

Problem-Oriented Policing Approaches to Outdoor Cannabis Growing

by

Dr. Joseph Clare
Simon Fraser University

and

Dr. Paul Brantingham
Simon Fraser University

and

Dr. Patricia Brantingham
Simon Fraser University

prepared for

Research and National Coordination
Organized Crime Division
Law Enforcement and Policy Branch
Public Safety Canada

*The views expressed herein are those of the authors and do not necessarily reflect those of the
Department of Public Safety Canada.*

Report No. 005, 2010

© Her Majesty the Queen in Right of Canada, 2010

Cat. No.: PS4-92/2010E-PDF

ISBN No.: 978-1-100-19935-1

Table of Contents

Abstract	3
Executive Summary	4
1 Introduction	6
2 POP and OMGOs within a Canadian Context	7
2.1 Principles Underlying POP	7
2.2 Meta-Analytic Findings: POP IS Effective, IF it is REALLY POP	8
2.3 Caveats for POP: Implementation Issues and the Generalizability of Successful Outcomes	10
2.4 Strengths and Limitations of Utilizing POP to Counter OMGOs in Canada.....	13
2.4.1 SARA Step 1: SCANNING for OMGOs in Canada	13
2.4.2 SARA Step 2: ANALYSIS of OMGOs in Canada	17
2.4.3 SARA Step 3: RESPONDING to OMGOs in Canada	20
2.4.4 SARA Step 4: ASSESSING Current Strategies for Dealing with OMGOs in Canada	23
2.4.5 Summarizing of Strengths and Limitations	23
3 Responding to OMGOs Outside of Canada	24
3.1 Categorising Drug Law Enforcement Evaluations	24
3.2 Previous Drug Law Enforcement Initiatives with Greatest Relevance to OMGOs	25
3.3 Extent to which Previous International Efforts Satisfy POP Criteria	28
4 Developing a Framework for a Comprehensive POP Approach to OMGOs in Canada.....	28
4.1 A Theoretical Framework for Deconstructing the SCANNING Phase for OMGOs.....	28
4.2 Applying the Theoretical Framework to the ANALYSIS of the OMGO Situation	30
4.3 Generating Theoretically-Motivated, Novel RESPONSES to OMGOs.....	32
4.3.1 Environmental Criminology and SCP	32
4.3.2 Responses will emerge from the Analysis Framework	34
4.3.3 Legislative Reform	35
4.3.4 Inter-Agency Collaboration.....	36
4.4 Coordinate and Standardize the Approach to ASSESSMENT of Better Defined Problems	38
5 A Hypothetical Case Study	39
6 Conclusions and Recommended Next Steps	42
References	43

Abstract

This discussion paper explores the potential application of a problem-oriented policing framework to counter outdoor marijuana grow operations in Canada. First, this report provides an overview of problem-oriented policing and then examines how compatible the current Canadian responses to outdoor marijuana grow operations are with this framework. Second, the main international responses to outdoor marijuana grow operations are reviewed and their compatibility with a problem-oriented policing approach is examined. Third, a novel theoretical approach is proposed to apply a problem-oriented policing framework to outdoor marijuana grow operations, which builds on a foundation provided by the Haddon Matrix and the set of situational crime prevention techniques. Finally, this model is expanded to demonstrate how it may be utilized to address a hypothetical example outdoor marijuana grow operation problem. This paper concludes with suggestion that a problem-oriented framework could make a positive contribution to efforts designed to combat outdoor marijuana grow operations. This conclusion is conditional on maintaining realistic expectations about the likely short-term impact of such a strategy. Furthermore, if pursued, this approach must be utilized in an iterative manner in order to deal with a crime problem that will evolve over time in response to effective crime prevention initiatives.

Executive Summary

Three broad components motivated this discussion paper:

- outline principles underlying problem-oriented policing (POP) and discuss how a POP approach is able to deal with outdoor marijuana grow operations (OMGOs), specific to Canada;
- review previous international approaches to dealing with OMGOs, particularly if they adhered to a POP framework and/or if they were evaluated; and
- propose a framework for undertaking a POP approach to OMGOs in Canada.

POP is a framework for developing strategies to counter crime, combining a broad range of approaches into a focused course of action. One common mnemonic that captures the essential components of POP is SARA (Eck and Spelman 1987), which stands for: (a) Scanning, (b) Analysis, (c) Response, and (d) Assessment.

Recent reviews give good support to the capacity of POP to develop strategies that can reduce persistent crime problems. This said, there are commonly established implementation weaknesses associated with POP, including:

- SARA is not always applied effectively, leading to “pseudo-POP”;
- partner agencies are not always persuaded to participate in and support the POP initiative;
- the outcomes of POP strategies are not always evaluated effectively; and
- successful examples of POP initiatives can be rolled-out unconditionally to novel contexts, ignoring the underlying factors that made them work.

Strengths and weaknesses emerge when assessing the current Canadian context with respect to suitability for implementing a POP developed strategy for combating OMGOs:

- scanning and assessment of the OMGGO problem in Canada is (a) facilitated by the unified *Criminal Code*, but limited by (b) the fact that OMGGOs is an overly inclusive term that restricts effective implementation of POP at this stage, and (c) as with everywhere else in the world, uncertainly surrounds the size of the OMGGO problem in Canada;
- eradication and seizure of crops are the major current responses to OMGGOs in Canada; and
- there is no framework for assessing the processes currently used to respond to OMGGOs in Canada.

Evaluation of drug law enforcement initiatives undertaken around the world indicate that proactive, partnership-focused interventions (involving police and third-parties/community entities) are the most effective mechanisms for reducing drug and non-drug problems. However, overall, the quality of drug law enforcement research is poor and evaluation is lacking.

Development of a POP-based framework for combating OMGOs in Canada could incorporate the following:

- enhancing the scanning and analysis phases of SARA by utilizing the theoretical underpinnings of the Haddon Matrix (Haddon 1999), which provides a broad framework for examining the context surrounding a specific event. With respect to OMGOs this deconstructs time into pre-OMGO, during OMGO, and post-OMGO intervals, while simultaneously partitioning the contextual components into human involvement, vehicles/equipment, and the environment;
- applying the situational crime prevention (SCP) techniques (developed by Clarke, and broadly speaking attempting to increase the risk, increase the effort, reduce the reward, remove the excuses, and reduce the provocations associated with specific criminal events) to generate novel, creative responses to OMGOs; and
- a hypothetical OMGOs scenario is used to demonstrate how these two theoretical frameworks could be utilised within a SARA process to address a specific OMGOs problem.

A POP framework could make a positive contribution to efforts designed to combat OMGOs. However, realistic expectations about the likely short-term impact of such a strategy must be maintained. Furthermore, given that this crime problem will evolve over time in response to effective crime prevention initiatives, if a POP approach is adopted to deal with OMGOs, it must be utilized in an iterative manner.

1 Introduction

As a consequence of the 2008 Summit on Organized Crime that resulted from the 2007 Ministerial Forum on Organized Crime it was determined that, in order to combat organized criminal activity, priority should be given to building upon existing research to improve the understanding of the evolving nature of these coordinated criminal entities. This report into problem-oriented policing (POP) approaches to outdoor cannabis cultivations forms part of a broad initiative to provide timely access to evidence-based research data across all levels of government that will: (a) provide decision makers with the appropriate information to develop optimal policy responses for combating all type of organized crime, and (b) provide a baseline from which the outcome of all anti-organized crime initiatives can be evaluated. This overall objective is under the auspices of the National Coordinating Committee on Organized Crime (NCC) which has instituted a research working group tasked with implementing a National Research Agenda on Organized Crime.

As indicated in the Statement of Work for this project, while the successes of law enforcement initiatives based on the principles of POP have been widely evaluated (e.g., see Weisburd et al. 2010, for a recent Campbell systematic review), little work has been done on applying POP to specific activities more associated with sophisticated organized criminal activities. The overarching purpose of this discussion paper, therefore, is to outline how the principles of POP might be applied to the operation of outdoor marijuana grow operations (OMGOs) controlled by organized crime groups within Canada. As per the Statement of Work, the three broad components that form the minimum requirements for this discussion paper are:

1. to outline the principles underlying POP and then discuss the merits/limitations of a problem-oriented/deterrence approach to dealing with OMGOs, specifically in the Canadian context;
2. to review POP approaches to OMGOs previously undertaken in other jurisdictions and summarise the results of evaluations of these programs (where available); and,

3. propose a framework/plan that a POP approach to OMGOs might follow, including which partners might be usefully engaged in its implementation.

2 POP and OMGOs within a Canadian Context

2.1 Principles Underlying POP

POP is a framework for developing strategies to counter crime which combines a diverse set of approaches into a focused course of action (Clarke and Eck 2003). This concept was first proposed by Goldstein (1979) with the underlying premise that, “policing should fundamentally be about changing the conditions that give rise to recurring crime problems and should not simply be about responding to incidents as they occur or trying to forestall them through preventative patrols” (as summarized by Clarke and Eck 2003: 20). In Goldstein’s (1979: 236) words, “If the police are to realize a greater return on the investment made in improving their operations ...they must concern themselves more directly with the end product of their efforts.” Goldstein advocated that to achieve this shift in focus, policing practices need to meet a number of objectives, including: (a) being more specific about the nature of individual problems, involving research, analysis, and interpretation of current and previous police responses, (b) assess the adequacy and effectiveness of these approaches within the context, (c) undertake a comprehensive exploration for novel, alternative responses to existing problems, and (d) select the most suitable response(s) and implement them.

The SARA (Scanning, Analysis, Response, and Assessment) mnemonic, which was first proposed by Eck and Spelman (presented in 1987 at a Police Executive Research Forum in Washington, D.C., and referenced by Tilley 2010: 186), builds on Goldstein’s propositions and provides a formalised framework for capturing the crucial components of POP. (Alternatives that have also been proposed in recent years include Read and Tilley’s (2000) PROCTOR (PROblem, Cause, Tactic/Treatment, Output, and Result), Ekblom’s (2005) 5Is (Intelligence, Intervention, Implementation, Involvement, and Impact), and the Royal Canadian Mounted Police’s (a.k.a., R.C.M.P. July 28, 2008) CAPRA (Clients, Acquire/Analyse Information, Partnerships, Response,

and Assessment of Action Taken).) These alternatives have been mentioned to indicate an awareness of their existence, however, as SARA remains the most commonly promoted approach to implementing POP, this is the framework that is discussed throughout the remainder of this paper.) Clarke and Eck (2003: 20) discuss the principles that underlie each of the components of SARA, which are summarized as follows:

- **SCANNING:** Examination of existing information to identify relevant patterns (a.k.a., *problems*) in a category of incidents that are routinely addressed.
- **ANALYSIS:** Undertake a comprehensive analysis of these specific problems with a view to identifying the contextual factors that contribute to their causes.
- **RESPONSE:** This requires two main activities: (a) generate creative, prevention-focused strategies for intervening at a preliminary stage in the causal chain with a view to reducing the likelihood of problems emerging (thinking beyond the traditional focus of the criminal law where relevant), and (b) building functioning partnerships with non-policing stakeholders that maximise the likelihood of collaborative, multifaceted prevention efforts being successful.
- **ASSESSMENT:** In order to truly utilize a POP approach, it is essential to complete the SARA steps by evaluating the outcome of the POP strategy, with a view to using this additional outcome information as a driver for the next iteration of the prevention process.
- Typically, efforts have been made to utilize the POP framework when concentrated applications of traditional crime prevention approaches have failed to produce the desired level of reduction. Consequently, it is important to maintain realistic expectations about what will be achieved through each individual implementation of POP, because "...POP describes the application of scientific methods and science rarely comes up with quick fixes. Most initial efforts fail!" (Tilley 2010: 192).

2.2 Meta-Analytic Findings: POP IS Effective, IF it is REALLY POP

To counter this caveat about the probable slow pace of success following the implementation of POP, it is important to emphasize that current research findings give strong support to a stance that POP is able to impact on persistent crime problems, provided that the approach is adopted

completely as it has been conceived. Although there are a number of individual examples whereby POP has been demonstrated to have a preventative impact, the strongest case for promoting POPs effectiveness was provided by the outcomes of the meta-analytic Campbell systematic review undertaken by Weisburd et al. (2010).¹ This synthesis exercise sourced over 5,500 articles that satisfied the following inclusion criteria: (a) summarised a strategy designed to counter a specific problem (area or people), (b) adhered to the fundamental principles of the SARA model, (c) contained a form of non-treatment comparison group with some demonstration of equivalence to the treatment group, and (d) reported sufficient quantitative data to calculate an effect size of the POP initiative. The central conclusion of this review was that, “POP as an approach has significant promise to ameliorate crime and disorder problems broadly defined” (2010: 164). In addition to this overall conclusion, however, four other important points that emerged from this Campbell review should be mentioned here and kept in mind should POP be utilised to develop a Canadian strategy for OMGOs controlled by organized crime groups:

- POP is a process, not a particular strategy to approach a specific crime. It is a mechanism that can be used by crime prevention practitioners to develop crime prevention and crime reduction strategies. As such, this review constituted an examination of the, “effectiveness of a process used by the police to develop tactics, not a particular police tactic” (Weisburd et al. 2010: 144);
- the overwhelming majority of research reviewed failed to satisfy the full set of inclusion criteria. Using the strictest interpretation criteria, 10 studies were retained: 4 randomised experiments and 6 quasi-experiments with a relevant comparison control group. When the inclusion criteria for a control/comparison condition were relaxed, Weisburd et al. were also able to review an additional 45 studies that involved a pre-post implementation approach, which were generally based on official crime data in the area before and after a POP intervention had occurred;
- although the impact of POP was deemed to be significant and positive according to both inclusion mechanisms, smaller positive effect sizes were observed for the studies that met the strict POP inclusion criteria compared to the pre-post studies that were

¹ As Weisburd et al. (2010: 143) explain, “Campbell reviews require a transparent and systematic search-and-analysis strategy that involves a methodological and substantive review of the project at both the proposal stage and before final reports are completed.” They direct readers to see campbellcollaboration.org/artman2/uploads/1/Review_Steps.pdf for an overview of the phases that must be addressed when conducting a Campbell review.

evaluated. Although Weisburd et al. did indicate that there can often be difficulties associated with implementing (quasi-) experimental designs, they did emphasise that it is more difficult to attribute outcomes from pre-post studies directly to the POP process, given the scope for other, uncontrolled contextual factors to overstate results; and,

- in view of these positive effects and with respect to the policy implications of these findings, Weisburd et al. (2010: 140) suggest that the study, “supports the overall commitment of police to POP but suggests that we should not necessarily expect large crime and disorder control benefits from this approach. Moreover, funders and the police need to invest much greater effort and resources to identify the specific approaches and tactics that work best in combating specific types of crime problems.”

In support of this position, Tilley (2010: 186) discusses that, while there “is convincing evidence that POP can reduce crime and disorder,” the challenges for POP now lie in improving the efficiency and reliability with which the intended prevention outcomes are achieved. In addition to the recommendations previously made for the need for effective evaluation of POP interventions, Tilley (2010) suggests that the most successful examples of POP have often involved a partnership between crime prevention researchers and crime prevention practitioners, in a manner that parallels disease prevention collaboration between medical researchers and clinicians. However, Tilley (2010) also notes that the history of policing and crime prevention does not champion evidence-based practice and theory in the same manner that medical prevention does. Consequently, Tilley (2010: 188) states that, “It seems likely that POP would improve by closer work and greater mutual understanding between the police (and their partners) and the research community, where there is a shared commitment to finding practical solutions to crime and disorder problems.”

2.3 Caveats for POP: Implementation Issues and the Generalizability of Successful Outcomes

As summarised in the previous section, there exists strong research support that POP is an effective strategy for developing crime prevention and crime reduction initiatives. However,

before focusing on the specific application of POP to OMGOs in a Canadian context, it is important to briefly outline some caveats, about which there is broad consensus amongst criminologists, associated with the implementation of POP strategies and the generalizability of successful strategies. The three implementation weaknesses discussed below are all expanded in detail by Tilley (2010).

The first major implementation weakness concerns the application of the SARA steps, which in practice often “falls far short of the ...demanding processes of specific problem identification, detailed analysis for causal pinch-points and careful trialling and the adaptation of thoughtfully chosen interventions” (Tilley 2010: 186). Tilley (2010: 189) discusses that the surface simplicity of SARA may lead to a “pseudo-POP” which is simplistic and formulaic, enabling previously tried or quick-fix, uninventive strategies to be redefined as satisfying the expectations of SARA. Tilley is keen to emphasize that SARA should be used to approach a specific problem in an iterative manner, whereby outcomes are not judged in isolation and discarded if initially unsuccessful (or rolled-out unconditionally if they do show isolated impact), but instead commence the problem-identification cycle again in light of the additional information now at hand.

The second implementation weakness concerns the delivery of the POP strategy, which can doom even the best thought-out intervention if the relevant stakeholders cannot be persuaded to participate and provide support (for a comprehensive discussion of this issue see Eck 2003; Scott 2003; Townsley et al. 2003; Tilley 2010). As Tilley (2010: 190) explains, “It is rarely the case that sustainable solutions to the recurrent problems addressed in POP are in the hands of police alone. ...Given this circumstance, the application of leverage on third parties has been deemed part of POP.” Although implementation is crucial to maximising the likelihood of an effective POP outcome, Tilley argues it is largely absent from the SARA framework (and at best is implicitly involved in the Response phase). With this in mind, Tilley (2010: 190-191) states that, “Issues of intervention implementation are of importance, thus, not only because of their implications for the conduct of evaluations, but also because they are crucial to the very design of responses to problems. They should properly be considered part of POP.”

The third implementation problem reflects the difficulties associated with ensuring the strict POP requirements for evaluation are adhered to. It is essential that an approach to evaluation seeks, dispassionately, to determine what impact the intervention had, rather than explores hopefully for any positive signs. The fact that very few POP studies have achieved this aim is demonstrated through the selection criteria for the meta-analysis undertaken by Weisburd et al. (2010). Although, as already discussed, it may not always (or even often) be possible to satisfy the extreme requirements of experimental or quasi-experimental design in a policing context, Tilley (2010) argues it is still plausible to expect that “realist” approaches to evaluating success for POP initiatives will be achievable. This process will be assisted by actively articulating what the successful POP outcome should be, from a working theory perspective, prior to commencing the intervention. This process would enable the logic underlying any POP initiative to be critiqued thoroughly before implementation and would also clarify how the initiative should proceed if it is successful (Tilley 2010).

In addition to maintaining a focus on these three implementation issues, it is also important to emphasise the care that should be exercised with interpretation of successful POP outcomes prior to unconditional extrapolation to novel contexts. Even when positive results are found for a specific initiative, Tilley (2010: 185) summarises four main caveats about assuming that the positive outcomes will necessarily generalise to a broader context simply as a consequence of consistently applying the specified POP method. These caveats are: (a) consider how the successful POP initiative was influenced by unmonitored factors such as secondment of experienced, enthusiastic police officers; (b) pay attention to short-term volatility of small area crime rates, which may give the appearance of a causal link to the initiative but may actually be independent from the POP impact; (c) keep in mind that the outcomes of POP initiatives are often associated with future funding allocations, which may (consciously or unconsciously) lead to manipulation of comparison (control) areas in a manner that influences the apparent effectiveness of ongoing, ‘normal’ policing activity in those areas (in a positive or negative manner, depending on the motivation); and (d) maintain awareness of the significant role small-area idiosyncrasies can play in preventing the identification of relevant control areas with which to test the impact of POP initiatives.

In summary, therefore, the overall finding from analysis of previous POP exercises is that, when applied optimally and acknowledging these various caveats, this approach has demonstrated a significant impact on persistent problems across a range of criminal issues. Consequently, as each example of OMGOs controlled by organized crime groups within Canada represents a large-scale problem that has proven to be highly resistant to traditional policing approaches to date, it is entirely reasonable to expect that effective implementation of POP to generate novel strategies from combating these problems should have a positive impact. The following section discusses the merits and limitations associated with implementing each of the components of the SARA framework with respect to reducing OMGOs (particularly those controlled by organized crime groups) in a Canadian context. This discussion will be supported by outlining how the crime prevention framework, activities, and infrastructure that are currently in place fit within the broad categories provided by the SARA framework.

2.4 Strengths and Limitations of Utilizing POP to Counter OMGOs in Canada

Within this section of the report, the current approaches to addressing each of the components of the SARA framework with respect to OMGOs in Canada are considered in turn. Following this, and before moving on to a discussion of international responses to OMGOs, the existing strengths and limitations associated with these current strategies will be briefly discussed. It will also be explained that some possible mechanisms for enhancing the approaches to scanning, analysis, response, and assessment will be the focus of Section 6 of this report.

2.4.1 SARA Step 1: SCANNING for OMGOs in Canada

2.4.1.1 Relevant Legislation for Prosecuting OMGO Perpetrators in Canada

The unified, federal *Criminal Code of Canada* is advantageous with respect to undertaking the scanning component of SARA with respect to OMGOs. The relevant Statute of this Legislation is the *Controlled Drugs and Substances Act* (Canadian Minister of Justice 1996, c.19). Within this *Act* there is a clear difference in the punishment schedules listed for cannabis in relation to other controlled substances. With respect to possession of a controlled substance, for offenders found

in possession of a Schedule I substance (including opium, coca, and their derivatives, amongst other drugs) are guilty of an indictable offence and liable to imprisonment for a term not exceeding seven years, while offenders found in possession of a sufficient quantity of Cannabis (which is included in Schedule II) are still guilty of an indictable offence but are liable to imprisonment for a term not exceeding five years less a day. By extension, those found guilty of trafficking a controlled substance other than marijuana have committed an indictable offence and are liable to imprisonment for life, whereas those found guilty of trafficking marijuana are guilty of an indictable offence and are liable in imprisonment for a term not exceeding seven years.

The National Coordinating Committee on Organized Crime (2003: 13-14) report described sentencing for production of marijuana to be a, “major stumbling block, as sentencing practices are seen as inconsistent and in general, lenient.” It is often difficult to prove aggravating factors (e.g., who owns and/or who will make money from the grow operation), and there are many cases (particularly with indoor grow operations) where the people who are producing the crop are simply caretaking the product and receive very little tangible benefit for their involvement. Malm and Tita (2006) also discuss the likelihood that informal longitudinal shifts towards more lenient responses to marijuana (production, possession, and distribution) are reflective of an underlying relaxed attitude towards marijuana use by the Canadian public.

2.4.1.2 Uncertainty as to the Size of the OMGOs Problem

To put the frequency of marijuana-related offending in perspective, (a) for the last 40 years cannabis-related offences have comprised a large majority of total reported drug offences in Canada, accounting for 60 percent of drug-related crimes in 2007, and (b) B.C. is the province with the highest reported drug offence rates, and it has held this dubious honour for three decades (Dauvergne 2009). The three key findings with respect to marijuana from the 2007 Drug Situation Report released by the R.C.M.P. Criminal Intelligence (R.C.M.P. 2007: 3) were: (a) rural and remote OMGOs increased in number during 2007, explained as a consequence of low property values and high privacy, (b) marijuana production and distribution remained highly profitable for organized crime, with most organized crime groups in Canada involved in these activities to some extent, and (c) forward-looking assumptions that Canadian marijuana would be

directed towards European and Asian markets as the amount of marijuana produced in the U.S. continues to increase. This report also indicated that B.C., Ontario, and Quebec are the primary producing regions with approximately 90 percent of, “an estimated 50,000 kgs and over 1.8 million marijuana plants seized in Canada” (R.C.M.P. 2007: 3) produced in these three provinces.

To locate these trends within an international context, the U.N. *World Drug Report 2009* (U.N. Office on Drugs and Crime 2009) provides some useful, broader contextual information. According to the 2009 U.N. report, cannabis constitutes the world’s largest illicit drug market with respect to spread of cultivation, production volume, and number of consumers. Despite this, however, reliable data about cannabis production is unavailable, with information into cannabis cultivation, “fragmented, non-standardized, and not always based on scientific research” (U.N. Office on Drugs and Crime 2009: 89). A triangulation approach to estimating cannabis cultivation, which combines information about user-rates, seizures, and cultivation, has been used previously as a type of best-practice for quantifying the size of the cannabis production industry. However, this method is imperfect, and the international estimates making use of all available data on cannabis production and cultivation produced by the U.N., still contain a large degree of uncertainty. In 2008, best estimates of the cultivation area required for OMGOs world-wide ranged from 25,800 ha to 641,800 ha, which is predicted to have produced between 13,300 mt and 66,100 mt of cannabis herb. Although there can be large variation in yield between OMGOs (as a result of a range of factors, including climate variation, the use of irrigation, etc.) the U.N. 2009 report assumes an average yield for OMGOs to be from 470-1,200 kg/ha, and (b) that 80-95 percent of the total cannabis production occurs outdoors (U.N. Office on Drugs and Crime 2009: 93). The U.N. report discusses that the level of uncertainty involved with estimating cultivation is too high to enable smaller ranges for these estimates to be produced. Globally, there was an increase in the volume of cannabis seized in 2007, with 5,605 mt of cannabis herb seized, almost two-thirds of which were captured in Mexico (2,177 mt or 39%) and the U.S. (1,447 mt or 26%). By contrast, it was estimated that 50 mt (0.9% of the world total) was seized in Canada over the same period of time (ranked 11th overall on this measure). The U.N. report also indicates that best estimates are that recent annual trends for cannabis use show relatively stable use in North America, increases in much of Africa and South and Central Asia, and declining use in Australia, the U.K., and Spain.

A number of recent estimates are available with respect to assessing the Δ^9 -tetrahydrocannabinol (THC) potency of herbal cannabis: (a) European importations displayed a long-term stability of around 2-8 percent TCH (European Monitoring Centre for Drugs and Drug Addiction 2008: 268); (b) seized samples from the UK in 2008 indicate a mean THC concentration of 8.4 percent (Hardwick and King 2008); and (c) estimates of around 5 percent THC, with the potential for dramatic increases in THC content in cannabis *sinsemilla*, which is derived from the unfertilized female plant (U.N. Office on Drugs and Crime 2009). The U.N. Office on Drugs and Crime (2009: 97) report also discusses the impact of cultivation methods on potency, with outdoor factors such as temperature, humidity, availability of light, and soil quality producing marked variation between grow sites. Overall, outdoor cultivated marijuana will typically be of lower potency relative to indoor produced cannabis, which often incorporates a combination of female-only, cloned plants, artificial light, and optimized, hydroponic cultivation (U.N. Office on Drugs and Crime 2009: 97).

2.4.1.3 OMGOs as an Overly-Inclusive Label

These general issues surrounding the quantification of the size of the OMGOs problem in Canada are compounded by the current lack of specificity with respect to defining the set of problems that fall within the broad term ‘OMGOs’. To make inroads into this broad issue it is crucial to clearly define these problems in a manner that acknowledges meaningful distinctions. It is reasonable to assume that variations in aspects of the grow operation will impact on the approach that should be best used to combat it. For example, is the grow operation a large scale exercise funded by organised crime groups, or a smaller “Mom and Pop” production? Is the grow operation located on public or private land? Is this in forest area or farm land? What is the relative potency (hence, the desirability and demand) of plants being produced across geographic areas?

To overlook the significance of these variations is to mask important differences between situations that will likely impact on the ability to develop an appropriate POP strategy. In his seminal work, Goldstein (1979) emphasized the importance of creating meaningful distinctions

within broader crime categories. Goldstein discussed arson as an example in support of classifying a crime within its broader context, suggesting that to develop a single strategy to counter all arson would ignore important variations in elements of each specific incident: such as the age and mental health of the perpetrator or the motivation for the fire (e.g., destroying evidence, vandalism, or intimidation). Goldstein (1979: 246) continued to suggest that, “at least initially in the development of a problem-solving approach to improved policing, [it seems desirable] to press for as detailed a breakdown of problems as possible.” With respect to OMGOs in Canada, as is discussed later in this paper, this specificity should include (a) a full range of contextual factors spanning temporally before, during, and after the grow operation occurs, (b) environmental factors associated with site selection, (c) partnership with non-policing agencies, (d) monitoring of purchases of legitimate products that facilitate the production of marijuana, (e) use of novel technology, and so on.

2.4.2 SARA Step 2: ANALYSIS of OMGOs in Canada

Therefore, as discussed in the previous section, there are two main issues that require additional analysis in order to utilise POP to develop a more comprehensive strategy for combating OMGOs in Canada: (a) increasing the specificity used to define the types of problems currently grouped collectively as OMGOs, and (b) exploring the merits of utilising novel approaches to scoping the size of these problems. These two issues are discussed below, and it is explained that successfully addressing the first may well positively impact on the second.

2.4.2.1 Increased Specificity: Identifying Meaningful Problems within OMGOs

By working in a collaborative manner with crime prevention experts who have been targeting relevant areas (e.g., marijuana specifically, drugs generally, and organized crime, etc.) it would be possible to produce a set of meaningful distinctions that would help deconstruct the overarching category of OMGOs into smaller, distinct types of problems. One example of how this process would benefit strategy development is outlined in Table 1, where four potential types of problem emerge from consideration of the interaction between the scale of production and the OMGOs site location.

These are basic distinctions which may actually require further subdivision and have only been provided as an example here. For example, given that one of the outcomes of an investigation into adolescent involvement in the marijuana production industry in an agricultural region of Quebec undertaken by Bouchard et al. (2009) was to emphasize the large heterogeneity within the group of outdoor marijuana growers, there may be further sensible divisions within the *scale of production* category that would need to be identified. In addition to this, these distinctions could be further refined through use of information that is already being gathered on specific organized crime groups (e.g., National Coordinating Committee on Organized Crime 2003; Criminal Intelligence Service Canada 2009) and through use of techniques such as SLEIPNIR and PROOF that are already being utilized. These mechanisms could be further supplemented by the techniques proposed by Albanese (e.g., 2004; 2008) who presents a mechanism for assessing risk posed by organized crime that focuses on illicit markets (rather than criminal groups) as the unit of analysis – a technique that is presented as, “offer[ing] a practical alternative for determining the presence of organized crime in areas that may or may not have a history of organized crime involvement” (Albanese 2008: 263). Moving to the other dimension in Table 1, in addition to these broad *site location* distinctions, it will probably also be valuable to consider the importance of factors such as climate, seasonal variations, and soil types, both within- and between-provinces.

Table 1. Example of possible meaningful distinctions for disaggregating OMGOs into smaller, meaningful categories to become the focus of POP strategy development

Scale of production (Who is doing it?)	Site location (Where are they doing it?)	
	Public land (e.g., forest)	Private land (e.g., farm)
Small (e.g., “Mom and Pop”)	Problem 1	Problem 2
Large (e.g., <i>Organized crime groups</i>)	Problem 3	Problem 4

These suggestions are designed to be thought provoking, and are by no means intended to be definitive or exhaustive. Once this process of problem specification is refined, however, it would make a strong contribution to targeting crime prevention efforts (for example, concentrating efforts against a specific large-scale, organized crime group who produce marijuana on farm land in northern Quebec with highly alkaline soil and a shorter-than-average suitable growing season

by Canadian standards). Successful problem specification would also possibly make in-roads into the second current issue, which concerns estimating the prevalence of OMGOs across Canada.

2.4.2.2 Exploring the Role of Novel Approaches to Better Estimating the Size of these More Specific Problems

As discussed previously, under current circumstances it is not known exactly how much marijuana is being produced in Canada. From the perspective of implementing a POP motivated strategy for addressing OMGOs in a Canadian context, however, it may be the case that increased specificity with respect to which outdoor grow operations problem is being targeted may help generate better estimates of the extent to which that specific problem is occurring (referring again to the hypothetical specific example listed in the previous paragraph).

In addition to utilizing the traditional triangulation approach to assessing the extent of production within these specific types of OMOG problems, there are at least two locally-developed methods that have been written about recently which warrant further exploration. The first is a capture-recapture methodology, originally developed in biology, which has been applied by Bouchard and colleagues to various aspects of the cannabis production industry in Quebec (e.g., see Bouchard 2007b; Bouchard 2007a; Bouchard et al. 2009; Bouchard and Dion 2009; Bouchard and Nguyen 2010; for examples of this work). Although Bouchard's published work to date has not been directly focused on defining the size of OMGOs with respect to contributing to the analysis phase of the development of a POP strategy, he is a Canadian-based expert in estimating the scales of marijuana production and his novel strategies may make an excellent contribution to the overall objectives of this initiative.

The second additional process that could be explored further with respect to generating more detailed estimates of the quantities of marijuana being produced by OMGOs (again, operating within the more specific boundaries of the problems that will be identified within this broad label) concerns the application of a range of techniques including: (a) geographical information systems (GIS), (b) high resolution satellite imagery, and (c) airborne hyperspectral imagery. Two recent studies conducted in B.C. (Howell et al. 2002; Thiessen 2007) have demonstrated success

in utilizing combinations of these techniques to locate OMGOs. The basic premise involved is that GIS helps identify areas that are highly suitable for locating OMGOs, and then satellite imagery and/or airborne hyperspectral imagery can be focused on those areas identified as likely candidates through GIS. Although none of these techniques are full-proof, the findings from these initial studies appear highly positive and these strategies warrant further investigation across contexts and in conjunction with other aspects of a fully-developed POP strategy.

2.4.3 SARA Step 3: RESPONDING to OMGOs in Canada

2.4.3.1 National Coordination

In November 2002 the R.C.M.P. appointed a National Coordinator of Marijuana Grow Operations, designed to perform the following five functions (R.C.M.P. 2010): (1) create a best-practice based enforcement template; (2) coordinate anti-marijuana grow operation effort across police agencies; (3) work in partnership with international law enforcement to reduce opportunities for the production, trafficking, and sale of marijuana; (4) implement consistent safety standards for employees involved with investigation and dismantling of OMGOs; and (5) inform debate about potential legislative change. In addition to this, the National Coordinator of Marijuana Grow Operations is responsible for Operation SABOT, which is a national interagency effort that began in 1989 and involves the R.C.M.P., air support provided by the Canadian Forces, and local enforcement agencies. The aim of Operation SABOT is to eradicate OMGO production sites. Operation SABOT, is an across-Canada collaborative initiative between the R.C.M.P. and the Canadian Forces, which is coordinated by the Federal RCMP and undertaken in partnership with the military. A representative from the National Coordinator of Marijuana Grow Operations advised that the Canadian Forces flying hours are allocated across Canada based on a combination of intelligence-led police work (including information from sources and public reports) and on the perceived value/utility derived from previously allocated flying resources. The Provinces then have local control about when best to utilize these resources in order to optimise the extent to which Operation SABOT fits in with other local OMGO reduction initiatives. Reports on the impact of SABOT suggest that, “Over the last four years [leading up to 2008] alone, more than 100,000 marijuana plants have been eradicated” (Price

2008: 36), and that, “In 2007, 171504 plants and 212 kgs were seized by the RCMP, Canadian Forces and local enforcement as part of SABOT. The seizures were effected mostly in Quebec and the National Capital Region” (R.C.M.P. 2007: 5).

2.4.3.2 British Columbia

A number of initiatives targeting marijuana production have been implemented in B.C., including the Vancouver Police Department’s “Growbusters” scheme (Vancouver Police Department 2001), and the Surrey-based Electrical and Fire Safety Inspection (EFSI) Initiative that commenced in 2004 (e.g., Garis 2006; Garis 2009; Garis et al. 2009). Although the conclusions from an evaluation into the effectiveness of these types of tactical units undertaken by Malm and Tita (2006) did conclude that these initiatives have decreased the incidence of grow operations in a geographically-specific manner, it is not directly clear how well these results generalise to OMGOs given that the majority of these interventions targeted indoor marijuana production. Overall in B.C., with the exception of the B.C. component of Operation SABOT and the studies into GIS, satellite imagery, and hyperspectral imagery, little has been published with respect to countering OMGOs. Plecas et al. (2005: 28) produced estimates that approximately 16 percent of founded grow operations in B.C. were located outdoors, and two-thirds of these were situated on Crown land. The Plecas et al. (2005: 29) report also discusses the regional variation in frequency of OMGOs within BC, which provides good support for the suggestions made previously in this paper about the merit in increasing the specificity with which OMGO problems are defined. A further point of note from the Plecas et al. (2005) paper concerned the heavy dependence of B.C. policing agencies on information provided by the public to detect grow operations, with suggestion that very little of what was being uncovered was as a consequence of proactive policing initiatives.

2.4.3.3 Ontario

Working in coordination with the Federal R.C.M.P. National Coordinator of Marijuana Grow Operations and the R.C.M.P. “A” Division involved with Operation SABOT, the Ontario Provincial Police (O.P.P.) also operate an eradication program for OMGOs, named the Provincial

Marijuana Eradication Program. There are two major sections from within the O.P.P. that are important to mention here. First is the Drug Enforcement Section, which represents the primary provincial expertise in this area and is responsible for providing “multi-level enforcement via joint force team undercover projects to suppress illegal drug use, production, sale, and distribution” (O.P.P. 2010a). The Drug Enforcement Section of the O.P.P. have strong working links with other special enforcement units within the O.P.P., and also, on an annual basis, work in conjunction with the O.P.P. Helicopter Section to conduct the Provincial Marijuana Eradication Program. This exercise is coordinated with local O.P.P. detachments and municipal police services (O.P.P. 2010a). The second category of specialist sections within the O.P.P. that have direct relevance to prevention and detection of OMGOs are the five Rural and Agricultural Crime Teams: with one located in each of Ontario’s five Regions (O.P.P. 2010b). These teams are also involved in the destruction of OMGOs throughout the province. To give some insight into the success experienced through these OMGO initiatives in Ontario, “In 2007, [the O.P.P.’s] efforts lead to the seizure of 164,828 plants and 6,700 kgs of dried marijuana from 365 outdoor grows and 186 indoor grow” (R.C.M.P. 2007: 5).

2.4.3.4 Quebec

Operation CISAILLE (Sûreté du Québec) is a multi-agency cooperation that was initiated in 1999 and is designed to eradicate marijuana production and trafficking in Quebec. The National Coordinating Committee on Organized Crime (2003: 11) report explained that, “[CISAILLE] aims to reduce the production of marijuana, investigate organized crime links, eradicate [marijuana grow operations] and educate the public to their existence.” The National Coordinating Committee on Organized Crime (2003: 12) also suggests that the Sûreté du Québec are proactive about generating positive working partnerships with private stakeholders with a view to enhancing the success of CISAILLE. In addition to this, “[CISAILLE] encourages the public to report suspected grow operations in their community. In 2007, CISAILLE efforts let to the seizure of 737,977 plants and 7,540 kgs of marijuana seized primarily from outdoor grows” (R.C.M.P. 2007: 5).

2.4.4 SARA Step 4: ASSESSING Current Strategies for Dealing with OMGOs in Canada

Although, as has been presented within this section, there are aspects of current practice that are consistent with the phases of SARA, no coordinated POP-focused strategy for OMGOs has been implemented in Canada. As is discussed in the following section of this paper, however, this dearth is not locally specific, as there are no clear examples from anywhere outside of Canada where a POP approach has been closely followed to address OMGOs. In addition to this, it is important to remember that a common failure across a range of POP interventions has been the absence of an effective assessment phase. Indeed, as Clarke and Eck (2003) explained, the analysis and assessment components of SARA are typically the areas that receive the least attention, particularly in a manner that is consistent with the aims of a comprehensive application of a POP framework.

2.4.5 Summarizing of Strengths and Limitations

Given this overview of the current Canadian context for addressing OMGOs through the use of the SARA approach to POP, there are some strengths and limitations that should be briefly highlighted.

- The unified *Criminal Code* and the national commitment to addressing this overarching issue are a definite strength.
- As currently used, ‘OMGOs’ is an overly inclusive term that limits the effective implementation of POP. However, this is not a severe limitation, and some strategies for addressing this limitation utilising existing policing intelligence have been discussed.
- The inability to calculate the size of these OMGO problems in Canada is a limitation at this stage. This is not specific to Canada, and there are some possible strategies that have already been investigated to some extent in Canada which may contribute to ameliorating this limitation, particularly if implemented in conjunction with the improved problem specification.
- There is an absence of assessment of the processes that have been used to date designed to impact on OMGOs. This is a limiting factor for the estimated value of a

POP approach to countering OMGOs and would require attention should such a strategy be adopted.

The limitations summarized here are not specific to OMGOs in Canada, however; particularly with respect to the need to improve the analysis process and to engage in a much larger degree of assessment. A framework for making some of the improvements in these areas is outlined in Section 6 of this discussion paper. Prior to that, the following Section provides an overview of relevant international approaches to OMGOs.

3 Responding to OMGOs Outside of Canada

Having discussed how the current Canadian responses to OMGOs align with an ideal application of POP, it is important to place these national initiatives in context by considering what approaches have been adopted in other parts of the world to deal with these types of problems. This section outlines the findings of summary research done by Mazerolle and colleagues (e.g., Mazerolle et al. 2005; Mazerolle et al. 2007) that looks at the main types of drug law enforcement exercises that have been undertaken to date. The interventions with greatest relevance to OMGOs are subsequently discussed before moving into Section 6 where some novel possibilities for developing POP strategies to counter Canadian OMGOs are proposed.

3.1 Categorising Drug Law Enforcement Evaluations

Motivated by the world-wide trend to commit very large percentages of resources available for illicit drug control to enforcement strategies, Mazerolle and colleagues undertook a systematic review of drug law enforcement strategies from around the world. The objectives and scope of this review were intentionally broad, with the aims to: (a) include drug law enforcement responses that had been implemented at all levels of policing, (b) include studies even if they were not printed in English, (c) expend particular effort to identify non-U.S. studies (in attempt to rectify any literature bias), and (d) be more inclusive and less restrictive on methodological grounds than is typical for systematic reviews (in part motivated by, “the dearth of high-quality research in the law enforcement arena,” Mazerolle et al. 2007: 117). This review maintained

exclusive focus on illicit drug law enforcement interventions led by police that specifically targeted drug supply and/or demand reduction. In total 155 studies that evaluated 132 unique interventions were examined.

The findings of this review are available in a summary report (Mazerolle et al. 2005) and related peer reviewed journal article (Mazerolle et al. 2007). As a result of this exercise, Mazerolle et al. identified five main categories of drug law enforcement evaluations that have been conducted to date: (1) international/national interventions, such as interdiction or drug seizures, (2) reactive/directed interventions, such as crackdowns and saturation patrols, (3) proactive/partnership interventions, including POP and community policing, (4) individualized interventions, involving arrest referrals and diversions, or (5) combination interventions that incorporated a mixture of reactive/directed and proactive/partnership strategies. In additional support for the underlying principles of POP strategies, Mazerolle et al. (2007: 115) concluded that, “proactive interventions involving partnerships between the police and third parties and/or community entities appear to be more effective at reducing both drug and non-drug problems in drug problem places than are reactive/directed approaches.” This supports the findings reported by Weisburd and Eck (2004) about the superior value of focused interventions involving partnerships that extend beyond law-enforcement resources relative to more general, police-only initiatives. In addition to this, and also consistent with the findings reported by Weisburd and Eck (2004), despite the generous review inclusion criteria utilised, Mazerolle et al. concluded that the overall quality of drug law enforcement research was poor and evaluation was limited.

3.2 Previous Drug Law Enforcement Initiatives with Greatest Relevance to OMGOs

With respect to OMGOs and POP, there are a number of previously evaluated initiatives reviewed by Mazerolle et al. (2005; 2007) that need brief explanation within this discussion paper. The first two examples involved OMGO crop eradication, along the lines of the current Canadian policing initiatives discussed above. Crop eradication typically involves large-scale efforts to locate and destroy/seize large quantities of drugs with a general focus on reducing growth and cultivation (Mazerolle et al. 2007). The two main components of these types of

interventions are (a) information gathering to locate crops; typically involving a combination of public complaints/informants, investigative work, undercover operations, and aerial reconnaissance, and (b) destruction/seizure of crops, either through the use of herbicides or manual, ground-focused police labour. Mazerolle et al. (2005; 2007) identified two OMGOs crop eradication evaluations, neither of which was considered to have been evaluated to the standards normally associated with scientific rigour.

The first of these was conducted by Potter et al. (1990) with respect to the marijuana eradication effort undertaken in Kentucky, U.S. between 1982 and 1987. An multi-agency, multi-faceted approach (involving, "air interdiction, joint state and federal operations, joint military operations, ...and traditional drug enforcement," Mazerolle et al. 2005: 5) was undertaken across Kentucky over this period of time, involving a combination of techniques that led to the destruction of crops when detected and the seizure and forfeiture of assets for those deemed responsible for the OMGOs. The outcome of the evaluation suggested that the overall approach was not successful, however, with Potter et al. (1990: 104) suggesting that, "rather than having a negative impact on the marijuana market, the marijuana enforcement program has merely reshaped that market, possibly making it more efficient and profitable than it previously was." Several major adjustments to the business structure that Potter et al. outlined included: (a) a move to smaller-scale productions, distributed across more locations – a diversification of risk of detection, (b) a distribution of OMGOs across a wider geographical range, (c) greater attention was paid to crop quality, with an increased level of THC observed in crops after the eradication initiative which actually increased demand for this product inter-State, (d) decoy plantations of "ditchweed" (low-grade marijuana) emerged to draw attention away from legitimate market-quality marijuana grows, and (e) the emergence of highly organized, coordinated criminal groups. In addition to this, the increased police eradication activity actually produced an upsurgeance of public support for the marijuana industry.

The second example of an OMGO eradication initiative that was evaluated took place in New Zealand and the findings are summarized by Wilkins et al. (2002). This eradication exercise involved a collection of targeted police operations focusing on areas of New Zealand with a history of OMGO activity. Aerial reconnaissance was undertaken to detect OMGOs and crops

were destroyed either through the use of herbicidal spray or by manual efforts of officers. Wilkins et al. (2002) “estimated this program was successful in eradicating 26-31 percent of the total cannabis production of New Zealand” (Mazerolle et al. 2005: 5), where the denominator in this rate calculation was estimated through a triangulation of police records and cannabis consumption rates as calculated from responses to the New Zealand National Drug Survey. Given the previously discussed issues acknowledged by the U.N. with respect to calculating marijuana production, it is important to interpret the extent of the success claimed in this case with caution.

With respect to the Kentucky and New Zealand evaluations, Mazerolle et al. (2007: 123) concluded that, “There was not a lot of support to suggest that crop eradication has a positive impact on supply and availability of cannabis.” This perspective is consistent with Farrell’s (1998: 395) estimation that, “Globally, the annual risk of eradication is continually below 10% for each crop [of opium poppy, coca bush, and cannabis plant].” These attitudes are further supported by the findings of “Barnard’s (2001) qualitative evaluation of U.S. supply-reduction strategies [which] suggested that federal agents viewed current strategies as ineffective and the alternatives to current strategies as even less effective” (as cited by Mazerolle et al. 2007: 123).

In addition to these OMGO eradication exercises, two search and seizure evaluations were examined by Mazerolle et al. (2007: 127). These were not focused on marijuana (instead, they were focused on chemical drugs) and both involved U.S. police departments (a 1997 effort coordinated by the Indiana State Police Department and a 2003 initiative undertaken by the Salt Lake City Police Department). Prior to undertaking the search and seizure process in these cases, in addition to the intelligence gathering activities the police completed, strong cooperative links were also developed with other agencies such as welfare, local community groups, drug treatment agencies, and probation services. The relevant outcome of these interventions for a comprehensive OMGOs initiative is the positive impact these inter-agency efforts had on a local level.

3.3 Extent to which Previous International Efforts Satisfy POP Criteria

As with the locally-focused Canadian eradication exercises, these international attempts to counter OMGOs do not adhere to the principles underlying a POP framework. This explains why neither the Kentucky nor the New Zealand studies were included in Weisburd et al.'s (2010) Campbell systematic review. However, as will be discussed in the following section, eradication and seizure should form part of a POP strategy to counter specific examples of OMGO problems, as these strategies make a definite contribution to the Response component of SARA.

4 Developing a Framework for a Comprehensive POP Approach to OMGOs in Canada

This section makes some additional suggestions for some theoretical frameworks that could be used to further develop each of the SARA steps with a view to developing a set of POP-consistent strategies for addressing OMGOs in Canada. Initially, with respect to the scanning of the OMGOs problems, a model is presented that will help identify the key contextual elements involved in an OMGO. Some specific examples as to how this model could contribute to the analysis are then outlined, followed by the description of a second model designed to facilitate the response phase of SARA. The final component of this section discusses the likely positive impact these frameworks would have on the assessment of future OMGO-reduction initiatives and also outlines the main gist of a recently published Australian approach to implementing a drug law enforcement performance measurement framework.

4.1 A Theoretical Framework for Deconstructing the SCANNING Phase for OMGOs

In their recent book that demonstrated how the risk of terrorist attacks can be ameliorated through application of a crime prevention framework (discussed in detail within the *response* section, below), Clarke and Newman (2006) appealed to the Haddon Matrix (e.g., Haddon 1999) to facilitate the specification and separation of terrorist opportunities into meaningful categories. The Haddon Matrix, which was originally developed within a population health paradigm and designed as a mechanism for deconstructing the context within which injuries occur, has two axes: the first partitions time into pre-event, event, and post-event categories, and the second

identifies, “elements of the epidemiological triad” (Lett et al. 2002: 199). Table 2 outlines the potential for utilising this matrix to develop a comprehensive understanding of the relationship

Table 2. Haddon Matrix-based Framework for Conceptualizing the OMGOs Problem

Time interval	Epidemiological Triad			
	Human involvement	Vehicle & equipment involvement	Environmental involvement	
			Physical	Socio-economic
Pre-OMGO	<ul style="list-style-type: none"> • Organization type (e.g., specific gang) • Location selector (from macro to micro) • Transporters: seeds and facilitating equipment 	<ul style="list-style-type: none"> • Start-up capital • Transport equipment (e.g., for seedlings, potentially to cover rough terrain) • Facilitating equipment (e.g., seedlings, clones, fertilizers, irrigation equipment) 	<ul style="list-style-type: none"> • Location suitability (e.g., isolation, access, water availability, soil type, climatic factors) • Type of land (e.g., forest vs. farm land, private vs. public land) 	<ul style="list-style-type: none"> • Community support (continuum from implicit to explicit) • Employment/economic factors (macro through to micro) • Cultural/ethnic factors
During OMGO	<ul style="list-style-type: none"> • Labourers (tend to and harvest the crop) • Protection/ security (ongoing vs. intermittent presence) 	<ul style="list-style-type: none"> • On-going financial support • Security devices/ weapons • Replenishment of facilitating equipment 	<ul style="list-style-type: none"> • Ongoing location suitability (e.g., isolation, access, water availability, soil type, climatic factors) 	<ul style="list-style-type: none"> • Proximity to supporting infrastructure (e.g., towns, power, communication)
Post-OMGO	<ul style="list-style-type: none"> • Transporters • Distributors • Interaction with other types of organizations (e.g., different gangs) 	<ul style="list-style-type: none"> • Distribution costs • Transportation to point-of-sale (possibility to cross international borders) 	<ul style="list-style-type: none"> • Market location (regional, province, country – distance impacts on costs and price) 	<ul style="list-style-type: none"> • Impact of broad market forces (demand and supply) – variations could result in movement to novel markets

between time and the various contextual factors involved with implementation of an OMGO, with some examples of variables that could differentiate between OMGOs listed. This model provides a broad mechanism for defining the opportunity structure that could help determine resource allocation and operational, crime prevention goals. Interestingly, one limitation that Lett et al. (2002: 199) discuss with the Haddon Matrix is its lack of a systematic plan of action, and they propose the four-level Public Health Approach (PHA, comprised of surveillance, risk factor identification, intervention evaluation, and program implementation) as a mechanism for operationalizing the matrix within an injury prevention setting. The parallels between this PHA approach and POP are obvious, adding good support to the assumption that, with respect to OMGOs, the POP framework would be an excellent process for developing a specific implementation plan for the outputs of a Haddon Matrix style examination.

4.2 Applying the Theoretical Framework to the ANALYSIS of the OMGO Situation

In this way, the Haddon Matrix would provide a formalized process for developing the problem definition suggestions made in Section 4 (involving scale of production, type of organized crime entity involved, and site location). Without wishing to expand in too much detail here, there are aspects OMGOs that could emerge across all dimensions of the epidemiological triad and across all time intervals specified by the Haddon Matrix framework which would contribute to the analysis and increased specificity within which OMGOs are defined. These include:

- **Identify and control facilitators.** There is a vast amount of information freely available online about the optimal strategies to follow when establishing an OMGO (e.g., Foltz 2004; HowToGrowMarijuana.com 2010; Weed Farmer 2010). By compiling regionally-specific information about the best seeds, fertilizer, clones, etc., it would be possible to develop a strategy for managing these facilitators. Bouchard and Dion (2009) discuss this with respect to hydroponic equipment, however, there are a great deal more facilitators that could be examined through using the two frameworks proposed here. Another facilitator is the human element, for example, in Oregon where the larger OMGOs are supported by man-power provided by illegal aliens who establish and maintain the marijuana grow op (Oregon HIDTA Program 2009: 12). There will be an interaction between legitimate and illegitimate enterprises here. For example, legitimate products (such as fertilizers and wetting agents) could be required in sufficient quantities for OMGOs to warrant suspicion.
- **Examine the opportunity backcloth.** Through consideration of ecumene patterns (the distribution of human residents), road networks (including access/minor roads), land use, zoning, housing density, water availability, access to distribution sites, etc., it would be possible to determine the relative suitability for sites that should be targeted pre-emptively for police attention. Seasonal variations and limitations would also fall into this category. These strategies would supplement the previously discussed GIS-type approaches, and could be used in conjunction with offender-based information (about individuals and gangs) to compile comprehensive profiles of risk. This analysis strategy could incorporate

what is known about previously detected OMGOs and link in with existing, current policing intelligence.

- **Consider the broader elements of the situation.** Examine the materials/infrastructure involved before, during, and after the OMGO that are required to make the exercise profitable. Consider the contextual factors that broadly impact on the viability of producing an outdoor marijuana crop (e.g., production, transportation, distribution, financing, and methodology). For example, with respect to transport, (a) are the OMGO outputs being transported by road, sea, rail, or air (or a combination of these), (b) how far are they moving, (c) what time period are they being shipped over, and (d) is there a time of year that is more likely to experience movement of large quantities of marijuana? It is likely to be possible to impact significantly on the unwanted behaviour (producing marijuana) through indirect action that targets other crucial aspects of the broader context. Examine other types of crime associated with OMGOs and how marijuana interacts with other illegal products (e.g., cocaine, amphetamines, and guns).
- **Evaluate the OMGO within the context of the organized crime group.** How does the OMGO fit in with the broader activities of the organized crime group? Build on what is known about distribution points. Who buys and sells marijuana at known distribution points? If these individuals are not local, this may give insight into the location of the production side of the operation. In addition to the range of research available into this area (e.g., Rengert et al. 2000; Oregon High Intensity Drug Trafficking Area (HIDTA) Program 2009) Sifaneck et al. (2007) examined variations in the target markets that outdoor plants may appeal to.

The information that emerged from this process would operate in conjunction with the previously discussed novel techniques for estimating the size of the OMGO production in Canada to develop much more specific estimates of the size of specific OMGO problems. As is discussed in the following section, this information would then lead directly to the development of focused, novel POP strategies for responding to OMGOs.

4.3 Generating Theoretically-Motivated, Novel RESPONSES to OMGOs

Building on the problem-specific information that will emerge from application of the Haddon Matrix during the scanning and analysis steps of SARA, this section outlines how a set of theoretically-grounded crime prevention techniques can be utilized to generate novel responses to specific OMGO problems. Initially, the situational crime prevention (SCP) approach will be explained and the scope for applying it in a broad sense to OMGOs will be discussed. Following this, some of the types of novel responses that will emerge from the application of this process are outlined, including the potential for increasing support for lobbying for legislative reform. Finally, the importance of developing effective collaborations, both between policing agencies and with non-police stakeholders, will be emphasized.

4.3.1 Environmental Criminology and SCP

Sutton (2006: 2) suggested that, “In applying the problem solving process to crime prevention it is important that any selected interventions are the logical extension of a sound theory (Eck 2002, 2005).” Such a basis can be provided by the core environmental criminology perspectives of routine activities theory, crime pattern theory, and rational choice which provide holistic support for the SCP framework for reducing opportunity. At a macro level, SCP is informed by routine activity theory (Cohen and Felson 1979), “that seeks to explain how changes in society expand or contract opportunities for crime” (Clarke 2005: 41). Next, from a meso-level, SCP is guided by the Brantingham’s (1984) crime pattern theory which explores how offender and offence distribution is influenced by normal, everyday activity. Finally, when addressing the micro level of offending, SCP appeals to the rational choice perspective, which conceptualizes criminal behaviour in terms of bounded rationality, and assumes “that crime is purposive behaviour designed to meet the offender’s commonplace needs” (Clarke 1997: 10) within the immediately relevant temporal, physical, and logistical constraints. Clarke (2008: 178-180) outlines three fundamental assumptions of SCP: (a) when crime occurs it is the result of an appropriate interaction between situation and motivation, (b) crime arises as a result of a choice, and (c) opportunity mediates the occurrence of crime.

Building on this theoretical basis and with these assumptions in mind, the SCP framework has developed over time into a set of 25 techniques that are categorized into five overarching styles: increasing effort, increasing risk, reducing rewards, removing excuses, and reducing provocations (e.g., Clarke 2005; 2008). Overall, the SCP framework provides a broad spectrum of highly malleable techniques that have relevance to the prevention of every crime (see Table 3 for a list of these techniques, as summarised in Clarke & Eck, 2003: 88). Generally, SCP calls for careful and separate examination of different forms of crime and does not assume that offenders are pathological. Situational approaches are broadly focused with respect to potential offenders, only consider motivation in terms of its relevance to prevention (and are explicitly uninterested with respect to “root causes” of offending), and adopt a highly-focused perspective with respect to opportunities and potential targets. Three important factors to note about SCP approaches to crime minimization are: (a) they do not discriminate, instead impacting on all citizens equally; (b) they do not necessarily restrict human rights and freedoms under the guise of increased security, producing a “fortress” society or a Brave New World scenario (e.g., see Clarke 1997, for a discussion of this point); and (c) they do not simply result in offenders picking the next-best target as a result of opportunity reduction (termed *displacement* within SCP).

Table 3. Twenty-Five Techniques of SCP (Clarke & Eck, 2003)

Technique focus	Technique		
Increase Risk	1. Extend guardianship	3. Reduce anonymity	5. Strengthen formal surveillance
	2. Assist natural surveillance	4. Use place managers	
Increase Effort	6. Target harden	8. Screen exits	10. Control tools/ weapons
	7. Control access to facilities	9. Deflect offenders	
Reduce Reward	11. Conceal targets	13. Identify property	15. Deny benefits
	12. Remove targets	14. Disrupt markets	
Remove Excuses	16. Set rules	18. Alert conscience	20. Control drugs and alcohol
	17. Post instructions	19. Assist compliance	
Reduce Provocations	21. Reduce frustrations and stress	23. Reduce arousal and temptation	25. Discourage imitation
	22. Avoid disputes	24. Neutralize peer pressure	

Until recently, SCP has made little-to-no comment about distal opportunities and broad motivating factors that influence risk. However, recent developments in this area have led to definite expansion of the scope of prevention techniques to instigate distal situational changes, with examples including Clarke and Newman (2006 - see their discussion of the four pillars of terrorist opportunity) and Freilich and Chermak (2009 - see their discussion of the 'soft' and 'hard'

strategies for prevention). Despite this expansion, which Freilich and Newman (2009: 6) suggest, “seemingly [breaks] the ‘rule of specificity’ so ardently promoted by the traditional SCP approach,” Clare and Morgan (2009a; 2009b) discuss how the expanded boundaries for SCP remain entirely consistent with the fundamental assumptions underlying situational prevention: namely (a) crime is both normal and inevitable, (b) no appeal is made to converting deviant individuals (i.e., a prevention focus is maintained at all times and no appeal is made to “root causes” for criminal behaviour), and (c) crime will never be eradicated. With these points in mind, with respect to impacting on OMGOs, environmental criminology theory can be interpreted to suggest that an optimal prevention framework will incorporate a mixture of proximal and distal strategies that make full use of the entire set of SCP techniques. This type of strategy should enable law enforcement agencies to simultaneously target different time-frames of intervention, with distal prevention strategies likely to take longer periods of time for successful implementation, while proximal approaches better able to produce more immediate benefits. The framework for such a model is outlined in Table 4, below.

Table 4. SCP for Responding to the OMGOs Problem: Building on Clarke & Newman’s (2006) Expansion to Terrorism

Focus of strategy	Situational characteristic for OMGOs (motivations and opportunities)				
	Increase Risk	Increase Effort	Reduce Reward	Remove Excuses	Reduce Provocations
Proximal					
Distal					

4.3.2 Responses will emerge from the Analysis Framework

Emerging from the work in the U.K. to design out crime, the term “Think Thief” (Design Council 2003: 13) has been used to encourage crime prevention practitioners to, “put themselves in the place of an offender, anticipate their actions, understand their tools, knowledge and skills.” Clarke and Newman utilised this idea to great effect in their examination of the positive contribution SCP could make to terrorist risk reduction with the parallel “Think Terrorist.” In a continuation of this trend, when seeking to develop novel and relevant prevention strategies, it would be highly worthwhile to “Think OMGO Producer.” Utilising the logic underpinning SCP and building on the increased specificity of information about types of OMGOs, it is important to

approach prevention and detection from an equivalent mindset that a potential OMGO perpetrator (or perpetrating organization) would do.

Applying this approach in conjunction with the information generated through the Haddon Matrix framework, it would be possible to identify novel responses that operate:

- on a proximal and/or distal level;
- manipulate the rewards, provocations, excuses, effort, and risk associated with developing an OMGO, with respect to motivation and opportunity; and
- implement strategies to disrupt the OMGOs pre-, during, and post-production.

4.3.3 Legislative Reform

One obvious example of the type of distal activity that could have long-term, significant impact on OMGOs concerns legislative reform. The National Coordinating Committee on Organized Crime (2003) made a number of relevant recommendations to this end, including:

- reviewing the *Controlled Drugs and Substances Act*, with respect to maximum sentencing options and ensuring aggravating factors be considered at sentencing (Recommendation #3, National Coordinating Committee on Organized Crime 2003: 15);
- exerting greater control over legal facilitators for OMGOs. An example of this type of legislative change was recommended by the National Coordinating Committee on Organized Crime (Recommendation #4, 2003: 17) report with respect to indoor, hydroponic equipment sales (such as monitoring sales, and gathering customer information);
- recommendations #5 and #6 from the National Coordinating Committee on Organized Crime (2003: 18) were concerned with amending legislation to allow pre-sentencing seizure of marijuana production equipment and moving to a national unified civil forfeiture legislation to proceeds of crime. Recommendation #8 of this same report discusses a fuller use of the *Income Tax Act* to its fullest scope to impede individuals and organizations that are profiting from marijuana production;

- it is also worth exploring what impact the medicinal marijuana laws are having in Canada. The Oregon experience suggests this is contributing to the problem (Oregon High Intensity Drug Trafficking Area (HIDTA) Program 2009);
- putting more onus on place managers (e.g., farmer managers who rent out agricultural land) to monitor land use; and,²
- alternative implementation/interpretation of existing legislation, e.g., implementing anti-terrorism legislation to monitor purchases of diesel fuel and fertilizer.

These possibilities are not included here with a view to overstating the deterrent effects of current legislation. However, these proposed legislative changes were made in 2003, and if they have not been enacted at this stage would be worthy of reconsideration.

4.3.4 Inter-Agency Collaboration

As discussed in Section 5, the types of drug enforcement interventions evaluated by Mazerolle et al. (2005; 2007) that produced the most positive impact on illicit drugs involved a combination of reactive/directed and proactive/partnership activities. Mazerolle et al. (2007) discuss a range of alternatives that can be grouped as proactive and partnership policing, including: (a) drug nuisance abatement, civil remedy, and third-party policing, (b) community policing, (c) multi-jurisdictional taskforces, (d) crime prevention through environmental design (CPTED), (e) drug free zones, and (f) POP and proactive combination tactics. The review of a multi-agency, highly complex initiative undertaken in the United Kingdom undertaken by Maclean et al. (2002) produced positive results in support of these types of initiatives. Although it moves beyond the scope of this discussion paper to develop these approaches further, the value of these types of collaborative efforts must be clearly stated when utilizing a POP framework to counter specific aspects of the overall OMGO problem.

² An equivalent process has been used to great effect in managing rental properties; involving proactive and partnership policing, as discussed by Mazerolle et al. (2007). The objective here is to put a responsibility of land owners (i.e., farm owners) to check that OMGOs are not taking place on leased farm land that they own. Real estate boards could also contribute to this process by monitoring for above average rental prices/above average sales prices for farm land. Monitoring farm rental activity is already an objective of the O.P.P. (2010b) that works in partnership with the Ag Crime network (www.agcrime.net) with the “aim to improve the lines of communication between local law enforcement agencies and the agricultural community.” See also Alberta Rural Crime Prevention resources (www.ruralcrimewatch.ab.ca/index/html), and the Ontario Ministry of Natural Resources Forestry Page (www.ontariosforests.mnr.gov.on.ca).

An excellent example of this type of collaborative effort between policing agencies designed to combat OMGOs in a coherent manner is already in place in Oregon. As explained in the Oregon HIDTA Program (2009: 36) report, “The Oregon High Intensity Drug Trafficking Area (HIDTA) Investigation Support Center (ISC) is an organizational leader and participant in the National Marijuana Initiative. This program connects the five western states by allowing analysts to collaborate and share marijuana trafficking organization intelligence directly with one another. Currently, the ISC has a full-time analyst and a full-time Oregon National Guard analyst assigned to the program that helps coordinate complicated marijuana manufacturing cases state-wide. This partnership has lead to many successful marijuana investigations throughout the Pacific Northwest.” The Oregon HIDTA Executive Board have also made police training and shared intelligence a priority, resulting in the development of the Oregon State Police Training Initiative, the Oregon State Intelligence Network (OSIN), and the Regional Information Sharing System Network (RISSNET). In addition to this, the Oregon HIDTA Program (2009: 36) report goes on to explain that: “Using RISSNET access via a secure intranet, law enforcement agencies are able to make real-time intelligence submissions and inquire directly into the OSIN system. A query of the system provides law enforcement personnel access to criminal intelligence information which includes both narcotic trafficking and other criminal related organizations. This integration of intelligence resources enables personnel to recognize the connection narcotic suspects have with other major crimes, such as weapons related offences, identity theft, financial fraud, auto theft, and gang related violence. ...In 2007, the Oregon HIDTA Program partnered with the Western States Information Network (WSIN) and created a seamless connection between the WSIN system and the OSIN system. Officers in Oregon can now seamlessly search the OSIN system and obtain valuable intelligence submitted by investigators in the five western states.”

As in Oregon, it is important to maximise the extent to which intelligence relating to criminal activity associated with OMGOs is coordinated and disseminated between policing agencies in Canada. The National Coordinating Committee on Organized Crime (2003: 10) report discussed the fact that databases that were in place (such as the Automated Criminal Intelligence Information System, ACIIS, managed by the Criminal Intelligence Service Canada) was probably not being utilised in an optimal manner, with policing agencies demonstrating reluctance to input intelligence into the system. If a more consistent and holistic system for coordinating and sharing

policing intelligence could be achieved this would be a positive from an investigative and prosecutorial perspective. Overall, the National Coordinating Committee on Organized Crime (2003: 11) recommended that, “all levels of government and law enforcement enhance and strengthen networks with key partners, such as other government departments and private sector stakeholders including banks, insurance companies, real estate boards, hydro companies, etc., to both raise their awareness of marijuana grow operations and to encourage them to develop their own policies that may assist in reducing the threats of grow ops.” The increased specification of the OMGOs problem that emerges from the use of the frameworks presented in this discussion paper may assist in identifying even more partner organizations that need to be coordinated with.

4.4 Coordinate and Standardize the Approach to ASSESSMENT of Better Defined Problems

In light of better defined problems and a framework for comprehensive analysis and response it is expected: (a) it will be possible to generate clearer expectations about what OMGO interventions should achieve, and (b) that this will lead to the identification and/or development of more appropriate measurement techniques to assess the impact of prevention activity. Assessment is a huge factor and must be undertaken. This should be approached with Tilley’s (2010) suggestions of an iterative, collaborative, medical model-style approach to prevention, rather than a sink-or-swim approach whereby initiatives are completely discarded if they are not found to be effective when first trialled or assessment is abandoned if suitable mechanisms are not already developed and available.

There is also scope for developing better measures for attempting to capture aspects of drug enforcement performance/intervention. As discussed previously, this effort is typically hindered by the uncertainty around what percentage the drugs captured during seizures comprise of the total drugs produced. As a consequence of refining the definition of individual OMGO problems, it would be useful to undertake a triangulation approach to performance assessment that includes a holistic interpretation of a range of drug-related outcome measures: e.g., price, THC content, arrests (for related offences, and for related individuals), asset seizures, impact on and disruption to organized crime groups/activities, deaths (gang and drug related), hospital admissions, and

public perceptions of the level of drug problems. Each of these measures in isolation is obviously insufficient, but when considered in combination may assist in developing more complete, comprehensive assessment processes to better interpret the impact of POP style interventions. The chapter by Dorn (2000) which looks at performance indicators and performance management is worth revisiting in detail here to see what advice can be gathered for any novel and ongoing POP strategies that are developed for OMGOs.

Motivated by a desire to provide a better process for evaluating the outcome of the estimated AUS\$1.7 billion spent annually on drug law enforcement in Australia, a series of reports have been released that propose (a) what a national drug law enforcement performance measurement framework would look like, and (b) how such a framework would be implemented in an effective manner (e.g., Willis and Anderson 2010; Willis et al. 2010a; Willis et al. 2010b; Willis et al. 2010c). The outcome of this process is to develop a framework that builds a systematic process for measuring drug law enforcement performance on the back of existing structures and procedures, which Willis et al. (2010c: x) suggest, “has shown to be an evolutionary and easily accepted way to generate a sustainable performance management and accountability procedure.” These reports also make a series of recommendations as to how such a national strategy should be implemented, including an approach, a realistic timeframe, and the supporting mechanisms that would be required. Although there are obvious differences with respect to Australia and Canada (from a policing structure and a legislative perspective) significant benefits may be gained from utilizing this contemporary framework for developing a locally equivalent national drug law enforcement performance measurement framework.

5 A Hypothetical Case Study

In a similar vein to Kennedy’s (2009) “thought experiment” whereby a deterrence approach was applied to domestic violence (as opposed to drug-markets and gang violence which were the original motivators for the approach), the following section provides a brief example of how the POP framework proposed within this discussion paper could be applied to a specific (hypothetical) type of OMGO problem in Canada. This example is designed to provide interested law enforcement practitioners and policy makers with a more concrete example as to how this

process might evolve. This approach will follow the SARA steps and utilize the theoretical frameworks outlined above for problem identification and novel response.

Scanning and Analysis

For the purposes of this exercise, the problem that is being addressed is the same one that was mentioned earlier: a specific large-scale, organized crime group who produce marijuana on farm land in northern Quebec with highly alkaline soil and a shorter-than-average suitable growing season. Building on this scenario, during the analysis phase of SARA, each of the cells in Table 5 should be examined and as much information as possible included. This process serves two purposes: first, in structuring what is known in a coherent manner, and second, identifying what is not known, which would in turn target subsequent investigation efforts.

Table 5. Completed Haddon Matrix for the Hypothetical Scenario OMGO Problem

Time interval	Epidemiological Triad			
	Human involvement	Vehicle & equipment involvement	Environmental involvement	
			Physical	Socio-economic
Pre-OMGO	<ul style="list-style-type: none"> Specific large-scale organized crime group (OCG) Suspected to be purchased and managed by known key individuals within OCG Suspected that facilitating equipment is purchased and transported by known junior members of the OCG 	<ul style="list-style-type: none"> Information suggests sufficient start-up capital is provided to buy farm land Facilitating equipment transported by private trucks 	<ul style="list-style-type: none"> Private farm land Significant water supplies on-site Isolated, but accessible by sealed roads 	<ul style="list-style-type: none"> Suspected to occur in remote community, with strong OCG presence and explicit support for OMGOs
During OMGO	<ul style="list-style-type: none"> Suspected illegal immigrant labourers cultivate and secure the OMGO crop 	<ul style="list-style-type: none"> Suspected weapons are located at OMGO site to protect crop Food and OMGO facilitators replenished weekly via truck 	<ul style="list-style-type: none"> Limited season appropriate for growth given climatic factors 	<ul style="list-style-type: none"> Reasonable proximity to supporting infrastructure
Post-OMGO	<ul style="list-style-type: none"> Group distributes into Europe: Liaise with alternative branches of same OCG 	<ul style="list-style-type: none"> Truck followed by shipping container to transport to point-of-sale 	<ul style="list-style-type: none"> Believed to be Europe 	<ul style="list-style-type: none"> Demand in Europe is dropping-off. Monitor ongoing demand and market forces

Response

Building on the platform of the information provided through the completion of the Haddon Matrix, some possible responses to this hypothetical problem are listed in Table 6, divided across the five broad focuses of the techniques and between the proximal or distal approach to the

OMGO situation. As discussed previously, there is significant variation between these techniques with respect to the implementation timeframes.

Assessment

In addition to the range of assessment measures discussed previously it would also be possible to examine a number of other measures. First, operating on a relatively short-term timeframe, it would be possible to examine the outcomes of the environmental scanning (e.g., number of suitable sites identified and checked). Beyond this, and operating over longer term, it would be worth considering what impact a systematic application of this type of approach has on legislation and sentencing, and also whether this process is able to impact on inter-agency collaboration/networks.

Table 6. Application of Selected SCP Techniques to the Hypothetical Scenario OMGO Problem

Technique focus	Proximal	Distal
Increase Risk	<ul style="list-style-type: none"> • Liaise with non-policing agencies to extend guardianship and formal surveillance of farm land • Reduce anonymity when purchasing facilitators such as fertilizers and wetting agent that would be required in large quantities to make the OMGO successful • Temporal and geographic monitoring of known prior offenders around the time of year suitable for OMGOs 	<ul style="list-style-type: none"> • Legislative reform: sentencing, place-managers • Foster and develop functioning collaboration to share information between crime prevention agencies • Liaise with customs and boarder officials to draw specific attention to shipments originating from high-risk geographic locations, particularly when the land has recently changed hands
Increase Effort	<ul style="list-style-type: none"> • Identify and monitor suitable locations for this type of OMGO • Monitor purchases and leasing of farm land, particularly in areas fitting the appropriate environmental profile for this problem • Control access to necessary farming equipment 	<ul style="list-style-type: none"> • Legislative reform: control over legal facilitators, pre-sentencing seizures of equipment • Prosecute distributors of cannabis seeds/clones • Liaise with agencies responsible for illegal/unskilled migrants to reduce likelihood of being involved in OMGOs
Reduce Reward	<ul style="list-style-type: none"> • Crop eradication • Seizure of cash and drugs • Disrupt the market before and after the OMGO 	<ul style="list-style-type: none"> • Legislative reform: forfeiture of proceeds of crime • Anti-money laundering regulations • Use publicity to isolate OCGs from the community
Remove Excuses	<ul style="list-style-type: none"> • Place more onus on place managers (e.g., farmers who lease agricultural land) to monitor land use 	<ul style="list-style-type: none"> • Whole-of-justice system commitment to enforcing maximum sanctions available for cannabis under current legislation • Targeted interventions in communities where support for cannabis production and/or organized crime is high
Reduce Provocations		<ul style="list-style-type: none"> • Ongoing activity to disrupt gang structure across the range of OCG activities • Continued efforts to discourage participation in OCGs

6 Conclusions and Recommended Next Steps

A fundamental principle underlying environmental criminology is that crime will always exist, and that it will continually evolve. Consequently, even when crime prevention initiatives are successful, they require constant reiteration as the problem itself will change with time. The pattern of adaptation observed in Kentucky is exactly as would be expected, and there is current anecdotal evidence that the distinction between OMGOs and indoor, hydroponic marijuana production is blurring, with a move towards underground, indoor grows taking place in buried shipping containers. This novel approach to marijuana production utilizes the same technology as the indoor operations, but requires space and isolation in the same way that OMGOs do. Should this increase in prevalence, future prevention efforts will have to adapt to counter this altered approach to production (for example, It would be possible to control the facilitators involved with this process, e.g., shipping containers, diesel generators, diesel fuel, excavator hire/access to bury the containers, etc.).

If POP is to be utilized to combat OMGOs in a Canadian context the following points are worthy of restating by way of a concise conclusion:

- realistic expectations of POP outcomes and a commitment to ongoing implementation of the SARA process, with design, implementation, and evaluation of POP to move towards a collaborative, iterative approach more akin to medical research than has been common within crime prevention to date (e.g., Tilley 2010);
- maximize the specificity with which unique problems within the broad category of OMGOs are identified and approached;
- explore the merits associated with constructing a Canadian national drug law enforcement performance measurement framework; and
- optimise use of existing national databases designed to coordinate information across crime prevention agencies.

References

- Albanese, Jay S. (2004). "North American organised crime." Global Crime **6**(1): 8-18.
- Albanese, Jay S. (2008). "Risk assessment in organized crime: developing a market and product-based model to determine threat levels." Journal of Contemporary Criminal Justice **24**(3): 263-273.
- Bouchard, Martin (2007a). A capture-recapture derived method to estimate cannabis production in industrialized countries. First Annual Conference of the International Society for the Study of Drug Policy, Oslo.
- Bouchard, Martin (2007b). "A capture-recapture model to estimate the size of criminal populations and the risks of detection in a marijuana cultivation industry." Journal of Quantitative Criminology **23**: 221-241.
- Bouchard, Martin, Marc Alain and Holly Nguyen (2009). "Convenient labour: the prevalence and nature of youth involvement in the cannabis cultivation industry." International Journal of Drug Policy **20**: 467-474.
- Bouchard, Martin and Claude B. Dion (2009). "Growers and facilitators: probing the role of entrepreneurs in the development of the cannabis cultivation industry." Journal of Small Business and Entrepreneurship **22**(1): 25-38.
- Bouchard, Martin and Holly Nguyen (2010). "Is it who you know, or how many that counts? Criminal networks and cost avoidance in a sample of young offenders." Justice Quarterly **27**(1): 130-158.
- Brantingham, Paul J. and Patricia L. Brantingham (1984). Patterns in Crime. New York, Macmillan.
- Canadian Minister of Justice (1996, c.19). Controlled Drugs and Substances Act. Canadian Ministry of Justice. <http://laws-lois.justice.gc.ca>, Minister of Justice.
- Cherney, Adrian (2006). "Problem solving for crime prevention." Trends and Issues in Crime and Criminal Justice **314**: 1-6.
- Clare, Joseph and Frank Morgan (2009a). Exploring parallels between situational crime prevention and non-criminological theories for reducing terrorist risk. Reducing Terrorism through Situational Crime Prevention, Crime Prevention Studies. Joshua D. Freilich and Graeme R. Newman. New York, Criminal Justice Press. **25**: 207-228.
- Clare, Joseph and Frank Morgan (2009b). Reducing terrorist risk: integrating jurisdictional and opportunity approaches. Terrorism and Torture: An Interdisciplinary Perspective. Werner Stritzke, Stephan Lewandowsky, David Denemark, Joseph Clare and Frank Morgan. Cambridge, Cambridge University Press.

Clarke, Ronald V. (1997). Introduction. Situational Crime Prevention: Successful Case Studies. Ronald V. Clarke. Albany, Harrow and Heston: 1-45.

Clarke, Ronald V. (2005). Seven misconceptions of situational crime prevention. Handbook of Crime Prevention and Community Safety. Nick Tilley. Cullompton, Devon, Willan Publishing: 39-70.

Clarke, Ronald V. (2008). Situational crime prevention. Environmental Criminology and Crime Analysis. Richard Wortley and Lorraine Mazerolle. Cullompton, Willan Publishing: 178-194.

Clarke, Ronald V. and John E. Eck (2003). Crime Analysis for Problem Solvers: In 60 Small Steps, US Department of Justice: Office of Community Oriented Policing Services: 150.

Clarke, Ronald V. and Graeme R. Newman (2006). Outsmarting the Terrorists. New York, Praeger Publishers.

Cohen, Lawrence E. and Marcus Felson (1979). "Social change and crime rate trends: a routine activity approach." American Sociological Review **44**(4): 588-608.

Criminal Intelligence Service Canada (2009). 09 Report on Organized Crime. Ottawa, Criminal Intelligence Service Canada.

Dauvergne, Mia (2009). "Trends in Police-Reported Drug Offences in Canada." Juristat Article: Component of Statistics Canada Catalogue no. 85-002-X **29**(2): 1-25.

Design Council (2003). Think Thief: A Designer's Guide to Designing Out Crime. Design, Design Council: 32.

Dorn, Nicholas (2000). Performance management, indicators and drug enforcement: in the crossfire or at the crossroads? Illegal Drug Markets, Crime Prevention Studies. Mangai Nataragan and Mike Hough. New York, Criminal Justice Press. **11**: 299-318.

Eck, John E. (2003). Police problems: the complexity of problem theory. Mainstreaming Problem-Oriented Policing: Crime Prevention Studies. Johannes Knutsson. New York, Criminal Justice Press. **15**: 79-113.

Ekblom, Paul (2005). The 5Is framework: sharing good practice in crime prevention. Quality in Crime Prevention. Erich Marks, Anja Meyer and Ruth Linssen. Hanover, M.D., LPR.

European Monitoring Centre for Drugs and Drug Addiction (2008). A Cannabis Reader: Global Issues and Local Experiences - Perspectives on Cannabis Controversies, Treatment and Regulation in Europe. EMCDDA Monograph. Sharon Rödner Sznitman, Börje Olsson and Robin Room. Lisbon, European Monitoring Centre for Drugs and Drug Addiction. **1**: 742.

Farrell, Graham (1998). "A global empirical review of drug crop eradication and United Nations' crop substitution and alternative development strategies." Journal of Drug Issues **28**(2): 395-436.

Foltz, Kevin C. (2004, December 1, 2004). "Outdoor grow tips." Retrieved March 8, 2010, from www.cannabisculture.com/v2/articles/3369.html.

Freilich, Joshua D. and Steven M. Chermak (2009). Preventing deadly encounters between law enforcement and American far-rightists. Reducing Terrorism Through Situational Crime Prevention, Crime Prevention Studies. Joshua D. Freilich and Graeme R. Newman. New York, Criminal Justice Press. **25**: 141-172.

Freilich, Joshua D. and Graeme R. Newman (2009). Introduction. Reducing Terrorism Through Situational Crime Prevention, Crime Prevention Studies. Joshua D. Freilich and Graeme R. Newman. New York, Criminal Justice Press. **25**: 1-7.

Garis, Len (2006). Eliminating Residential Marijuana Grow Operations - An Alternate Approach. Surrey BC, Surrey Fire Service: 32.

Garis, Len (2009). Combatting Canada's Marijuana Grow Industry: Stronger Penalties and other Deterrents. Surrey BC, A submission to the Standing Senate Committee on Legal and Constitutional Affairs on Bill C-15, an Act to Amend the Controlled Drugs and Substances Act: 7.

Garis, Len, Darryl Plecas, Irwin M. Cohen and Amanda V. McCormick (2009). Community Response to Marijuana Grow Operations: A Guide Towards Promising Practices. Surrey BC, City of Surrey: 32.

Goldstein, Herman (1979). "Improving policing: a problem-oriented approach." Crime and Delinquency **25**: 236-258.

Haddon, William Jr. (1999). "The changing approach of the epidemiology, prevention, and amelioration of trauma: the transition to approaches etiologically rather than descriptively based." Injury Prevention **5**: 231-236.

Hardwick, Shiela and Leslie King (2008). Home Office Cannabis Potency Study 2008. London, Scientific Development Branch, Home Office: 20.

Howell, T., RADARSAT International BC and Canadian Police Research Centre Ont (2002). Operation SABOT and Illicit Crop Information Management Using Satellite Imagery. Ottawa, Defence Research and Development Canada: 30.

HowToGrowMarijuana.com. (2010). "How to Grow Marijuana." March 5, 2010, from <http://howtogrowmarijuana.com/>.

Kennedy, David M. (2009). Applications II: A thought experiment: the framework of a deterrence approach to domestic violence. Deterrence and Crime Prevention: Reconsidering the Prospect of Sanction. London, New York, Routledge: 166-181.

Lett, Ronald, Olive Kobusingye and Dinesh Sethi (2002). "A unified framework for injury control: the public health approach and Haddon's Matrix combined." Injury Control and Safety Promotion **9**(3): 199-205.

Maclean, Doug, Joanna Gilliantt and Jenny Brogden (2002). Evaluation of the "Know The Score" Drugs Campaign. Edinburgh, Lambda Research and Consultancy Ltd., on Behalf of Scottish Executive Social Research: 92.

Malm, Aili E. and George E. Tita (2006). "A spatial analysis of green teams: a tactical response to marijuana production in British Columbia." Policy Sciences **39**(4): 361-377.

Mazerolle, Lorraine, David Soole and Sacha Rombouts (2005). Drug Law Enforcement: The Evidence. Drug Policy Modelling Project Monograph Series. Brisbane, Turning Point Alcohol and Drug Centre, Inc. **5**.

Mazerolle, Lorraine, David Soole and Sacha Rombouts (2007). "Drug law enforcement: a review of the evaluation literature." Police Quarterly **10**(2): 115-153.

National Coordinating Committee on Organized Crime (2003). NCC Working Group on Marijuana Grow Operations: Report and Recommendations to Ministers, Report and Recommendations to Federal/Provincial/Territorial (FPT) Ministers Responsible for Justice: 31. Ontario Provincial Police. (2010a). "Drug Enforcement." Retrieved March 2, 2010, from <http://www.opp.ca/ecms/index.php?id=53>.

Ontario Provincial Police. (2010b). "Rural and Agricultural Issues." Retrieved March 2, 2010, from <http://www.opp.ca/ecms/index.php?id=155>.

Oregon High Intensity Drug Trafficking Area (HIDTA) Program (2009). Drug Threat Assessment and Counter Drug Strategy: Program Year 2009, Oregon High Intensity Drug Trafficking Area (HIDTA) Program: 46.

Plecas, Darryl, Aili E. Malm and Bryan Kinney (2005). Marijuana Growing Operations in British Columbia Revisited: 1997-2003. Abbotsford BC, Department of Criminology and Criminal Justice, University College of the Fraser Valley: 64.

Potter, Gary, Larry Gaines and Beth Holbrook (1990). "Blowing smoke: an evaluation of marijuana eradication in Kentucky." American Journal of Police **9**: 97-116.

Price, John (2008). Interagency co-operation at its best. The Gazette, Royal Canadian Mounted Police. **70**: 36-37.

Rengert, George, Sanjoy Chakravorty, Tom Bole and Kirstin Henderson (2000). A geographic analysis of illegal drug markets. Illegal Drug Markets, Crime Prevention Studies. Mangai Nataragan and Mike Hough. New York, Criminal Justice Press. **11**: 219-239.

Royal Canadian Mounted Police. (2010, August 7, 2008). "Drug Enforcement Branch." Retrieved March 4, 2010.

Royal Canadian Mounted Police. (July 28, 2008). "RCMP CAPRA Problem Solving Model." Retrieved March 5, 2010, from www.rcmp-grc.gc.ca/ccaps-spcca/capra-eng.htm.

Royal Canadian Mounted Police Criminal Intelligence (2007). Drug Situation Report - 2007. Ottawa, Royal Canadian Mounted Police: 41.

Scott, Michael S. (2003). Getting police to take Problem-Oriented Policing seriously. Mainstreaming Problem-Oriented Policing: Crime Prevention Studies. Johannes Knutsson. New York, Criminal Justice Press. **15**: 49-77.

Sifaneck, Stephen J., Geoffrey L. Ream, Bruce D. Johnson and Eloise Dunlap (2007). "Retail marijuana purchases in designer and commercial markets in New York City: sales units, weights, and prices per gram." Drug and Alcohol Dependence **90S**: S40-S51.

Thiessen, Brian (2007). Satellite Detection of Cannabis sativa Outdoor Grow Operations Ottawa, Canadian Police Research Centre: 43.

Tilley, Nick (2000). The evaluation jungle. Secure Foundations: Key Issues in Crime Prevention, Crime Reduction, and Community Safety. Scott Ballintyne, Ken Pease and Vic McLaren. London, IPPR.

Tilley, Nick (2010). "Whither problem-oriented policing." Criminology & Public Policy **9**(1): 183-195.

Townsley, Michael, Shane D. Johnson and Ken Pease (2003). Problem orientatoin, problem solving and organizational change. Mainstreaming Problem-Oriented Policing: Crime Prevention Studies. Johannes Knutsson. New York, Criminal Justice Press. **15**: 183-212.

United Nations Office on Drugs and Crime (2009). World Drug Report 2009. Vienna, United Nations Office on Drugs and Crime: 314.

Vancouver Police Department (2001). "Growbusters": An Alternative POP Project. Vancouver, Vancouver Police Department: 19.

Weed Farmer. (2010). "Simple Steps for Outdoor Growers." Retrieved March 8, 2010, from www.weedfarmer.com/cannabis/outdoorcult_guide.php.

Weisburd, David and John E. Eck (2004). "What can police do to reduce crime, disorder, and fear?" The ANNALS of the American Academy of Political and Social Science **593**: 43-65.

Weisburd, David, Cody W. Telep, Joshua C. Hinkle and John E. Eck (2010). "Is problem-oriented policing effective in reducing crime and disorder? Findings from a Campbell systematic review." Criminology & Public Policy **9**(1): 139-172.

Wilkins, Chris, Krishna Bhatta and Sally Casswell (2002). "The effectiveness of cannabis crop eradication operations in New Zealand." Drug and Alcohol Review **21**: 369-374.

Willis, Katie and Jessica Anderson (2010). Foundations for an effective performance measurement system for drug law enforcement: Companion document to NDLERF Monograph Series No. 34, "Developing the capacity and skills for national implementation of a drug law enforcement performance measurement framework". Canberra, Australian Institute of Criminology: 24.

Willis, Katie, Jessica Anderson and Brent Davis (2010a). Implementing a drug law enforcement (DLE) performance measurement framework in Australia: Companion document to NDLERF Monograph Series No. 34, "Developing the capacity and skills for national implementation of a drug law enforcement performance measurement framework". Canberra, Australian Institute of Criminology: 254.

Willis, Katie, Jessica Anderson, Peter Homel and Andrew Smith (2010b). A plan for national implementation of the drug law enforcement performance measurement framework: Companion document to NDLERF Monograph Series No. 34, "Developing the capacity and skills for national implementation of a drug law enforcement performance measurement framework". Canberra, Australian Institute of Criminology: 28.

Willis, Katie, Peter Homel and Jessica Anderson (2010c). Developing the capacity and skills for national implementation of a drug law enforcement performance measurement framework: NDLERF Monograph Series No. 34. Canberra, Australian Institute of Criminology: 77.