The author(s) shown below used Federal funds provided by the U.S. Department of Justice and prepared the following final report:

Document Title:	Project Safe Neighborhoods Case Study Report: Southern District of Alabama (Case Study 10)
Author(s):	Natalie Kroovand Hipple, Ph.D., Timothy O'Shea, Ph.D., Edmund F. McGarrell, Ph.D.
Document No.:	241728
Date Received:	April 2013
Award Number:	2002-GP-CX-1003

This report has not been published by the U.S. Department of Justice. To provide better customer service, NCJRS has made this Federallyfunded grant report available electronically.

> Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

This report has not been published or externally reviewed by the U.S. Department of Justice. To provide better customer service, NCJRS has made this Federally-funded grant report available electronically.

Project Safe Neighborhoods Case Study Report: Southern District of Alabama

Natalie Kroovand Hipple, Ph.D. Research Specialist School of Criminal Justice Michigan State University

Timothy O'Shea Ph.D. Associate Professor Political Science/Criminal Justice Department University of South Alabama

> Edmund F. McGarrell, Ph.D. Director and Professor School of Criminal Justice Michigan State University

> > March 2007

PSN Case Study Report #10

School of Criminal Justice Michigan State University 560 Baker Hall East Lansing, MI 48824

This report has not been published or externally reviewed by the U.S. Department of Justice. To provide better customer service, NCJRS has made this Federally-funded grant report available electronically.

U.S. Department of Justice Office of Justice Programs 810 Seventh Street, N.W. Washington, D.C. 20531

> Alberto R. Gonzales Attorney General U.S. Department of Justice

This project was supported by Grant #2002GP CX1003 awarded by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice. Points of view in this document are those of the authors and do no necessarily represent the official position or policies of the U.S. Department of Justice. The Project Safe Neighborhoods Case Study Series has benefited from the support, assistance, and comments of John Irving, Lois Felson Mock, Robyn Thiemann, and members of the Firearms Enforcement Assistance Team (FEAT) of the U.S. Department of Justice.

Foreword

In 2001 the Bush Administration made the reduction of gun crime one of the two major priorities of the U.S. Department of Justice (DOJ), along with defeating terrorism and enhancing homeland security. The vehicle for translating this goal into action is Project Safe Neighborhoods (PSN). PSN represents a **commitment** to gun crime reduction through a **network** of local partnerships coordinated through the nation's 94 United States Attorneys Offices. These local partnerships are supported by a **strategy** to provide them with the resources that they need to be successful.

The PSN initiative integrates five essential elements from successful gun crime reduction programs such as Richmond's Project Exile, the Boston Ceasefire Program and DOJ's Strategic Approaches to Community Safety Initiative (SACSI). Those elements are: partnerships, strategic problem solving, outreach, training and accountability.ⁱ

The strategic problem-solving component of PSN was enhanced through grants to local researchers to work in partnership with the PSN task force to analyze local gun crime patterns, to inform strategic interventions, and to provide feedback to the task force about program implementation and impact. At the national level, PSN included a grant to a research team at the School of Criminal Justice at Michigan State University (MSU) to provide support to the strategic problem-solving component as well as to conduct research on PSN implementation and impact. As part of its research role, MSU has produced a series of strategic case studies of PSN interventions that have emerged in a number of jurisdictions across the country.ⁱⁱ The current report is part of a second series of studies focused on implementation of PSN in particular districts.

These site-specific case studies are intended to provide information about how PSN has been structured and implemented in different jurisdictions. PSN is a national program tailored to address varying gun crime patterns in local jurisdictions. One of the key roles of the research partner is to analyze these patterns to help inform the PSN task force. The local nature of PSN, however, makes it important to examine implementation and impact at the local level. Consequently, this series of site-specific cases studies addresses these issues.

The local nature of the national PSN program also creates challenging evaluation issues. Whereas some components of PSN (e.g., coordination through U.S. Attorney's Office; national media campaign; inclusion of research partners and community engagement partners) are common across the country, other components are locally driven (e.g., specific target areas, intervention strategies). Additionally, there is significant variation across the various PSN districts in terms of the timing of PSN implementation. It appears that in districts with existing federal-state-local programs focused on gun crime, the implementation of PSN offen occurred at a quicker pace than was the case in districts where new relationships focused on gun crime had to be forged. Similarly, where research partners had established relationships with local criminal justice agencies the integration of research tended to occur more rapidly.

These characteristics raise a number of thorny evaluation issues. For example, the national dimensions of PSN make it difficult to identify comparison sites to assess the impact of PSN. Similarly, the multiple components of PSN make it difficult to generalize across all PSN districts in terms of the nature and intensity of PSN intervention strategies. For example, in some districts, PSN has meant a significant increase in federal prosecution of gun crime cases coupled with a communication strategy of a deterrence-based message. This reflects a Project Exile-type strategy. In other districts, research helped isolate particular target areas and

dimensions of gun violence (e.g., gangs, drug market locations) and resulted in focused interventions targeted at these dimensions. This reflects a SACSI-type strategy.

Given this variation across districts, as a first step in the national research program, a series of site-specific case studies is being conducted. Having decided on this approach, the first challenge was on choosing districts for study. The main criterion for selection was a sense that key components of the PSN strategy had been implemented in a meaningful fashion and had been in operation for a sufficient period to potentially affect levels of gun crime. The MSU research team has reviewed multiple indicators in an effort to identify districts meeting these criteria. These include district reports to the Department of Justice (DOJ), interviews with PSN project coordinators and PSN research partners, and review of data and project reports submitted to DOJ. From these sources, districts have been nominated for a possible case study based on:

• Evidence of implementation of PSN strategies (e.g., increased federal prosecution, joint prosecution case review processes, incident reviews, offender notification meetings, chronic violent offender programs, targeted patrol, probation/parole strategies, gang strategies, prevention, supply-side strategies, etc.)

• Evidence of new and enhanced partnerships (local, state, federal; community, etc.)

• Integration of research partners and/or evidence of research-based strategies

• Meaningful implementation for a sufficient time period to allow assessment of impact

• Sufficient base-rate levels of gun crime to allow assessment of impact

In effect, we employ these dimensions to ask: Is gun crime being addressed differently in this district based on one or several of the PSN core components?

For districts meeting these criteria, we then sought districts representing different regional and demographic dimensions (e.g., region of country, large city, medium city, rural jurisdictions) and with different local histories of federal, state, local relationships and involvement of researchers. The initial three case studies reflect these criteria. The Middle District of Alabama reflects a small U.S. Attorney's Office whose largest city is relatively small.

It is also a district where prior to PSN there was minimal federal-state-local coordinated gun crime reduction efforts and little involvement of local researchers. In other words, PSN was "starting from scratch" in terms of coordinated, multi-agency, gun crime reduction. The Eastern District of Missouri (EDMO), in contrast, had a long history of coordinated violence reduction initiatives, including SACSI. It focused on a major urban jurisdiction (St. Louis) that consistently ranks among the nation's leaders in levels of gun crime. The district also had a long history of working with the local research partner. The district of Massachusetts, like EDMO, also had a long history of multi-agency violence reduction efforts, particularly through the Boston Gun Project that served as the foundation for SACSI and as one of the foundations of PSN. In this case, however, we focused on PSN implementation in Lowell. Here the interest was driven by the question of whether PSN could facilitate the transfer of multi-agency, strategic problem solving from one jurisdiction (Boston) to another (Lowell). Lowell also represents an opportunity to examine PSN in a small city. The common ingredient in each site is that evidence suggests that gun crime is being addressed in a new and serious fashion through PSN.

The current study, focused on the Southern District of Alabama, is similar to the situation in the Middle District of Alabama. The PSN effort was initially focused on the major city within the district and relied on a strong partnership between the local police department and the U.S. Attorney's Office. The task force implemented a strategy that drew heavily on Project Exile and the core principles of PSN.

Once sites were identified, the MSU research team conducted site visits to learn more about PSN structure, implementation, and impact. Cooperative relationships between the local research partners and the MSU research team were established for the purpose of generating the case studies. This provided the benefit of the "deep knowledge" of the local research partners

with the "independent eyes" of the national research team. This approach will continue to be employed through an ongoing series of case studies in additional PSN sites.

Given this strategy, in effect a purposive sampling approach, the case studies cannot be considered representative of PSN in all 94 judicial districts. Rather, these are studies of PSN within specific sites. Through these studies, particularly as more and more case studies are completed, complemented by evaluations conducted by local research partners, we hope to generate new knowledge about the adaptation of the national PSN program to local contexts as well as about the impact of PSN on levels of gun crime in specific jurisdictions.

EXECUTIVE SUMMARY

Context: The Southern District of Alabama is one of three federal districts covering the state of Alabama. It is one of the smaller districts in the United States. The largest city in the district is Mobile. The initial focus of PSN in the Southern District was Mobile, due to the concentration of the district's gun crime in the city. The Southern District is part of a coordinated deterrence-based communication strategy known as "Alabama ICE" that was developed and implemented in all three federal districts in Alabama.

Task Force: Steering away from a traditional task force structure in which officers are assigned to a task force, the Southern District relied on a less structured format in whereby key officials from Mobile Police Department (MPD), ATF, and the USAO stayed within their agencies but worked on a daily basis to focus on gun crime. PSN efforts were concentrated in the district's largest community, Mobile. A gun coordinator within MPD screened all gun cases and funneled all eligible gun cases through ATF to the United States Attorney's Office for federal prosecution. Additionally, the USA reached out to all the local law enforcement agencies to encourage them to send their eligible cases to the USAO. Following the successful implementation within Mobile, a second PSN Task Force was established in Selma that meets on a quarterly basis. The Task Force Agent for the Selma Police Department screens gun cases for funneling to USAO.

Problem Analysis: The PSN task force included a local researcher from the University of South Alabama who was experienced in working with MPD. With the support of a well-established crime information system, the research partner provided analyses demonstrating the concentration of the district's gun crime within Mobile and hot spot concentrations of gun crime within particularly areas of the city. Similar to the situation in most urban areas, analysis of criminal history records indicated that people involved in gun crime tended to be repeat offenders. This analysis was coupled with a consensus among task force leaders that overcrowding in the Alabama prison system had resulted in the loss of a deterrent threat for gun crime offenders.

Strategies: The gun crime reduction strategies in the Southern District were based on a Project Exile-type approach which coupled increased federal prosecution with a media campaign communicating a deterrence message. The strategy is based on incapacitation of serious chronic offenders as well as a change in the perception among the offender population in terms of the threat of punishment for illegal possession and use of gun.

Outcomes: The gun crime trend in Mobile was analyzed using time series techniques. Total gun crime, all violent crime with a gun, robberies with a gun, and assaults with a gun all declined following the implementation of PSN. Homicides with a gun did not change significantly. In addition, gunshot admissions to the local trauma center also declined during this period, thus validating the police crime data. During this same period, property crime slightly increased and the analyses indicated that the decline in gun crime held controlling for the trend in property crime. This suggests that the decline in gun crime was due to the impact of PSN as opposed to a general decline in all crime.

Contents

Project Safe Neighborhoods in the Southern District of Alabama	1
The Development and Initial Implementation of PSN	3
Tired of the 'Waiting Game'	4
The Structure of PSN in the Southern District	5
PSN within the United States Attorney's Office	5
PSN within the Mobile Police Department	6
Building Partnerships with Local Law Enforcement	7
The Gun Coordinator as the Bridge	7
Community Engagement	8
Research Partners	9
The Nature of the Gun Crime in the Southern District of Alabama	9
Gun Crime Reduction Strategies	11
Increased Federal Prosecution and Joint Gun Case Prosecution Screening	11
Communication Strategy	13
Sustainability	16
Results	16
Evidence of Implementation- Outputs	16
Evidence of Impact- Outcomes	17
Findings: ARIMA Analysis	20
Summary	21
Leadership	21
Task Force Structure	22
Partnerships	22
Challenges	22
Conclusion	23
References	25
Endnotes	26

List of Figures

Figure 1: Southern District of Alabama	3
Figure 2: Gun Crime Problem and PSN Strategies	15

List of Tables

Table 1: Aggravated Assault and Murder Rates, 2001	2
Table 2: Gun crime trend data- City of Mobile	18
Table 3: Pre- and Post- Intervention Means (through August 1, 2006)	
Table 4: ARIMA Findings (through August 1, 2006)	21

Project Safe Neighborhoods in the Southern District of Alabama

The state of Alabama is served by three federal judicial districts with corresponding United States Attorney's Offices. These include the Northern, Middle, and Southern Districts. The state of Alabama is interesting because the three districts have coordinated a common PSN theme, logo, and message. Specifically, *Alabama ICE*, standing for Isolate the Criminal Element, is the common vehicle used across all three districts to communicate a consistent theme -- *Gun Crime = Hard Time*.

Southern District of Alabama

The Southern District of Alabama is one of the nation's smaller federal judicial districts in terms of population size. The district ranks 82^{nd} out of the 90 U.S. districtsⁱⁱⁱ with an aggregate of 790,130 total inhabitants.^{iv} The Southern District of Alabama encompasses 13 counties. The city of Mobile, located within Mobile County, has a population of just under 200,000. Mobile is the largest city in the district, accounting for roughly 25 percent of the overall population. The population density is substantially higher in Mobile (1,687 people per square mile) than the rest of the Southern District of Alabama (52.2 people per square mile) as well as the overall state's population density (87.6 people per square mile). In terms of demographics, Mobile is 50 percent white and the median home income (\$31,440) is slightly less than the state's average (\$34,100). The next largest concentrated population occurs within the city of Selma. Selma has a population of just over 20,000 inhabitants, which makes up nearly three percent of the overall district's population. Selma's demographic makeup is twenty-eight percent white and has a lower median home income (\$29,700) than both Mobile and the rest of the state. The remainder of the district can be described as mostly small towns and rural.

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

1

The Southern District of Alabama suffers from a high homicide rate, as evidenced by Uniform Crime Report data from 2001 at the outset of PSN. Specifically, the district ranks 10th overall among federal judicial districts (upper quartile) in its murder rate, with an average rate of 0.85 murders per 10,000 inhabitants. Additionally, it ranks 46th (third quartile) in aggravated assaults with 24.68 assaults per 10,000 inhabitants. Table One displays the murder and aggravated assault rates for the Southern District of Alabama, comparably sized U.S. districts^v, and the U.S. average. As the Table indicates, the Southern District of Alabama has a higher than expected rate of homicide per 10,000 inhabitants.

Table 1: Aggravated Assault and Murder Rates, 2001	Table 1:	Aggravated	Assault and	Murder	Rates, 2001
--	----------	------------	-------------	--------	-------------

Site	Aggravated Assault Rate (Per 10,000)	Murder Rate (Per 10,000)
Alabama Southern District	24.68	0.85
United State's Average*	30.65	0.65
U.S. Districts of Comparable Size**	27.05	0.43

*90 federal judicial districts

** Districts ranging from 592,600 to 987,660 population

The U.S. Attorney's Office in the Southern District of Alabama is one of the smaller offices in the country. In 2000, the Southern District employed fourteen Assistant United State's Attorneys in their Criminal Division plus a Division Chief. This number has actually decreased to 13 plus a Division Chief in 2005. Prior to the inception of PSN, the Southern District prosecuted 46 gun crime cases in FY2000 and 48 gun crime cases in FY2001. As will be discussed subsequently, the Southern District has experienced a significant increase in the federal prosecution of gun crimes over the course of PSN.

Figure 1: Southern District of Alabama



The Development and Initial Implementation of PSN

It seems that a PSN-type approach to gun crime may have already been in the minds of several key community leaders in the Southern District of Alabama prior to President George W. Bush's 2001 program announcement. In the years before President Bush's election, the city of Mobile had been experiencing a significant increase in gun assaults and drive by-shootings. The police believed that drug gangs were fighting over turf and illegal drug profits.

The Mobile Police Chief recalls a Tri-County Chiefs of Police meeting in late 2000 attended by an Alabama Senator, also a former USA for the Southern District, where the question was asked, "[w]hat can we do about the increase in violence?" Due to a serious prison overcrowding situation across the state of Alabama, criminal justice officials were all too aware that normal processing of guns through state channels would usually result in probation. But, these criminal justice officials were attentive to the fact that federal prosecution would be a better approach to gun crimes. Shortly thereafter in 2001, PSN was officially "kicked off" by the Department of Justice. David P. York, a former Alabama state prosecutor, was appointed United States Attorney for the Southern District of Alabama in November of 2001. As was common in

many United States Attorney's Offices, the focus on the 9/11 attacks and the threat of terrorism and related national security concerns resulted in PSN being "put off" in the Southern District of Alabama until early 2002.

After things settled down, the Mobile Police Department Chief of Police focused on ways to lower the violent crime rates. The Chief visited Richmond, Virginia and saw Project Exile and he had also read about Project ICE (Isolate the Criminal Element) in Birmingham, Alabama that was modeled after Project Exile. Both programs were showing success in lowering violent crime rates. Mr. York thought that ICE was promising and the Mobile Police Chief felt the new U.S. Attorney would support more aggressive gun case prosecutions than the previous USAO. *Tired of the 'Waiting Game'*

The momentum for PSN was building in the Southern District of Alabama. The USAO was on board and had the full cooperation of the Chief of Police in Mobile. In the beginning, the Chief had a list of gripes, the biggest one that it was taking too long to get PSN going; it seemed to be taking a long time for the money to become available for use in the Southern District. The Chief got impatient and decided to take it upon himself to kick off PSN within the Mobile Police Department. With hopes of making an impact in the Mobile community, the Chief contributed \$50,000 of the police department's drug forfeiture money to get things started. The money went towards the media campaign and getting the word out about Alabama ICE. He first formed a Community Action Group to help head off the perception that this program would be targeting minority community members since gun crime in Mobile disproportionately involved non-whites as both victims and offenders. The Chief recognized that community support was crucial.

The Structure of PSN in the Southern District

The goal of Alabama ICE in the Southern District of Alabama was to prosecute as many cases as possible. However, after listening to some of the concerns of the Mobile Police Chief, the USAO realized that a traditional task force was not going to work. Traditional task forces involving federal agencies are often perceived by local law enforcement to be a drain on local resources without much in return. This would be the case especially for small agencies that make up the majority of law enforcement agencies in the Southern District. The local ATF RAC, a twenty-year veteran, was willing to try something new so the USAO, along with several others, came up with what they called a "hybrid" task force model. And, what made this task force different is that the core components are located within the Mobile Police Department (MPD), rather than the USAO.

PSN within the United States Attorney's Office

The PSN Task Force in the Southern District of Alabama is loosely structured. Like many smaller Federal Districts, personnel resources are tight and therefore the USA has delegated PSN responsibilities to more than just one person. Mr. York assigned an Assistant United States Attorney to act as the Project Coordinator (PC). The PC is responsible for PSN within the USAO. The USA and PC took the position that the USAO will accept all gun cases that can be prosecuted federally. At first, just the PC and two other AUSAs prosecuted ICE cases. Now, all attorneys with the exception of OCDEFT attorneys prosecute ICE cases.

Like many districts, the Southern District also relies heavily on the Law Enforcement Community Coordinator (LECC). A former officer from a local police department, the LECC plays an important liaison role with the local law enforcement agencies. He also works closely

with the Mobile Police Department Gun Coordinator and ATF to coordinate PSN training throughout the District.

There is a smaller Task Force that meets in Selma (Dallas County) on a quarterly basis to discuss ICE cases and update Task Force members on ICE happenings. This task force includes representatives from ATF, the PC along with two other AUSAs, and representatives from the local police and sheriff's department.

PSN within the Mobile Police Department

The MPD Chief demonstrated his commitment to PSN when he dedicated one sergeant and one patrolman full-time to work on ICE cases. The sergeant became the department's Gun Coordinator, under the Criminal Investigation Division, and would be augmented by an officer who was cross-deputized with ATF. This officer would work specifically with an agent dedicated to ICE cases and serve as the liaison between the Gun Coordinator at MPD and ATF.

From the beginning, the Chief of Police felt it was important to get the buy-in for Alabama ICE from officers throughout the department. To do this, he employed two key strategies that would later prove essential to the success of PSN in the Southern District of Alabama. First, MPD began what came to be known as the ICE internship program. The MPD jurisdiction is divided into four precincts and each precinct has three shifts. Each month one officer is assigned to the Gun Coordinator (ICE Sergeant) as a shadow or "intern". This officer learns how to investigate and prepare files to support prosecution of gun cases. After twelve months, this resulted in one officer per shift per district being trained as a gun crime "expert" and then put back in the field. Second, the Gun Coordinator also developed a two-hour in-service to train all the officers in the department on federal gun laws and to get them to buy into the ICE program. ICE training became part of the 40 hours of in-service that each officer is required to attend each year.

Building Partnerships with Local Law Enforcement

The Mobile Police Department is surrounded by 9 police departments in a 25-mile radius. In cooperation with ATF, the MPD has offered free trainings to these police departments about the nuts and bolts of what a beat officer/detective needs to know about incidents where guns are involved that may potentially be federal cases. These trainings are conducted by the Gun Coordinator from MPD and the ATF agent specifically assigned to handle gun cases. The MPD Chief sees it as a way to train their own people as well as contribute to other departments. Anecdotally, both the Gun Coordinator and ATF agents have commented that narrative writing has improved following ICE training, especially in cases involving misdemeanor possession of a pistol without a permit. The initial PSN funding came from the Mobile Police Department, Escambia County Drug Task Force, and the Selma District Attorney's Office.

The Gun Coordinator as the Bridge to ATF and USAO

Since the Mobile Police Department is the largest police department in the Southern District and, therefore, would generate the most federal gun cases, ATF worked with the MPD to develop their own case screening system. The screening system was designed to correspond to the elements of a gun crime needed to support federal prosecution. That is, they decided a more common "round table" approach where every contributing agency had someone at the table would not work well for them.

The Gun Coordinator and the ATF agent dedicated to ICE cases have been working together since the program's inception, which has created open lines of communication between

the two agencies. As noted above, MPD also committed one full time officer to be crossdesignated with ATF and co-located with ATF. This officer started out as an intern with the Gun Coordinator and was selected for this position because he had generated a significant number of ICE cases while on the street. He serves as the liaison between ATF and the Mobile Police Department and also does case follow-up for the Assistant United States Attorneys prosecuting ICE cases.

In Selma, most cases are brought to the USAO through the Selma Police Department (SPD). Like the Mobile Police Department, SPD has a designated Task Force Agent (a sworn Lieutenant) who screens all gun cases and then brings appropriate cases to ATF and then the USAO.

Community Engagement

The United Way of Southern Alabama is the fiscal agent in the Southern District. The United Way officials explained that they were very pleased to be asked to be included with PSN and Alabama ICE as this role would go beyond their traditional role and coincide with their goal of increasing community outreach efforts. The general managers from all three media companies in Mobile sit on the United Way Board of Directors, which has made the media very receptive and contributed to the success of the ICE media campaign.

In a very unusual move, the Southern District partnered with the Northern District of Alabama and pooled their media campaign funding. By doing this, they chose one company to help create and distribute the Alabama ICE message. This cut back on development costs and gave both districts more buying power and leverage. And, due to the layout of the federal

districts in Alabama (see Figure 1), many of the media markets were shared which meant it made even more sense to work together.

Research Partners

Due to an already existing relationship between the Mobile Police Department and the University of South Alabama, the Southern District of Alabama selected the University of South Alabama as their research partner (RP). The original idea of the PSN Task Force was to focus on Mobile both because it was disproportionately responsible for the district's gun crime and because the RP had previously worked with MPD and had a good relationship with the department. The RP was familiar with MPD's existing data sources and Mobile had historical data the research partner could tap into. MPD had geocoded crime and calls for service data and the RP also had access to offender data that he was able to geocode. In contrast, crime data throughout much of the rest of the district, including two other potential sites (Selma and Escambia County) was more limited.

In the beginning, it seemed that the research partner and the PSN Task Fore had different ideas about PSN. However, it soon became very clear that the PSN Task Force wanted to focus on federal prosecution over some of the other potential PSN strategies. The RP developed crime maps (e.g. monthly density maps) and pulled out arresting officers to determine who made gun cases. This would help focus there efforts both geographically and in deciding on whom to focus their initial training efforts.

The Nature of the Gun Crime in the Southern District of Alabama

As previously mentioned, the city of Mobile, with a population of nearly 200,000 comprises approximately 25 percent of the total population of the Southern District of Alabama. However, Mobile accounts for approximately 75 percent (20,068/34,197) of the index crime in

the district and about 70 percent (775/1123) of reported gun crimes (homicide, rape, robbery, assault). In Mobile, crimes against a person (murder, rape, robbery and assault) declined in the late 1980s, rose substantially in the early 1990s followed by equally substantial declines in the late 1990s.

Researchers quickly discovered that gun crimes in Mobile were not randomly distributed. The highest concentration of gun crimes were occurring in the area immediately surrounding the downtown area, which is located about center city on its eastern border. The eastern border of the city is Mobile Bay. This is generally the high crime, low income area of the city. Animated density maps of gun crimes from 1998 to 2005 show consistent hot spot activity in the downtown area and the area approximately one mile north/northwest and one mile south/southwest of the downtown area, forming a crescent. As one moves toward the western border of the city (approximately 12 miles), hot spot activity tends to take on a more random appearance. In the persistent hot spot areas, gun crime varies little by season. There were expected increases in gun crimes between 8:00 PM and 4:00 AM, with slightly increased activity on Fridays and Saturdays.

The Mobile Police Department, prior to initiating Operation Ice, and based on arrest records, discovered that there was a high degree of repeat offender gun crime activity. Several individuals were found to be responsible for multiple gun crime offenses. In each case, court dispositions of those arrested resulted in community corrections sentences or prolonged release on bail.

The heavy geographic concentration of gun crime as well as analyzes indicating a high level of repeat offenders involved in gun crime was coupled with the belief among PSN officials in the USAO, MPD and ATF that overcrowding in the Alabama prison system had resulted in an absence of incapacitation of high risk chronic offenders and a lack of a deterrent threat for illegal

possession and use of a gun. Impressed by Richmond, Virginia's Project Exile, officials with MPD concluded that mandatory minimum prison sentences preceded by no bond for these targeted individuals, subsequent to arrest, held promise for substantial reductions in gun crimes.

Gun Crime Reduction Strategies

Increased Federal Prosecution and Joint Gun Case Prosecution Screening

The Gun Coordinator position within the Mobile Police Department has been a key component to increasing federal firearms prosecution in the Southern District of Alabama. Officials within the MPD did not feel it needed to change its field operations drastically due to Alabama ICE. Instead, MPD felt part of the problem was the lack of credible state sanctions coupled with reluctance of federal prosecutors and judges to aggressively enforce existing federal illegal gun possession laws, laws that were harsher than state statutes. So, the Gun Coordinator would help change the way things were done within the MPD once gun cases came in from the street, which in turn would affect federal gun prosecution cases. The process begins when a gun comes into the MPD property room. This is the "trigger" that starts the PSN gun case process in motion. Specifically, EVERY gun that comes into the MPD property room, regardless of the reason (e.g. seizure or voluntary surrender), gets traced through the ATF tracing center (prior to Alabama ICE, no guns were being sent to ATF for tracing by MPD). As part of this process, the property room forwards a form to the Gun Coordinator relaying the case report information. The Gun Coordinator then runs a criminal history on every person associated with the forfeited gun regardless of whether the gun was used in a crime or not. The Gun Coordinator looks for three things, "Guy, Gun, and Event," that would trigger an ICE case.

- 1). Guy- Is s/he prohibited under state or federal law?
- 2). Gun- Is the gun illegal under state or federal law?
- 3). Event- Does the event violate a federal law?

If the Gun Coordinator can answer 'yes' to any of the three "Gun, Guy, Event" questions, she starts to make a case and then passes it on to her MPD counterpart at ATF. The Gun Coordinator will also search for fingerprint records, get all prior convictions certified, and look for related cases. Generally, ATF accepts most cases that are forwarded from the Gun Coordinator.

Immediately there were numerous cases, which created a backlog in the USAO and ATF. ATF and the USAO were not initially ready to handle the increase in cases and the Mobile Police Department became frustrated with ATF. Some of this frustration was still tied to the delay in PSN funding, however, the United State's Attorney responded to this by creating a spreadsheet to track the progress of gun cases. The USA soon realized that these ICE cases were not moving through the federal system like he thought they should be. This exercise also helped demonstrate the need to increase the number of gun prosecutions by the USAO. The USA examined his staff to determine who bought into ICE and prosecuted gun cases well and sent ICE cases to these prosecutors. Additionally, officials in the Southern District conferred with officials in the Middle District to learn about how they were handling the influx of cases since the inception of ICE.

MPD, however, was not the only law enforcement agency to work ICE cases in the Southern District. District Attorney's in both Dallas County (Selma) and Escambia County (Brewton and Atmore) are actively involved with ICE and all law enforcement agencies in the Southern District of Alabama are aware of ICE. The Sheriff's Department in Escambia County has a sworn investigator that is funded with PSN money. This investigator works the tri-county area and provides the link for the locals to the state and federal systems. He works with every gun related case, regardless of the type of crime involved.

Communication Strategy

In addition to increased federal gun case prosecution, the Southern District of Alabama focused a considerable amount of their time and energy on their communication strategy. This was a core ingredient in the statewide Alabama ICE program and modeled on Richmond's Project Exile. Simply put, the media campaign was intended to maximize the impact of federal sanctions by communicating the USAO's commitment to federal prosecution of illegal gun possession and use. This followed a roughly year long ad campaign by the Mobile Police Department. According one criminal justice official, "…it was never about locking everyone up but is about getting the message to the criminal population." The roughly 14-month, three phase campaign rolled out in June 2003 beginning with billboards. There were three message goals of the campaign:

1). We are serious (Johnny Cochran Ad)^{v_1}

2). Length of stay in federal prison and not doing the time in Alabama

3). Creating awareness with families of offenders- moms, sisters, brothers, grandparents

The Southern District selected an Alabama based communication and public relations firm as their community engagement and media partner. They used the print ads and television and radio public service announcements (PSAs) created by a national public relations firm for all districts to use. The ads were tailored slightly to reflect the local jurisdiction. Additionally, they combined their media efforts with those of the Northern District to communicate the Statewide Alabama ICE message. Sharing their media partner provided what was described as "weight" geographically. Given that media markets span federal district boundaries and by working with the together they were able to create synergistic effects of the message (the Northern and Southern Districts share a boundary, please refer to Figure 1). The sharing of the media partner also allowed for cost efficiencies. Each district shared the cost of logo development, ads,

posters, and brochures. But, each district was allowed some individualization. The combined effort of pooled money also created leverage to get the media outlets to provide in-kind placements along with the paid media spots. The PSN task force paid for about \$90,000 of media purchases and received \$500,000 in additional media coverage.

In October of 2004 the Southern District embarked on a second set of media messages focusing specifically on domestic violence.

Interviews with officials in ATF and the USAO revealed that task force members have noticed through the street officer's incident report narratives that the word is out on the streetdon't get caught with a gun. Officers have quoted suspects as saying, "I can't get caught with a gun," and "I'm a felon, I can't get ICED." Officers are also reporting that suspects will now (i.e. since ICE inception) admit to drugs but will deny a gun indicating they are aware of the possible federal consequences. They are also seeing buzzwords in the narratives like "felon" and "ICE" communicated by offenders.

Figure 2: Gun Crime Problem and PSN Strategies

Problem	Overall Strategy	Specific Components			
Chronic offenders	Incapacitate & deter	USAO commitment to federal prosecution	All AUSAs expected to prosecute gun crime cases		
Lack of credible sanctions for gun crime offenses	Increase federal sanctions	Mobile Police Department establishes Gun Coordinator position	Increase flow of cases and improve quality		
Perception of low certainty & severity for illegal gun possession & use	Implement public education campaign	ICE	TV, radio, billboard, poster, etc. campaign		
City of Mobile accounts for 70% of reported gun crimes	Initial geographic focus on Mobile	Build relationships between local police department and feds	Cross-designation of MPD officer to ATF.		
		Training for all MPD officers	In-service training, recruit academy training; officer internship training		
		Sustain relationships throughout police department	Feedback to officers		
	Spread PSN to other areas of the District	Creation of District Task Forces	Selma PD Task Force Agent funnels all gun cases to ATF and USAO		
Lack of gun crime prevention efforts	Prevention of illegal possession & use of guns	PSN funds used to support community-based prevention strategies	TV, radio, billboard, poster, etc. campaign		

15

Sustainability

One of the problems with any criminal justice initiative is personnel turnover. It had now been over five years since the inception of Project Safe Neighborhoods and the Southern District of Alabama did not escape the loss of several major stakeholders. In September 2005, the United States Attorney for the Southern District of Alabama stepped down and a new presidentially appointed USA followed (Deborah J. Rhodes). Also in 2005, the Mobile Police Department Chief, a major impetus to Alabama ICE stepped down as Chief. But, such changes, which often derail initiatives, did not interrupt the work being done in the Southern District. The new USA continued to support PSN and Alabama ICE. Later that year, the former Chief of Police was elected Sheriff of the Mobile County Sheriff's Department and fully intends to bring the same Gun Coordinator concept to the formerly uninterested Sheriff's Department. Additionally, the new Chief of Police pledged to maintain the Gun Coordinator position and continue to support Alabama ICE.

Results

Evidence of Implementation- Outputs

As previously mentioned, the Southern District of Alabama is one of the smaller U.S. Attorney Offices in the United States. Despite only having between only 14 lawyers in the criminal division, the number of indictments under U.S. Code 922 and 924 increased from 46 in FY 2000 to 81 in FY 2002, an increase of just over 76 percentage points. Subsequently, indictments in the same category increased to 109 in FY 2005, a 139 percentage point increase from FY 2000. Similarly, the number of defendants prosecuted in federal court increased from 65 in FY 2000 to 129 in FY 2005, an increase of over 98 percentage points. The numbers are even more telling when considered in light of the district's population. As one of the least populous federal judicial districts (ranked 8th least populous out of 90 federal districts^{vii}), the Southern District of Alabama has consistently ranked in the top seven percent in regards to rate of defendants per 100,000 population. For 2005, the number of defendants prosecuted per 100,000 is just over 16. This rate ranks second among the 90 judicial districts for that year. Clearly, the goal of increased federal prosecution was realized in the Southern District of Alabama.

Evidence of Impact- Outcomes^{viii}

The ultimate goal of PSN both nationally and in each federal district is to reduce the level of gun crime. In order to assess whether the Southern District of Alabama's PSN strategies had an impact on gun crime, the outcome analyses focused on gun crime and homicide trends in Mobile. Additionally, property crime was included as a control variable. The focus on Mobile was based on the fact that it served as the initial and primary target area of PSN.^{ix}

As an initial step in the outcome analysis, the annual trends in homicide, armed robbery and assault with a firearm were reviewed. Declines can be seen in both aggravated assaults with a firearm and robbery with a firearm, though with an upturn in 2005. Homicide increased and decreased from year to year with little discernible pattern over the six-year period (see Table 2).

	2000	2001	2002	2003	2004	2005
Homicide (total)	14	39	34	18	22	32
Aggravated assault with a firearm	135	121	113	78	92	145
Robbery with a firearm	497	487	432	374	347	348

Table 2: Gun crime trend data- City of Mobile

To assess the significance of these trends, interrupted time series using autoregressive integrated moving average (ARIMA) models were employed to analyze the impact of PSN on gun violence in Mobile. This type of analysis is considered one of the most powerful evaluation tools because it can take into account trends in crime prior to the intervention point and assess the significance of any change in levels of crime following the intervention.

Eight models were constructed to investigate the effect of the PSN intervention on several aspects of gun violence. The dependent variables were as follows: 1) total gun crimes (assault with a gun, discharging a firearm, ex-felon in possession of a firearm, homicide with a gun, menacing with a gun, no pistol permit, sex crimes (rape and sodomy) with a gun, robbery with a gun and shooting into a car or residence); 2) total violent crime with a gun (assault with a gun, homicide with a gun, sex crimes-i.e. rape and sodomy) with a gun and robbery with a gun; 3) total homicides with a gun; 4) total sex crimes with a gun (rape and sodomy); 5) total robberies with a gun; 6) total assault with a gun; 7) total menacing with a gun; and, 8) total gunshot trauma admissions.^x

Independent Variables

The hypotheses constructed were straightforward. The PSN program, based on case screening, increased federal prosecution, and the media campaign, should result in a decrease in gun-related crime and gunshot trauma admissions. Thus, we modeled the impact of the intervention on the variance in eight dependent variables. To control for overall rises or declines in crime pre- and post-intervention, we created a property crime variable (see above). The

intervention/interruption was operationalized as a dummy variable. The start date for the intervention was set at August 2002. This was approximately four months after the announcement by the Mobile Police Department of Operation Ice. For gun crime models this provided us with fifty-five months of pre-intervention data and forty-five months of post-intervention data. For the gunshot trauma model we had thirty-one months of pre-intervention data.

Descriptive Statistics

	Pre-intervention Mean	Post-intervention Mean	% change
Total Gun Crime	130.04	100.49	-29.55
Violent Crime w/Gun	52.02	39.94	-12.08
Homicide w/Gun	1.65	1.65	0
Sex Crime w/Gun	.65	.79	+.14
Robbery w/Gun	39.51	29.81	-9.7
Assault w/Gun	13.44	10.56	-2.88
Menacing w/Gun	36.04	25.67	-10.37
Gunshot Trauma Admission	11.10	8.76	-2.34
Property Crime	681.42	687.40	+5.98

 Table 3: Pre- and Post- Intervention Means (through August 1, 2006)
 Intervention

Table 3 summarizes the pre- and post-intervention means for the seven gun crime categories, gunshot trauma unit admissions, and property crimes. The pre- and post-intervention means for all of the gun crime categories, except for homicide with a gun and sex crimes with a gun, decreased when comparing the two periods. In contrast, the property crime mean increased in the period after the Operation Ice/PSN program was initiated, providing preliminary support for the idea that the decrease in gun crime was not a reflection of overall declines in crime.

Findings: ARIMA Analysis

ARIMA models were calculated independently for each of the dependent variables according to the previously described analytic strategy. We applied an intervention component that assumed a four-month delay (following the April 2002 roll out of Operation Ice) in the effects of the PSN program. Thus, our interruption was set at August 2002. This assumes an immediate deterrent effect after the interruption date.

Table 4 summarizes the results of the ARIMA analysis of the eight models.^{xii} With the exception of sex crimes with a gun, all the coefficients were negative suggesting a decline in gun crime. The PSN intervention, after controlling for property crime, had a significant effect in four crime categories (total gun crime, all violent crime with a gun, robberies with a gun and all assaults with a gun) and in gunshot trauma admissions. There was no reduction in sex crimes and the reduction in homicides and menacing was not statistically significant.

Total gun crime,^{xiii} after the implementation of PSN, decreased on average by about 26 incidents per month, after controlling for property crime; violent crime with a gun,^{xiv} decreased on average by about 16 incidents per month, after controlling for property crime; and robbery with a gun decreased on average by about 11 incidents per month after controlling for property crimes. Additionally, gunshot trauma admissions, representing the number of patients admitted to the local trauma center (i.e., University of South Alabama Hospital) for gunshot wounds, decreased on average by about 2 incidents per month after controlling for property crimes. Thus, the data suggest that the SDAL PSN intervention had an impact on the level of gun crime in Mobile and that this held when contrasted with the trend in property crime.

Gun Violence	AI	RIMA	Model	under der dan der einer	Property		R-
Туре	р	d	q	Intervention	Crime	F	Square
Total Gun Crime	0	1	1	-26*	.05*		
All Violent Crime w/ gun	0	1	1	-16*	.04*		
All Gun Homicides	0	0	0	027	.003*	1.96	.04
All Sex Crimes	0	0	0	.139	0	.240	.005
All Robberies w/gun	0	1	1	11*	.03*		
All Assaults	1	0	0	-2.57*	02		
w/gun	1	0	0	11			
Total Menacing w/gun	0	1	1	-6	002		
Gunshot Trauma Unit Admissions *p=<.05	0	0	0	-2*	.003	3.76*	.09

Table 4: ARIMA Findings (through August 1, 2006)

Summary

Leadership

One of the key factors that makes the Southern District of Alabama stand out from some of the other districts is the leadership provided by the Mobile Police Department Chief (now county sheriff) in cooperation with the U.S. Attorney. Additionally, the three USAs from the three federal districts in Alabama had agreed upon a single, statewide Alabama ICE message. Project Safe Neighborhoods was a priority across the state. The local police Chief took it upon himself, again in collaboration with the USAO, to spearhead the Alabama ICE efforts in his city. Not only did he use some of his department's funding to get the media campaign started, he also implemented changes within his department to encourage change with the way gun cases were being handled both locally and federally. And, once things were up and running smoothly within the department he allowed his Gun Coordinator to work with the USAO and ATF to train other departments in the Southern District.

Task Force Structure

Like many small districts, a traditional task force structure was not going to work in the Southern District of Alabama. Instead, the Southern District of Alabama maintained a loose task force structure and focused their efforts in Mobile. The key position came to be the Gun Coordinator within Mobile Police Department. The initial focus of Alabama ICE was in Mobile and then later expanded to include Brewton and Selma.

Partnerships

The change in the way gun crime cases were handled both locally in Mobile, throughout the district, and federally could not have been done without effective partnerships. The MPD partnered closely with the USAO and ATF to screen all gun crime cases, identify cases eligible for federal prosecution, and ultimately increase significantly the number of gun crime cases prosecuted federally. Having established a strong PSN program in Mobile, the USAO reached out to smaller police departments and district attorney offices through their LECC as well as by conducting gun crime related trainings with MPD and ATF. Similarly, the partnership with the United Way and the middle and northern districts of Alabama led to a coordinated media campaign throughout the state.

Challenges

One of the major challenges for the research partner involved data collection. This is not an uncommon challenge across PSN sites. Despite the desire to collect and use data from across

This document is a research report submitted to the U.S. Department of Justice. This report has not been published by the Department. Opinions or points of view expressed are those of the author(s) and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

the district, the research partner was forced to concentrate on Mobile for evaluation purposes due to the nature of the data sources. Given the concentration of gun crime in Mobile, this was not a major obstacle for the inclusion of research in the PSN initiative.

Another challenge not uncommon to other districts and projects relates to turnover. The Southern District of Alabama experienced the loss of two major players within PSN. First, the United States Attorney and second the Chief of the Mobile Police Department. However, these changes do not appear to have negatively affected the day to day operations of PSN as the program was well-established and the new USAO and Chief of Police were supportive. Additionally, the former chiefs move to the Sheriff's Department brought on an additional collaborating law enforcement agency to the PSN task force.

Conclusion

As was found in a previous study of the Middle District of Alabama^{xv}, the PSN program in the Southern District of Alabama can be described as a Project-Exile type initiative drawing on both PSN core principles and the interventions developed in Richmond, Virginia's Project Exile.^{xvi} The Southern District was also characterized by a strong commitment to PSN by the leadership within the Mobile Police Department, the U.S. Attorney's Office, and ATF.

Given the concentration of gun crime in Mobile, within specific areas of Mobile, and among chronic offenders, and given the perception of a lack of credible sanctions within the state court and prison system, the PSN task force decided to focus on increasing federal prosecution of gun crime offenders. To ensure that gun crime cases received appropriate screening and prioritization, new partnerships were created between MPD, USAO, and ATF. Federal prosecution of gun crime cases were made a priority within the USAO and, indeed, federal prosecutions increased significantly. The prosecution strategy was complemented by a public

media campaign based on the Alabama ICE message of increased certainty of punishment for felons in possession or illegally using a gun in a crime. Analysis of the pre- and postimplementation trends in total gun crime, violent crime with a gun, robberies with a gun, and assaults with a gun, all indicated a significant decline in these gun-related offenses following the implementation of PSN. Similarly, there was a statistically significant decline in hospital admissions for gunshot wounds. There was no significant change in homicides with a gun, sex crimes with a gun, or menacing with a gun, though all but sex crimes with a gun, a relatively rare event, witnessed a downward trend. The findings must be tempered due to the lack of a control site, the decline in gun crime occurred during a time that property crime in Mobile was increasing, thus lending support for the hypothesis that the PSN intervention had an impact on gun crime.

References

- Bynum, T., S.H. Decker, J. Klofas, N.K. Hipple, E.F. McGarrell, and J. McDevitt, Forthcoming. Chronic Violent Offender Strategies: A Project Safe Neighborhood Strategic Intervention. Washington, DC: U.S. Department of Justice, Office of Justice Programs.
- Cook, T.D. and D. Campbell. 1979. *Quasi-Experimentation: Design and Analysis Issues for Field Settings*. Boston, MA: Houghton Mifflin Co
- Decker, S.H., J. McDevitt, E.F. McGarrell, T. Bynum, J. Klofas, and N.K. Hipple. Forthcoming. *Gun Prosecution Case Screening: A Project Safe Neighborhood Strategic Intervention*. Washington, DC: U.S. Department of Justice, Office of Justice Programs.
- Klofas, J., N.K. Hipple, J. McDevitt, T. Bynum, E.F. McGarrell, S.H. Decker. Forthcoming. Crime Incident Reviews: A Project Safe Neighborhood Strategic Intervention. Washington, DC: U.S. Department of Justice, Office of Justice Programs.
- McDevitt, J., S.H. Decker, N.K. Hipple, E.F. McGarrell, J. Klofas, and T. Bynum. Forthcoming. *Offender Notification Meetings: A Project Safe Neighborhood Strategic Intervention.* Washington, DC: U.S. Department of Justice, Office of Justice Programs.
- McGarrell, E.F. 2005. Strategic Problem Solving and Project Safe Neighborhoods. PSN Case Study Report #1. East Lansing, MI: Michigan State University. <u>www.cj.msu.edu/%7Eoutreach/psn/Strategic_Problem_Solving_PSN_wp1%5B1%5D.pd</u> <u>f</u> (Accessed 3/2/06).
- McGarrell, E.F., N.K. Hipple, N. Corsaro, E. Pappanastos, E. Stevens, and J. Albritton. Forthcoming. *Project Safe Neighborhoods Case Study Report: Middle District of Alabama.* Washington, DC: U.S. Department of Justice, Office of Justice Programs.
- O'Shea, T. Forthcoming. Getting the Deterrence Message Out. Police Quarterly.
- Office of Juvenile Justice and Delinquency Prevention. 1999. *Promising Strategies to Reduce Gun Violence*. Washington, DC: U.S. Department of Justice.
- Rosenfeld, R., R. Fornango, and E. Baumer. 2005. "Did Ceasefire, Compstat, and Exile Reduce Homicide?" *Criminology and Public Policy* 4:4190449.
- U.S. Department of Justice, Bureau of Justice Assistance, 2004. *Project Safe Neighborhoods: America's Network Against Gun Violence*. Bureau of Justice Assistance Program Brief. Washington, DC: U.S. Department of Justice.

Endnotes

 $^{\mbox{\scriptsize iv}}$ All population data are based on the 2000 U.S. Census.

xiv That is, homicide with a gun, rape with a gun, robbery with a gun, aggravated assault with a gun.

^{xv} See McGarrell et al., forthcoming.

ⁱ Background on PSN is available through Bureau of Justice Assistance, 2004; McGarrell, 2005; and at the Department of Justice's PSN website, www.psn.gov.

ⁱⁱ See Decker et al., 2005; McDevitt et al., 2005; Klofas et al., 2005; and Bynum et al., 2005.

ⁱⁱⁱ Comparable demographic and crime statistics were unavailable for the federal districts of Puerto Rico, the Virgin Islands, Guam, and the Marinas Islands. All comparisons are based on the 90 remaining federal districts.

^{\vee} The exact population for the Southern District of Alabama is 790,130: Thus, we examined districts with a population of +/- 25 percent (e.g., districts with at least 592,600 and at most 987,660). Eleven judicial districts were included in this analysis.

^{vi} The district relied heavily on an ad whereby well-known attorney Johnny Cochran states that when it comes to an illegal gun crime, even he will not be able to get the defendant off.

^{vii} Comparable population data were unavailable for the federal districts of Puerto Rico, the Virgin Islands, Guam, and the Marinas Islands. All comparisons are based on the 90 remaining federal districts. ^{viii} O'Shea (forthcoming).

^{ix} And, despite the efforts to implement PSN in other areas within the Southern District, the research partner found that it was too difficult to collect adequate crime data in other possible target cities.

^x Note that the dependent variables are not inclusive and exclusive. Some are subsets of other dependent variables. Doing so enables a comparison of effects between commonly considered offenses and combinations of offenses. ^{xi} In the gun crime models and the gunshot trauma model, note the data points exceed the 50 observation rule of thumb (Cook and Campbell, 1979: 228).

^{xii} Three of the eight models had ARIMA parameters of 0,0,0. The dependent variables, in these models, were not autocorrelated. The method of analysis in these models, thus, was OLS linear regression. In those models, the F statistic and R-square are reported.

^{xiii} That is, all categories in the Mobile Police Department database in which a gun was used in commission of the offense and those instances when a gun was in possession of an offender.

^{xvi} For PSN core principles, see Bureau of Justice Assistance, 2004; McGarrell, 2005. For an evaluation of Project Exile, see Rosenfeld, Fornango, and Baumer, 2005.