997; Smith et al. 2002) which serve to challenge this view, critics continue to dispute the data (Grabosky, 1996). What is clear is that the evidence on displacement remains at best, limited.

Whilst there is no intention of exploring this in detail here, one criticism is that researchers do not really explore this area in carrying out their own studies. Being cognisant of this fact, this research ensured this was not applicable in this case. To do this it was necessary to consider the five forms of displacement highlighted by Repetto (1976). These include offenders changing how, or when, or where, or the type of offence or the targets they select. Specifically there is temporal displacement, when offenders change the time of their offending; Spatial displacement, where offenders move the location of their offending; target displacement, where offenders move from one target to another; tactical
displacement, where the offender alters the method they use to carry out an offence and offence displacement, where offenders move from one crime type to another. This was added to by Barr and Pease (1990) in what they call perpetrator displacement where a crime is so lucrative that new offenders fill a gap left by the removal of an existing perpetrator.

If displacement does occur we need to realise that this is not necessarily a negative aspect. For example relocating drug dealing from near a school or stopping persistent ‘joy riding’ near an old people’s home would all be positive outcomes. Also if offenders can be prevented from committing more violent serious crimes, to crimes of a less impactful nature, then clearly this would be a positive outcome for society (Barr & Pease, 1990). Guerette and Bowers (2009) in their evaluation of 102 situational crime prevention projects concluded that so-called benign displacement could have positive effects. They noted for example how moving crime from a concentrated hot spot location to a more widespread number of victims could have a positive impact. An example could be a crime series targeting vulnerable individuals in sheltered housing that is relocated to a more general populated area could be said to have had a positive effect. In summary benign displacement occurs when the result is lower volumes of crimes, causes less harm or indeed crime is less severe in its nature. The contrary position to benign displacement is what Barr and Pease (1990) referred to as ‘malign’ displacement. As the name suggests this occurs when any form of displacement occurs and results in more harmful consequences.

In more recent years speculation that crime displacement is an inevitable consequence of situational crime prevention approaches has moved to the point that displacement is now seen as inconsequential and at worst rarely attaining the level of crime prevented in the target area (Barr and Pease (1990) or Eck (1993)). Indeed if we look at the findings from these two studies some key conclusions can be drawn. First, there was little evidence of displacement occurring in the first place and if it there was displacement it proved to be less than the numbers of crimes prevented. Weiburd et al (2006, p556) however highlighted two caveats in relation to these conclusions. First, the size of any displacement will depend on
the type of prevention strategy applied. Secondly, it will also depend on the type of crime being prevented. Eck (1993) found that preventing drug dealing is more likely to displace crime as opposed to other crime types for example.

The rational choice perspective of offenders discussed earlier provides a possible explanation for why displacement would or would not occur. D. Cornish and Clarke (1986) noted offenders will only displace their crime if the effort and risks required meets any potential reward they may gain. Secondly by altering the situational characteristics to a position whereby the offender no longer sees it as worth the risk, the individual, may move to legitimate and lawful means to meet their needs (see Brisgone (2004)). Sutherland (1947) noted in his classic criminology text that

’a thief may steal from a fruit stand when the owner is not in sight but refrain when the owner is in sight; a bank burglar may attack a bank which is poorly protected but refrain from attacking a bank protected by watchmen and burglar alarms.’ (1947: 5)

More recently Wortley (2008) details how environmental factors can directly influence individuals and their propensity to offend. He details how the cumulative effects of a crowded environment, loud noise, long queues may trigger a violent response from a normally placid individual and how if you remove some of these factors this response may not occur and nor would that crime be displaced. The second theory of routine activity theory, (L. E. Cohen & M. Felson, 1979) provides further evidence of whether or not displacement would or would not occur. Quite simply if there were further convergences of a suitable target, a motivated offender and the lack of a capable guardian then there would be crime displacement. If these factors do not occur then crime will not be displaced.

A greater contrast is provided by a second band of literature, which focuses on the theory of a diffusion of benefit whereby the positive impact of an initiative extends beyond the area of the intervention. It is the opposite to crime displacement and its occurrence is documented in a range of previous studies Clarke and Weisburd (1994), Weisburd and Green (1995b), Green (1995), K. Bowers and Johnson
(2003) and Weisburd et al. (2006). This contrasts with the notion of displacement and is found in more recent studies, which have found positive unanticipated benefits as a result of situational crime prevention techniques. These benefits focus on the unexpected reduction of crimes not directly targeted by the prevention initiative. Clarke and Weisburd (1994) provided a term for this phenomenon, which they described as “diffusion of crime control benefits”. Weisburd et al. (2006) describe how a number of researchers have found this effect and given it a range of further terms; the halo effect (Scherdin, 1986), the bonus effect (L. W Sherman, 1990) and the multiplier effect (Chaiken, Lawless, & Stevenson, 1974). What this highlights is the strength of research that has found this positive diffusion. Clarke and Weisburd (1994) see two processes as underlying this effect namely deterrence and discouragement. For deterrence to occur the potential offender must feel that the potential area in which they may be captured or caught is in reality far greater than the specific area being targeted. This effect was found by Poyner (1992) in his study of car parks which had CCTV fitted and the positive impact on a further site where no cameras were placed. He suggested that the positive advertising of offenders who were captured by the cameras had the positive effect of increasing the perception of risk to the offender in all the car parks. In the second process of discouragement offenders may feel that if they are prevented from offending in one area, the perceived benefits by moving to another area are outweighed by the potential risks of being caught resulting in crime reductions to the wider area (Clarke & Weisburd, 1994).

Let us now explore past studies on property marking per se.

**Past studies on property marking**

This study adds to our academic understanding in several key ways. First there are few academic studies on the impact of property marking strategies on reducing burglary and none apparent in terms of the breadth of this study. A review of the literature revealed a limited number of past research works of this kind. Knutsson (1984) and Laycock (1985) both conducted research on property marking but were
limited in scale and did not reflect the impact of more modern marking and marketing techniques to advertise the use of the product. Knutsson’s trial took place in Sweden in a residential area of approximately 3500 houses. Commencing in 1979, households were initially presented with literature and subsequent discounts to improve their home security. In 1981 the residents were then offered property-marking equipment and questioned about the extra measures they had taken. An estimated 24% had already marked their property and 40% took up the offer of the loaned equipment. In addition residents placed ‘Operation Identification’ stickers on display warning offenders they had taken extra security measures. This had a final take up rate of just 24%. Whilst this study had some of the characteristics of this trial, overall it varied in the technology being deployed, the intensity of deployment, had a more limited marketing approach and the fact that a range of means of prevention techniques (alarms, improved door locks, property marking and prevention advice) were tested at the same time. The study concluded that between 1979 to 1983 no crime prevention effect was documented. This study did not explore if there were any crime displacement or diffusion of benefit effects.

Laycock’s trial took place in South Wales in three villages in Caerphilly. In total the area comprised of some 2234 residential addresses. For this trial the home addresses were visited by the police, the scheme was explained to occupiers and then property-marking equipment provided. Stickers were affixed to the front and back of homes highlighting the fact that property within had been marked. The police then followed up the initial visit a week later and asked the occupants to detail what property had been marked and checked if the stickers were on display. In this instance the occupier marked property with the postcode of their address using a UV pen. The scheme was officially launched by the Chief Constable and had a take up rate of some 72% of households (1614 homes). Residential burglary levels were then assessed over a 12-month period. The study saw a statistically significant reduction in the burglary rate from 5.1% to 3.0%. In numerical terms it saw a year on year reduction of 40% less burglaries. The trial was not able to draw firm conclusions on the impact on police satisfaction levels. Laycock in her conclusion highlights the difficulty in generalising the results to other areas due to
the uniqueness of the rural trial area and in particular to urban areas. That said she notes how her study findings were far more significant than the previous studies in Sweden (detailed above). She notes some key points of relevance that were applied to this traceable liquid study. Firstly she highlights the high take up rate, which she attributes to the police visits and the advance publicity surrounding the trial. She was unclear on the reason for the reduction in burglary but noted there was no apparent displacement between participant and non-participant houses. She also noted that in explaining the scheme to participants it was inevitable that they were also explaining the effects to potential offenders.

Outside of the specified confines other limitations were apparent. Firstly the technology used for property marking has moved on and is now identifiable and discoverable for a far longer period, is almost impossible to remove without damaging the item marked and is now able to be applied to a far wider range of property types. Secondly crime displacement of diffusion of benefits was not broadly assessed. However, usefully for future studies she offered some practical implications for future trials. She highlights how residents in high crime areas are likely to welcome crime prevention initiatives. She believed it was as important to tell burglars about the approach, as it was residents. Finally she described the window/door sticker as being a key part of the reduction strategy.

Tilley and Webb (1994) in their review of nationwide burglary reduction schemes drew findings from a property-marking scheme that was carried out in Nottingham in the St Anne’s district. This scheme differed from this study in that homes had their property marked ‘on demand’ as opposed to on a large scale area saturation basis utilised in this trial. Despite this they noted that very few houses displaying the stickers highlighting property had been marked were burgled (1.4%) compared to those that were not (7.8%). However due to the voluntary nature of this trial they were unable to conclude if this was due to the marking per se or because these households were more inclined to secure their homes.

A more recent assessment that explored this area is K. J. Bowers, Johnson, and Hirschfield (2003). This study examined four different prevention strategies: alley
gating, target hardening of property, property marking and an offender rehabilitation intervention utilised in a project in Liverpool. For the property marking areas, personal property was marked with ‘Smartwater’, which was one of the solutions utilised in this study. For the Liverpool trial, property was marked for households on different streets. In addition each of the residents was given a sticker to place in the window or door to highlight the fact they were part of the scheme. A limitation of this study was that some areas had multiple interventions applied and in total the study focused on just 500 households. For the Smartwater solution only 54 houses exclusively received this type of intervention. It is not therefore directly comparable with this study. Of note however is that it did seek to measure both diffusion of benefit and displacement effects and indeed found that both had occurred.

Having reviewed these studies, it was clear that there was academic space to fill knowledge gaps within this general area of study. Firstly none of the trials above were able to exclusively measure the impact of property marking on a large scale. None of the previous trials looked to explore the effects on public satisfaction levels. Finally, as will be highlighted later in this report, most trials did not seek to understand if displacement or diffusion of benefits occurred as a result of the intervention and certainly not to the level of this trial.

Having considered the past studies an important area of current topicality is the accuracy of the police data utilised in this and other studies. This next section explores the strengths and weaknesses of this information.

**Should we be concerned by the accuracy of the police data?**

Within the broad context of this study and less obvious to the reader, a further area of relevant literature concerns the accuracy of police related research and in particular the accuracy of police crime information. The author though a Professional Doctorate student is also a senior police officer who is making use of police recorded crime data. It is of obvious relevance therefore to examine the general strengths and weaknesses of this information. Whilst this will not be
explored in explicit detail for a useful overview of this subject area see the chapter by Maguire (2012) in the Oxford Handbook of Criminology or the HMIC (2014b) crime data integrity literature review by Ms Patricia Mayhew.

In January 2014 the UK Statistics Authority made the decision to remove Police Recorded Crime (PRC) data of its designation as ‘National Statistics’. It did so primarily as a result of findings and the subsequent report from the House of Commons (2014), Public Administration Select Committee (PASC) review of Police Crime Statistics chaired by Bernard Jenkin, MP that found shortcomings in how the police record crime. A useful overview of some of the key concerns that were voiced is provided by Patrick (2014). The limitations of Police Recorded Crime are a well-trodden theme that presents itself in most criminological textbooks and indeed are not ‘new’ findings but rather more of a complex decision making process the fallibilities of which have been well documented over many years (Maguire, 1994). Indeed this parliamentary process highlighted human decision making fallibilities itself when one of the main witnesses was a PC facing separate disciplinary matters. He had subsequently gone to Mr Jenkin (as his MP) to air his apparent ‘whistleblowing findings” and despite having no academic standing and limited expertise was then asked to provide evidence to the hearing. When later interviewed by the HMIC to provide proof of his allegations he was unable to provide any (HMIC, 2014c). This type of witness has not helped the PRC debate.

Perhaps at the heart of why PRC is a repeating theme by critics is the naive perception that they are designed to accurately reflect national crime levels. This is by no means the case. Probably the greatest use of PRC data is as a measure as to how busy police forces workloads are or as an indicator in crime trends. A fuller (but not complete) picture of crime is provided by the Crime Survey for England and Wales (CSEW, formally the British Crime Survey (BCS)). However for the purposes of this study we will focus on the PRC data.

At the heart of crime recording is human decision making based on a set of socially created rules. What is meant by this, is what is ultimately recorded is
defined by what is classed as a crime in legislation, what crimes the police are then informed about and finally what, whether and how the police then decide to record that crime. Indeed J. Young (1988) wrote:

‘At heart the extent of crime is a political as well as a behavioural matter...The figures for crime...are not ‘hard facts’ in the sense that this is true of the height and weight of physical bodies. They are moral not physical statistics.’

Let us explore these areas in more detail. In the first instance it is critical that we understand that PRC data in England and Wales is comprised only of notifiable offences. These are a list of offences which the police are required to submit to the Home Office under Section 44 of the Police Act 1996. These include most indictable offences (triable at the Crown Court) and triable either way offences (triable in both the Crown Court and the Magistrates Court). Finally, only some summary offences (offences that can only be heard in the Magistrates Court) are also included. What this means is that many crimes are not covered by this data. This would include crimes collated by other agencies such as business and cyber crime, benefit fraud, tax offences or trading standard offences. For the purpose of considering the strengths and weaknesses of this study, the offences of residential burglary, robbery and theft of and from motor vehicle are all notifiable offences.

The second area to consider is how offences are counted and classified. Past studies (Farrington and Dowds (1985), Bottomley and Coleman (1981) and J Burrows, Tarling, Mackie, and Lewis (2000)) highlighted inconsistencies between forces on how crimes were counted. In order to standardise counting practises countrywide in 2002 a new National Crime Recording Standard (NCRS) was introduced. The NCRS introduced a more victim-oriented approach such that any allegation of crime was to be recorded unless there was credible evidence to the contrary. This aimed, as well as creating a common framework, to increase police recording levels. Its effects were almost immediate with British Crime Survey (BCS) data showing that the percentage of personal and household crimes that ended up recorded by the police increased from 62% in 2000/1 to 75% in 2003/4. These rules have become more and more prescriptive over time in an attempt to
remove officer discretion. So by way of an example if a residential home is broken into one might automatically assume that is recorded as a residential burglary. However if that home was having building works and was not seen as habitable as the utilities were not connected whilst this was done, then this would be correctly recorded as a non–residential burglary. Despite this prescriptive detail, gaps and concerns remain particularly in respect of third party reported incidents, police identified crime or when suspects admit offences. In the recent HMIC (2014c) report into crime recording, the Inspectorate concluded that the police were failing to record some 19% of crimes reported to them with the greatest concerns being violence against the person and sexual offences where the under recording rates were seen as 33% and 26% respectively. It was noted however that when a crime was recorded, in 96% of cases it was classified correctly. This fact is of importance to this academic study as it highlights that provided there were consistent recording practices across the trial period any variation in crime levels would be an accurate one.

During the PASC review it was highlighted that performance targets set for the police may be acting as an adverse incentive for the police to mis-record crime. This assertion was found in the HMIC review, which stated:

‘a number of forces accepted that undue performance pressure had adversely affected crime recording in the past, and the culture of chasing targets as ends in themselves had distorted crime-recording decisions.’

At the heart of this problem is that forces are required to record crime themselves and at the same time this measure has then been used to judge their effectiveness. A renewed governmental focus away from performance targets alongside the recent HMIC recommendations aims to change this recording position.

The next area affecting police recorded crime levels is the public’s ability and willingness to report offences in the first place. Failure to report crime creates a number of issues. It stops a policing response. It prevents victim support.
Academically it has undermined the analysis of crime prevention initiatives (Skogan, 1984). Studies have shown that between 77% and 96% of crimes are initially reported to the police by members of the public (Bottomley & Coleman, 1981; Farrington & Dowds, 1985; Mawby, 1979; McCabe & Sutcliffe, 1978). The public willingness to report can be affected by a range of issues. These include their knowledge that a crime has occurred, their trust in the police and the ease of reporting. Past studies have shown that the more ‘trivial’ the offence the less likely it is to be recorded (Hough & Mayhew, 1985). It is interesting to note the part the media and celebrity offending can play in this with the increase in reported sexual offences to the MPS as a result of the Jimmy Saville enquiry.

One final area of criticism is its effectiveness in recording crime in the modern era of Internet based offending. One offender located in his home in any country can send a ‘scam’ email to thousands of individuals and fraudulently obtain money from them. Quite simply current reporting and recording practises are limited in their ability to accurately capture this type of offending. In this regard the PRC can be seen as more effective at capturing traditional reported crime levels and will need reform or support from other methods and agencies if it is to accurately capture reported cyber crime offending.

This academic study took place within the Metropolitan Police force district area. Usefully HMIC (2014a) carried out an inspection of the force’s crime data integrity. In this review it examined the number of incidents reported to the police and the subsequent number that it believed should have been recorded as a crime. Of the 1169 crimes, which should have been recorded, it found that 948 were. For burglary it found that 86% of crimes were correctly recorded and indeed the report stated that crimes of this type were found by inspection staff to be areas where crimes were more likely to be recorded in line with the HOCR. Further more within the MPS it was noted (HMIC (2014a)) that there was no evidence of performance pressures unduly affecting their approach to decision making for crime recording. This clearly undermines any PASC assertion that performance measures were undermining the ethicality of crime recording within the MPS. Whilst there were areas requiring improvement, for the context of this study there is no reason to
believe the recorded data was not both consistent over the 12 month study period and sufficiently accurate to draw accurate inferences.

The relevance of the study

Levels of burglary crime and the police’s effectiveness in reducing this crime type continue to occupy a unique place in the public awareness. It is a crime that causes significant financial and psychological effects on its victims and causes considerable anxiety across communities. In 2013/14 residential burglaries accounted for 7.84% of all crime in England and Wales. In the MPS in the rolling year to February 2013 there were 61,498 residential burglaries (Metropolitan Police Service, 2013). Using the latest Home Office Integrated Offender Management Value for Money Toolkit valuation (2011), the cost of this to society was £241 million. In this context, improving our understanding on what methods are effective in reducing these crimes and understanding the effects of those measures has obvious importance and standing.

Secondly this study will add to research literature concerning the effect of this strategy on either crime displacement or diffusion of benefits. Reppetto (1976: p68) argued:

‘to date, no concerted attempts appear to have been made to forecast the forms and dimensions of the displacement problem, this topic seems ripe for comprehensive and quantitative research.’

Weisburd et al. (2006) noted how measuring the possible effects of displacement was often overlooked in studies and left them unable to find a single direct empirical study for review. Guerette and Bowers (2009) in their review of situational crime prevention highlighted how this area remains a work in progress. In their review of the literature concerned with crime displacement S. D. Johnson, Guerette, and Bowers K J (2012) noted that there is a need for more data. In particular they highlight how most of the studies have focused around the use of
CCTV and as such there is a clear academic need to examine the effects of other types of situational crime prevention. Where research has been carried out, spatial examination is often limited in size. Weisburd and Green’s (1995b) study on the Jersey City Drug Market looked at an area two blocks around crime hotspots, finding no displacement effects. This study has added to this sphere of work, by looking at crime levels in the direct trial hotspot area and then thereafter looking at crime levels extending out to 750m around that area. It has undertaken this in ten different areas around London. It is of therefore of a significantly larger scale.

Third, a key measure for police forces nationally is to improve levels of public confidence and satisfaction. This study also examines the impact of property marking strategies on public satisfaction levels. No past studies of this nature have been attempted on such a detailed scale.
Chapter 3 - Research methodology

Introduction

This study set out to assess the impact of traceable liquid property marking strategies on crime and public satisfaction levels in order to improve our academic understanding of this situational crime prevention approach. It did this by examining the impact of traceable liquid property marking across 5000 London residential households over a 12 months time period.

To do this a mixed methods approach was utilised (see Campbell and Fiske (1959), Sieber (1973), Cresswell (1994) and Tashakkori and Teddlie (2003)) which by definition employed both quantitative and qualitative research approaches. This was considered necessary in order to bring about “completeness” and “credibility” (Bryman, 2006a). In order to explore the strengths and weaknesses of the utilised methodology we will first focus on the general research design and the strengths and weaknesses of quantitative and qualitative methodologies. Having done so we will then explore all of the components of the deployment strategy. This is necessary as it was far more than just property marking but also included a clear marketing strategy that directly impacted on the effectiveness of the trial and this included demonstrating the effectiveness by catching offenders and publicising their arrest and conviction. By doing this we are then able to better understand the specific research methods, which will then be explained in detail. Finally we will look at the precise trial and control sites used for the study.

Research design

Research is described as having three main aims namely to explore, to describe or to explain (Robson, 2011, p39). This study aimed to describe the impact of traceable liquids on crime levels and public confidence and to then seek to explain those findings as far as was possible. Most importantly it aimed to provide information to police forces nationally of the value of this form of property marking.
Brown and Strega (2005) see this being achieved either as a direct result of a study or for its subsequent influence on policy. One consideration was to ensure that the research approach was one that had a scientific approach and basis. Robson (2011) uses this term to describe research that is carried out ‘systematically, sceptically and ethically’. This means that the research would be carried out in a planned and considered way, would be the subject of testing and scrutiny and conducted in a manner that protects the interests of the subjects the data is taken from. A definition of the term ‘science’ which resonated with the planned approach is provided by B. Johnson and Christensen (2004):

“We define science as an approach for the generation of knowledge that places high regard for empirical data and follows certain norms and practises that develop over time because of their usefulness’. (p. 14)

The research methodology was designed with these outline principles in mind. Crotty (1998) suggests that in designing a research project we should consider four specific areas namely; the epistemology or theory applied, the theoretical perspective, the methodology that links the method to the outcome and finally the method we have applied. Epistemology in this context concerns how we know things and what we can and cannot consider as knowledge. O’Leary (2007) provides a core definition of:

‘How it is that we come to have legitimate knowledge of the world; rules for knowing.’ (p. 76)

In seeking to understand the epistemological considerations it was important to understand the key concepts of ‘positivism, realism and interpretivism’. Positivists see the world as ‘real’ and advocate the application of the methods of the natural sciences to the study of reality. They see knowledge as being derived using scientific methodology and being based on sensory experience. Invisible or theoretical entities are rejected. They see the need for science being conducted in a way that is value free. In recent years proponents of positivism have been the subject of a range of criticisms. These include doubts over whether direct
experience is a solid basis for scientific knowledge, a rejection of the view that science should deal only in observable phenomena, that ‘facts’ and ‘values’ can not be separated and that theoretical concepts do not have a 1:1 correspondence with reality (Blaikie, 2007). Following a so-called demise of the positivist viewpoint, a way forward for quantitative research was the post-positivist approach. Bachman and Schutt (2011) describe post positivism as:

‘The belief that there is an empirical reality but that our understanding of it is limited by its complexity and by biases and other limitations of researchers.’

One of the most common forms of post-positivism is the philosophy called critical realism. Realists agree that the same methods of data collection can be applied to both the natural and the social sciences. They also accept that particular things exist independently of perception. There are two major forms of realism namely empirical realism and critical realism. Empirical realists (also known as naïve realists) believe that any reality can be understood by applying the correct research method. Critical realists as defined by Bhaskar (1989) believe that:

‘We will only be able to understand – and so change – the social world if we identify the structures at work that generate those events and discourses…these structures are not spontaneously apparent in the observable pattern of events; they can only be identified through the practical and theoretical work of the social sciences.’

Critical realists believe that there is a reality independent of our thinking that science can still study. The critical realist is therefore in fact critical of our ability to know reality with certainty.

Contrasting the positivist viewpoint is that of the Interpretivist. They argue that the social world is very different from the natural one and that as a result any study of it requires an entirely different logic of research process. Von Wright (1971) sees the positivist as trying to explain human behaviour whilst the interpretivist wants to understand human behaviour. One of the strongest philosophies in this area is that
of phenomenology. This form of research focuses on the need to understand how humans view themselves and the world around them and how the philosopher should bracket out inherent preconceptions they have about their view of the world. In order to understand a person’s behaviour, ‘the phenomenologist attempts to see things from that person’s point of view’ (Bogdan & Taylor, 1975).

Having acknowledged a range of different epistemological viewpoints a positivist position was adopted as it allowed a scientific approach to be adopted.

Before deciding on the research instrument the next area of consideration was to recognise the ontological standpoint. Ontological assumptions have a key impact into the ways research is formulated. Two of the central and opposing positions are those of objectivism and constructionism. Objectivism implies that social phenomena have an existence that is independent of social factors and that they are beyond our reach and influence. In the context of organisations this means that we assume that each organisation has a framework and internal influence on its members. It is seen as a tangible object. Whilst the degrees of structure and hierarchy may vary from one organisation to another we are accepting that each has a reality that is separate from the members who operate within it. This same belief is applied to cultures and subcultures whereby members comply to customs and values in order to be considered good citizens. Contrasting this position is constructionism. Bryman (2012) describes it as an ontological position that asserts that social phenomena and their meanings are continually being accomplished by social actors. Straus, Schatzman, Ehrich, Bucher, and Sabshin (1973) carried out studies in a psychiatric hospital in order to research organisations. In doing so they concluded that instead of it being construed as a pre-existing entity it was very much something that was worked at and as such was in a constant state of revision or flux. The same point can also be made for cultures. For example Becker (1982) suggested that:

‘people create culture continuously…No set of cultural understandings…provides a perfectly applicable solution to any problem people have to solve in the course of
their day, and they therefore must remake those solutions, adapt their understanding to the new situation in light of what is different about it.’

We see therefore how these ontological considerations will influence the stance researchers take in deciding their research method. Those who believe organisations are individual entities that act on individuals will take an objective view, whilst those that focus their design on the active involvement and influence of people will take a constructionist stance.

Having focused on gaining an understanding of both theory and theoretical perspective the next step was to explore the methodology that would be utilised in the study. Before doing this however it is useful first to identify how the research question was selected.

Bryman (2012) highlights the main steps in identifying a research question. The first stage is to identify the area of research. In this case the general area of interest was situational crime prevention techniques that could be utilised to prevent residential burglary crimes being committed. This research area was closely aligned to the researcher’s past experience and current role within the Metropolitan Police Service.

I am a Detective Superintendent and the organisational lead for crime prevention. Additionally I oversee six capability teams whose role is to identify process changes and opportunities in order to improve and support the organisation to better reduce and detect crime. Sitting on the ACPO Burglary Reduction Group the researcher is one of the MPS organisational experts in this area. During my 20 years in the organisation my principal role has been the application of conventional and covert techniques to deter and detect crime. My last BOCU operational role was as a DCI responsible for CID crime on what was at that time the borough with the highest burglary levels in London. In my time in this role I oversaw a number of focused operations employing large numbers of police officers and staff. An interest that developed as a consequence of this was whether such strategies merely displaced crime. Through my past studies and experiences I have also
seen technological advances that have provided opportunities for increasing prevention. One question was were the police making the best use of these new opportunities and developing at the same pace of the change.

The second stage was to select an aspect of that research area. Asked to develop an offer from a traceable liquid provider to the Commissioner of the MPS, this opportunity developed into a clear framework to both assess academically the effectiveness of the strategy on reducing residential burglary and also to assess if crime displacement occurred and its impact on levels of public confidence.

Having chosen the precise research area the next stage as cited by Bryman was to consider possible research questions. A range of questions was considered and after much deliberation three key areas were identified. First what was the impact of the traceable liquid strategy on reducing residential burglary crime? Second did its deployment result in crime displacement or diffusion of benefit effects? Third did the deployment of the property marking equipment by the police positively impact on public confidence levels in the police? Having identified the research questions let us now explore the individual quantitative and qualitative methods realised.

**Research design - quantitative methods**

In order to explore the research questions two primary methods of quantitative research were utilised namely secondary data analysis of crime levels in geo-coded areas and an on-line survey.

Creswell (2003, p 18) describes a quantitative approach as one in which the investigator uses postpositivist claims for developing knowledge. They employ techniques such as experiments and surveys and collect data using predetermined instruments that deliver statistical data. Bryman (2012, p161) offers a generic process model for quantitative research:
Bryman’s Process of Quantitative Research

1. Theory
2. Hypothesis
3. Research design
4. Devise measures of concepts
5. Select research site
6. Select research subjects/respondents
7. Administer research instruments/collect data
8. Process data
9. Analyse data
10. Findings/conclusions
11. Write up findings/conclusion

This model obviously represents an ideal account of quantitative research and as such we recognise that each of these steps is not necessarily present in all research. Indeed from the outset, this research differed significantly from this model. Bryman’s model commences with a theory and derives from this a hypothesis suggesting a broadly deductive approach. The term theory in simplistic terms is a description of an observed behaviour (Bryman, 2012, p21). An example could be that individuals from deprived areas are more likely to commit crime. However for this study a fact-finding approach was utilised that steered away from pre-conceptions over what would be discovered. Whilst this approach is less common examples such as Fenton, Bryman, and Deacon (1998) quantitative content analysis of social research reported in the British mass media demonstrate the relevance of this approach. By adopting this method an inductivist theoretical approach was applied as opposed to the more typical deductivist one. In deductivist theory the researcher takes what is known about a subject and deduces from that a theory, which they then subject to empirical testing. In an inductivist approach the researcher uses the findings from the analysed data to infer their theory.
Before looking in detail at the two quantitative methods employed it is useful to recognise some of the general criticisms of quantitative research approaches. Schutz (1962) argued that quantitative researchers fail to distinguish people and social institutions from the world of nature. Schutz argued that quantitative researchers in effect ignore in their studies the differences between social and the natural world. They ignore the fact that people interpret the world for themselves and from differing perspectives (Bryman, 2012, p178). A second criticism was levelled by Cicourel (1964) who saw approaches to measures such as questionnaires as flawed as they presume when individuals respond to questions they interpret the key terms similarly. The reality is quite different. Cicourel (1982) in his later work raised further concerns. He argued that the reliance on instruments to obtain data in reality hinders the connection between research and everyday life. A final area of criticism was put forward by Blumer (1956). He argued that quantitative methods are static and fail to bring out the interrelationships between variables that go on in human groups. Bryman (2012, p179) describes it as ‘carrying an objectivist ontology that reifies the social world.’

The next stage was to consider a research design that would form a framework to collect and analyse the data. In making this decision we need to be mindful of three criteria, which are regularly used to evaluate social research - reliability, replication and validity. Bachman and Schutt (2011) define reliability as:

> ‘A measure is reliable when it yields consistent scores or observations of a given phenomenon on different occasions. Reliability is a prerequisite for measurement validity.’

Reliability is concerned therefore that the results of a study are repeatable. In quantitative research we are very much concerned with the fact that the results are stable. This means if we carry out tests on the data using a range of measures we still get the same result. The second criterion is quite simply the fact that the study is capable of being replicated. Despite Burawoy (2003) belief that ‘in academia the real reward comes not from replication but from originality’, replicability is valued by social researchers. The third and in many ways the most important area is that
of validity. Validity means that the findings of research have integrity and can withstand scrutiny. Validity can be assessed in a number of ways. Face validity asks whether at face value the measuring instrument appears to measure what it was attempting to measure. This is a subjective test. Content validity is again judgemental and establishes to what extent the measure covers the full range of the concepts meaning. Construct validity asks whether the instrument in question does, in fact, measure what it has been designated to measure (Cronbach & Meehl, 1955). Demonstrating that a measure is related to a variety of other measures can show this. Criterion validity is when published results can be accurately compared to those obtained with an already validated study of the same phenomenon.

Before looking in detail at the research methods we need to explore the second methodology used in this mixed methods study. This is the area of qualitative methodology.

**Research design - qualitative methods**

In order to ensure as much learning as possible was taken from the trial a small number of semi-structured interviews were utilised employing a qualitative methodology. Bryman (2012, p384) offers the following outline model for qualitative research:
Bryman’s outline model of qualitative research.

1. General research question(s)

2. Selection of relevant site(s) and subjects

3. Collection of relevant data

4. Interpretation of data

5. Conceptual
   5a – Tighter specification of the research question(s)
   5b – Collection of further data

6. Writing up findings/conclusions

Qualitative research is a strategy that tends to focus on words rather than quantification in the collection and analysis of data. It emanated in the early 20\textsuperscript{th} century when anthropologists and sociologists carried out direct field research as a means of better understanding native communities (Emerson, 1983). Its methods are principally focused around three distinctive research designs: participant observation, intensive interviewing and focus groups.

Whilst there are clear differences between each of these approaches they share a range of common characteristics. Firstly the researcher is primarily focused on collecting qualitative data. They are interested in the natural behaviours and thinking exhibited by the participants as opposed to quantitative information and data. To do this it is most often carried out at the place of the participant. In this way qualitative researchers get to view social life as the participants experience it.
They can then develop principles based on the observations they have made and in doing so they view the social phenomena holistically.

Secondly, qualitative researchers typically adopt an epistemological position that is interpretivist and that focuses on understanding the social world through the eyes and understanding of its participants. Kaufman (1986) highlights how it is important for the qualitative researcher to focus on human subjectivity and how individuals:

‘interpret and evaluate their life experiences and attempt to integrate these experiences to form a self–concept.’ (1986, p24-25)

In doing this qualitative researchers adopt an ontological position that is constructivist in nature. Bryman (2012, p 33) describes this as a position that asserts that social phenomena and their meanings are continually being accomplished by social actors and are the outcomes of the interactions between those individuals. Researchers therefore are focused towards social context and interactions Venkatesh (1997).

Thirdly researchers typically adopt an inductive approach. Rather then test an existing hypothesis, they allow their findings to develop as the research is progressed.

Rossman and Rallis (1998) identified further characteristics of qualitative research. They highlighted the need for the researcher to reflect on their own values, biases and interests and to recognise how these may impact on the study itself. Mertens (2003) saw this as recognising how all research is value laden. Rossman and Rallis (1998) saw qualitative research as involving multiple methods and as continuously developing. Increasingly researchers are seeking the active involvement of participants in the collecting of the data. Finally they saw the qualitative researcher as using one or more strategies of enquiry as a guide for the procedures in the study.
Like quantitative research, qualitative research has been the subject of several areas of criticism. Bryman (2012 p 405) highlights a range of concerns. Firstly it is often seen as being too subjective. Decisions on what is important and most relevant in this type of research are made by the researcher themselves. Its quality therefore can be dependent upon the skill and judgement of the researcher. Added to this is the fact that communications with subjects often have multiple meanings and as such are under an increased threat of researcher reflexion (Graneheim & Lundman, 2004).

Secondly it has often been criticised for being difficult to replicate and lacking scientific rigour. The very nature of qualitative research means it is very much unstructured and often relies on the ingenuity of the researcher in order to be conducted. Indeed it is likely the very personal characteristics of the researcher will impact on the eventual findings. Bryman (1994) supported this view and highlighted the difficulties faced by ethnographers when they attempted to replicate previous studies.

Thirdly it can be seen as often impossible to generalise. So if a study has taken place within a limited or confined organisation or group at a specific moment in time, it is hard to see how these findings are capable of being interpreted into a wider setting. Not all critics fully accept this view. Williams (2000) argued that ‘moderatum generalisations’ or aspects of the focus of an enquiry ‘can be seen to be instances of a broader set of recognizable features.’

A final criticism is that qualitative research lacks transparency. What is meant by this, is that it is hard to identify how the researcher came to the point of their conclusions (Bryman & Burgess, 1994). Some writers have suggested that qualitative data should be assessed on a different set of criteria. Lincoln and Guba (1985) and Guba and Lincoln (1994) proposed the alternative measures of ‘trustworthiness and authenticity’ as they were critical of there being an absolute truth of the social world and instead believed there can be more then one account.
Having explored in general the two different research approaches and before we look at the precise research methods utilised in this study, we need to first of all understand what traceable liquids are and how they were distributed.

**What is traceable liquid property marking and how was it marketed and deployed?**

As part of the trial led by the author, three traceable liquid companies (SmartWater, Applied DNA Sciences and Stealth Mark) provided kits, expertise, training and signage to trial their products across London. Each company agreed for the results to be published and utilised for academic research. Whilst it is acknowledged that the actual products differ in their detailed make up, all three shared a range of common characteristics and were deployed using the same broad methodology.

At the heart of the strategy is property marking or entering a mark onto an item of property so as to make it identifiable. In broad terms there were three methods for doing this. Firstly there is the overt marking of property. An example of this that has been used in the past was the stamping in of a postcode and house number onto the frame of a bike. The key here is that the marking is on ready display should the potential thief examine the item of property. Whilst this may deter the offender from taking the property, for the persistent offender they may chose to damage or remove the property mark. We have seen this occur for example when offenders have in the past stolen motor vehicles and then removed or ground out the identifiable marks. The second method has been serial number registration. This has been used widely in trying to combat the theft of mobile phones with property details being registered on the ‘Immobilise’ database. The strength of this has been that if an offender is stopped with a registered piece of property, the police can carry out checks to identify or not if the property is stolen. Its limitation is that it is restricted to property that has a serial number. The third option is to covertly mark property. This is the case with traceable liquids.
The main component is a unique, invisible to the naked eye, property marking solution that can be applied to almost any product. The solution is supplied in bottle form and is applied by a brush or applicator to an item of valuable property. The marking solution is extremely difficult to remove. The solution itself becomes visible when scanned with a UV light. Once discovered a swab sample is then taken of the solution and as each sample contains a unique identifier, the owner of that property can be located. From a policing perspective this allows an item of property to be identified as being potentially stolen and importantly it allows the owner to be found. For the offender it removes the generic anonymity of previously unidentifiable property and as a result increases their chances of being caught.

Figure 1 – Image of traceable liquid applied to a watch and viewed under UV light

For the trial and following initial training, householders were visited by local police officers or Police Community Support Officers (PCSO’s) and literally had their property marked and registered for them. A part of the strategy was to densely saturate the areas with the products, with up to 85% of the residential homes being marked. By doing this it was inevitable that offender’s home addresses would also be approached within the catchment areas. By speaking directly to them as homeowners about the product, the police were aiming to remove excuses for their offending.

One aspect this study explores is the impact of this type of property marking on public satisfaction levels. A feature of this was the messaging given out by police staff when they distributed the products. Brent borough was the first to distribute
their products and created a series of key messages that were to be passed on to householders. These were adopted to varying degrees at the other trial sites. These messages included:

- This makes your house less attractive for a burglar because they are more likely to be caught and makes it harder for them to sell things they steal.
- We are doing this so that we can give you back your property if it’s stolen.
- This makes your property uniquely identifiable with an invisible marker like a fingerprint.
- The product is extremely hard to remove. It contains a polymer to bond the forensic marker to the surface of your property. It’s best applied to slightly irregular surfaces i.e. not highly polished and totally smooth.
- This kit normally costs £xxxxx per year but has been provided free of charge for life to try and stamp out burglary in your area.
- We are doing this in your area as we believe it can make a big difference here.
- We are committed to reducing burglary and this is a valuable tool in achieving that reduction.
- Insurance may pay out, but won’t replace the contact numbers in your phone, pictures in your camera and personal memories that you won’t get back.
- It makes it harder for them to sell the stolen property, as pawn shops check for traceable liquids and will call police if necessary.
- If you buy new high value items you can still mark it, the kit lasts a long time if used sparingly.

To help reinforce these messages a letter was posted to residents in the area that again reinforced these messages.

A key part of the strategy was seen as informing offenders that householder’s property had been marked. To do this a range of methods were employed by the companies and the police. The first was prominent stickers that were viewable from outside the property were displayed on front and back doors or windows of
treated properties. Secondly signage advertising the traceable liquid deployment was put up on the streets surrounding the target area. The signage covered an area that was wider than the deployment footprint area in the belief that it would broaden the impact of the products. The aim was to alert potential offenders as they entered a property marked area.

Figure 2 – Examples of street signs

A further component was a co-ordinated media strategy by the companies and the police to help convey the products ability to secure convictions, as a means of deterring offenders from committing offences. Externally, this included the use of press articles, radio and social networks such as Twitter and Facebook as a means of detailing the deployment as well as maximising the media coverage from suspects arrested as a result of the product. Other more innovative approaches were adopted. Leaflets describing the product were placed in police station offices.
Posters were placed in bus stops directly within and around the property marked areas. These were repositioned periodically to reactivate public awareness. In one area traceable liquid advertising was put on prescription bags at chemists, most commonly used by drug users who were being prescribed methadone. By doing so they felt they would raise awareness to potential burglary offenders.

In order to directly raise awareness with potential offenders the police took a number of opportunities to highlight the use of the traceable liquids. Every prisoner and their property brought in to custody in the trial areas was scanned with UV light and the reason for doing so explained to them. Officers conducted visits to second hand good stores and provided owners and store managers with posters advertising the products and checked their stock using UV lights. The aim here was to dissuade them from taking in stolen property and to make it harder for an
offender to dispose of that property. On one of the boroughs the most prolific top ten burglars were the subject of a personal visit during which they were told about the use of traceable liquids and how it worked.

Two of the companies also provided ‘sting’ equipment to directly catch offenders. An example of this was a car fitted with covert cameras, tracking devices and a sprayable version of the traceable liquid that would mark an offender’s body and clothes if and when they broke into the vehicle. On two of the trial sites, offenders were captured and subsequently convicted from these deployments. When this occurred press opportunities were maximised with articles showing the offender widely published. By doing this, the company was aiming to show offenders that the marketing was not all talk but rather a successful means of catching and convicting offenders. By doing this and advertising the success the companies aimed to maximise the deterrent effect and to dissuade offence displacement to other crime types. The example on the next page was retrieved from the BBC website (BBC News London, 2013).
30 September 2013

Thief Yafet Askale caught out by 'invisible' dye

A thief who broke into a decoy car was caught out due to an "anti-crime" dye that turned his face bright green.

Yafet Askale, 28, was sprayed with the substance, which can only be seen under ultraviolet light, when he broke into a police "trap car" in Harlesden, north-west London.

Askale denied the charge of theft from a motor vehicle, but was convicted at Hendon Magistrates’ Court.

Police said that the dye proved Askale had been in the car.

He was also found to have a number of stolen items, including a laptop.

Askale, of Harlesden Gardens, Harlesden, was sentenced on Friday to 49 hours of community service and was ordered to pay £400 costs.

Brent Police said they had also been providing residents with invisible dye kits so they can mark their property to deter thieves.
Having explored what traceable liquids are, how they were deployed and the wider supporting marketing let us now look at the precise research methodology used to assess their effectiveness;

**Study research methods**

Before looking in detail at how the trial was carried out it is useful to consider how the data is presented. Early on the decision was made to use simple descriptive statistics, tables and graphs. The reason for this approach was to ensure the study would be readily accessible to all readers, whilst also be seen as totally suitable for the study outcomes. This approach has clear academic support from a range of authors (Gorard (2006), Rosnow and Rosenthal (1989) and Cohen (1990). Let us now explore the methodology in detail.

**How the impact of traceable liquid products on residential burglary crime levels was measured**

Assessing the impact of traceable liquid products on crime levels was the primary focus of this study. All of the companies believed that the correct deployment of their products would lead to a significant reduction in residential burglary and this study sought to test this.

For the trial, three companies each agreed to provide sufficient traceable liquid products in order to property mark areas of 500 households. Two of the companies agreed to cover 4 such areas (2000 households) and one company, two areas (1000 households). In total therefore 5000 households were property marked.

In order to assess the effectiveness of this property marking strategy, it was decided that areas of 500 households would be targeted. Two such areas would be located on an individual London Borough, which meant 5 London Boroughs, could be targeted in total. This met a range of competing needs. Firstly the areas
had to be of sufficient size and to have experienced a level of residential burglaries in order for any conclusions to be arrived at on the products’ impact on crime levels. Secondly, by running the trial in 5 separate boroughs this would help generalised conclusions to be drawn. There were also professional policing factors, which influenced the decision. Police officers or Police Community Support Officers would distribute the products themselves. This represented a significant investment of resource time and public funds. There was a natural police imperative to reduce residential burglary and a resultant need to focus the trial on some of the areas where it could have the largest impact on residential burglary crime reduction. Taking these factors into account a method for identifying the areas was discovered.

Data was obtained on 250 metre (m) grid square areas, which had experienced the highest residential burglary levels across London in the previous twelve months. Areas of this size were selected as these broadly represented approximately 500 household areas and this was in line with the equipment companies had offered to supply. Having done this a second criterion was applied. This looked at the offending levels in the last three months for these areas. In the literature review we saw how crime pattern theory has been used most notably with the researching of crime hotspots. In this study ‘hotspots’ for residential burglary were selected as trial areas in order to assess the impact of the traceable liquids. Areas, which proved to have the highest residential burglary crime levels for the last 12 months and were also the worst for the last 3 months were deemed suitable for inclusion. By applying both of these criteria, areas were selected that had both high long term and current levels of residential burglary. By purposively selecting these areas and using this theoretical thinking, these areas were seen as most susceptible to future burglary offences. They were most likely to be targeted by offenders and were also areas that could be described as having both a current and a chronic residential burglary problem.

London police boroughs, which featured two high-output areas, were selected, enabling 1000 households to be targeted on each. A strength of this approach was it allowed for the best possible and most powerful research design by targeting the
areas, which had the most crimes to deter and also the highest displacement potential. It is recognised that whilst these areas secured the ‘best fit’ for the competing needs of the public, the study and the police, it is important to acknowledge that in pure analytical terms a better solution would have been to focus on median performing areas. It needs to be recognised therefore that by selecting the extreme areas for residential burglary offending we could anticipate seeing slightly stronger results as any crime changes would be more stark. This compromise highlights the challenge faced by proponents of evidence based policing in how studies are undertaken in the real world.

Having done this the method for identifying specific areas was considered. One option would have been to carry out a randomised control trial with randomly selected treatment and non-treatment or control areas. This method was rejected for several reasons;

First, the real life policing imperative to try to reduce the number of burglary victims, directed the trial towards the highest residential burglary areas. Second there was a need to limit the number of other variables occurring in an area. This was central as we needed to examine the effectiveness in these areas and beyond, in a controlled context with a clear understanding of all police activity. Having selected a possible area it was necessary to meet with the local police leads to ensure no other policing operations were due to take place or were already taking place in that area. For example it could have been possible to randomly select an area only to discover there was a long-term covert operation running in the area and that when it entered its arrest phase this would have a dramatic impact on the crime levels in that area. This would have a negative impact on the validity of the results from that trial area. It was for this precise reason that a randomised control method was rejected and indeed in a test where there is a need to understand and control variables, it would have been an unsuitable methodology.

The third reason was to ensure local support for the implementation of the trial. There was a clear need to meet with the relevant Borough Commander to gauge
their support for the study. This study required an investment of local resources to distribute the products to householders. With competing performance needs a Borough Commander may not want to focus his or her resources in this area. Interestingly despite this approach one of the boroughs did not fully embrace the trial. As a result its implementation produced variable results. This will be explored later in this study but it served to highlight the importance of this area of ‘implementation buy-in’. Finally, when boroughs were approached other unexpected issues were identified. On one borough for example, another company’s traceable liquid product had been distributed in an ad hoc fashion within the target area in the last few years. Clearly this would send out a mixed message to local residents and it would undermine the experimental nature of the trial. For all these reasons therefore a purposive selection approach was taken.

In order to strengthen the validity of the results, control areas were selected on each of the boroughs. These control areas were selected in exactly the same way and using the same data as the trial areas. Again they were purposively selected to ensure no other variables would impact on crime in these areas. In addition Mosaic™ data was used in order to identify a control area that was of the same broad social consumer base as the study areas. Mosaic™ is a social classification system created by the company Experian. It aims to provide a detailed understanding of the consumer demographics, behaviour and lifestyle of UK households and residents. For this experiment it was utilised in an attempt to match similar demographics between the trial and control areas on each of the London Boroughs.

The effect of the methodology employed and specifically the positive selection of the experiment areas meant that a quasi-experimental design was adopted for the study. These types of research have many of the characteristics of an experimental design but not all. Cook and Campbell (1979) provide a useful overview of these designs. In this case it was the non-random assignment of experimental and control areas that detracted from an experimental design. While those who hold a purist view about the need for experimental design may question the validity of these results, it could be argued that the need to control or
understand a range of factors made a quasi-experimental approach far more valuable by allowing cause and effect assumptions to be made in relation to it.

Using this methodology trial sites and control areas were selected in the London boroughs of Brent, Islington, Hammersmith and Fulham, Lambeth and Southwark. Before the roll out each borough received a detailed briefing from the trial lead. Specific training from the respective companies in how to distribute their product supported this. The boroughs were provided with detailed maps of the areas to be covered and spread sheets to complete regarding the deployment. The deploying officers were asked to list every house that was marked.

As noted, the trial areas were selected using 250m grid squares. These grid squares were often not of 500 households and at times would divide streets or an area in an illogical fashion with half a street being in a trial and half not. To negate this the areas were expanded and re-drawn around the assigned grid squares. Each Borough received a large detailed map of the control area. Once they had completed the roll out using this data the external perimeter of the traceable liquid area was exactly mapped on the police crime mapping system using the computer program ‘Mapinfo’. By doing this all crime that occurred within these areas could be precisely mapped and using historic data compared to the previous year. It was this same system that allowed displacement effects to be monitored, which will be detailed later in this section.

For each area the deploying officers were set the target of achieving an 85% saturation of households who were property marked within these areas. Once this saturation level was achieved and all signage and supporting infrastructure was in place, then data analysis could commence. Such a high saturation level was selected as all the companies felt that the effectiveness of the strategy and the need to market the property marking was magnified (and as a result would be more effective) if areas were saturated. It had also been noted in Laycock’s (1985) trial that a high take up had helped in the effectiveness of her property marking research.
For each area, crime data, post implementation of the traceable liquid products was compared against the same period in the previous year and fluctuations in crime levels explored. These figures were compared against MPS, borough and control area performance to seek to understand their significance. To aid the researcher to undertake all of this and to also provide system expertise, an MPS analyst extracted the data. This also helped to remove potential researcher bias.

Despite the detailed briefing and prescriptive roll out measures as noted by Hope and Murphy (1983) some degree of implementation failure occurred. In Southwark and Lambeth the high 85% saturation levels were not achieved. This was particularly stark in the Lambeth areas where one target area resulted in a wider 30 - 50% saturation level. In Islington the stickers that should have been placed on front and rear doors and windows were not always used or displayed. While this was interesting from an academic perspective and provided improved understanding of the methodology, it also highlighted the key challenges of rolling out such a programme on a large scale. Interestingly the traceable liquid roll out involved a single agency police response with only a limited involvement of a second agency (local authority). Issues of implementation failure have been more often found in multi-agency initiatives (Saulsbury & Bowling, 1991).

By monitoring crime data in this way, the research method being used for this element was secondary data analysis. Secondary analysis of data can be described as an unobtrusive method. This type of measure allows us to obtain data about individuals or groups without their direct knowledge or participation (Bouchard, 1976);(Sechrest, 1980). Webb et al. (1966) identified four main types of methods to do this. Firstly there are physical traces that subjects leave behind such as rubbish or graffiti. Secondly there is simple observation whereby the researcher simply allows events to unfold without seeking to assert any influence whatsoever. Next there are archive materials such as government statistics, official records or media and it is this approach that was used in this study. Finally there is contrived observation which is similar to simple observation but here the researcher uses hidden cameras or seeks to vary the setting whilst remaining unobtrusive. Webb et al argued that in social research; researchers are often
reliant on methods of data collection that are prone to *reactivity*. In other words whenever people know they are involved in a study a component of their replies is influenced by their knowledge of this fact. So-called unobtrusive methods therefore have the advantage of eliminating this influence.

There are disadvantages to this method. The first is one of potential invasion of privacy. The respondents in this type of study have not given permission for their data to be used. It was important therefore when dealing with the information about real crimes and involving real victims to ensure any findings were anonymised and could not be attributed to any one individual. Of equal concern was how the information was handled. In response to this permission was obtained to carry out the research from the head of the unit. Having done this a third party analyst was used to present the data.

We will now explore the precise trial and control areas in greater detail:
The trial and control areas

Trial areas were selected on the five London Boroughs of Brent, Islington, Hammersmith and Fulham, Southwark and Lambeth. Two sites were located on each borough making ten in total. The sites and boroughs are identified in the map below:

Figure 5 – Map showing all ten trial sites (black) and control areas (red) on the five boroughs
Let us explore the five borough trial and control sites in individual detail.

**Brent borough**

Brent is an outer London Borough located in the North West of the city. It is one of the most densely populated outer London boroughs. Its bordering boroughs include Barnet, Harrow Ealing and Camden. According to the ONS in 2011 its population is over 311,000. It is one of two London Boroughs where non-white groups (54.8% of population) represent a greater proportion than white groups. It also has the lowest percentage of UK-born population at 53.4% and the highest proportion of people born outside the EU at 38.1%. Its major areas are Kilburn, Wembley and Willesden. It is home to Wembley Stadium. It is made up of a
mixture of residential, commercial and industrial land. Brent borough has the greatest diversity and representation of different cultures of any London borough. For this study the two trial areas were located in Church End and Harlesden wards towards the south of the borough. These are displayed below:

Figure 7 - Brent borough trial areas

The Church End ward trial area is shown as Grid Square 212845 above. The table below shows the detailed map of this area. The borders indicate the specific and exact area that received the 85% property marking saturation.

Figure 8 - Brent target area grid square 212845 (left) with Mosaic™ profile (right)
In order to understand the socio demographics of the area, Mosaic™ data was obtained for this location. 49% of the area falls into the pink zone which refers to Mosaic group F or people living in social housing with uncertain employment in deprived areas, which also has high density social housing, mostly inner London with high levels of diversity. 27% of the area was marked yellow, which is Mosaic group D that refers to close-knit inner city and manufacturing town communities’ inner city terraces attracting second generation Londoners from diverse communities. 24% falls into the green category, which is group E - educated, young, single people living in areas of transient populations and neighbourhoods with transient singles living in multiply occupied large old houses.

The second trial area was on Harlesden ward and was located at Grid Square 218838. The marked area represents the exact space at least 85% of householders received the traceable liquid property marking.

Of the houses within this area 25% fall into a pink zone, which refers to Mosaic group F, people living in social housing with uncertain employment in deprived areas, which has high density social housing, mostly inner London with high levels of diversity. 74% fall into Mosaic group D, which refers to close-knit inner city and manufacturing town community’s inner city terraces attracting second generation Londoners from diverse communities.
Brent control area

As noted, control areas were identified on every trial site borough using the same methodology applied to select the trial areas. Discounting those in close proximity to the existing trial areas (and looking for a best match in terms of housing stock and occupant types), the area to the East of the borough close to the border with Camden and Barnet was selected.

Figure 10 - Brent residential burglary hotspots - 12 and 3 months prior to the trial

This Grid Square as it transpired fell entirely within Mapesbury Ward, which is displayed in greater detail on the maps overleaf.
The control area is the area bordered in red centred on the selected Grid Square. This area was selected for several key reasons in addition to its 12 month and 3 month crime profile. First the area fell within the majority of the selected Grid Square. Second it contained approximately 500 address points/properties (n=510). Third, a range of Mosaic types were represented which broadly conforms to those featuring within the trial areas. Finally the housing stock was primarily terraced and with a wide range of occupant types.

**Islington Borough**

Islington is situated in the North of London and is the second smallest London Borough. It is densely populated with a high population from ethnic minority backgrounds. Open spaces only account for 7% of the borough. It is statistically one of the most deprived London Boroughs, yet at the same time it has areas of great affluence. The ONS in 2013 estimated it as having a population of over 215,000. Bordering boroughs include Camden, Haringey and Hackney. Two areas were selected on Islington Borough and they were located in the wards of Archway and St Georges.
Area 298860 is located in St Georges Ward. The area below shows the defined trial area;

Looking at the data, it can be seen that of the houses within this area 69.7% fall in a green zone which is group E - educated, young, single people living in areas of transient populations and neighbourhoods with transient singles living in multiply occupied large old houses. 30.2% of households in the grid square fall in group A -
career professionals living in sought after locations - financially successful people living in smart flats in cosmopolitan inner city locations.

Area 290870 is the second of the Islington areas and is located on Archway Ward. The bordered area represents the trial area:

Looking at the Mosaic data, we can ascertain that of the houses within this area, 85.3% fell in a green zone which is group E - educated, young, single people living in areas of transient populations and neighbourhoods with transient singles living in multiple occupied large old houses. 14.6% of households in the grid square fall in Group A - career professionals living in sought after locations - financially successful people living in smart flats in cosmopolitan inner city locations.

Islington Control Area

As viewed from the map below, Islington has a number of dense concentrations of burgled homes, which are in close proximity to each other. This made the selection of a suitable control area problematic. Discounting the hotspots in the vicinity of the trial areas we were left with no areas, which were both long term and persistent burglary hotspots prior to the trial. The areas close to the trial areas had buffer zones (detailed later), which would impinge upon those of the trial areas. In addition directly to the east of these areas is a significant barrier in the form of a major rail line, which would further restrict this area. A decision was therefore
made to select a hotspot area, which while not persistent over the three months prior to the trial was a volume problem over the 12 months before the trial.

Figure 15 - Islington borough control area selection with 12 and 3-month data

![Islington borough control area selection with 12 and 3-month data](image)

Trial areas within irregular black polygons

Numerals in Red indicate high numbers of offences in Grid Square over past three months.
Numerals in Blue indicate high numbers of offences in Grid Square over past twelve months.
Selected Control area centred over Yellow Grid Square.

This hotspot was to be found across the middle of Canonbury Ward. This is displayed below.

Figure 16 - Islington control area (left) with Mosaic™ profile (right)

![Islington control area (left) with Mosaic™ profile (right)](image)
The selected control area proved to be the area bordered in red in the centre of the ward. This area was chosen for several reasons. The area fell over the majority of the selected Grid Square. It contained approximately 500 address points (n=534) and those households match those found within the two trial areas. Finally housing stock is a mix of social and multi-occupancy terraced housing.

**Hammersmith and Fulham borough**

Hammersmith & Fulham is situated in the South West of London. It is the third smallest London Borough. According to the ONS in 2013 it had a population of over 185,000. Its housing composition comprises a high proportion of flats and maisonettes. Its bordering boroughs include Wandsworth, Richmond, Hounslow, Ealing, Brent and Kensington & Chelsea. It has three busy town centres with Shepherds Bush in the north, Hammersmith in the centre west and Fulham in the south. It is one of the most affluent boroughs in London. Two areas in Hammersmith & Fulham were used as the trial areas. They were located in Munster and Sands End Wards and are displayed in the image below.

*Figure 17 - Hammersmith & Fulham two trial areas*
The first area (242765) was located in Munster Ward.

Looking at the Mosaic data, it is clear that of the houses within this area 87.8% of households are in Mosaic group E, highlighted in green above. This consists of educated, young, single people living in areas of transient populations and neighbourhoods with transient singles living in multiply occupied large old houses. 13.2% of households are in a pink zone, which refers to mosaic group F - people living in social housing with uncertain employment in deprived areas, which has high density social housing, mostly inner London with high levels of diversity.

The second area was located in Sands End ward.
We find that of the houses within this area 1.7% of the houses fell in to the pink zone. This refers to Mosaic group F - people living in social housing with uncertain employment in deprived areas. This has high density social housing, mostly inner London with high levels of diversity. 5% are situated within a yellow zone, which is mosaic group D that refers to close-knit inner city and manufacturing town communities' inner city terraces attracting second generation Londoners from diverse communities. Group E makes up 88.2% of the households in the area, this consists of educated, young, single people living in areas of transient populations and neighbourhoods with transient singles living in multiply occupied large old houses

Hammersmith & Fulham control area

From the map overleaf we discovered that Hammersmith and Fulham has a number of persistent and long-term concentrations of burglaries. After discounting the area in close proximity to the existing trial areas the best match was in the east of the borough on the border with Kensington and Chelsea.
This hotspot falls almost entirely within Addison Ward, which is displayed in more detail on the maps below:

The selected control area is the area bordered in red in the east of the ward. This area was selected as it had approximately 500 address points (n=530). It also had
a broadly similar Mosaic and housing profile to the trial areas. Finally the housing stock is terraced housing with a mix of occupant types.

Southwark borough

Southwark Borough is situated in the south east of London. According to the ONS in 2011 it has a population of over 288,000 and over 120,000 households. It is directly south of the river Thames. Its bordering boroughs include Tower Hamlets, Lewisham and Lambeth. It is London’s fastest growing tourist quarter and attractions within it include Tate Modern and the Globe Theatre. The two selected trial sites are highlighted in the map below:

Figure 22 - Southwark trial areas

The first area (345782) is shown overleaf:
The data for the above grid square (345782) demonstrates that 50.4% of households are in Mosaic group E (as highlighted in green above). This consists of educated, young, single people living in areas of transient population and neighbourhoods with transient singles living in multiple occupied large old houses. 38% of households are in a pink zone, which refers to Mosaic group F, people living in social housing with uncertain employment in deprived areas. This has high density social housing, mostly inner London with high levels of diversity. 10.8% are situated within a yellow zone, which is mosaic group D which refers to close-knit inner city and manufacturing town communities’ inner city terraces attracting second generation Londoners from diverse communities.

The second area (328778) is displayed overleaf:
It can be seen that of the houses within this area 87% of the houses fell in a pink zone. This refers to Mosaic group F, people living in social housing with uncertain employment in deprived areas. This has high density social housing, mostly inner London with high levels of diversity. 1% are situated within a yellow zone, which is mosaic group D that refers to close-knit inner city and manufacturing town communities' inner city terraces attracting second generation Londoners from diverse communities. Group E makes up 6% of the households in the area, this consists of educated, young, single people living in areas of transient populations and neighbourhoods with transient singles living in multiply occupied large old houses.

**Southwark control area**

The map overleaf highlights a range of 12 and 3-month hotspots that were available for a possible control area. The most intense and Southerly of these was selected as the control area (marked in yellow).
Trial areas within irregular black polygons

Numerals in Red indicate high numbers of offences in Grid Square over past three months. Numerals in Blue indicate high numbers of offences in Grid Square over past twelve months. Selected Control area centred over Yellow Grid Square.

The selected area fell within Peckham Rye ward. The map below shows the selected area marked in red located on the north west of the ward:

Figure 26 - Southwark control area (left) with Mosaic™ profile (right)
This was selected for several reasons. It had approximately 500 address points (n=496). The area was away from the trial areas whilst also experiencing high residential burglary crime levels. It had some match in terms of Mosaic profile. Finally the housing profile was primarily terraced residential housing.

**Lambeth borough**

Lambeth is situated in the south of London. It is one of thirteen boroughs that constitute inner London. It measures seven miles north to south and about two and a half miles east to west. The north of the borough is bounded by the Thames. According to the ONS in 2011 it had a population of over 300,000 people and around 130,000 households. Lambeth’s bordering boroughs include Westminster, Southwark and Wandsworth. Largely residential it is one of the most densely populated places in the country. The borough is the 14th most deprived in England but has areas of extreme affluence and deprivation side by side. The trial areas in Lambeth were situated in Brixton and South Lambeth. These are highlighted in the next image:

*Figure 27 - Lambeth borough trial areas*

The first of these areas (grid square 302750) is displayed over:
Looking at the Mosaic profile, we can see that of the houses within this area 98.8% fall in a green mosaic zone which is Group E - educated, young, single people living in areas of transient populations and neighbourhoods with transient singles living in multiply occupied large old houses. Within this trial area 1.2% fell in Group D, which refers to close-knit inner city and manufacturing town communities inner city terraces, attracting second generation Londoners from diverse communities.

The second Lambeth trial area (305770) located in south Lambeth is detailed below:
This area had the following Mosaic profile. From this we can see that of the houses within this area 29.9% fell into a pink zone, which refers to Mosaic group F (people living in social housing with uncertain employment in deprived areas), which has high density social housing, mostly inner London with high levels of diversity. 52.9% of households fell in the green mosaic zone which is group E - educated, young, single people living in areas of transient populations and neighbourhoods with transient singles living in multiply occupied large old houses. 17.2% of households fell within a purple zone, this is classified as Mosaic group A which consists of career professionals living in sought after locations - financially successful people living in smart flats in cosmopolitan inner city locations.

Lambeth control area

From the map overleaf we can see that Lambeth has number of dense concentrations of burglary offences however due to the proximity of the trial areas the majority of those best suited were discounted. The area in yellow was the selected control area.
Figure 30 - Lambeth possible control areas

Numerals in Red indicate high numbers of offences in Grid Square over past three months. Numerals in Blue indicate high numbers of offences in Grid Square over past twelve months. Selected Control area centred over Yellow Grid Square.

The hot spot falls within the area detailed below and is marked in red;

Figure 31 - Lambeth control area with Mosaic™ profile (right)
The area was selected for several reasons. The area fell across the most intense burglary hot spot and was not in close proximity to the trial areas. Secondly the area contained approximately 500 address points (n=501). It had a broadly similar Mosaic profile. The housing stock is primarily multi-occupancy residential terraced housing.

Having explored the trial and control areas, let us now explore the other utilised research methods:

**How crime displacement or diffusion of benefits was measured**

In order to measure whether crime displacement or diffusion of benefits occurred suitable displacement zones had to be selected. K. Bowers and Johnson (2003) suggested to do this that three key aspects need to be considered. The first was the location and proximity of the diffusion catchment area to the trial areas. The second consideration was the size of the diffusion areas (Weisburd & Green, 1995a). These needed to be of sufficient size so that any crime increase was discernable but equally not so big that any cause and effect assessment would be difficult to link to the traceable liquid trial. The final consideration was to ensure no other factors could impact on the trial or displacement areas results as far as possible (Weisburd & Green, 1995a).

For this trial it was assumed that if diffusion was to occur it would most likely occur proximal to the trial area. For this reason concentric circles of 250m, 500m and 750m were exactly mapped around the precise areas to which the traceable liquids had been deployed. These were placed on to the same mapping software on to which the 500 household areas had been marked. This allowed crime levels to be assessed on the areas around the trial sites. 250m blocks stretching out to 750m around the trial site were felt to offer a happy medium between being of sufficient size to measure crime impacts whilst still being sufficiently localised to draw correct inferences. Both of these factors are seen as desirable qualities of buffer zones by K. Bowers and Johnson (2003). Within these ‘displacement’ zones
crime levels were contrasted against the same period in time in the previous year again using secondary data analysis. This methodology was also applied to the respective control area.

Part of the original selection of the areas for the trial was to ensure there were no physical restrictions to any potential crime displacement areas. So if an area was bounded by the River Thames for example this area was rejected as it could falsely influence any possible crime displacement. The importance of controlling and understanding both the areas and the crime patterns within the trial and displacement areas was of critical importance to the study. Pease (1993) highlights the complexity and challenge in understanding diffusion effects. Indeed he states:

‘Even if money (for evaluation) were unlimited but displacement were to diverse offences and places, the effect would disappear into the normal variation in crime.’

While some crimes could be lost in this way, analysis in this study focused not just on residential burglary offending rates but also similar offences such as motor vehicle, and robbery crime were monitored. In addition total notifiable offences (TNO’s) for each area were also assessed. In this way the aim was to minimise these 'lost' crimes as far as was possible.

The theoretical rationale and justification for the analysis of these areas was threefold. First it was assumed that if displacement or diffusion of benefits occurred there would be a change in crime levels and patterns within the displacement zones. Secondly this change would contrast with the previous years crime patterns. Third crime levels and patterns within these zones would contrast with those of the control area and the wider police borough area. To do this, crime levels in the areas were measured for residential burglary, robbery, motor vehicle crime and overall total notifiable offences and compared against the previous year. Additionally crime levels across the Borough were observed to understand overall crime trends. While the principal focus of this study was on the impact of the property marking on residential burglary levels, past research has suggested that
situational crime prevention techniques when applied to a specific crime type may lead to the offender moving their offender behaviour to a different crime type. It was necessary therefore to look at a range of crime types to have confidence that crime was being reduced as opposed to be refocused into other areas.

**How the impact of traceable liquids on public satisfaction was measured**

Measuring the impact of the strategy on public confidence levels was carried out by means of a web survey using software provided by ‘WorldApp Keysurvey’. A survey uses questionnaires or structured interviews for data collection from a defined population, with the intent of generalizing from a sample to a population (Babbie, 1990). The method utilised represents a quantitative approach.

As part of the distribution of the traceable liquids to homes, householders were asked if they would like to participate in a future survey on the impact of the trial. Those who agreed were asked to provide an email address for later use. In this regard a convenience sampling approach was utilised and any generalisations would normally be confined to the traceable liquid households. Householders were then sent a bespoke trial survey six months after they had received the product. The survey was distributed as an attached web link questionnaire survey. What this meant was that unlike an embedded or an attached email questionnaire, the respondent received an email introducing the study but then had to click on a web link to then access the survey. An advantage of this approach was that the results were then automatically and anonymously collated online and downloaded to a database for each of the five boroughs. In order to maximise the response rates a follow up request was sent to respondents two weeks after the initial email. This was sent out to all respondents due to the anonymous nature of the study.

The decision to wait until six months after the product roll out before conducting the study was made for several reasons. It was felt that undertaking a survey too soon after the householder had received a visit from a police officer or other
member of the police family was likely to lead to a favourable response if for no other reason that they had been given something for free. This could have led to a false positive. Secondly, a key part of the traceable liquid strategy was the marketing and signposting of the products. As the boroughs commenced the trial there was an initial marketing campaign around the products. By waiting until six months had expired this initial flourish would have expired and a more normal long-term status quo would be in place. Finally, after 6 months the strategy would be very much embedded into the community and as such by this point any change in community ‘feeling’ would be apparent to householders.

In order to draw the widest range of inferences and to broaden the generalisations that could be made from the survey, some of the questions asked deliberately mirrored those of the MPS Public Attitude Survey (PAS), which is carried out by BMG Research. Since 1983 the MPS has commissioned a survey of Londoners in order to help gain public insights of their perceptions of the police, public views on policing priorities and their experiences following contact with the police. This survey currently comprises of 33-34 face to face monthly interviews within each of London’s 32 boroughs that comprise the Metropolitan Police District. Residents are selected by a random probability sample generated using the Royal Mail’s Postcode Address File for each of the boroughs. This survey is published quarterly and as a result enabled some of the findings of the on-line survey to be contrasted against those of the previous PAS survey in order to see if there had been a change in public perceptions. The strength of doing this was that for the questions that were common to both surveys, a broader range of population inferences could be drawn.

The survey comprised of 29 questions themed around 10 key areas. The question format was a series of closed questions requiring a fixed range of responses. All of the questions were Likert-like. The Likert scale is a multiple measure enabling a degree of intensity of feeling to be measured. Whilst most of the questions had already been tested and established as part of the MPS Public Attitude Survey others were bespoke for this study. All of the questions met the key characteristics of a Likert scale in that respondents were provided with a statement (not a
question), they related to the effectiveness of the policing response or the fear of crime and all of the items making up the scale were interrelated. Ranges of responses were used but typical for the study was a scale from 'strongly agree' to 'strongly disagree' or 'excellent' to 'very poor'.

When we consider the use of the online survey there were some clear benefits to this approach. First it was a low cost option. The web questionnaire software package was readily available and was simple to use. Second the responses provided were quickly obtained and due to the ease of the software package, readily written in an attractive and clear format. A strength of the package was that the results were automatically assimilated. Also in the returns of those who completed the survey, there were no unanswered questions, which meant data opportunities were maximised.

There were also limitations to this approach. There were for example wasted opportunities with the personnel who distributed the traceable liquids, misreporting or failing to obtain email addresses. Households are also often made up of a number of individuals but only one email address was taken per household. For families the nominated ‘head of the household’ was the person who provided the email address. In this way the views of children were not captured as part of this study. By carrying out an online survey only people who were available online could reasonably be expected to be involved in the study. Whilst most people could be expected to have an email address there would have been a percentage of the survey excluded for this reason. Due to the fact the trial focused on households the great majority had access to an email account. Typically internet users are also a biased sample of the population, in that they tend to be better educated, wealthier, younger and not representative in ethnic terms (Couper, 2000). The overall response rate was also limited. Of the 2184 emails obtained there was a 12.1% response rate (266 returns). Finally issues can arise for respondents over confidentiality. Despite the fact all respondents’ replies were kept confidential and their responses kept anonymous, respondents may not always feel this is the case due to the potential of addresses being embedded within replies.
Statistical testing

In order to ascertain if the results obtained in the trial areas and from the online survey were of academic significance, statistical analysis was carried out. To do this Chi-Square statistical testing was utilised to compare expected data with the actual results obtained during the study. A benefit of using such a test is that it sort to remove or eliminate so-called regression to the mean (RTM) effects. RTM is a statistical phenomenon that makes natural variations in repeated data look like real change. It most often occurs when contrasting large results are obtained and then followed by ones closer to the mean. The result is that incorrect interpretations can be made. The threat of RTM is more pronounced when random assignment is not utilised. The use of control areas, statistical testing, and the fact 10 trial areas were utilised which were then summarised together in this study, all prevented false interpretations being drawn.

Chi Square (symbolised by the Greek letter chi, squared $\chi^2$) is a test of the independence of the association amongst nominal or categorical variables. It questions whether the two variables are independent, have no relationship or any association due to coincidence, or are dependent where the relationship exists and would rarely occur if left to chance alone (Hagen, 1997). The formula for doing this is described as follows:

$$(o-e)^2 / e$$

What this means is that you take your observed data ($o$), subtract the expected data ($e$). The results are then squared and divided by the expected data in each category.

A useful overview of hypothesis testing is provided by Lakin (2011). This test assessed anticipated results against those actually obtained. If the difference between the variables was large, it allowed us to assess the significance of the results. In this study 0.5 confidence level was applied, which meant that only
results at or above a 95% confidence level were considered as significant. What this means is when we look at a generic sample, in normal distribution 95% of the results will lie between -1.96 and 1.96 illustrated below.

Figure 32 – Example of a graph showing a 95% confidence interval.

Outside of the blue area are two tail areas. These tails fall outside the 95% distribution range. Results that fell into these areas could be said not to have occurred by chance. So in the case of crime levels in our trial areas if the results fell into these tail areas then we have at least a 95% confidence level that they occurred as a result of the trial. In doing this we are accepting an alternative hypothesis and rejecting a null hypothesis. In this study the null hypothesis was a prediction that the changes made by applying the traceable liquid marking strategy had no effect at all. The alternative hypothesis was that the changes that occurred were as a direct result of the traceable liquid property marking strategy. As we see later in the results section, the size of the changes proved to be statistically significant in almost all cases. Throughout the results chapters, the findings will be described either as statistically significant where a confidence level of 95% was achieved or not significant where this threshold was not met.

**Taking qualitative learning from those who implemented the trial**

In order to triangulate the findings from the secondary data analysis and the online survey, a small sample of semi-structured interviews was carried out with both
managerial (Inspector rank or above) and tactical leads (Constables or Sergeants) on each of the Borough sites. In total 7 interviews were conducted. From the beginning it is important to recognise that this was a limited number of interviews from which inferences were drawn. The interviews were seen as a method of enhancing the study and were most significant when considered as part of the range of methodologies employed in the study.

Interviews are commonly identified as the method of choice for those engaged in qualitative research (Potter & Hepburn, 2005). The two main types of interview in qualitative studies are the unstructured interview and the semi-structured interview. Because there were key aspects of the trial that the study was concerned with, a semi-structured interview model was adopted. This is seen as most appropriate when as in this case the interviewer is closely connected with the research process. In this type of interview, the interviewer has a guide that ensures key topics are covered with a precise wording. However these can then be modified based on the flow of the interview. Unplanned questions are also asked in response to the direction taken by the interviewee. This has the benefit of simplifying comparisons being made between those being interviewed. It also allowed key themes to be easily identified.

It should be noted that there are some key differences from the other quantitative methods utilised within this study. The interviewer has a far greater interest in the interviewee’s perspective. Thus, although the interview was semi structured, it was perfectly acceptable for the respondent to go off on what they saw as an important tangent. By allowing for this, a greater insight into their viewpoint can be obtained. In this respect the interview is flexible and not overly proscribed.

Each of the interviews was recorded. For ease of review the interviews once completed were transcribed. This was a lengthy process but it ensured all the relevant information was captured.
Ethical considerations

Ethical considerations were given due weight both in preparation for and during the study. The study conformed to British Society of Criminology ethical guidelines and with the University of Portsmouth guidelines. The project gained ethical approval from the Research Ethics Committee of the University Faculty of Humanities and Social Sciences and the approval letter is at Appendix 6.

For the study as a whole permission to carry out the study was obtained from the MPS. In order to manage both MPS and the University needs, regular summary updates of the quantitative results occurring in the trial area were provided to the MPS so as to inform senior managers of the effectiveness of the trial. Indeed this 6-month data was used as a basis for the MPS to consider whether a wider roll out would be funded. In addition there were three separate companies involved in the MPS proof of concept trial. Permission to use the data obtained for academic study was a condition of the contracts entered into between them and the MPS.

The study explored in detail residential burglary, robbery and M/V crimes committed in specific localities. This type of information and secondary data analysis is utilised by the police, Home Office, criminal justice departments, criminologists and researchers without the specific individual consent of each victim in order to inform communities and to shape crime policy. Indeed under normal circumstances all of this anonymised information would be provided upon the receipt of a ‘Freedom of Information (F.O.I) request.

As a serving Detective Superintendent and the MPS burglary lead representative, the author had lawful access to information on crimes committed in London as necessary in the prevention and detection of crime. Additionally as a researcher the author obtained specific permission to access the data from a senior MPS Commander. This access was necessary both to complete the MPS sponsored doctorate but additionally as the MPS lead heading the ‘proof of concept’ trial for assessing the crime reduction impact and possible future procurement of traceable
liquid products. The formal permissions obtained allowed the author access to all staff, data and information obtained during the trial.

In order to strengthen this unique position as a researcher and practitioner additional ethical measures were integrated into the research. It was recognised there were clear benefits by having a ‘sterile corridor’ between the crime data information, and the lead researcher. To support this MPS Crime Analytical Support staff were utilised to collate the information. They provided the data in an anonymised format to the researcher further strengthening any ethical considerations whilst also removing any unwitting influence on the data gathering.

In order to present the results detailed mapping software was used. A possible negative consequence of this for the study (if not considered), was that maps could be presented that would enable a reader to specifically identify the exact address where a burglary was committed. For some victims this could be considered an unfair and unreasonable invasion of privacy. The potential possible consequence of this could be psychological and emotional harm to a victim. Equally as a senior police officer within the MPS, the incorrect disclosure of such information could harm the reputation of the MPS. This dilemma was not a new one and there was already a legal and utilised framework for using such information. For example the Home Office now publishes crime maps for England and Wales that allows resident to explore maps showing crime in their area. However these maps, whilst accurately presenting crime in general locations, are not so accurate as to exactly identify where an offence has been committed. In order to ensure in this study no harm was caused, the exact same approach was adopted. In addition the researcher followed the guidelines provided by the Information Commissioner's Office (2013) which provided specific advise on crime mapping. All of the presented maps were not so accurate as to identify specific locations.

A further possible area of ethical concern arose at the semi structured interview stage. While some of the interviews were with officers of the same or higher rank, others were with officers of more junior rank. To ensure permission from them was
truly consensual, a letter was utilised explaining the study and its purpose and the fact that participating in the study for this purpose was purely optional. University of Portsmouth headed paper was used to help separate the study from work and study purposes. Additionally other members of the project team conducted some of the interviews to help further remove any possible conflict. Those who consented were then asked to sign consent forms (copies contained in the appendix).

The final part of the study was to carry out a simple on-line satisfaction survey. At the time of distribution the residents were asked if they would be willing to complete a questionnaire at a later date. They were told that this was voluntary and if they agreed their email address was obtained from them. All of these addresses were securely held according to existing management of information requirements on a password protected secure system. Six months later when they were emailed the on-line survey they were again reminded that the decision to respond was voluntary and that the results would be anonymised (See copy of request in appendix). Again all responses were held and collated on a password protected secure system.
Chapter 4 - Findings and discussion

The impact on burglary crime on the target areas

Individual borough results

Before we consider the individual borough results it is useful to summarise the key measures. First all borough measured time periods were exactly a year in duration (to eliminate seasonal effects). However the actual dates varied for each borough depending on the date they achieved the 85% saturation level or, in the case of Southwark and Lambeth, had fully distributed their allocated kits.

The exact time periods for each of the boroughs is as follows;

- Brent – From 12/12/2012 through to 11/12/2013
- Islington – From 14/01/2013 through to 13/01/2014
- Hammersmith and Fulham - From 07/02/2013 through to 06/02/2014
- Lambeth – From 18/02/2013 through to 17/02/2014
- Southwark – From 12/03/2013 through to 11/03/2014

To facilitate the study report, the time period of the trial at times has been labelled as ‘2013’. In reality it reflects more accurately the dates above. The data was obtained from CRIS (the ‘MPS’ crime recording system) and was based upon the ‘recorded’ date of the offence.

The reader should note that when assessing each borough’s trial area performance in the first instance a measure of how the borough performed as a whole was carried out. In doing this the crime counts in the target areas was not removed. It was felt this would have a negligible impact at this macro level and would unnecessarily complicate this measure.

This first section explores the crime changes in just the target areas. For the purposes of this section, the displacement areas are not considered.
**Brent borough results**

Over the year the trial was undertaken, Brent borough's overall crime reduced in all the measured areas (detailed below). Total Notifiable Offences (TNO) fell by 14%. This was a reduction of 3856 reported crimes. It was important therefore to consider the effectiveness of traceable liquids within the context of wider crime reduction.

**Figure 33 - Brent borough year on year crime level performance**

<table>
<thead>
<tr>
<th>Crime Type</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>%Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>2962</td>
<td>2379</td>
<td>-583</td>
<td>-20%</td>
</tr>
<tr>
<td>Robbery</td>
<td>1615</td>
<td>1089</td>
<td>-526</td>
<td>-33%</td>
</tr>
<tr>
<td>Theft Of MV</td>
<td>632</td>
<td>567</td>
<td>-65</td>
<td>-10%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>2367</td>
<td>2202</td>
<td>-165</td>
<td>-7%</td>
</tr>
<tr>
<td>TNO</td>
<td>27512</td>
<td>23656</td>
<td>-3856</td>
<td>-14%</td>
</tr>
</tbody>
</table>

**Distribution until 85% Saturation**

Brent began distribution of the traceable liquid packs on the 26 November 2012, and reached 85% saturation of both the trial areas by 10 Dec 2012. Taking just 15 days, this borough distributed the kits to householders more speedily than any of the other borough sites. Indeed this enthusiasm prevailed throughout the trial with this BOCU committing the most effort to the traceable liquid strategy. As a likely consequence it also saw the most significant reductions in crime levels.

The maps overleaf show the direct trial areas (outlined in blue) within which the 85% saturation of 500 households was achieved.
Levels of crime were measured during the distribution of the products to the point the 85% saturation levels were achieved. For this period the impact on crime levels when compared to the previous year were as follows:

<table>
<thead>
<tr>
<th>Brent 212845</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>3</td>
<td>2</td>
<td>- 1</td>
</tr>
<tr>
<td>Robbery</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>1</td>
<td>0</td>
<td>- 1</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>TNO</td>
<td>281</td>
<td>210</td>
<td>- 71</td>
</tr>
</tbody>
</table>

Table 2 - Year on year crime comparisons (26 Nov 2011 to 10 Dec 2012 – 10 Dec 2012) of crime levels during traceable liquid roll out in area 218838

<table>
<thead>
<tr>
<th>Brent 218838</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>4</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Robbery</td>
<td>1</td>
<td>0</td>
<td>- 1</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>0</td>
<td>1</td>
<td>+1</td>
</tr>
<tr>
<td>TNO</td>
<td>8</td>
<td>6</td>
<td>- 2</td>
</tr>
</tbody>
</table>

We see that in the 15-day period that police officers distributed the product there were reductions in some crime levels with no significant increases in any crime
type. However with the small time frame and comparatively low number of offences it would be unsafe to draw inferences from this period from this one borough.

Once the products had been distributed and the surrounding signage was in place, crime levels within the target areas were monitored over a 12-month period. The results for each of the measured crime types in each area are detailed below:

Table 3 - Comparison of crime levels in Brent target area 212845 10.12.11 to 09.12.12 versus 10.12.12 to 09.12.13

<table>
<thead>
<tr>
<th></th>
<th>Pre trial year</th>
<th>Trial</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>56</td>
<td>18</td>
<td>-38</td>
<td>-68%</td>
</tr>
<tr>
<td>Robbery</td>
<td>12</td>
<td>6</td>
<td>-6</td>
<td>-50%</td>
</tr>
<tr>
<td>Theft Of MV</td>
<td>4</td>
<td>3</td>
<td>-1</td>
<td>-25%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>10</td>
<td>13</td>
<td>3</td>
<td>30%</td>
</tr>
<tr>
<td>TNO</td>
<td>267</td>
<td>212</td>
<td>-55</td>
<td>-21%</td>
</tr>
</tbody>
</table>

Table 4 - Comparison of crime levels in Brent target area 218838 10.12.11 to 09.12.12 versus 10.12.12 to 09.12.13

<table>
<thead>
<tr>
<th></th>
<th>Pre trial year</th>
<th>Trial</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>43</td>
<td>6</td>
<td>-37</td>
<td>-86%</td>
</tr>
<tr>
<td>Robbery</td>
<td>9</td>
<td>7</td>
<td>-2</td>
<td>-22%</td>
</tr>
<tr>
<td>Theft Of MV</td>
<td>1</td>
<td>7</td>
<td>6</td>
<td>600%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>11</td>
<td>2</td>
<td>-9</td>
<td>-82%</td>
</tr>
<tr>
<td>TNO</td>
<td>133</td>
<td>92</td>
<td>-41</td>
<td>-31%</td>
</tr>
</tbody>
</table>

The table below details the same measures applied to the control site.
Table 5 - Comparison of crime levels in Brent control area 10.12.11 to 09.12.12 versus 10.12.12 to 09.12.13

<table>
<thead>
<tr>
<th>Brent control area</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>17</td>
<td>19</td>
<td>2</td>
<td>12%</td>
</tr>
<tr>
<td>Robbery</td>
<td>2</td>
<td>6</td>
<td>4</td>
<td>200%</td>
</tr>
<tr>
<td>Theft Of MV</td>
<td>5</td>
<td>7</td>
<td>2</td>
<td>40%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>7</td>
<td>9</td>
<td>2</td>
<td>29%</td>
</tr>
<tr>
<td>TNO</td>
<td>85</td>
<td>115</td>
<td>30</td>
<td>35%</td>
</tr>
</tbody>
</table>

When we contrast the crime levels onto a single bar chart we can see the effectiveness of the strategy on the two Brent borough sites.

Figure 35 - Brent target and control area numerical crime changes

When these numbers are reflected in terms of percentage change the impact on the target areas is clear.
What is highly relevant here are the overarching trends. Residential burglary significantly reduced in the target areas. When offset against the control area performance, residential burglary reductions of 80% and 98% were achieved. Whilst there were changes in M/V crime, however due to the number of crimes no significance was drawn on this single borough. The overall reductions in TNO’s (56% and 66%) proved to be significant.

If we focus on residential burglary, the principal crime a traceable liquid strategy aims to reduce, we can see from the spatial maps overleaf how offending patterns within this area changed. Each dot represents a residential burglary crime. From this we can visually see the changes in offences levels.
The line graphs below illustrate the impact on residential burglary crime levels over the trial period on the Brent sites. It displays the number of crime reports for 6 months prior to the trial beginning (grey), the 12 months after the area reached 85% saturation date (pink line), and the same period for the previous year (blue).

Figure 38 - Residential burglary line graph for Brent area 212845
For both trial sites we can see the immediate effect traceable liquid property marking had on reducing residential burglary within the target areas and how this reduction then proved consistent over the 12-month period.

The graphs below provide the breakdown in the number of crime reports in both target areas over the year period, with reports of residential burglary broken down on a weekly basis.
Both graphs illustrate a consistent and perpetuated reduction in residential burglary crime levels.

This final graph shows the contrast in residential burglary reductions in percentage terms between the MPS, Brent borough, the two trial areas and the control area.
Overall Brent borough recorded the biggest changes within the trial areas. It was the fastest borough to distribute the equipment and signage and throughout the trial maximised both press and marketing opportunities. As a Borough it most fully implemented the trial requirements.
**Islington borough results**

**Distribution until 85% Saturation**

Over the year of the trial, Islington’s crime fell in many key areas (these are detailed below). Total numbers of offences (TNO) fell by 13%. This was a reduction of 3885 reported crimes. It was important therefore to consider the effectiveness of traceable liquids for these trial areas within the context of the crime reductions.

**Table 6 - Islington borough year on year crime level performance**

<table>
<thead>
<tr>
<th>Crime Type</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>1375</td>
<td>1264</td>
<td>- 111</td>
<td>-8%</td>
</tr>
<tr>
<td>Robbery</td>
<td>1041</td>
<td>830</td>
<td>- 211</td>
<td>-20%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>585</td>
<td>621</td>
<td>+ 36</td>
<td>6%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>1773</td>
<td>1667</td>
<td>- 106</td>
<td>-6%</td>
</tr>
<tr>
<td>TNO</td>
<td>26918</td>
<td>23533</td>
<td>- 3385</td>
<td>-13%</td>
</tr>
</tbody>
</table>

Islington began distribution of the traceable liquid packs on the 26 November 2012, and reached 85% saturation of both the trial areas by 14 January 2013. This meant they took 50 days to distribute the kits to the minimum of 425 households in each area and to achieve the 85% saturation level. The direct trial areas are shown below.

**Figure 43 - Islington trial area 1 grid square 290870 (left) and trial area 2 grid square 298860 (right)**

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For the distribution period the impact on crime levels when compared to the previous year was as follows:

Table 7 - Year on year crime comparisons (26 Nov 12 to 14 Jan 13) of crime levels during traceable liquid roll out distribution in area 290870

<table>
<thead>
<tr>
<th></th>
<th>Islington 290870</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Robbery</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>2</td>
<td>1</td>
<td>-1</td>
<td></td>
</tr>
<tr>
<td>TNO</td>
<td>4</td>
<td>5</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Table 8 - Year on year crime comparisons (26 Nov 12 to 14 Jan 13) of crime levels during traceable liquid roll out distribution in area 298860

<table>
<thead>
<tr>
<th></th>
<th>Islington 298860</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Robbery</td>
<td>2</td>
<td>1</td>
<td>-1</td>
<td></td>
</tr>
<tr>
<td>Theft of MV</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Theft From MV</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>TNO</td>
<td>21</td>
<td>14</td>
<td>-7</td>
<td></td>
</tr>
</tbody>
</table>

Over this period we can see there were more limited changes in crime levels than those experienced in Brent. Once the products had been distributed and the surrounding signage was in place crime levels were monitored over a 12-month period. In the two areas the following results were recorded:
Table 9 - Comparison of crime levels in Islington target area 290870 - 14.01.12 to 13.01.13 versus 14.01.13 to 13.01.14

<table>
<thead>
<tr>
<th>Islington 290870</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>15</td>
<td>8</td>
<td>-7</td>
<td>-47%</td>
</tr>
<tr>
<td>Robbery</td>
<td>2</td>
<td>4</td>
<td>+2</td>
<td>100%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>6</td>
<td>8</td>
<td>+2</td>
<td>33%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>11</td>
<td>16</td>
<td>+5</td>
<td>45%</td>
</tr>
<tr>
<td>TNO</td>
<td>58</td>
<td>52</td>
<td>-6</td>
<td>-10%</td>
</tr>
</tbody>
</table>

Table 10 - Comparison of crime levels in Islington target area 298860 - 14.01.12 to 13.01.13 versus 14.01.13 to 13.01.14

<table>
<thead>
<tr>
<th>Islington 298860</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>43</td>
<td>23</td>
<td>-20</td>
<td>-47%</td>
</tr>
<tr>
<td>Robbery</td>
<td>7</td>
<td>3</td>
<td>-4</td>
<td>-57%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>11</td>
<td>7</td>
<td>-4</td>
<td>-36%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>32</td>
<td>32</td>
<td>+0</td>
<td>0%</td>
</tr>
<tr>
<td>TNO</td>
<td>158</td>
<td>144</td>
<td>-14</td>
<td>-9%</td>
</tr>
</tbody>
</table>

Over this period we can see that there were significant reductions in residential burglary and overall reductions in TNO’s. The table below highlights the results for Islington’s control target area for the same 12-month period.

Table 11 - Comparison of crime levels in Islington control area 14.11 to 09.12.12 versus 10.12.12 to 09.12.13

<table>
<thead>
<tr>
<th>Islington Control Area</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>9</td>
<td>2</td>
<td>-7</td>
<td>-78%</td>
</tr>
<tr>
<td>Robbery</td>
<td>4</td>
<td>2</td>
<td>-2</td>
<td>-50%</td>
</tr>
<tr>
<td>Theft Of MV</td>
<td>8</td>
<td>2</td>
<td>-6</td>
<td>-75%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>8</td>
<td>3</td>
<td>-5</td>
<td>-63%</td>
</tr>
<tr>
<td>TNO</td>
<td>92</td>
<td>51</td>
<td>-41</td>
<td>-45%</td>
</tr>
</tbody>
</table>

Figure 44 overleaf displays a comparison for Islington’s target areas versus Islington’s control areas for each crime type firstly in numerical terms. This excludes the displacement zones.
Figure 44 - Islington target and control area numerical crime changes

Figure 45 shows the changes in percentage terms.

Figure 45 - Islington target and control area percentage crime changes

Overall we see mixed results for this area with the control area outperforming the trial areas.
If we focus on residential burglary crime we can see from the spatial maps below how this crime type was affected by use of the traceable liquid marking strategy. Here we can see that residential burglary crimes were reduced but less than occurred at Brent.

Figure 46 - Spatial depiction of residential burglary crime in Islington area 1 - 290870 (left) and Islington area 2 – 298860 (right)

The line graphs below display the number of crime reports, for 6 months prior to the trial beginning (grey), the 12 months after the area reached 85% saturation (pink line), and the same period for the previous year (blue).

Figure 47 - Residential burglary line graph for Islington area 290870
For this area we saw mixed results across the year. The graphs below presents the breakdown in the number of crime reports in both target areas over the year. Reports of residential burglary are presented on a weekly basis.
Figure 50 - Islington year on year comparison of weekly residential burglary crime reports for area 298660

Figure 51 compares the residential burglary percentage changes across the trial period for the MPS, Islington borough, the trial areas and the control area.

Figure 51 - Summary of target site performance versus control, borough and MPS performance
Overall Islington borough saw no significant changes in residential burglary when compared to the control area. The target areas did however see reductions almost five times higher than the MPS and Borough levels suggesting the traceable liquid marking was indeed effective. This control area saw the highest year on year reduction when compared to the other control areas and it may be some other undiscovered factor influenced this control area result or this simply presented outside the statistical norm.
Hammersmith and Fulham borough results

Distribution until 85% Saturation

Over the year of the trial Hammersmith and Fulham’s crime fell in all measured crime areas (detailed below). Total numbers of offences (TNO) fell by 15%. This was a reduction of 3155 reported crimes.

<table>
<thead>
<tr>
<th>Hammersmith and Fulham</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>1191</td>
<td>972</td>
<td>-219</td>
<td>-18%</td>
</tr>
<tr>
<td>Robbery</td>
<td>598</td>
<td>469</td>
<td>-129</td>
<td>-22%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>573</td>
<td>491</td>
<td>-82</td>
<td>-14%</td>
</tr>
<tr>
<td>Theft from MV</td>
<td>2252</td>
<td>1702</td>
<td>-550</td>
<td>-24%</td>
</tr>
<tr>
<td>TNO</td>
<td>21529</td>
<td>18374</td>
<td>-3155</td>
<td>-15%</td>
</tr>
</tbody>
</table>

Hammersmith and Fulham began distribution of the traceable liquid packs on the 26 November 2012, and reached 85% saturation of both the trial areas by 7th February 2013. This meant they took 74 days to distribute the kits to the 425 households in each area and to achieve the 85% saturation level. The target areas are outlined in blue below;

Figure 52 - Hammersmith and Fulham trial area 1 – grid square 242765 (left) and trial area 2 – grid square 298860 (right)
For the distribution period the impact on crime levels when compared to the previous year was as follows:

Table 13 - Year on year crime comparisons (26 Nov 12 to 7 Feb 13) of crime levels during traceable liquid roll out distribution in area 242765

<table>
<thead>
<tr>
<th></th>
<th>Hammersmith 242765</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td></td>
<td>6</td>
<td>5</td>
<td>-1</td>
</tr>
<tr>
<td>Robbery</td>
<td></td>
<td>0</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Theft of MV</td>
<td></td>
<td>3</td>
<td>0</td>
<td>-3</td>
</tr>
<tr>
<td>Theft from MV</td>
<td></td>
<td>8</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>TNO</td>
<td></td>
<td>14</td>
<td>16</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 14 - Year on year crime comparisons (26 Nov 12 to 7 Feb 13) of crime levels during traceable liquid roll out distribution in area 258760

<table>
<thead>
<tr>
<th></th>
<th>Hammersmith 258760</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td></td>
<td>7</td>
<td>1</td>
<td>-6</td>
</tr>
<tr>
<td>Robbery</td>
<td></td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Theft of MV</td>
<td></td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Theft from MV</td>
<td></td>
<td>5</td>
<td>1</td>
<td>-4</td>
</tr>
<tr>
<td>TNO</td>
<td></td>
<td>23</td>
<td>14</td>
<td>-9</td>
</tr>
</tbody>
</table>

Once the products had been distributed and the surrounding signage was in place crime levels were monitored over a 12-month period.

Table 15 - Comparison of crime levels in Hammersmith and Fulham target area 242675 - 14.01.13 to 13.01.13 versus 14.01.13 to 13.01.14

<table>
<thead>
<tr>
<th></th>
<th>Hammersmith 242765</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>25</td>
<td>15</td>
<td></td>
<td>-10</td>
<td>-40%</td>
</tr>
<tr>
<td>Robbery</td>
<td>4</td>
<td>3</td>
<td></td>
<td>-1</td>
<td>-25%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>10</td>
<td>11</td>
<td></td>
<td>1</td>
<td>0%</td>
</tr>
<tr>
<td>Theft from MV</td>
<td>39</td>
<td>34</td>
<td></td>
<td>-5</td>
<td>-13%</td>
</tr>
<tr>
<td>TNO</td>
<td>132</td>
<td>108</td>
<td></td>
<td>-24</td>
<td>-18%</td>
</tr>
</tbody>
</table>
Table 16 - Comparison of crime levels in Hammersmith and Fulham target area 258760 - 14.01.12 to 13.01.13 versus 14.01.13 to 13.01.14

<table>
<thead>
<tr>
<th>Hammersmith 258760</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>20</td>
<td>11</td>
<td>-9</td>
<td>-45%</td>
</tr>
<tr>
<td>Robbery</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>50%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>13</td>
<td>6</td>
<td>-7</td>
<td>-54%</td>
</tr>
<tr>
<td>Theft from MV</td>
<td>8</td>
<td>11</td>
<td>3</td>
<td>38%</td>
</tr>
<tr>
<td>TNO</td>
<td>133</td>
<td>90</td>
<td>-43</td>
<td>-32%</td>
</tr>
</tbody>
</table>

The table below highlights the results for Hammersmith and Fulham’s control Area’s target area for the same 12-month period as the trial area.

Table 17 - Comparison of crime levels in Hammersmith and Fulham’s control area 07.02.12 to 06.02.13 to 07.02.13 to 06.02.14

<table>
<thead>
<tr>
<th>Hammersmith and Fulham Control Area</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>17</td>
<td>9</td>
<td>-8</td>
<td>-47%</td>
</tr>
<tr>
<td>Robbery</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>67%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>9</td>
<td>4</td>
<td>-5</td>
<td>-56%</td>
</tr>
<tr>
<td>Theft from MV</td>
<td>14</td>
<td>10</td>
<td>-4</td>
<td>-29%</td>
</tr>
<tr>
<td>TNO</td>
<td>98</td>
<td>77</td>
<td>-21</td>
<td>-21%</td>
</tr>
</tbody>
</table>

Figure 53 displays a comparison between Hammersmith and Fulham’s target areas versus the control areas for each crime type. This excludes the displacement zones.
We see from this that when compared to the control areas there was no significant change in residential burglary and mixed findings in the other areas.
If we focus on residential burglary, the principal crime the traceable liquid strategy aims to reduce, we can see from the spatial maps below how this crime has been affected.

Figure 55 - Spatial depiction of residential burglary crime in Hammersmith and Fulham’s area 1 - 242765 (left) and area 2 – 258760 (right)

Figures 56 and 57 display the number of crime reports, for 6 months prior to the trial beginning (grey), the 12 months after the area reached 85% saturation (pink line), and the same period for the previous year (blue).

Figure 56 - Residential burglary line graph for Hammersmith and Fulham’s area 242765
From the above we see that residential burglary fell significantly for the first 6 months and overall remained lower than the previous year.

Figures 58 and 59 below shows the breakdown in the number of crime reports in both target areas over the year period, with reports of residential burglary presented on a weekly basis.
Figure 59 - Hammersmith and Fulham's year on year comparison of weekly residential burglary crime reports for area 258760

Figure 60 summarises the impact of the strategy on residential burglary for the target areas:

Figure 60 - Summary of target site performance versus control, borough and MPS performance
When we consider this data the results presented are mixed. Whilst there has been a clear fall in both target areas that is over double the MPS (11%) and the borough (18%) reduction performance, it is at about the same level as the control area. Of note was the fact that the reductions were most significant in the first 6 months. This borough had the least support from the trial company and indeed the company went out of business at around the 6-month point. This meant that the strategy was not as intensely implemented over the full 12 month period, unlike the other sites.

On this borough there was a degree of implementation failure which was highlighted in the on line surveys. It was discovered that the number of houses, which displayed the front and rear door stickers, was significantly lower than the other BOCUs. When we later consider that overall just 3% of the marked homes that displayed these stickers were burgled during the trial then it is anticipated that this failure will have significantly influenced performance outcomes.
Southwark borough results

Distribution until 85% saturation

Like other trial areas, Southwark’s crime reduced in all the measured areas over the year of the trial. Total numbers of offences (TNO) fell by 8%. This was a reduction of 2368 reported crimes. Any crime reductions in this trial area have to be considered within the general context of falling recorded crime.

Table 18 - Southwark borough year on year 2012/13 and 2013/14 crime level performance

<table>
<thead>
<tr>
<th>Crime Type</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>1940</td>
<td>1862</td>
<td>-78</td>
<td>-4%</td>
</tr>
<tr>
<td>Robbery</td>
<td>2149</td>
<td>1818</td>
<td>-331</td>
<td>-15%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>886</td>
<td>1002</td>
<td>116</td>
<td>13%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>1866</td>
<td>2112</td>
<td>246</td>
<td>13%</td>
</tr>
<tr>
<td>TNO</td>
<td>31473</td>
<td>29105</td>
<td>-2368</td>
<td>-8%</td>
</tr>
</tbody>
</table>

Southwark borough began distribution of the traceable liquid packs on the 26 November 2012, and reached 85% saturation of both the trial areas by 12th March 2013. This meant they took 106 days to distribute the kits to the 425 households in each area. This proved to be the longest of any of the trial areas. The trial areas are highlighted below. It was important to note that on this borough the officers distributing the products failed to achieve the 85% saturation levels within their original 500 household areas. As a result by the time they had distributed over 425 kits to households they had covered a far wider area. It is estimated that they distributed 425 kits in a household footprint of almost a 1000 houses. As a result they achieved therefore a far lower density of saturation.

The maps overleaf show the marked areas outlined in blue.
Figure 61 - Southwark Area 1 – Grid square 345782 (left) and Trial Area 2 – Grid square 328778 (right)

From this we can see how much larger the distribution areas were. For the distribution period the impact on crime levels when compared to the previous year is identified in table 19 and 20 below:

Table 19 - Year on year crime comparisons (26 Nov to 12 March) of crime levels during traceable liquid roll out distribution in area 345782

<table>
<thead>
<tr>
<th>Southwark 345782</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>21</td>
<td>5</td>
<td>-16</td>
</tr>
<tr>
<td>Robbery</td>
<td>5</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>2</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>6</td>
<td>4</td>
<td>-2</td>
</tr>
<tr>
<td>TNO</td>
<td>77</td>
<td>48</td>
<td>-29</td>
</tr>
</tbody>
</table>

Table 20 - Year on year crime comparisons (26 Nov to 12 March) of crime levels during traceable liquid roll out distribution in area 328778

<table>
<thead>
<tr>
<th>Southwark 328778</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>20</td>
<td>12</td>
<td>-8</td>
</tr>
<tr>
<td>Robbery</td>
<td>16</td>
<td>15</td>
<td>-1</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>8</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>TNO</td>
<td>172</td>
<td>164</td>
<td>-8</td>
</tr>
</tbody>
</table>
Despite the larger distribution areas both saw reductions in residential burglary over this period. It is however worth considering the long time period taken and also the resultant impact of longer term visible policing within the area.

Once the products had been distributed and the surrounding signage was in place crime levels were monitored over a 12-month period as is identified in table 21 and 22 below:

<table>
<thead>
<tr>
<th>Southwark 345782</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>24</td>
<td>14</td>
<td>-10</td>
<td>-42%</td>
</tr>
<tr>
<td>Robbery</td>
<td>22</td>
<td>11</td>
<td>-11</td>
<td>-50%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>15</td>
<td>17</td>
<td>2</td>
<td>13%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>14</td>
<td>21</td>
<td>7</td>
<td>50%</td>
</tr>
<tr>
<td>TNO</td>
<td>200</td>
<td>164</td>
<td>-36</td>
<td>-18%</td>
</tr>
</tbody>
</table>

Table 22 - Comparison of crime levels in Southwark’s target area 328778 - 12.03.12 to 11.03.13 versus 12.03.13 to 11.03.14

<table>
<thead>
<tr>
<th>Southwark 328778</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>101</td>
<td>50</td>
<td>-51</td>
<td>-50%</td>
</tr>
<tr>
<td>Robbery</td>
<td>67</td>
<td>55</td>
<td>-12</td>
<td>-18%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>11</td>
<td>9</td>
<td>-2</td>
<td>-18%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>29</td>
<td>26</td>
<td>-3</td>
<td>-10%</td>
</tr>
<tr>
<td>TNO</td>
<td>641</td>
<td>446</td>
<td>-195</td>
<td>-30%</td>
</tr>
</tbody>
</table>

The table over highlights the results for Southwark’s control area for the same 12-month period as the trial area.
Table 23 - Comparison of crime levels in Southwark's control area 12.03.12 to 11.03.13 to 12.03.13 to 11.03.14

<table>
<thead>
<tr>
<th>Southwark Control Area</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>19</td>
<td>16</td>
<td>-3</td>
<td>-16%</td>
</tr>
<tr>
<td>Robbery</td>
<td>6</td>
<td>3</td>
<td>-3</td>
<td>-50%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>150%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>14</td>
<td>17</td>
<td>3</td>
<td>21%</td>
</tr>
<tr>
<td>TNO</td>
<td>97</td>
<td>112</td>
<td>15</td>
<td>15%</td>
</tr>
</tbody>
</table>

The graph below displays a comparison for Southwark’s target areas and the relationship with Southwark’s control area for each crime type. This excludes displacement zones.

Figure 62 - Southwark’s target areas versus control area in numerical terms.

Figure 63 shows the reductions in percentage terms.
When contrasted with the control sites we can identify significant reductions in residential burglary, TNO’s and M/V crime.

Focusing on residential burglary crime, the principal crime a traceable liquid strategy aims to reduce, we can see from the spatial maps below how this crime was impacted upon.

---

**Figure 63 - Southwark’s target areas versus control area changes in percentage terms**

<table>
<thead>
<tr>
<th>Southwark target areas</th>
<th>Percentage change in number of crime reports</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Burglary</td>
</tr>
<tr>
<td>328778</td>
<td>-50%</td>
</tr>
<tr>
<td>345782</td>
<td>-42%</td>
</tr>
<tr>
<td>Control</td>
<td>-16%</td>
</tr>
</tbody>
</table>

---

**Figure 64 - Spatial depiction of residential burglary crime in Southwark’s area 1- 345782 (left) and area 2 - 328778 (right).**

- 2012 -2013
- 2013 - 2014
The line graphs below display the number of crime reports, for 6 months prior to the trial beginning (grey) the 12 months after the area reached 85% saturation (pink line) and the same period for the previous year (blue).

Figure 65 - Residential burglary line graph for Southwark’s area 345782

![Graph 1](image1)

Figure 66 - Residential burglary line graph for Southwark area 328778

![Graph 2](image2)
Both graphs highlight how burglary levels were significantly reduced at the start of the trial and remained broadly thereafter lower over the 12-month period.

Figures 67 and 68 below provide the breakdown in the number of crime reports in both target areas over the one year period. Reports of residential burglary are presented on a weekly basis.

Figure 67 - Southwark's year on year comparison of weekly residential burglary crime reports for area 345782

![Graph 1](image1.png)

Figure 68 - Southwark's year on year comparison of weekly residential burglary crime reports for area 328778

![Graph 2](image2.png)
These figures show the consistent reductions across the trial period. This final slide summarises the impact of the strategy on residential burglary for the target areas:

**Figure 69 - Comparative percentage change for residential burglary**

The table shows quite clearly the significant reductions achieved in the target areas for residential burglary. It demonstrates that even when offset against the control areas, reductions of 26% and 34% were achieved.
Lambeth borough results

Over the year of the trial Lambeth’s crime has reduced in all but one of the measured crime areas (detailed below). Total numbers of offences (TNO) have fallen by 7%. This is a reduction of 2363 reported crimes. It was important therefore to consider the effectiveness of traceable liquids within the context of these reductions.

Table 24 - Lambeth borough year on year crime level performance

<table>
<thead>
<tr>
<th></th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>2490</td>
<td>2336</td>
<td>-154</td>
<td>-6%</td>
</tr>
<tr>
<td>Robbery</td>
<td>2285</td>
<td>2047</td>
<td>-238</td>
<td>-10%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>912</td>
<td>792</td>
<td>-120</td>
<td>-13%</td>
</tr>
<tr>
<td>Theft from MV</td>
<td>2440</td>
<td>2477</td>
<td>37</td>
<td>2%</td>
</tr>
<tr>
<td>TNO</td>
<td>33935</td>
<td>31572</td>
<td>-2363</td>
<td>-7%</td>
</tr>
</tbody>
</table>

Lambeth began distribution of the traceable liquid packs on the 26 November 2012, and reached 85% saturation of both the trial areas by 18th February 2013. This meant they took 82 days to distribute the kits to the 425 households in each area. This was the second extended distribution time. Like Southwark borough, the officers distributing the property marking went well beyond their original target area. This resulted in considerably reduced saturation levels, which proved to be the lowest of all the trial sites. This diluted the intensity of the property marking considerably.

The two target areas are illustrated overleaf:
For the distribution period the impact on crime levels when compared to the previous year is identified below:

Table 25 - Year on year crime comparisons (26 Nov 12 to 18 Feb 13) of crime levels during traceable liquid roll out distribution in area 302750.

<table>
<thead>
<tr>
<th></th>
<th>Lambeth 302750</th>
<th></th>
<th></th>
<th>Change in number of crime reports</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre trial year</td>
<td>Trial 2013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burglary</td>
<td>18</td>
<td>17</td>
<td></td>
<td>-1</td>
</tr>
<tr>
<td>Robbery</td>
<td>8</td>
<td>7</td>
<td></td>
<td>-1</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>5</td>
<td>0</td>
<td></td>
<td>-5</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>15</td>
<td>11</td>
<td></td>
<td>-4</td>
</tr>
<tr>
<td>TNO</td>
<td>109</td>
<td>89</td>
<td></td>
<td>-20</td>
</tr>
</tbody>
</table>

Table 26 - Year on year crime comparisons (26 Nov 12 to 18 Feb 13) of crime levels during traceable liquid roll out distribution in area 305770

<table>
<thead>
<tr>
<th></th>
<th>Lambeth 305770</th>
<th></th>
<th></th>
<th>Change in number of crime reports</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre trial year</td>
<td>Trial 2013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burglary</td>
<td>10</td>
<td>6</td>
<td></td>
<td>-4</td>
</tr>
<tr>
<td>Robbery</td>
<td>7</td>
<td>1</td>
<td></td>
<td>-6</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>1</td>
<td>1</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>7</td>
<td>7</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>TNO</td>
<td>52</td>
<td>42</td>
<td></td>
<td>-10</td>
</tr>
</tbody>
</table>

During this longer distribution period we see there were reductions in all of the key crime areas.
Once the products had been distributed and the surrounding signage was in place crime levels were monitored over a 12-month period. Data illustrating the results are illustrated in figures 27 and 28 below.

Table 27 - Comparison of crime levels in Lambeth target area 302750 - 18.02.12 to 17.02.13 versus 18.02.13 to 17.02.14

<table>
<thead>
<tr>
<th>Lambeth 302750</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>65</td>
<td>66</td>
<td>1</td>
<td>2%</td>
</tr>
<tr>
<td>Robbery</td>
<td>34</td>
<td>32</td>
<td>-2</td>
<td>-6%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>14</td>
<td>7</td>
<td>-7</td>
<td>-50%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>36</td>
<td>32</td>
<td>-4</td>
<td>-11%</td>
</tr>
<tr>
<td>TNO</td>
<td>446</td>
<td>342</td>
<td>-104</td>
<td>-23%</td>
</tr>
</tbody>
</table>

Table 28 - Comparison of crime levels in Lambeth target area 305770 - 18.02.12 to 17.02.13 versus 18.02.13 to 17.02.14

<table>
<thead>
<tr>
<th>Lambeth 305770</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>23</td>
<td>18</td>
<td>-5</td>
<td>-22%</td>
</tr>
<tr>
<td>Robbery</td>
<td>10</td>
<td>9</td>
<td>-1</td>
<td>-10%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>6</td>
<td>10</td>
<td>4</td>
<td>67%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>13</td>
<td>15</td>
<td>2</td>
<td>15%</td>
</tr>
<tr>
<td>TNO</td>
<td>125</td>
<td>139</td>
<td>14</td>
<td>11%</td>
</tr>
</tbody>
</table>

The table below highlights the results for Lambeth’s control area’s target area for the same 12-month period as the trial area.

Table 29 - Comparison of crime levels in Lambeth’s control area 18.02.12 to 17.02.13 to 18.02.13 to 17.02.14

<table>
<thead>
<tr>
<th>Lambeth Control Area</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>26</td>
<td>21</td>
<td>-5</td>
<td>-19%</td>
</tr>
<tr>
<td>Robbery</td>
<td>6</td>
<td>4</td>
<td>-2</td>
<td>-33%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>200%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>5</td>
<td>10</td>
<td>5</td>
<td>100%</td>
</tr>
<tr>
<td>TNO</td>
<td>97</td>
<td>105</td>
<td>8</td>
<td>8%</td>
</tr>
</tbody>
</table>
Figure 71 below provides a comparison for Lambeth’s target areas versus Lambeth’s Control areas for each crime type.

Figure 71 - Lambeth’s target areas versus control area in numerical terms

Looking at this in terms of percentage changes we see the following:

Figure 72 - Lambeth target areas versus control area changes in percentage terms
There was a mixed performance across all crime type areas. Focusing on residential burglary crime, the principal crime a traceable liquid strategy aims to reduce, we find from the spatial maps below how this crime has been influenced by the traceable liquid strategy.

Figure 73 - Spatial depiction of residential burglary crime in Lambeth’s area 1- 302750 (left) and area 2 – 305770 (right)

The line graphs overleaf present the number of crime reports, for 6 months prior to the start of the trial (grey) the 12 months after the area reached 85% saturation date (pink line) and the same period for the previous year (blue).
From this data we see how performance reductions were most pronounced over the first 6 month period. One reason for this may be that the trial companies were more engaged for the formal MPS 6 month trial period after which an assessment
was made for a future procurement process. However for the study performance was monitored over 12 months. Figures 76 and 77 below provide a breakdown in the number of crime reports in both target areas over the one year period. Reports of residential burglary are once again presented on a weekly basis.

Figure 76 - Lambeth’s year on year comparison of weekly residential burglary crime reports for area 302750

![Weekly breakdown in number of residential burglary crime reports](image)

Figure 77 - Lambeth’s year on year comparison of weekly residential burglary crime reports for area 305770

![Weekly breakdown in number of residential burglary crime reports](image)
Figure 78 provides a summary of the impact of the strategy on residential burglary for the target areas:

As can be seen the final overall reductions were mixed between the two trial sites with only one site showing a reduction above that of the control and Borough level. This was likely to be as a consequence of the lower saturation levels that were achieved during the distribution.
Overall results

Having detailed the individual borough results, an assessment of the cumulative impact of the traceable liquid strategy on crime levels within just the target areas needs to be made.

The first issue relates to the overall impact on crime levels during the distribution period. Before doing so it is helpful to understand how the combined borough wide crime levels of Brent, Islington, Hammersmith and Fulham, Southwark and Lambeth compared to the previous year. We can see from this that all measured crime areas saw a fall in crime. Both residential burglary and the total number of notifiable offences fell by 11%. We have therefore to assume that these reductions would have been experienced in the trial areas even had the traceable liquid strategy not been applied to them.

Table 30 - Combined borough crime levels over the 12-month trial period.

<table>
<thead>
<tr>
<th>Combined Boroughs</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNO</td>
<td>141367</td>
<td>126240</td>
<td>-15127</td>
<td>-11%</td>
</tr>
<tr>
<td>Burglary</td>
<td>9958</td>
<td>8813</td>
<td>-1145</td>
<td>-11%</td>
</tr>
<tr>
<td>Robbery</td>
<td>7688</td>
<td>6253</td>
<td>-1435</td>
<td>-19%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>3588</td>
<td>3473</td>
<td>-115</td>
<td>-3%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>10698</td>
<td>10160</td>
<td>-538</td>
<td>-5%</td>
</tr>
</tbody>
</table>

Taking the above into account, what impact the trial had will now be explored. The first area to consider is the overall impact of the distribution period on crime levels.

Table 31 - Combined trial area results for the distribution period

<table>
<thead>
<tr>
<th>Combined Boroughs</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNO</td>
<td>492</td>
<td>409</td>
<td>-83</td>
<td>-17%</td>
</tr>
<tr>
<td>Burglary</td>
<td>94</td>
<td>57</td>
<td>-37</td>
<td>-39%</td>
</tr>
<tr>
<td>Robbery</td>
<td>41</td>
<td>35</td>
<td>-6</td>
<td>-15%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>15</td>
<td>16</td>
<td>1</td>
<td>7%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>51</td>
<td>47</td>
<td>-4</td>
<td>-8%</td>
</tr>
</tbody>
</table>
We discover from this that there were almost immediate reductions in residential burglary and also other measured crime types. Clearly as the products were distributed by police officers, these areas experienced an intense policing presence. As selected these areas were in fact some of the worst areas for residential burglary in London. This meant that officers were being focused in areas that burglars would be targeting. As a result the presence of a visible ‘capable guardian’ was likely to have influenced these reductions.

Looking at the trial target areas (without the displacement zones) for the year trial period, the table below provides a summary of all the target areas combined totals during the 12-month trial.

Table 32 - Combined trial area performance over 12 months.

<table>
<thead>
<tr>
<th>Target Areas Combined</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNO</td>
<td>2293</td>
<td>1789</td>
<td>-504</td>
<td>-22%</td>
</tr>
<tr>
<td>Burglary</td>
<td>415</td>
<td>229</td>
<td>-186</td>
<td>-45%</td>
</tr>
<tr>
<td>Robbery</td>
<td>169</td>
<td>133</td>
<td>-36</td>
<td>-21%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>91</td>
<td>85</td>
<td>-6</td>
<td>-7%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>203</td>
<td>202</td>
<td>-1</td>
<td>0%</td>
</tr>
</tbody>
</table>

For residential burglary there was an overall reduction of 45% or some 186 offences. To draw conclusions these changes need to be contrasted against the control areas.

Over the trial period the five control areas experienced the following crime level changes. See table 33 below: -

Table 33 - Combined control area performance over 12 months.

<table>
<thead>
<tr>
<th>Control Areas Combined</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNO</td>
<td>469</td>
<td>460</td>
<td>-9</td>
<td>-2%</td>
</tr>
<tr>
<td>Burglary</td>
<td>88</td>
<td>67</td>
<td>-21</td>
<td>-24%</td>
</tr>
<tr>
<td>Robbery</td>
<td>21</td>
<td>20</td>
<td>-1</td>
<td>-5%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>25</td>
<td>21</td>
<td>-4</td>
<td>-16%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>48</td>
<td>49</td>
<td>1</td>
<td>2%</td>
</tr>
</tbody>
</table>
When we contrast this performance with that of the combined trial areas the crime changes are highly significant. The first table presents the difference in terms of percentage change. See table 34 below:

<table>
<thead>
<tr>
<th></th>
<th>Target Areas</th>
<th>Control Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNO</td>
<td>-22%</td>
<td>-2%</td>
</tr>
<tr>
<td>Burglary</td>
<td>-45%</td>
<td>-24%</td>
</tr>
<tr>
<td>Robbery</td>
<td>-21%</td>
<td>-5%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>-7%</td>
<td>-16%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>0%</td>
<td>+2%</td>
</tr>
</tbody>
</table>

A bar chart presented below demonstrates this even more clearly.

**Figure 79 - Target and control area percentage change in numbers of crime reports.**

This next table highlights the difference in terms of changes in crime reports.
By offsetting the trial area and the control areas we can identify the true impact of the trial. Residential burglary fell by 21%, TNO’s by 20%, robbery by 16%. There were no statistically significant changes in the M/V crime offences. Overall therefore no significant offence displacement was seen within the trial areas. Rather, significant diffusion of benefits effects were achieved. Taking into consideration that these figures include the consequences of degrees of implementation failures, it can be clearly seen the significance of the property marking strategy has had on reducing crime.

Focusing now on residential burglary levels, the principal aim of the traceable liquid strategy we also see significant results. Figure 81 displays the weekly breakdown of residential burglary in the target areas in comparison to the same period one year before.
This graph highlights the longitudinal and a consistent reduction in residential burglary throughout the trial period. It is worth however noting that the difference began to decline towards the end of the trial. A possible reason for this was that the companies involved fully supported the trial for a 6 month period. But there was less publicity and marketing towards the last 6 months.

The following graph provides performance data, 6 months before the trial, the trial period and the previous year’s performance. Of note here is that the trial started in November, a seasonal peak period when residential burglaries occur. The contrast between the previous year and the trial period was quite evident and was recorded quite early on.
The graph and tables presented below summarise a comparison between the MPS, the combined trial boroughs, the target trial and target control areas. From this it can be seen how the control and target areas saw much greater decreases than the overall MPS and borough averages. This is of interest as both the trial and control areas were areas experiencing very high levels of residential burglary over both the short and long term.

Table 35 - Total comparative performance of target areas, boroughs and the MPS

<table>
<thead>
<tr>
<th>Residential Burglary</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPS</td>
<td>74103</td>
<td>67407</td>
<td>-6696</td>
<td>-9%</td>
</tr>
<tr>
<td>All trial (5) Boroughs</td>
<td>9958</td>
<td>8991</td>
<td>-967</td>
<td>-10%</td>
</tr>
<tr>
<td>Combined Target Areas</td>
<td>415</td>
<td>229</td>
<td>-186</td>
<td>-45%</td>
</tr>
<tr>
<td>Combined Control Target Areas</td>
<td>88</td>
<td>67</td>
<td>-21</td>
<td>-24%</td>
</tr>
</tbody>
</table>

Figure 83 displays this in a bar chart format.
The clear effectiveness of traceable liquids in reducing residential burglary within the target areas is identifiable. The target areas realised almost double the reduction of the trial areas and also more than four times the MPS and borough performance.

A significant point has proved to be the impact of traceable liquids on decreasing householder chances of being the victim of residential burglary. Within the trial areas there were 229 residential burglaries compared to 415 in the previous 12 months. Research was undertaken to assess how many had their property marked by traceable liquids and had stickers on display notifying a would-be offender that their property was marked. 136 of the houses that were burgled were sampled. Of those just 16 had their property marked and of these just 4 displayed stickers. This suggests that only 3% of the marked and ‘signposted’ houses were burgled. The general high saturation levels achieved by the trial highlight the effectiveness of the property marking strategy. It also raises a dilemma in that if a household decides not to mark their property their chances of being targeted by an offender may have actually been quite significantly increased.
Was crime displaced or did a diffusion of benefits occur?

Individual borough results

For the traceable liquid trial in each target area, three buffer zones were used to measure if displacement or diffusion of benefits effects occurred as a result of the strategy being applied. These were situated at a radius on 250m, 500m and 750m surrounding the target area. The individual borough results will be examined before exploring the overall impact. All of the following tables include both the trial area results and the impact in the cumulative displacement zone out to 750m.

Brent borough results

The next tables demonstrate the effects on crime levels across the displacement zones, during the distribution of the traceable liquids in each of the Brent areas from the 26th Nov 2012 to 10th Dec. 2012;

Table 36 - Brent area 212845 – impacts on target and displacement areas during distribution.

<table>
<thead>
<tr>
<th>Brent 212845</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
<td>250 m</td>
<td>500 m</td>
<td>750 m</td>
</tr>
<tr>
<td>Burglary</td>
<td>3 8 6 9</td>
<td>2 2 3 12</td>
<td>-7</td>
<td>-33%</td>
</tr>
<tr>
<td>Robbery</td>
<td>1 1 8 6</td>
<td>1 1 0 12</td>
<td>-10</td>
<td>0%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>1 1 1 2</td>
<td>0 1 0 1</td>
<td>-3</td>
<td>-100%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>0 2 3 1</td>
<td>0 4 2 10</td>
<td>10</td>
<td>0%</td>
</tr>
<tr>
<td>TNO</td>
<td>12 31 40 66</td>
<td>11 29 23 85</td>
<td>-1</td>
<td>-8%</td>
</tr>
</tbody>
</table>
While accepting the limitations of this small sample it was of interest to note that reductions were present in the main crime areas out to 750m with the exception of theft from M/V. But what happened to the crime levels over the 12 month period in the displacement areas? We focus first on residential burglary the main target of the traceable liquid strategy.

**Residential Burglary Performance**

The table below displays residential burglary offences (including displacement zones to 750m) for the MPS, Brent borough, the control area and each of Brent’s trial areas for the 12-month trial period.

<table>
<thead>
<tr>
<th>Table 37 - Brent area 218838 – impacts on target and displacement areas during distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Brent 218838</strong></td>
</tr>
<tr>
<td><strong>Area</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Burglary</td>
</tr>
<tr>
<td>Robbery</td>
</tr>
<tr>
<td>Theft of MV</td>
</tr>
<tr>
<td>Theft From MV</td>
</tr>
<tr>
<td>TNO</td>
</tr>
</tbody>
</table>

We see that over this period the MPS experienced an 8% reduction in burglary levels. Additionally both Brent borough and the control area saw significant
reductions, however none of these proved to be at the same level of the two trial sites, which saw average reductions of 38%, compared to the 25% of the control area. When we display this in a bar chart the changes become clearer.

**Figure 84 - Bar chart summary of Brent residential burglary performance**

The combined Brent target and displacement zones saw an overall reduction of 290 crime reports for residential burglary for the 12-month period.

Figures 85 and 86 overleaf demonstrates the trend both preceding the trial and during the trial when compared to the previous year.
Figure 85 - Residential burglary trends over the trial period – area 212845

![Graph showing residential burglary trends over the trial period, same period the year before and 6 months prior to trial for area 212845.](image)

Figure 86 - Residential burglary trends over the trial period – area 218838

![Graph showing residential burglary trends over the trial period, same period the year before and 6 months prior to trial for area 218838.](image)
Here we again discover how the property marking strategy reductions were most pronounced at the start and then having achieved a significant reduction that reduction stabilised thereafter.

Tables 87 and 88 shows the more granular weekly year on year residential burglary levels for each of the two areas and includes the data from the displacement zones to 750m:

Figure 87 - Brent year on year burglary performance Brent area 212845

![Brent 212845 target and displacement Areas
Weekly breakdown in number of crime reports for residential burglary](image)

Figure 88 - year on year burglary performance Brent area 218838

![Brent 218838 target and displacement zones
Weekly breakdown in number of crime reports for residential burglary](image)
This indicates that there was a constant longitudinal level of reduction across both areas.

The spatial map below displays recorded residential burglaries, which occurred both during the year trial period and the same period the year before for each of the areas and their displacement zones.

**Figure 89 - Spatial display of Brent area 212845 year on year residential burglaries**

**Figure 90 - Spatial display of Brent area 218838 year on year residential burglaries**

Using hot spot maps to display not only the trial sites but also the wider borough as a whole we find the effectiveness of the strategy in reducing residential burglary.
The map below displays the hotspots in Brent and the trial areas and thereafter the wider picture.

Figure 91 - Brent hotspot maps including surrounding area

It is evident from the maps that the hotspots surrounding the trial areas, such has been the reduction in residential burglary, have been removed. At the same time there is no evident displacement of burglary offending across the borough or beyond.

Wider crime performance

Having focused on residential burglary, to discover if the reduction in burglary has led to displacement to other crimes an exploration of the wider crime picture is needed.
The two tables below focus on the additional crime types of robbery, theft of and theft from motor vehicle and total notifiable offences as a whole:

Table 39 - Brent year on year assessment of crime levels including displacement zones for area 212845.

<table>
<thead>
<tr>
<th>Brent 212845</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area 250 m</td>
<td>500 m</td>
<td>750 m</td>
<td>Area 250 m</td>
</tr>
<tr>
<td>Burglary</td>
<td>56  99</td>
<td>93</td>
<td>135</td>
<td>18  48</td>
</tr>
<tr>
<td>Robbery</td>
<td>12  27</td>
<td>45</td>
<td>76</td>
<td>6  21</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>4   14</td>
<td>22</td>
<td>23</td>
<td>3   15</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>10  33</td>
<td>51</td>
<td>96</td>
<td>13  25</td>
</tr>
<tr>
<td>TNO</td>
<td>267 629</td>
<td>843</td>
<td>1466</td>
<td>212 496</td>
</tr>
</tbody>
</table>

Table 40 - Brent year on year assessment of crime levels including displacement zones for area 218838.

<table>
<thead>
<tr>
<th>Brent 218838</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area 250 m</td>
<td>500 m</td>
<td>750 m</td>
<td>Area 250 m</td>
</tr>
<tr>
<td>Burglary</td>
<td>43  62</td>
<td>104</td>
<td>169</td>
<td>6   42</td>
</tr>
<tr>
<td>Robbery</td>
<td>9   39</td>
<td>75</td>
<td>83</td>
<td>7   27</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>1   18</td>
<td>21</td>
<td>26</td>
<td>7   10</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>11  27</td>
<td>83</td>
<td>133</td>
<td>2   39</td>
</tr>
<tr>
<td>TNO</td>
<td>133 513</td>
<td>1602</td>
<td>1548</td>
<td>92  464</td>
</tr>
</tbody>
</table>

When we display these as a cumulative percentage bar charts we can see the findings more clearly.
For both areas we see there has been significant reduction in all the crime areas with the exception of theft of MV.
The table over leaf identity’s the same year on year assessment but for the control area.

Table 41 - Brent control area year on year crime performance including displacement areas.

<table>
<thead>
<tr>
<th>Brent Control Area</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of Crime Reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>250 m</td>
<td>500 m</td>
<td>750 m</td>
<td>250 m</td>
</tr>
<tr>
<td>Burglary</td>
<td>17</td>
<td>56</td>
<td>104</td>
<td>110</td>
</tr>
<tr>
<td>Robbery</td>
<td>2</td>
<td>29</td>
<td>27</td>
<td>38</td>
</tr>
<tr>
<td>Theft Of MV</td>
<td>5</td>
<td>38</td>
<td>47</td>
<td>59</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>7</td>
<td>52</td>
<td>63</td>
<td>85</td>
</tr>
<tr>
<td>TNO</td>
<td>85</td>
<td>787</td>
<td>785</td>
<td>886</td>
</tr>
</tbody>
</table>

As can be seen there has been an overall reduction in all crime areas including overall TNO crime levels.

Figure 94 contrasts total performance in the target areas including the displacement zones against the control area (including displacement zones to 750m) performance;

Figure 94 - Brent total crime performance summary for all areas.
When we express this in terms of percentage change the impact is clear.

Figure 95 - Brent control, target and displacement areas percentage change in number of crime reports.

These overall findings are of key significance. When contrasted with the control site we can see there have been reductions in residential burglary, robbery, and overall TNO’s. There also appears to have been transference of offending behaviour towards theft of M/V offences, however.
Islington borough results

The first table shows the impact on crime levels during the distribution of the traceable liquids in each of the areas from the 26th November 2012 to the 14th January 2013 at which point at least 85% saturation had been achieved.

Table 42 - Islington area 290870 – impacts on target and displacement areas during distribution.

<table>
<thead>
<tr>
<th>290870 Archway</th>
<th>Pre Trial Year</th>
<th>2013 Year</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
<td>250 m</td>
<td>500 m</td>
<td>750 m</td>
</tr>
<tr>
<td>Burglary</td>
<td></td>
<td>0</td>
<td>12</td>
<td>17</td>
</tr>
<tr>
<td>Robbery</td>
<td></td>
<td>0</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Theft of MV</td>
<td></td>
<td>0</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Theft From MV</td>
<td></td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>TNO</td>
<td></td>
<td>4</td>
<td>54</td>
<td>103</td>
</tr>
</tbody>
</table>

Table 43 - Islington area 298860 – impacts on target and displacement areas during distribution.

<table>
<thead>
<tr>
<th>Islington 298860</th>
<th>Pre Trial Year</th>
<th>2013 Year</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
<td>250 m</td>
<td>500 m</td>
<td>750 m</td>
</tr>
<tr>
<td>Burglary</td>
<td></td>
<td>5</td>
<td>14</td>
<td>21</td>
</tr>
<tr>
<td>Robbery</td>
<td></td>
<td>2</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Theft of MV</td>
<td></td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Theft From MV</td>
<td></td>
<td>0</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>TNO</td>
<td></td>
<td>21</td>
<td>74</td>
<td>168</td>
</tr>
</tbody>
</table>
Whilst accepting the limitations of the individual sample sizes, it was of interest to note that reductions were present for residential burglary and robbery to 750m. An exploration of what happened to crime levels over the 12-month period in the displacement areas focusing on residential burglary, the main aim of the traceable liquid strategy, is made below.

**Residential burglary performance**

The table below displays the residential burglary offences (including displacement zones to 750m) for the MPS, Islington borough, the control area and each of Islington’s trial areas for the 12-month trial period between.

<table>
<thead>
<tr>
<th>Residential Burglary</th>
<th>Last Year</th>
<th>This year</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPS</td>
<td>61220</td>
<td>55891</td>
<td>-5329</td>
<td>-9%</td>
</tr>
<tr>
<td>Islington Borough</td>
<td>1375</td>
<td>1264</td>
<td>-111</td>
<td>-8%</td>
</tr>
<tr>
<td>Grid Square 298860</td>
<td>402</td>
<td>295</td>
<td>-107</td>
<td>-27%</td>
</tr>
<tr>
<td>Grid Square 290870</td>
<td>269</td>
<td>208</td>
<td>-61</td>
<td>-23%</td>
</tr>
<tr>
<td>Control</td>
<td>262</td>
<td>277</td>
<td>+15</td>
<td>+6%</td>
</tr>
</tbody>
</table>

Of particular note is that taking into account an area out to 750m around the target area, we observed overall reductions in residential burglary that significantly exceed those of the control area. This is a reversal from when comparing the target areas for this borough. Overall the target areas saw 168 less residential burglaries. Displaying this in a bar chart from the changes makes this more evident:
The following figures highlight the comparative year on year performance for the combined target area and displacement area out to 750m:

**Figure 96 - Bar chart summary of Islington residential burglary performance**

**Figure 97 - Comparative year on year performance including displacement for target area 290870**
These show mixed performance levels across the areas to the 750m point. Figures 99 and 100 show the weekly year on year residential burglary levels for each of the two areas and includes the data from the displacement zone;
The spatial map below displays the residential burglaries, which occurred during the trial year period (and the same period the year before) for each of the areas and their control zones.

Figure 101 - Spatial display of Islington area year on year residential burglaries

Figure 100 - year on year burglary performance Islington area 290860
Using hot spot maps to display not only the trial sites but also the wider borough as a whole we can see the effectiveness of the strategy in reducing residential burglary. Figure 103 overleaf displays the hotspots in Islington and the trial areas and zooms out to show the wider picture.
Figure 103 - Islington hotspot maps including surrounding area

The hotspots map below show the surrounding boroughs and their hotspots.

The Hotspot maps suggest that prior to the traceable liquid trial, Islington’s trial areas were residential burglary hotspots. After the trial these hotspots disappeared. Both neighbouring boroughs of Haringey and Hackney were not part of the trial and it is unclear due to the distances involved whether the new hot spot in Hackney is a result of wider crime displacement.

**Wider crime performance**

Having focused on residential burglary, to identify if the reduction in burglary has led to significant increases in other crimes we now focus on the wider crime picture.
The two tables below focus on crime types of burglary, robbery, theft of and theft from motor vehicle and total notifiable offences as a whole;

Table 45 - Islington year on year assessment of crime levels including displacement zones for area 298870.

<table>
<thead>
<tr>
<th>Islington 290870</th>
<th>Last Year</th>
<th>This Year</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area 250 m</td>
<td>500 m</td>
<td>750 m</td>
<td>Area 250 m</td>
</tr>
<tr>
<td>Burglary</td>
<td>15</td>
<td>51</td>
<td>77</td>
<td>126</td>
</tr>
<tr>
<td>Robbery</td>
<td>2</td>
<td>16</td>
<td>31</td>
<td>46</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>6</td>
<td>13</td>
<td>32</td>
<td>41</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>11</td>
<td>43</td>
<td>56</td>
<td>123</td>
</tr>
<tr>
<td>TNO</td>
<td>58</td>
<td>484</td>
<td>894</td>
<td>1110</td>
</tr>
</tbody>
</table>

Table 46 - Islington year on year assessment of crime levels including displacement zones for area 290860.

<table>
<thead>
<tr>
<th>Islington 298860</th>
<th>Last Year</th>
<th>This Year</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area 250 m</td>
<td>500 m</td>
<td>750 m</td>
<td>Area 250 m</td>
</tr>
<tr>
<td>Burglary</td>
<td>43</td>
<td>55</td>
<td>110</td>
<td>194</td>
</tr>
<tr>
<td>Robbery</td>
<td>7</td>
<td>21</td>
<td>70</td>
<td>95</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>11</td>
<td>21</td>
<td>36</td>
<td>49</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>32</td>
<td>76</td>
<td>103</td>
<td>165</td>
</tr>
<tr>
<td>TNO</td>
<td>158</td>
<td>572</td>
<td>1446</td>
<td>2448</td>
</tr>
</tbody>
</table>

When we display these as a cumulative bar chart we can highlight the findings more clearly.
Both areas now show significant reductions in both burglary and robbery offences. Conversely in both M/V offence types and TNO crimes increases were recorded.
Table 47 below shows the same year on year assessment for the control area.

Table 47 - Islington control area year on year crime performance including displacement areas.

<table>
<thead>
<tr>
<th>Islington Control Area</th>
<th>Last Year</th>
<th>This Year</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area 250 m</td>
<td>500 m</td>
<td>750 m</td>
<td>Area 250 m</td>
</tr>
<tr>
<td>Burglary</td>
<td>9</td>
<td>50</td>
<td>75</td>
<td>128</td>
</tr>
<tr>
<td>Robbery</td>
<td>4</td>
<td>35</td>
<td>68</td>
<td>119</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>8</td>
<td>21</td>
<td>41</td>
<td>52</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>8</td>
<td>41</td>
<td>115</td>
<td>186</td>
</tr>
<tr>
<td>TNO</td>
<td>92</td>
<td>660</td>
<td>1234</td>
<td>2438</td>
</tr>
</tbody>
</table>

The figure below contrasts total performance in the target areas including the displacement zones against the control area:

Figure 106 - Islington target areas (Inc. displacement areas) vs. control area and displacement zone.

When this is expressed in terms of percentage change the true nature of the strategy's impact emerges.
The graph shows significant reductions in residential burglary and robbery to 750m when compared to the control area. This is in contrast to the theft of M/V, theft from M/V and TNO crime levels.
Hammersmith and Fulham Borough Results

This first table shows the effects on crime levels during the distribution of the traceable liquids in each of the areas from the 26th Nov 2012 to 10th Dec. 2012;

Table 48 - Hammersmith and Fulham area 242765 – impacts on target and displacement areas during distribution.

<table>
<thead>
<tr>
<th>Hammersmith 242765</th>
<th>Last Year</th>
<th>This Year</th>
<th>Change in number of crime reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>250 m</td>
<td>500 m</td>
<td>750 m</td>
<td>Area</td>
</tr>
<tr>
<td>Burglary</td>
<td>6</td>
<td>14</td>
<td>20</td>
<td>27</td>
</tr>
<tr>
<td>Robbery</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>3</td>
<td>6</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>Theft from MV</td>
<td>8</td>
<td>25</td>
<td>32</td>
<td>41</td>
</tr>
<tr>
<td>TNO</td>
<td>14</td>
<td>143</td>
<td>148</td>
<td>206</td>
</tr>
</tbody>
</table>

Table 49 - Hammersmith and Fulham area 258760 – impacts on target and displacement areas during distribution

<table>
<thead>
<tr>
<th>Hammersmith 258760</th>
<th>Last Year</th>
<th>This Year</th>
<th>Change in number of crime reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>250 m</td>
<td>500 m</td>
<td>750 m</td>
<td>Area</td>
</tr>
<tr>
<td>Burglary</td>
<td>7</td>
<td>20</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Robbery</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>1</td>
<td>5</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Theft from MV</td>
<td>5</td>
<td>13</td>
<td>31</td>
<td>22</td>
</tr>
<tr>
<td>TNO</td>
<td>23</td>
<td>79</td>
<td>74</td>
<td>207</td>
</tr>
</tbody>
</table>

Again, it is interesting to note that even during this short distribution period reductions in residential burglary all the way out to 750m surrounding the target area are recorded. Let us now focus on residential burglary, the main target of traceable liquid strategy.
Residential burglary performance

The next table displays the residential burglary offences (including displacement zones) for the MPS, Hammersmith and Fulham, the control area and each of Hammersmith and Fulham’s trial areas for the 12-month trial period between.

Table 50 - Summary of Hammersmith and Fulham’s residential burglary performance

<table>
<thead>
<tr>
<th>Residential Burglary</th>
<th>Pre Trial Year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPS</td>
<td>61149</td>
<td>54527</td>
<td>-6622</td>
<td>-11%</td>
</tr>
<tr>
<td>Hammersmith</td>
<td>1191</td>
<td>972</td>
<td>-219</td>
<td>-18%</td>
</tr>
<tr>
<td>258760</td>
<td>182</td>
<td>103</td>
<td>-79</td>
<td>-43%</td>
</tr>
<tr>
<td>242765</td>
<td>286</td>
<td>200</td>
<td>-86</td>
<td>-30%</td>
</tr>
<tr>
<td>Control Area</td>
<td>229</td>
<td>227</td>
<td>-2</td>
<td>-1%</td>
</tr>
</tbody>
</table>

Although all four areas saw a decrease in the number of crime reports, the trial areas have experienced a larger decrease in terms of percentage change. Displaying this in a bar chart form the changes become more evident:

Figure 108 - Bar chart summary of Hammersmith and Fulham’s residential burglary performance
Hammersmith and Fulham target and displacement zones saw an overall reduction of 165 crime reports for residential burglary for the 12-month period after the borough reached 85% saturation. Whilst the control area saw a reduction of 1%, the trial areas saw overall reductions of 43% and 30% respectively.

The following figures highlight the comparative year on year performance for the target area and displacement area out to 750m:

**Figure 109 - Comparative year on year performance including displacement for target area 242765.**

**Figure 110 - Comparative year on year performance including displacement for target area 258760.**
Both figures highlight the almost immediate reductions achieved by the strategy. The next graphs demonstrate the weekly year on year residential burglary levels for each of the two areas. This includes the data from the displacement zones:

Figure 111 - Hammersmith and Fulham year on year burglary performance area 242765

Figure 112 - Hammersmith and Fulham year on year burglary performance area 258760
The spatial map below displays the incidence of residential burglaries, which occurred both during the trial year period and the same period the year before for each of the areas and their control zones.

Figure 113 - Spatial display of Hammersmith and Fulham area 242765 year on year residential burglaries

Figure 114 - Spatial display of Hammersmith and Fulham area 258760 year on year residential burglaries
Using hot spot maps to display the trial sites and the wider borough as a whole highlighted once again the effectiveness of the strategy in reducing residential burglary. The map below identifies the hotspots in Hammersmith and Fulham and the trial areas (outlined in the south) and extends to show the wider picture.

Figure 115 - Hammersmith hotspot maps including surrounding area

Hammersmith 07 Feb 2012 - 06 Feb 2013

Hammersmith 07 Feb 2013 - 06 Feb 2014

Hammersmith 07 Feb 2012 - 06 Feb 2013

Hammersmith 07 Feb 2013 - 06 Feb 2014

2
Such has been the reduction on residential burglary crime, it is evident from the pictures that the hotspots surrounding the trial areas have been removed. At the same time there is no evident displacement of burglary offending across the borough or beyond.

Wider crime performance

Having focused just on residential burglary, to understand if the reduction in burglary has led to significant increases in other crimes we focus on the wider crime picture.

The two tables below focus on the crime types of burglary, robbery, theft of and theft from a motor vehicle along with total notifiable offences as a whole.

**Table 51 - Hammersmith and Fulham year on year assessment of crime levels including displacement zones for area 242765.**

<table>
<thead>
<tr>
<th>Hammersmith 242765</th>
<th>Last Year</th>
<th>This Year</th>
<th>Change in number of crime reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area 250m</td>
<td>500m</td>
<td>750m</td>
<td>Area 250m</td>
</tr>
<tr>
<td>Burglary</td>
<td>25 76 94 91</td>
<td>15 41 68 76</td>
<td>- 86</td>
<td>-40% -46% -28% -16%</td>
</tr>
<tr>
<td>Robbery</td>
<td>4 16 32 36</td>
<td>3 6 14 27</td>
<td>- 38</td>
<td>-25% -63% -56% -25%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>10 42 39 46</td>
<td>11 35 51 40</td>
<td>+ 0</td>
<td>10% -17% 31% -13%</td>
</tr>
<tr>
<td>Theft from MV</td>
<td>39 104 134 182</td>
<td>34 76 101 133</td>
<td>- 115</td>
<td>-13% -27% -25% -27%</td>
</tr>
<tr>
<td>TNO</td>
<td>132 673 804 1169</td>
<td>108 482 642 1027</td>
<td>- 519</td>
<td>-18% -28% -20% -12%</td>
</tr>
</tbody>
</table>

**Table 52 - Hammersmith and Fulham year on year assessment of crime levels including displacement zones for area 258760.**

<table>
<thead>
<tr>
<th>Hammersmith 258760</th>
<th>Last Year</th>
<th>This Year</th>
<th>No. of Crime Reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area 250m</td>
<td>500m</td>
<td>750m</td>
<td>Area 250m</td>
</tr>
<tr>
<td>Burglary</td>
<td>20 56 39 67</td>
<td>11 33 20 39</td>
<td>- 79</td>
<td>-45% -41% -49% -42%</td>
</tr>
<tr>
<td>Robbery</td>
<td>2 8 17 46</td>
<td>3 17 23 31</td>
<td>+ 1</td>
<td>50% 113% 35% -33%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>13 32 39 55</td>
<td>6 28 33 36</td>
<td>- 36</td>
<td>-54% -13% -15% -35%</td>
</tr>
<tr>
<td>Theft from MV</td>
<td>8 56 82 152</td>
<td>11 63 79 115</td>
<td>- 30</td>
<td>38% 13% -4% -24%</td>
</tr>
<tr>
<td>TNO</td>
<td>133 486 505 1302</td>
<td>90 476 442 1041</td>
<td>- 377</td>
<td>-32% -2% -12% -20%</td>
</tr>
</tbody>
</table>
When we display these as a cumulative bar chart we can see the findings more clearly.

Figure 116 - Hammersmith and Fulham area 242765 - total crime performance including displacement areas.

![Cumulative Bar Chart for Hammersmith 242765](image)

<table>
<thead>
<tr>
<th></th>
<th>Burglary</th>
<th>Robbery</th>
<th>Theft of MV</th>
<th>Theft from MV</th>
<th>TNO</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Change</td>
<td>-40%</td>
<td>-25%</td>
<td>0%</td>
<td>-13%</td>
<td>-18%</td>
</tr>
</tbody>
</table>

Figure 117 - Hammersmith and Fulham area 258760 - total crime performance including displacement areas.

![Cumulative Bar Chart for Hammersmith 258760](image)

<table>
<thead>
<tr>
<th></th>
<th>Burglary</th>
<th>Robbery</th>
<th>Theft of MV</th>
<th>Theft from MV</th>
<th>TNO</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Change</td>
<td>-43%</td>
<td>1%</td>
<td>-26%</td>
<td>-10%</td>
<td>-16%</td>
</tr>
</tbody>
</table>

The table overleaf shows the same year on year assessment for the control area.
Table 53 - Hammersmith and Fulham control area year on year crime performance including displacement areas.

<table>
<thead>
<tr>
<th>Hammersmith Control Area</th>
<th>Last Year</th>
<th>This Year</th>
<th>Change in number of crime reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>250 m</td>
<td>500 m</td>
<td>750 m</td>
<td></td>
</tr>
<tr>
<td>Burglary</td>
<td>17 62 53 97</td>
<td>9 71 61 62</td>
<td>- 26</td>
<td>-47% 15% 15% -36%</td>
</tr>
<tr>
<td>Robbery</td>
<td>3 18 45 82</td>
<td>5 16 33 40</td>
<td>- 54</td>
<td>67% -11% 27% -51%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>9 30 24 55</td>
<td>4 25 25 41</td>
<td>- 23</td>
<td>-56% -17% 4% -25%</td>
</tr>
<tr>
<td>Theft from MV</td>
<td>14 99 99 204</td>
<td>10 69 59 170</td>
<td>- 108</td>
<td>-29% -30% -40% -17%</td>
</tr>
<tr>
<td>TNO</td>
<td>98 640 1433 3937</td>
<td>77 544 1343 3327</td>
<td>- 817</td>
<td>-21% -15% -6% -15%</td>
</tr>
</tbody>
</table>

There has been an overall reduction in all crime areas in both the target areas and the trial sites.

The graphs below contrasts total performance in the target areas including the displacement zones against the control area in number and then percentage terms.

Figure 118 - Hammersmith and Fulham target areas (Inc. displacement areas) vs. control area and displacement zone.
From this we can see the clear evidence of significant reductions in residential burglary crime levels with no resultant increases in overall TNO’s.
Southwark borough results

This first table shows the effects on crime levels during the distribution of the traceable liquids in each of the areas from the 26th Nov 2012 to 12th March, 2013;

Table 54 - Southwark area 345782 – impacts on target and displacement areas during distribution

<table>
<thead>
<tr>
<th>Area</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southwark 345782</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burglary</td>
<td>21</td>
<td>34</td>
<td>34</td>
<td>43</td>
</tr>
<tr>
<td>Robbery</td>
<td>5</td>
<td>20</td>
<td>21</td>
<td>23</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>2</td>
<td>9</td>
<td>13</td>
<td>23</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>6</td>
<td>18</td>
<td>24</td>
<td>31</td>
</tr>
<tr>
<td>TNO</td>
<td>77</td>
<td>382</td>
<td>479</td>
<td>460</td>
</tr>
</tbody>
</table>

Table 55 - Southwark area 258760 – impacts on target and displacement areas during distribution

<table>
<thead>
<tr>
<th>Area</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southwark 345782</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burglary</td>
<td>20</td>
<td>36</td>
<td>43</td>
<td>53</td>
</tr>
<tr>
<td>Robbery</td>
<td>16</td>
<td>39</td>
<td>31</td>
<td>64</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>1</td>
<td>10</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>8</td>
<td>15</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>TNO</td>
<td>172</td>
<td>484</td>
<td>467</td>
<td>659</td>
</tr>
</tbody>
</table>

Here again we see immediate reductions in residential burglary crime levels to 750m during the distribution period. If we now explore what happened to the crime levels over the 12-month period in the displacement areas focusing on residential burglary the main target of the traceable liquid strategy.
Residential burglary performance

The table below displays the residential burglary offences (including displacement zones) for the MPS, Southwark Borough, the control area and each of Southwark’s trial areas for the 12-month trial period between.

Table 56 - Summary of Southwark’s residential burglary performance.

<table>
<thead>
<tr>
<th>Residential Burglary</th>
<th>Last Year</th>
<th>This Year</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPS</td>
<td>60833</td>
<td>54735</td>
<td>-6098</td>
<td>-10%</td>
</tr>
<tr>
<td>Southwark</td>
<td>1940</td>
<td>1862</td>
<td>-78</td>
<td>-4%</td>
</tr>
<tr>
<td>328778</td>
<td>482</td>
<td>358</td>
<td>-124</td>
<td>-26%</td>
</tr>
<tr>
<td>345782</td>
<td>278</td>
<td>229</td>
<td>-49</td>
<td>-18%</td>
</tr>
<tr>
<td>Control</td>
<td>236</td>
<td>263</td>
<td>27</td>
<td>11%</td>
</tr>
</tbody>
</table>

We see that while the MPS and Southwark borough saw reductions in levels of residential burglary, the control site saw an 11% increase. This contrasted greatly with the two trial locations which saw 18% and 26% reductions overall. When we display this in a bar chart the changes are made clearer.

Figure 119 - Bar chart summary of Southwark’s residential burglary performance

Southwark’s target and displacement zones have seen an overall reduction of 173 crime reports for residential burglary for the 12-month period after the borough reached 85% saturation of the traceable liquid.
Figures 120 and 121 highlight the comparative year on year performance for the target area and displacement area out to 750m;

Figure 120 - Comparative year on year performance including displacement for target area 345782

Figure 121 - Comparative year on year performance including displacement for target area 328778
The graphs show early reductions in residential burglary crime levels that are thereafter broadly maintained. The next figures show the weekly year on year residential burglary levels for each of the two areas. This includes the data from the displacement zones.

**Figure 122 - Southwark’s year on year burglary performance area 345782**

![Weekly breakdown in number of residential burglary crime reports for Southwark 345782 target and displacement areas](image)

**Figure 123 - Southwark’s year on year burglary performance area 328778**

![Weekly breakdown in number of residential burglaries reported for Southwark 328778 target and displacement areas](image)
Both graphs show a broadly consistent reduction across the 12 months to the 750m radius area. The spatial map below highlights burglaries, which occurred during the year trial period and the same period the year before for each of the areas and their control zones.

**Figure 124** - Spatial display of Southwark area 345782 year on year residential burglaries showing 250m displacement zones

**Figure 125** - Spatial display of Southwark area 328778 year on year residential burglaries
When we use hot spot maps to display not only the trial sites but also the wider borough as a whole we see the effectiveness of the strategy in reducing residential burglary.

The map below displays the hotspots in Southwark and the trial areas and extends out to provide the wider picture:

Figure 126 - Southwark hotspot maps including surrounding area
It is evident from the images that the hotspots surrounding the trial areas have been removed such has been the reduction of residential burglary crime. There is also no evident displacement of burglary offending across the borough or beyond.

Wider crime performance

Having focused just on residential burglary, to understand if the reduction in burglary has led to significant increases in other crimes let us now focus on the wider crime picture.

Table 57 - Southwark year on year assessment of crime levels including displacement zones for area 345782

<table>
<thead>
<tr>
<th>Southwark 345782</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of Crime Reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
<td>250 m</td>
<td>500 m</td>
<td>750 m</td>
</tr>
<tr>
<td>Burglary</td>
<td>24</td>
<td>70</td>
<td>71</td>
<td>113</td>
</tr>
<tr>
<td>Robbery</td>
<td>22</td>
<td>98</td>
<td>111</td>
<td>118</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>15</td>
<td>43</td>
<td>52</td>
<td>68</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>14</td>
<td>88</td>
<td>77</td>
<td>127</td>
</tr>
<tr>
<td>TNO</td>
<td>200</td>
<td>1349</td>
<td>1611</td>
<td>1733</td>
</tr>
</tbody>
</table>

Table 58 - Southwark year on year assessment of crime levels including displacement zones for area 328778

<table>
<thead>
<tr>
<th>Southwark 328778</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of Crime Reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
<td>250 m</td>
<td>500 m</td>
<td>750 m</td>
</tr>
<tr>
<td>Burglary</td>
<td>101</td>
<td>100</td>
<td>126</td>
<td>155</td>
</tr>
<tr>
<td>Robbery</td>
<td>67</td>
<td>136</td>
<td>156</td>
<td>222</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>11</td>
<td>31</td>
<td>43</td>
<td>40</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>29</td>
<td>44</td>
<td>76</td>
<td>121</td>
</tr>
<tr>
<td>TNO</td>
<td>641</td>
<td>1531</td>
<td>1982</td>
<td>2135</td>
</tr>
</tbody>
</table>
When we display these in figures 127 and 128 we can see the findings more clearly.

**Figure 127 - Southwark area 345782 - total crime performance including displacement areas**

Southwark target area and displacement zones 345782  
Percentage change in number of crime reports  
12 March 2012 - 11 March 2014

<table>
<thead>
<tr>
<th>% Change</th>
<th>Burglary</th>
<th>Robbery</th>
<th>Theft of MV</th>
<th>Theft from MV</th>
<th>TNO</th>
</tr>
</thead>
<tbody>
<tr>
<td>-18%</td>
<td>-19%</td>
<td>9%</td>
<td>14%</td>
<td>-8%</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 128 - Southwark area 328778 - total crime performance including displacement areas**

Southwark target area and displacement zones 328778  
Percentage change in number of crime reports  
12 March 2012 - 11 March 2014

<table>
<thead>
<tr>
<th>% Change</th>
<th>Burglary</th>
<th>Robbery</th>
<th>Theft of MV</th>
<th>Theft from MV</th>
<th>TNO</th>
</tr>
</thead>
<tbody>
<tr>
<td>-26%</td>
<td>-12%</td>
<td>2%</td>
<td>26%</td>
<td>-7%</td>
<td></td>
</tr>
</tbody>
</table>

The table below shows the same year on year assessment for the control area.
Table 59 - Southwark control area year on year crime performance including displacement areas

<table>
<thead>
<tr>
<th>Southwark Control Area</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>250 m</td>
<td>500 m</td>
<td>750 m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>250 m</td>
<td>500 m</td>
<td>750 m</td>
<td></td>
</tr>
<tr>
<td>Burglary</td>
<td>19</td>
<td>44</td>
<td>77</td>
<td>-16%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>96</td>
<td>16</td>
<td>-16%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>28</td>
<td>87</td>
<td>-36%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>132</td>
<td>27</td>
<td>-16%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>27</td>
<td>-16%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>132</td>
<td>-36%</td>
</tr>
<tr>
<td>Robbery</td>
<td>6</td>
<td>25</td>
<td>63</td>
<td>-32%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>59</td>
<td>3</td>
<td>-32%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15</td>
<td>58</td>
<td>-32%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45</td>
<td>-32</td>
<td>-50%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-32</td>
<td>-50%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>2</td>
<td>17</td>
<td>23</td>
<td>150%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>34</td>
<td>5</td>
<td>-29%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
<td>31</td>
<td>35%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>43</td>
<td>15</td>
<td>-8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15</td>
<td>-8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>150%</td>
<td>-29%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>14</td>
<td>36</td>
<td>71</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>88</td>
<td>17</td>
<td>-8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>62</td>
<td>33</td>
<td>-13%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>108</td>
<td>62</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>108</td>
<td>-13%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-13%</td>
<td>23%</td>
</tr>
<tr>
<td>TNO</td>
<td>97</td>
<td>349</td>
<td>867</td>
<td>15%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>971</td>
<td>112</td>
<td>-15%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>112</td>
<td>-15%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>71</td>
<td>-17%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>71</td>
<td>-17%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-113</td>
<td>8%</td>
</tr>
</tbody>
</table>

The figure over contrasts total performance in the target areas including the displacement zones against the control area;

Figure 129 - Southwark total figurative crime performance summary for all areas

The following graph details these findings in comparative percentage terms.
When contrasted against the control area to 750m, residential burglary has in fact decreased between 29% and 37% but robbery has increased, theft of M/V has decreased, theft from M/V has increased and overall TNO’s have reduced by between 2% and 3%. What we see is a mixed picture with possible offence displacement to robbery and theft of M/V offences.
Lambeth Borough Results

This first table shows the effects on crime levels during the distribution of the traceable liquids in each of the areas from the 26th Nov 2012 to 18th Feb 2013.

Table 60 - Lambeth area 302750 – impact on target and displacement areas during distribution

<table>
<thead>
<tr>
<th></th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>250 m</td>
<td>500 m</td>
<td>750 m</td>
<td>250 m</td>
</tr>
<tr>
<td>Burglary</td>
<td>18</td>
<td>37</td>
<td>46</td>
<td>35</td>
</tr>
<tr>
<td>Robbery</td>
<td>8</td>
<td>75</td>
<td>71</td>
<td>79</td>
</tr>
<tr>
<td>Theft MV</td>
<td>5</td>
<td>12</td>
<td>6</td>
<td>17</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>15</td>
<td>60</td>
<td>39</td>
<td>46</td>
</tr>
<tr>
<td>TNO</td>
<td>109</td>
<td>1050</td>
<td>857</td>
<td>629</td>
</tr>
</tbody>
</table>

Table 61 - Lambeth area 305770 – impact on target and displacement areas during distribution

<table>
<thead>
<tr>
<th></th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of Crime Reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>250 m</td>
<td>500 m</td>
<td>750 m</td>
<td>250 m</td>
</tr>
<tr>
<td>Burglary</td>
<td>10</td>
<td>21</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Robbery</td>
<td>7</td>
<td>23</td>
<td>28</td>
<td>56</td>
</tr>
<tr>
<td>Theft MV</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>7</td>
<td>19</td>
<td>11</td>
<td>34</td>
</tr>
<tr>
<td>TNO</td>
<td>52</td>
<td>219</td>
<td>433</td>
<td>433</td>
</tr>
</tbody>
</table>

It should be noted that while the target areas saw reductions in residential burglary quite unlike the other areas, burglary crime increased in both sites in all of the displacement zones. This area suffered from a degree of implementation failure and as a result never achieved the 85% saturation levels required. In fact the products were distributed over a far wider area.
Residential burglary performance

If we focus first on residential burglary, which remains the main focus of the traceable liquid strategy, there are some significant results.

The table below displays residential burglary offences (including displacement zones) for the MPS, Lambeth Borough, the control area and each of Lambeth’s trial areas for the 12-month trial period between.

Table 62 - Summary of Lambeth’s residential burglary performance

<table>
<thead>
<tr>
<th>Residential Burglary</th>
<th>Last Year</th>
<th>This year</th>
<th>Change in number of crime reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPS</td>
<td>61193</td>
<td>55197</td>
<td>-5996</td>
<td>-10%</td>
</tr>
<tr>
<td>Lambeth BOCU</td>
<td>2490</td>
<td>2514</td>
<td>+24</td>
<td>+1%</td>
</tr>
<tr>
<td>Grid Square 302750</td>
<td>605</td>
<td>599</td>
<td>-6</td>
<td>-1%</td>
</tr>
<tr>
<td>Grid Square 305770</td>
<td>246</td>
<td>241</td>
<td>-5</td>
<td>-2%</td>
</tr>
<tr>
<td>Control Area</td>
<td>277</td>
<td>253</td>
<td>-24</td>
<td>-9%</td>
</tr>
</tbody>
</table>

This was the borough that saw the lowest reductions in residential burglary levels and indeed the control area outperformed the trial sites. Displaying this in a bar chart form makes these findings even starker:

Figure 131 - Bar chart summary of Lambeth’s residential burglary performance
Lambeth target and displacement zones saw an overall reduction of just 11 residential burglary crime reports for the 12 month period after the borough reached full distribution (as opposed to 85% saturation) of the traceable liquids.

The following figures highlight the comparative year on year performance for the combined target area and displacement area out to 750m;

Figure 132 - Comparative year on year performance including displacement for target area 302750

Figure 133 - Comparative year on year performance including displacement for target area 305770
The graphs highlight how for this area the traceable liquid roll out had little impact particularly when compared to the other trial sites. It clearly demonstrates how by not following the intense saturation levels of the other sites and not maximising the press and pro-activity demonstrated in the other areas, then the strategy proved to be far less effective.

The following line graph shows the weekly year on year residential burglary levels for each of the two areas and includes data from the displacement zones:

Figure 134 - Lambeth area 302750 year on year burglary performance

![Graph 134](image1)

Figure 135 - Lambeth area 305770 year on year burglary performance

![Graph 135](image2)
The spatial map below displays the residential burglaries, which occurred during the trial year period and the same period the year before for each of the areas and their control zones.

Figure 136 - Spatial display of Lambeth area 302750 year on year residential burglaries

Figure 137 - Spatial display of Lambeth area 305770 year on year residential burglaries
The maps serve to highlight the sheer volume of burglaries that occurred within this area and the comparatively small impact of the trial in this area. Using hot spot maps to display not only the trial sites but also the wider borough as a whole we can however see the effectiveness of the strategy in reducing residential burglary.

The next maps display the hotspots in Lambeth and the trial areas and pans out to show the wider picture.

*Figure 138 - Lambeth hotspot maps including surrounding area*
While there is evidence that the number of hotspots have reduced, they have not done so to the levels achieved on the other borough sites. There is however no evidence of displacement of burglary offending across the borough or beyond.

**Wider crime performance**

Having focused on residential burglary, we now focus on other crime types. The two tables below include the crime types of, robbery, theft of and theft from motor vehicle and total notifiable offences as a whole:

**Table 63 - Lambeth year on year assessment of crime levels including displacement zones for area 302750**

<table>
<thead>
<tr>
<th></th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
<td>25m</td>
<td>500m</td>
<td>750m</td>
</tr>
<tr>
<td>Burglary</td>
<td>65</td>
<td>205</td>
<td>156</td>
<td>179</td>
</tr>
<tr>
<td>Robbery</td>
<td>34</td>
<td>334</td>
<td>244</td>
<td>226</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>14</td>
<td>49</td>
<td>68</td>
<td>78</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>36</td>
<td>186</td>
<td>186</td>
<td>177</td>
</tr>
<tr>
<td>TNO</td>
<td>446</td>
<td>473</td>
<td>3664</td>
<td>2510</td>
</tr>
</tbody>
</table>

**Table 64 - Lambeth year on year assessment of crime levels including displacement zones for area 305770.**

<table>
<thead>
<tr>
<th></th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
<td>25m</td>
<td>500m</td>
<td>750m</td>
</tr>
<tr>
<td>Burglary</td>
<td>23</td>
<td>63</td>
<td>62</td>
<td>78</td>
</tr>
<tr>
<td>Robbery</td>
<td>10</td>
<td>66</td>
<td>103</td>
<td>136</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>6</td>
<td>24</td>
<td>26</td>
<td>34</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>13</td>
<td>101</td>
<td>80</td>
<td>153</td>
</tr>
<tr>
<td>TNO</td>
<td>125</td>
<td>884</td>
<td>1160</td>
<td>1585</td>
</tr>
</tbody>
</table>
When we display these as totalled bar charts that include all the areas to 750m we see the findings more clearly demonstrated.

Figure 139 - Lambeth area 302750 – percentage change including displacement areas.

![Lambeth 302750 Percentage change in number of crime reports](chart)

<table>
<thead>
<tr>
<th></th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>-1%</td>
</tr>
<tr>
<td>Robbery</td>
<td>-11%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>-27%</td>
</tr>
<tr>
<td>Theft from MV</td>
<td>6%</td>
</tr>
<tr>
<td>TNO</td>
<td>-9%</td>
</tr>
</tbody>
</table>

Figure 140 - Lambeth area 305770 - percentage change including displacement

![Lambeth Target and Displacement Areas 305770 Percentage change in number of crime reports](chart)

<table>
<thead>
<tr>
<th></th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>-2%</td>
</tr>
<tr>
<td>Robbery</td>
<td>-13%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>-20%</td>
</tr>
<tr>
<td>Theft from MV</td>
<td>9%</td>
</tr>
<tr>
<td>TNO</td>
<td>0%</td>
</tr>
</tbody>
</table>

The tables above demonstrate mixed changes in crime levels. Crime reductions are achieved in all areas with the exception of theft from M/V offences.
The table below shows the same year on year assessment but for the control area.

Table 65 - Lambeth control area year on year crime performance including displacement areas

<table>
<thead>
<tr>
<th>Lambeth Control Area</th>
<th>Area</th>
<th>Pre trial year</th>
<th>Change in number of Crime Reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50</td>
<td>103 96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burglary</td>
<td>26</td>
<td>21 49 76 107</td>
<td>-24 -19% -2% -26% 9%</td>
<td></td>
</tr>
<tr>
<td>Robbery</td>
<td>6</td>
<td>4 17 37 55</td>
<td>-14 -33% -19% 0% -13%</td>
<td></td>
</tr>
<tr>
<td>Theft of MV</td>
<td>1</td>
<td>3 10 29 37</td>
<td>-8 200% -50% 7% -5%</td>
<td></td>
</tr>
<tr>
<td>Theft From MV</td>
<td>5</td>
<td>10 30 69 59</td>
<td>-61 100% -29% -27% -32%</td>
<td></td>
</tr>
<tr>
<td>TNO</td>
<td>97</td>
<td>418 705 823</td>
<td>49 8% -5% 5% 3%</td>
<td></td>
</tr>
</tbody>
</table>

Within the control area we see overall reductions in all the crime levels with the exception of TNO’s. These saw a small overall increase. Figures 141 and 142 below contrasts total performance in the target areas (including the displacement zones) against the control area in figurative terms and also in percentage terms.

Figure 141 - Lambeth percentage performance summary for all areas

![Lambeth target, control and displacement areas Change in number of crime reports](chart.png)
When contrasted against the control areas to the 750m point, residential burglary has increased by between 7-8%, robbery has increased by 2%, theft of M/V increased from 11 – 18%, theft from M/V increased by 33% to 36% and yet TNO’s overall have fallen by 2% to 11%. These results are in contrast to the other areas and were a likely consequence of the failure to implement the strategy as proscribed.
Overall results for the target areas with displacement zones included

Having considered the individual borough sites and their displacement zones individually let us now explore the cumulative impact of the traceable liquid strategy on crime levels to 750m.

The first issue is the overall impact on crime during the distribution period. Before considering this it might be useful to remind ourselves of the combined borough crime levels at Brent, Islington, Hammersmith and Fulham, Southwark and Lambeth compared to the previous year.

Table 66 - Combined comparative trial borough levels over the 12 month trial period

<table>
<thead>
<tr>
<th>Combined Boroughs</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNO</td>
<td>141367</td>
<td>126240</td>
<td>-15127</td>
<td>-11%</td>
</tr>
<tr>
<td>Burglary</td>
<td>9958</td>
<td>8813</td>
<td>-1145</td>
<td>-11%</td>
</tr>
<tr>
<td>Robbery</td>
<td>7688</td>
<td>6253</td>
<td>-1435</td>
<td>-19%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>3588</td>
<td>3473</td>
<td>-115</td>
<td>-3%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>10698</td>
<td>10160</td>
<td>-538</td>
<td>-5%</td>
</tr>
</tbody>
</table>

This general borough context highlights how over this time period the boroughs saw overall reductions across all the crime types. This needs to be considered when measuring the impact on crime levels following the trial. Looking at the combined crime levels including the displacement zones for the distribution to 85% saturation period, we found the following crime changes:

Table 67 - Combined year on year crime levels during the distribution period

<table>
<thead>
<tr>
<th>Combined results</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area 250 m</td>
<td>500 m</td>
<td>750 m</td>
<td>Area 250 m</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burglary</td>
<td>84</td>
<td>198</td>
<td>218</td>
<td>57</td>
</tr>
<tr>
<td>Robbery</td>
<td>41</td>
<td>175</td>
<td>193</td>
<td>33</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>15</td>
<td>52</td>
<td>69</td>
<td>16</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>51</td>
<td>167</td>
<td>171</td>
<td>47</td>
</tr>
<tr>
<td>TNO</td>
<td>492</td>
<td>2531</td>
<td>2621</td>
<td>409</td>
</tr>
</tbody>
</table>
When displayed as a bar chart covering the crime levels (and including all the displacement zones), the changes in crime levels during the distribution period appear even more striking.

Figure 143 - Combined target and displacement zones to 750m – distribution to saturation.

It is evident that as police officers started to distribute the kits to households and the signage was being put up in the immediate and surrounding areas, residential burglary crime started to fall. It is also evident that reduction benefits were experienced out to 750m. This was most significant in relation to residential burglary, robbery and overall TNO's. Theft from M/V crime actually showed an increase for this roll out period.

Looking at the target and displacement area results to 750m for the 12-month trial periods, in the table over. We find that there have been reductions in almost all the crime types in all the displacement zones.
Table 68 - Combined trial area 12 month data including displacement zones

<table>
<thead>
<tr>
<th>Combined Results</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
<td></td>
<td>Area</td>
<td></td>
</tr>
<tr>
<td></td>
<td>250 m</td>
<td>500 m</td>
<td>750 m</td>
<td>250 m</td>
</tr>
<tr>
<td>Burglary</td>
<td>411</td>
<td>857</td>
<td>932</td>
<td>1307</td>
</tr>
<tr>
<td>Robbery</td>
<td>169</td>
<td>761</td>
<td>884</td>
<td>1084</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>91</td>
<td>287</td>
<td>378</td>
<td>460</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>203</td>
<td>758</td>
<td>928</td>
<td>1429</td>
</tr>
<tr>
<td>TNO</td>
<td>2,293</td>
<td>12,004</td>
<td>14,511</td>
<td>17,006</td>
</tr>
</tbody>
</table>

Showing this in terms of overall performance to 750m we get the following results:

Table 69 - Crime changes including overall displacement zones to 750m

<table>
<thead>
<tr>
<th>Combined Results</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary</td>
<td>3511</td>
<td>2704</td>
<td>-807</td>
<td>-23%</td>
</tr>
<tr>
<td>Robbery</td>
<td>2898</td>
<td>2457</td>
<td>-441</td>
<td>-15%</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>1216</td>
<td>1177</td>
<td>-39</td>
<td>-3%</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>3318</td>
<td>3294</td>
<td>-24</td>
<td>-1%</td>
</tr>
<tr>
<td>TNO</td>
<td>45814</td>
<td>41673</td>
<td>-4141</td>
<td>-9%</td>
</tr>
</tbody>
</table>

Figure 144 displays this in bar chart form.

Figure 144 - Combined target and displacement area results percentage change in crime reports to 750m

Combined target and displacement area results
Percentage change in crime reports for 2013 and the previous year

- Burglary: -23%
- Robbery: -15%
- Theft of MV: -3%
- Theft from MV: -1%
- TNO: -9%
If we now look at total control area performance including displacement zones across the five trial boroughs, we see that reductions also occurred in all the displacement zones.

Table 70 - Combined control area performance including displacement areas over the 12 month period.

<table>
<thead>
<tr>
<th>Combined Results</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area</td>
<td>250</td>
<td>125</td>
<td>500</td>
</tr>
<tr>
<td>Burglary</td>
<td>88</td>
<td>262</td>
<td>412</td>
<td>529</td>
</tr>
<tr>
<td>Robbery</td>
<td>21</td>
<td>128</td>
<td>240</td>
<td>361</td>
</tr>
<tr>
<td>Theft of MV</td>
<td>25</td>
<td>126</td>
<td>162</td>
<td>239</td>
</tr>
<tr>
<td>Theft From MV</td>
<td>48</td>
<td>270</td>
<td>443</td>
<td>650</td>
</tr>
<tr>
<td>TNO</td>
<td>469</td>
<td>2874</td>
<td>4989</td>
<td>9029</td>
</tr>
</tbody>
</table>

Figure 145 shows the control area performance in terms of overall percentage change.

Figure 145 - Combined control and control displacement area results percentage change in crime reports to 750m.

If we now combine the control and target area results that include the displacement areas to 750 m, we can identify the true impact of the property marking strategy to this distance.
If we offset the control area results with those of the target area results we see the overall impact that occurred to the 750m point. Residential burglary decreased significantly by 17% indicating clear diffusion of benefit effects. There was, however, some possible offence displacement. TNO’s increased comparatively by 1%, Robbery by 5%, Theft of M/V by 10% and Theft from M/V by 15%. Figure 147 highlights the actual crime reductions achieved in both the control and target areas to 750m:
It is important to recognise that every crime type decreased to some extent out to 750m around the target areas. The following graphs focus on how crime levels varied across the 250m, 500m and 750m respectively over the 12 month trial period. Figure 148 reflects the 250m performances.

Figure 148 - Percentage change in crimes in 250m target displacement zone and 250m control displacement zone
We see here how residential burglary crime has decreased significantly still when compared to the control area in this zone. However at this point we see that while robbery, theft of M/V and TNO’s have all fallen, this reduction is less than the overall control site performance. Theft from M/V offences increased. This suggests there has been some offence displacement from residential burglary offending to the other crime types. It also highlights how an area immediately surrounding an initiative of this type will see more pronounced crime changes if displacement effects occur.

Figure 149 illustrates the performance at 500m:

Figure 149 - Percentage change in crimes in 500m target displacement zone and control displacement zone

At this 500m point we see a different perspective emerging. Here the reductions in residential burglary, robbery and overall TNO are better than the performance of the control areas. Theft of M/V and theft from M/V have reduced in the trial 500m site, but not so much as reduced as in the control sites. This, again, suggests some offence displacement towards this crime type.
The final graph in this area shows the performance in the 750m-displacement zone.

**Figure 150 - Percentage change in crimes in 500m-target displacement zone and control displacement zone.**

Here we continue to see dramatic reductions in residential burglary now some three quarters of a kilometre surrounding the trial area. We also continue to see reductions in robbery, theft of M/V, theft from M/V and TNO’s but again not at the same rate as the control area. This again indicates offence displacement from residential burglary to other crime types.

Having viewed each of the displacement zones we examine individual crime types across the control and displacement zones. Figure 151 looks at the overall residential burglary crime levels across each of the target and displacement areas:
The results here are significant. Residential burglary crime levels have consistently fallen across the target and displacement areas. This clearly evidences the significant reduction impact of the traceable liquid strategy on reducing residential burglary. The next graph focuses on reported robbery offences:

Here a different pattern emerges. Within the target area we see a significant reduction in robbery levels. However, as we move to 250m we see there has been
a comparative increase in robbery offences. This suggests displacement may have occurred. This is however reversed at the 500m point and also reversed at the 750m zones. The next graph looks at theft of M/V crimes.

Figure 153 - Changes in theft of M/V crimes across the target and displacement zones

![Graph showing theft of M/V crimes](image)

In this graph we see that overall theft of M/V crime has increased on a comparative basis across all the target and displacement zones suggesting offence displacement has occurred. Figure 154 looks at theft from M/V.

Figure 154 - Changes in theft from M/V crimes across the target and displacement zones

![Graph showing theft from M/V crimes](image)
In this graph we find that there has been a very slight reduction of this crime type within the target area. However there is a significant increase in the 250m zone and then further increases in the 500m and 750m zone. There is a clear inference that offence displacement has taken place. Finally we examine the overall TNO’s.

Figure 155 - Changes in overall TNO crimes across the target and displacement zones

Here within the target area, there were clear reductions in overall TNO’s. However there is a comparative increase in the 250m zone suggesting crime has been displaced to this area. Within the 500m zone there is a slight decrease in offending but this is reversed significantly within the 750m zone. Again this suggests that a degree of crime displacement has occurred.

If we now concentrate just on residential burglary the primary focus of the traceable liquid strategy we see some interesting results. The graph and tables below provide an overall comparison between the MPS, the combined trial boroughs and the target trial and target control areas including all the displacement zones to 750m.
Table 71 - Summary comparing trial sites including displacement zones with the average borough and MPS reduction

<table>
<thead>
<tr>
<th>Residential Burglary</th>
<th>Pre trial year</th>
<th>Trial 2013</th>
<th>Change in number of crime reports</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPS</td>
<td>74103</td>
<td>67407</td>
<td>-6696</td>
<td>-9%</td>
</tr>
<tr>
<td>All trial (5) Boroughs</td>
<td>9958</td>
<td>8991</td>
<td>-967</td>
<td>-10%</td>
</tr>
<tr>
<td>Combined Grid Squares</td>
<td>3511</td>
<td>2704</td>
<td>-807</td>
<td>-23%</td>
</tr>
<tr>
<td>Combined Control Areas</td>
<td>1291</td>
<td>1211</td>
<td>-80</td>
<td>-6%</td>
</tr>
</tbody>
</table>

These results are now shown in the following bar chart;

Figure 156 - Summary comparing trial sites including displacement zones with the average borough and MPS reduction

This shows how both the MPS and the overall individual trial BOCU’s saw larger percentage reductions than the combined control areas. However we know that both the target and control areas represented outlier high output residential burglary areas. As such they were unlikely to fully mirror overall average area performances. Of significance is that even when we offset the target and displacement areas against those of the control area, we find that residential burglary has decreased by 17% (23% - 6%).
The next graph displays the weekly year on year residential burglary performance over the 12-month period.

**Figure 157 - Combined target area and displacement areas weekly breakdown of residential burglary crime reports**

The graph demonstrates how the reductions were most pronounced at the start of the trial and then continued at this lower level throughout the trial. It is also worth noting how in the last quarter the effect appears reduced. This is likely to have occurred because the trial companies reduced their support following the six-month trial period when procurement commenced. As a result, less press and media coverage occurred during this period and this may have reduced the impact. It is important to recall that the graph displays changes in residential burglary crime levels out to 750m surrounding the combined trial areas. These displacement zones residents had no property marking and no stickers on display within their homes.

Figure 158 highlights the comparative monthly year on year performance trend for the target area and displacement area out to 750m and includes the preceding 6-month period;
This graph again highlights the overall reduction trend across this period. The next maps provide a residential burglary hotspot map of all the trial sites before the trial and after the trial. For these maps the ‘redder’ the area the more intense the residential burglary offending in that area.
From these maps we can clearly see how with the exception of Lambeth where a strong degree of implementation failure of the strategy occurred the overall
residential burglary levels have been transformed in all the areas. The hotspots in Brent, Southwark, Islington, Hammersmith and Fulham have gone. There are also no new hotspots suggesting the crime has not been displaced either.
The findings from the online survey

During the roll out of the property marking residents were asked if they would be willing to take place in a subsequent on-line survey. Those who agreed were asked to provide an email address. This was done for each of the trial boroughs. In total 2184 addresses and permissions were obtained. The survey was emailed out to the occupiers six months after the 85% saturation levels were achieved (or once 425 kits had been distributed where this saturation was not achieved). The overall response rate was 12.1% or some 266 returns. The number of responses from each area is detailed below;

![Figure 161 - Number of responses from each area](image)

The questionnaire results were used in two ways. Firstly by reflecting some of the questions in the Public Attitude Survey (PAS), direct comparisons could be made against the most recent quarter results, which covered the period October 2012 to September 2013. Secondly it asked the householder for their attitudinal perceptions of the role out and impact of the traceable liquids.

Let us firstly explore the results comparable with the ‘PAS’. In doing so it is important to note that the number of respondents for each of the boroughs was
under 100 and as such was not suitable for individual borough statistical analysis. This meant statistical significance had to be carried out at the ‘total’ level. All statistical significance testing was carried out to two standard deviations.

**Post-Trial results comparable with the PAS**

Figure 162 - ‘Taking everything into account how good a job do you think police in your area are doing?’

The above graph shows the percentage of respondents who responded either ‘excellent’, ‘good’ or ‘fair as to how well they thought the policing of their area was going following receiving traceable liquids. The average satisfaction level of the trial respondents was 85% against 68% for the PAS results, which is, statistically, significantly higher. This suggests a clear benefit to the police if they wish to improve public opinion of policing and public satisfaction levels by focusing on high crime areas and applying the strategy. This might be considered significant when you consider the fact that these areas had some of the highest burglary victimisation rates in London.
In this case only 65% of the trial respondents felt the police understood the issues in their community (‘strongly agree’ or ‘agree’). This compared to 70% from the PAS survey. The results were not shown as statistically significant.

In this case in all the trial areas respondents felt that the police did not deal with the issues that mattered to people in this community better than the PAS results for the same borough. The average satisfaction level of the trial respondents was 56% (‘strongly agree’ or ‘Agree’) against 66% for the PAS. This is, statistically, significantly lower. In many ways this response could be anticipated. The PAS represents respondents from across the whole borough. The trial area by definition focused on some of the worst areas on the borough for burglary and indeed across London. In this respect we should expect to see more negative responses on the effectiveness of the police.
In the trial boroughs, more respondents from the trial areas thought that the police could not be relied on to be there when they needed them. This was worst than the PAS for the same borough. The average satisfaction level of the trial respondents was 61% ('strongly agree' or 'agree') against 74% for the same boroughs, which is statistically significantly lower.

The results for the trial boroughs were worse than for the PAS. Overall 46% of residents felt the police could be relied upon to deal with minor crimes, compared to 61% for the PAS ('Strongly agree' or 'Agree'). These results were statistically significantly lower.
In all the trial boroughs, respondents from the trial areas thought the police listened to the concerns of local people at a lower level than the PAS areas. The average satisfaction level of the trial respondents was 59% (Strongly or Agree) against 66% for the same boroughs, which is statistically significantly lower.

The views from the trial boroughs was mixed. Results from the trial boroughs of Islington and Lambeth improved but they fell in Brent, Hammersmith and Southwark. The average satisfaction level of the trial respondents was 80% (Strongly agree or Agree) against 84% from the PAS results, which was not statistically significant.
They treat everyone fairly regardless of who they are

The view from the trial boroughs was mixed. In the trial borough of Islington it slightly improved. However it declined steeply in Brent, Hammersmith, Lambeth and Southwark. The average satisfaction level of the trial respondents was 50% (Strongly agree or Agree) against 69% for the same PAS, which is statistically significantly lower.

They are helpful

The views from the trial boroughs were mixed. In the trial borough of Islington it improved but declined in Brent, Hammersmith, Lambeth and Southwark. The average satisfaction level of the trial respondents was 75% (Strongly agree or Agree) against 78% for the PAS, which was not statistically significant.
The responses were mixed. In the trial boroughs of Brent and Islington the views of residents improved but in Hammersmith, Lambeth and Southwark they fell. The average satisfaction level of the trial respondents was 77% (Strongly agree or Agree) against 79% for the PAS, which was not statistically significant.

In all the trial boroughs, all the respondents were concerned about crime more than for the residents of their Borough as a whole. The average response level of the trial respondents was 65% (Very or Fairly worried) against 31% for the same boroughs, which is statistically significantly higher.

In this section therefore we have some significant results. First we note how, overall, the residents in the trial boroughs tended to have more negative attitudes towards the police when compared to the findings from the PAS. This finding is in
itself of note. It suggests and reinforces the view that residents in areas that experience higher crime levels tend to have more negative attitudes towards the police. The trial areas were in fact some of the worst areas for residential burglary offending in London. Despite these attitude levels, we will note later that the distribution of traceable liquids had a positive impact, increasing the confidence in the effectiveness of the police to the public by a statistically significant 17%.

In the next area comparative attitudes were explored both before and after the distribution of the property marking.

**Post Trial Traceable Liquid Attitude Results**

*Figure 173 – ‘Prior to the traceable liquid initiative what was your overall opinion of the police in your area?’*

In all the trial boroughs, all the respondents had a lower opinion of the police than among residents of their borough as a whole. The average response level of the trial respondents was 50%, who responded generally high against 68% for the same boroughs as a whole. This is statistically significantly lower. This again highlights the view that higher crime areas such as these will have a more negative opinion of policing than the average.
In the trial boroughs, all respondents stated that their opinion of the police had improved since the introduction of traceable liquids into their properties. The borough, which saw the highest increase, was Brent at 43%. The average overall increase was 33%.

In all the trial boroughs, respondents stated that they felt safer (a lot safer or a little safer) since the introduction of traceable liquids into their properties. Brent saw the biggest improvement with 72% of respondents indicating they felt safer. The average, across all the trial boroughs, was 51% felt safer as a result of having their property marked.
Overall 52% of the respondents said that having the traceable liquids utilised in their home made them feel safer. Again Brent saw the most significant benefits with 61% of respondents feeling safer.

These results highlighted the positive impact of the roll out of traceable liquid property marking on public attitudes. In the next section the focus is primarily on residents views as to how the police distributed the products and their manner in doing so.
Post-trial assessment regarding the introduction of traceable liquids into the homes

Figure 177 – ‘Were the officers professional when they visited your home?’

Overwhelmingly the trial residents recorded that the officers did act in a professional manner. The lowest rates were for Brent and Hammersmith at 97%, but the average rate proved to be 98%.

Figure 178 – ‘Did they give practical help (e.g. how and where to apply the traceable liquids)?’

In all the borough sites the trial residents recorded that the officers did provide practical help with the average response being 92%. Hammersmith and Fulham had the lowest levels at 83% compared to Brent. This again had the highest positive levels with a response of 97%.
Overwhelmingly the trial residents recorded that the officers were capable. The lowest rates were for Brent and Hammersmith at 97%, the average rate was 98%.

With an average of 93% it is clear that the deploying officers explained the property marking strategy. In this case Lambeth recorded the highest levels and Hammersmith the lowest at 83%.
The respondents were reassured with an average rate of 87%. Islington achieved the highest reassurance levels (94%) and this contrasted with the lowest Hammersmith and Fulham at 82%.

The numbers of respondents expecting further contact from the police varied within a small band around the average of 19%. The kind of ‘further contact’ was not detailed so this could have been further contact regarding the traceable liquids or could be further contact for another reason.
Did you know how to contact the police about this if you needed further explanation?

The numbers of respondents reporting that they knew how to contact the police for further explanation regarding traceable liquids averaged 65%, with Hammersmith and Lambeth lowest at 61%.

Were you offered stickers to be put up in the front and back of your house?

Whilst Brent achieved 100%, Hammersmith and Fulham achieved only 46% against the overall average of 84%. The result from Hammersmith and Fulham was so low it reflected clear implementation failure in this area.
Figure 185 - ‘Did you agree to the stickers being displayed in your house?’

Again the results here suggest there were issues with the distribution of the stickers within Hammersmith and Fulham borough. The overall average result was 71% but this was reduced by Hammersmith and Fulham’s return of just 35%. This contrasts widely with the next lowest of Lambeth at 69%.

Figure 186 - ‘Are the stickers still in place?’

The overall average was 64% however this was influenced by Hammersmith and Fulham’s result of just 34%. The next borough was at 64%, which highlighted the contrast.
Hammersmith and Fulham again had the lowest response rate with 88%. This time however the results between the Boroughs were much closer with the average response being 92%.

This highlighted two key areas. First, the officers distributing the traceable liquids were knowledgeable and conducted themselves professionally. Second there is a clear inference that the officers involved in the roll out on Hammersmith and Fulham borough did not properly or adequately distribute the trial stickers within their area.
The findings from the semi-structured interviews

In order to capture and triangulate further information from this study a small sample of semi-structured interviews were conducted. The participants were either a senior leader responsible on a borough for implementing the trial or part of the team that oversaw the roll out. In total seven key participants were interviewed. By targeting individuals who had responsibility at each of these levels the study aimed to identify a representative sample. Each of the companies’ products and all but one of the boroughs were represented. This allowed a limited number of conclusions to be drawn. A summary of the issues made in response to the questions is provided below.

What was your involvement in the trial?

The participants that were interviewed comprised of three groups. One oversaw the wider delivery of overall borough strategy and performance. Three directly visited addresses and on a daily basis physically implemented the strategy. Three typically had middle management responsibility for the ward areas where the traceable liquids were deployed and were directly responsible for overseeing the property marking roll out.

How did you go about distributing the products?

All the boroughs used neighbourhood police officers and PCSO’s to distribute the property marking kits to residents. There was a need to supplement these local officers with more staff in order to roll the kits out more quickly. The best time to capture residents at home was found to be in the afternoon (2-3pm) through to the evening. Respondents felt that some of the PCSO’s who distributed the kits were better at communicating than others. This was evidenced by the fact that on one team two members were able to distribute successfully far more of the kits than the other team members. This demonstrated how, despite the fact policing is a key public role, not every officer showed strengths in communicating with the public.

Challenges were also identified in distributing the products. Staff interviewed highlighted homes where the occupants did not speak English. Due to the diversity
of communities in the areas, there was in places a significant language barrier. This was addressed by using English speaking family members or neighbours. It did however highlight the need to identify the ethnic mix of an area and to consider providing explanation sheets in different languages prior to the roll out. Another solution was to utilise officers or MSC staff from diverse backgrounds who had broader language skills. Understanding differing communities was important. For example one borough had a large Somali community and the female householders would not let a male officer or PCSO into their home without the male householder being present. Clearly using female police officers or PCSO’s would have helped here.

Inevitably people were also not always at home. This was more likely to be the case in the morning or during working hours. As a result most teams changed their hours and commenced distribution in the early afternoon and then worked through to the evening. To ensure households were not missed it was important to create a re-visit plan for those households that were unavailable.

A further issue relating to one company was how the product was utilised. For this company, the bottle containing the solution had to be returned to the company as the means of evidentially marrying up the solution with an individual householder. This limitation was particularly noticeable with the roll out commencing not long before Christmas. Residents wanted to retain the solution to mark any new gifts they received as presents. They were unable to do so and this was a clear limitation of their product.

Finally police needed to carry out a risk assessment on the neighbourhoods being targeted to ensure there were no dangers in deploying staff at specific locations.

**How did householders receive the property marking strategy?**

Those interviewed stated that householders positively received property marking. Interviewees felt that as the public were receiving something from the police for free to make their homes safer and this could only be seen as positive. A small
number of householders refused the kits and this was often because of the time available to the householder. Two respondents felt that householders who were ‘iffy’ (criminal in nature) or mistrusted the police were some of the few participants who did not want their property marked. One respondent noted that households, who initially refused the kit and were then the victim of a burglary, subsequently did want their property marked.

The senior strategic leads felt that the communication skills and enthusiasm of those distributing the kits played a key part in how well the products were received.

In the future, in order to make the distribution smoother, some respondents felt that there was a need to highlight to the community what the police were doing prior to rolling the strategy out. Some suggested engaging with the Safer Neighbourhood Panel. Others informed Neighbourhood Watch Coordinators and gave them information to circulate to their members both in advance and during the product distribution. One approach that helped was to get the support of Housing Association Housing Officers. As many of these areas had a high proportion of social housing, housing officers were able to visit householders and to communicate with them in advance, to explain what the police were doing and to encourage them to take on the property marking.

Finally one of the companies required Internet registration by the householder. This proved difficult for some elderly residents who did not have an Internet connection.

**Did everyone put the product stickers on their front and rear doors?**

While most residents displayed their front and rear door/window stickers some chose not to. The reason for this was that they had been given in the past ‘Bumblebee’ stickers, which were hard to remove, and left a mark on surfaces. The stickers for the trial were however well received as they could be simply removed and relocated. Occupants of rented property had fewer qualms about putting the stickers on display because it was felt they did not own the property.
Senior officers felt that when visiting the homes, it was best for officers to literally apply the stickers whilst they were there to ensure it was done.

**How else did you let potential offenders know property was marked?**

A number of methods were used to highlight the property marking strategy to potential offenders. All of those interviewed felt telling offenders about the property marking was key to the strategy’s success. Most used a common set of techniques that included social media, placing signage in the surrounding area, local press and general media releases as a means of informing both the general public and criminals about the activity being under taken.

Many of the boroughs designed marketing approaches around the custody booking in process for arrests. Prisoners and their property were routinely scanned using a UV light and torch. Custody leaflets and posters were designed for offenders to read that explained what traceable liquids were and how they worked. One borough put some of the stickers in the cells for offenders to personally contemplate. One Borough Commander visited detained suspects and directly explained the approach. Using images of offenders, who had been captured by the pro-active equipment, he informed them of the possible consequences of continued offending in connection with the traceable liquid strategy.

Inevitably when the products were distributed offenders and their homes would also be marked and informed about the strategy. One interviewee noted how offenders who initially did not want police officers or PCSO’s entering their property changed their behaviour. They stated:

‘*Bizarrely some of the burglars or people with previous convictions then became very receptive because they wanted to learn about the product*’

Over time officers found that rather than being ignored by past offenders as the products were distributed, officers were directly approached and asked about the product. One officer who distributed the product stated how he
'Even got to SmartWater an offenders home’. (SmartWater was one of the trial companies).

Those interviewed detailed how they undertook visits to second hand goods stores and informed them about the traceable liquid strategy. In some boroughs they provided them with UV lights to scan property and put posters in the window of the store. In this way they hoped to deter offenders from selling stolen property.

**How did you market the strategy internally?**

Briefings and training was provided to Safer Neighbourhood Teams, Custody Officers and Response Team officers. Borough Commanders posted information on their weekly blogs. CID teams were briefed and given UV torches to scan for property when searching suspect addresses. Posters were put up around the station. Response team officers were given UV lights to scan property when carrying out ‘stop and searches’ of possible suspects.

**How did you sustain the marketing strategy?**

Almost all of those interviewed felt it was important to regularly revitalise the marketing around the traceable liquid strategy. They felt this was necessary to maintain its effectiveness. To achieve this a range of methods were utilised. This included constant marketing to offenders whilst in custody, regular visits to second hand stores and the use of UV torches for stop and searches in the street and for formal searches of addresses. Other approaches included the Borough Commander writing an article for the local paper, to press and radio interviews and letters from Registered Social Landlords (RSL's) to householders. Some of the respondents felt that it was hard to maintain the momentum and that these processes waned over time. Many felt that it could have been marketed more strongly from the start. One commented how if they were rolling the process out again, from the outset they would make a point of highlighting the street signs to offenders in the area to increase their awareness of the use of traceable liquids.

Despite these challenges some innovative approaches came into being. One borough mapped the bus routes that went through their burglary areas and then
with the support of Transport for London (TFL) put posters about the campaign at bus stops on the public information boards. This highlighted the approach to both the general public and offenders.

A second approach arose from a borough, which identified its main methadone prescription chemists in its borough. It then placed advertising on the prescription bags, which advertised the traceable liquid strategy. The assumption was that a high percentage of drug users were also offenders. This therefore was seen as a way of deterring them from future offending.

Two respondents highlighted the importance of the pro-active deployments. Over the trial period they caught offenders using several ‘trap cars’ and a ‘trap house’. Once an offender was caught and charged they maximised the media publicity. This included both newspaper and television opportunities. They felt this strengthened the deterrent effectiveness of the strategy to any potential offenders. It was felt any convicted offenders would pass on what happened to them to other potential burglars. Within one of these areas there was a large Portuguese community. They picked up on the successes and transmitted a piece on a Portuguese television. This highlighted the importance of understanding locally diverse communities.

One company marked war memorial sites for free. One borough had such a site in the middle of its trial areas. As a result it was able to publicise this event as another way of generating media interest for the product.

**Overall how effective do you feel traceable liquids are as a strategy to reduce crime?**

All the respondents interviewed felt the strategy was highly effective at reducing crime during the trial period. Two respondents highlighted the strength of their belief. One respondent stated that:

‘*In the trial areas, the ones who were the victims were the ones who didn’t take the kits on*. ’
Another stated when commenting on crimes that did occur in the trial area that:

‘Of all the burglaries we had, none of them had the kits’

It was clear that the strategy was seen by respondents to be very popular with householders as it was rolled out. One interviewee summed up this when he stated that:

‘I think the whole kit thing is actually a brilliant idea and I think it works really well cause everybody always asks for it’

All of those interviewed felt it was an ideal engagement tool that improved confidence in the police.

Does it have limitations?

In general those interviewed were highly positive when talking about the strategy and considered that it was highly effective at reducing crime. However some concerns were also expressed. One respondent felt that it could displace crime to other areas though he could not evidence this belief. Another questioned its effectiveness over time and believed ultimately the strategy would become like ‘wallpaper’ with both the marketing and signage blending into the background. In doing this they felt the effectiveness of the approach could gradually erode over time.

Have there been any other policing operations that will have had a significant impact on the trial areas?

No other policing operations were described as having had an impact on the trial results.

How effective do you feel the strategy is in catching offenders?

Overall those interviewed felt the traceable liquid property marking was stronger as a preventative measure rather than a technique that would lead to the arrest of offenders. They noted that with the exception of the pro-active targeting of
offenders, no persons were arrested who had stolen property from a property-marked address. They recognised however that few of the addresses that were marked subsequently became the target of a burglary. As a result it was unlikely to lead to arresting offenders.

**Any other comments?**

One commentator felt that the marketing of the product was more important than the product itself. They felt that if a borough had conducted all the marketing, put up the signage and the stickers and then linked this with the pro-active operations to catch offenders, then this would deliver the same results without actually marking householders property. A project lead on one area explained in fact how officers had given just the stickers to householders who were victims of crime as a means of preventing further victimisation.
Chapter 5 - Conclusion

This study examined the effectiveness of traceable liquid property marking on residential burglary crime reduction, crime displacement and public confidence. A past study by Clare (2009), considered variations in burglars' domain-specific perpetual and procedural skills and focused on the differences between novice and experienced burglars. They stressed the need for researchers to explore and identify target-hardening approaches that dissuaded offenders. This study has helped fill this gap. Whilst it did not seek to distinguish between the relative experiences of offenders, the level of burglary offences reduced, suggests that burglary offenders of all experience levels were discouraged from offending.

Looking at the trial area performance in isolation there were significant reductions in crime levels. Residential burglary fell by 45%, robbery by 21% and there was a 22% reduction in overall TNO's. Additionally there was no significant change in M/V crime. Residential burglary offence levels fell from 415 to 229 recorded offences. Just 3% of these involved houses that had been property marked and had stickers advertising the fact, on display. Thus homes that were part of the trial had their burglary victimisation levels significantly reduced. Conversely homes that were not marked within the trial area were more likely to be targeted in these same areas.

When the trial area results were offset against the control areas, residential burglary levels were seen to reduce by 21% and there were clear diffusion of benefit effects to other crime types. Robberies fell by 16% and overall TNO's by 20%. Motor vehicle crime saw no statistically significant change. In numerical terms this equated to 87 less burglaries, 27 less robberies, no statistically significant change in M/V crime and overall 458 less TNO’s in an area comprising of just 5000 households. This represented a significant fall in crime and also a demonstration of diffusion of benefit effects.
The trial also found that crime levels reduced far beyond the boundaries of the trial locations and indeed to a distance at least 750m surrounding the areas. For the trial areas in isolation and including the displacement zones, there was a 23% reduction in residential burglaries, a 15% reduction in robberies, a 3% reduction in theft of M/V, 1% reduction in theft from M/V and 9% less TNO’s. This is significant as it meant the combination of factors deployed delivered a resultant impact to at least 750m surrounding the target areas.

If we focus on the displacement area findings we can analyse this in greater detail. When performance was offset against the control sites, residential burglary was reduced by a statistically significant 12% in the 250m zones, 7% in the 500m zones and 23% in the 750m zones. Overall residential burglary declined by 17% out to the 750m radius. If we identify the centre point of our target areas this means that out to almost a kilometre radius, residential burglary levels were reduced. Clear diffusion of benefits effects for this crime type were therefore apparent and caused not by physical changes, but by applying other psychological strategies. Typically this was achieved by means that included targeted press releases, the marketing of pro-active arrests (which closed the loop on the strategies effectiveness), visits to second hand stores and the scanning of prisoners and their property.

However, it should not be viewed as a panacea for crime reduction. The cost of such reduction, once offset against the control area performance, was found to be a degree of offence displacement to other crime types. This was most pronounced in the 250m zone area immediately surrounding the trial areas. Here robbery increased by 8%, theft of M/V by 27%, theft from M/V by 24% and overall TNO’s by 3%. In terms of numbers this translated into 62 more robberies, 74 more theft of M/V’s, 192 more theft from M/V and in terms of overall TNO’s an increase of 339 offences in return for 173 less burglaries. If we however consider this cumulatively between the trial area and the 250m zones this would work out as 203 less residential burglaries, 36 more robberies, 91 more thefts of M/V’s, 192 more theft from M/V’s and overall 39 less TNO’s. It is clear that the benefits of the fall in
residential burglary overall outweighed the shift to offending to less serious offences.

For the 500m zone a 7% reduction in residential burglary was identified, in return for a 7% reduction in robbery, a 4% increase in theft of M/V, a 16% increase in theft from M/V and a decrease of 4% in overall TNO’s. At the 750m zone a further 23% reduction in residential burglary was recorded, a 13% increase in robbery, a 5% increase in theft of M/V, a 11% increase in theft from M/V and a 5% increase in overall TNO’s. If cumulatively we were to take all the target and control areas to 750m the following would be noted. For a reduction of 589 burglaries, there was an increase of 131 robberies, 120 thefts of M/V offences, 503 thefts from M/V’s and an overall increase of 298 TNO’s.

Using the Home Office (2011) revised costs for crime and the breakdown in costs provided by Dubourg and Hamed (2005), the monetary benefits for the trial for the key crimes can be identified. Using the inflationary change between the 2005 to the 2011 data, indicative policing costs of £623 for a residential burglary, £950 for a personal robbery, £88 for a theft of M/V and £34 for theft from M/V were calculated. Looking at the crime level changes to 750m, this works out as a saving of £215,000. From the trial, on average an officer or PCSO would distribute the product to 12 houses in an 8-hour shift. Assuming a third were distributed by police officers at £260 per day and two-thirds by PCSO’s at £166 per day (MPS indicative costs 2015) then the saving reduces to £133,000. Even if we assumed the cost of the 4250 kits and strategy itself was £10 per kit, then we still see a net saving of £90,500. This does not factor in the benefit realised by the increase in public confidence.

These figures also include boroughs that did not perform as well as the best performing due to their failure to implement the trial effectively. By utilising the best practise from the trial, it is clear that the offence displacement can be reduced further (if not fully removed) and the residential burglary reductions increased. This strategy therefore should clearly be considered as cost effective and efficient.
Looking at what has been learned from crime displacement, Clarke and Weisburd (1994) identified two main processes underlying diffusion of deterrence and discouragement. Both of these have had an immediate relevance to this study. In the case of deterrence they found that offenders often overestimated the significance of the crime prevention initiative carried out by the police. The methodology employed in the trial played on this effect by using a range of means.

First, by putting up signage wider than just the perimeter of the target area, the perceived area engaged in the property marking experiment was expanded. Second, the police visited second hand goods buyers within and surrounding the trial areas and made them aware of the property marking strategy. They also provided UV lights and marketing literature to enable them to check for stolen goods and to discourage the sale of stolen items. By doing this they hoped to limit the outlets available to offenders for stolen property. Third, on one of the boroughs, advertising was placed on chemist bags for drug users who were prescribed methadone. Chemists were selected that were the highest providers of methadone subscriptions. The belief was that a high percentage of drug users committed offences to support their drug habit. By highlighting the strategy to them, the police aimed to dissuade them from committing residential burglary offences.

Finally, within two of the boroughs the companies supporting the deployments provided pro-active equipment for the police to deploy in the traceable liquid areas. This included bikes that were property marked and had tracking assets, cars that sprayed offenders with traceable liquids should they attempt a break in, as well as covert cameras and tracking equipment. ‘Sting’ houses were used which deployed a similar methodology. All these approaches achieved some success in the trial. When a suspect was arrested and charged the police in that area maximised the publicity opportunity. This aimed to prove the effectiveness of the strategy to offenders and served to close the strategies effectiveness in their mind. Cumulatively these factors served to increase the psychological impact and pressure on potential offenders. They will have all, in the mind of an offender, expanded the depth and breadth of the property marketing strategy and it will have
made them believe that these locations created a hostile environment where they were highly likely to be arrested if they offended. This is supported by what Eck (1993) described as ‘familiarity decay’. He suggested that if an offender is dissuaded from targeting a specific address or area they will select the next best target with similar characteristics. If however the same level of dissuasion exists at that address then offending could be deterred altogether.

These methods also impacted on the second mechanism of discouragement (Clarke & Weisburd, 1994). This is where the offender feels that both the effort and risk in committing the offence is no longer worth the benefit. Discouragement can be seen to occur when an initiative removes the rewards from committing an offence. In this case the property marking strategy aimed both to make it harder to sell on stolen property (by marking previously unmarkable property with a ultra violet marker and unique DNA coding) and also increasing the offenders risk of being caught. For offenders, property such as jewellery, which is not normally identifiable or attributable to an owner, now potentially became identifiable. The risk of capture by the police had been increased.

Summarising learning from the on line survey there were significant results. First, the results highlighted how areas that experience high crime levels had a more negative view of the police than areas with low crime levels. This is of relevance to police forces where they aim to improve public confidence and satisfaction as it provides clarity on where they should focus finite resources to improve public support. Second it was clear that the property marking strategy when directly deployed by police officers or PCSO’s made householders feel much more secure. Thus, 51% of householders felt safer in their area and 52% felt safer in their home when asked some 6 months after the rollout. More significant was perhaps the fact that 33% had more positive opinion of the police. The strategy therefore provides the police with a tangible method of both reducing residential burglary crime while also improving public confidence.

Finally looking at the interviews we find that those who were responsible for the wider distribution of the products typically highlighted the same findings discovered
earlier in the quantitative results. The need to market the product and to maximise the psychological impact on potential offenders was seen as key to the strategy’s success. The value of supporting the strategy with pro-active deployments that captured offenders and brought them to justice was seen as being important as it helped convince would be offenders of the strategies effectiveness. Respondents saw this as key in preventing future offending. This also served to highlight the effectiveness of their work to the wider criminal community. The approach created a professional inquisitiveness by offenders. Offenders wanted to understand what the property marketing strategy was about. Of interest was one respondent who felt that by using all the marketing approaches they believed they could deliver the same impact without needing to mark any property. Whilst this lack of tangible substance may be questionable over time, it served to highlight the belief in psychological marketing as a crime reduction technique.

When the data was fully analysed the reality was that few offenders were in fact caught as a result of the trial. However, this demonstrated the impact of what might be termed as the ‘psychological focus’ on situational crime prevention initiatives. In other words the psychological methodology employed during the trial led to wider crime reductions. It is appropriate therefore in considering wider crime reduction to add ‘psychological effects’ to the existing model of twenty-five techniques of situational crime prevention in the following way (over leaf):
This model now reflects how both physical and psychological changes are capable of delivering crime reduction and indeed as this study has demonstrated, the cumulative power of applying both approaches at the same time. In terms of the research it is of note that the area that saw the greatest residential burglary crime reduction achieved the highest combination of traceable liquid saturation, invested the most in the pro-active methodology and maximised their use of publicity when offenders were arrested.

To maintain the psychological pressures on offenders it was important to keep revitalising the local marketing of the traceable liquid strategy. The press images of the captured offender (see figures 3 and 4) demonstrated to offenders that the property marking could and indeed did result in court convictions. It was not an idle threat. Rather then use generalised campaigns that earlier research has shown have only a limited impact (J. Burrows and Heal (1980) and Riley (1980)), the
effectiveness of localised and specific press marketing prevailed. This same phenomenon was highlighted by Laycock (1985) when she explored the impact on property marking and the effect of renewed press interest after the first year.

Finally it is important that in a summary the learning, conclusions and outcomes from this study is presented along with some recommendations to other police services in implementing this approach. These are identified below:

- Traceable liquid property marking is highly effective at reducing residential burglary.
- For residential burglary offences there will be clear diffusion of benefits effects to at least 750m surrounding any targeted areas.
- Just 3% of homes that had the stickers displaying their home as property marked were the subject of a further burglary during the 12 months of the trial. This could mean that houses that are not marked see an increased risk of being burgled.
- It is a strategy that will improve the public’s confidence and satisfaction in the police.
- 51% of householders felt safer in their area.
- 52% of householders felt safer in their home.
- 33% had an improved opinion of the police.
- This study focused on deployments to 500 household areas as opposed to one off homes. It is unclear if the strategy is as effective if not deployed with high levels of saturation.
- High saturation levels are likely to increase the effectiveness. 85% was the target level set for the trial.
- Marketing is critical to the strategy’s success.
- General methods utilised included, social media, local newspapers, national press, TV and local radio and advertising sights (bus stops, poster boards etc.).
- Focus on marketing to local areas.
• Every marked house must display stickers that are easily recognised on the front and rear of their property identifying the house as property marked.

• Street signage should be placed on the perimeter of targeted areas and set out wider than just the targeted area to maximise the impact.

• Visits must be made to second hand goods sellers. Consider providing them with marketing posters and UV lights to scan property they are offered for sale.

• There is a need to focus marketing to offenders. This could include scanning for traceable liquids as offenders are arrested and information sheets, posters and stickers in cells and custody suites highlighting the strategy. The use of UV lights for searches of premises and during 'stop and searches'. The placing of adverts on chemist bags where high levels of methadone subscriptions are given out.

• It should not be seen as a panacea.

• There is likely to be some offence displacement to other crime types and in particular M/V crime offences but at a level that is less than the impact of the crime prevented. This can be minimised by maximising the wider marketing of the strategy and carrying out pro-active deployments of 'sting' bicycles, cars and houses within the targeted areas, where offenders are marked by traceable liquids as part of the methodology. There is a need to then maximise locally, press and social media releases to inform offenders that suspects have been captured and convicted. This is key to the deterrent effect.

• There is a need to refresh and update the marketing of the strategy over time to maintain the psychological impact on the offender.

In conclusion this approach can have a significant impact for police forces nationally on reducing residential burglary and increasing public confidence and satisfaction levels. In times of austerity this limited trial has demonstrated a clear evidence base for the strategy’s effectiveness both in terms of crime reduction and overall cost effectiveness. It is also important to remember that this is not a panacea. This should be considered only one in a range of policing options for
deterring and disrupting crime. It is clear that the application of physical change in crime prevention strategies can have an impact. However, applying localised ‘psychological’ marketing techniques in parallel with the physical reduction strategy can considerably magnify this impact. It is this knowledge that provides the most opportunity for police forces moving forward.

Impact of the study

Having invested in the size of this trial it is of key importance to consider the impact of these findings. After six months of the traceable liquid trial, the effectiveness of the strategy was presented to the Assistant Commissioner for Territorial Policing for the MPS. Based on evidence of the strategy’s impact on crime reduction, a positive effect on public confidence and the comparative cost effectiveness when compared to the cost of a residential burglary crime, a business case for a wider London roll out was agreed. Commencing in May 2015 traceable liquids will be distributed to 440,000 residential homes across London. This represents approximately 1 in 7 of London’s housing stock. The aim will be to reduce a further 7000 residential burglaries across London. This will be the largest ever worldwide implementation of this form of situational crime prevention. Its impact across London on this scale will continue to be measured. It is a visible demonstration of the influence a practising academic might have on professional service.

Recommendations for future research

Finally having reviewed this study several areas have been identified, which warrant further investigative research.

First a more detailed study on what is the optimum ‘dosage’ level in order to maximise the impact of property marking whilst minimising the financial cost. For this trial a saturation level of 85% was identified and where achieved this resulted
ultimately in higher reductions than the lower rate achieved on at least one of the boroughs. More detailed analysis of this area would however be useful.

Second the effectiveness of a property marking approach needs to be monitored over a longer time frame. Indeed a full study could be replicated in this way. As part of the MPS London wide roll out it is the intention to consider how effective the approach is over 2 and 3 years. There is a need to map the reductions in residential burglary crime levels achieved against the same period in the previous year. A proposal would be that reductions return to a point where they are at the same level the previous years for a fixed period of time. Then a renewed marketing approach will be brought in to revitalise its effectiveness.

Third, a better understanding of the impact of signage and general marketing approaches to crime prevention initiatives would also help police forces in their assessment of how much effort to invest in this area and for what potential gain.

Finally there would appear to be an academic opportunity to assess the impact of this strategy by interviewing burglary offenders in order to evaluate its impact on their perceptions of future offending.

This study set out to assess the impact of traceable liquid property marking on crime and public satisfaction levels in order to improve our academic understanding of this situational crime prevention approach. These objectives were met. It demonstrated that a traceable liquid property marking strategy can significantly reduce residential burglary offending. It identified clear diffusion of benefits effects whilst also highlighting reduced levels of offence displacement to less serious crime types that need to be mitigated against. The study also evidenced how the property marketing significantly increased the confidence in the police of residents making them feel safer in their homes. Finally it identified the power of psychological marketing effects in altering offender behaviour. It recognised that this should be considered as a component of any crime reduction strategy.
Appendices

Appendix 1 – Invitation Letter

Study Title: Cooling hot property? An assessment of the impact of traceable liquid property marking in five London Boroughs.

Dear Participant

I would like to invite you to participate in a research study that I am conducting as part of my professional doctorate studies. I am interested in evaluating the impact of traceable liquids on crime reduction, crime displacement and public confidence.

This study has been approved by CDR Letchford for the MPS and he has given me permission to approach you to see if you would be interested in assisting me by taking part in a 40 minute semi-structured interview.

The interview will be tape-recorded and the tapes will be kept in a locked and secure cabinet to which only I have access. Once I have transcribed the tapes they will be destroyed. Information that arises from the interviews may be used as part of the research findings and you may be quoted verbatim in the final thesis.

You do not have to take part in this research.

If you do agree to participate, you may withdraw your consent up until 01/04/14 when the data will be collated.

If you have any further questions, please feel free to contact my tutor, xxxxxx(xxxxxxxx) or me (xxxxxxxxxxx).

There is a consent form at appendix A for you to sign if you agree to take part in the study.

Thank you very much

Iain Raphael.
Appendix A

I give my consent to participate in the research being conducted by Iain Raphael as part of his professional doctorate studies. I have been informed that I may withdraw my consent at any time and that I agree to participate on the basis that I may be identified from the study.

Signed.......................................................... Date..................................................
Appendix 2 – Participant Information Sheet

Study Title: Cooling hot property? An assessment of the impact of traceable liquid property marking in five London Boroughs

REC Ref No: 0

I would like to invite you to take part in our research study. Before you decide we would like you to understand why the research is being done and what it would involve for you. Talk to others about the study if you wish. Ask if there is anything that is not clear.

I am conducting research as part of my professional doctorate studies and have chosen to evaluate the effect of traceable liquid property marking on crime reduction, displacement and public confidence levels.

What is the purpose of the study?
The purpose of this study is to evaluate the impact of traceable liquid property marking on several key areas. How effective is it in reducing residential burglary and other crime? Does it merely push offending to other areas? If the police distribute it, does it improve public confidence and satisfaction? This study will also be submitted to fulfil the requirements of my professional doctorate studies.

Why have I been invited?
You have been identified as being directly involved in the MPS traceable liquid ‘proof of concept’ trial. I would like to speak to those who have first hand knowledge of rolling out the strategy in an attempt to capture your learning, thoughts and experience.

Do I have to take part?
It is entirely your own decision whether or not to take part in this research. I will describe the study and go through this information sheet. If you agree to take part, I will then ask you to sign a consent form.

What will happen to me if I take part?
If you agree to take part, I would like to interview you on tape. The only reason I will be recording the interview is so not to miss anything you may say that I am unable to capture during the interview. Also, I would like to listen to the interview to ensure that I have understood what you
are saying. I will ask your permission to identify you and use any quotes that you give in relation to my research.

The tapes will be transcribed and then destroyed. The tapes will be kept in a locked and secure cabinet to which only I have a key until they are transcribed. Transcripts will be kept in the same place and destroyed once my Thesis has been submitted and meets the requirements for my doctoral award.

**Expenses and payments**
All interviews will be conducted in your normal place of work or at a place of your choice in Central London.

**What will I have to do?**
If you agree to take part, I will conduct a semi-structured interview that should last between 30 minutes and an hour. The interview will be in relation to your experiences on the traceable liquid trial.

**What are the possible disadvantages and risks of taking part?**
I can see no disadvantages or risks to taking part.

**What are the possible benefits of taking part?**
The benefit of taking part will hopefully be a better understanding of the use of traceable liquid marking strategies.

**Will my taking part in the study be kept confidential?**
If you join the study, you may be directly quoted and be identified in the study. I will ask for your express permission if this is the case.

With regards to all data collected from the interviews, please be assured:

- That it will be stored securely in a locked cabinet.
- The information gained from the interviews will only be retained for as long as is necessary and will be destroyed once the requirement of the professional doctorate submission has been satisfied. It will not be used for any future research.

**What will happen if I don’t want to carry on with the study?**
If you decide that you no longer wish to take part once you have given consent that is entirely your right. I will also give you the opportunity to withdraw at anytime up until the thesis is submitted.

**What if there is a problem?**
If you have a concern about any aspect of this study, you should ask to speak to the researcher or their supervisor, who will do their best to answer your questions. If you remain unhappy and wish to complain formally, you can do this by writing to Dr Phil Clements, Head of the Institute for Criminal Justice Studies at the address at the top of page 1.

**What will happen to the results of the research study?**
The findings of my research will be used to complete my doctoral thesis.

Who is organising and funding the research?
The University of Portsmouth and the Metropolitan Police Service will sponsor my research. This research will inform both organisations of the impact of traceable liquid property marking strategies.

Who has reviewed the study?
Research in the University of Portsmouth is looked at by independent group of people, called a Research Ethics Committee, to protect your interests. This study has been reviewed and given a favourable opinion by the Faculty of Humanities and Social Sciences.

Further information and contact details

Iain Raphael – xxxxxxxx

Barry Loveday- xxxxxxxx

If you have any questions as to whether you should participate, please also contact the above.

Concluding statement
Thank you for taking the time to read the information sheet. If you decide to participate you will be given a copy of the information sheet to keep and your signature of consent will be required on a separate consent form.
Appendix 3 – Consent Form

Study Title: Cooling hot property? An assessment of the impact of traceable liquid property marking in five London Boroughs.
REC Ref No:
..............................................................................................
Name of Researcher: Iain Raphael.

Please initial box

1. I confirm that I have read and understand the information sheet dated 23/01/14 (version 8) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, up until the analysis of the data which is anticipated to be 01/04/14.

3. I understand that data collected during the study, may be looked at by individuals from Portsmouth University, or from regulatory authorities. I give permission for these individuals to have access to my data.

4. I agree to my interview being audio recorded.

5. I agree to being quoted verbatim and/or identified in the study.

6. I agree to take part in this study.
Name of Participant: Date: 23/01/14  Signature:

Name of Person taking consent: Date: 23/01/14  Signature:

When completed: 1 copy for the participant; and one copy for the researcher's file;
Appendix 4 – Semi Structured Interview

<table>
<thead>
<tr>
<th>Question No.</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>What has been your involvement in the traceable liquid trial?</td>
</tr>
<tr>
<td>2</td>
<td>How did you go about distributing the product?</td>
</tr>
<tr>
<td></td>
<td>How simple was it to understand what you needed to do (or tell others what to do)?</td>
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<tr>
<td></td>
<td>How easy was it to explain to members of the public?</td>
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<td></td>
<td>How long did it take?</td>
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<tr>
<td>3</td>
<td>How was it received by householders</td>
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<tr>
<td></td>
<td>Was there any resistance to property marking?</td>
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<tr>
<td></td>
<td>Did any people refuse to mark their property?</td>
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<tr>
<td></td>
<td>What reason did they give?</td>
</tr>
<tr>
<td>4</td>
<td>Did everyone put the product stickers on their front and rear doors?</td>
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<tr>
<td></td>
<td>If not, why not</td>
</tr>
<tr>
<td>5</td>
<td>How else did you let potential offenders know property was marked?</td>
</tr>
<tr>
<td></td>
<td>Signage? Easy to get put up?</td>
</tr>
<tr>
<td></td>
<td>Media?                      Advertising on products?</td>
</tr>
<tr>
<td>6</td>
<td>Within Policing how did you market the strategy?</td>
</tr>
<tr>
<td></td>
<td>Custody - scanning prisoners/property?</td>
</tr>
<tr>
<td></td>
<td>Visit to second hand markets?</td>
</tr>
<tr>
<td></td>
<td>Utilise on searches?</td>
</tr>
<tr>
<td>7</td>
<td>Over the six months did you try to keep the marketing going?</td>
</tr>
<tr>
<td></td>
<td>If yes, how?</td>
</tr>
<tr>
<td>8</td>
<td>Overall how effective do you feel traceable liquids are as a strategy to reduce crime?</td>
</tr>
<tr>
<td>9</td>
<td>Do you feel it has any limitations?</td>
</tr>
<tr>
<td>10</td>
<td>Have there been any policing operations in the last 6 months that will have had a significant impact on crime levels in the trial area?</td>
</tr>
<tr>
<td>11</td>
<td>How effective a strategy do you feel it is at catching offenders?</td>
</tr>
<tr>
<td></td>
<td>What could we do better to improve its effectiveness?</td>
</tr>
<tr>
<td>12</td>
<td>Any other comments/thoughts?</td>
</tr>
<tr>
<td></td>
<td>What could we do better to improve its effectiveness?</td>
</tr>
<tr>
<td>11</td>
<td>Any other comments/thoughts?</td>
</tr>
</tbody>
</table>
Appendix 5 – Ethics Self Assessment Form

Record of ethical considerations in planning your research proposal and dissertation in ICJS Postgraduate Programme Area.

The information below should be supplied with your research proposal and will be passed to your dissertation supervisor.

Student number: 36144

Date: 27 June 2013

Proposed research topic (please print clearly):

A study on the effectiveness of property marking and its effects on crime levels and public confidence.

Background/preparation (student to complete as self-assessment)

1. Student has read the relevant section in the unit handbook (Part 3, Section 5)
   Yes [x] No [ ]

2. Student has read the British Society of Criminology ethical guidelines
   (see www.britsoc.org/ethics.htm)
   Yes [x] No [ ]

3. Student has attended the taught research ethics session (campus only)
   Yes [ ] No [ ] Not applicable [ x ]

4. Will the research involve the collection and analysis of primary or secondary data?
   Primary data Yes [x] No [ ]
   Secondary data Yes [x] No [ ]

If ‘no’ to both parts of Q4, outline any ethical issues that may arise in your research at the end of the questions below (e.g. political considerations in taking a critical stand on a sensitive issue). If ‘yes’ to either primary or secondary data collection, go on to answer ALL the following questions.

5. Does proposed research involve face-to-face contact with members of the community?
   Yes [x] No [ ]

6. Is access to personal or confidential data sought?
   Yes [ ] No [x]

7. Are you aware of the need to ensure anonymity and confidentiality of research participants?
   Yes [x] No [ ]
8 Are there potential risks (to you or research subjects) in the research? *(Specify which in the space provided)*

Physical  
Yes [ ]  No [x].

Psychological  
Yes [ ]  No [x].

Compromising situations  
Yes [ ]  No [x]. See below

I will ensure that respondents are aware of both the professional and academic uses to which the research will be put.

9 Are there data protection issues?  
Yes [x]  No [ ]

10 Do you believe you need to deceive research subjects? *(e.g. by not being clear about the purpose of your research)*

Yes [ ]  No [x].

11 Is there any likely harm to participants involved in the research?  
Yes [ ]  No [x].

12 Is there any potential role conflict for you in the research?  
Yes [ ]  No [x]. See Q8 above

13 Is participation in the research voluntary?  
Yes [x]  No [ ]

14 Have you considered how you are going to obtain informed consent from research participants?  
Yes [x]  No [ ]

15 Are there any other potential sources of ethical issues or conflict in the proposed research?  
Yes [ ]  No [x]. See ethics part

Any other ethical issues? *(e.g. political considerations, sensitivity of the topic)*

No.
Appendix 6 – Ethical Approval Letter

Mr Iain Raphael  
Professional Doctorate Student  
Institute of Criminal Justice Studies  
University of Portsmouth

REC reference number: 12/13:29  
Please quote this number on all correspondence.

19th September 2013

Dear Iain,

**Full Title of Study:** Cooling hot property? An assessment of the impact of traceable liquid property marking in five London Boroughs.

**Documents reviewed:**  
Consent Form  
Interview Questions  
Invitation Letter  
Participant Information Sheet  
Protocol

Further to our recent correspondence, this proposal was reviewed by The Research Ethics Committee of The Faculty of Humanities and Social Sciences. A number of observations were also given by myself, with regards to your original proposal. I am pleased to tell you that the proposal was awarded a favourable ethical opinion by the committee.

Kind regards,

FHSS FREC Chair  
David Carpenter

Members participating in the review:

- David Carpenter
- Richard Hitchcock
- Jane Winstone
Appendix 7 – On-Line survey request

Dear Resident,
Thank you for taking part in our Traceable Liquids trial. 6 months ago you were visited by police and provided with individual property marking, utilising a product from either Smart Water, Applied DNA Science or Stealth Mark. As part of this you were asked if you would voluntarily provide an Email address in order for us to carry out a follow up survey with you.

Your answers to this survey will be completely anonymous and we will not ask you for a name or address. The survey is being overseen by a University of Portsmouth doctorate student who is exploring the effectiveness of these products and your responses will help inform this study. **Please take this opportunity to complete the survey via the link below. Your opinions are valuable to us and will be treated with confidentiality.**

[http://www.keysurvey.co.uk/f/529494/2e67/](http://www.keysurvey.co.uk/f/529494/2e67/)

Many thanks in advance.

Iain Raphael
Appendix 8 – Ethic Check List

FORM UPR16
Research Ethics Review Checklist

Please complete and return the form to Research Section, Quality Management Division, Academic Registry, University House, with your thesis, prior to examination

<table>
<thead>
<tr>
<th>Postgraduate Research Student (PGRS) Information</th>
<th>Student ID: UP/36144</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candidate Name: Iain Raphael</td>
<td></td>
</tr>
<tr>
<td>Department: ICJS</td>
<td>First Supervisor: Barry Loveday</td>
</tr>
<tr>
<td>Start Date: Sept 2011 (or progression date for Prof Doc students)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study Mode and Route:</th>
<th>Part-time</th>
<th>Full-time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

| Thesis Word Count: (excluding ancillary data) | 45802 |

| Title of Thesis: | Cooling hot property? An assessment of the impact of property marking on residential burglary crime reduction, crime displacement or diffusion of benefits and public confidence. |

If you are unsure about any of the following, please contact the local representative on your Faculty Ethics Committee for advice. Please note that it is your responsibility to follow the University’s Ethics Policy and any relevant University, academic or professional guidelines in the conduct of your study.

Although the Ethics Committee may have given your study a favourable opinion, the final responsibility for the ethical conduct of this work lies with the researcher(s).

UKRIO Finished Research Checklist:
(If you would like to know more about the checklist, please see your Faculty or Departmental Ethics Committee rep or see the online version of the full checklist at: http://www.ukrio.org/what-we-do/code-of-practice-for-research/)

<p>| a) Have all of your research and findings been reported accurately, honestly and within a reasonable time frame? | YES |</p>
<table>
<thead>
<tr>
<th>b) Have all contributions to knowledge been acknowledged?</th>
<th>YES</th>
</tr>
</thead>
<tbody>
<tr>
<td>c) Have you complied with all agreements relating to intellectual property, publication and authorship?</td>
<td>YES</td>
</tr>
<tr>
<td>d) Has your research data been retained in a secure and accessible form and will it remain so for the required duration?</td>
<td>YES</td>
</tr>
<tr>
<td>e) Does your research comply with all legal, ethical, and contractual requirements?</td>
<td>YES</td>
</tr>
</tbody>
</table>

*Delete as appropriate

**Candidate Statement:**

I have considered the ethical dimensions of the above named research project, and have successfully obtained the necessary ethical approval(s)

<table>
<thead>
<tr>
<th>Ethical review number(s) from Faculty Ethics Committee (or from NRES/SCREC):</th>
<th>12/13:29</th>
</tr>
</thead>
</table>

Signed: *Iain Raphael*  
(Student)  
Date: 06.04.2015

If you have not submitted your work for ethical review, and/or you have answered ‘No’ to one or more of questions a) to e), please explain why this is so:

Signed:  
(Student)  
Date:
Appendix 9 – Example survey questions

Q1
As a resident who has taken part in the Traceable Liquid trial we would like to ask you a few questions regarding the service you received from the police.

Q2
Have you been the unfortunate victim of burglary in the last 6 months?
1. Yes 2. No

Q3
To what extent are you worried about crime in YOUR AREA?

Q4
General opinions of the Police in your area

Q5
To what extent do you agree with the following statements about the police in YOUR AREA?
They can be relied on to be there when you need them
They would treat you with respect if you had contact with them for any reason
They treat everyone fairly regardless of who they are
They can be relied on to deal with minor crimes
They understand the issues that affect this community
They are dealing with the things that matter to people in this community
They listen to the concerns of local people
They are helpful
They are friendly and approachable
They are easy to contact
They would treat you with respect if you had contact with them for any reason
They treat everyone fairly regardless of who they are
They can be relied on to deal with minor crimes
They understand the issues that affect this community
They are dealing with the things that matter to people in this community
They listen to the concerns of local people
They are helpful
They are friendly and approachable
They are easy to contact

Q6
How well informed do you feel about what the police in YOUR AREA have been doing over the last 6 months?
1. Very well informed 2. Fairly well informed 3. Not at all informed 4. Don't know

Q7
Taking everything into account how good a job do you think the police in YOUR AREA are doing?

Q8
Introducing Traceable Liquids to your home
1. Yes 2. No 3. Don't know/Can't remember
Were the officers professional when they visited your home?
Did they give practical help? (e.g) how and where to apply the traceable liquids)
Did they know what they were doing? (i.e. were they capable of their job)
Did they explain what was going to happen and why?
Were you reassured by what the police did?

Did you expect further contact from the police?

Did you know how to contact the police about this if you needed further explanation?

Were you offered stickers to be put up in the front and back of your house?

Did you agree to the stickers being displayed in your house?

Are these stickers still in place?

Does having Traceable Liquids within your home make you feel safer?

Did you feel that your questions were answered adequately?

Did they give practical help? (e.g.) how and where to apply the traceable liquids)

Did they know what they were doing? (i.e. were they capable of their job)

Did they explain what was going to happen and why?

Were you reassured by what the police did?

Did you expect further contact from the police?

Did you know how to contact the police about this if you needed further explanation?

Were you offered stickers to be put up in the front and back of your house?

Did you agree to the stickers being displayed in your house?

Are these stickers still in place?

Does having Traceable Liquids within your home make you feel safer?

Did you feel that your questions were answered adequately?

Q9
Prior to the traceable liquid initiative what was your overall opinion of the police...

Q10
Has your opinion of the police changed since the introduction of traceable liquids to your home?

1. Yes, it has improved  2. Yes, it has got worse  3. No, it has stayed the same  
4. I'm not sure

Q11
To what extent has the fact that your property has been treated with traceable liquids, changed how safe you feel in YOUR AREA?

1. A lot safer  2. A little safer  3. No change  4. A little less safe  5. A lot less safe

Q12
If you would like to talk to someone about an issue in your area or require any further information about policing in London please ring 101 or visit: www.met.police.uk
Please remember in an emergency always ring 999.
Bibliography


(Eds.), *The Oxford Handbook of Crime Prevention* (pp. 300 - 315). Oxford: Oxford University Press.


