

# Assessing the evidence base of a police service patrol portfolio

Howard Veigas\* and Cynthia Lum\*\*

**Abstract** Financial pressures on police forces are driving a re-evaluation of the legitimacy, effectiveness, and value for money of law enforcement services and activities. Evidence-based policing—using the best available research and analysis to help guide police practice—has been seen as an important tool in this era of austerity and accountability, but how is it to be accomplished? This study provides one demonstration of how such an effort might begin—by applying a large body of police research to assess a range of practices in one police service in the UK. Such evidence assessments are valuable strategic approaches in the absence of evaluations, when agencies are faced with choices about what programmes to retain or cut. This study is the first in the UK or the USA to apply the Evidence-Based Policing Matrix systematically to assess crime control effectiveness across a range of a police department's patrol strategies.

## Evidence-based policing in an age of reform and austerity

Two influences have weighed heavily on both UK and US police agencies in the recent decade. The first is the push for police to become more accountable for reducing and preventing crime using the best available knowledge, analysis, and research. The second has been the recession in Europe and North America, which has led to police cutbacks, layoffs, and in some cases agency consolidation or elimination. Although these two influences may appear unrelated, accountability and austerity each has the potential to instigate fundamental changes in policing and lead to reassessments of the value for money of police services and activities.

More specifically, both of these have manifested as a more general push for evidence-based policing.

For example, in the UK, the Home Office published a high-level working group report (Home Office, 2010) that asserted that over the coming years forces would need to meet twin challenges of increased financial pressure and continued expectation from the public for a high level of service. The government anticipated that effective patrol deployment and the use of evidence-based approaches would be at the heart of this police strategy. In 2012, Her Majesty's Inspectorate of Constabulary (HMIC) appointed an Academic Advisory Group to provide information for the newly elected Police and Crime Commissioners<sup>1</sup>

\*Derbyshire Constabulary, Derbyshire DE5 3SU.

\*\*George Mason University, Center for Evidence-Based Crime Policy, Department of Criminology, Law and Society. E-mail: clum@gmu.edu

<sup>1</sup> See <http://www.homeoffice.gov.uk/police/police-crime-commissioners/public/what-is-pcc/>.

on 'What works in policing to reduce crime'.<sup>2</sup> These efforts, along with the new College of Policing and the What Works Centre for Crime Reduction<sup>3</sup> emphasize the importance of evidence-based policing as a core value and working framework in facing the demands of accountability and austerity. In the USA, recent funding vehicles by the Bureau of Justice Assistance have explicitly required programs requesting funding to either be supported by research evidence or at least show use of data-driven, analytic approaches.<sup>4</sup> The National Institute of Justice also prefers proposals for policing evaluations that use the highest level of methodological rigor, and in recent solicitations has requested cost-effectiveness analysis.<sup>5</sup>

Why has evidence-based policing featured so prominently in this recent discourse of accountability and austerity? By definition, evidence-based policing, as described by Sherman (1998), is the idea that police should use the best available evidence, knowledge, and analysis to make sound decisions about how to deal with crime and organizational operations. This approach is counter to the notion that decisions about law enforcement strategies and tactics should be developed and justified only using standard operating procedure, the rule of law, officer experience and hunches, or traditions and habits (Lum, 2009). Rather, an evidence-based approach holds policing accountable to such measures as crime prevention, police legitimacy, and citizen satisfaction. This linking of decisions to measurable outcomes, then sets the framework for accountability through both evaluation and data-driven approaches. Of course, not every strategy in every agency can be evaluated or be based on research evidence. However, an evidence-based approach requires at least (1) an attempt to use tactics which reflect principles of effective crime

prevention (Lum *et al.*, 2011) and (2) that research and analysis are a 'part of the conversation about what to do about reducing crime, increasing legitimacy, and addressing internal problems' (Lum *et al.*, 2012, p. 62).

In turn, because of its focus on justifying interventions through some objective measuring tool (e.g. research, science, evaluation, and analysis), evidence-based policing has also become intertwined with the contemporary fiscal crises in policing, regarded as an approach that might help police do more with less by assessing the cost-effectiveness of police activity. Research in policing has already challenged the traditional mainstays of police services that may have little impact on crime but that use a large amount of police resources (e.g. random beat patrol, rapid response to calls for service, case-by-case investigations). Although law enforcement has not necessarily aligned itself with this body of knowledge, research is beginning to be used to at least question the cost-effectiveness of police tactics. As Sherman adds in a 2010 lecture, 'cost saving is an opportunity to introduce evidence' (Sherman, 2010).

Given this environment, scholars and practitioners are together determining how to use research in ways that can advance both evidence-based policing and also cost-effectiveness (as we are doing here). One approach is to use the body of research to inform decisions about programme cut-backs, which directly challenges past approaches. Previously, seniority and preference drove these decisions; those with the longest time served were retained over those recently hired, regardless of contribution to the agency. Civilian employees were the first to be dismissed, even though some (such as crime analysts) might be essential to crime reduction and prevention efforts. Programmes and people deemed 'core' and 'essential' by senior

<sup>2</sup> See <http://www.hmic.gov.uk/pcc/what-works-in-policing-to-reduce-crime/>.

<sup>3</sup> See <http://www.college.police.uk/>.

<sup>4</sup> See e.g. the Smart Policing Initiative (<https://www.bja.gov/Funding/13SmartPolicingSol.pdf>) or the Byrne Criminal Justice Innovation Program (<https://www.bja.gov/Funding/13BCJIsol.pdf>).

<sup>5</sup> See e.g. the 2013 Research and Evaluation on Policing solicitation (<https://ncjrs.gov/pdffiles1/nij/sl001035.pdf>).

command were retained, while programmes unpopular among officers or the command staff may be cut even if they were in fact reducing crime. And some programmes may be retained based on personal belief that they work or because citizens like them, no matter the costs (Drug Abuse Resistance Education, or DARE, in the USA comes to mind). But Sherman reminds us that ‘we are all entitled to our own opinions, but not to our own facts’ (Sherman, 1998, p. 4). Using knowledge about outcome effectiveness to make hard decisions about which programmes to retain, cut, or reform may prove a more justifiable and effective strategy for agencies facing both pressures of accountability and austerity.

This study is the first to use the *Evidence-Based Policing Matrix*<sup>6</sup> (herein, ‘the Matrix’, see Lum, 2009; Lum *et al.*, 2011) to conduct such an evidence assessment in one of England’s 43 police services—Derbyshire. We compare Derbyshire’s tactical patrol portfolio (22 patrol deployment programmes in total) against the visual display of research evidence about effective policing in the Matrix. Through this process, we identify types of patrol deployment that might be reconsidered.

## What is the evidence? Police research and the Evidence-Based Policing Matrix

Historically, law enforcement agencies like Derbyshire have generally relied upon a traditional model of policing. This model, based on adherence to standard operating procedures, random preventative patrol and reactive response to calls for service regardless of the concentration of crime at places, case-by-case investigation through specialized units, and an emphasis on arrest, continues to dominate operations in both the UK and USA. However, we now know from a large body of

rigorous research that many of these mainstays of policing are not very effective in reducing or preventing crime. One of the most influential reviews of research was the 1997 University of Maryland report to Congress, conducted by Sherman and his colleagues, on ‘What Works, What Doesn’t, and What’s Promising’ in crime prevention, (later updated in Sherman *et al.*, 2002). Taking into account the methodological quality of studies, the policing section of those volumes concluded that directed patrols of hot spots, proactive arrests of repeat offenders and drunk drivers, and problem-oriented policing were strategies that appeared to be effective, not reactive arrests, increasing numbers of police, or even some community-oriented policing tactics.

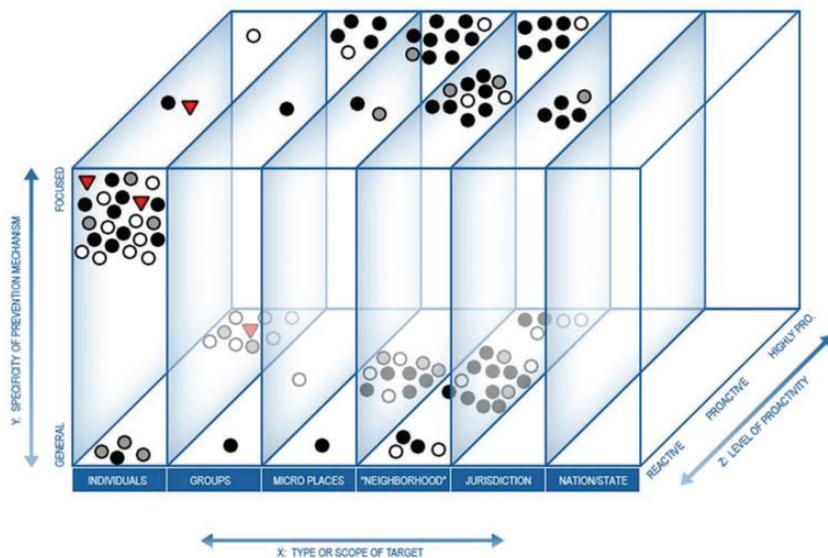
The Maryland report was supplemented by other compilations, which have repeatedly pointed out that the traditional policing approach may not as effective as had been assumed. These included a series of systematic reviews by the Campbell Collaboration Crime and Justice Coordinating Group beginning in 2000, targeting more specific policing areas and using only high-quality evaluation studies.<sup>7</sup> Many of these systematic reviews again found that proactive and place-based approaches seemed most effective in reducing crime, findings that were supported by a 2004 National Research Council (NRC) report on research across a range of policing areas. The report covered crime prevention effectiveness as well as organizational and cultural dimensions of policing (NRC, 2004; see also Weisburd and Eck, 2004).

In an effort to make this large body of research evidence more accessible to practitioners in terms of both generalized principles and specific examples of interventions, Lum, Koper and Telep developed the *Evidence-Based Policing Matrix* at the Center for Evidence-Based Crime Policy at George Mason University<sup>8</sup> (see Lum, 2009; Lum *et al.*, 2009,

<sup>6</sup> See <http://cebcp.org/evidence-based-policing/the-matrix/>.

<sup>7</sup> To view specific studies, see [http://www.campbellcollaboration.org/crime\\_and\\_justice/index.php](http://www.campbellcollaboration.org/crime_and_justice/index.php).

<sup>8</sup> See [www.cebcp.org](http://www.cebcp.org).



**Figure 1:** The Evidence-Based Policing Matrix (Lum *et al.*, 2009, 2011). Inverted triangle: significant backfire (increased harm, recidivism or crime); open circle: non-significant finding; grey circle: mixed finding (both significant and non-significant findings); filled circle: successful intervention (statistically significant finding).

2011). A detailed description of the Matrix is provided in Lum *et al.* (2011) and online, and will only be summarized here. The Matrix is a visual organization of all moderate to rigorous<sup>9</sup> research on police crime control interventions. At the time this study was conducted, the Matrix contained almost 100 evaluated interventions, and has grown to 125 since (it is updated yearly). Its focus on crime control means that not all police activities or issues are included in this Matrix. However, it does provide one freely accessible online tool with which to develop and assess evidence-based policing strategies.

Each evaluation in the Matrix is individually mapped into a three-dimensional visualization (Fig. 1) by common crime prevention dimensions of the intervention studied. These common dimensions make up the Matrix's *x*-, *y*-, and *z*-axes. The *x*-axis comprises the type and scope of the target of

an intervention—from an individual or group of individuals to micro places, neighbourhoods, and even larger geographic aggregations. The *y*-axis indicates the level of specificity of an intervention and its goals, from general to more focused and tailored strategies. Finally, the *z*-axis represents the level of proactivity of an intervention, ranging from reactive to proactive to highly proactive. Each axis should be considered as a continuum, although for simplicity the Matrix authors used discrete categorizations for studies. Using this visual organization, the authors mapped research evaluation studies on police crime control interventions according to how they are characterized on these three dimensions.

Clusters of studies (and their findings) illustrate the concentration of effective (and ineffective) practices within areas of the Matrix. Specific areas reflect the combination of specific categories of the

<sup>9</sup> The minimum threshold for a study's inclusion in the Matrix is that at least one comparison group (or area) that did not receive the intervention was included in the evaluation. Additionally, the study had to meet at least one of the following criteria: (1) comparison group was well matched, (2) use of multivariate controls, or (3) use of rigorous time series analysis (Lum *et al.*, 2011).

three dimensions. For example, the cluster of black dots in the portion of the Matrix in which ‘micro places’, ‘highly proactive’, and ‘focused’ intersect shows that interventions targeted at small geographic units that are more specific and proactive tend to show positive crime prevention effects. In the online tool, one can look at the Matrix generally to see these clusters or click on dots or x-axis slabs to learn about specific interventions.

Lum *et al.* (2011) examined the distribution of evaluations showing effective interventions. From their analysis three principles of effective policing emerged. Law enforcement can be more effective when it is (1) proactive, (2) focused and tailored in its strategies, and (3) place-based. When examining the higher quality studies within the Matrix, these principles become even more pronounced. Furthermore, the details of these studies indicate that crime analysis plays an important role in developing the information needed to be proactive, focused and tailored or place-based. Such knowledge becomes immediately useful; agencies could mimic a particular intervention studied in a cluster with many effective studies, or they could take these general principles and apply them when creating an intervention suited to their jurisdiction (see Lum *et al.*, 2012, and Lum and Koper, 2013, for more discussion on the applicability of the Matrix).

Overall, the Matrix adds to earlier systematic reviews by creating an accessible and practice-based tool that allows agencies to pull generalizations—or crime prevention principles—from a large body of research to create new deployments. The visualization is also a template from which agencies could map and compare, in the absence of evaluation, their own deployment strategies and tactics. This was the approach we tried in Derbyshire, England.

## Applying the Matrix to preliminarily assess patrol strategies in Derbyshire, England

Derbyshire was a suitable constabulary for this project, especially given the support and willingness of its Chief Constable to conduct the research and the first author’s position there as Superintendent. The Derbyshire Constabulary serves a region of over 1,000 square miles, with a population of just over 1 million and with 6.7% of the county population from a black minority ethnic background. The force has a policing model structured around three Basic Command Units, with each division covering one or more local authority areas. It also has 95 safer neighbourhood teams (SNTs) designed to deliver locally based policing operations (including responding to calls for service) and engage with the local community to take action on identified local problems. The Constabulary currently receives around 2,200 calls a day<sup>10</sup> and deals with approximately 51,440 crimes a year.<sup>11</sup>

To assess the evidence base of patrol strategies in Derbyshire, relevant strategies had to first be located and gathered. Derbyshire develops its patrol strategy from frontline resources, which are a mix of uniformed community support officers (PCSOs) and regular uniformed patrol officers. Patrol as defined for this study includes foot and mobile patrols by these uniformed officers who were responsible for a particular neighbourhood or roads network and does not include non-uniformed personnel or detectives. Furthermore, the term ‘patrol’ refers to both a frontline resource allocation and the functions and goals of the officers themselves. Police forces in England and Wales are often judged by the Home Office on increasing reassurance and citizen satisfaction by improved visibility. Thus, patrol strategies in Derbyshire were ones that not only were implemented by

<sup>10</sup> As of January, 2013.

<sup>11</sup> As of March 2013.

these uniformed frontline personnel, but that also reflected the general functions of patrol—to increase visibility and activity to reduce and prevent crime as well as antisocial behaviour.

No single document lists all of Derbyshire's patrol interventions. Some interventions are documented as special operations, some are part of standard operating procedures, and others are ad hoc tactics developed when needed. As a commanding officer in Derbyshire, the first author accessed both documented patrol activities and also standard operating procedures and strategies (after consulting others in command and the second author, a former police officer) to determine all police patrol tactics used in Derbyshire.<sup>12</sup> In total, 22 interventions were found that were conducted by Derbyshire's patrol officers (Table 1). They are broadly defined as operations that focus on victimization and the community more generally, offenders, and general patrol operations.<sup>13</sup> However, all strategies and tactics required frontline, uniformed resources that provided increased visibility or extra activity.

The *Evidence-Based Policing Matrix* only includes evaluations of interventions for their outcomes related to the control and prevention of crime and anti-social behaviour. While we sought to include interventions intended to do the same for purposes of comparison with the findings from the Matrix, we were also more flexible in our selection of patrol tactics for this study. Police forces have many goals in implementing various patrol strategies, from reducing crime and antisocial behaviour, to reducing fear and increasing engagement and collective efficacy within the communities they serve. However, when evaluating

interventions, researchers may purposefully select a particular outcome to assess over another. In some cases, researchers may also find it difficult to parse out the effects of different parts of an intervention which may address different types of outcomes (see Taylor *et al.*, 2011; Tuffin *et al.*, 2006). Given this, we sought to include interventions which were directly or indirectly designed to impact crime and disorder.

### Mapping the interventions into the Matrix

In the same way that Lum (2009) and Lum *et al.* (2011) mapped studies of interventions into the Matrix, we mapped the 22 interventions from Table 1 into the Matrix, discussing each at length in terms of how to characterize them with regard to the three Matrix dimensions. We also made an adjustment to the Matrix's *y*-axis during this mapping process by adding a middle-range value to provide more specificity. We coded as 'General' those tactics that do not target specific crimes or people but are more deterrence orientated. 'Focused' tactics lent themselves to particular crimes, groups, or people. Finally, 'Highly Focused or Tailored' tactics were those where the mechanism of prevention is highly specific to a particular crime problem type.

Additionally, while studies in the Matrix were colour-coded by their results—whether evaluations of interventions showed effective outcomes, non-significant findings, or harmful effects—the Derbyshire patrol functions have not yet been evaluated. However, using a similar colouring scheme, we hypothesize the effectiveness of each Derbyshire tactic using two criteria—where the tactic fell in the Matrix and whether other existing studies evaluated

<sup>12</sup> This documentation is in the form of operational orders that relate to specific pre-planned activity, examples of SNT patrol strategies, evaluation documents aimed at force-wide activity (i.e. Operation Relentless), briefing slides, and other documents where there is a specific sub function of patrol deemed necessary. These documents are available by request from the first author.

<sup>13</sup> The 22 patrol strategies in Table 1 were current in 2010. Some have since been reviewed, amended, or removed since that time period.

**Table 1:** Derbyshire patrol strategies ( $n = 22$ )**A. Victim and/or community based**

<b>T1</b>	Door knocks	SNTs visit residents to discuss local priorities and partnership initiatives in crime hot spots and confidence cold spots
<b>T2</b>	'Think 25' Alcohol campaign	Joint working of Trading Standards Unit and police officers to support local retailers of alcohol
<b>T3</b>	'Be Safe' patrols with partnerships	Officers on patrol on Friday and Saturday nights provide a place of safety for youth, with collaboration from youth and alcohol workers, sexual health partners, and parents
<b>T4</b>	Community-oriented policing for burglaries	A patrol strategy that includes use of personal visits to each victim, supply of burglary packs, target hardening, and property marking
<b>T5</b>	Targeted street briefings	SNTs conduct a street briefing for all interested parties where problems are discussed and solutions agreed upon by community members
<b>T6</b>	SNT newsletters	Quarterly newsletters containing information about public meetings, team members, identified priorities, and actions taken
<b>T7</b>	Multi-agency Gang Unit (Operation Redshank Patrol)	High-visibility patrols in priority areas of gang-related activity, including use of license plate recognition technology (ANPR), prevention strategies, and mediation

**B. Offender/location based**

<b>T8</b>	Operation Vanquish	ANPR operation tackling cross-border crime by Roads Policing Department using hot lists. Use of focused and dedicated response to patrol of main arterial routes
<b>T9</b>	Target Repeat Persistent Priority Offenders (PPO)	Officers are tasked to patrol and visit PPO as a tactic to ensure compliance checks. The PPOs are also visited by partner agency staff for other intervention measures to try and reduce/break offending cycle
<b>T10</b>	Summer robbery hot spot patrols	Officers are briefed on geographic and temporal analysis of locations of robbery and deployed to hot spots of crime
<b>T11</b>	Operation Vanquish	Hot spot patrols between 0000 and 0500 hours every Sunday to Wednesday on main arterial routes
<b>T12</b>	Road Policing deployment strategy	Includes targeted arrests of known drunk drivers and crime prevention patrols to specific micro places
<b>T13</b>	Christmas drink drive campaign	National campaign aimed at a combination of tactics including an intelligence-led approach targeting drunk/drug drivers
<b>T14</b>	Reduced gang crime and use of firearms	High-visibility patrols responding to community concerns focused on deterring firearms and gang-related activity in priority areas

**C. General/reactive patrols**

<b>T15</b>	General foot patrols	Officers assigned to priority locations to patrol, which provides high impact visibility
<b>T16</b>	Truancy patrols	High-visibility patrols in partnership with educational agencies around identified areas. Includes use of telephone 'hotline' for police/schools/park rangers and others to report suspected truants
<b>T17</b>	School 'adoption' by Police Community Support Officer (PCSO)	Uniform PCSOs were designated to 'adopt a primary school' in their area. The goal is increased visibility through uniformed patrol and more early engagement with children to prevent them becoming involved in crime
<b>T18</b>	Rapid response to emergency calls	Focused on quick response from assignment to crime scene to increase likelihood of apprehension of offenders
<b>T19</b>	Neighbourhood patrols targeting hot spots of crime and antisocial behavior.	Officers are tasked to improve quantity and quality of contacts between police and local community to reduce calls for service and fear of crime
<b>T20</b>	Reactive arrest strategies	Officers from the Armed Response Units are tasked with a list of outstanding 'recall to prison' individuals that they then try and locate during that shift as a reactive arrest
<b>T21</b>	Reactive arrest for domestic violence case	A list of outstanding and open domestic incidents where the offender was not present at the time of the incident is reviewed by senior management teams to search for and arrest the alleged offender
<b>T22</b>	Dwelling burglary reactive mobile patrols (Operation Greyhound)	Use of double-crewed marked Road Policing Unit vehicles on high visibility patrol at suggested routes of main arterial routes in rural location to try and combat increasing house burglary problem

similar tactics. Toward this end, each of the 22 interventions was scored in the following way:

- ‘1’ if the tactic is within an area of the Matrix where more ineffective tactics reside; or
- ‘2’ if the tactic is in an area of the Matrix that shows promise in terms of the evidence; or
- ‘3’ if the tactic is likely to be effective given that it shares similar characteristics of other interventions shown to be effective; or
- ‘U’ if it is unknown how effective the tactic could be given its place in the Matrix where little knowledge and research exists.

To illustrate the mapping process, an example may prove useful. In 2004, the UK Home Office launched the Prolific and other Priority Offender programme (PPO), listed as intervention T9 in Table 1. This intervention targeted a small number of offenders known to commit a disproportionately large amount of crime. The responsibility of tackling these PPOs fell to local multi-agency partnerships primarily involving the police and probation, and included monitoring repeat offenders whilst also offering supportive services to them. This approach is similar to the intervention evaluated by Abrahamse *et al.* (1991) in Phoenix, Arizona (USA), on proactive arrests of repeat offenders involving partner agencies such as probation. The findings showed that developing post-arrest cases of repeat offenders increased the odds of them being arrested again and returned to prison. Lum *et al.* (2009) mapped this study into the Matrix and found it to be individual, focused, and reactive. The experiment also had high methodological rigour and was found to be statistically significant in crime control effectiveness.

Similar to the intervention in Phoenix, the PPO intervention is placed into the area of the Matrix where the dimensions of ‘*x*=individual’, ‘*y*=focused’, and ‘*z*=reactive’. Furthermore, this intervention would receive a score of ‘3’ given that the methodologically rigorous Abrahamse

study indicates such an approach can be effective. Thus, even if an intervention falls into an area of the Matrix that may *more generally* not be a fruitful area of policing, the intervention *more specifically* may have an evidence-base of effectiveness.

### Limitations of this approach

It should be made clear at the outset that this approach does not evaluate or determine the effectiveness of Derbyshire’s patrol interventions. Only rigorous evaluation research can do so, and none of Derbyshire’s interventions have yet to be evaluated. Evidence assessments are only a one step towards including research in the conversations of policing (see Lum *et al.*, 2012, 2013). Such a process can provide hypotheses to begin developing insights about—in the absence of evaluation—the potential for effectiveness of any given intervention.

Thus, deciding where to place 22 strategies into the Matrix ultimately requires some element of subjective judgement. Each Matrix dimension is intended to be flexible and fluid and some may overlap. However, to improve the inter-rater reliability, the authors conferred with each other on the placement of each intervention, and a senior officer within Derbyshire was also consulted. This approach provides a reasonable alternative for a large portfolio of interventions when evaluation is not readily available, establishing likely hypotheses about interventions. It also provides a starting point for further discussions about these interventions that would not have been prompted without such an assessment.

### Results

Table 2 reports the coding for each of the 22 patrol functions, by type of target (*x*-axis), level of focus (*y*-axis) and level of proactivity (*z*-axis). Similar studies found in the Matrix are listed, as well as a *hypothesis* about the intervention’s effectiveness based on the criteria described above (again, this is not a determination of effectiveness). Finally, an

**Table 2:** Coding of the 22 patrol tactics in Derbyshire

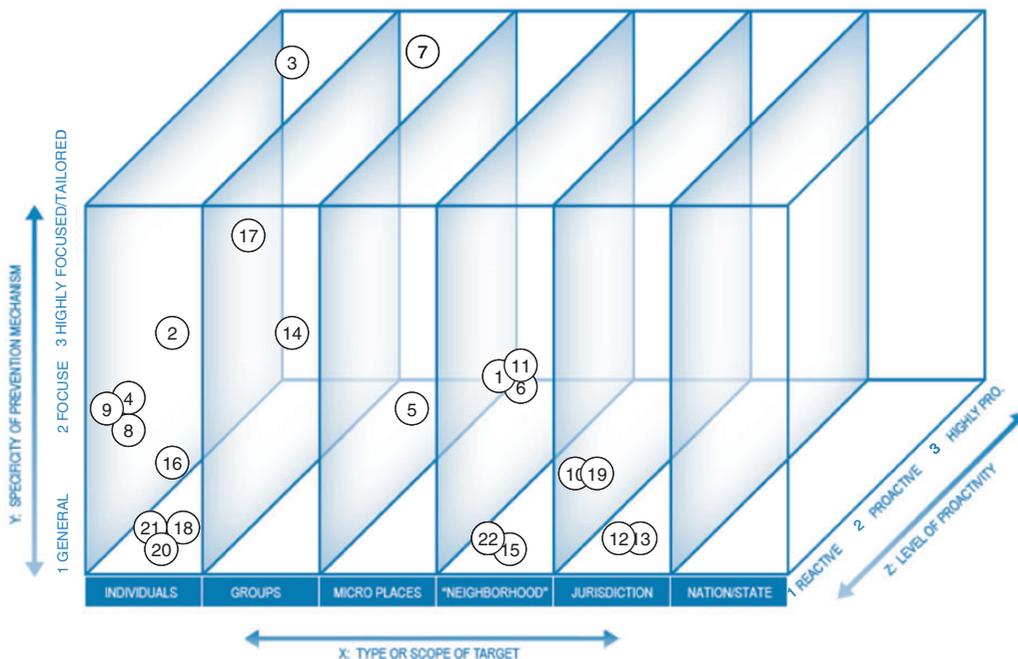
Tactic	X: Target <sup>a</sup>	Y: Level of Focus <sup>b</sup>	Z: Level of Proactivity <sup>c</sup>	Similar studies in the Matrix?	Hypothesis about effectiveness <sup>d</sup>	Frequency of patrol function
<b>T1</b> Door knocks	N	2	2	Laycock, 1991	3	Monthly
<b>T2</b> 'Think 25' Alcohol campaign	I	2	2	None	U	Specific operations 2–3 times per year
<b>T3</b> 'Be Safe' patrols with partnerships	I	3	3	Tuffin <i>et al.</i> , 2006	3	Specific operations 2–3 times per year
<b>T4</b> Community oriented policing for burglaries	I	2	1	Laycock, 1991	U	Ad hoc, when spike in number of crimes occurs
<b>T5</b> Targeted street briefings	MP	2	1	Tuffin <i>et al.</i> , 2006	2	Varies across force, can be weekly or monthly
<b>T6</b> SNT newsletters	N	2	2	Pate <i>et al.</i> , 1985	1	Sent out quarterly
<b>T7</b> Multi Agency Gang Unit (Operational Redshank)	G	3	3	Braga, 2008; Tuffin <i>et al.</i> , 2006	3	When spike in number of crimes
<b>T8</b> Operation Vanquish	I	2	1	Weiss and Freels, 1996	1	Can be weekly if required
<b>T9</b> Targeting Persistent Priority Offenders (PPO)	I	2	1	Abrahamse <i>et al.</i> , 1991	3	Weekly
<b>T10</b> Summer robbery hot spot patrols	N	1	2	Nearest is Novak <i>et al.</i> , 1999	2	When spike in number of crimes
<b>T11</b> Operation Vanquish	N	2	2	Weiss and Freels, 1996	2	Specific days in week—when required
<b>T12</b> Road Policing deployment strategy	J	1	1	None	1	Daily
<b>T13</b> Christmas drink drive campaign	J	1	1	None	U	2 weeks in December
<b>T14</b> Reduced gang criminality and use of firearms	G	2	2	Braga <i>et al.</i> , 2001	2	Can be daily if gun incident or when needed
<b>T15</b> General foot patrols	N	1	1	Police Foundation, 1981	U	Daily
<b>T16</b> Truancy patrols	I	1	2	Fritsch <i>et al.</i> , 1999	U	Specific operations two/three times per year
<b>T17</b> Adopt a local school by Police Community Support Officer	I	2	3	Ringwalt <i>et al.</i> , 1991; Rosenbaum <i>et al.</i> , 1994	U	Weekly
<b>T18</b> Rapid response to emergency calls	I	1	1	Sherman and Eck, 2002	1	Daily
<b>T19</b> Neighbourhood patrols across the force	N	1	2	Tuffin <i>et al.</i> , 2006	2	Daily
<b>T20</b> Reactive arrest strategies	I	1	1	None but Sherman and Eck, 2002	U	Daily
<b>T21</b> Reactive arrest for domestic violence case	I	1	1	Hirschel <i>et al.</i> , 1990	U	Daily
<b>T22</b> Dwelling burglary reactive mobile patrols (Operation Greyhound)	N	1	1	None	1	When spike in number of crimes

<sup>a</sup>I = Individual, G = Groups, MP = Micro place, N = Neighbourhood, J = Jurisdiction.

<sup>b</sup>1 = General, 2 = Focused, 3 = Highly focused/tailored.

<sup>c</sup>1 = Reactive, 2 = Proactive, 3 = Highly proactive.

<sup>d</sup>1 = Doesn't work, 2 = Promising or in a realm with moderate rigour, 3 = Likely to be effective, U = Unknown.



**Figure 2:** Mapping of Derbyshire’s patrol tactics (T1–T22) into the Matrix.

additional column records how frequently the activity occurred in patrol operations.<sup>14</sup>

Each of the 22 interventions was then mapped into the Matrix according to this coding (Fig. 2) to be compared against the original Matrix (Fig. 1).

From this visualization, a number of observations are apparent. We present these results as Tables 3 and 4 in a similar way to Lum *et al.*'s (2011) Tables 1 and 3, respectively. First, patrol strategies targeting individuals constituted the largest group of approaches in Derbyshire (10 interventions, or 45.5%), with neighbourhood interventions (not micro-place interventions) accounting for nearly a third (32%). There was an even split between the tactics that were general in

nature and those mapped as focused (45.5% each). In terms of proactivity, half the patrol functions mapped (50%) were deemed reactive in nature, but just over a third (36%) were considered proactive. Additionally, nine tactics (41%) were hypothesized as either likely to be effective or promising given their placement in the Matrix and also previous research. There were 13 (59%) assessed as either not likely to be effective or effectiveness unknown.

Table 4 presents cross-tabulations comparing each characterization of the intervention with its hypothesized result. We recognize that the cell values are small and show this cross-tabulation merely for illustrative purposes.<sup>15</sup> For ease of

<sup>14</sup> In another analysis (Veigas, 2010), the first author also examined the amount of hours officers spent on a range of activities. This was conducted using historic Activity Analysis data and providing a graphical breakdown of how long uniformed officers spent on each activity. From the total number of hours recorded it was possible to quantify the hours available for visible patrol.

<sup>15</sup> We also ran chi-squared statistics between the hypothesized effectiveness of each intervention and each axis. Given the small N for this study, we do not report the statistics with the chart, but provide this information here if readers are interested. The chi-squared statistics were:  $\chi^2$  x-axis = 1.650,  $P = .205$ ;  $\chi^2$  y-axis = 3.316,  $P = .082$ ; and  $\chi^2$  z-axis = 4.701,  $P = .040$ .

description, the *x*-axis dimension was collapsed into ‘person-based’ (combining individual or group-focused interventions of the *x*-axis) or ‘place-based’ (combining micro-place and neighbourhood interventions). The *y*-axis ‘focused’ and ‘highly focused’ dimensions were recoded as ‘focused, and proactive and highly proactive for the *z*-axis was combined as ‘proactive.’ The two

jurisdiction tactics were excluded from this analysis. Furthermore, hypothesized findings were also combined into two categories. ‘U’ and ‘1’ were labelled interventions in which effectiveness was hypothesized to be unknown or ineffective, respectively, while ‘2’ and ‘3’ were combined as interventions likely to be promising or effective.

**Table 3:** Frequencies for characteristics of 22 patrol functions by dimensions

	<i>n</i>	%
<b><i>x</i>-axis (target)</b>		
Individuals	10	45.5
Groups	2	9.1
Micro places	1	4.5
Neighbourhoods	7	31.8
Jurisdictions	2	9.1
Total	22	100
<b><i>y</i>-axis (specificity)</b>		
General (1)	10	45.5
Focused (2)	10	45.5
Highly Focused (3)	2	9.1
Total	22	100
<b><i>z</i>-axis (proactivity)</b>		
Mostly Reactive (1)	11	50.0
Proactive (2)	8	36.4
Highly Proactive (3)	3	13.6
Total	22	100
<b>Hypothesized effectiveness</b>		
Doesn't work (1)	5	22.7
Promising (2)	5	22.7
Likely to be effective (3)	4	18.2
Unknown if effective (U)	8	36.4
Total	22	100

From the 12 tactics that were ‘person based’, only four (33%) were assessed as promising or likely to be effective at reducing crime, whereas for the remaining eight (67%) either no evidence base existed, or an ineffective outcome was hypothesized. The four hypothesized to be promising included Be Safe (T3) and Multi Agency Gang Unit (T7). Again, we caution that this only suggests, given the available research, that such strategies have the potential of being found effective if rigorously evaluated, given that they have characteristics of effective interventions. Specifically, both of these were highly tailored and highly proactive, and were the only two patrol tactics that were in the most effective realm. The PPO strategy (T9) was a focused but reactive tactic, and the high-visibility patrol Operation Redshank (T14) was in the mid-range realm of effectiveness, being classified as a focused and proactive strategy. This is compared with the five of eight tactics that were ‘place based’ (62.5%), which were hypothesized to be promising based on their placement in the Matrix and also existing literature. These tactics included door knocks (T1), street briefings (T5), robbery hot spots (T10), Operation Vanquish (T11), and

**Table 4:** Cross-tabulations between hypothesized effectiveness and characteristics of the tactic

	<i>x</i> -axis		<i>y</i> -axis		<i>z</i> -axis	
	Person-based	Place-based	General	Focused	Reactive	Proactive
Hypothesized to be promising or likely effective	4 (33.3%)	5 (62.5%)	2 (20%)	7 (58.3%)	2 (18.2%)	7 (63.6%)
Hypothesized to likely be ineffective, OR, we were unable to hypothesize whether the intervention could be effective	8 (66.7%)	3 (37.5%)	8 (80%)	5 (41.7%)	9 (81.8%)	4 (36.4%)
ColumnTotal	12 (100%)	8 (100%)	10 (100%)	12 (100%)	11 (100%)	11 (100%)

neighbourhood patrols (T19). Two of the tactics fell into the mid-section of the Matrix (T1) and (T11). Tactic (T5) was a reactive patrol function but was focused, and although tactics (T10) and (T19) were general in specificity they were still proactive. However, ultimately these strategies have to be evaluated to determine their effectiveness.

Additionally, while 80% of the more general interventions were hypothesized as either 'unknown' or 'likely ineffective' in terms of hypothesized effects, 58% of more focused strategies were hypothesized to be more effective. Eighty-two percent of the reactive strategies either were hypothesized to be likely ineffective or were just unknown, 64% of Derbyshire's proactive strategies were hypothesized to likely be effective.

Some of the individual-based tactics did contain some elements of effective studies mapped by Lum *et al.* (2011). For example, tactic (T4) was aligned to a burglary reduction strategy from Laycock (1991). An example of a debatable tactic is tactic (T17). This patrol function sits within the Matrix at an intersecting dimension of focused and highly proactive. However, strategies can fall within this range and be deemed not as effective. Sherman *et al.* (1997) found this to be the case in their evaluation of the notable Drug Abuse Resistance Education (DARE) programme. This strategy, whilst well intended, did not have any effect on the numbers of students who became involved with use of drugs. In a similar vein, the tactic of adopting a local PSCO to work in a school with young children may indeed break down barriers between children and law enforcement agencies, but it has not been rigorously tested in terms of assessing the impact on crime reduction in a specific area.

### Where do we go from here?

This paper set out to determine how aligned the portfolio of uniform patrol strategies used by Derbyshire police were with research evidence.

The findings indicate some alignment between Derbyshire's tactics and the research evidence and other strategies that have not been shown to be effective or whose effectiveness is unknown. Beyond this evidence assessment, however, this exercise may be useful for other reasons. The Derbyshire police service, like many other UK and US forces, is relatively new to evidence-based policing, and some of its patrol functions reflect more traditional, reactive, and procedural-based approaches. Aside from evaluation of single tactics, prior to this assessment there was no distinct method of analysing an entire portfolio of patrol tactics in a systematic way and against some objective measuring stick other than traditions and culture. In the absence of a strongly funded research and evaluation programme for the purposes of determining which functions to cut and which to retain in a time of fiscal belt tightening, methods such as this one are meaningful exercises in evidence-based policing.

Overlaying Derbyshire's patrol portfolio into the Matrix also helps to more generally view the suite of patrol functions within a police service. For Derbyshire, this study helped the first author better understand the nature of his patrol service tendencies, confirmed by the NRC report: Policing practice is remarkably individually-based, reactive and general in nature (Lum, 2009). Nearly half of his patrol's strategies fell into these categories. While some of Derbyshire's tactics do reflect the research, such as its efforts to tackle an emerging gun crime problem (for example, Operation Redshank), shifting the tendency of patrol more towards effective principles of policing seems a reasonable goal. Moving towards more place-based, proactive, and problem-oriented patrol strategies ultimately means that patrol will have to pay more attention to what they do in between calls for service, not just when they respond reactively to calls for service (Lum *et al.*, 2012). Furthermore, the use of crime analysis to more specifically target crime problems, geographic concentrations of crime, and community concerns, is essential to

moving towards a more place-based, proactive, and tailored police strategy.

Although not shown here, the first author also conducted a preliminary activity analysis to determine how much time and resources officers were spending conducting various patrol activities (see Veigas, 2010). While determining the evidence base of a portfolio of police patrol activities is helpful to understand the evidence-base of the *types* of activities officers engage in, what is also needed is an understanding of the extent to which officers have time to carry out proactive, place-based, and tailored activities. Additionally, if only one tactic within a patrol portfolio is place-based, targeted, and proactive, but officers spend the majority of their time engaged in that tactic compared to other options, then the reality of engagement in evidence-based practices is misleading by only counting the tactics which are supported by evidence. Using historic data, Veigas recorded uniform officers' movements at fifteen minute intervals for the period of their shift. This analysis showed how long officers spent on activities such as taking statements, going to court, or being on patrol. The results revealed that reactive patrol officers had 15% of time allocated to visible patrol, SNT officers had 33% and roads policing 21%. While data was not available to examine the time officers were spending in each of the 22 tactics studied here, this preliminary analysis indicates that changes in resource allocation to more cost effective patrol strategies concentrated in the most crime and ASB hot spot areas is possible.

The Matrix is meant to be a starting point, not a panacea, as Lum *et al.* (2012) emphasize. Comparing Fig. 2 with Fig. 1 can reveal not only where Derbyshire is in terms of its patrol portfolio, but also where it might like to move towards. Evidence-based policing requires a change in deployment approach, and also more generally a

reconsideration of the organizational and operational culture that might hinder an agency in being a dynamic learning organization. Derbyshire already benefits from being a learning organization, and has experience using knowledge to add and modify strategies and tactics based on rewards, risk and resources. But in some law enforcement agencies, the hierarchy of management and the hyper-structured standard operating procedures may not be the most conducive environment for dynamic discussion and debate about tactics and strategies. There may also be preexisting biases against research in policing more generally, as impractical or removed from the 'real world'. Researchers may also fail to translate knowledge and develop ways for it to be disseminated and used (Lum *et al.*, 2012).

All of these aspects of policing mean that knowledge exchange between law enforcement practitioners and researchers is itself a strategy that needs assistance. Institutionalizing the use of research knowledge into practice, and training researchers to also be more attuned to what is possible in policing are important goals in evidence-based policing. As highlighted by Lum *et al.* (2012) in their *Matrix Demonstration Projects*,<sup>16</sup> finding ways to incorporate ideas garnered from research into every day policies and practices is the next step in achieving evidence-based policing. Questions remain for Derbyshire in terms of how it can find ways to have officers be more proactive in between calls for service, or how it can re-orient officers to more place-oriented approaches. This may include building appropriate requirements into training, promotions, and rewards, using research to create new tactics or adjust existing ones, using managerial meetings to discuss possible crime prevention tactics more dynamically, and ensuring that rigorous evaluations are conducted as often as possible using

<sup>16</sup> See <http://cebcp.org/evidence-based-policing/the-matrix/matrix-demonstration-project/>.

opportunities presented by partnerships with universities or the new college of policing. Although academics and practitioners still have more work to do, this first groundbreaking study has shown that such assessments are possible. Scientific evidence will not stand on its own merits but will require senior leaders to fully grasp the opportunities and ensure the tenets of evidence-based policing are embedded at the grass roots level.

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