

TSA'S COMPREHENSIVE STRATEGY TO SECURITY AT U.S. AIRPORTS

ASSESSING THE EVIDENCE-BASE OF THE "PLAYBOOK"



June 2011

PHASE 1 REPORT



Principal Investigators: David Weisburd & Cynthia Lum
Project Team: Charlotte Gill, Breanne Cave, and Julie Hibdon
Center for Evidence-Based Crime Policy, *George Mason University*

TSA's COMPREHENSIVE STRATEGY TO SECURITY AT U.S. AIRPORTS

**PHASE 1 FINAL REPORT:
ASSESSING THE EVIDENCE-BASE OF THE "PLAYBOOK"**

AUTHORED BY:

Cynthia Lum, Charlotte Gill, Breanne Cave, Julie Hibdon, & David Weisburd
Center for Evidence-Based Crime Policy
George Mason University, Department of Criminology, Law and Society
4400 University Drive, MS 6D3
Fairfax, VA 22030
<http://www.cebcpc.org>
cebcpc@gmu.edu

FOR:

The Department Of Homeland Security, Science And Technology Directorate
Human Factors/Behavioral Sciences Division
Program Manager: Richard Legault, Ph.D.
S&T HFD MS#0207, DHS
245 Murray Lane
Washington, D.C. 20528-0207

CONTENTS

LIST OF FIGURES	III
ACKNOWLEDGMENTS	IV
EXECUTIVE SUMMARY	V
1 INTRODUCTION	1
2 AIRPORT SECURITY AND TSA'S PLAYBOOK STRATEGY	3
3 RELEVANT RESEARCH PERSPECTIVES FOR ASSESSING THE PLAYBOOK	5
Rational Choice, Opportunity, and Routine Activities	6
Situational and Place-Based Prevention and Deterrence	7
Deterrence and Unpredictability	9
Interagency Cooperation	10
4 ASSESSING THE EVIDENCE-BASE FOR THE PLAYBOOK	12
Developing the Airport Security Matrix	13
X-Axis: The Location or Place of the Playbook Intervention	14
Y-Axis: Mechanism of Prevention	15
Z-Axis: Interagency Cooperation and Reliance on Other Agencies	16
Method for Mapping Plays into the Airport Security Matrix	16
A Note on Strategic Plays	17
5 RESULTS	19
Independent, TSA-Only Plays	19
Cooperative Plays	21
Differences across the Three Playbooks	22
Strategic Plays	24
6 DISCUSSION: IS THE PLAYBOOK EVIDENCE-BASED?	26
Prevention, Deterrence, and Unpredictability	29
Increasing Guardianship	31
Decreasing Vulnerabilities of Passengers and other Targets	33
Interagency Cooperation	34
Possible Collateral Effects of Playbook Implementation	35
7 CONCLUSION	38
REFERENCES	40

LIST OF FIGURES

Figure 1. Twenty-Five Techniques of Situational Crime Prevention	8
Figure 2. The Evidence-Based Policing Matrix	12
Figure 3. The Airport Security Matrix	14
Figure 4. Independent Plays	19
Figure 5. Cooperative Plays [REDACTED]	21
Figure 6. Differences in Mechanisms of Prevention [REDACTED]	22
Figure 7. Differences in Location of Implementation [REDACTED]	23
Figure 8. Differences in Interagency Cooperation and Reliance on Other Agencies	23
Figure 9. Differences in Mechanisms of Prevention across Locations within the Airport	24
Figure 10. General Description of Plays in Intersection of Location and Prevention Mechanism	27
Figure 11. Comparable Evaluations of Situational Crime Prevention and Deterrence Interventions	28

ACKNOWLEDGMENTS

We are grateful to the following for their support and assistance in preparing this report:

Richard Legault, Department of Homeland Security
Jennifer Foley, Department of Homeland Security
Richard Lempert, Department of Homeland Security
Erin Steigerwald, Transportation Security Administration
Emily Wyant, Transportation Security Administration
TSA, Reagan National Airport
TSA, Washington Dulles International Airport
Julie Wan, Editor

EXECUTIVE SUMMARY

ASSESSING THE EVIDENCE-BASE FOR TSA'S COMPREHENSIVE STRATEGY TO SECURITY IN U.S. AIRPORTS (THE "PLAYBOOK")

The Project

One of the recent developments in airport security has been the call for a more coordinated security apparatus. In December 2008, the Transportation Security Administration (TSA) revised and re-implemented its Comprehensive Strategy to Security at Airports, also known as "the Playbook," to supplement and coordinate additional security at airports. The Department of Homeland Security, at the request of the TSA, tasked George Mason University's Center for Evidence-Based Crime Policy (CEBCP) with carrying out the first comprehensive, independent assessment of the Playbook. This analysis, to occur over two years, includes four phases:

- (1) **Phase I:** Determine the evidence-base of the Playbook using existing criminological research.
- (2) **Phase II:** Survey all Category X, I and II airports to examine how Playbook is implemented.
- (3) **Phase III:** Conduct site visits of a selection of airports to gain further information about implementation of the Playbook.
- (4) **Phase IV:** Use information gained in Phases I, II, and III to design a large systematic experimental evaluation of the Playbook.

Contained herein is the Final Report for Phase I of this project. Currently, there is very little existing research on the effects of security measures within airports upon which to base such an assessment. However, the everyday prevention and deterrence mechanisms to physically secure the airport environment ("plays") contained within the Playbook are similar to other crime prevention measures that have been extensively discussed and evaluated in criminology. Thus, we use a "translational criminology" approach to assess the evidence-base for Playbook strategies. Translational criminology uses existing criminological theory and evaluations to enable a preliminary assessment of the prevention and deterrence mechanisms of the Playbook in the context of knowledge about crime prevention more generally.

The Research

The security mechanisms used in the strategies and tactics of TSA's Playbook reflect concepts similar to those found in situational crime prevention and deterrence research as well as common criminological theories such as opportunity, rational choice, and routine activities. Specifically, Playbook plays use physical and environmental crime control methods such as target hardening, blocking opportunities, reducing vulnerabilities, controlling access, increasing surveillance, and increasing the unpredictability of deployment to stop and discourage offenders, provide increased guardianship, and strengthen the vigilance of passengers. TSA also emphasizes the Playbook's role in promoting interagency cooperation, and its importance in establishing security. The usefulness of interagency cooperation is also reflected more generally in existing research in criminal justice, security, and policing.

The similarities between airport security goals in the Playbook and crime prevention research allow us to use existing methods and evaluations to preliminary assess the evidence-base of TSA's comprehensive

approach to airport security. In this Phase, we categorized plays according to common characteristics derived from the situational crime prevention, deterrence, and interagency cooperation literatures. Following the premise of the *Evidence-Based Policing Matrix*[®], a visual tool developed by Lum, Koper and Telep (2009) for summarizing and displaying evaluation evidence, we mapped [REDACTED] Playbook plays onto a hypothetical matrix to make generalizations to the broader crime prevention literature. This approach allows us to examine clusters of play characteristics along common dimensions that can be compared to what existing evidence tells us about these prevention and deterrence mechanisms. While this approach does not substitute for rigorous evaluation and testing (which will be proposed in Phase IV), it does provide some understanding of how well the evidence supports Playbook activities.

Important Findings

- The Playbook security tactics and strategies reflect common prevention and deterrence mechanisms that have long been the subject of crime prevention and criminological research.
- Most plays [REDACTED] are tactical in nature, rather than strategic. "Tactical" plays are those carried out immediately, for a specific situation or preventative effect and usually at a specific location. "Strategic" plays are intended to be more long-term in nature, and that usually has a planning or proactive nature to them (for example, training exercises to practice responses to a potential situation).
- [REDACTED].
- [REDACTED] of the tactical plays primarily carried out by TSA, aim to increase offenders' perceived effort through target hardening and deterrence, rather than increase guardianship [REDACTED] or reduce passenger and target vulnerabilities [REDACTED].
- We identified seven specific locations in which TSA security is implemented, which include areas external to the airport, public spaces, screening areas, secure areas for employees and for passengers, gates, and areas around and in the aircraft itself.
- Although plays touch upon many airport areas and "layers of security", [REDACTED].
- For the minority of plays designed to increase guardianship, these usually [REDACTED].
- For the [REDACTED] Plays designed to reduce passenger and target vulnerability, these focus on [REDACTED].
- Long-term and strategic plays highlight security planning, awareness, and infrastructure management. They focus on guardianship, are less place-specific and more likely to require cooperation.
- Randomized plays emphasize deterrence, while strategic and cooperative plays are handed down by TSA management in response to specific threats.
- The situational crime prevention literature provides evidence that measures to deflect, deter, and increase offender effort, like those in the Playbook, can prevent crime. However, how plays are implemented ultimately determines the effectiveness of those plays.

- Research shows randomization at targeted high-risk locations is key to deterrence. More investigation is needed to understand how risk assessment and randomization are used in Playbook operations, and in turn, lead to prevention.
- Research shows tailored, multi-tactic interventions to reduce vulnerability may be effective. TSA should consider these measures throughout the airport, [REDACTED].
- Multi-agency approaches can lead to significant crime control benefits. TSA should further emphasize collaboration where appropriate to strengthen the security apparatus.
- TSA should be cognizant of collateral consequences in Playbook implementation, including displacement, differential enforcement, and reduced legitimacy.
- This assessment is only preliminary and cannot replace evaluation. Scientific evaluations of airport security measures are needed to determine (1) if the play is effective in achieving the outcomes desired and (2) whether the play, as implemented, can achieve that goal.

The Conclusions

The Playbook attempts a broad range of prevention and deterrence tactics across multiple cooperating (and sometimes non-cooperating) authorities. As such, it is imperative to understand the prospects and challenges of its implementation, and to understand how measures of success might be derived, in order to accurately judge Playbook's effectiveness. Overall, we find that the Playbook is partly supported by evidence-based crime prevention and deterrence principles. However, we also find that the Playbook needs further assessment in the areas of randomization and unpredictability, place-based focus, interagency cooperation, and implementation. By understanding the structure and processes of the different organizations and people involved in the prevention strategies within the Playbook, and the challenges to implementation they can create, much can be learned about how to improve deterrence and prevention of violence and crimes at airports.



Center for Evidence-Based Crime Policy

TSA's COMPREHENSIVE STRATEGY TO SECURITY AT U.S. AIRPORTS

PHASE I FINAL REPORT: ASSESSING THE EVIDENCE-BASE OF THE "PLAYBOOK"

1 INTRODUCTION

Transportation security at the nation's airports has become a major priority in United States homeland security since the events of September 11, 2001. The establishment of the Transportation Security Administration, the advancement of new scanning and detection technologies, the increased use and sharing of information, and greater coordination between various law enforcement, security, and civilian agencies, all emphasize the importance of airport security. Even prior to 9/11, airports have been the focus of more security efforts than any other transportation system. Their size, complexity, use, and multiple functions have presented opportunities for a range of criminal and terrorist activities, and consequentially, crime prevention efforts.

One of the recent developments in airport security has been the call for a more coordinated security strategy. In 2009, the Transportation Security Administration (TSA) revised and re-implemented its **Comprehensive Strategy to Security at Airports**—also known as “the Playbook”¹—to supplement and coordinate existing security at airports. The Playbook is part of TSA's “layers of security” concept,² which seeks to provide a holistic security apparatus for air transportation. It consists of a myriad of situational tactics and strategies which span various domains, sectors, and environs of the airport and are designed to prevent, detect, deter, and protect against crime. The purpose of the Playbook, as described by TSA, is “to create a transportation security system that increases unpredictability, thereby frustrating terrorist plans and potentially deterring attacks” (U.S. Transportation Security Administration, 2010).

To date, there has been no independent assessment of either the implementation or effectiveness of the Playbook, or of airport security as a whole. Given the importance of and increased attention toward airport



¹ Per the CEBCP's confidentiality agreements with DHS and TSA, we do not discuss specific Playbook content in this report.

² See http://www.tsa.gov/what_we_do/layers/index.shtm.

security, it is surprising that airports remain relatively under-studied in social science and evaluation research. Research can play a crucial role in providing objective assessments of the nature and effectiveness of airport security, which encompasses prevention, control, and deterrence of many types of crime, from the most "ordinary" to the most severe. Both the U.S. Government Accountability Office (see e.g., U.S. Government Accountability Office, 2007; 2009; 2010) and the Transportation Research Board of the National Academies (2003) have formally called for more evaluation, assessment, and research cooperation in airport security.

Thus, to advance research in this area, the Department of Homeland Security (DHS) Science and Technology Directorate, at the request of the TSA, tasked the Center for Evidence-Based Crime Policy (CEBCP) at George Mason University (GMU) with carrying out a comprehensive four-phase assessment of the Playbook. Here, we provide the results of the first phase of this project, which uses "translational criminology" to preliminarily assess the evidence base of the prevention and deterrence mechanisms of the Playbook using existing knowledge from crime prevention. While recognizing the importance of empirical assessments of the Playbook and other aspects of airport security, evaluations of airport security need not start from scratch. The translational criminological approach posits that existing evaluations and theory enable a preliminary assessment of whether prevention mechanisms within the Playbook are consistent with what is known about crime prevention more generally (see Lum & Koper, 2011). This assessment will become the research toehold by which experimental evaluations and hypothesizing about possible effects of interventions will be explored. It is uncertain whether the nature of offending at airports differs so significantly from other types of offending that criminological research is not applicable. A comparison of the Playbook against similar research may prove useful in hypothesizing about the fruitfulness of such research.

2 AIRPORT SECURITY AND TSA'S PLAYBOOK STRATEGY

Aviation assets are both visible and symbolic, making them an attractive target for terrorism. The images and aftermath of 9/11 and subsequent incidents and attempts of violence have solidified air transportation attacks as “one of the most deadly and spectacular tactics employed by terrorists” (Asal, Rethemeyer, Bellandi, Legault, & Tynes, 2010, p. 2). Such attacks are not confined to hijackings and in-air violence. In 2002, a limousine driver opened fire in the unsecure, publicly accessible ticketing area of El Al Airlines at Los Angeles International Airport. More recently, on January 24, 2011, a bomber targeted the unsecured reception area outside of customs at Domodevo Airport in Moscow, Russia (Englund & Lally, 2011).

These security breaches, as well as crime more generally at airports, have led airport authorities and DHS to prioritize security in airports and air transportation (U.S. Department of Homeland Security, 2008). Most recently, the establishment of the TSA by the Aviation and Transportation Security Act on November 19, 2001, emphasized this priority. The new agency took over security and other regulatory responsibilities previously vested in the Federal Aviation Administration (FAA) of the Department of Transportation (DOT), and was also given new duties. Its original mandate was to provide for the “security for all modes of transportation; recruit, assess, hire, train, and deploy Security Officers for 450 commercial airports from Guam to Alaska in 12 months; and provide 100% screening of all checked luggage for explosives by December 31, 2002” (U.S. Transportation Security Administration, 2011). In November 2003, governance of TSA moved from the Department of Transportation to DHS, as part of a national effort to centralize homeland security functions.

Toward these security goals, the TSA piloted the Playbook in 2008 and then developed, revised, and implemented it more fully in 2009. The Playbook reflects a comprehensive approach to the physical security of airports, consisting of a myriad of situational tactics and strategies (or “plays”) that span various domains of airport security. They can include increasing surveillance and screening of passengers, employees and airport personnel at different locations of the airport; monitoring luggage, planes, and other equipment; restricting or blocking access to secured locations; or redirecting passenger or vehicular traffic. Types of activities are generally discussed in Figure 10 in Section 5 of this report.³

Many of the plays within the Playbook are not new to airport security, as the purpose of the Playbook was to add to the overall TSA goal of strengthening “layers of security” by capitalizing on existing security tactics. Plays mimic concepts similar to those found in situational crime prevention (Clarke, 1983, 1995, 1997; Cornish & Clarke, 1987, 2003; Eck, 2002) and deterrence research (for reviews, see Durlauf and Nagin, 2011; Nagin, 1998). Through physical and environmental prevention and deterrence mechanisms, plays are intended to stop and discourage offenders, provide increased guardianship, increase the perception of a risk of

³ The Playbook was provided to CEBCP by the TSA under a cooperative agreement, protected by a non-disclosure agreement for the purposes of this study. Thus, no specific play is discussed in detail in this report, because the Playbook is classified as “Sensitive Security Information” (see www.tsa.gov/assets/pdf/stakeholder_brochure.pdf).

apprehension, and also strengthen the vigilance of passengers. They include a wide array of prevention mechanisms such as hardening targets, blocking opportunities, reducing vulnerabilities, controlling access, or increasing surveillance.

At the time of writing, the plays are organized into [REDACTED]

[REDACTED] To increase unpredictability of security measures, TSA officials use a "randomizer," or computer program that randomly selects plays [REDACTED]

[REDACTED] (or they can develop plays themselves). The combination of random selection and discretion in choosing plays is designed to both thwart attempted security breaches by reducing the ability of offenders to anticipate TSA's actions, and allow officials to take account of local security conditions in deciding how to deploy their assets.

The TSA also believes that the Playbook promotes interagency cooperation, and so increases the ability of units to carry out specialized tasks. TSA personnel emphasize coordination as the key to successfully establishing airport security generally and to deploying the Playbook strategy specifically. While most plays are conducted solely by TSA staff, some require coordination and cooperation between the TSA and other airport groups such as the airport authority, the public, employees inside of the airport and within airlines, and local businesses. Although it is not mandatory for all airports to subscribe to the Playbook, many TSA units across the nation's airports know of and use the Playbook in various ways.⁴

On its face, the Playbook appears to be rational and useful. However, whether this is true is important to examine. Given that we know that many interventions and programs in crime prevention once thought to be effective are not, or can even increase harm (McCord, 2003; Sherman, Farrington, Welsh, & MacKenzie, 2002), it is important for both fiscal and prevention purposes to examine Playbook effectiveness. Four key questions of evidence-based crime policy apply:

"Research can play a crucial role in providing objective assessments of the nature and effectiveness of airport security."

- (1) Is there a theoretical, scientific, and research evidence base for the Playbook?
- (2) Is the deployment of the Playbook effective in maintaining security at airports?
- (3) Following (2), what is the reality of implementation of the Playbook across airports?
- (4) Can airport security be scientifically evaluated, and are there measurable outcomes we can use for evaluation?

This report focuses on the first of these issues, with the goal of preliminarily assessing the Playbook to inform the continued research by the CEBCP team.

⁴ A detailed analysis of Playbook implementation at selected airports will be the focus of later phases of CEBCP's study.

3 RELEVANT RESEARCH PERSPECTIVES FOR ASSESSING THE PLAYBOOK

Currently, only one counterterrorism measure has been shown to be effective through systematic evaluation: metal detectors in airports. In a Campbell Collaboration⁵ systematic review of counterterrorism interventions, Lum, Kennedy, and Sherley (2006) summarized 16 outcomes of metal detector evaluations across five research studies that used interrupted time series methods (Cauley & Im, 1988; Enders & Sandler, 1993, 2000; Enders, Sandler, & Cauley, 1990; Landes, 1978). Overall, these studies showed that passenger screening using metal detectors deters and reduces hijackings over time, although two studies (Cauley & Im, 1988; Enders & Sandler, 1993) found possible substitution effects of terrorist activity to other types of terrorism. Dugan, LaFree, and Piquero (2005), using the Global Terrorism Database from the START Center⁶ (see LaFree, 2011; Sheehan, 2011), also discovered a deterrent effect of metal detectors when the certainty of apprehension was increased.



However, there are many other ways to secure airports that extend beyond metal detectors (and many more ways they could be evaluated). These include no-fly lists and pre-screening, random searching and screening of both passengers and employees, general visibility of law enforcement personnel, canine units trained to detect explosives or contraband, or other security measures used to block or restrict access into secure areas. Many of these exist as plays within the Playbook. Research on these interventions, unlike other

crime prevention measures, is almost non-existent. Lum recently reported to the National Research Council of the National Academies that evaluative studies in policing outnumber those on counterterrorism (at least those that are publicly available) more than tenfold, and she found no rigorous experimental or non-time series quasi-experimental evaluations of airport security strategies compared to approximately 25 randomized controlled experimental trials and 10 rigorous quasi-experiments of policing strategies at the time of writing (National Research Council, 2010; see also Lum et al., 2006; Weisburd, Feucht, Hakimi, Mock, & Perry, 2009).

Yet, the consequences of interventions with regard to cost, safety, passenger and employee satisfaction, and civil liberties make evaluations imperative. Is there previous theoretical and evaluation research that can help evaluate tactics within the Playbook? Terrorism is sometimes viewed as a unique problem, given its ideological nature, political or religious motivations, and the involvement of social institutions beyond law enforcement and criminal justice agencies (e.g.,

⁵ The Campbell Collaboration (see <http://www.campbellcollaboration.org/>) is an internationally recognized research network that produces systematic reviews and meta-analyses on the effects of interventions in crime and justice, education, social welfare, and international development. It also examines the methods used for evaluation.

⁶ <http://www.start.umd.edu/start/>

Deflem, 2004; LaFree & Dugan, 2004; Mythen & Walklate, 2006; Rosenfeld, 2004). However, even with the dearth of empirical research specifically addressing airport security, there are other sources of research evidence from which we can preliminarily assess the Playbook. Acts of, and preparations for, terrorism involve well-understood illegal activities that at least in theory can be interpreted through a criminal justice lens and potentially be deterred or blocked (Lum & Koper, 2011). Lessons, concepts, and ideas from theories and evaluation of crime and crime prevention may be useful, specifically rational choice, opportunities, and routine activities theory, as well as research on situational crime prevention, deterrence and unpredictability in deployment, and interagency cooperation. Each of these concepts is now discussed.

Rational Choice, Opportunity, and Routine Activities

A rational choice perspective of offending can be relevant to terrorism and counterterrorism and might help us hypothesize about the potential effects the Playbook can have on motivated offenders. Rational choice theories propose that offenders, given certain constraints, are decision makers who "respond selectively to ... the opportunities, costs and benefits" associated with specific crimes (Cornish & Clarke, 1987, p. 934). It is reasonable to hypothesize that although acts of terrorism may seem irrational and rare, terrorism can reflect elastic deterrence structures (see Durlauf & Nagin, 2011) that are responsive to interventions. Indeed, a number of scholars have argued that rational choice theory is relevant to explaining terrorist offending (Berrebi, 2009; Clarke and Newman, 2006; Crenshaw, 1990; Dugan et al., 2005; Jackson, 2009).

The ability to deter offenders at airports by increasing the cost of offending (risk of apprehension) has some empirical support. Dugan and colleagues (2005) found that airplane hijackers respond rationally to variation in opportunity. New hijacking attempts were less likely when the use of metal detectors and law enforcement tactics at screening checkpoints increased the certainty of apprehension. This deterrent effect was not found for criminalization policies on terrorist-related hijackings (although it was found on non-terrorist-related hijackings). Their work suggests that prevention mechanisms in airports should focus on identifying and eliminating opportunities created by security and infrastructure weaknesses, thereby increasing detection, prevention, and deterrence while minimizing the possible displacement or substitution effects suggested by Cauley and Im (1988).

Although a rational choice perspective provides an umbrella explanation for an individual's decision to offend, we have to consider why rational decisions to commit crime are often concentrated in certain situations, and at specific places and times. Additional criminological perspectives, such as routine activities (Cohen & Felson, 1979; Felson, 1994) and opportunity theories (see Clarke, 1980; 1983; 1992; 1995; 1997) are helpful. Clarke argued that an opportunity to commit crime must be present prior to the occurrence of a rational decision. Opportunities arise, as Cohen and Felson (1979) argue, when motivated offenders, suitable targets, and a lack of capable guardianship converge in space and time. Felson (1994) described these and other situational attributes as the "chemistry for crime", which when present in the right environment could beget criminal events. Such convergences are not random, and

result from daily routines, or "rhythms," "tempos," and "timings" of daily activities (see Cohen and Felson, 1979, p. 590).

Further, research on the "criminology of place" (Sherman, Gartin, and Buerger, 1989; Weisburd, 2002; Weisburd, Groff, and Yang, 2009) views places as important attractors of these opportunities (i.e., high-risk locations). A strong body of research suggests that crime opportunities are not spread randomly across places but are highly concentrated. For example, research has found that half of all crime in a city occurs in just 4–6% of places (Sherman et al., 1989; Weisburd, Bushway, Lum, & Yang, 2004), and in some cases, about 1% of chronic hot-spot street segments have been found to consistently produce more than 20% of crime (Weisburd et al., 2004). This research emphasizes the importance of identifying "vulnerable" locations within larger administrative or geographic units as targets of intervention. It also identifies the importance of not only crime opportunities in creating vulnerability, but also social and structural characteristics of places (for example, the social fabric of locations created by the types of people who live or work there) that make them more resistant to criminal activity (Weisburd et al., 2009). In total, rational choice, opportunity, routine activities, and criminology of place theories all provide theoretical context for hypothesizing about the place-focused crime prevention and deterrence strategies found in the Playbook.

Situational and Place-Based Prevention and Deterrence

The interplay of rationality, routine activities, and opportunity structures explains the non-random concentration of crime at specific places, times, and situations, and has direct implications for crime prevention and deterrence (Clarke, 1980; Felson, 1994; Weisburd, 2002, 2008). Within these frameworks, offending can be predictable and therefore preventable by altering the potential for the convergence of a motivated offender, lack of guardian, and suitable target. A wealth of prevention research has developed around these ideas, most notably situational crime prevention (see Clarke, 1997; Cornish & Clarke, 1987; Eck, 1997) and place-based, hot spots policing (Braga and Weisburd, 2010; Sherman & Weisburd, 1995; Weisburd, 2008). Clarke and Newman (2006) have extended their work in situational crime prevention to counterterrorism.

Situational crime prevention and deterrence measures are actions, environmental changes, or other tactics that prevent crime by blocking opportunities or access to crime, hardening targets, strengthening people against offenders, and increasing the risk of detection and apprehension by increasing guardianship. Although overlapping and related, prevention and deterrence measures are distinguished often by perspective: prevention refers to blocking opportunities so crime cannot occur, while deterrence measures often increase the risk of certainty, severity, or celerity of punishment and apprehension. Both can cause an alteration in the decision making process of an individual to commit crime, and both prevention and deterrence mechanisms can be found in the same interventions (metal detectors are a good example). By changing the availability of opportunities offered by the environment, such interventions are intended to

persuade the potential offender that an area is not conducive to committing a crime—the risks are too great and the rewards too modest to make the effort worthwhile.

Examples of situational crime prevention measures include putting locks on doors, blocking off streets, reducing the maximum number of drinks at a bar, increasing street lighting, marking property, or using video surveillance. Cornish and Clarke (2003) detail twenty-five techniques (reproduced in Figure 1) that could encompass a wide variety of measures. Many of the plays in the Playbook mimic these techniques through screening, searching, surveillance, access blocking, and vulnerability-reducing measures.

Figure 1. Twenty-Five Techniques of Situational Crime Prevention

Increase the Effort	Increase the Risks	Reduce the Rewards	Reduce Provocations	Remove the Excuses
1. Harden targets immobilisers in cars; anti-robbery screens	6. Extend guardianship cocooning; neighbourhood watch	11. Conceal targets gender-neutral phone directories; off-street parking	16. Reduce frustration and stress efficient queuing; soothing lighting	21. Set rules rental agreements; hotel registration
2. Control access to facilities alley-gating; entry phones	7. Assist natural surveillance improved street lighting; neighbourhood watch hotlines	12. Remove targets removable car radios; pre-paid public phone cards	17. Avoid disputes fixed cab fares; reduce crowding in pubs	22. Post instructions 'No Parking'; 'Private Property'
3. Screen exits tickets needed; electronic tags for libraries	8. Reduce anonymity taxi driver IDs, 'how's my driving?' signs	13. Identify property property marking; vehicle licensing	18. Reduce emotional arousal controls on violent porn; prohibit paedophiles working with children	23. Alert conscience roadside speed display signs, 'shoplifting is stealing'
4. Deflect offenders street closures in red light district; separate toilets for women	9. Utilise place managers train employees to prevent crime; support whistle-blowers	14. Disrupt markets checks on pawn brokers; licensed street vendors	19. Neutralise peer pressure 'idiots drink and drive'; 'it's ok to say no'	24. Assist compliance litter bins; public lavatories
5. Control tools/weapons toughened beer glasses; photos on credit cards	10. Strengthen formal surveillance speed cameras; CCTV in town centres	15. Deny benefits ink merchandise tags; graffiti cleaning	20. Discourage imitation rapid vandalism repair; V-chips in TVs	25. Control drugs/alcohol breathalysers in pubs; alcohol-free events

Adapted from Cornish and Clarke, 2003

Extensive theoretical development and testing of situational crime prevention approaches have already been undertaken within the rational choice, routine activity, deterrence and opportunity frameworks (see Clarke, 1983; 1992; 1995; Clarke and Newman, 2006; Cornish & Clarke,

1986; Eck, 2002; Weisburd, 1997). A large body of literature indicates that target hardening and access control can be promising ways to block motivated offenders and reduce opportunities for crime (Clarke, 1992; 1995; Eck, 2002; Newman, 1972). Further, in a systematic review of the collateral effects of situational crime prevention interventions, Guerette and Bowers (2009) found that crime displacement—the shift of criminal activity to other locations, crime types, offenders, or strategies as a result of an intervention—occurs less frequently than believed, and is seldom total if it does (see also Braga, 2007; Clarke & Weisburd, 1994; Weisburd, 2002; Weisburd et al. 2006). Whether this is the case at airports remains to be seen.

Researchers have also found that the most effective situational prevention strategies are those tailored to the targeted offense and the context (Clarke, 1997). For example, although Lum and colleagues (2006) found that metal detectors at airports were effective in reducing attacks at airports, more general situational measures meant to fortify embassies and protect diplomats against a range of potential attacks were not similarly effective. This might be due to different motivations of these two types of crimes, which can also be tied into environmental settings (see Clarke, 1997). The effectiveness of greater specificity has been found in policing interventions as well (see Lum, Koper, & Telep, 2011; Weisburd and Eck, 2004).

While situational crime prevention approaches can be implemented at very specific places, there is also strong research showing that law enforcement deterrence and guardianship efforts directed at hot spots of crime and risky places can have significant crime reduction effects (Weisburd, 1997; 2002; 2008). Beginning with the Minneapolis hot spots experiment (Sherman & Weisburd, 1995), numerous studies have shown repeatedly that directed patrol can deter would-be offenders (for reviews, see Braga, 2007; Lum et al., 2011; National Research Council, 2004; Sherman, 1997; Sherman & Eck, 2002; Weisburd & Eck, 2004). Further, Durlauf and Nagin (2011) argue that certainty-based deterrence approaches like hot spot policing seem more effective than "severity-enhancing" deterrence approaches in which threats of severe punishment are used to create a deterrent effect. Both situational crime prevention and place-based deterrence approaches are used throughout the Playbook, which is highly oriented to certain places at the airport. The question is whether the locations chosen are indeed high risk, and whether the implementation of the plays at those locations leads to a measurable effect.

Deterrence and Unpredictability

One key feature that TSA highlights within the Playbook is the element of unpredictability of the implementation of specific interventions. The Playbook attempts to achieve this through a computer-based application that allows personnel to randomly select sets of plays and supplement them with other non-randomly selected tactics to be implemented during a period of time. Ideally, potential offenders would be deterred because it is difficult for them to anticipate the location, timing, and nature of security measures. Under a rational choice perspective, this uncertainty of the opportunity structure could prevent them from making an informed decision about risk and rewards, increasing the risks (and costs) of their offending and consequently discourage them from crime.

The idea that unpredictability might create a perceived “omnipresence” that can then deter crime has parallels in both the traditional preventive police patrol research and also the hot spots studies mentioned above. Before the hot spots studies, it was long argued that spreading police randomly and widely across the city would deter potential offenders (e.g., Repetto, 1976). However, a large field study in the 1970s conducted by the Police Foundation in Kansas City (Kelling, Pate, Dieckman, & Brown, 1974) appeared to counter this argument, showing that increases or decreases in preventive patrol in large areas had no measurable impact on crime or on citizens’ feelings of security and safety. Sherman and Weisburd (1995), in the Minneapolis Hot Spots experiment, argued that random preventive patrol across large areas was not likely to be successful because of the relatively small dosage that most city police were able to deploy and the fact that most crime in a city is concentrated in very specific places (“hot spots”). They contend that patrol should not be spread randomly but rather be focused on high-risk places.

Overall, the research indicates that unpredictability in security and law enforcement efforts can be effective when there is an initial targeting of places (or even people) that are at highest risk of offending. The Koper Curve hypothesis (Koper, 1995), which indicates that directed patrol can have diminished residual deterrent effects after a peak time of direct patrol, supports this notion. Moving patrol from hot spot to hot spot in an unpredictable manner for shorter periods of time may be more effective in reducing crime rates in a city (or place) than keeping officers at a single hot spot all day. Plays within the Playbook, and the Playbook more generally, have the *potential* for both targeted, unpredictable approaches and non-targeted, unpredictable approaches. Which is more efficacious in an airport setting is a question for evaluation.

Interagency Cooperation

Finally, the Playbook emphasizes the importance of interagency cooperation for preventing terrorism and crime in many of its plays. Interagency cooperation is also a theme in existing crime prevention and counterterrorism literature. In law enforcement, multi-agency cooperation grew primarily from policing models such as community-oriented and problem-oriented policing, as well as “all-hazards” approaches to disaster response. These models of security and policing center around general notions of inclusiveness, democratic decision making, tailored and multi-faceted problem-solving, and “thinking outside of the box,” all of which invoke principles of cooperation across stakeholders toward common goals.

There is growing evidence in the research literature that interagency cooperation may be a promising part of crime reduction and deterrence, especially in law enforcement. Both Weisburd and Eck (2004) and Lum and colleagues (2011) discovered that tailored policing approaches, which often employ third-party partnerships, are effective in reducing crime (see also Mazerolle & Ransley, 2005; Weisburd, Telep, Hinkle, & Eck, 2010). Further, Riley and Hoffman (1995) and Lum, Koper, and Telep (2009) found a strong post-9/11 trend in law enforcement to pursue and support information sharing across agencies and interagency collaboration for purposes of establishing homeland security systems (see also Carter and Chermak, 2011).

In our discussions with TSA managers, they emphasize that coordination and collaboration must occur for airport security to be effective. This includes cooperation between TSA officers and administrators, local police departments both in and outside of the airport, the airport authority, those doing business in and around the airport, and passengers themselves. Whether the

“...the overall conceptual framework of the Playbook generally reflects criminological theory as well as research in various areas of crime prevention and deterrence.”

Playbook achieves collaboration that proves to be effective and efficient in providing security is therefore an important question in assessing the Playbook.

In conclusion, the overall conceptual framework of the Playbook generally reflects criminological theory as well as research in various areas of crime prevention and deterrence. Thus, to use a translational

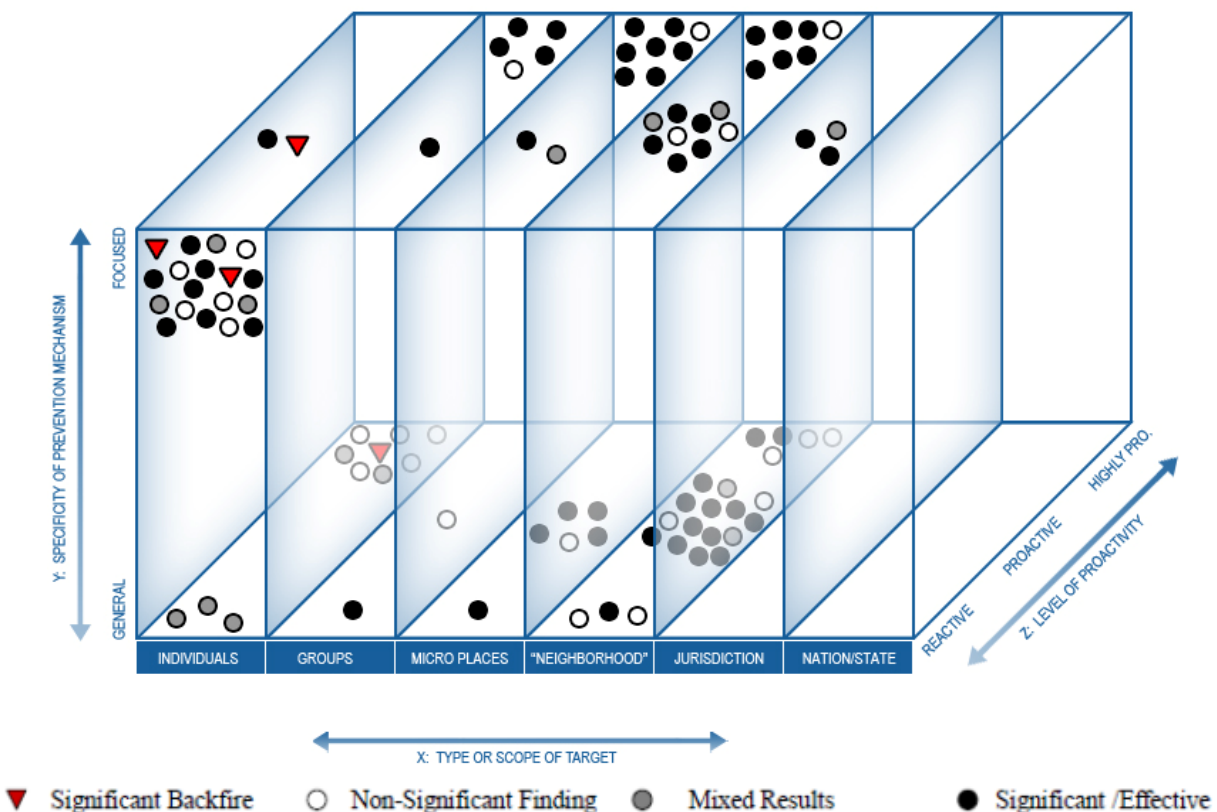
criminological approach to preliminarily assess airport security measures is not farfetched. In the next section, we more specifically analyze all of the [REDACTED] plays within the Playbook against the evaluation research within these research areas. To do this, we dig into the prevention and deterrence mechanisms of the plays in the Playbook, and compare them to the evidence on similar mechanisms of prevention in existing crime prevention research. Although the constraints of the non-disclosure agreements of this project prohibit us from discussing specific plays, we present the general tendencies of the plays for purposes of thinking about advancing airport security.

4 ASSESSING THE EVIDENCE-BASE FOR THE PLAYBOOK

Given the similarities of the theoretical contexts of airport security and criminology, the purpose of this analysis is to assess whether the Playbook fits the current evidence base of crime prevention. This exercise is useful in the absence of experimental evaluations on airport security, and can provide a general sense of whether the Playbook reflects what we know works in security more generally. To accomplish this, the first step is to categorize plays in such a way that allows us to make generalizations from them that apply to the broader crime prevention literature.

A categorization approach for evidence-based policy has been developed in the area of policing by Lum, Koper, and Telep called the *Evidence-Based Policing Matrix*.[©] In 2007, Lum and Koper developed a visual organization scheme to systematically display evaluation evidence called the Crime Prevention Matrix (see Lum and Koper, 2011). In 2008, Lum, Koper, and Telep extended this concept to the policing literature, creating the *Evidence-Based Policing Matrix* (see Lum, 2009; Lum, Koper and Telep, 2009, 2011) as shown in Figure 2. The purpose of this was to create a tool by which existing research knowledge could be easily summarized according to common attributes of interventions (target of the intervention, level of specificity and proactivity of the intervention).

Figure 2. The Evidence-Based Policing Matrix



By mapping all moderate to highly rigorous police evaluation research according to common dimensions (shown by each axis) of tested interventions, clustering patterns of effective tactics emerge. These clusters can be described in the areas of the matrix in which specific nodes on the X, Y, and Z axes intersect, creating generalizations of promising interventions. The purpose of creating generalizations from such mapping was to create a tool that could eventually be used to assess tactics that have yet to be evaluated. For example, if a police agency wanted to know if a neighborhood-level, proactive, and general intervention could be effective, the totality of the research in that area of the Matrix indicates that such an approach might be promising.

We think the Matrix concept offers an opportunity to categorize the Playbook and assess its evidence base in a similar fashion. However, it is impossible to create a matrix of airport security measures given the lack of evaluations in this area. Further, a matrix of situational crime prevention and deterrence measures has yet to be created and is well beyond the scope of this project. However, to approximate this approach, we carried out a “reverse matrix” exercise. Lum (2009) initially advised police agencies to create a mapping of their own deployment tactics and then compare visualizations with the policing matrix. In similar fashion, we developed a hypothetical airport security matrix, according to common characteristics developed from the situational crime prevention, deterrence, and interagency coordination literature. We then mapped the plays into the airport security matrix, which allowed us to discern common tendencies across plays. Then, because there is a large amount of evaluation research on situational crime prevention, we compared clustering of play tendencies along common dimensions to what we know about those dimensions from that literature. Although this approach does not substitute evaluation, it provides some understanding of how well the evidence supports Playbook activities.

Developing the Airport Security Matrix

To develop a Matrix for airport security, we examined all [REDACTED] plays [REDACTED] to identify similar characteristics with regard to prevention, deterrence and interagency cooperation.⁷ [REDACTED]

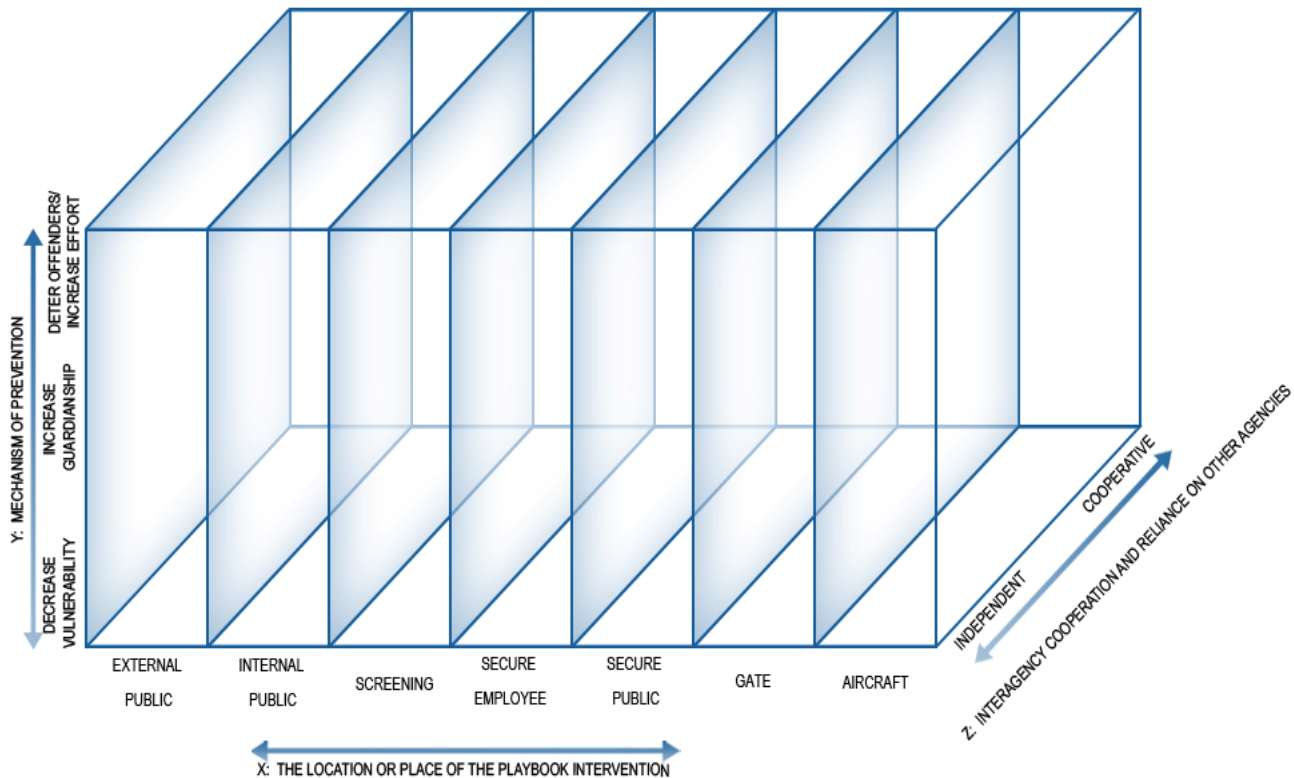
⁷ [REDACTED]

them (for example, training exercises to practice responses to a potential situation). Thirty-six percent of the total plays are HQ plays.

Like the Evidence-Based Policing Matrix methodology (see Lum et al. 2011), we began building a classification scheme by first examining a sample of plays in the context of common crime prevention principles informed by the literature. The plays were then coded using several key features of each play, including the nature of the activity involved in the play, the classification of the play according to Cornish and Clarke's 25-item situational crime prevention typology (Figure 1), and criminological theories reflected in the play, timing, target population, agencies involved, and the mechanism of prevention. All members of the research team were involved in this coding exercise, which fostered consensus about the nature of airport security.

What emerged are three dimensions that we believe are critical to understanding the prevention activities central to the Playbook, as shown in our "Airport Security Matrix" (Figure 3). The X-axis classifies the location at which a particular play is implemented, the Y-axis indicates the mechanism of the preventative strategy, as informed by situational crime prevention scholars (see Cornish & Clarke, 2003), and the Z-axis indicates the level of interagency cooperation.

Figure 3. The Airport Security Matrix



X-Axis: The Location or Place of the Playbook Intervention

A common way to describe a crime prevention tactic is the target of the prevention, usually a person, group, location, or place. Although airport counterterrorism measures do target specific

persons and groups (i.e., no-fly lists, employees with criminal histories), the Playbook tactics primary are place-based. Indeed, TSA's "layers of security" approach emphasizes implementing different tactics at different airport locations to create a secure environment. For our matrix, we delineated target locations, and thus the X-axis, moving from the outermost to innermost layers, closest to the airplane itself:

External public airport areas: Places within the airport perimeter but outside the physical airport building and entry terminals, such as taxi areas, walkways, curb drop-off and pick-up locations, rental car parking lots, etc. Also places outside the airport perimeter, such as mass transit systems or streets that connect to airport entrances.

Internal public airport areas: Publicly accessible areas of the interior of airport buildings, prior to security screening; for example, ticket counters and baggage claim areas.

Screening areas: Perimeter check points for either passengers or employees (which may be the same or separate areas). These screening areas divide publicly accessible areas from secure areas.

Secure public areas: Areas that can only be accessed after passing through a formal screening process. These areas are available to ticketed passengers and authorized and screened employees.

Secure employee areas: Areas that can only be accessed by employees after passing through a formal screening process (including vetting prior to employment and/or entry screening with an identification check). These areas may be inside buildings and outdoors in areas enclosed in a security perimeter. [REDACTED]

Gate: Places in the immediate vicinity of the gate area for a specific departing flight.

Aircraft: The interior or immediate exterior of aircraft bodies.

Y-Axis: Mechanism of Prevention

The Y-axis reflects the prevention mechanism used by a specific tactic. We derived the Y-axis categories using three common constructs of situational crime prevention and opportunity theories: (1) to deter offenders by increasing their effort, (2) to increase general guardianship, and (3) to reduce the vulnerability of passengers and other potential targets. In many cases, plays could be classified into multiple categories on this dimension, given their theoretical overlap. For example, tactics intended to harden targets for deterrence could also be interpreted as reducing the vulnerability of a potential victim. Where there was overlap, we selected the primary mechanism of prevention based on the intended target of the tactics:

Deter offenders/increase their effort: These involve plays that primarily focus on blocking offenders by increasing the effort they would have to use in order to succeed in a specific activity. Examples include [REDACTED].

Increase guardianship: These plays generally attempt to increase the level of general watchfulness and oversight to detect criminal activity. Broadly, this classification is used for plays that intend to increase the risk of being apprehended through increasing surveillance (for example, [REDACTED]).

Reduce vulnerability of passengers and other targets: These plays are designed to decrease the vulnerability of targets (both people and places) or to make criminal activity less worthwhile for the offenders by making passengers, employees, or other targets more alert or less available. Such plays are designed to protect people and locations even in the presence of a motivated offender. Examples include [REDACTED].

Z-Axis: Interagency Cooperation and Reliance on Other Agencies

The Z-axis of the matrix describes the extent to which TSA must rely on other agencies to implement plays. The Playbook and the TSA emphasize increased cooperation with agencies at the airport not under TSA jurisdiction. These might include local law enforcement responsible for security in non-screening areas; the airport authority and business managers of the airport; vendors; and employees of the airport, airline, and outside agencies. Thus, the Z-axis is divided accordingly:

Independent or TSA-Primary: These are plays that are primarily conducted by TSA officers/employees. Cooperation of other agencies (such as law enforcement) may be sought or needed for arrest but is not necessary to initiate or carry out the play.

Cooperative: These plays require cooperation between TSA and another agency, such as law enforcement, in order for them to be initiated. The Playbook specifically suggests agencies whose cooperation is strongly encouraged. However, because the Playbook arises from TSA, there are no plays in which the TSA does not take a lead or cooperative role.

Method for Mapping Plays into the Airport Security Matrix

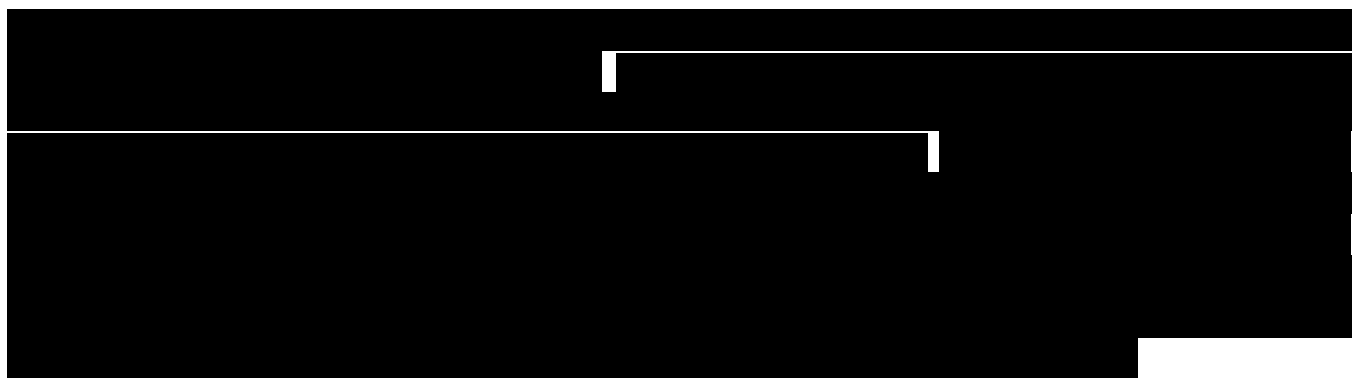
After the Airport Security Matrix was adapted and the axes were defined, each play was initially coded by two members of the research team. To maximize inter-rater reliability, each was given half of the plays to code, and then each examined the other's coding to check for inconsistencies. Any disputes were resolved by the project manager and principal investigators who oversaw the play coding and frequently examined individual plays. To further strengthen coding, the project manager checked a random sample of plays, and the principal investigators served as a final point of dispute resolution.

During this process, the definition of the categories for each axis continued to be refined, which often led to further examination of plays and re-coding. This process increased the amount of individuals examining and discussing the coding of each play. Where more than one mechanism of prevention applied to a single play, the research team discussed the apparent intent of the

play and selected the primary intended mechanism on this basis. For example, a play involving [REDACTED] might be interpreted on the Y-axis as intended to increase guardianship or decrease the vulnerability of the target. However, following discussions, the research team agreed that increased guardianship referred primarily to “general watchfulness,” looking for suspicious activity but not necessarily a specific threat. [REDACTED] was more specific and therefore was categorized as “reducing vulnerability of passengers or other targets.” Similarly, [REDACTED] could be coded as either deterring offenders or reducing vulnerability of aircraft. Again, the team agreed that if decreasing vulnerability was primarily concerned with minimizing the impact of a threat that had not otherwise been blocked, [REDACTED] should be coded as deterring offenders by providing increased effort because they are designed to block or deter a specific threat (i.e., contraband, weapons, or explosives penetrating a layer of security).

It is important to note that this process of coding the plays into the airport security matrix was a dynamic process, for the purpose of illustration and categorization only. We did not treat this process in the same way one might validate a measurement or coding instrument through reliability statistics for classification consistency. The goal of this exercise was to develop consensus across the team about describing plays according to common dimensions. The final definitions provided in each of the dimensions above reflect this consensus building, and the details within each description provide others with guidance on further mapping new plays (if any) into the matrix. However, even within the dimensions, there is definitional overlap, as described above. Further, unlike the Evidence-Based Policing Matrix, there is not a populated airport security matrix to compare plays against. More important to the overall project is determining how to evaluate the Playbook's effectiveness. The purpose of this exercise is to gain a better sense of the nature and potential of the Playbook and to find ways to compare activities against existing research in a qualitative manner.

A Note on Strategic Plays

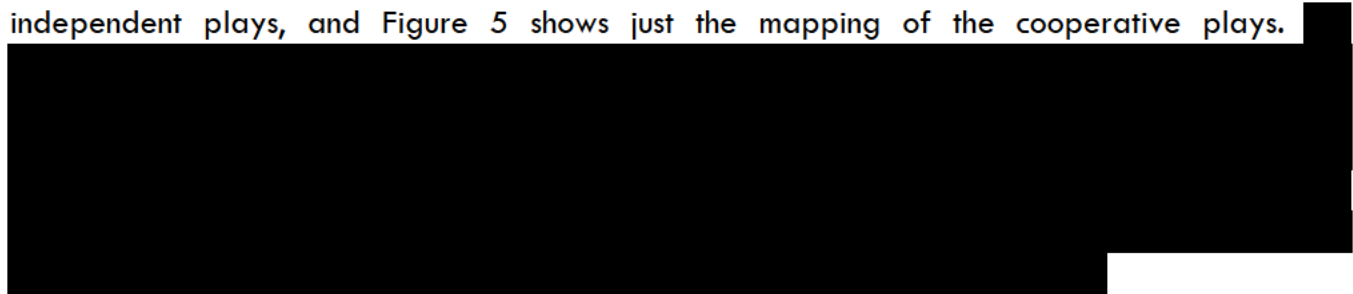


Finally, it should be noted that during this first phase of our multi-phase project, we were in constant contact with DHS and TSA personnel about questions and clarifications of the Playbook. We also conducted two site visits to one international and one domestic airport that used the Playbook regularly, to discuss how the Playbook and the randomization software were

implemented and to obtain a better sense of the realities of the Playbook. In-depth examination of airport use of the Playbook occurs in later phases of this project. However, for the purpose of establishing an evidence base for the Playbook here, these visits and interactions provided an important realistic context in which the Playbook operates.

5 RESULTS

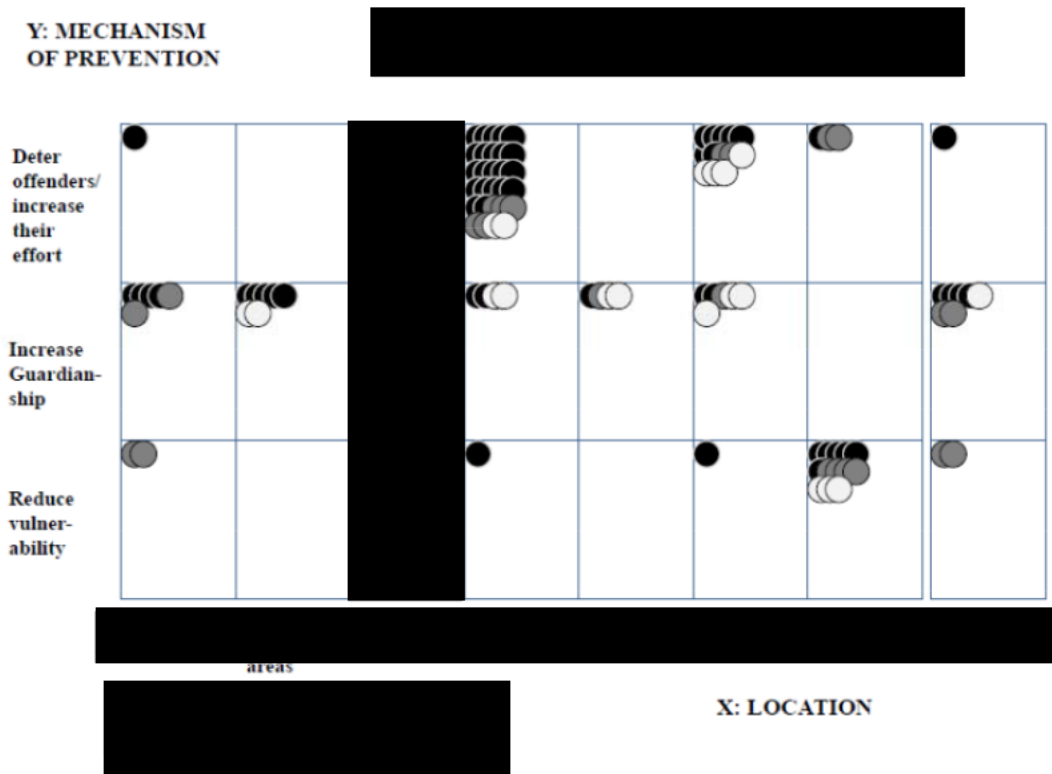
For ease of visualization and discussion, we divide our results into two two-dimensional “cuts” of the Airport Security Matrix along its Z-axis. Figure 4 shows just the Matrix codings for independent plays, and Figure 5 shows just the mapping of the cooperative plays.



Independent, TSA-Only Plays



Figure 4. Independent Plays



A number of interesting findings are immediately apparent. The first is the heavy clustering of Playbook tactics that focus on [REDACTED]

[REDACTED] In our discussion of our results (section 5), we generally describe these types of plays in Figure 10.

These offender blocking, target hardening, and deterrence-focused plays are most often conducted in the screening area, as expected, and are fairly equally divided among passengers ("P") and employees ("E"). [REDACTED]

[REDACTED] This might reflect an avoidance of deterrence-based approaches on passengers after security screening, perhaps to reduce customer dissatisfaction or delays. Secure employee area plays include [REDACTED]

[REDACTED]. From this mapping, it appears one emphasis of the Playbook is increasing security measures toward airport staff, vendors, contractors, airline representatives, and TSA employees. This tendency is further supported when considering [REDACTED]

[REDACTED] . TSA might consider deterrence at much earlier stages (external to airport) given recent events like those in Los Angeles or Moscow.

The plays that are more likely to occur in public areas outside and directly inside of the main airport terminal are those that attempt to increase general guardianship and watchfulness. Indeed, [REDACTED] of plays in these areas were guardianship-oriented. The tendency toward general guardianship plays might be due to such tactics seeming less intrusive or easier to implement in these public spaces as compared to offender-deterrence strategies. Plays that increase guardianship primarily include [REDACTED]

[REDACTED] Of course, other tactics outside of the purview of the Playbook, including TSA's Federal Air Marshals program, as well as airline employee activities, still occur.

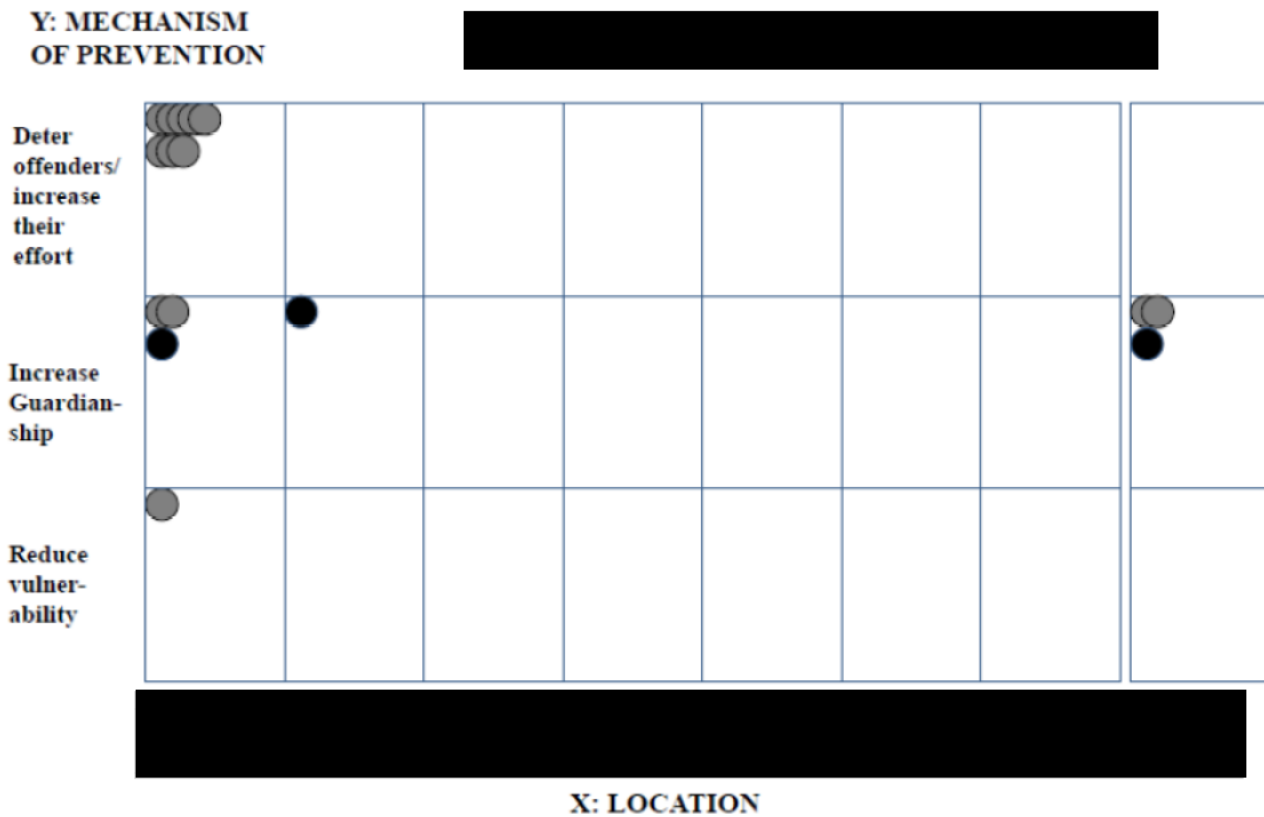
While the guardianship plays were more evenly spread across multiple location settings, plays intended to decrease the vulnerability of passengers or other potential targets (or reduce rewards for offending), like deterrence plays, were more clustered. These plays took place in

and around the aircraft itself, [redacted] vulnerability-reducing plays occur in and around the aircraft) [redacted]. Additionally, this mechanism of prevention tended to employ K-9 teams.⁸

Cooperative Plays

[redacted] Of those plays that are tactical and immediate in nature, [redacted] tactical plays, relied on the cooperation of other non-TSA entities in a substantial way.⁹ Cooperative plays most likely appeared in the category not mapped in the Airport Security Matrix—the strategic plays. Three cooperative tactical plays could not be categorized in terms of a specific location and appear at the right of Figure 5. These were plays that have the potential for deployment across multiple areas of the airport or that were on-the-spot audits of badges and access at various locations.

Figure 5. Cooperative Plays [redacted]



⁸ It is unclear whether the use of K-9 is a cooperative or TSA-independent venture. In visits to two airports, the research team learned that there may be variation across airports who owns this particular resource and how often it can be used.

⁹ We recognize that many plays require law enforcement to follow through with arrest. However, to be “cooperative” in our classification requires more than this use of law enforcement after the play is implemented.

The majority of the cooperative plays took place in areas external to the airport, either outside the building (curbside, taxi stands, etc.) or in adjacent spaces connected to the airports (parking lots, rental car locations, taxi waiting areas).

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[REDACTED]

¹⁰ Although significance testing is not entirely meaningful for this type of analysis, we report significance values in footnotes for those interested. Here, Chi-Squared = 9.78, df = 4, p<.05

¹¹ Chi-Squared = 33.6, df = 10, p<.001.

[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[REDACTED]

¹² Chi-Squared = 24.2, df= 2, p<.001.

¹³ However, TSA Playbook Managers at TSA Headquarters remarked during review of this document that some [REDACTED] plays do encourage cooperation.

¹⁴ Chi-Squared = 105.0, df= 10, p<.001.

addressing the capacity of the security apparatus itself over the long term through management and planning.¹⁵

¹⁵ Upon final review of this document by TSA in March of 2012, a reviewer from the Playbook Program Office stated: "The HQ Playbook security awareness plays are planned to be removed from the document as these activities are normal functions of the airport and FSD staff."

6 DISCUSSION: IS THE PLAYBOOK EVIDENCE-BASED?



The results above show the classification of the Playbook across common crime prevention mechanisms and where they cluster in the airport security matrix. However, plotting unevaluated plays into this matrix does not provide knowledge of the *effectiveness* of these specific interventions, only a categorization of common prevention and deterrence tendencies of similar plays. The question for evidence-based security policy is whether these tendencies are supported by research evidence on evaluated interventions that

use similar prevention approaches. Unfortunately, the lack of evaluation research in airport security means that we do not have an evidence base to develop a matrix by which to compare our mapping of the Playbook plays (as was done in policing by Lum, et al. 2011). However, a translational criminological approach allows us to examine existing research in similar subject areas to see whether the evidence supports the mechanisms of prevention of the Playbook plays. This provides a preliminary assessment of effectiveness for better informed decisions now, and builds the case for more evaluation. Here, we use the aforementioned literature on situational crime prevention, deterrence, and interagency cooperation to make such comparisons.

In Figure 10 we first describe the groupings of plays that fall within each cell of the airport security matrices in Figures 4 and 5.¹⁶ These descriptions provide an overview of the types of plays that fall within a cell (e.g., "external public areas" which "deter offenders by hardening targets"). Using these general descriptions, we then looked for existing evaluations of similar situational crime prevention, security, and policing mechanisms. We relied heavily on Eck's (2002) review of situational crime prevention measures, and sometimes on policing studies collected in Weisburd and Eck (2004) and Lum, Koper, and Telep (2009, 2011). We choose research evidence that uses at least a "moderately rigorous" evaluation design of which to compare. "Moderately rigorous" is labeled by Sherman, Farrington, Welsh, & MacKenzie (2002) in their *Scientific Methods Score (SMS)* as "Level 3" (of five levels). A Level 3 evaluation design "measures crime before and after the program in [nonequivalent] experimental and comparable control conditions" and is considered the minimally acceptable research design in determining "what works" (Sherman et al., 2002, p. 17; see also Cook & Campbell, 1979). Level "4" and "5" studies are those that use more rigorous quasi-experimental and experimental designs, respectively. Figure 11 summarizes this evidence using the same cells as Figure 10, with the SMS score provided in parentheses after each citation.

¹⁶ We remind the reader that due to non-disclosure agreements, these descriptions are general and non-specific. Further, our descriptions and presentation of the results have been reviewed by the Department of Homeland Security.

Figure 10. General Description of Plays in Intersection of Location and Prevention Mechanism

	Deterring offenders and increasing their efforts	Increasing guardianship	Reducing vulnerability of passengers/other targets
External public areas	[REDACTED]	[REDACTED]	[REDACTED]
Internal public areas	[REDACTED]	[REDACTED]	[REDACTED]
Screening areas	[REDACTED]	[REDACTED]	[REDACTED]
Secure areas (Employees)	[REDACTED]	[REDACTED]	[REDACTED]
Secure areas (Passengers) (except boarding gates)	[REDACTED]	[REDACTED]	[REDACTED]
Gate	[REDACTED]	[REDACTED]	[REDACTED]
Aircraft	[REDACTED]	[REDACTED]	[REDACTED]
No area specified	[REDACTED]	[REDACTED]	[REDACTED]

Figure 11. Comparable Evaluations of Situational Crime Prevention and Deterrence Interventions

	Deter offenders	Guardianship	Decrease vulnerability
External public	Challinger, 1996 (3), identification requirements. Poyner, 1994 (3), redesign of residence. Ekblom, 1988 (3), bullet-proof screen and barriers. Atlas & LeBlanc, 1994 (3) and Lasley, 1998 (3) street closures and barricades. Enders & Sandler, 1993, 2000 (3) fortifying embassies showed NO effect.	Mixed findings regarding guardianship in <i>outdoor</i> places that have not had preliminary screening. Hesseling, 1995 (3), guards have no impact, but Barclay, Buchley, Brantingham, Brantingham, & Whinn-Yates, 1996 (3), Laycock & Austin, 1992 (3), and Poyner, 1994 (3), found an effect. CCTV in open public spaces showed some positive effects, only in UK, not in US (Welsh & Farrington, 2008).	Evidence on street closures, rerouting and barricades. Mixed but mostly effective. (Eck = "promising") Atlas & LeBlanc, 1994 (3); Lasley, 1996, 1998 (3); Newman 1996 (3). Restricting pedestrian movement is effective - Poyner 1994 (3).
Internal public	██████████ strategies that may be comparable in Eck (2002) are public-space interventions that increase lighting (or in this case, "visibility") (see Eck, 2002, p. 270–271). Hot spot patrol targeting high risk locations may be relevant, i.e., Sherman & Weisburd, 1995.	Mixed findings regarding guardianship in <i>indoor</i> places that have not had preliminary screening. Kenney, 1986 (3), Guardian Angels have no impact in subways. Webb & Laycock, 1992 (3), CCTV in subways.	Strategies here may be similar to those two cells to the left, especially in increasing lighting.
Screening areas	Metal detectors are effective - Cauley & Im, 1988 (3); Enders & Sandler, 1993 (3); 2000 (3); Enders, Sandler, & Cauley, 1990 (3); Landes, 1978 (3). CDC, 1993 (4), metal detectors in schools.	Due to secure sensitive information policies of DHS and TSA, some information here cannot be disclosed. However, confidential studies exist in this area.	No comparable evaluation could be located.
Secure areas (E)	Interventions that stop employees from becoming facilitators may be applicable, including time-lock cash boxes and safes—Clarke & McGrath, 1990 (3).	May be similar to bar and tavern evaluations, such as codes of practice and training for employees. Felson, Berends, Richardson, & Veno, 1997 (3), Putnam, Rockett, & Campbell, 1993 (3).	Could be comparable to changing codes of practice through training of employees in alcohol outlets or convenience stores—Felson et al., 1997 (3); Putnam et al., 1993 (3); Saltz, 1987 (3).
Secure areas (P)	Strategies that may be comparable in Eck (2002) are the CCTV studies already mentioned (3) (for purposes of deterrence, as opposed to guardianship, see below) as well as hot spots studies by Sherman & Weisburd, 1995 (5) in specific high risk areas.	First two cells in this column above may apply. However, this is an area of the airport security matrix that focuses on public <i>past</i> the initial screening and security stage. There are no studies comparable in the crime prevention literature on this type of prevention strategy.	No comparable studies found.

	Deter offenders	Guardianship	Protect potential targets, decrease vulnerability
Gate	Passenger screening mentioned in above cells are relevant, if repeated at gates. Targeting high-risk flights and gates may be more effective than a random selection strategy, given what we know from hot spots studies (see Braga's reviews 2005, 2007).	Could be compared to security interventions at gate areas of pass transit systems, but evaluations of this are weak (SMS=2); see e.g., DesChamps, Brantingham, & Brantingham, 1992 (2); van Anandel, 1989 (2).	Bank studies on reducing vulnerability found that screens protecting tellers resulted in burglary reductions—Ekblom, 1987 (3); Barclay et al., 1996, Hesselting, 1995, Laycock & Austin, 1992 (3); Poyner, 1994 (3).
Aircraft	Some studies have examined protective screens for drivers, but were not scientifically rigorous (see Poyner & Warner, 1986). Target hardening of public coin machines may have similar mechanisms of prevention (Decker, 1972 (4))	No studies found, but evaluations in this area could include those that would examine business checks by police or place-specific targets.	No comparable studies found.
No area specified	Some parallels might be found regarding cooperation element—Weisburd & Eck (2004) and Lum et al. (2011) argue the more tailored and multi-agency strategies (sometimes needing outside agency) are more effective.	Van Anandel, 1989 (2) is a very weak study that indicates getting public to monitor may reduce crime. Neighborhood watch might apply here (see Bennett et al., 2008 (3)), which showed some positive effects, but many are weak studies.	Reducing vulnerability in general: tagging and property marking has mixed results, some backfires (Gabor 1981 (3)). Laycock 1985, 1991 (3)—highly publicized property marking is effective; Farrington et al 1993 (3) —effective. Repeat victimization studies have been effective (see Farrell's 2005 review, most studies level 3, a few 4).

Prevention, Deterrence, and Unpredictability

The translation from the research evidence in Figure 11 back to the descriptions of mechanisms of prevention in the Playbook plays in Figure 10 is challenging. Not only do the subject matters differ, but the methodological rigor of many studies in this area of criminology is also modest. Thus, only cautious translation is encouraged here.

For example, one major element of the Playbook is the focus on tactics and strategies intended to prevent and deter offenders by increasing the amount of effort they would have to undertake to commit an offense (by target hardening, for example). This is embodied both within the individual plays and more generally in the concept of randomly selecting and deploying sets of plays to increase unpredictability of security actions. The most relevant studies in this area are those directly related to metal detectors at airports, the effects of which have been highlighted above. However, other studies in Eck's (2002) review of situational crime prevention measures that are intended to deflect and deter offenders may also apply, although again, caution should

be exercised, given that many of these evaluations have only been conducted using moderately rigorous methods (Weisburd, 1997). Methods of access control, entry/exit screening, and target hardening, such as improving the security of doors and windows (Tilley & Webb, 1994), closing walkways connecting buildings (Poyner, 1994), or blocking off or restricting access to streets and alleyways (Bowers, Johnson & Hirschfield, 2004), have all been shown to help reduce robberies and burglaries. Clarke (1997) asserts that entry/exit screening also significantly reduces crimes such as theft, shoplifting, and fare evasion. In a systematic review of public-area surveillance and crime prevention, Welsh, Mudge, and Farrington (2010) provide further evidence that techniques such as street closures and barricades are effective crime-prevention methods. Again, although these findings are not directly related to TSA operations, they show strong support for similar crime prevention mechanisms in many plays that reduce access, improve guardianship, and decrease the vulnerability of targets at airports.

Although the vast majority of the relevant literature is not policing related, some policing evaluation studies may be useful, especially those that relate to gun carrying and drug enforcement. For example, McGarrell, Chermak, Weiss, and Wilson (2001) and Sherman, Shaw, and Rogan (1995) showed mixed but promising results in targeting places that have high incidents of gun crime (and thus gun carrying) using directed traffic and pedestrian patrols and stops in high gun-crime neighborhoods. This strategy could be loosely interpreted as a "screening" mechanism as well as random searching. However—and this is a key distinction—these studies also depend on one very important caveat not present in Playbook deployment: a specific location that is identified as high risk for contraband carrying. Many Playbook deterrence plays take place at screening checkpoints and employee-secure areas [REDACTED]. Some deterrence plays do occur at gates for identified high-risk flights, which may present an opportunity for better place-based targeting and gate selection for play deployment. [REDACTED]

Existing research in police patrol suggests that combining these types of deterrence-oriented plays with more specific place-based targeting may increase the deterrent effect without significant spatial displacement (Braga, 2007). As already emphasized, this approach is contrary to a non-directed patrol approach, in which little to no analysis is done to try to anticipate high-risk places, people, times, or situations. There is little to no evidence that ad hoc deployment of tactics is an effective strategy against reducing crime in a jurisdiction (National Research Council, 2004; Weisburd & Eck, 2004; Lum et al., 2011).

However, it is important to note the differences between policing street crime versus screening at airports when applying police-related research to airport security. These differences may affect whether or not translation between crime prevention evaluations and counterterrorism or security is possible. In policing, high risk locations are easily identified and fairly stable (Weisburd et al., 2004), given the regularity and "everyday" aspects of crime and disorder. Not only is targeting high risk locations easier given the high predictability of these places, but offending is usually more visible, especially in areas with high crime rates. Further, the motivations of the average

offender may (or may not) be different or more tenuous than someone intending to do harm in an airport. While Dugan et al. (2005) indicate that hijackers generally succumb to rational choice forces (see also Berrebi, 2009; Crenshaw, 1990; Jackson, 2009), Nagin (1998) and Durlauf and Nagin (2011) note that the deterrent effect of strategies may have varying ranges of elasticity with regards to the responsiveness of offenders to interventions. We might hypothesize that an airport offender has a less elastic deterrence response to prevention interventions than an offender in a more "everyday" crime situation. While we use policing literature here to emphasize that place-based targeting is important in general patrol and increased guardianship, airport security efforts may be more translatable from situational crime prevention research.

Most importantly, translation statements rely on the assumption that plays have been properly implemented. For example, with regard to the random selection of plays from the Playbook, we found from our initial assessments of the implementation of the Playbook in two airports that the randomization scheme of the Playbook [REDACTED]. TSA personnel have the prerogative to deselect plays from the randomization software prior to running it. Plays may be deselected for a variety of reasons, [REDACTED]



[REDACTED] Further, once the randomizer selects plays, TSA personnel can supplement the selection with specifically selected, non-randomized plays. Once the suite of plays are selected across the period of time in which that particular randomized selection is used (i.e., one or two weeks, a month), TSA personnel can select which plays they implement on any given day. Finally, the Playbook only represents one part of many other security measures provided by TSA, local law enforcement, passengers, airport workers, and other employees that are not in the Playbook.

Increasing Guardianship

Situational crime prevention studies, as well as police patrol studies, on increasing guardianship have also been conducted using moderately rigorous to highly rigorous evaluation methods. These strategies primarily focus on increasing formal and informal surveillance through law enforcement, although some evaluate other types of guardians. The most translatable studies for airport security are evaluations of interventions that increase general watchfulness of areas, such as CCTV and Neighborhood Watch. Campbell Collaboration systematic reviews of these interventions indicate generally positive but highly variable results depending on the location of the intervention, the nature of the guardianship, and the strength of the evaluation method used.

For example, Bennett, Holloway, and Farrington (2008) found that Neighborhood Watch programs that attempted to increase civilian detection of suspicious activity through increased guardianship were associated with crime reductions of between 16 and 26%. However, many of the evaluations they reviewed involved non-equivalent comparison groups and weak designs, which Weisburd, Lum and Petrosino (2001) found are biased towards showing positive results. Further, it was not always possible to distinguish whether the crime reduction effect stemmed from the guardianship element of the program or from other security measures employed alongside it (such as property marking).

Additionally, Welsh and Farrington (2008a) reviewed studies of formal surveillance using closed-circuit television cameras. They also found a modest crime-reduction effect overall, but further analyses suggested that this effect was driven by successes in very specific situations and contexts, such as reducing vehicle crime in parking lots. The cameras were less successful in reducing other crime types and in city centers or residential areas (see also Farrington, Gill, Waples, & Argomaniz, 2007; Sherman & Eck, 2002). The variety of findings is also evident in a recent quasi-experimental evaluation of the deterrent effect of CCTV by Caplan, Kennedy and Petrossian (2011). Interestingly, the deterrent effect of CCTV did not change depending on whether cameras were placed in strategic or random locations, possibly challenging ideas related to directed versus random deployment for this particular situational crime prevention intervention.

Some of the CCTV research examines surveillance cameras in conjunction with other crime reduction interventions like street lighting, creating difficulties in identifying a direct causal effect. Improved street lighting in itself has been shown in a Campbell systematic review to significantly decrease personal and property crime in public spaces (Welsh & Farrington, 2008b), but it is unclear whether increased guardianship facilitated by better visibility is the primary causal mechanism, or whether improved lighting creates an image of community investment and social cohesion that operates to reduce crime through informal social control. However, the comparability of better visibility to airport security is questionable.

Welsh and colleagues (2010) conducted a more general systematic review of a variety of public-area surveillance strategies using at minimum studies which employed at least a non-equivalent comparison group design. They found some support for the effectiveness of both security guards and citizen patrols (such as "Guardian Angels") in reducing crime, although again there are limitations in the findings. For instance, the few evaluations of security guards were all conducted in parking lots, so they are only shown to be effective in that limited context. Additionally, the Guardian Angels studies indicated reductions in property crime but not violent crime. Welsh and colleagues (2010) also examined two promising studies of place managers (a concierge in a housing block and a taxi firm operating in a parking lot), but again it was not possible to distinguish whether increased guardianship was the primary causal mechanism, or whether other factors were more important in reducing crime (e.g., access control performed by the concierge).

Although the results of the research on increased guardianship are mixed, the use of surveillance and general watchfulness strategies do represent a promising approach to airport security. The

evidence base indicates that increased guardianship may play some role in reducing crime in specific contexts and when used in conjunction with other situational mechanisms. It remains unclear what types of guardianship work best in the context of airport security, as well as the effects such guardianship might have on passenger and employee perceptions of (and thus legitimacy they afford to) airport security personnel. However, given the extent to which guardianship is a key aspect of securing large spaces, more research is clearly warranted.

Decreasing Vulnerabilities of Passengers and other Targets

Passengers and employees can also become effective guardians themselves, not only in improving guardianship more generally, but also in decreasing their own risk of victimization. Further, airport security systems which encourage passenger and employee empowerment may have additional benefits of garnering support, legitimacy, and willingness to cooperate from people. In the language of the Playbook, decreasing vulnerability of passengers and other targets primarily translates into checking aircraft and areas around aircraft for explosives and hiding spaces, conducting final search and screening of passenger bags and persons at gates, as well as erecting barriers, redirecting traffic, and also ensuring baggage procedures are followed. General security announcements and reminders also play a role in decreasing vulnerability, although these strategies apply to airport security more generally, not just to the Playbook.



While there is no research in the situational crime prevention literature that examines these specific strategies, there have been evaluations of related techniques to make targets less attractive, thus reducing their vulnerability, and increasing awareness. Property marking or tagging is one such intervention, albeit questionable with regard to similarities with airport security. Only a handful of moderately rigorous studies have examined property marking, and while a few

found positive results (Farrington et al., 1993; Laycock, 1985; 1991), Gabor (1981) found an increase in burglaries following property marking schemes.

The repeat victimization literature also provides some information on the effects of reducing victim vulnerability (summarized in Farrell, 2005). This body of research focuses specifically on interventions that reduce the tendency for some people, places, or targets to experience victimization more frequently than others. The evaluations of at least moderate rigor in this field have focused on repeat residential burglary victimization and encompass a range of tactics, including citizen awareness and advice schemes, property marking, security assessments, and target hardening. Taken together, these studies suggest that using multiple tactics that are tailored to the specific context in which the victimization occurs may be the most successful

approach. However, the most successful combinations of tactics tended to be those focused on target hardening or target removal, whereas studies involving mainly victim advice and awareness schemes appear to have less of an impact on crime.

TSA's Playbook provides for a number of vulnerability-reducing plays at the innermost layers of security, such as at the gate area and around the aircraft itself. As noted above, these are important points of intervention for ensuring the safety of the aircraft and passengers. Some plays, [REDACTED], also aim to reduce vulnerabilities at the airport perimeter. The lack of vulnerability-reducing plays at the intermediate levels may reflect the fact that most activity in these areas is more directly concerned with screening for and blocking specific threats. However, given that the literature on repeat victimization suggests the effectiveness of tailored, multi-tactic approaches to reduce vulnerability, TSA may also consider focusing a similar variety of efforts [REDACTED]

Interagency Cooperation

Our site visits and discussions with TSA personnel revealed that Playbook operations take place in a complex environment. Security activities potentially influence (and sometimes directly engage) a wide range of stakeholders, including employees, vendors, the public, local law enforcement agencies, and other agencies that perform security and law-enforcement functions near airport areas. Each of these individuals and organizations has a different set of interests related to airport areas—not just in terms of security but also business and commercial interests that may come into conflict with safety concerns.

Research on interagency cooperation in criminal justice has examined how cooperation between agencies occurs in general, as well as how cooperation relates to specific crime prevention activities, such as community-based and situational crime prevention (e.g., see Crawford & Jones, 1995; Knutsson & Clarke, 2006). This body of research highlights the difficulties that justice agencies can face when attempting to establish cooperative processes, such as managing the exchange of information, organizational resistance to change, and sometimes conflicting organizational goals (Gil-Garcia, Schneider, Pardo, & Cresswell, 2005). The plays that we classified as strategic and cooperative required TSA personnel to accomplish a wide variety of tasks, such as interacting with experts in threat mitigation, ensuring that established security procedures were being followed, and checking that all vendors operating at the airport are authorized to do so. Such activities involve challenges that are similar to those experienced by law enforcement agencies that are trying to establish cooperative processes with third parties.

Some research exists that indicates that multi-agency approaches to problems can achieve significant crime reduction gains. Weisburd and Eck (2004), as well as Lum and colleagues (2011), highlight a number of "tailored" evaluations of policing drugs and violence that involve third parties and use of civil remedies. Many of the highest quality studies include experimental evaluations of the use of nuisance abatement, finding that cooperation between law enforcement and property managers, prosecutors, and other city agencies can reduce drug problems at hot

spots (see Braga et al., 1999; Eck & Wartell, 1998; Mazerolle, Price, & Roehl, 2000). However, in these cases, the third parties provided a specific service needed to shut down a crime facilitator, rather than to ensure security. With regard to homeland security, while Lum, Habermeld, Fachner, and Lieberman (2009) found that many law enforcement agencies see interagency cooperation and information sharing as important to counterterrorism, there remains no evaluation of this assertion with regard to either crime prevention or homeland security.

One criticism of American intelligence efforts before 9/11 was the lack of interagency cooperation, which was discussed extensively in the 9/11 Commission Report (National Commission on Terrorist Attacks upon the United States, 2004). This criticism led to the creation of “fusion centers,” which sought to create greater cooperation between police and security agencies (see Carter and Chermak, 2011). A study of counter-terrorism operations in Israel reinforces the idea that strong cooperation among agencies will aid effective prevention efforts (Weisburd, Jonathan, et al., 2009). However, there is also some evidence that interagency collaboration may not always be desirable or add to specific and focused crime prevention efforts. For example, Boba, Weisburd, and Meeker (2009) report that efforts to develop regional data sharing in Redlands Valley, California were hindered by the simple reality that most ordinary prevention efforts occurred within a specific enough context that data sharing between agencies was unnecessary. This may also be the case for Playbook operations. Indeed, most plays did not require interagency cooperation. While this may be because most plays take place in areas over which TSA has primary jurisdiction, it is uncertain whether assistance and cooperation with other agencies could improve outcomes.

Our preliminary site visits indicated that, in practice, the Playbook activities presented both a challenge and an opportunity to TSA and other airport personnel. Challenges include educating and soliciting the cooperation of other airport entities, including law enforcement, airport authorities, airport employees, contractors and vendors, and passengers about the Playbook. However, the Playbook also provides tangible tasks and activities that can serve as a forum by which interaction and relationship-building can occur. It seems reasonable to hypothesize (for future analysis) that improved cooperation between entities responsible for security can provide for a stronger security apparatus against both passenger and insider threats.

Possible Collateral Effects of Playbook Implementation

Any implementation of prevention and deterrence measures can have collateral effects. These might include displacement, net widening of tactics to low or no-risk individuals, perceptions of bias and differential treatment in implementation, or even violations of privacy or Fourth Amendment rights. While passengers have expressed their willingness to submit to searches in airports for the sake of security (USA Today/Gallup Poll, Nov. 19-21, 2010), airport authorities, the TSA, and law enforcement agencies are still concerned with how broader security measures can affect their legitimacy with the public, or potentially weaken security.

“By understanding the structure and processes of the different organizations and people involved in ... the Playbook, and the challenges to implementation they can create, much can be learned about how to improve deterrence and prevention of violence and crimes at airports.”

For example, one collateral effect often mentioned in situational crime prevention strategies is displacement. Displacement refers to the change in either the method or location of crime in response to a crime prevention strategy. Some studies point to a lack of major spatial displacement for general crime trends from focused, place-based interventions, countered with diffusion of crime control benefits (see Clarke & Weisburd, 1994; Guerette & Bowers, 2009). However, these studies concern spatial

displacement of directed patrol in high crime places. Research on potential displacement effects of airport security measures has not yet been conducted, with the exception of the substitution effects from hijacking to different types of incidents noted by Cauley and Im (1988). Displacement of method or location is important to consider and evaluate when examining counterterrorism and security programs.

A second potential collateral effect of implementing the Playbook is the possibility of reduced legitimacy of security authorities, especially those involving screening and searches of passengers and employees (Elias, 2010). Not all security activities are equally legitimate in the public's eyes, and even in an environment with a relatively supportive public there may be wariness about more intrusive screening tactics among passengers. General deterrence strategies have the drawback of creating “false positives” when broadly applied to a population. As noted above, this creates a challenge to the values of democratic societies, such as privacy or human dignity, which in turn can lead to reduced legitimacy. Tyler (1990; 2003; 2004; 2011) has argued that when practices and procedures of governing institutions are perceived as fair and equitable by the individuals subject to them (procedural justice) —even if outcomes are not favorable—the legitimacy of the institution will not be eroded, and individuals will be more likely to cooperate with authorities. This cooperation is crucial in airports because many security measures rely on citizens and employees to act as additional “eyes and ears” to maintain security.

The legitimacy afforded to airport security is not just connected to the way passengers are treated, but also the equality (and perceived equality) of that treatment. The notion that treatment, or the way in which security is doled out to individual passengers has been connected to theories of procedural justice by three empirical studies of airport security - Sindhav et al. (2006), Hasisi and Weisburd (2011) and Lum and colleagues (2007). In general, Sindhav et al. (2006), found a positive relationship between the perceived fairness of airport security and customer satisfaction. More specifically, Hasisi and Weisburd (2011) found significant differences in the legitimacy afforded by Israeli Arabs compared to Israeli Jews to airport security (with more legitimacy afforded by Jews than Arabs). They emphasize that that the influence of ethno-nationality on legitimacy afforded to security disappears when controlling for type of security measure provided. However, what consistently remains the strongest predictor of a passenger's

perception of the legitimacy of security is a belief of biased security checks - that they were being profiled.

And in a study of a major U.S. airport, Lum and her colleagues (2007) also found that perceptions of the legitimacy and fairness of airport security may be distributed different along racial and ethnic lines. In an on-site survey of 500 passengers who had just passed through airport security, Lum and her colleagues found Non-White passengers reporting that they were more likely to be subject to additional screening and receive a higher number of additional screening actions, and less likely to be given a verbal explanation as to why they were receiving additional screening. Non-White passengers were also more likely than White passengers to feel inconvenienced and embarrassed by additional screening. Of course, these are perception, and more direct systematic social observation is needed to test these findings. However, perceptions of fairness may also be as important as actual fairness (Tyler, 2003). It is often perceptions of treatment that directly speak to the legitimacy afforded to security officers or law enforcement. Indeed, these studies are not different than the more general police literature that indicate a concurrence in findings across law-enforcement and security entities that ethnic minorities in the United States are more likely to perceive their treatment by law enforcement as unfair (Langan, Greenfeld, Smith, Durose, & Levin, 2001; National Research Council, 2004¹⁷). These are important considerations in the implementation of any crime/terrorism prevention intervention as they are very likely to have a direct impact on the perceived legitimacy of security agencies.

¹⁷ The National Research Council (NRC) is part of the National Academies whose mission is to improve government decision making and public policy, increase public understanding, and promote the acquisition and dissemination of knowledge in matters involving science, engineering, technology, and health. The Research Council's independent, expert reports and other scientific activities inform policies and actions that have the power to improve the lives of people in the U.S. and around the world (<http://www.nationalacademies.org/nrc/>). This document is a review of all pertinent research related to this area.

7 CONCLUSION

This report describes the first systematic, evidence-based review and assessment of TSA's Playbook strategy to prevent and deter crime and terrorist activity at our nation's airports using a translational criminological approach. As we have seen, there are very few evaluations of counterterrorism measures or airport security compared to other law-enforcement sectors. Given the massive amount of money spent on such measures since 9/11, evaluation of the efficiency and outcome effectiveness of such measures is imperative. However, many of the crime prevention measures at airports mirror a broader criminological literature on situational crime prevention, deterrence, and interagency cooperation. Here, we have used these parallels in our preliminary assessment and evaluation of the TSA Playbook.

In classifying the Playbook using an "Airport Security Matrix," we found that most plays are immediate and tactical in nature, and few are strategic. Further, the vast majority of plays do not require cooperative deployment. Thus, much of our analysis focuses on immediate and tactical plays that are primarily carried out by TSA personnel. For these plays, we discovered four general tendencies. The first is that these plays more often involve mechanisms of prevention that aim to harden targets, deter and prevent offenders by increasing their perceived effort, rather than increase guardianship or reducing vulnerabilities of passengers or other targets. Secondly,

Third, plays occurring in public areas outside or directly inside of the airport entrance tend to be guardianship-oriented rather than specifically focused on deterring offenders. Finally, the Playbook tends to focus on reducing passenger and target vulnerability largely at the final "layer of security" located at gates and airplanes.

When we examined the immediate/tactical plays, we found additional concentrations of plays in both mechanism type and location of play. For instance,

A small minority of the plays were strategic in nature, and most focus on long-term management activities that incorporate the use of general watchfulness and increased guardianship. It is expectedly in the strategic plays that requirements for cooperation are found.

When comparing more general descriptions of plays at intersecting Matrix dimensions, we found that the Playbook generally and loosely incorporates many evidence-based practices for prevention and deterrence, although this evidence base varies across studies by design rigor as well as applicability to airport security and counterterrorism. Of course, *how* and *which* plays are implemented at any given time ultimately tempers the Playbook's effectiveness. The majority of

plays within the Playbook use situational crime prevention mechanisms (e.g., blocking offender access and target hardening), which have been supported in other crime prevention evaluations. Additionally, studies confirm and support the use of tailored, place-specific interventions for crime prevention and deterrence. The Playbook illustrates some compliance with this evidence-based mechanism through the location focus of many of the plays. However, how places are chosen for play implementation is not clear. More importantly, exactly how such studies translate to the context of terroristic violence within a confined location (airports) is still unknown.

Destination	Flight	Time	Status
Minneapolis	8	7:35 PM	On Time
Detroit	2	7:40 PM	On Time
Atlanta	8	7:41 PM	On Time
Washington-IAD	3	7:42 PM	On Time
Milwaukee	8	7:45 PM	On Time
Chicago-Midway	3	7:50 PM	On Time
Fort Worth	7	8:00 PM	On Time
Hialeah	8	8:20 PM	On Time
	2	8:30 PM	On Time
	8	9:15 PM	On Time
	9	9:30 PM	On Time
	2	9:40 PM	On Time
	9	9:55 PM	On Time
	2	10:15 PM	On Time
	5	10:19 PM	On Time
		5:55 PM	

With regard to the notion of randomization as a deterrence mechanism, the research indicates that randomly allocating patrol at selected high-risk places can increase crime-prevention effects. However, whether the locations in which plays are implemented are indeed the highest-risk locations in the airport is unknown. Further, although the Playbook has a built-in randomization component for selecting the set of plays used at any particular time, this element of the Playbook may be manipulated in such a way that reduces randomization. Reducing random deployment of plays may not be negative depending on whether such

randomization increases or decreases deterrence. This is not clearly understood in criminological research and is not researched at all in counterterrorism studies.

Additionally, although there is research supporting some of the prevention mechanisms that are found in both situational crime-prevention measures and airport security (which itself needs to be more closely scrutinized for comparison), there are some types of airport security measures for which we could not easily identify parallel evidence in the crime-prevention literature. Ultimately, the determination of effectiveness must be supported by evaluations, through experimentation and simulation, of the actual interventions within airports.

Finally, we think the Playbook, which uses plays that involve interagency cooperation, can actually serve as a means of facilitating and fostering working relationships between the TSA and other agencies that operate in and around the airport. It might be worthwhile to explore how these interagency relationships and efforts could benefit from involvement in additional plays beyond public airport areas and areas external to the airport.

The Playbook attempts a broad range of prevention and deterrence tactics across multiple contexts. Understanding the prospects and challenges of implementing such a strategy and identifying ways in which measures of success might be derived are imperative in accurately judging this method of airport security.

REFERENCES

- Asal, V., Rethemeyer, K., Bellandi, R., Legault, R., & Tynes, R. (2010). *Making the wrong connection: The determinants of terrorist targeting of airplanes and airports*. Presented at the International Studies Association Annual Convention, New Orleans.
- Atlas, R. & Leblanc, W. (1994). The impact on crime of street closures and barricades: A Florida case study. *Security Journal*, 5, 140–145.
- Barclay, P, Buchley, J., Brantingham, P., Brantingham, P., & Whinn-Yates, T. (1996). Preventing auto theft in suburban Vancouver commuter lots: Effects of a bike patrol. In R. Clarke (ed.), *Preventing mass transit crime*. Crime Prevention Studies, Vol. 6. (pp. 133–62). Monsey, NY: Criminal Justice Press.
- Bennett, T., Holloway, K., & Farrington, D. (2008). (2006). Does neighborhood watch reduce crime? A systematic review and meta-analysis. *Journal of Experimental Criminology*, 2(4), 437-458.
- Berrebi, C. (2009). The economics of terrorism and counterterrorism: What matters and is rational-choice theory helpful? In P. Davis and K. Cragin (eds.), *Social science for counterterrorism: Putting the pieces together*. Santa Monica, CA: RAND.
- Boba, R., Weisburd, D., & Meeker, J. (2009). The limits of regional data sharing and regional problem solving: Observations from the East Valley, CA COMPASS initiative. *Police Quarterly*, 12(1), 22–41.
- Bowers, K., Johnson, S., & Hirschfield, A. (2004). Closing off opportunities for crime: An evaluation of alley-gating. *European Journal on Crime Policy & Research*, 10(4), 285–308.
- Braga, A. (2005). Hot spots policing and crime prevention: A systematic review of randomized controlled trials. *Journal of Experimental Criminology*, 1(3), 317–342.
- Braga, A. (2007). *Effect of hot spots policing on crime*. Campbell Systematic Reviews 2007:1. DOI: 10.4073/csr.2007.1.
- Braga, A. & Weisburd, D. (2010). *Policing Problem Places*. New York, NY: Oxford University Press.
- Braga, A., Weisburd, D., Waring, E., Mazerolle, L., Spelman, W., & Gajewski, F. (1999). Problem-oriented policing in violent crime places: A randomized controlled experiment. *Criminology*, 37(3), 541–580.
- Caplan, J., Kennedy, L. & Petrossian, G. (2011). Police-monitored CCTV cameras in Newark, NJ: A quasi-experimental test of crime deterrence. *Journal of Experimental Criminology* DOI: 10.1007/s11292-011-9125-9.
- Carter, J. & Chermak, S. (2011). Evidence-Based Intelligence Practices: Examining the Role of Fusion Centers as a Critical Source of Information. In C. Lum and L. Kennedy (Eds.), *Evidence-Based Counterterrorism Policy*. New York, NY: Springer-Verlag.
- Cauley, J. & Im, E. (1988). Intervention policy analysis of skyjackings and other terrorist incidents. *The American Economic Review*, 78(2), 27–31.
- Centers for Disease Control and Prevention (1993). Violence-related attitudes and behaviors of high school students: New York City, 1992. *Morbidity and Mortality Weekly Report*, 42, 773–777.

- Challinger, D. (1996). Refund fraud in retail stores. *Security Journal*, 7, 27–35.
- Clarke, R. (1980). Situational crime prevention: Theory and practice. *British Journal of Criminology*, 20(2), 136–147.
- Clarke, R. (1983). Situational crime prevention: Its theoretical basis and practical scope. In M. Tonry & N. Morris (Eds.), *Crime and justice: An annual review of research*, Vol. 14. Chicago, IL: The University of Chicago Press.
- Clarke, R. (1992). *Situational crime prevention: Successful case studies*. New York: Harrow and Heston.
- Clarke, R. (1995). Situational crime prevention. In M. Tonry & D. Farrington (Eds.), *Building a safer society: Strategic approaches to crime prevention*. Chicago: The University of Chicago Press.
- Clarke, R. (1997). Introduction. In R. V. Clarke (Ed.), *Situational crime prevention: Successful case studies*, 2nd ed. (pp. 1–43). Albany, NY: Harrow and Heston.
- Clarke, R. & McGrath, G. (1990). Cash reduction and robbery prevention in Australian betting shops. *Security Journal*, 1, 160–163.
- Clarke, R., and Newman, G. (2006). *Outsmarting the Terrorists*. Westport, CT: Praeger Security International.
- Clarke, R., & Weisburd, D. (1994). Diffusion of crime control benefits: Observations on the reverse of displacement. In R. Clarke (Ed.), *Crime prevention studies*, Vol. D. Monsey, NY: Criminal Justice Press.
- Cohen, L. & Felson, M. (1979). Social change and crime rate trends: A routine activity approach. *American Sociological Review*, 44(4), 588–608.
- Cook, T. & Campbell, D. (1979). *Quasi-experimentation: Design and analysis issues for field settings*. Chicago: Rand McNally.
- Cornish, D. & Clarke, R. (Eds.) (1986). *The reasoning criminal*. New York: Springer-Verlag.
- Cornish, D. & Clarke, R. (1987). Understanding crime displacement: An application of rational choice theory. In S. Henry & W. Einstader (Eds.), *The criminology theory reader* (pp. 45–56). New York, NY: New York University Press.
- Cornish, D. & Clarke, R. (2003). Opportunities, precipitators, and criminal decisions: A reply to Wortley's critique of situational crime prevention. In M. Smith & D. Cornish (Eds.), *Theory for situational crime prevention. Crime Prevention Studies* (Vol. 16). Monsey, NY: Criminal Justice Press
- Crawford, A. & Jones, M. (1995). Interagency cooperation and community-based crime prevention: Some reflections on the work of Pearson and Colleagues. *British Journal of Criminology*, 35(1), 17–33.
- Crenshaw, M. (1990). The logic of terrorism: Terrorist behavior as a product of strategic choice. In W. Reich (ed.), *Origins of Terrorism: Psychologies, Ideologies, Theologies, States of Mind*. Washington, DC: Woodrow Wilson International Center for Scholars.
- Decker, J. (1972). Curbside deterrence: An analysis of the effect of a slug rejection device, coin view window and warning labels on slug usage in New York City parking meters. *Criminology* 10, 127–42.

- Deflem, M. (2004). *Terrorism and counter-terrorism: Criminological perspectives*. San Diego, CA: Elsevier.
- DesChamps, S., Brantingham, P., & Brantingham, P. (1992). The British Columbia transit fare evasion audit. In R. Clarke (Ed.), *Situational crime prevention: Successful case studies* (1st Ed) (pp. 139–150). Albany, NY: Harrow and Heston.
- Dugan, L., LaFree, G., & Piquero, A. (2005). Testing a rational choice model of airline hijackings. *Criminology*, 43(4), 1031–1066.
- Durlauf, S. & Nagin, D. (2011). Imprisonment and crime: Can both be reduced? *Criminology and Public Policy*, 10(1), 13–54.
- Eck, J. (1997). Preventing crime at places. In L.W. Sherman, D. Gottfredson, D. MacKenzie, J. Eck, P. Reuter, & S. Bushway. (Eds.), *Preventing crime: What works, what doesn't, what's promising*. Washington, DC: U.S. Department of Justice, National Institute of Justice.
- Eck, J. (2002) Preventing crime at places. In L. Sherman, D. Farrington, B. Welsh, & D. MacKenzie (Eds.), *Evidence-based crime prevention* (pp. 241–294). New York: Routledge.
- Eck, J., & Wartell, J. (1998). Improving the management of rental properties with drug problems: A randomized experiment. *Crime Prevention Studies* (Vol. 9) (pp. 161–185). Monsey, NY: Criminal Justice Press.
- Ekblom, P. (1988). Preventing post office robberies in London: Effects and side effects. *Journal of Security Administration*, 11, 36–43.
- Elias, B. (2010). *Airport passenger screening: Background and issues for Congress*. Washington, DC: Congressional Research Service.
- Enders, W. & Sandler, T. (1993). The effectiveness of antiterrorism policies: A vector-autoregression-intervention analysis. *The American Political Science Review*, 87(4), 829–844.
- Enders, W. & Sandler, T. (2000). Is transnational terrorism becoming more threatening? *Journal of Conflict Resolution*, 44, 307–332.
- Enders, W., Sandler, T., & Cauley, J. (1990). UN conventions, terrorism, and retaliation in the fight against terrorism: An econometric evaluation. *Terrorism and Political Violence*, 2(1), 83–105.
- Englund, W. & Lally, K. (2011). *Russia airport blast kills 35*. Retrieved July 30, 2011, from <http://www.washingtonpost.com/wp-dyn/content/article/2011/01/24/AR2011012406445.html>.
- Farrell, G. (2005). Progress and prospects in the prevention of repeat victimization. In N. Tilley (Ed.), *Handbook of crime prevention and community safety* (pp 143–172). Collumpton: Willan Publishing.
- Farrington, D., Bowen, S., Buckle, A., Burns-Howell, T., Burrows, J., & Speed, M. (1993). An experiment on the prevention of shoplifting. In R. Clarke (Ed.), *Crime Prevention Studies*, Vol. 1. Monsey, NY: Criminal Justice Press.
- Farrington, D., Gill, M., Waples, S., & Argomaniz, J. (2007). The effects of closed-circuit television on crime: Meta-analysis of English national quasi-experimental multi-site evaluation. *Journal of Experimental Criminology*, 3(1), 21–38.

- Felson, M. (1994). *Crime and everyday life: Insight and implications for society*. Thousand Oaks, CA: Pine Forge Press.
- Felson, M., Berends, R., Richardson, B., & Veno, A. (1997). Reducing pub hopping and related crime. In R. Homel (Ed.), *Policing for prevention: Reducing crime, public intoxication and injury* (Vol. 7) (pp. 115–132). Monsey, NY: Criminal Justice Press.
- Gabor, T. (1981). The crime displacement hypothesis: An empirical examination. *Crime and Delinquency*, 26, 390–404.
- Gil-Garcia, J., Schneider, C., Pardo, T., & Cresswell, A. (2005). *Interorganizational information integration in the criminal justice enterprise: Preliminary lessons from state and county initiatives*. Proceedings of the 38th Hawaii International Conference on System Sciences.
- Guerette, R. & Bowers, K. (2009). Assessing the extent of crime displacement and diffusion of benefits: A review of situational crime prevention evaluations. *Criminology*, 47(4), 1331–1368.
- Hasisi, B. & Weisburd, D. (2011). Going beyond ascribed identities: The importance of procedural justice in airport security screening in Israel. *Law and Society Review*.
- Hesseling, R. (1995). Theft from cars: Reduced or displaced? *European Journal of Criminal Policy and Research*, 3, 79–92.
- Jackson, B. (2009). Organizational decisionmaking by terrorist groups. In P. Davis and K. Cragin (eds.), *Social science for counterterrorism: Putting the pieces together*. Santa Monica, CA: RAND.
- Kelling, G. L., Pate, A. M., Dieckman, D., & Brown, C. (1974). The Kansas City preventive patrol experiment: Technical report. Washington, DC: Police Foundation.
- Kenney, D. (1986). Crime on the subways: Measuring the effectiveness of the Guardian Angels. *Justice Quarterly*, 3, 481–496.
- Koper, C. (1995). Just enough police presence: Reducing crime and disorderly behavior by optimizing patrol time in crime hotspots. *Justice Quarterly*, 12(4), 649–672.
- Knutsson, J. & Clarke, R. (Eds.) (2006). Putting theory to work: Implementing situational crime prevention and problem-oriented policing. *Crime prevention studies* (Vol. 20). (pp. 89–110). Monsey, NY: Criminal Justice Press.
- LaFree, G. (2011). Generating Terrorism Event Data Bases: Results from the Global Terrorism Database, 1970 to 2008. In C. Lum and L. Kennedy (Eds.), *Evidence-Based Counterterrorism Policy*. New York, NY: Springer-Verlag.
- LaFree, G. & Dugan, L. (2004). How does studying terrorism compare to studying crime? In M. Deflem (Ed.), *Terrorism and counter-terrorism: Criminological perspectives, sociology of crime, law and deviance*, Vol. 15 (pp. 53–75). Oxford: Elsevier.
- Landes, W. (1978). An economic study of U.S. aircraft hijackings, 1961–1976. *Journal of Law and Economics*, 21, 1–31.
- Langan, P., Greenfeld, L., Smith, S., Durose, M., & Levin, D. (2001). *Contacts between police and the public: Findings from the 1999 national survey*. Washington, DC: Bureau of Justice Statistics.

- Lasley, J. (1996). *Using traffic barriers to 'design out' crime: A program evaluation of LAPD's Operation Cul-De-Sac. Report to the National Institute of Justice.* Fullerton, CA: California State University.
- Lasley, J. (1998). "Designing out" gang homicides and street assaults. Washington, DC: National Institute of Justice.
- Laycock, G. (1985). Property marking: A deterrent to domestic burglary? *Crime Prevention Unit Paper no. 3.* London: Home Office.
- Laycock, G. (1991). Operation identification, or the power of publicity? *Security Journal, 2*, 67–72.
- Laycock, G. & Austin, C., (1992). Crime prevention in parking facilities. *Security Journal, 3*, 154–60.
- Lum, C. (2009). Translating Police Research Into Practice. *Ideas in American Policing.* Washington, DC: Police Foundation.
- Lum, C., Beech, D., Connors, M., Crafton, Z., Parsons, R., & Smarr, T. (2007). *Examining collateral effects of counterterrorism interventions: Airport security screening.* Congressional Briefing, Senate Russell Building, September 10, 2007. Washington DC.
- Lum, C., Haberfeld, M., Fachner, G., & Lieberman, C. (2009) Police Activities to Counter Terrorism: What We Know and What We Need To Know. In David Weisburd, Thomas Feucht, Idit Hakimi, Lois Mock and Simon Perry (Eds.), *To Protect and to Serve: Police and Policing in an Age of Terrorism - and Beyond.* New York, NY: Springer.
- Lum, C. & Kennedy, L. (Eds.) (2011). *Evidence-Based Counterterrorism Policy.* New York, NY: Springer-Verlag.
- Lum, C., Kennedy, L., & Sherley, A. (2006). Are counter-terrorism strategies effective?: The results of the Campbell Systematic Review on counter-terrorism evaluation research. *Journal of Experimental Criminology, 2*(4), 489–516.
- Lum, C., Koper, C., & Telep, C. (2009). *Evidence-based policing Matrix online tool.* Retrieved March 1, 2011, from <http://gemini.gmu.edu/cebcp/matrix.html>
- Lum, C. & Koper, C. (Online copy, 2011). Is crime prevention relevant to counter-terrorism? In B. Forst, J. Greene, and J. Lynch (Eds.), *Criminologists on terrorism and homeland security.* Cambridge University Press.
- Lum, C., Koper, C., & Telep C. (2011). The evidence-based policing Matrix. *Journal of Experimental Criminology, 7*(1), 3–26.
- Mazerolle L., Price J., & Roehl J. (2000). Civil remedies and drug control: A randomized field trial in Oakland, CA. *Evaluation Review, 24*(2), 212–241.
- Mazerolle, L., & Ransley, J. (2005). *Third party policing.* Cambridge University Press: Cambridge, NY.
- McCord, J. (2003). Cures that harm: Unanticipated outcomes of crime prevention programs. *Annals of the American Academy of Political and Social Sciences, 587*, 16–30.
- McGarrell, E., Chermak, S., Weiss, A., & Wilson, J. (2001). Reducing firearms violence through directed police patrol. *Criminology and Public Policy, 1*, 119–148.

- Mythen, G., & Walklate, S. (2006). Criminology and terrorism: Which thesis? Risk society or governmentality?. *British Journal of Criminology*, 46(3), 379–398.
- Nagin, D. (1998). Criminal deterrence research at the outset of the 21st century. *Crime and Justice: A Review of Research*, 23, 1–42.
- National Commission on Terrorist Attacks Upon the United States (2004). *The 9/11 Commission Report*. New York: W.W. Norton & Company.
- National Research Council, The National Academies. (2004). Fairness and effectiveness in policing: The evidence. In W. Skogan & K. Frydl (Eds.), *Committee to Review Research on Police Policy and Practices, Committee on Law and Justice, Division of Behavioral and Social Sciences and Education*. Washington, DC: National Academies Press.
- National Research Council, The National Academies. (2010). *Field evaluation in the intelligence and counterintelligence context: Workshop summary*. Washington, DC: The National Academies Press.
- Newman, O. (1972). *Defensible space: Crime prevention through urban design*. Macmillan: New York, NY.
- Newman, O. (1996). *Creating defensible space*. Washington, DC: U.S. Department of Housing and Urban Development.
- Poyner, B. (1994). Lessons from Lisson Green: An evaluation of walkway demolition on a British housing estate. In R. Clarke (Ed.), *Crime prevention studies* (Vol. 3). Monsey, NY: Criminal Justice Press.
- Poyner, B. and Warner, C. (1986). *Violence to staff: A basis for assessment and prevention*. London: Tavistock.
- Putnam, S., Rockett, I., & Campbell, M. (1993). Methodological issues in community-based alcohol-related injury prevention projects: Attribution of program effects. In T. Greenfield & R. Zimmerman (Eds.), *Experience with community action projects: new research in the prevention of alcohol and other drug problems* (Vol. 14) (pp. 31–39). Rockville, MD: Center for Substance Abuse Prevention.
- Repetto, T. (1976). Crime prevention and the displacement phenomenon. *Crime and Delinquency*, 22, 166–177.
- Riley, K., & Hoffman, B. (1995). *Domestic terrorism: A national assessment of state and local preparedness*. RAND: Santa Monica, CA.
- Rosenfeld, R. (2004), Terrorism and criminology. In M. Deflem (Ed.), *Terrorism and counter-terrorism* (pp.19–32). *Sociology of Crime, Law and Deviance* (Vol. 5). Oxford: Elsevier.
- Saltz, R. (1987). The role of bars and restaurants in preventing alcohol-impaired driving: An evaluation of server education. *Evaluation in Health Professions*, 10, 5–27.
- Sheehan, I. S. (2011). Assessing and Comparing Data Sources for Terrorism Research. In C. Lum and L. Kennedy (Eds.), *Evidence-Based Counterterrorism Policy*. New York, NY: Springer-Verlag.
- Sherman, L. (1990). Police crackdowns: Initial and residual deterrence. In: M. Tonry & N. Morris (Eds.). *Crime and justice: An annual review of research* (Vol. 12). University of Chicago Press: Chicago.

- Sherman, L. (1997). Policing for crime prevention. In L. Sherman, D. Gottfredson, D. MacKenzie, J. Eck, P. Reuter, & S. Bushway (Eds.), *Preventing crime: What works, what doesn't, what's promising*, pp. 295-329. Washington, DC: National Institute of Justice.
- Sherman, L., & Eck, J. (2002). Policing for crime prevention. In L. Sherman, D. Farrington, B. Welsh, & D. MacKenzie (Eds.), *Evidence-based crime prevention* (pp. 295-329). Routledge: New York.
- Sherman, L., Farrington, D., Welsh, B., & MacKenzie, D. (2002). *Evidence-based crime prevention*. New York: Routledge.
- Sherman, L., Gartin, P., & Buerger, M. (1989). Hot spots of predatory crime. *Criminology*, 27(1), 27-56.
- Sherman, L., Shaw, J., & Rogan, D. (1995). *The Kansas City gun experiment*. Research in brief. Washington, DC: National Institute of Justice, U.S. Department of Justice.
- Sherman, L. & Weisburd, D. (1995). General deterrent effects of police patrol in crime "hot spots": A randomized, controlled trial. *Justice Quarterly*, 12(4), 625-648.
- Tilley, N. & Webb, J. (1994). *Burglary reduction: Findings from safer cities schemes*. London: Home Office. Retrieved January 14, 2011, from <http://webarchive.nationalarchives.gov.uk/20110220105210/rds.homeoffice.gov.uk/rds/prgpdfs/fcpu51.pdf>.
- Transportation Research Board of the National Academies. (2003). *Airport research needs: Cooperative solutions*. Special Report 272. Washington, DC: National Academies. Retrieved January 14, 2011, from <http://onlinepubs.trb.org/onlinepubs/sr/sr272.pdf>.
- Tyler, T. (1990). *Why people obey the law: Procedural justice, legitimacy, and compliance*. New Haven, CT: Yale University.
- Tyler, T. (2003). Procedural justice, legitimacy, and the effective rule of law. *Crime and Justice*, 30, 283-357.
- Tyler, T. (2004). Enhancing police legitimacy. *The Annals of the American Academy of Political and Social Science*, 593(1), 84-99.
- Tyler, T. (2011). Toughness vs. Fairness: Police Policies and Practices for Managing the Risk of Terrorism. In C. Lum and L. Kennedy (Eds.), *Evidence-Based Counterterrorism Policy*. New York, NY: Springer-Verlag.
- U.S. Department of Homeland Security (2008). *National infrastructure protection plan: Transportation systems sector*. Retrieved January 14, 2011, from http://www.dhs.gov/xlibrary/assets/nipp_transport.pdf.
- U.S. Government Accountability Office (2007). *Risk, experience, and customer concerns drive changes to airline passenger screening procedures, but evaluation and documentation of proposed changes could be improved*. Retrieved January 14, 2011, from <http://www.gao.gov/new.items/d07634.pdf>.
- U.S. Government Accountability Office (2009). *DHS and TSA have researched, developed, and begun deploying passenger checkpoint screening technologies, but continue to face challenges*. Retrieved January 14, 2011, from <http://www.gao.gov/new.items/d10128.pdf>.

- U.S. Government Accountability Office (2010). *TSA has taken actions to manage risk, improve coordination, and measure performance, but additional actions would enhance its actions*. Retrieved January 14, 2011, from <http://www.gao.gov/new.items/d10650t.pdf>.
- U.S. Transportation Security Administration (2010). *What we do*. Retrieved March 1, 2011, from http://www.tsa.gov/what_we_do/layers/index.shtm.
- U.S. Transportation Security Administration (2011). *Our history*. Retrieved March 1, 2011, from <http://www.tsa.gov/research/tribute/history.shtm>.
- USA Today/ Gallup Poll (2010). *Gallup Poll daily tracking*. Retrieved March 1, 2011, from <http://www.pollingreport.com/terror.htm>.
- van Andel, H. (1989). Crime prevention that works: The case of public transport in the Netherlands. *British Journal of Criminology*, 29, 47–56.
- Wagner, A. (1997). A study of traffic pattern modification in an urban crime prevention program. *Journal of Criminal Justice*, 25(1), 47–56.
- Webb, B. & Laycock, G. (1992). *Reducing crime on the London underground: An evaluation of three pilot projects* (Vol. 30). London: Home Office.
- Weisburd, D. (1997). *Reorienting criminal justice research and policy: From the causes of criminality to the context of crime*. National Institute of Justice: Washington, DC.
- Weisburd, D. (2002). From criminals to criminal contexts: Reorienting crime prevention research and policy. In D. Weisburd & E. Waring (Eds.), *Crime & Social Organization, Advances in Criminological Theory* (Vol. 10) (pp. 197–216). New Brunswick, NJ: Transaction Publishers.
- Weisburd, D. (2008). Place-based policing. *Ideas in American Policing*. Washington, DC: Police Foundation.
- Weisburd, D., Bushway, S., Lum, C., & Yang, S. (2004). Trajectories of crime at places: A longitudinal study of street segments in the city of Seattle. *Criminology* 42(2), 283–322.
- Weisburd, D., & Eck, J. (2004). What can the police do to reduce crime, disorder, and fear? *The Annals of the American Academy of Political and Social Science*, 593, 42–65.
- Weisburd, D., Feucht, T., Hakimi, I., Mock, L., & Perry, S. (Eds.) (2009). *To protect and to serve: Police and policing in an age of terrorism—and beyond*. New York: Springer.
- Weisburd, D. & Green, L. (1995). Policing drug hot spots: The Jersey City drug market analysis experiment. *Justice Quarterly*, 12(4), 711–735.
- Weisburd, D., Groff, E., & Yang, S.M. (2009). *Understanding developmental crime trajectories at places: Social disorganization and opportunity perspectives at micro units of geography*. Washington, DC: National Institute of Justice.
- Weisburd, D., Jonathan, T., & Perry, S. (2009). The Israeli model for policing terrorism: Goals strategies, and open questions. *Criminal Justice and Behavior*, 36(12), 1259–1278.
- Weisburd, D., Lum, C., and Petrosino, A. (2001). Does Research Design Affect Study Outcomes in Criminal Justice? *Annals of the American Academy of Political and Social Sciences* 578: 50-70.

- Weisburd, D., Telep, C., Hinkle, J., & Eck, J. (2010). Is problem-oriented policing effective in reducing crime and disorder? Findings from a Campbell systematic review. *Criminology and Public Policy*, 9(1), 139–172.
- Weisburd, D., Wyckoff, L., Ready, J., Eck, J., Hinkle, J., & Gajewski, F. (2006). Does crime just move around the corner? A controlled study of spatial displacement and diffusion of crime control benefits. *Criminology*, 44, 549–592.
- Welsh, B., & Farrington, D. (2008a). *Effects of closed circuit television surveillance on crime*. Campbell Systematic Reviews 2008:17. DOI: 10.4073/csr.2008.17.
- Welsh, B., & Farrington, D. (2008b). *Effects of improved street lighting on crime*. Campbell Systematic Reviews 2008:13. DOI: 10.4073/csr.2008.13.
- Welsh, B., Mudge, E., & Farrington, D. (2010). Reconceptualizing public area surveillance and crime prevention: Security guards, place managers, and defensible space. *Security Journal*, 23(4), 299–319.
- Wilson, J. & Kelling, G. (1982). Broken windows: The police and neighborhood safety. *Atlantic Monthly*, March, 29–38.