

“Repeat Victimisation – Road to Reduction”

Disrupting the Optimal Forager

‘Predictive Mapping and Super - Cocooning in Trafford’

Project Summary

This submission relates to a two year process where Trafford Basic Command Unit (BCU) has sought to address the problem of Burglary Dwelling (BDW) via the operationalisation of academic research.

A journal article (Fielding and Jones, 2012) detailing the findings of Phase 1 of this process have been written to illustrate the cycle of academic research and effective application in a policing environment.

The processes concerned have evolved over time leading to a one year evaluation (Phase 1) followed by a modified application based on recommendations from the Jill Dando Institute (S. Chainey) which formed Phase 2. This second phase was not foreseen at the initial implementation, but is consistent with the problem solving ethos surrounding practical application.

The “golden thread” connecting the methods employed in this study is that of tackling “Repeat Victimisation”.

The initial approach was adapted from an original article produced by Ross and Pease 2007, ‘Predicting where Lightning will Strike’.

Initial scanning within Trafford showed 61% (n-752) of Burglaries in the 12 months prior to implementation would have been within a predicted area. This demonstrated a significant opportunity for coordinated and concentrated action on the part of a number of agencies to successfully address this issue.

A response was developed from the research which involved examining the propensity of offenders to return to a familiar area and the placement of a capable guardian in these areas at the right time in an attempt to disrupt the offending pattern of the ‘optimal forager’ (Phase 1).

During the first 12 months, Trafford BCU saw a -26.6% (n-327 BDW) reduction in BDW compared to the 12 months prior to implementation, outperforming its most similar groups both within Greater Manchester Police (GMP) and nationally.

This has been further enhanced by an effective systematic programme of cocooning and target hardening based on the communicability of burglary risk from Jill Dando Institute of Crime (JDI) review (Phase 2).

Over the two years, this targeted intervention has assisted in the 38.2% reduction in BDW.

The scientific research around this subject has been used in a simple and cost effective manner to the produce predictive patrol plans and additional complimentary cocooning interventions. This demonstrates an effective and efficient use of available resources.

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SCANNING

The fiscal year of 2009/10 showed 1,302 Burglary Dwelling (BDW) offences committed across Trafford, a reduction of 5.5% from the year before (ranking Trafford 7th out of the 12 Greater Manchester Police (GMP) divisions) but below the level of 7%, achieved nationally. The new target for 2010/11 was then set at 1,181 BDW offences, requiring a 9.3% reduction, almost twice the previous reduction.

Traditional policing methods around BDW tend to focus on costly, resource intensive “reactive” policing, i.e. response, investigation and “cocooning”. A fresh approach was deemed necessary to “pro-actively” police areas, utilising modern criminological theory and straightforward operational methodology, requiring little cost and making better use of existing resources within police and partnership agencies.

Trafford Basic Command Unit (BCU) had the lowest weekly mean across GMP indicating that achieving the reduction by traditional methods could prove difficult. However, opportunistic BDW was high (28% by insecurity) and Trafford’s social-demographic profile (using the vulnerable localities index) appeared to be representative of Greater Manchester (GM), identifying Trafford as an ideal testing ground for a new “pro-active” policing technique.

The criminological theory that pervaded the project from its inception, was firstly a study by Farrell and Pease in 2007, who commented on the “Optimal Forager”, an offender who is unsophisticated in his approach to offending, who looks for the easiest opportunities and minimum amount of risk and therefore continues to return to that area until the opportunities are exhausted or the risk of detection becomes too risky.

Due to the nature of these “Optimal Foragers” they argued the possibility of predicting offending patterns. Studies (Johnson and Bowers, 2004; Ross and Pease, 2007) showed that over a period of six weeks, domestic burglaries are most likely to occur within 400 metres of the last BDW offence, with the risk diminishing over that period. This theory provides the basis to predict the areas that offenders are most likely to offend and enable the police and its partners to put in place an effective disruption tactic.

Using this methodology to predict ‘Optimal Forager’ offences enables existing resources (i.e. police/PCSO patrols) to be efficiently deployed to disrupt and deter. Effective methodology could also provide opportunities for other departments of GMP and partnership agencies to be utilised in a more dynamic manner.

To make the project work, all stakeholders and senior leadership members had to be focused on driving the production and use of the maps to address the following objectives:

- Reduce BDW in Trafford
- Reduce the numbers of victims and repeat victims
- Reduce the fear of crime
- Give new impetus to sustainable working partnerships at minimum cost

ANALYSIS

The source of the data has predominantly come from the analysis of crimes figures and surveys but was supported by the opinions of local residents and their fears of certain types of crimes. Open sources were used to gain a nationwide perspective. No issues arose regarding the validity of BDW offence locations. Through reading various academic papers, only distraction burglaries are thought to be under-reported. However, this methodology is not specifically aimed at this type of Modus Operandi (MO). Maintaining positions of offences on the mapping systems will be fundamental to the success.

Problem Analysis Triangle

Offender:

There were 89 offenders charged/cautioned with BDW offences in the last 12 months in Trafford with 88 of these being male. Two thirds of the males were between 16 to 25 years old, with 1 in 5 having previous convictions for shoplifting, half being linked to business and personal robberies and over half linked to S.47 assaults/common assaults. This highlights the propensity of burglary offenders to commit numerous types of offences, not solely active in one area of criminality.

Victim:

Trafford has approximately a tenth of the population, ethnicity and area of GM (213,000 residents, 41 sq miles, 89% White, 5.1% S. Asian, 2.3% Black and 2.9% classed as other). These figures demonstrate that Trafford could be used as a sample area of GM, improving the possibility of rolling this methodology out across GM if successful.

The analysis showed that the victims of BDW offences followed the general trend of homeowners within Trafford, creating the inference that burglars were not targeting an age group, which could have required a more bespoke response.

Location:

Preliminary testing of Pease and Ross (2007) theory of 'Predicting Where Lightning Will Strike' within Trafford revealed that 61% (n~752) of BDW offences would have occurred within a predicted area, with 30% (n~373) being within a "high risk" area. This identified Trafford's susceptibility to near repeats, pointing to the use of directed disruption tactics to deter offenders repeatedly targeting an area.

Previous responses have only focused on one or two sides of the problem analysis triangle. For example, Operation Magadan targets offenders at their home addresses and Operation Spotlight focused on target hardening properties across Trafford. These operations and initiatives have been restricted by a lack of statistical evaluation, thus limiting their transferability and preventing development work.

Project Objectives

Completion of the analysis led to the creation of one main objective with associated hypothesis to statistically test and two secondary objectives. Also built into the objectives were ways in which they would be measured.

Main Objective:

Reduce the number of victims of BDW within Trafford by disrupting the 'Optimal Forager'.

Statistical hypothesis of main objective to test:

Hypothesis – "There has been a statistically significant reduction in Burglary Dwelling offences."

Null Hypothesis – "There has not been a significant reduction in Burglary Dwelling Offences."

Secondary Objectives:

- 1) Provide crime prevention advice, distribute any available crime prevention products in key areas and provide reassurance to improve confidence of residents across Trafford.
- 2) Use this methodology to identify persistent problem locations to lead environmental survey sites.

The expected partnership objectives were to help reduce BDW offences by acting as capable guardians in the hotspot areas, to distribute crime prevention advice in hotspot areas and for Housing Trusts to improve locations by target hardening properties in risk areas.

Effective Evaluation

The following methods were selected to evaluate success.

- Comparisons to
- Before vs. After
 - Same period in the previous year (accounts for seasonality)
 - Most similar GMP BCU (Stockport – Control Sample)
 - All Divisions and GMP
 - National most similar groups BCU's
 - Statistical Testing

Planned Time Frames

Building on from the objectives a timeline of events was created (See Appendix 1), including development, implementation, evaluation and distribution of results for Phase 1 to maintain focus of police and partnership resources through the process.

It was decided that to effectively evaluate this approach, there would, if successful at each stage, be 3 stages of evaluation. The stages of evaluation would be at 3, 6 and 12 months. At each of these stages, evaluation would determine the future for the approach, whether there would be alterations made or simply a discontinuation. The project would look prior and post implementation, allowing statistical evaluation to be performed as well as comparisons to control samples locally and nationally.

RESPONSE

The scanning and analysis stages emphasized the simplicity of the concept and this needed to be maintained in the response and involvement of partnership agencies. For this to happen each side of the PAT triangle was considered in order provide a holistic response.

Initial Design of Partners Involved

A list of potential key partner agencies and additional support was drawn up that would be required for successful implementation of this project. These included:

- GMP - Divisional Officers, Crime Reduction Advisors, Intelligence Officers, Driving School Instructors
- Trafford Council - Community Safety Patrollers
- Greater Manchester Fire Service (provide additional capable guardianship after callouts)
- North West Ambulance Service NHS Trust (consequently deemed unsuitable due to perceived conflict with their primary purpose)
- Youth Offending Service
- Probation Services
- Registered Social Landlords (crime prevention advice and target hardening)
- The AA and RAC (provide additional capable guardianship whilst on downtime)
- Victim Support

Burglary Risk Maps

The maps were designed and developed and the output shown in Appendix 2, showing the level of risk in the area. These maps were distributed to the partners who were identified as being key to the response.

Location Based Responses:

Through the production of Burglary Risk Mapping, key areas are persistently being targeted for deployment of resources.

- Police and Partner agencies used the Burglary Risk Map documentation produced weekly to focus resources, particularly at key times highlighted.
- Crime Reduction Advisors setup days of action for crime prevention within high-risk areas (identified by the predictive maps) with the aid of partner agencies (Fire Service)
- North and South Safer Groups with Registered Social Landlords conducted environmental surveys within persistent high-risk areas to identify potential crime enhancers. Areas were identified and drawn into an action plan utilising partnership financial resources.

Victim Based Responses:

To subtly convey the message to residents that they live in a high-risk area by means of the effective distribution of crime prevention equipment in addition to high visibility patrols providing reassurance.

- PCSO's visited victims of domestic burglary following an offence to assess the need of target hardening, provide crime prevention advice and reassurance by being visible within high-risk areas. This received positive feed back from residents.
- High-risk areas were targeted for distribution of crime prevention advice. Victims and potential victims have been targeted for support. Utilising the maps has ensured the most vulnerable areas and people are selected, reducing the propensity of repeat victimisation.
- With the development of geographical positioning and tracking of resources, both within the Police and external agencies, offers the new possibility of controlling resources and being able to measure visits to an area. A mobile communication system (text message based) called iCan also provides the possibility of targeting potential victims quicker and more efficiently if the at risk area is known.
- The system of iCan is being developed to allow victims, who are particularly at risk from a BDW, to be contacted with advice and a contact number for any information or suspicious activity. The system is supplemented by the GMP Neighbourhood Management System to circulate crime prevention advice to those residents considered at greatest risk.

Offender Based Responses:

Identifying unknown offenders within an area who could be offending, via improved intelligence processes. This was used to identify potential 'Optimal Forager' type offenders in risk areas prior to an individual committing an offence in order to deter them from offending through either the presence of a 'capable guardian' or interacting with the offender on the street.

- Intelligence Officers (IO) on a daily basis identify, (using stop and search forms and intelligence submissions) individuals within high-risk areas. This is assisted by officers marking the Stop and Search form with a simple cipher denoting a stop in a risk area and always starting intelligence submissions with the word "orange" or "red" etc to illustrate it related to activity in a risk area.
- Offender Management Unit, Youth Offending Services and Probation made aware of individuals stopped within high-risk areas to ascertain current risk those individuals pose and conduct visits to offender's addresses to prevent future offences.

Partnership resources were tasked more effectively and efficiently performing the role of 'capable guardian'. The Burglary Risk maps have allowed the police to influence the allocation of Local Authority and partner resources to supplement capable guardianship.

Main Problems Encountered

- Police – "Always done it this way, why change? What can an academic tell me about policing?"

Attitude – Necessary to overcome negativity and illicit assistance to cascade rationale. This needed string management and full SLT support.

- Local Council – No control on how they use their resources, maps can be sent but it might not fit their agenda.

Regular meetings were setup during council briefing sessions to explain the concept to the community safety patrollers and feedback was that it gave them more purpose as they used to just visit areas that they knew.

- Project – After 6-month evaluation it was noted that there were two different patterns, weekdays and weekends.

Distribution was altered to bi-weekly, once on Monday morning for the following 4 days and Friday morning to cover the weekend. This ensured the most up-to-date data was used to create maps without significantly adding to the analyst's workload.

Was there a Requirement for an Exit Strategy?

No. This involved the more effective and efficient use of existing resources. It was therefore not anticipated that there would need to be a planned exit strategy as only mainstream resources were used and if unsuccessful a return to original deployments would have minimal effect. If successful, deployments would continue with intelligence led patrolling.

ASSESSMENT

As the project was continued for two years which wasn't initially seen, the assessment has been split into two sections Phase 1, reviews this first 12 months and Phase 2, detailing another tactical intervention and the review of this.

Phase 1 - Seasonal Trend Analysis

Appendix 3 shows the 12-month prior and post implementation, accounting for seasonality. Results showed that the mean number of offences post implementation had reduced from 23.6 to 17.3 BDW a week.

Since implementation there have been three recalculations of the mean and standard deviation (SD), due to 8 weekly counts below the initial mean that was calculated. This requirement of recalculating the mean was not required in the 12 months prior to implementation. In 12 months post implementation there have been 5 occasions where counts have dropped below 2 SD's, a phenomenon only seen once in the 12 month prior.

Peaks can still be seen post implementation, but now there is better understanding of the increases as there is not as much 'noise' from other, easily deterred offenders. Thus allowing "Investigators to Investigate".

Prior and post analysis showed that Trafford BCU had reduced the number of BDW from 1229 to 902 (-26.6%). Out of 12 BCU's in GM, Trafford ranks 2nd in percentage decrease and 4th in count decrease. The BCU's with larger count reductions had almost double Trafford's count of BDW and during the analysis period had large numbers of force resources to combat the problem, which Trafford did not experience.

Phase 1 - Most Similar Group (MSG)

When compared to the control samples (MSG within GMP and Nationwide) results were impressive. Stockport BCU (which is the most similar to Trafford) showed a 7% increase in the same time period whilst GMP as a whole showed a reduction of 9.8%, both far less than the reduction seen in Trafford.

Appendix 4 from iQuanta system, measures Domestic Burglaries by 1000 households against most similar groups nationally. The first chart indicates that prior to implementation burglary rates were amongst the worst across the groups and were higher than the mean. Post implementation indicates an improvement of four places and the level now falls below the mean. When running the graphs for all crime, Trafford only moved one position, which shows the vast improvement specifically within BDW.

Phase 1 - Statistical Testing

During the analysis stage, a statistical hypothesis was created to test the main objective of significantly reducing burglary dwelling.

Statistical Hypothesis of Main Objective to test:

Hypothesis – "There has been a statistically significant reduction in Burglary Dwelling offences."

Null Hypothesis – "There has not been a significant reduction in Burglary Dwelling Offences."

A time series analysis producing a T value was used to test this hypothesis on the counts of BDW in the 52 weeks prior to implementation against the 52 weeks post. The results showed a significant reduction of BDW offences at a 99% confidence level meaning the hypothesis could be accepted and the null hypothesis rejected.

Phase 1 - Predicted Area Results

One of the biggest questions though is how do Trafford know they have been successful in areas which they have targeted. To do this we retrospectively looks back at 12 months prior to implementation and established how many offences we should see within each risk area. This allowed an evaluation to take place post implementation to determine if we have altered offending.

Analysis showed that prior to implementation 61% of BDW offences (752 out of 1231) occurred within the predicted areas - post implementation shows this figure is now 47% (433 out of 902) and demonstrates the tactics used impacted upon the count and location of offences.

Particularly of interest is the reduction that has been seen with the target areas of Orange and Red (where available resources were informed to target – hyper risk and high risk areas). Within these areas a 48% reduction (prior - 373 BDW, Post - 194 BDW) was seen, almost double Trafford BCU's average reduction. Within the Orange area alone, there was a 52.5% reduction (-73) in BDW offences.

As Appendix 5 shows, all areas have seen a reduction in offences but outside the predicted area, offences have decreased at a disproportionately smaller rate compared to predicted areas.

Of note, outside predicted areas it was found that the level of insecure BDW offences increased to 38%, higher than 28% (Trafford average). This percentage suggests the 'Optimal Forager' is moving into unfamiliar areas and committing fewer offences but also being more visible to residents and resources.

Phase 2 – Super Cocooning Development

This concluded the initial Phase 1 of the work. Findings and problems encountered during implementing were written into a journal article (Fielding and Jones, 2012). Following this a review was conducted by Spencer Chainey (JDI) who made recommendations aimed at galvanising progress to date and increasing aspects of operational effectiveness on a number of levels. The review stated Trafford BCU still showed a repeat (RV) and near repeat victim (NRV) pattern of BDW offences, specifically within 7 days of the initial offence, recommending more emphasis could be given to the victim aspect of the triangle.

Similarly to the predictive mapping, research was conducted on the current understanding of this problem (Cohen and Felson 1979, Polvi et al 1991, Farrell and Pease 1993, Johnson and Bowers 2001, Townsley et al 2003, Johnson and Bowers 2007). Building on the academic research of Johnson and Bowers 2007 (Appendix 6), Trafford attempted to develop a tactical response to reflect their findings. This led to the creation of standardised cocooning activity termed 'Super-Cocooning'.

The standardised format is as follows, after a BDW offence a dedicated burglary car visits the targeted address (Appendix 7 - Blue Address) and two addresses either side to provide physical target hardening to the addresses. Then local neighbourhood teams would be tasked from the central Trafford office to visit 8 more either side, 20 addresses opposite and 5 addresses behind the burgled address. These numbers were chosen as it reflects the risk highlighted from the academic research (Appendix 6) and in discussion with neighbourhood teams it was seen as feasible numbers of residents to engage.

The resources that were tasked with the 'super-cocooning' were instructed to have face-to-face interactions with the residents and not simply leaflet addresses. A feedback sheet was also implemented to ensure compliance and accountability, allowing effective evaluation of the new tactic.

Officers visiting the address were provided with a seasonally adjusted script to highlight the low chance of being a victim but ways in which residents could lessen the chance. This gave a link for intelligence back from residents whilst allowing officers to perform basic surveys of addresses to refer to the crime prevention officers if necessary. Whilst completing the 'super-cocooning' officers are present in risk areas, engaging with potential victims that require reassurance and also potential offenders who are looking for another opportunity.

Phase 2 – Evaluating Super Cocooning (6 Months)

At the implementation stage it was decided number of addresses visited, neighbourhood survey results, number of repeat and NRV would determine the success of this tactical response:

Address Visits – Results from the compulsory feedback sheet showed after 6 months of implementation there has been 447 addresses offered physical target hardening and 9,423 addresses visited which equates to 10% of the addresses in Trafford (n=94,000). In terms of type of contact, 38.4% (3,621) had the recommended face-to-face contact from an officer. However this percentage varied across the four neighbourhood areas in Trafford which needs addressing in the future through analysis of time officers are being sent to addresses.

Neighbourhood Survey - In October 2011, 86% of residents had 'Confidence in the Police doing a Good Job'. By April 2012, this figure was at 92.3%, best in force. No other Division in GMP saw an increase on this level however it is not possible to definitively draw conclusions that this increase is solely down the 10% of residents in Trafford being in contact with the police due to the 'super-cocooning' activity.

NRV – Using the Near Repeat Calculator (Ratcliffe 2007) showed that NRV, particularly within 7 days had reduced but there was still a significant trend. It is believed that improvement of the current 38.4% face to face interaction will reduce this trend.

Phase 1 and Phase 2 – Reducing Repeat Victimisation (RV)

The thread through this whole project has been tackling RV. Nationally the rate of RV is approximately 15-20% which demonstrates the significant reduction that can be made if this type of victim is targeted.

Appendix 8 shows the count of BDW RV's in Trafford contributed for the last four years. In the two years prior to implementation of predictive mapping (Red Squares) there were constantly 50-55 RV's contributing over 100 offences.

In the first year (Phase 1) of the predictive mapping being implemented the number of RV's fell to 30 victims contributing 63 offences. During 2011/12 (Phase 2) with the 'super cocooning' activity the number of RV's fell again to 15 contributing 30 offences. Over two years this is a reduction of 35 RV's but more importantly over 70 offences. Trafford's RV's now account for 2% of total BDW victims.

Phase 2 – Going Equipped

One add on to the predictive mapping during this project has been the successful use of stop and search powers, measured by arrests for the offence of Going Equipped for Theft. This rose dramatically by comparison to previous years with a 100% increase (12 in 2009/10 to 24 in 2011/12). This echoes the original aim, which sought to place a resource in the right place at the right time, meaning they would more readily come into contact with would-be offenders, having the opportunity to disrupt or arrest as appropriate.

Conclusions

What has been described in the preceding sections illustrate our journey of research, practical application, evaluation, amendment and further application. It demonstrates the value of embracing academic research as a means of producing enhanced operational effectiveness.

The design from the initial concept has been altered dramatically throughout the course of implementation and analysis to make it more specific to the needs of the users.

The theory of the project was to reduce BDW by disrupting the 'Optimal Forager'. The results demonstrated a reduction in this offence type and through analysis of the location a disruption of this type of offender.

The approach was adapted from an article produced by Ross and Pease 2007, 'Predicting where Lightning will Strike'. This has latterly been enhanced by an effective systematic programme of cocooning and target hardening based on the communicability of burglary risk (Johnson and Bowers 2007).

The Phase 1 response to that research involved examining the propensity of offenders to return to a familiar area and the placement of a capable guardian in these areas at the right time, attempting to disrupt the offending pattern of the 'optimal forager'.

This approach has now been operational for two years with results being favourable for the reduction of BDW. Trafford BCU saw a substantial reduction in BDW offences, outperforming its most similar groups both within Greater Manchester Police (GMP) and nationally.

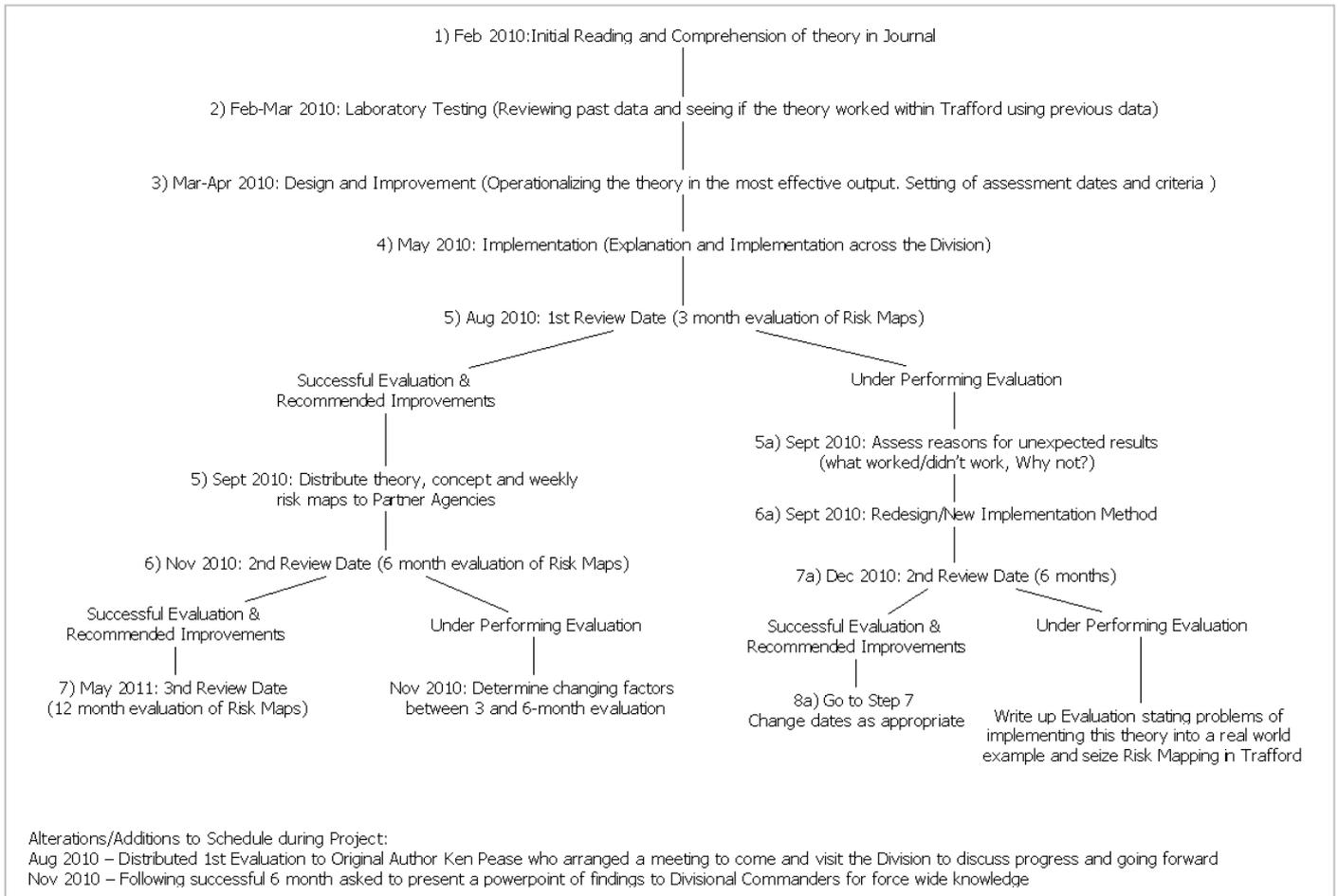
Phase 2, built on phase 1 was more targeted towards victims and how targeted intervention of Trafford residents could further reduce BDW offences.

This project has used scientific research in a simple and cost effective manner to produce patrol plans with complimentary cocooning interventions. The established processes based on the scientific research combined with strong management have played a significant part in the 38.2% reduction in BDW offences.

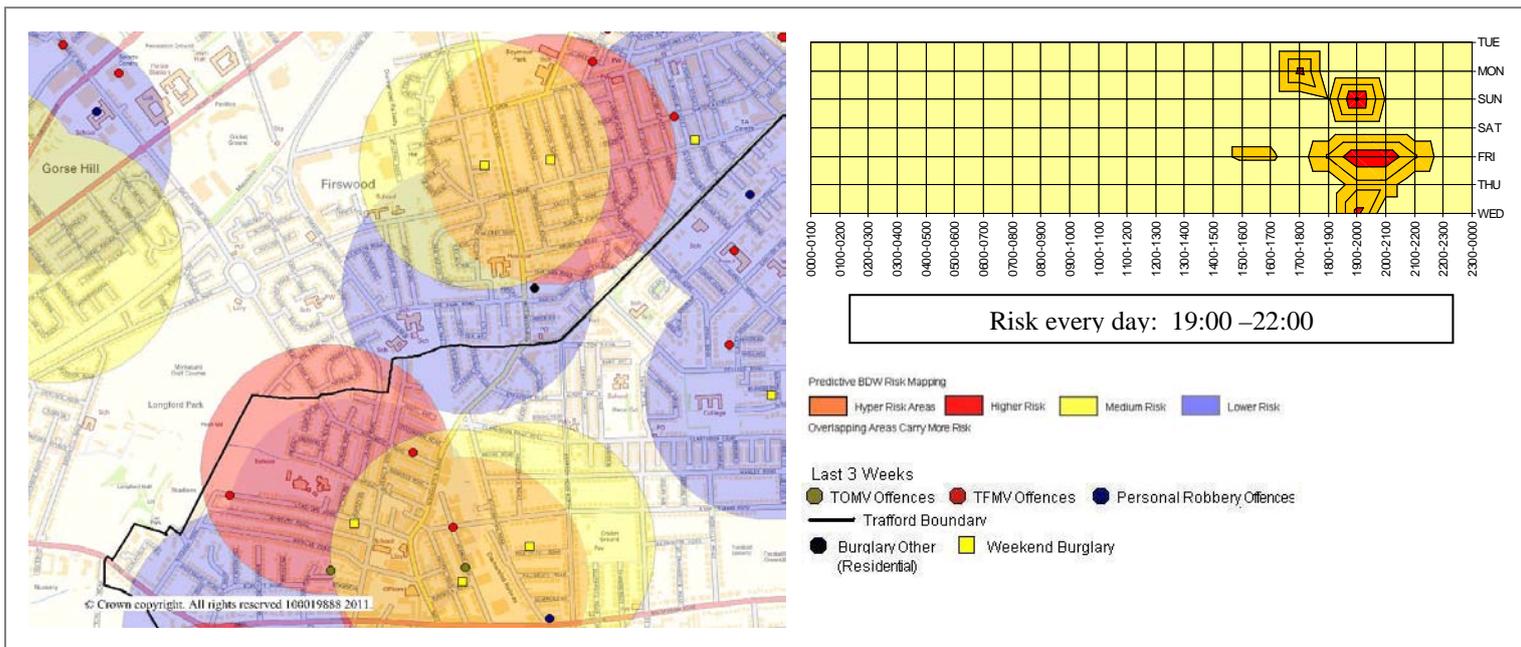
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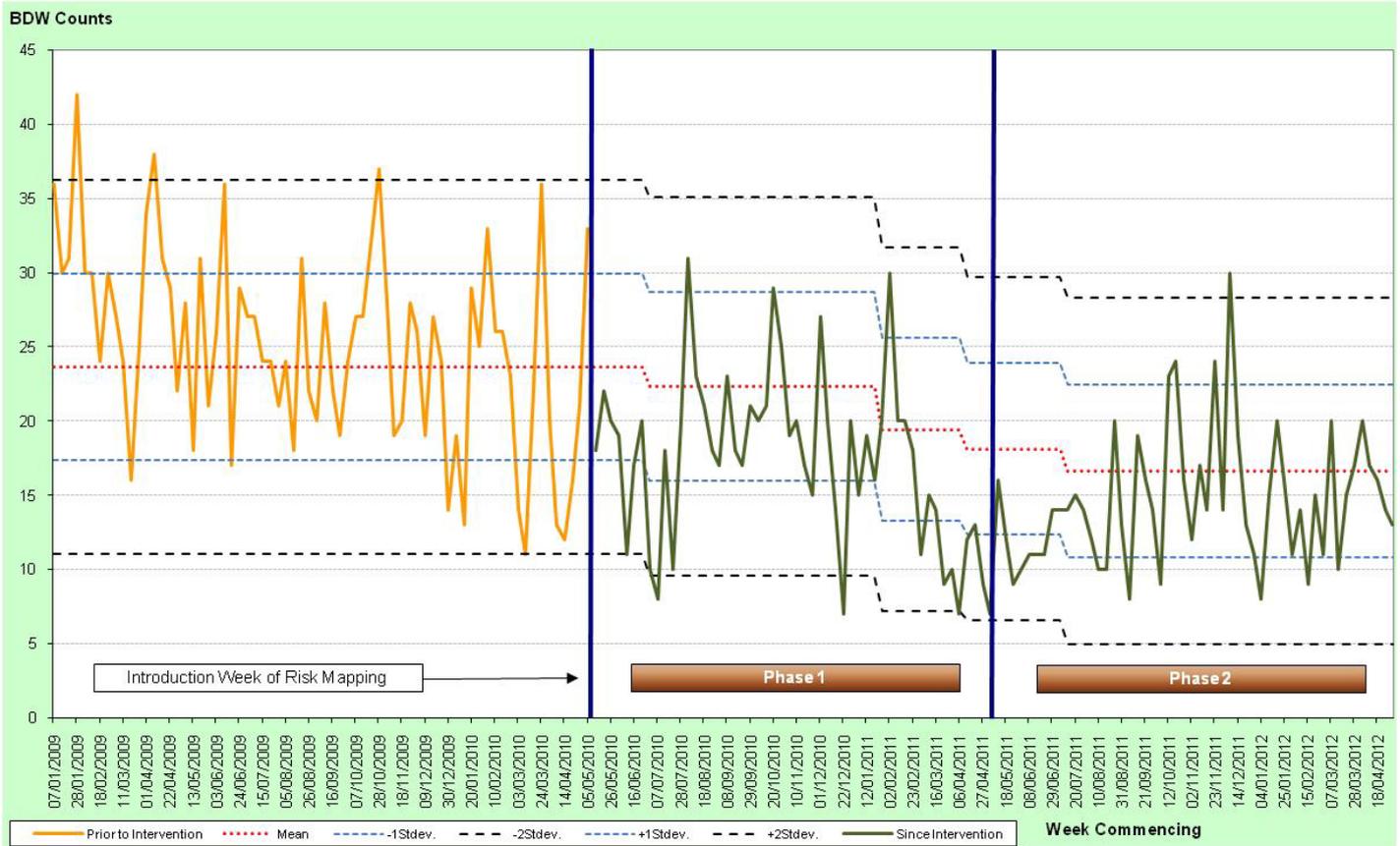
Appendix 1



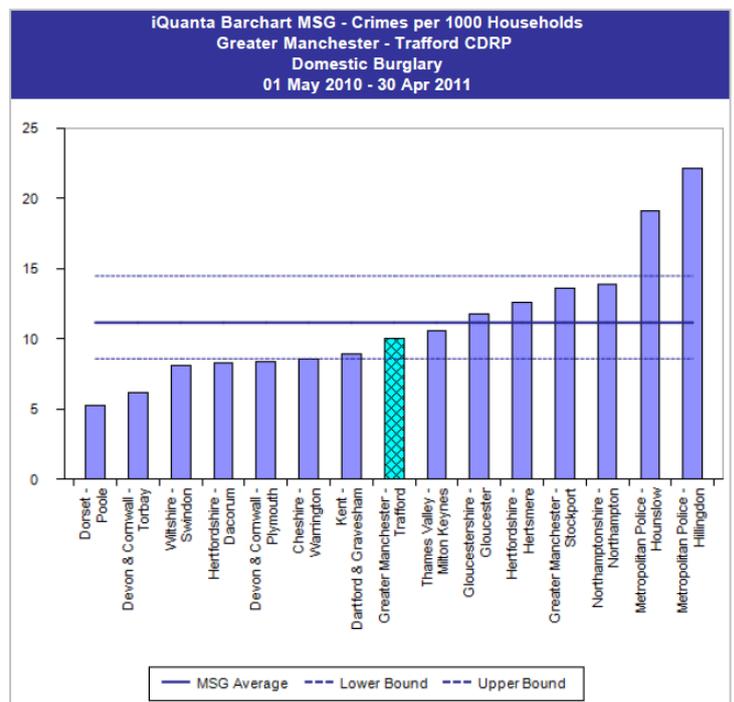
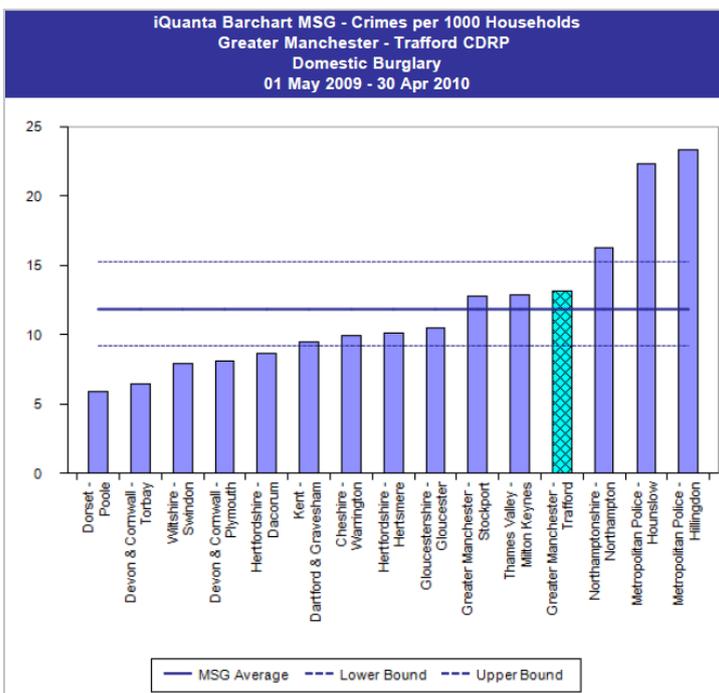
Appendix 2



Appendix 3



Appendix 4

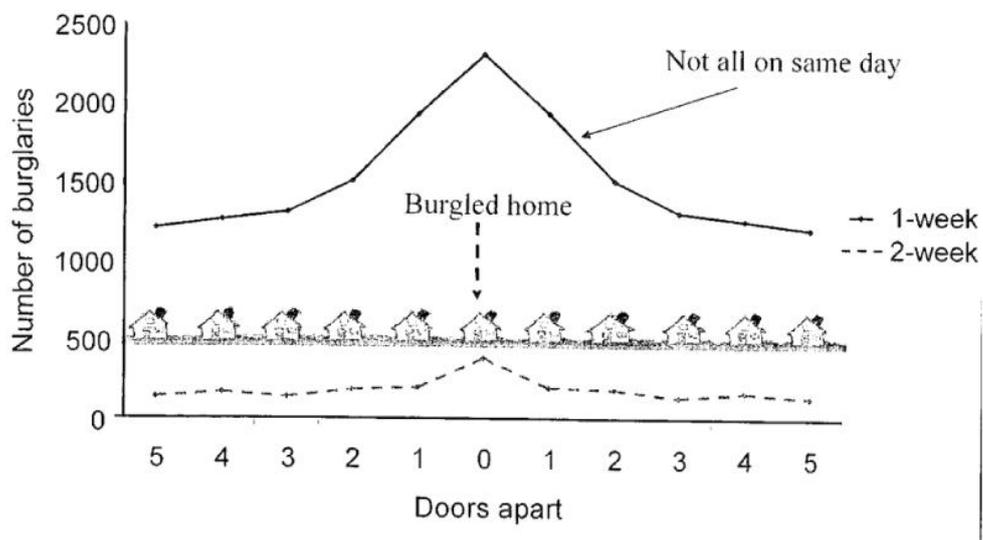


Appendix 5

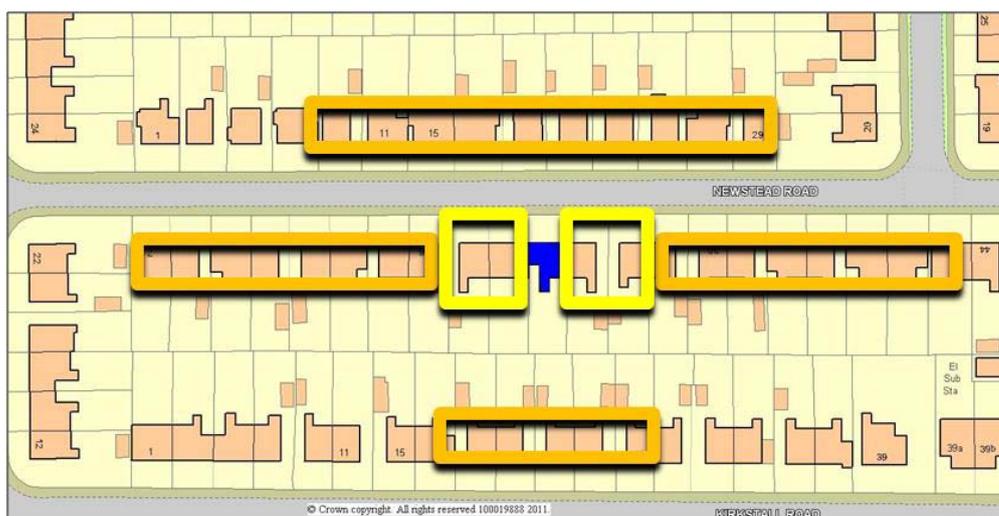
Count of BDW's	Inside Orange Areas	Inside Red Areas	Inside Yellow Areas	Inside Blue Areas	Outside Predicted Areas	Total
12/05/10-10/05/11	139	234	218	159	479	1229
13/05/09-11/05/10	66	128	141	97	470	902
Change	-52.5%	-45.3%	-35.3%	-39.0%	-1.9%	-26.6%

- Orange areas are any overlapping Red and Yellow areas – hyper risk.
- Red areas are a 400m radius around Burglaries in the previous week – high risk.
- Yellow areas are a 400m radius around Burglaries, 2 weeks previous – medium risk.
- Blue areas are a 400m radius around Burglaries, 3 weeks previous – low risk.

Appendix 6



Appendix 7



Appendix 8

