TECHNICAL REPORT

Strategies for Disrupting Illegal Firearm Markets

A Case Study of Los Angeles

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Supported by the National Institute of Justice

National Institute of Justice grant 2001-IJ-CX-0028 funded this research. Points of view in this document are those of the authors and do not necessarily represent the official position of the U.S. Department of Justice.

RAND Safety and Justice

A RAND INFRASTRUCTURE, SAFETY, AND ENVIRONMENT PROGRAM

This research was supported by a grant from the National Institute of Justice and conducted under the auspices of the Safety and Justice Program within RAND Infrastructure, Safety, and Environment (ISE).

Library of Congress Cataloging-in-Publication Data is available for this publication.
ISBN 978-0-8330-4478-5

Published 2008 by the RAND Corporation
1776 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138
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Preface

In 2001, with the support of a grant from the National Institute of Justice, RAND initiated a research and program-development effort to understand the nature of illegal gun markets operating in the city of Los Angeles, California. The primary goal of this project was to determine whether a data-driven problem-solving approach could yield new interventions aimed at disrupting the workings of local illegal gun markets serving criminals, gang members, and juveniles in Los Angeles. By studying applicable firearm laws, making good use of available data sources, soliciting the input of law enforcement from several agencies, developing and implementing strategies, and evaluating their results, this study demonstrates that this approach can result in interventions that have the potential to reduce the supply of illegal firearms.

This report should be of interest to public-safety officials, both in Los Angeles and elsewhere, charged with reducing gun violence, and to stakeholders in the nation's gun-policy debate. RAND work that may be of interest to readers of this report includes the following:

- *Reducing Gun Violence: Results from an Intervention in East Los Angeles* (Tita, Riley, et al., 2003)
- *Evaluation of the New York City Police Department Firearm Training and Firearm-Discharge Review Process* (Rostker et al., forthcoming)
- *Firearm Storage Patterns in US Homes with Children* (Schuster et al., 2000).

The RAND Safety and Justice Program

This research was conducted under the auspices of the Safety and Justice Program within RAND Infrastructure, Safety, and Environment (ISE). The mission of RAND Infrastructure, Safety, and Environment is to improve the development, operation, use, and protection of society's essential physical assets and natural resources and to enhance the related social assets of safety and security of individuals in transit and in their workplaces and communities. Safety and Justice Program research addresses occupational safety, transportation safety, food safety, and public safety—including violence, policing, corrections, substance abuse, and public integrity.

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In 2001, with the support of a grant from the National Institute of Justice (NIJ), RAND initiated a research and program-development effort to understand the nature of illegal gun markets operating in the city of Los Angeles, California. The primary goal of this project was to determine whether a data-driven, problem-solving approach could yield new interventions aimed at disrupting the workings of local illegal gun markets serving criminals, gang members, and juveniles in Los Angeles. There were three key components of this research and development project. First, we developed a software tool designed to support strategic analyses of firearm-information resources, such as Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) firearm-trace data, California state handgun-purchase and -sale data, and local Los Angeles Police Department (LAPD) gun-crime data by identifying key illicit pathways through which criminals acquire guns. Second, these data-analysis techniques and illegal gun–market research findings were incorporated into an interagency working-group process that developed a community-based intervention intended to reduce the illegal flow of guns to Los Angeles–area criminals. Key participants in the working-group process included ATF, LAPD, the U.S. Attorney's Office, state and city prosecutors, academics, and other criminal-justice agencies. Third, we conducted an analysis of ammunition purchases in the target area of Los Angeles to highlight the possibility of additional analyses and interventions.

By studying applicable firearm laws, making good use of available data sources, soliciting input from several law-enforcement agencies, developing and implementing strategies, and evaluating their results, we demonstrate that this approach can result in effective interventions that have the potential to reduce the supply of illegal firearms.

Why Los Angeles?

After sharp falls from the peaks in 1991, Los Angeles' violent-crime rates began to worsen in the early years of this decade. In 2000, the city registered a 27-percent increase in homicides, and, when we proposed this study in 2001, Los Angeles was on track to show a 12-percent increase over 2000 (LAPD, undated). Other crime categories, including robbery, aggravated assault, and rape, were showing similar increases. As a consequence, Los Angeles' violent-crime rate (922.3 per 100,000 residents) was higher than the rates in Philadelphia, New Orleans, and Detroit. Only New York had a higher total violent-crime rate. Los Angeles' homicide rate (9.3 per 100,000 residents), however, substantially exceeded New York's (7.3 per 100,000 residents). Much of the crime, particularly homicide, was, and continues to be, gun-related. LAPD

statistics show that, between 1999 and 2003, 64 percent of homicides were committed with a handgun (MacDonald, Wilson, and Tita, 2005).

Los Angeles' 1999 Youth Crime Gun Interdiction Initiative (YGCII) data suggest that a substantial portion of the city's crime guns (guns used in commission of a crime) (20 percent) go from first retail purchase to use in a crime relatively quickly (ATF, 2002). This finding suggests that a noteworthy portion of California retail sales may be associated with criminal intent. Combined, the YCGII data suggest that Los Angeles has a problem with people acquiring guns from illegal and unregulated sources.

Our working knowledge of the operations of the illegal gun market needed to be further refined to develop effective supply-side interventions. During the developmental stages of this project, it quickly became apparent to the interagency working group that, for the purposes of launching street-level interventions, attempting to address the illegal gun market citywide was not feasible. Given available resources, the group needed to focus on a particular area of the city. LAPD's 77th Street policing area (south Los Angeles) was chosen for two reasons:

1. Between January 1999 and March 2003, there were 322 homicides in this area, 91 percent involving guns. In three of the past four years, the 77th Street area ranked first among all LAPD areas in total number of homicides. These homicides primarily involved gangs; 53 percent were gang motivated, and another 20 percent involved gang members. The 77th Street area serves a population of approximately 175,000 in a 12-square-mile area. This area is characterized by many social ills, including concentrated poverty, single-female–headed households, high unemployment, and violent crime.
2. The 77th Street policing area is also a target area for the U.S. Department of Justice (DOJ)-sponsored Project Safe Neighborhoods (PSN) initiative. Since a key element of PSN is to address the illegal sources of guns and many of our law-enforcement partners were already part of the PSN enterprise, it made sense to capture economies of scale by incorporating members and resources across both working groups.

Accomplishments

This project consisted of three activities. The first was the creation of a software tool to increase ATF's ability to analyze patterns in crime-gun data to identify gun-trafficking cases. The second activity focused on developing an intervention to reduce the supply of illegal guns in two Los Angeles neighborhoods. The intervention involved a public information campaign designed by our working group to target straw purchasers to discourage them from transferring legally purchased guns to illegal possessors. The third activity evaluated the utility of records of retail purchases of ammunition for identifying prohibited firearm possessors. We describe each of these briefly here. Each of the remaining chapters of this report describes these activities and their results in more detail.

The Software Tool: The Firearms Trace Pattern Analysis Workstation

This project coincided with ATF's establishment of a new regional crime-gun center for Southern California, based in Los Angeles. Consequently, a large portion of our work focused on developing the analytic capacity of the fledgling crime-gun center. We did this by creating

a software-based tool: the Firearms Trace Pattern Analysis (FTPA) workstation. The FTPA workstation is intended to address two important law-enforcement needs: (1) to identify patterns of potential firearm trafficking and other suspicious activities and (b) to minimize the training and technical expertise required to obtain this type of intelligence. It was designed to operate as an application within ATF's overall firearm-tracing and crime-analysis processes and to expand analysts' and agents' ability to perform pattern-analysis searches of firearm-trace data. As the project unfolded, staffing at the Southern California Regional Crime Gun Center (SCRCGC) declined such that, by the end of 2006, the office had no analysts assigned to the lead-generation process. However, the careful documentation of the development of SCRCGC's information resources and analytic capacity serves as an important blueprint for other jurisdictions interested in developing a dynamic knowledge base to launch strategic gun-market interventions.

The FTPA system consists of five components: (1) a data warehouse that integrates information from different individual database tables within the Firearms Trace System (FTS), as well as—from other databases within ATF—(2) data cleaning; (3) development of indicators of potential firearm trafficking, other suspicious behaviors, and characteristics of illegal firearm markets; (4) an interface allowing analysts and investigators to select indicators to identify potential patterns of firearm trafficking and other suspicious behaviors; and (5) a customizable reporting system for suspicious patterns that investigators have identified.

Using our new tool, we conducted initial analyses of illegal gun markets serving criminals in the target area. Results showed that many crime guns were first purchased at local—that is, in-county—licensed dealers, rather than from out of state. That is, contrary to the conventional wisdom in the Southern California law-enforcement community that crime guns were being trafficked across state borders from places with less stringent regulations, such as Arizona and Nevada, we found that a majority of the guns used in crimes were purchased in Los Angeles County. Furthermore, we found that, when the firearm possessor was not the original purchaser, the geographic distance between the two was quite small. In more than one-third of all such instances in the 77th Street study area, the original legal purchaser resided within 4.5 miles of 77th Street. Based on its investigative experience, the interagency working group suggested that the local nature of the market was driven by prohibited possessors who were having local friends or family members conduct straw purchases[1] for them.

Targeting Straw Purchasers

Consistent with criminological theory, the working group felt strongly that, because the person conducting the straw purchase does not have a criminal history forbidding him or her from making legal purchases, this population could potentially be deterred from initiating this illegal activity. While we have no information on whether this pathway of crime guns is particularly more dangerous than other sources, the working group assessed that law enforcement has the most leverage, through police and legal options, to influence this pathway cost-effectively. As a result of these analyses, the working group associated with the project organized a "letter-campaign" intervention that attempted to dissuade legal firearm purchasers from selling or

[1] Under current federal law, a straw purchase occurs when the actual buyer of a firearm uses another person, a straw purchaser, to execute the paperwork necessary to purchase a firearm from a licensed dealer. The straw purchaser violates the Gun Control Act of 1968 (P.L. 90-618) by making a false statement with respect to information required to be kept in the licensed dealer's records (Bureau of Alcohol, Tobacco, and Firearms, 2000b, p. 1).

transferring their firearms to others without filing the necessary paperwork with the state. This program was possible because California law requires the California Department of Justice (CalDOJ) to maintain a database of all firearm sales. In selected areas, new gun buyers received notification letters during their 10-day waiting period, before they picked up their newly purchased firearms, that informed them of their responsibilities as gun owners and that the firearms could be traced back to them if used in a crime. The key idea of this new gun-market–disruption strategy was to deter small-scale straw purchasers from picking up their firearms and from making other illegal purchases in the future. Our findings suggest that the campaign may have had a large impact on straw purchasing.

Findings from Ammunition-Sale Analysis

The interagency working group was also very concerned about the apparent ease with which criminals in Los Angeles acquired ammunition for their illegal firearms. Fortunately, the City of Los Angeles regulates ammunition sales and requires city dealers to keep records of ammunition-sale transactions in a log book. We acquired and analyzed data on retail ammunition sales to assess the volume of sales to prohibited possessors of ammunition. The purpose of these analyses was to inform the public debate on regulations that might require checks for ammunition or might give local law enforcement an intelligence tool for locating potential crime guns. We found that 3 percent of ammunition purchasers had a prior felony conviction or another condition that prohibited them from possessing ammunition. During the study period, prohibited possessors purchased more than 10,000 rounds of ammunition in Los Angeles.

The initial reaction to these findings might be to try to close the pathway of illegal ammunition transfers by expanding Brady criminal-background checks (P.L. 103-159) to include prospective ammunition. However, the ammunition logs might also be used as an intelligence tool for local, state, and federal law-enforcement agencies. Not only can law-enforcement agencies prosecute individuals who purchase and possess ammunition illegally, but it is reasonable to conclude that these prohibited possessors also possess a firearm. On the basis of the ammunition-log data, local authorities can seek a search warrant that may lead to the confiscation of firearms from these prohibited possessors. The costs and benefits of recording and screening ammunition-sale records needs further evaluation.

Acknowledgments

National Institute of Justice grant 2001-IJ-CX-0028 funded this research. The authors would like to thank Bureau of Alcohol, Tobacco, Firearms, and Explosives special agent Terrence Austin (retired) for his valuable assistance in the completion of this research. We also appreciate the efforts of Jamaal Hawkins of the Southern California Regional Crime Gun Center, who assisted with gathering information and data collection. In the Office of the City Attorney, Rocky Delgadillo; Peter Shutan, supervising attorney for the gun-violence section; and Martin Vranicar, supervising attorney for the gang-prosecution and -prevention section, were indispensable for devising strategies and fielding the new gun-buyer letter initiatives. Bill Flannery of the Los Angeles Police Department's gun unit was a great resource on gun crimes, the local gun markets, and the collection of ammunition logs. We also would like to thank Lois Mock of the National Institute of Justice for her sage advice and patience in guiding our research efforts. Points of view in this document are those of the authors and do not necessarily represent the official position of anyone acknowledged here or of the U.S. Department of Justice.

Abbreviations

ACES	Armed Criminal Enforcement Study
AFS	Automated Firearms System
ATF	Bureau of Alcohol, Tobacco, Firearms, and Explosives
CalDOJ	California Department of Justice
CCRKBA	Citizens Committee for the Right to Keep and Bear Arms
CI	confidence interval
CIJS	Common Integrated Justice System
DOJ	U.S. Department of Justice
DROS	dealer record of sale
ETSS	Electronic Trace Submission System
FFL	federal firearm licensee
FinCEN	Financial Crimes Enforcement Network
FTPA	Firearms Trace Pattern Analysis
FTS	Firearms Trace System
GCA	Gun Control Act of 1968
HSC	handgun-safety certificate
IO	industry operations
LAPD	Los Angeles Police Department
LEAD	law-enforcement–agency data
NCIC	National Crime Information Center
NIJ	National Institute of Justice
NTC	National Tracing Center
PSN	Project Safe Neighborhoods

SCRCGC	Southern California Regional Crime Gun Center
TECS	Treasury Enforcement and Communication System
TOWRS	Trace Operations, Workflow, and Reporting System
YCGII	Youth Crime Gun Interdiction Initiative

CHAPTER ONE

Introduction

In 2001, with the support of a grant from the National Institute of Justice (NIJ), RAND initiated a research and program-development effort to understand the nature of illegal gun markets operating in the city of Los Angeles, California. The primary goal of this project was to determine whether a data-driven, problem-solving approach could yield new interventions aimed at disrupting the workings of local illegal gun markets serving criminals, gang members, and juveniles in Los Angeles. There were three key components of this research and development project. First, we developed a software tool designed to support strategic analyses of firearm-information resources, such as Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) firearm-trace data, California state handgun-purchase and -sale data, and local Los Angeles Police Department (LAPD) gun-crime data by identifying key illicit pathways through which criminals acquire guns. Second, these data-analysis techniques and illegal gun–market research findings were incorporated into an interagency working-group process that developed a community-based intervention intended to reduce the illegal flow of guns to Los Angeles–area criminals. Key participants in the working-group process included ATF, LAPD, the U.S. Attorney's Office, state and city prosecutors, academics, and other criminal-justice agencies. Third, we conducted an analysis of ammunition purchases in the target area of Los Angeles to highlight the possibility of additional analyses and interventions.

In this introductory chapter, we give some background on supply-side strategies for intervening in the illegal firearm market. Then we give a brief overview of the accomplishments of this project.

Disrupting Illegal Firearm Markets

In the United States, there are some 258 million privately owned firearms, including 93 million handguns (Wellford, Pepper, and Petrie, 2005). This immense stockpile serves as a source of guns for juveniles and other prohibited persons, who may obtain them through a variety of means. Although there is much debate about proper gun-control measures to reduce legal access to guns, insufficient emphasis is placed on the fact that only about one of every six firearms used in crime was legally obtained (Reiss and Roth, 1993–1994). Unlike narcotics or other contraband, the illegal supply of guns does not begin with illegal smuggling or in clandestine factories. Virtually every crime gun in the United States starts out in the legal market. Clearly, there is a problem with illegal gun acquisition from regulated and unregulated legal sources, and there is a corresponding need to intervene in these markets to make it more expensive, inconvenient, or legally risky to obtain firearms for criminal use.

The pervasiveness of guns in the United States suggests to some that it is simply not feasible to prevent people barred by law from possessing firearms from obtaining them if they are so inclined. The supply-side enforcement strategies seem futile if one accepts the common view that "guns are everywhere," that almost anyone can quickly and cheaply obtain a gun regardless of age or place of residence (see, e.g., James D. Wright, 1995). However, much evidence suggests that many active criminals and a majority of crime-involved youth do not own guns. For example, according to victim reports, 75 percent of robbers do not use a gun, despite the tactical advantage of doing so (Cook and Leitzel, 1996). A longitudinal study of teenage gang members in Rochester, New York, found that only one-third owned a gun (Bjerregaard and Lizotte, 1995). Similarly, only one-third of juvenile male arrestees in 11 cities reported owning a gun (Decker, Pennell, and Caldwell, 1997). Some policy analysts suggest that, even in gun-rich environments, supply-side efforts directed at reducing access by those who are legally proscribed can be used to reduce the prevalence of gun possession and use by criminals and juveniles (see, e.g., Cook and Braga, 2001; Braga, Cook, et al., 2002). Unfortunately, arguments for and against a market-based approach to reduce criminal gun use are based largely on speculation, not on research evidence (Wellford, Pepper, and Petrie, 2005).

Legislation Related to Firearm Sales and Crime-Gun Investigations

Federal Firearm Laws

At the national level, the Gun Control Act of 1968 (GCA) (P.L. 90-618) established the legal mandate for ATF to trace crime-related firearms. This legislation specifies a set of requirements for tracing firearms from their point of import or manufacture to their first retail sale and purchase. To achieve this objective, GCA requires that all new firearms be marked with a unique serial number. Further, GCA requires all federal firearm licensees (FFLs), from manufacturers to retailers, to keep records of all transactions involving firearms. This includes shipments received in addition to retail sales. In response to a request for firearm-trace information, GCA also mandates that FFLs supply details about firearm transactions to ATF. GCA further allows that, once a year, ATF can conduct an audit of an FFL's transaction records to ensure compliance with the law. In the event that an FFL ceases to conduct business, all transaction records are to be submitted to ATF for storage as required by GCA. In essence, GCA established a set of record-keeping procedures that allows ATF to trace firearms to first-time retail purchases (Pierce and Griffith, 2005). In 1994, Congress added the requirement that firearm manufacturers and FFLs must respond to a firearm-trace request from ATF within 24 hours (27 C.F.R. Part 178, §178.25a).

Congress also passed legislation that regulates how ATF manages firearm-trace information. Specifically, ATF cannot maintain records of gun sales or gun ownership. ATF's fiscal-year 1979 appropriation provided that "no funds appropriated herein shall be available for administrative expenses in connection with consolidating or centralizing . . . the records of receipt and disposition of firearms maintained by Federal firearms licensees" ("Firearms Regulations," 1978).

In addition to limits on how and what firearm-trace data ATF can manage, Congress has restricted the information that ATF can share with local law enforcement and the general public (P.L. 109-108). These restrictions are known popularly as the Tiahrt Amendment after the U.S. representative from Kansas, Todd Tiahrt, who introduced them. In more recent years,

these restrictions have become more severe. For example, police investigators could get trace data on specific guns that were part of a criminal investigation, but they could not acquire more cumulative data on traces to analyze trends or detect patterns. This prevented those communities facing severe gun-violence problems from developing strategies to target the supply of illegal firearms.

California Firearm Laws

In addition to the federal legal context, California has a set of specific laws and regulations that are potentially relevant to the tracing and investigation of firearm trafficking. Individuals are limited to one firearm purchase per month starting at the time of the application.[1] After an application is submitted, there is a ten-day waiting period before the transaction is approved (Calif. Penal Code §§12071[b][3][A], 12072[c][1]). Individuals who have applied for multiple purchases may not transfer guns during the first 30 days after the initial application. Individuals are not permitted to purchase firearms from someone else unless a licensed dealer handles the transfer (Calif. Penal Code §§12072[a][5], 12072[d]). In addition, other relevant components of California state law include that, 48 hours after the discovery of the theft or other loss of a firearm, the licensed dealer is responsible for reporting it (Calif. Penal Code §12071[b][13]).

Some California laws reinforce or clarify the federal statutes. Individuals prohibited from firearm transactions include felons, individuals who have renounced their citizenship, individuals convicted of a domestic-violence misdemeanor or who are the subject of a restraining order, fugitives, and illegal aliens. Age restrictions include the prohibition of long guns and handgun ammunition sales to those under the age of 18 and prohibition of handguns to those under the age of 21 (Calif. Penal Code §§12072[a][3][A], 12072[b]).

As with the federal law, California law requires that a licensed dealer maintain records of transactions conducted at that place of business and that he or she make these records available on inspection by law enforcement (Calif. Penal Code §12071[b][17]). Anyone who frequently conducts firearm transactions needs to have a federal firearm license, local license, California resale permit, and a CalDOJ certificate of eligibility (Bureau of Alcohol, Tobacco, and Firearms, undated, p. 68; Calif. Penal Code §12070[a]). The record for handgun purchases must contain information about the gun, such as the make, model, manufacturer, serial number, caliber, and any other identifying features; telephone and address of the purchaser is required as well as his or her occupation, date and place of birth, sex, aliases, physical description, and signature (Calif. Penal Code §12077[b]). Finally, the date and time of the purchase is recorded along with the name, address, dealer number, and any other identifying information about the place of purchase.

The purchaser is also required to record whether he or she is prohibited from purchasing firearms and ammunition and is required to present a handgun-safety certificate (HSC). California residents obtain an HSC by passing a written test at an FFL or shooting range and must pass the test prior to purchasing a firearm. Unlike ATF, which cannot maintain database

[1] Calif. Penal Code §§12071, 12072. Effective January 1, 2000, the California Department of Justice (CalDOJ) began screening all handgun transactions to ensure compliance with these sections. The new law prohibits California firearm dealers from selling or transferring title of any handgun to any person who has already acquired a handgun within the state of California in the past 30 days.

of noncrime guns, the California Department of Justice (CalDOJ) maintains these records centrally in the Automated Firearms System (AFS).

Since 2003, a purchaser's right thumbprint is required on all transactions (Calif. Penal Code §12077[b][2]), and the purchaser's date of birth, name, and ID number is to be taken from the magnetic strip on the driver's license or other state-issued identification card (Calif. Penal Code §12077[f]). These regulations reduce the potential for purchasers providing false identification to a firearm dealer.

Unlike federal law, California law regulates all secondary transfers: transfers between parties after the initial retail sale (Calif. Penal Code §12072[d]). The seller must deliver the gun to an FFL, and the purchaser must complete all of the steps of the purchase process as if it were a regular retail purchase, provide an HSC, complete a background check, and have his or her information recorded in the state's dealer record of sale (DROS).

In 2002, the California legislature enacted the nation's first statewide crime-gun–tracing bill, which mandates that all firearms used in a crime, suspected to have been used in a crime, illegally possessed, or found, be submitted to CalDOJ for the purpose of tracing through ATF (Calif. Penal Code §11108[a]).

ATF's legislative mandates and regulations place restrictions on how law enforcement can use firearm-trace data. This means that it is generally not possible to describe secondary transfers using ATF trace data.[2] However, this is not a limitation for firearm transactions in California.[3] California's firearm laws make it possible to trace all handguns and assault rifles through to a last-known sale and purchase. These provide potentially significant additional crime-analysis information on the trafficking of second-hand firearms sold in California beyond that available using standard ATF firearm-trace data.

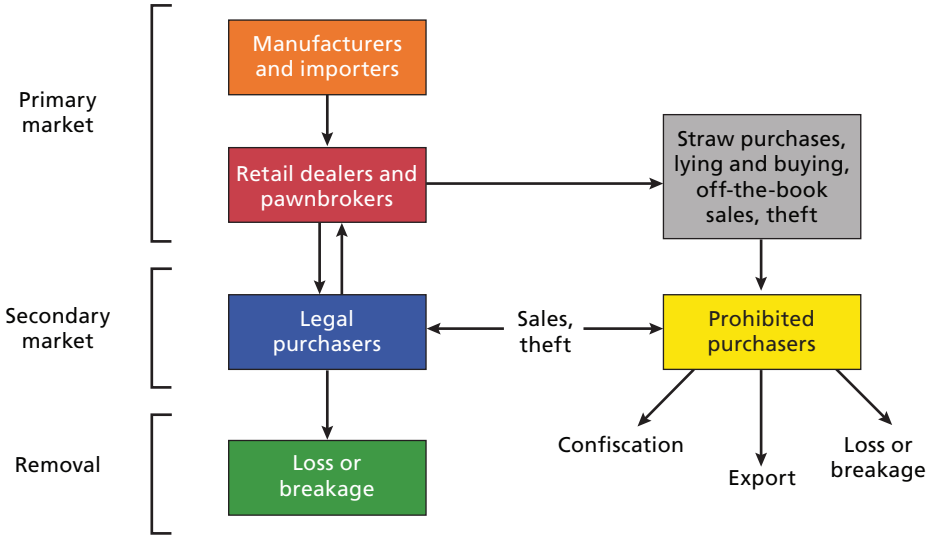
Legal and Illegal Firearm Commerce

Legal firearm commerce is comprised of transactions made in the *primary* firearm market and in the largely unregulated *secondary* firearm market (see Figure 1.1). Transactions of new and secondhand firearms conducted through FFLs form the primary market for firearms (Cook, Molliconi, and Cole, 1995). Retail gun stores sell both new and secondhand firearms and, in this regard, resemble automobile-sale lots. Once a gun is in private hands, it can be transferred in a wide variety of ways, such as through classified ads in newspapers and gun magazines and at gun shows (which include both licensed and unlicensed dealers). Transfers of secondhand firearms by unlicensed individuals form the secondary market, for which no records are kept and criminal background checks are not required federally and only infrequently at the state level (Cook, Molliconi, and Cole, 1995). About 30 to 40 percent of all gun transactions occur on the secondary market (Cook and Ludwig, 1996). Primary and secondary firearm markets

[2] Secondary sales between nondealers are not traceable. Those secondary sales that are documented in the records of out-of-business FFLs that ATF retains can be traced. It is still possible to trace a crime gun past the point of a first-time retail sale through to a last-known legally recorded sale through a process of investigative traces that involves ATF agents interviewing all subsequent sellers and purchasers of a gun through to a set of final transactions. This process, however, is very labor intensive and is generally only used in very high-priority cases.

[3] The CalDOJ firearm division maintains the AFS of handguns sold, pawned, transferred, or voluntarily registered in the DROS. Also, prior to enactment of the assault-weapon ban, CalDOJ also maintained records of all registered assault weapons in the state; however, further transfer or sale of these assault rifles is prohibited.

Figure 1.1
Flow of Legal and Illegal Firearms



SOURCE: Adapted from Braga, Cook, et al. (2002, Figure 1).

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are closely linked, because many buyers move from one to the other depending on relative prices and other terms of the transaction (Cook and Leitzel, 1996). As regulations tighten in the primary market, Cook, Molliconi, and Cole (1995) suggested, the unregulated secondary market will become increasingly attractive.

Survey research suggests that theft from private citizens is an important source of firearms for criminals (Beck, 1993; James D. Wright and Rossi, 1994; Sheley and Wright, 1995). However, analyses of ATF firearm-trace data and ATF firearm-trafficking–investigation data reveal that illegal diversions of firearms from retail businesses are also important sources of crime guns (see, e.g., Braga and Kennedy, 2001; Wachtel, 1998; Kennedy, Piehl, and Braga, 1996a; Pierce, Briggs, and Carlson, 1995; Moore, 1981). Through crime-gun tracing, trace analysis, investigative work, and the help of outside researchers, ATF has developed a more refined picture of the complex illegal firearm market that supplies guns to proscribed persons. The components of the market include (1) trafficking in *new* firearms, interstate and intrastate, by licensed firearm dealers (FFLs, including pawnbrokers), large-scale straw purchasers or straw purchasing rings, and small-scale straw purchasers (i.e., legally entitled purchasers buying one or a few guns for prohibited persons); (2) trafficking in *secondhand* firearms, interstate and intrastate, by licensed firearm dealers (including pawnbrokers), large-scale straw purchasers or straw purchasing rings, small-scale straw purchasers (i.e., buying one or a few guns), unregulated private sellers (operating at gun shows and flea markets, through want ads, the Internet, and personal associations), and bartering and trading within criminal networks; and (3) trafficking in new and used *stolen* firearms involving theft from licensed dealers and pawnbrokers, organized fencing of stolen guns, common-carrier theft, manufacturer theft, and household theft (ATF, 2000a, 2000b).

While trace data are potentially useful for identifying some patterns, limitations of the data make it difficult to quantify the magnitude of the various sources of crime guns. First, trace data represent only those guns that law enforcement was able to recover and tell us noth-

ing about those that are still in criminal possession. Second, not all jurisdictions submit crime guns to ATF for tracing, and those that do might request traces only in certain cases. Third, of those guns submitted to ATF for tracing, many cannot be traced to first retail purchasers. In our study, 35 percent of crime guns recovered in LAPD's 77th Street area could not be traced to the first retail sale, often because the gun was too old or there was a problem with the serial number. Lastly, ATF data lead only to the first retail sale and, unless the purchaser is conscientious and lives in a state that records secondary sales, secondary transfers are not documented. As a result, trace data can only be suggestive of the illegal firearm market, and other data sources are necessary to verify or discount the results from trace-data analysis.

Pierce, Braga, Hyatt, and Koper (2004) noted that, based on inmate surveys, as many as half of all crime guns may be diverted to offenders through theft (James D. Wright and Rossi, 1994). Conversely, this suggests that at least half of crime guns make their way to offenders through one of a series of nontheft primary- or secondary-market transactions. The available data make it difficult to compare the relative importance of illegal diversions from the primary and secondary markets. Analyses of firearm-trace data indicate that new firearms are more likely to be used as crime guns than are older firearms (see, e.g., Kennedy, Piehl, and Braga, 1996b; Cook and Braga, 2001). A third of James D. Wright and Peter H. Rossi's (1994) male prison inmates reported that their most recently acquired handgun was new rather than used, and 21 percent purchased their most recently acquired handgun from a retail outlet. The acquisitions from licensed dealers could have occurred in a variety of ways: buys from corrupt FFLs; theft from FFLs (3 percent of Wright and Rossi's respondents had stolen their most recent gun from a gun store); buys from FFLs through fraudulent means, including straw purchases, the use of fake identification, or the provision of false information about buyer eligibility; or legal buys from FFLs (a respondent may have had a clean record at the time of the most recent purchase). Thus, existing research indicates that illegal diversions from both the primary and secondary markets are important sources of guns for prohibited users. See Pierce, Braga, Koper, et al. (2003) for a more extensive examination of the source of crime guns.

The Prospects of Supply-Side Enforcement

Demand-side interventions generally involve dispensing swift, certain, and severe penalties for gun crimes. For example, in 1997, Richmond, Virginia, initiated Project Exile, in which all felonies committed with a gun would be federally prosecuted without regard to the type or seriousness of the crime. Such programs aim to increase the effective cost of carrying or using a firearm in the commission of a crime and therefore should reduce the demand in the illegal firearm market.

Supply-side interventions aim to increase the cost of criminal firearm possession by limiting the availability of guns to the illegal market. These include such strategies as background checks on prospective buyers, investigations of suspect FFLs, and prosecutions of those responsible for supplying crime guns.

In their review of data on the illegal supply of firearms, Braga, Cook, et al. (2002) suggested that, in the parlance of environmental regulation, illegal gun markets consist of both "point sources" (ongoing diversions through scofflaw dealers and trafficking rings) and "diffuse sources" (acquisitions through theft and informal, voluntary sales). A reasonable conclusion is that, as in the case of pollution, both point sources and diffuse sources are important (see also

Cook and Braga, 2001). Braga and his colleagues (2002) also speculated that the mix of point and diffuse sources differs across jurisdictions, depending on the density of gun ownership and the strictness of gun controls. For example, systematic gun trafficking from retail point sources may be more difficult in jurisdictions with stricter controls on the purchase and sale of firearms, such as Boston and New York, than in looser-control jurisdictions, such as Atlanta and Dallas. Given that there is a mix of point and diffuse sources, the potential effectiveness of supply-side enforcement may also vary across jurisdictions.

Effective supply-side efforts could help increase the price of guns sold to prohibited persons and increase the "effective price" of acquiring guns—that is, the time and difficulty required to make a "connection" to buy a gun (see Moore, 1973, 1977). The benefit of this approach would be an increased incentive for criminals and youth to economize on gun possession and use. As guns become scarcer and more valuable, these potential market players will be slower to buy and quicker to sell. Thus, prohibited persons would possess guns for smaller amounts of time over the course of their criminal careers (Kennedy, 2002). Unfortunately, there is little direct evidence that successful regulatory and enforcement actions against point and diffuse sources will actually reduce availability and, thus, gun use in crime. As the National Academy of Sciences Committee to Improve Research Information and Data on Firearms concluded, "it is simply not known whether it is actually possible to shut down illegal pipelines of guns to criminals nor the costs of doing so" (Wellford, Pepper, and Petrie, 2005, p. 8). More research on the structure of illegal gun markets and experimentation with market-disruption tactics are sorely needed. The available research on gun-market interventions is briefly summarized below.

Illegal Gun–Market Interventions

Strategic analyses of trace data provide more focused information on the identities of FFLs and others who are most active in diverting guns into criminal use (Pierce, Braga, Hyatt, and Koper, 2004). These data have become an increasingly important tool in enforcement efforts. The use of trace data as an investigative tool has been enhanced by the development of Project LEAD (law-enforcement–agency data) beginning in 1993 (ATF, 1995). Project LEAD is a software application that contains information on all traced firearms in ATF's National Tracing Center's (NTC's) Firearms Trace System (FTS). The system provides ATF agents with data useful in identifying gun traffickers, straw purchasers, and scofflaw FFLs. ATF also analyzes multiple-sale data for suspicious purchasing patterns suggestive of gun trafficking. Nearly 30 percent of 1,500 ATF firearm-trafficking investigations from between July 1996 and December 1998 were initiated through strategic analyses of information—analyses of trace data, multiple-sale data, or both (ATF, 2000b). After initiation of investigations, tracing was used to gain information on recovered crime guns in 60 percent of the 1,500 ATF firearm-trafficking investigations.

Local problem-oriented–policing projects hold great promise for creating a strong response to illicit firearm markets. Problem-oriented policing works to identify *why* crimes are occurring and to frame responses using a wide variety of often-untraditional approaches (Goldstein, 1990). This approach provides an appropriate framework to uncover the complex mechanisms at play in illicit firearm markets and to develop tailor-made interventions to disrupt the gun trade. The famous illustration of this approach was the Boston Gun Project, launched during the early 1990s. It included an interagency problem-solving group that sought to disrupt the

illegal supply of firearms to youth by analyzing firearm-trace data and doing several things systematically:

- expanding the focus of local, state, and federal authorities to include *intrastate* trafficking in Massachusetts-sourced guns, in addition to interstate trafficking
- focusing enforcement attention on traffickers of those makes and calibers of guns most used by gang members, on traffickers of guns showing short time-to-crime, and on traffickers of guns used by the city's most violent gangs
- attempting restoration of obliterated serial numbers and subsequent trafficking investigations based on those restorations
- supporting these enforcement priorities through analysis of crime-gun traces generated by the Boston police department's comprehensive tracing of crime guns and by developing leads through systematic debriefing of, especially, arrestees involved with gangs or involved in violent crime (Braga, Kennedy, Waring, and Piehl, 2001, p. 199).

The Boston supply-side approach was implemented in conjunction with a powerful deterrence-based demand-side strategy to reduce youth violence. Unfortunately, the gun-trafficking investigations and prosecutions followed the implementation of a very successful deterrence strategy, and their effects on gun violence could not be independently established (Braga, Kennedy, Waring, and Piehl, 2001). An NIJ-funded evaluation found that the focused enforcement efforts significantly reduced the illegal supply of new handguns to criminals (Braga and Pierce, 2005). However, the evaluation also suggested that Boston criminals may have substituted older guns for new guns and moved from primary markets to secondary markets in response to the enforcement strategy.

Another interesting application of strategic analyses of trace data has been as a guide to licensing and regulatory enforcement. As a result of licensing reforms in 1993 and 1994, federal dealers' licenses are now being issued far more selectively, and the number of active licensees has dropped from more than 260,000 to about 100,000. Koper (2002) questioned the effectiveness of these reforms, as he found little evidence to suggest that guns sold by the "dropout" dealers were more likely than other dealers to be crime-gun suppliers. Nevertheless, with the elimination of some 160,000 marginal dealers, ATF regulatory and enforcement resources are spread less thinly. Moreover, relatively few dealers are associated with the bulk of crime-gun traces (Pierce, Briggs, and Carlson, 1995). As such, ATF has focused its investigations on this small group.

In 2000, ATF conducted focused compliance inspections of dealers who had been uncooperative in response to trace requests and of FFLs who had 10 or more crime guns (regardless of time to crime) traced to them in 1999 (ATF, 2000a). The inspections disclosed violations in about 75 percent of the 1,012 dealers inspected. Nearly half (47 percent) of the dealers had at least one inventory discrepancy. While the majority of the discrepancies were resolved during the inspection process, 202 FFLs could not account for some 13,271 missing guns. Sixteen FFLs each had more than 200 missing guns. More than 57 percent had at least one violation relating to a failure to properly execute transaction paperwork, and 54 percent failed to maintain a complete and accurate record book. The focused compliance inspections identified sales to more than 400 potential firearm traffickers and nearly 300 potentially prohibited persons, resulting in 691 referrals sent to ATF agents for further investigation (ATF, 2000a).

Other market-based interventions have included gun buy-back programs, limiting multiple-gun sales, and screening gun buyers. Gun buy-back and exchange programs have been popular in a number of jurisdictions, but they appear to have only symbolic value (Kennedy, Piehl, and Braga, 1996a). Evaluations indicate that they have had no observable effect on either gun-crime or firearm-related–injury rates (see, e.g., Callahan, Rivara, and Koepsell, 1994).

Analyses of multiple-purchase data revealed that handguns acquired in multiple transactions are relatively likely to be associated with gun trafficking (Koper, 2005; YCGII, annually since 1999). In July 1993, Virginia implemented a law limiting handgun purchases by any individual to no more than one during a 30-day period. Prior to the passage of this law, Virginia had been noted as one of the leading source states for crime guns recovered in northeast cities, such as New York, Boston, and Washington, D.C. (Weil and Knox, 1996). Using firearm-trace data, Weil and Knox (1996) showed that, during the first 18 months the law was in effect, Virginia's role in supplying guns to New York and Massachusetts was greatly reduced. For traces initiated in the northeast corridor, 35 percent of the firearms acquired before one-gun-a-month took effect and 16 percent purchased after implementation were traced to Virginia dealers (Weil and Knox, 1996). Although the number of guns originating from Virginia decreased, the number of guns originating from other states increased, suggesting that this approach would be most effective if a national one-gun-a-month law were adopted. Maryland adopted a one-gun-a-month law in 1996, and California followed suit in 1999 (Wintemute, 2000).

The Brady Handgun Violence Prevention Act (P.L. 103-159), implemented in 1994, required that anyone purchasing a handgun from an FFL pass a criminal-background check. In 1998, the background check was expanded to include transfers of rifles and shotguns. Analyses of Brady background checks revealed that a large number of prohibited persons do attempt to buy handguns from licensed dealers. Between 1994 and 1998, Brady background checks resulted in some 320,000 requests for purchase being denied, with about 220,000 of the rejections due to prior felony convictions or pending indictments (Manson, Gilliard, and Lauver, 1999). Other would-be handgun purchasers may have been discouraged from attempting to buy, knowing that they would not have passed the Brady check.

The check's effect on reducing gun violence by keeping guns out of prohibited hands has been mixed. Studies in California suggest that screening procedures have been effective in keeping guns out of the hands of violent criminals (Mona A. Wright, Wintemute, and Rivara, 1999; Wintemute, Wright, et al., 1999). However, Ludwig and Cook (2000) evaluated the Brady bill and found that there were no discernable differences in homicide trends between the 32 Brady states (states directly affected by the Brady bill) and the 18 non-Brady states (those states with laws already in compliance with the Brady bill). Criminals acquiring firearms from the unregulated secondary market may have undermined the bill's effectiveness in preventing homicide. Cook and Braga (2001) documented the fact that criminals in Chicago were being supplied to a large extent by organized gun trafficking from south-central states—in particular, Mississippi—and that a modest increase in regulation imposed by the Brady bill had shut down that pipeline. However, this large change in trafficking channels did not have any apparent effect on gun availability for violent people in Chicago, as the percentage of homicides with guns did not drop after 1994 (Cook and Braga, 2001).

Accomplishments of the Los Angeles Case Study

This project consisted of three activities. The first was the creation of a software tool to increase ATF's ability to analyze patterns in crime-gun data to identify gun-trafficking cases. The second activity focused on developing an intervention to reduce the supply of illegal guns in two Los Angeles neighborhoods. The intervention involved a public information campaign designed by our working group to target straw purchasers to discourage them from transferring legally purchased guns to illegal possessors. The third activity evaluated the utility of records of retail purchases of ammunition for identifying prohibited firearm possessors. We describe each of these briefly here. Each of the remaining chapters of this report describes these activities and their results in more detail.

The Software Tool: The Firearms Trace Pattern Analysis Workstation

This project coincided with ATF's establishment of a new regional crime-gun center for Southern California, based in Los Angeles. Consequently, a large portion of our work focused on developing the analytic capacity of the fledgling crime-gun center. We did this by creating a software-based tool: the Firearms Trace Pattern Analysis (FTPA) workstation. The FTPA workstation is intended to address two important law-enforcement needs: (1) to identify patterns of potential firearm trafficking and other suspicious activities and (2) to minimize the training and technical expertise required to obtain this type of intelligence. It was designed to operate as an application within ATF's overall firearm-tracing and crime-analysis processes and to expand the ability of analysts and agents to perform pattern-analysis searches of firearm-trace data. As the project unfolded, staffing at the Southern California Regional Crime Gun Center (SCRCGC) declined such that, by the end of 2006, the office had no analysts assigned to the lead-generation process. However, the careful documentation of the development of SCRCGC's information resources and analytic capacity serves as an important blueprint for other jurisdictions interested in developing a dynamic knowledge base to launch strategic gun-market interventions.

New Gun-Buyer Notification Program

Using our new tool, we conducted initial analyses of illegal gun markets serving criminals in the target area. Results showed that many crime guns were first purchased at local—that is, in-county—licensed dealers, rather than from out of state. That is, contrary to the conventional wisdom that crime guns were being trafficked across state borders from places with less stringent regulations, such as Arizona and Nevada, we found that a majority of the guns used in crimes were purchased in Los Angeles County. Furthermore, we found that, when the firearm possessor was not the original purchaser, the geographic distance between the two was quite small. In more than one-third of all such instances in the 77th Street study area, the original legal purchaser resided within 4.5 miles of 77th Street. Based on its investigative experience, the interagency working group suggested that the local nature of the market was driven by prohibited possessors who were having local friends or family members conduct straw pur-

chases for them.[4] Consistent with criminological theory, the working group felt strongly that, because the person conducting the straw purchase does not have a criminal history forbidding him or her from making legal purchases, this population could potentially be deterred from initiating this illegal activity. While we have no information on whether this pathway of crime guns is particularly more dangerous than other sources, the working group assessed that the most leverage comes through police and legal options to influence this pathway cost-effectively. As result of these analyses, the working group associated with the project organized a "letter-campaign" intervention that attempted to dissuade legal firearm purchasers from selling or transferring their firearms to others without filing the necessary paperwork with the state. This program was possible because California law requires CalDOJ to maintain a database of all firearm sales. In selected areas, new gun buyers received a notification letter during their 10-day waiting period, before they picked up their newly purchased firearm, that informed them of their responsibilities as a gun owner and that the firearm can be traced back to them if used in a crime. The key idea of this new gun-market–disruption strategy was to deter small-scale straw purchasers from picking up their firearms and from making other illegal purchases in the future. Our findings suggest that the campaign may have had a large impact on straw purchasing.

Findings from Ammunition-Sale Analysis

The interagency working group was also very concerned about the apparent ease with which criminals in Los Angeles acquired ammunition for their illegal firearms. Fortunately, the City of Los Angeles regulates ammunition sales and requires city dealers to keep records of ammunition-sale transactions in a log book. We acquired and analyzed data on retail ammunition sales to assess the volume of sales to prohibited possessors of ammunition. The purpose of these analyses was to inform the public debate on regulations that might require checks for ammunition or might give local law enforcement an intelligence tool for locating potential crime guns. We found that 3 percent of ammunition purchasers had a prior felony conviction or another condition that prohibited them from possessing ammunition. During the study period, prohibited possessors purchased more than 10,000 rounds of ammunition in Los Angeles.

The initial reaction to these findings might be to try to close the pathway of illegal ammunition transfers by expanding Brady criminal-background checks to include prospective ammunition. However, the ammunition logs might also be used as an intelligence tool for local, state, and federal law-enforcement agencies. Not only can law-enforcement agencies prosecute individuals who purchase and possess ammunition illegally, but it is reasonable to conclude that these prohibited possessors also possess a firearm. On the basis of the ammunition log data, local authorities can seek a search warrant that may lead to the confiscation of firearms from these prohibited possessors. The costs and benefits of recording and screening ammunition-sale records needs further evaluation.

[4] Under current federal law, a straw purchase occurs when the actual buyer of a firearm uses another person, the straw purchaser, to execute the paperwork necessary to purchase a firearm from a licensed dealer. The straw purchaser violates GCA by making a false statement with respect to information required to be kept in the licensed dealer's records (ATF, 2000b, p. 1).

Organization of This Report

This chapter has reviewed the existing research literature on legal and illegal firearm commerce and documented the development and implementation of the FTPA workstation within existing ATF information systems. Subsequent chapters present our development of tools for analyzing ATF's trace data, an analysis of gun violence and illegal gun market conditions in the 77th Street area leading to the development of a letter campaign to dissuade small-scale straw purchasers, and our analysis of the Los Angeles ammunition logs. The report concludes with a summary of the lessons learned from this research and development project.

CHAPTER TWO

Development of the Firearms Trace Pattern Analysis Software

In this chapter, we describe the FTPA software tool developed for this project and also describe analyses that we conducted using this software. The FTPA software is designed to facilitate the analysis and dissemination of firearm-trace information on guns recovered by law enforcement. While this chapter serves as a case study of FTPA's development in Los Angeles, it also provides a blueprint for other jurisdictions interested in enhancing their firearm-information resources and analytic capacity to respond to illegal gun markets.

Introduction

The complexity and diversity of illegal gun markets suggest that there is no single best policy or approach to disrupting the illegal supply of guns across the numerous jurisdictions in the United States. Jurisdictions interested in reducing the availability of guns to the illegal market need to develop a portfolio of interventions based on partnerships among federal, state, and local authorities. As described in the literature review, problem-oriented policing holds great promise for creating a strong response to illicit firearm markets. This adaptable and dynamic analytic approach provides an appropriate framework to uncover the complex mechanisms at play in illicit firearm markets and to develop tailor-made interventions to disrupt the gun trade. The RAND research and development program conducted for this project was framed as a problem-oriented–policing effort that engaged an interagency working-group process to understand the nature of illegal firearm markets in Los Angeles and to frame interventions to deal with identified illicit pathways of firearms.

Background: ATF's Current Firearm-Tracing System

To understand the purpose of the FPTA system, it is helpful to understand the current ATF process for tracing firearms and analyzing trafficking patterns.

To support ongoing firearm-crime investigations and provide investigative leads on potential firearm trafficking and other firearm violations, ATF's NTC conducts traces of crime-related firearms recovered by any federal, state, local, or international law-enforcement agency (e.g., recovered at crime scenes or from a youth or other person prohibited from possessing firearms) (ATF, 2003).

The following lists the steps of the basic firearm-tracing process (Pierce and Griffith, 2005). The tracing process begins with a law-enforcement agency's submission of a request to

the NTC to trace a crime-related firearm. Traditionally, law-enforcement agencies must submit the request using ATF form 3312.1 (ATF, 2007). This form requires information on (1) the firearm, including firearm type (e.g., pistol, revolver, shotgun, rifle), manufacturer, caliber, serial number (unless obliterated), importer (if the gun is of foreign manufacture), and where law enforcement recovered the firearm; (2) the criminal offense associated with the firearm; (3) the name, identification information, and selected demographics of the crime-gun possessor, if one was identified; and (4) the name(s) and identification information of associates of the crime-gun possessor, if any such individuals were identified.

1. A federal, state, local, or international law-enforcement agency recovers a crime-related firearm.
2. The law-enforcement agency submits information to NTC on the firearm, recovery location, crime-related circumstances, and firearm possessor using ATF form 3312.1.
3. NTC sends information on the firearm (e.g., serial number, model) to the manufacturer (unless trace information is available in the out-of-business or multiple-sale records).
4. The manufacturer sends information to NTC regarding the dealer to which it sold the firearm.
5. NTC requests information from the dealer regarding the firearm sale and purchaser. This can proceed through a series of transactions between dealers (e.g., wholesale dealer to retail dealer) until a firearm is finally sold to a private citizen in a retail sale.
6. The retail dealer sends information on the date of sale and the purchaser to NTC.
7. NTC integrates information from the tracing process on the (a) firearm, (b) firearm possessor, (c) crime circumstances, (d) recovery location, (e) firearm dealer, and (f) firearm purchaser into the FTS, which stores the data for possible retrieval and analysis.[1]
8. The trace is checked against trafficking indicators. These are features of gun traces that analysts or investigators have determined are indicative of trafficking, such as short time to crime, an unregistered gun, a gun with an obliterated serial number, or a gun traced to a purchaser who is the source of other traced guns. ATF uses the trafficking indicators to assess whether they should begin building a case. The FTPA's role is to help ATF analysts develop indicators and search for traces on which a gun-trafficking case might be built.
9. If the trace has indicators of trafficking or suspicious patterns, ATF develops an investigation-referral packet, pulling in information on the purchaser, possessor, FFL, and other entities involved.

Each firearm-trace request is assigned to an NTC firearm-tracing specialist. The information is first checked against an index of manufacturers and firearm serial numbers contained in the records of out-of-business FFLs that ATF stores and that are in the records of multiple-handgun purchases reported on an ongoing basis by FFLs as well as in records of guns reported stolen from FFLs. If the firearm does not appear in these databases, the firearm-tracing specialist contacts the manufacturer or importer and tracks the recovered crime gun through the distribution chain to the first retail-sale dealer. If the dealer, wholesaler, or manufacturer is still in business, the dealer is asked to examine its records to determine the identity of the next busi-

[1] Note that, while the Tiahrt amendment (P.L. 109-108) restricts ATF from publishing and sharing data with other agencies, the trace data are available to ATF analysts for searching for suspicious patterns and for strategic planning.

ness transaction involving the firearm. The objective is to trace the firearm through the chain of commerce to the first-time retail purchaser. At each stage in the tracing process, information is entered into FTS, an NTC-maintained database system that manages all firearm-trace requests, multiple-sale records, and firearms reported stolen from FFLs that are submitted to and processed by the NTC (Pierce and Griffith, 2005).

The administrative challenges of managing a national firearm-tracing system are significant. The tracing process requires NTC to communicate and interact with many different private- and public-sector businesses and agencies from across the nation. In addition, for the public sector, NTC must interact with agencies at the federal, state, and local levels of government.[2]

To meet these complex administrative challenges, over the past 15 years, ATF has implemented information-technology systems to improve the management of firearm-trace data, manage NTC operations more efficiently, and facilitate the acquisition of firearm-trace data from law-enforcement agencies and private businesses.[3] ATF has made significant strides in facilitating the submission of a firearm-trace request to NTC from law-enforcement agencies and also in conducting and receiving information on firearm traces from firearm dealers and manufacturers. Currently, ATF provides five methods for law-enforcement agencies to submit firearm-trace requests, including fax, mail, and preferred electronic-submission methods. The far less labor-intensive electronic-submission methods include batch uploading of trace requests, the Electronic Trace Submission System (ETSS), and, most recently, an Internet browser–based submission system, eTrace (Pierce and Griffith, 2005).

The batch-uploading firearm-trace request enables law-enforcement agencies that store their firearm-trace–request data on their own computer systems to routinely export batches of firearm-trace requests to NTC for processing via the Internet. This method is most useful for larger law-enforcement agencies that have information-technology expertise on staff.

The ETSS enables law-enforcement agencies to submit and retrieve trace-request information with NTC using an easy-to-understand graphical interface that helps to standardize and simplify the submission of firearm-trace data. However, the ETSS application requires a participating agency to load ETSS client software onto at least one of its computers to use the system. Although this is a modest technical task, it can be a barrier to the use of this and other systems by some law-enforcement agencies (Pierce and Griffith, 2005).

The eTrace system eliminates almost all technical barriers to the submission of firearm-trace requests. The eTrace system is an Internet-based application that enables law-enforcement agencies to submit firearm-trace request information using standard Web-browser technology. A law-enforcement agency needs only the proper authorization and authentication and a com-

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[2] In the process of conducting traces for requests submitted by law-enforcement agencies in 2003, NTC communicated with approximately 700 different firearm manufacturers, 46,000 separate retail and wholesale firearm dealers, and 6,500 individual law-enforcement agencies or units. In addition, information was collected on 203,933 crime-gun possessors (Pierce and Griffith, 2005). During fiscal-year 2005, NTC received more than 265,870 firearm-trace requests from law-enforcement agencies (ATF, 2005). During 2005, the average time for completing a trace was 9.65 days, although traces identified as urgent were typically completed in less than 24 hours (ATF, 2005).

[3] Since 1998, FTS has run on an Oracle® database and application platform that provides a user interface and a faster system-response time (compared to the former mainframe database) and a lower user learning curve for NTC tracing specialists and other support personnel (Pierce and Griffith, 2005). In addition, ATF has also developed the Trace Operations, Workflow, and Reporting System (TOWRS), which has eliminated many redundant and time-consuming tasks that were required of trace personnel under earlier systems (Pierce and Griffith, 2005).

puter with access to the Internet to use eTrace. Essentially, the technical costs of participation have been dropped to near zero. Importantly, eTrace employs an easy to understand graphical Web environment that (like ETSS) helps to standardize and simplify the submission of firearm-trace data. The overall focus of the eTrace system is to enhance its users' efficiency and reduce their workload, improve the quality and accuracy of data submitted, and provide for a technically secure exchange of firearm-related information between agencies and NTC (Pierce and Griffith, 2005). As of 2005, more than 400 law-enforcement agencies were using this method, and an additional 793 were in the process of acquiring access (ATF, 2005).

The final phases in the firearm-tracing crime-analysis process consist of generating relevant strategic and investigative analyses from the tracing process and disseminating that information to relevant law-enforcement actors, such as local ATF offices, CalDOJ, and local police-department investigators and detectives. Information analysis and dissemination are combined here because it is often the case that the same staff and information systems are at least partially involved in sets of tasks.

ATF's current process for tracing crime-related guns is effective but limited by the fragmentary and stove-piped nature of its various data sources. ATF and other relevant agencies lack the ability to look easily and quickly across all of these data sources to generate leads and highlight patterns of interest. The FTPA workstation developed for this project was intended to address this need by placing this ability to look for patterns across disparate data sources onto the desktops of agents and analysts searching for signs of illegal firearm transfers and trafficking.

The FTPA workstation, developed over the course of this project, was designed to facilitate the analysis and dissemination of strategic and tactical firearm-trace information. The workstation is intended to address two important law-enforcement needs: (1) to identify patterns of potential firearm trafficking and other suspicious activities and (2) to minimize the training and technical expertise required to obtain this type of intelligence. It was designed to operate as an application within ATF's overall firearm-tracing and crime-analysis processes. It was intended to expand the type of analytic capabilities becoming available via ATF's eTrace system and its older Online LEAD system. Specially, FTPA was designed to expand the ability to perform pattern-analysis searches of firearm-trace data.

The FTPA system was field tested in the SCRCGC in Los Angeles. The field test enabled us to examine how ATF analysts used the system to generate potential leads and also how investigative leads generated from the analysis of firearm-trace data can be integrated with other law-enforcement intelligence sources and data to produce more comprehensive analyses. The FTPA system was assessed in terms of its own functionality and in terms of its operation within the SCRCGC context.

SCRCGC, along with six other regional crime-gun centers, evolved from the need to develop trained analysts for the purpose of analyzing the significant volumes of data on firearm-related crime and criminals in and out of California. SCRCGC's origins laid in ATF's efforts in the 1990s to develop a nationwide comprehensive firearm-tracing and -analysis capability and President Clinton's YCGII. The YCGII program, announced in 1996, brought together federal, state, and local law-enforcement officials to improve information about the illegal

sources of guns recovered from criminals and to use that information to strengthen enforcement efforts to reduce firearm violence.[4]

The Firearms Trace Pattern Analysis Software Tool

The purpose of the FTPA software is to highlight patterns in firearm-trace data and flag indicators of criminal activity. It does this by organizing these patterns into a form that is more accessible to investigators and analysts.

The FTPA system consists of five components: (1) a data warehouse that integrates information from different individual database tables within the FTS system, as well as—from other databases within ATF—(2) data cleaning; (3) development of indicators of potential firearm trafficking, other suspicious behaviors, and characteristics of illegal firearm markets; (4) an interface allowing analysts and investigators to select indicators to identify potential patterns of firearm trafficking or other suspicious behaviors; and (5) a customizable reporting system for suspicious patterns that investigators have identified. To facilitate ATF-user interaction, the FTPA system's user interface was designed to look and feel like that of eTrace.

The FTPA system incorporates data from FTS as well as ATF data on licensed firearm dealers. For each traced firearm, the data include information on the FFL that sold the firearm, the initial purchaser of the gun, and the circumstances surrounding law enforcement's recovery of the gun (where the gun was recovered, who was in possession of the gun, associates of the gun's possessor, and any criminal activity associated with the gun and its recovery). Appendix A contains a dictionary of the trace data that the FTPA system incorporates. The FTPA system also performs standard data preparation and data cleaning. While data cleaning is appropriate for analysis, the original versions of data elements need to be maintained in their initial form for evidentiary purposes.

Once FTPA cleans and prepares the data, it constructs indicators of potential firearm trafficking, other suspicious behaviors, and characteristics of illegal firearm markets from selected ATF firearm-trace–related data attributes. The original identification of these indicators evolved from interviews and observations of expert law-enforcement investigators and crime-gun analysts and through more-standard forms of statistical analyses and database mining of firearm-trace data (Pierce, Braga, Hyatt, and Koper, 2004; Pierce, Briggs, and Carlson, 1995; Braga, Kennedy, et al., 2001; Wintemute, Cook, and Wright, 2005). One California-specific indicator, the gun not being registered in AFS, is included simply because it defines the occurrence of an additional offense, since all guns in California should appear in AFS.

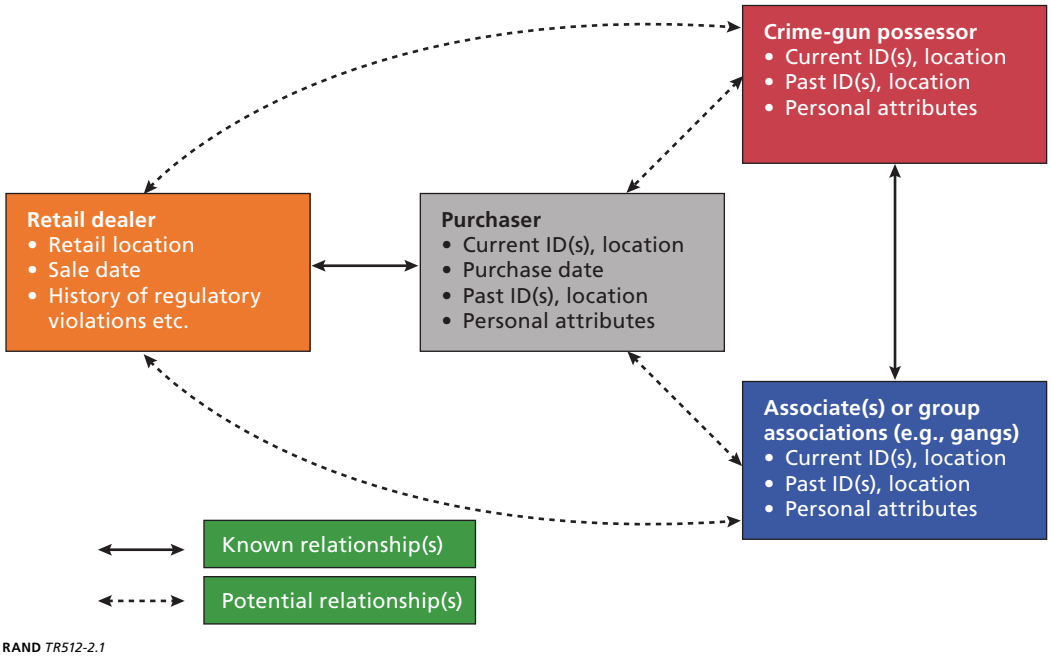
The interview-and-observation approach was essentially a process of reverse engineering the experience of top-level ATF investigators and analysts. The purpose of this process is to identify the types of intelligence and information for which operational personnel look in electronic databases and paper records when conducting inspections and investigations. The reverse-engineering approach explicitly recognizes the critical and unique value of the experi-

[4] John (1999). The YCGII program was designed to collect, analyze, and disseminate information on thousands of crime-related firearms recovered by law-enforcement agencies in 17 high-crime U.S. cities with more than 200,000 inhabitants. The program subsequently expanded to cover 56 such cities by 2002. The YCGII program was designed to serve all branches of law enforcement regarding the identification, investigation, and prosecution of firearm-trafficking activities that aided and abetted underaged youths and violent criminals. See also Bureau of Alcohol, Tobacco, and Firearms (2002).

ence and knowledge driven in the field. We believe that the qualitative input from investigators and analysts, complemented by statistical analyses, is essential to ensuring that we derive benefit from and actually institutionalize the best analytic methods and insights that have been developed over the course of many conventional analyses and investigations. Selected indicators incorporated into the workstation were found to be statistically significant determinants of time to crime (Pierce, Braga, Hyatt, and Koper, 2004).[5] Traced guns with purchasers associated with multiple crime guns and guns shelved for a long time are likely to have short time-to-crime. The list of trafficking and suspicious behavior indicators that are presently incorporated into the FTPA system are listed in Appendix B. Figure 2.1 provides a graphical representation of the major types of relationships for which trafficking indicators are available in the FTPA workstation.

The FTPA system allows analysts and investigators to choose indicators to identify potential patterns of firearm trafficking and other suspicious behaviors. The indicators can be selected via drop-down lists that hide queries to the FTPA database, requiring the user to have knowledge only of how to navigate a standard Web-browser interface. The identification of potential indicators provides the FTPA workstation with a pattern-analysis capability. Pattern analysis allows law-enforcement analysts and investigators to search firearm-trace data (on guns recovered in their jurisdiction) for suspicious patterns that might be indicative of firearm trafficking or some other illegal activity. The FTPA workstation provides investigators and analysts with the ability to perform custom queries on selected criteria (e.g., on whether a gun was recovered

Figure 2.1
Known and Potential Relationships Available from Firearm-Trace Data



[5] Short–time-to-crime guns are of particular interest because they are often easier for ATF to build cases, since the evidence is fairly new and short time to crime may itself be indicative of an organized effort to obtain a crime gun through straw purchasing or off-the-books exchange with a gun dealer.

during a short period following its original sale) with a minimum of training and technical skills. The pattern-analysis capabilities of the FTPA approach is designed to complement the case-specific search capabilities of data currently available to law-enforcement investigators through Online LEAD.

Finally, the FTPA system was designed to provide a flexible interface that can generate customized reports on identified suspicious patterns. To do this, the system allows investigators and analysts to select what variables they would like to include in the analysis. Appendix A presents the full list of attributes that can be selected. A customized selection of attributes is important simply because analysts and investigators may have different information needs or their needs may change depending on the nature of an investigation or analysis.

The FTPA workstation (1) enhanced integration of information from different individual database tables within FTS, as well as, from other databases maintained by ATF and CalDOJ (e.g., cross-references to ATF's FFL-applicant file, CalDOJ's AFS and to firearms reported stolen; (2) helped standardize and normalize firearm-trace data (in particular, providing cleaner geographic information); (3) identified and developed indicators of potential firearm trafficking and other suspicious behaviors as well as characteristics of illegal firearm markets; (4) developed an easy-to-learn interface that enables analysts and investigators to select indicators of potential firearm trafficking and other suspicious behaviors; and (5) developed an easy-to-learn and flexible interface that enables analysts and investigators to generate reports of traces based on potential trafficking indicators or other suspicious behavior. Although we did not produce measurements of investigative efficiency, SCRCGC staff reported that the type of interactive interface developed in the FTPA workstation significantly reduced the time and training required to analyze firearm-trace data.

SCRCGC staff also felt that, if the FTPA workstation's capabilities were integrated with ATF's eTrace system, it would enable a wide range of ATF investigators to perform advanced analyses and queries of firearm-trace data without the need for computer-programming support and without the need for extensive training. Information from other analyses of crime-related firearms recovered in Los Angeles before the restrictions of the Tiahrt amendment went into effect (P.L. 109-108) indicate that a significant percentage of firearms recovered in Los Angeles are associated with firearm-trafficking indicators of the type that are integrated in the FTPA workstation (see Pierce and Griffith, 2005).

A major limitation of the FTPA system, which was recognized when the system was designed, is that the data on the workstation were not regularly updated with the most recent firearm traces from NTC's FTS database. It would have been cost prohibitive to develop real-time capabilities into the prototype FTPA workstation. In an operational version, the query- and report-generation capabilities of the FTPA workstation (as well as other capabilities) would be linked directly into the FTPA system through a Web-browser interface.

The Southern California Regional Crime Gun Center (SCRCGC): The Crime-Analysis and Dissemination Process

We deployed the trace software at SCRCGC, which is responsible for reviewing firearm-trace requests from Southern California law-enforcement agencies and submitting those requests to NTC for tracing. In this role, SCRCGC checks the thoroughness and accuracy of firearm-trace requests from police departments throughout the state. In 2005, SCRCGC reviewed and

submitted 22,223 crime-gun traces (Torres, 2006). The value of the SCRCGC tracing and crime-analysis functions is its ability to systematically perform quality-control checks on submitted trace requests, identify trafficking indicators and other suspicious behavior in firearm traces that NTC has returned to the center, and, finally, to compile and disseminate relevant analyses to law-enforcement investigators regarding suspicious behavior.

Firearm-Trace–Request Data Quality Assurance

Incorporation of SCRCGC data-review protocols and procedures into ETSS and eTrace has helped ATF to institutionalize data quality in checking standards across law-enforcement agencies nationally that use these methods to submit firearm-trace requests. Further, incorporation of data-quality standards and procedures into eTrace reduces the training requirements normally associated with submitting firearm traces, as the data standards provide online guidance and data checking for selected potential data problems. Because eTrace is a Web-enabled application, it is feasible to anticipate a significant increase in the number of law-enforcement agencies using the eTrace submission method in the not-so-distant future.

Investigative Lead Generation

Upon completion of NTC's tracing process, trace results along with the original information submitted in the trace request are available to SCRCGC for analysis. At this point, SCRCGC firearm-crime analysts can begin looking for potential indicators of firearm trafficking in the data, such as traces with very short time to crime, purchasers with multiple firearms traced to them, and dealers located far from a recovery location but whose firearms have short times to crime.

The crime-gun center has used several firearm-trace query and analysis applications to facilitate the identification of potential firearm trafficking, including the FTPA system.[6] During the study period, 2003 to 2006, SCRCGC employed four different firearm-trace–analysis applications to help identify instances of potential firearm trafficking or other suspicious behavior. These applications included an R:Base database-analysis system, Oracle Discoverer® Web-based querying tool, the interface of Tipster in conjunction with Oracle Discoverer, and the FTPA application. Table 2.1 gives an overview of the information systems used in the trace-submission and lead-generation process.

Additional FTS query capabilities are also available to SCRCGC analysts through eTrace and Online LEAD. Currently, ATF's Online LEAD and eTrace systems enable analysts and agents to perform case-specific searches on various data fields in the NTC databases (e.g., suspect names or other identifiers, addresses). These systems also provide some support for

[6] Just over a decade ago, firearm investigators typically had little or no direct access to firearm-trace data stored in ATF's FTS. Without direct access to the FTS data, as well as other firearm-related information managed by ATF, some regional ATF offices created local stand-alone databases of firearms recovered in their regions (see, for example, Bureau of Alcohol, Tobacco, and Firearms and Boston Police Department, 1994). Although such projects went through the inefficient process of having to reenter trace data into their own databases and were restricted to viewing only information collected within their own jurisdictions, they helped demonstrate the value of these data for developing investigative leads. To facilitate access to firearm-trace data, ATF developed a case-specific search (e.g., search on firearm purchaser or possessor name) query application, LEAD, which operated on a stand-alone computer and required frequent data imports from FTS. In the late 1990s, with the universal availability of the Internet, ATF migrated the LEAD application to a Web-enabled system tied directly to NTC, Online LEAD. However, Online LEAD did not support pattern-based searches of FTS trace data.

Table 2.1
Overview of Firearm-Trace Query and Analysis Tools

System	Features and Capabilities
Project LEAD	Early version of Online LEAD
Online LEAD	Allows case-specific searches (e.g., searches on firearm purchaser or possessor name). Operates on a stand-alone computer and requires frequent data imports. No support for pattern-based searches of trace data.
eTrace	A browser-based system that allows authorized law-enforcement agencies to submit firearm traces to NTC and receive firearm-trace results. A user can search a database of those firearm traces submitted by his or her agency. Incorporates some pattern-analysis capabilities for traces, such as short–time-to-crime cases.
R:Base	Early querying tool with features that were migrated into the Oracle Discoverer application.
Oracle Discoverer	A general-purpose Web-based querying application. ATF analysts using Discoverer have direct access to the trace data. Many querying and analysis capabilities, but requires several days of training to learn the system.
Tipster	Displays the output from specific queries to the trace data in a user-friendly data sheet. Produces trace reports based on indicators: short time to crime, underage possessors, female purchasers and male possessors, firearm purchased out of state, suspect trace status, restored firearm serial number, handgun not in the California AFS, and multiple traced guns associated with the same purchaser. Directly accesses the data at NTC.
FTPA	Designed to have a similar look and feel to that of eTrace. Little cost for adopting, deploying, or learning the system. Comprised of (1) a data warehouse that integrates information from different individual database tables within FTS and other ATF databases, (2) data cleaning, (3) development of indicators of potential firearm trafficking, (4) a user-friendly interface that allows analysts and investigators to flag patterns indicative of firearm trafficking, and (5) a customizable report-generating system that can report on approximately 100 firearm-trace–data attributes.

identifying a limited number of potential indicators of firearm trafficking in FTS data (e.g., short–time-to-crime traces).

Julius Wachtel, former ATF supervisor and pioneer in the early detection and investigation of illegal gun markers, developed the R:Base system. This system implemented a set of firearm-trace indicators using local or regional trace data. In 2004, the query techniques available in R:Base were migrated into Oracle Discoverer, a Web-based querying and analytic application that directly accesses FTS. Wachtel also developed Tipster (Wachtel, 2003), which displays the output from specific queries to FTS in a user-friendly data sheet. Currently, the Tipster application produces trace reports based on eight different indicators: short time to crime, underage possessors, female purchasers and male possessors, firearm purchased out of state, suspect trace status, restored firearm serial number, handgun not in the California AFS, and multiple traced guns associated with the same purchaser.

The Tipster/Oracle Discoverer system has demonstrated the importance of the availability of up-to-date firearm-trace information for crime analysts, the utility of searching firearm-trace data using indicators of potential firearm trafficking and the importance of providing information to analysts in an easily understandable format. The eTrace and Online LEAD each demonstrate the utility of real-time (or close to real-time) access to ATF firearm-related data to law-enforcement crime analysts and investigators.

The FTPA is a Web-enabled system that provides investigators and analysts with a much wider range of potential indicators of firearm trafficking and other potentially suspicious behavior patterns from which to select than do other analytic applications presently available.

Further, these patterns can be selected in different combinations with one another.[7] The system is designed to allow analysts and investigators the ability to focus on particular crime-gun–recovery regions. Other components of the FTPA system contribute to its potential utility to law-enforcement investigators and crime analysts. First, the FTPA system integrates information from several different ATF firearm-related databases into one analytic data warehouse. Through a standard Web-enabled browser interface, the FTPA system allows analysts and investigators to select and change a broad range of firearm-trace attributes that can be included in their analytic output. The Web interface also enables analysts to select from a broad set of indicators of potential firearm trafficking to generate analytic reports on trace data that meet a particular indicator or combination of indicators with which to search the FTPA data warehouse. Finally, the system provides customizable report output.

The major limitation of the FTPA in its current form is that, as a prototype system, it does not have a direct link to ATF firearm databases (and thus must receive periodic data updates from ATF). Also, the system's data-cleaning procedures and the construction of its indicators are not dynamic, which they would be in an operational version of the system. An operational version of the FTPA system, which would also include lessons learned from the work on other query applications used by ATF, could integrate these capabilities into a single ATF Internet portal for use by authorized crime analysts and law-enforcement investigators. The Tiahrt amendment (P.L. 109-108), though, limits local law enforcement's access to trace data in other jurisdictions and their ability to share these data with other agencies.

According to SCRCGC personnel and other ATF staff, the demand for investigative applications that operate with the same ease of use as their home computers increased as agents and investigators have become more familiar with standard computers and Internet applications. In addition, discussions also indicate that agents and investigators may wish to customize their own queries and reports and to have the ability to generate leads at their desk, based on the dynamics of their ongoing investigations. The FTPA system combined many of these functions into a Web-browser portal. If integrated with ATF's firearm databases and incorporated into the eTrace module, it would provide ATF with an expanded eAnalysis feature for the existing eTrace system. This would, in a sense, create a form of one-stop shopping for law-enforcement agencies seeking to submit or analyze firearm-trace data. Discussions indicate that this type of approach would significantly ease the deployment of analytic capabilities authorized to law-enforcement investigators and, at the same time, would reduce the level of training required for agents to effectively use the system. Prior to the development of the FTPA system, there were no advanced intelligence-driven information systems uniquely designed for investigators and criminologists at the local level, those individuals whose primary role was to mine databases to discover complex trafficking indicators in a particular city or region.

The Investigation-Referral Process

Once indicators of gun trafficking and suspicious patterns are identified in the firearm-trace data, crime analysts develop a referral information packet for transfer to law-enforcement

[7] Discussions with ATF personnel note that cross-accessing data is a major challenge. The data-warehouse component of the FTPA system integrates information extracted from ATF's FTS database, interstate theft, suspect gun, and multiple-sale database and others that are not all simultaneously accessible using any of ATF's standard query applications. The impact of deploying such a tool, which could tap vital existing ATF data from numerous sources, could reduce investigative time and increase productivity by more effectively identifying dealers and suspects whom ATF deems problematic.

investigators. This referral packet includes a narrative that includes specific details regarding the circumstances surrounding the seizure of the firearm, additional recoveries or purchases by the suspected straw purchaser, criminal history, and printouts from databases with relevant information. The printouts and other relevant information include link and spatial-analysis charts and tables, police reports, printouts from the firearm-trace summary and AutoTrack (a public-record database), state-based gun-registration information (if available), and the history and status of the FFL involved in the transaction (Wachtel, 2003). Details that suggest a relationship between parties associated with the recovered firearms are included. The referral is also entered into the Treasury Enforcement and Communication System (TECS) and N-Force (Wachtel, 2003, p. 12). Accompanying each packet is an investigative-database checklist (Appendix D), which informs the investigator of all automated and nonautomated databases that had been checked, documenting both the positive hits and negative results.

In the process of developing investigative-referral packets, analysts draw on a broad range of law-enforcement and public-sector databases. AutoTrack is a national subscription database used for investigating fraud, conducting criminal and civil investigations, locating witnesses, finding covert individuals, or locating and verifying assets. Cal/Gang® is a California database that includes information on individuals who meet a stringent criterion for gang affiliation in California. The criminal-justice information system provides DMV licensing photos and records used in most gun purchases, firearm registration, FBI's National Crime Information Center (NCIC) data, federal and local warrant information, and criminal histories. The Financial Crimes Enforcement Network (FinCEN) provides an analysis of businesses and individuals. FIRES is an application that allows users to print out an exact copy of NTC's firearms-trace summary results on all traced firearms. Lexis/Nexis® is a nationwide subscription service used to query numerous databases containing court rulings, bankruptcy filings, criminal- and civil-litigation information on individuals, and information on businesses and their principal owners. N-Force and N-SPECT are the ATF's case-management databases used by its agents and inspectors to collect, disseminate, manage, and analyze data for criminal investigations in its regulation of the firearm industry. TECS is a national law-enforcement database used by most departments under the U.S. Department of the Treasury for investigative case management; tracking the movement of domestic and foreign nationals in and out of the United States; tracking U.S. Customs and Border Protection information regarding border crossings; and monitoring U.S. currency, people or goods, and services.

Depending on the type of suspicious behavior identified in trace data, the referral packets are organized into one of several different types of referral reports. *Interstate or international referral reports* are produced for traces with potential firearm trafficking associated with activity from out-of-state suspects. These reports contain information about other state purchases and guns recovered in foreign countries but that were purchased in California. *Intrastate referral packets* focus on trafficking indicators and activity that is specific to California. Currently, several trafficking-indicator reports are produced and include those reports consisting of guns with short time to crime (usually for 90 or 180 days) and female purchasers and underage crime-gun possessors. The last two reports indicate potential straw purchases, although the underage gun possessors could indicate misconduct by an FFL. Finally, *FFL-licensee trafficking-indicator reports* are also produced. These reports are about nonresponsive FFLs and DROS failures. DROS failures indicate a lack of recordkeeping on guns sold by a California-based dealer. However, California has automated only the past 10 years of transactions involving handguns, assault rifles, and secondhand sales into its AFS.

Over the 2003 to 2006 period, the SCRCGC analyses and part-time support staff generated 100 trace-initiated referrals (see Table 2.2). These were referrals based on trace-recovery information using the available trace-analysis applications. SCRCGC staff also initiated case referrals based on trace-recovery information for 19 ongoing ATF cases between 2003 and 2006. Considering that firearm recoveries often take place after a case has been opened, even between court dates, these additional recoveries and subsequent analysis can be helpful in furthering the case. In addition to providing SCRCGC with initiated trace analyses, SCRCGC staff also responded to law-enforcement requests to develop case-support materials for intelligence initiatives or to support case prosecutions. This could involve developing case materials, such as timeline charts that illustrate purchase and recovery activity and supplemental suspect information.

SCRCGC also responded to ten requests for analytic support from ATF industry operations (IO). These requests are the result of inspections made by an ATF IO inspector at an FFL and stem from the inspector's observation that there may be criminal activity taking place at the FFL in question. SCRCGC validates the information in the IO referral and, if appropriate, generates a referral package on all parties involved. SCRCGC analytical staff generated 13 referrals based on the entries in the Los Angeles ammunition-purchase records, but this activity was concentrated solely in 2004. Finally, SCRCGC staff generated firearm-trace analyses for referrals that came from other sources, such as telephone tips or NTC referrals.

Table 2.2 also shows that, by far, the greatest level of firearm-trace–initiated referrals occurred in the first two years of the 2003 to 2006 period. Indeed, the number of referrals declined from 49 in 2003 to 33 in 2004 and to 14 and 4 in each of the subsequent two years. A major factor in this decrease was the reduction in analytical support staff responsible for developing and preparing reports. The staffing level in SCRCGC fell steadily through this period. At the beginning of the period, in 2003, there were two full-time and one part-time SCRCGC analysts assigned to the lead-generation and support process. In 2005, the level of support fell to one full-time analyst for a full year and one full-time analyst for about eight months, along with a part-time data-entry staff person for entering ammunition-log data. By 2004, the level of staffing had dropped to one full-time analyst for the full year and one part-time analyst for four months. Finally, by 2006, there were no analysts assigned to the lead-generation process, and activities that did occur were supported by staff assigned to other tasks. Although no analysts are now searching for leads, the information systems now in place have the potential

Table 2.2
SCRCGC Firearm-Trace–Initiated Investigations and Investigator-Support Activities, 2003–2006

Referral Year	Trace-Initiated Investigation	Trace Support for Investigations	Case-Support Requests	Industry Operational Requests	Ammunition Log–Initiated Investigation	Other Referral Sources	Total
2003	49	2	2	0	0	8	61
2004	33	3	0	0	13	11	60
2005	14	13	3	1	0	0	34
2006	4	1	1	9	0	5	20
Total	100	19	6	10	13	24	175

to make every agent an analyst, give agents the capability to track issues that they sense are emerging, and encode resulting indicators so that they are propagated throughout ATF.

Summary and Conclusions

In support of SCRCGC, we deployed FTPA, a system (software and workstation) designed to facilitate the analysis and dissemination of strategic and tactical firearm-trace information. The FTPA workstation encodes the knowledge of expert ATF crime-gun investigators as well as indicators of short–time-to-crime guns found in the literature. With these indicators encoded in the workstation, analysts can quickly flag patterns of potential firearm trafficking and other suspicious activities. The software minimizes the training and technical expertise required to obtain this type of intelligence.

Three critical issues limited the software's initial success. First, the system was not directly connected to ATF's NTC databases and worked off of periodically updated data files. This limited ATF's ability to develop "fresh" cases. Second, FTPA was not accessible outside of the gun center. Transforming the system into an online tool would not be complicated, given that it is already developed with a Web-browser interface. Third, early success at generating case-referral packets dissipated when ATF cut staffing of crime-gun analysts. If the first two issues are resolved, analyst staffing will become less of an issue. Instead, analysis of fresh data would be accessible to all field offices, central analysts at NTC, and potentially even local law-enforcement gun-investigation units.

While the project produced a prototype with these limitations, the system is nearly ready for large-scale release.

CHAPTER THREE

New Gun-Buyer–Notification Program

Introduction

Once the FTPA workstation was deployed, our workgroup began a process to highlight important crime-gun–trafficking indicators and to develop an intervention to reduce the supply of illegal guns in the target areas of Los Angeles. For example, one such indicator that investigators proposed is whether the possessor's sex differed from that of the original purchaser. This indicator can suggest that a male who is prohibited from legally purchasing a firearm is using a girlfriend, wife, or other associate to make a straw purchase. However, once we compared the rate at which this occurred to the rate at which females in the DROS database legally transferred a firearm, we found that they were statistically independent events. Therefore, an initiative aimed at a broader population would be necessary to disrupt straw purchasing.

We used FTPA, other information systems, and data from SCRCGC to identify two types of sources of illegal guns. These are point sources (ongoing diversions through scofflaw dealers and trafficking rings) and diffuse sources (acquisitions through theft and informal, voluntary sales) (Braga, Cook, et al., 2002). Point sources of illegal firearms were addressed through SCRCGC case referrals made to several other gun-violence–prevention activities in Los Angeles. One of the larger initiatives was PSN, a DOJ program that provided $1.5 billion nationally to fund local programs to reduce gun crimes through prosecution, outreach, firearm safety, and police training. Analysis of the SCRCGC data was also shared with the PSN group, and the analysis motivated many of the demand-side strategies that PSN adopted.

In addition, ATF fielded the Armed Criminal Enforcment Study (ACES) West, a task force that brought additional ATF field agents to Los Angeles to partner and work within the LAPD divisions most affected by gun violence. Though our analysis was certainly instrumental in demonstrating the need for additional resources in the 77th Street area, our analysis did not directly affect the sort of activities (buy-bust operations, serving search warrants on suspected gun traffickers) undertaken by the ACES West task-force members. Similarly, several LAPD officers had been cross-designated as ATF agents and were collocated in offices shared with ATF field agents. These cooperative arrangements began during our project and are ongoing. The primary function of these units is to investigate suspected gun traffickers, including rogue FFLs.

Given the geographic scope of Los Angeles and the modest resources of the project and the partners (ATF, LAPD), the interagency working group selected LAPD's 77th Street policing district as a manageable geographic area, where it would be possible to conduct targeted interventions. Not only did the 77th Street area face serious levels of gun violence, it was also part of the PSN target area.

Our analyses of recovered crime guns suggested that gang members and serious criminals in the 77th Street area were acquiring many of their illegal guns through diffuse sources. The interagency working group examined the results of our gun-market analyses and, based on their collective investigative experience, suggested that the local nature of the market was driven by prohibited possessors who were having local friends or family members conduct straw purchases for them. As such, the working group organized a letter-campaign intervention that attempted to deter these small-scale straw purchasers from illegally transferring their firearms to others without filing the necessary paperwork with the state.

Gun Violence in LAPD's 77th Street Area

The 77th Street area police serve a population of approximately 175,000 in a 12-square-mile area. Though traditionally a black community, according to the 2000 U.S. Census, Hispanics now represent a slight majority of the population (54 percent). This area is characterized by many social ills including concentrated poverty, single-female–headed households, high unemployment, and violent crime. Among the 18 LAPD policing areas, the 77th Street area consistently ranks first or second in the number of total homicides, with African-Americans being overrepresented among homicide victims and offenders in the area. Gang rivalries provide the impetus for the majority of lethal violence.

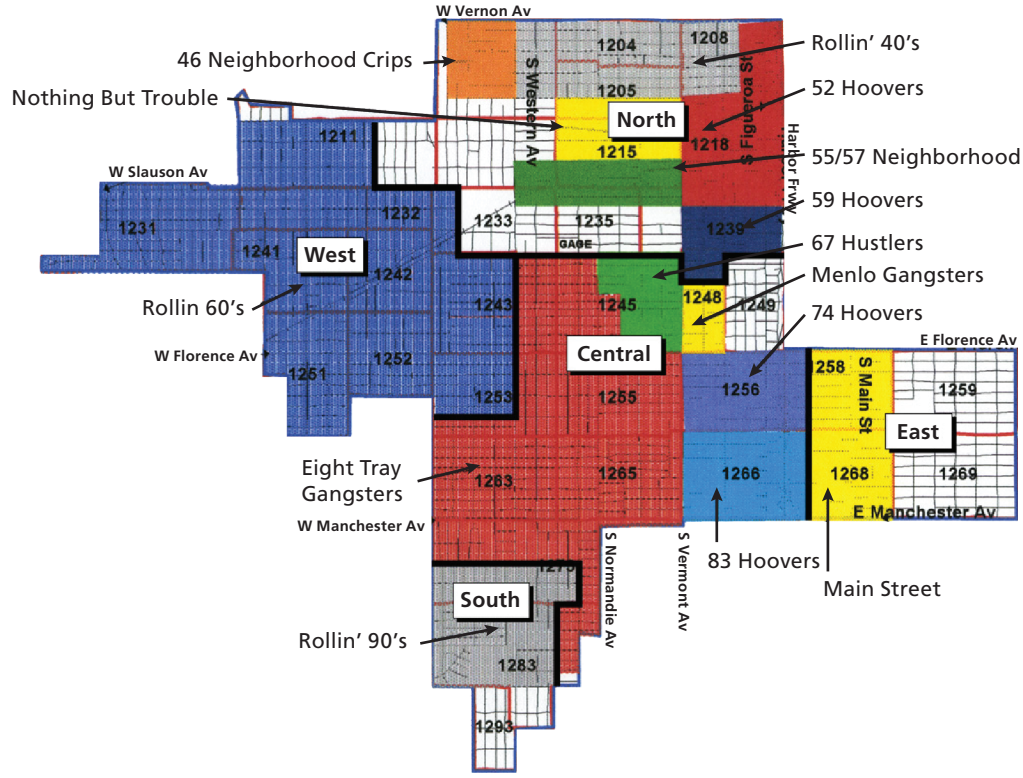
The local 77th Street community has a long history of being the home for many urban street gangs, both black and Latino. The gangs, for the most part, are racially and ethnically homogenous, and the vast majority of violence occurs between gangs of the same racial or ethnic background. The black gangs are split between Blood and Crip gangs, with the Crip gangs being, by far, the most numerous in the area. There are approximately 20 Crip gangs in the 77th Street area, three Blood gangs, and four Latino gangs. Bloods, Crips, and Latino gangs are not each confined to a certain portion of the 77th Street area but rather are spread throughout. Gang detectives provided maps of the gang territories (see Figures 3.1 and 3.2).

The 77th Street area is the most violent section of the city, as measured by the commission of aggravated assaults. For each year from 1998 through 2005, the 77th Street area had the highest number of aggravated assaults (LAPD, 1999, 2000, 2001, 2002, 2003, 2004a, 2004b, 2005, 2006). Similarly, for the same period, the area led the city in total number of homicides every year except 1999, 2000, and 2003; during those years, the 77th Street area was second (Table 3.1).

Demography, Gangs, and Guns

Tita, Hiromoto, et al. (2004) completed a review of homicide files in the 77th Street area as part of the design and implementation of gun-violence–reduction strategies. Examining data from 1998 through 2003, they found that, consistent with most other urban areas, males, blacks, and gang members were overrepresented as victims and offenders (Table 3.2). Moreover, 91 percent of homicides in the area involved firearms. As noted previously, Latinos rather than blacks are now a majority in the area, but blacks comprise the large majority of homicide victims and offenders. Though law-enforcement estimates of the total number of gang members in the area were unavailable, we are confident that they comprise nowhere near the proportion of the total population that they comprise of homicide victims and offenders.

Figure 3.1
77th Street–Area Crip Gang Territories



SOURCE: Los Angeles Police Department data.

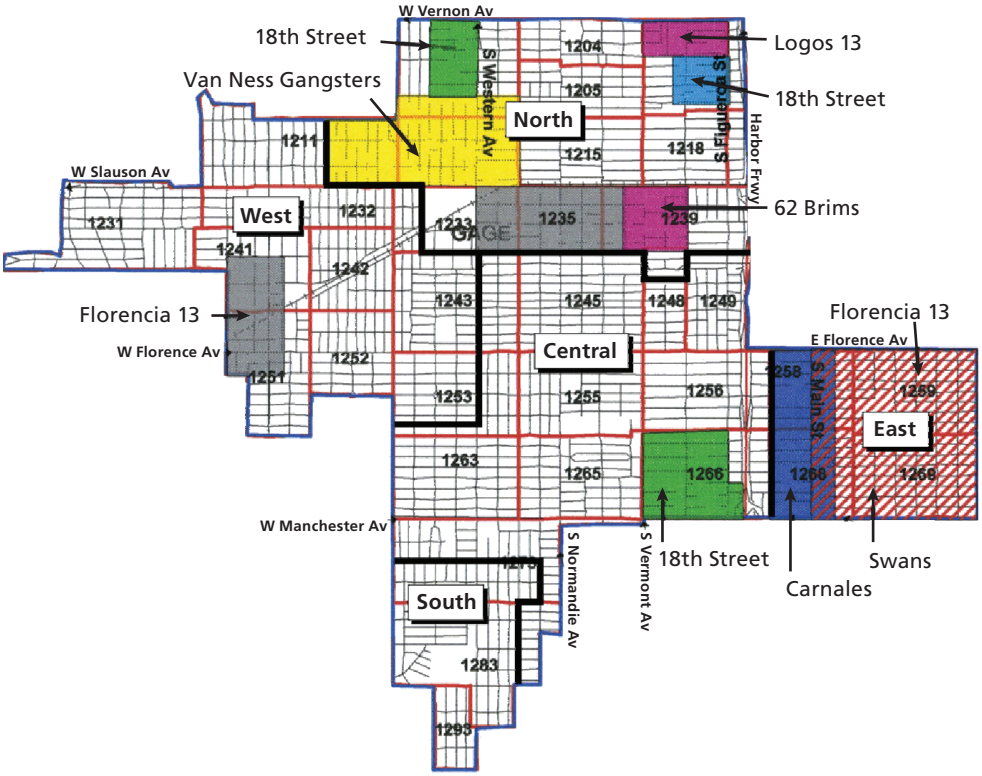
RAND *TR512-3.1*

Motives

"Gang-motivated" homicides, homicides related to intergang rivalries or intragang conflicts and strictly limited to gang issues, comprise most homicides in the area (Table 3.3).[1] "Arguments" are the second most frequent motive for homicides. These typically result from the escalation of a verbal or physical conflict, such as barroom or gambling disputes or ongoing disputes between neighbors and acquaintances (but do not include homicides related to drugs, gangs, or domestic disputes). Drug-involved homicides were third most common. These included disputes over quality or quantity of drugs sold, collection of drug debts, killing of rival dealers, and robbery of drug dealers. Robbery homicides, those that took place during a crime in which the primary intent was to take property or money from a person or dwelling but not including those that may have been drug involved, were fourth most common. Domestic homicides, including those resulting from disputes among family members, were fifth most common. Homicides from still other motives comprised 4 percent of the total, while 9 percent of

[1] Gang-motivated homicides are considered to be exclusive from other categories in Table 3.2. If, for example, a gang member were involved in an argument not related to gang issues that led to a homicide, the homicide would be coded as being motivated by an argument rather than being gang motivated. Likewise, a homicide resulting from a robbery involving a gang member is considered to have robbery as its motive rather than being gang motivated.

Figure 3.2
77th Street–Area Blood and Latino Gang Territory



SOURCE: Los Angeles Police Department data.

RAND *TR512-3.2*

Table 3.1
Homicides and Aggravated Assaults in Los Angeles' 77th Street Area

	Homicide			Aggravated Assaults		
Year	N	Percent of City Total	Citywide Rank	N	Percent of City Total	Citywide Rank
1998	49	12.1	1	2,755	9.2	1
1999	50	12	2	2,743	9.3	1
2000	67	12.3	2	3,219	10	1
2001	83	14.1	1	3,377	10.3	1
2002	117	18	1	3,425	10.6	1
2003	66	13	2	3,186	10.5	1
2004	87	16.8	1	2,771	10.7	1
2005	73	15	1	1,882	12.1	1

SOURCE: Tita, Hiromoto, et al. (2004).

Table 3.2
Demographic Characteristics of Homicide Victims and Offenders

Characteristic		Victims	Offenders
Mean age[a]		28.9	23.7
Race or ethnicity (%)	Black	78	67
	Latino	21	19
	Other	1	0
	Unknown	0	14
Sex (%)	Male	86	86
	Female	14	3
	Unknown	0	11
Gang affiliation (%)	Member	39	58
	Nonmember	21	7
	Unknown	41	35

SOURCE: Tita, Hiromoto, et al. (2004).

[a] Estimated for offenders, whose exact age was not always known. If the offender's age category was known (e.g., "between 20 and 25"), the category median was used as the value in calculating overall mean.

Table 3.3
Homicides, by Motive

Motive	Number	Percent of Total	Percent Involving Gang Member[a]
Gang motivated	170	53	100
Argument	35	11	43
Drug involved	29	9	62
Robbery	24	7	46
Domestic	22	7	27
Other	14	4	21
Unknown	28	9	32

SOURCE: Tita, Hiromoto, et al. (2004).

[a] Includes victims for whom gang membership is suspected but not formally documented, as well as some listed as having an unknown gang affiliation in Table 3.2.

homicides had unknown motives. Even though nearly half of the homicides in the 77th Street area are not gang motivated, two in five of these homicides still involve a gang member.

Contrary to some community and law-enforcement perceptions, there is little evidence of a link between drug-market competition and intergang violence. Rather, the issues that lead to gang homicides usually involve respect or longstanding feuds. Gang members do sell drugs, and there is violence associated with this dealing. Nevertheless, homicides related to such violence are more likely to be from a drug deal gone bad than from a calculated decision of one gang to take over the market of another. Put another way, even if all drug dealing were

eliminated, there would likely be little effect on area homicides, given that less than 10 percent had a clear drug motive. Eliminating killing resulting from intergang rivalries, however, would reduce the overall number of homicides by more than 50 percent.

The Source of Illegal Guns Recovered in the 77th Street Area

To understand the dynamics of the local illegal gun market, we examined traces initiated from January 2002 through April 2003. During this period, local law enforcement recovered 1,477 firearms and submitted them to SCRCGC for tracing.[2] Of these recovered firearms, a successful trace was completed for 989. Incomplete information prevented us from analyzing the data from the additional 488 guns. This is admittedly a large number of untraceable guns, and it is plausible that these untraceable guns differ from the traceable guns in policy-relevant ways that cannot be observed. Though we would have liked to have more completed traces, SCRCGC's newness did not permit time for ATF to conduct extensive training of local law-enforcement agencies with respect to the types of data needed. Such training occurred during the course of the project. The ATF data included the address of the FFL who last sold the gun, the address of the last legal purchaser, and the address of the gun possessor (if different from the legal purchaser) at the time of crime or recovery.

The first aspect of the geography of the market we examined was whether guns were being purchased near to or far from the 77th Street area. Anecdotal evidence from local law-enforcement officers suggested that many of the crime guns were being purchased outside the state, especially at the gun shows held in Arizona and Nevada. Our analysis did not confirm this theory. Instead, we found that 670 of the 989 (67.8 percent) were purchased in California. While many of the remaining guns were purchased in Arizona and Nevada, we did not find any evidence that they were being purchased at gun shows. Furthermore, by examining the FFLs' names and addresses, we found that 253 dealers sold the 319 guns from outside California, though there is some evidence that a small number of dealers had a relatively large number of crime guns recovered in the 77th Street area (Table 3.4). ATF noted that the two dealers with eight and 14 traced guns were already under ATF investigation.

The Local Market

In addition, we looked at the distribution of dealers within the state. Not surprisingly, there are many more dealers who have had multiple traces come back to identify them as the FFL of record (Table 3.5). Still, 195 of the 242 dealers (81 percent) with traced firearms sold either one or two guns that ended up being traced. Discounting the large chain stores, which have only a single FFL address, 24 dealers had between four and 19 firearms traced back to them. Once again, some of these dealers were already known to ATF and in the process of being investigated.

We also looked regionally to find out how many of the guns recovered in the target area were originally purchased in, or immediately adjacent to, Los Angeles County. Of the 670 guns known to be originally purchased in California, more than 63 percent (n = 423) were purchased within this region of Southern California.

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[2] Coincidentally, for roughly the same period, DROS data showed that approximately 1,500 legal purchases of firearms were transacted by individuals living within the ZIP® codes of the targeted area.

Table 3.4
Distribution of the Number of Crime Guns Recovered in the 77th Street Area Traced to Dealers Outside California

Traces	Dealers with That Number of Traces
1	223
2	21
3	3
4	2
6	2
8	1
14	1
Total	253

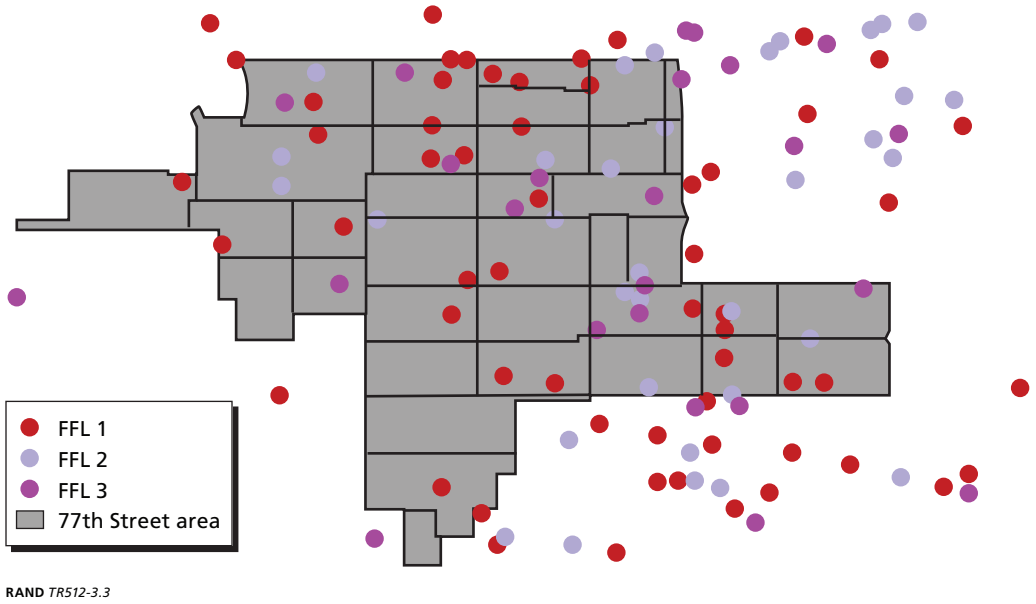
Table 3.5
Distribution of the Number of Crime Guns Recovered in the 77th Street Area Traced to California Dealers

Traces	Dealers with That Number of Traces
1	164
2	31
3	19
4–9	16
10–19	8
29	1[a]
63	1[a]
Total	240

[a] Chain stores with multiple sites.

Finally, we looked at whether certain gangs might have preferred doing business with a particular FFL. One might expect that members of rival gangs would not purchase their firearms from the same licensed dealer. Though the purchaser and possessor data contain no information on gang affiliation, it is reasonable to expect that, if certain gangs did favor one FFL, purchases from that FFL would be concentrated within the territory of the particular gangs. However, no such pattern was found—the purchase of recovered and traced guns made at the three most common FFL sources of crime guns were randomly scattered throughout the area (Figure 3.3).

Figure 3.3
Spatial Distribution of the Recovery Location of Guns Purchased by Common FFL Sources



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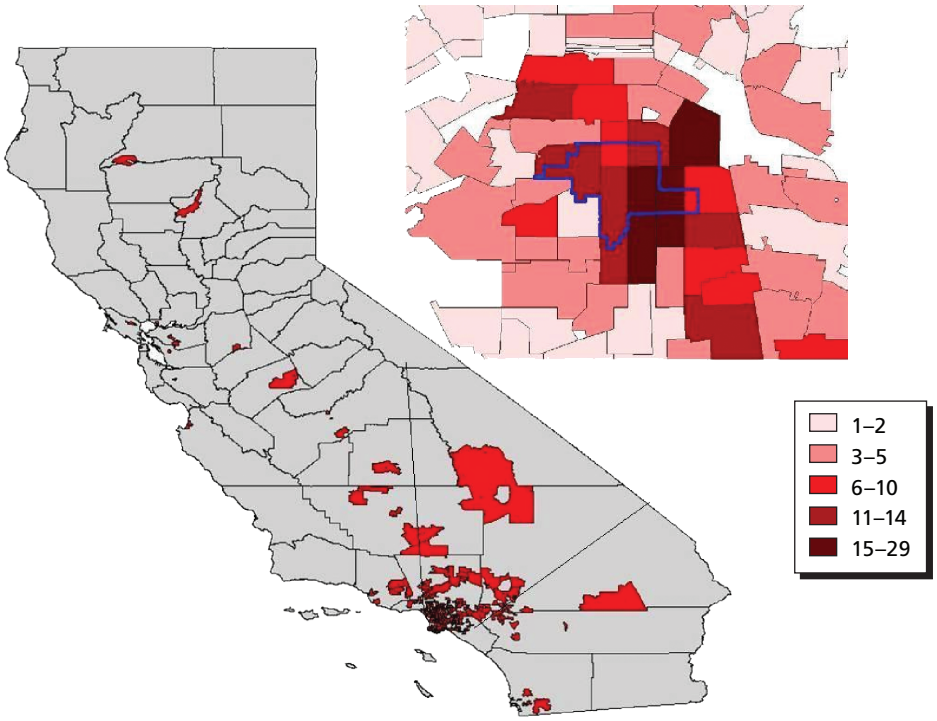
Next, we focused on the subset of crime guns for which the criminal possessor of the firearm was not the last-known legal purchaser. Of the 989 traces with complete information, we found that 75 percent (737) were not in the possession of the last-known legal purchaser when recovered or used in a crime. Figure 3.4 illustrates that the majority of legal purchases completed in California were, in fact, made close to the target area. When we restrict the geographic scope further and include only those instances in which the last legal purchaser lived within a 4.5-mile radius of the target area, we find that more than one-third (35 percent) of all purchasers resided within this area. Though we are unable to determine how the firearm came into the possession of the illegal possessor (e.g., stolen, nonreported transaction, straw purchase), this clearly demonstrates that much of the illegal firearm market is "local." The locality of the market applies both to the nearness of the FFL that last legally sold the firearm to the last-known legal purchaser (who did not possess the firearm at time of the recovery).

These analyses indicate that, in a one-year period, 35 percent of the 989 guns recovered were not in the hands of the original purchaser—yet the purchaser lived within the 77th Street area. We know little about how guns are transformed from legally purchased firearms to crime guns. Theft, straw purchasing, gifts, and undocumented sales are all possible. The interagency working group hypothesized that these methods of entry into the illegal firearm market were prime candidates for disruption, because they begin with a legal purchaser. Since federal law prohibits felons and other potentially dangerous individuals from purchasing firearms, the original purchaser must have only a minor or no criminal record and, therefore, can plausibly be deterred from transferring the legally purchased firearm to another.

Figure 3.4
California ZIP Codes of Original Purchaser of Crime Guns Recovered in the 77th Street Area



NOTE: Inset highlights the 77th Street area plus the surrounding area within a 4.5-mile radius.
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The Letter-Campaign Intervention

The culmination of this phase of the project was an intervention developed by our interagency working group. This consisted of a direct-mail campaign to target new gun buyers before they had an opportunity to transfer their firearm to someone else. Gun buyers in California must wait ten days after initiating the firearm purchase before taking possession of the gun. The letter we developed (Appendix D) was intended to arrive in the new gun buyer's mailbox during the ten-day waiting period and remind gun buyers of their legal obligations as gun owners. The letter indicates that the firearm purchase has been documented and that, should it be used in a crime, the gun can and will be traced back to them as the first legal purchaser.

The mail campaign was premised on the idea that straw purchasers can be deterred from illegally transferring guns. The working group posited that, because these individuals had no prior arrests or convictions that prohibited them from making a legal firearm purchase, they represented a target population that could be deterred easily. A prior history of arrest is a significant predictor of future arrest (independent of sanctions), suggesting either a lack of deterrence or stable individual differences in the propensity for arrest over time (Nagin and Paternoster, 1994). If, in fact, individuals have a stable propensity for arrest over time, then straw purchasers, having clean records, are not generally inclined to criminal behaviors. Specific-deterrence

perspectives suggest that such individuals are more likely than those with criminal histories to be deterred by the prospect of increased risks for criminal sanctions (see Paternoster, 1987, and Nagin, 1998, for a review). A letter that clearly informs the straw purchaser of the risk of sanctions generates that specific deterrence.

We identified two geographically distinct areas located within the city of Los Angeles for inclusion in the letter program: Devonshire and the 77th Street policing districts of the LAPD. In addition to being geographically noncontiguous (Devonshire is located in the San Fernando Valley; the 77th Street area is in South Los Angeles), they also differ from each other in terms of their racial and ethnic composition, income levels, and levels and patterns of violence. Yet both areas have large numbers of residents who are legally buying guns that are ultimately being recovered as crime guns in the possession of others.

The 77th Street Policing Area

Over the one-year period of April 2003 to March 2004, for the entire county of Los Angeles, law enforcement recovered nearly 17,500 crime guns and turned them over to ATF for tracing. Just more than 13,000 were recovered within the city of Los Angeles, nearly 1,500 of which came from the 77th Street area. That is, the 77th Street area of the city was responsible for 8.5 percent of all guns recovered in Los Angeles County.

With complete information on 989 of the nearly 1,500 crime guns recovered in the 77th Street area, we found that the source of these guns is local. For 342 of these 989 crime guns (35 percent), the possessor was not the last legal purchaser, and the last legal purchaser lived within the 77th Street area or within the neighborhoods surrounding it (within a 4.5-mile radius). For 125 of these 342, the last legal purchaser lived within the 77th Street area.

We defined firearm purchasers in the 77th Street area as those purchasers who resided in ZIP codes 90001, 90003, 90037, 90043, 90044, 90047, and 90062, excluding the parts that extend beyond the city limits, beyond the jurisdiction of the Los Angeles city attorney.

Devonshire Policing Area

Devonshire is located in the San Fernando Valley in the northern part of Los Angeles. The total area of Devonshire is nearly 54 square miles, with a total population of 250,000. Population density is not nearly as great in this area as in the 77th Street area. Devonshire is also much more affluent (mean home value in 1990 was $280,000, compared with $165,000 in the 77th Street area), has a high percentage of non-Latino whites, and contains mostly owner-occupied housing. There is, however, an area known as "the Witches' Hat" in which much of the crime and poverty is concentrated. Violence is not solely concentrated among blacks but involves several groups, including El Salvadoran, Armenian, and a few Asian gangs.

The data used for the analysis cover a slightly different time frame (July 2003 through June 2004) but are comparable in all other ways to the preceding analysis. First, outside of the highly impoverished areas near the core of downtown Los Angeles (including South Los Angeles), Devonshire ranks high in the number of crime guns recovered (283); for 137 of those guns (48 percent), the last legal purchaser lived within Devonshire, but the possessor was someone other than the last legal purchaser. Second, as to crime guns recovered outside Devonshire, we found that 181 such guns had been last legally purchased by Devonshire residents but recovered in someone else's possession.

We defined firearm purchasers in the Devonshire area as those purchasers who resided in ZIP codes 91401, 91402, 91403, 91405, 91406, 91411, 91423, and 91436.

The launching of the letter program in two areas met two important objectives. First, it permitted us to determine whether the effects of the campaign were robust across places that differed along important socioeconomic characteristics. Second, by including the relatively more affluent Devonshire policing area, the program avoided the potential objection that the program targeted a particular group in terms of race, ethnicity, or economic status. The heads of the state and local criminal-justice agencies who signed the letter were particularly sensitive to the possibility of such criticisms and agreed to participate only if a predominantly non-Latino, white area was included.

Letter Campaign

On July 29, 2005, CalDOJ began forwarding to the Los Angeles city attorney's office daily information on *all* gun purchases by residents of Devonshire and the 77th Street areas, regardless of where the purchases occurred. CalDOJ set up a secure Web site that was updated daily with tables of data on targeted transactions. Each morning, a Los Angeles city-attorney staff member would access the Web site and produce new letters using the new names and addresses in the table. The letters were mailed on day two or three of the ten-day waiting period and presumably arrived by day five. This left several days for the gun buyer to read the letter and consider the pending firearm transaction.

We hypothesized two possible outcomes. First, we expected several guns not to be collected from the dealer at the end of the ten-day waiting period (the buyer has up to 30 days to take possession of the gun; Calif. Penal Code §§12071, 12072). Second, we expected an increase in the number of properly documented transfers of firearms, transfers that take place with the assistance of a licensed firearm dealer and that require a background check and a new ten-day waiting period for the newest owner.

We anticipated being able to collect data on cancellation rates directly from CalDOJ's computer files. We planned on comparing the cancellation rates of those who received a letter with those of gun purchasers in neighboring communities who did not receive a letter. However, CalDOJ firearm-division staff learned after the fielding of the letters that cancelled transactions are completely removed from their system and that no reliable method of tracking cancellations is currently possible. Our intended evaluation protocol was therefore not viable. Fortunately, an alternative evaluation became available when, in 2007, Edmund Gerald (Jerry) Brown Jr. replaced Bill Lockyer as California's attorney general. The new gun-buyer letter was stopped to update the attorney general's signature on the letter. Between May 2007 and July 2007, we continued to collect data on firearm purchases in the target areas, but no letters were sent. We used outcomes from gun purchases during this period for comparison.

ATF searched AFS for all firearms that generated a letter and determined whether they were recorded in AFS, indicating that the transaction had been completed rather than cancelled.

Results

Between August 2005 and December 2006, residents in the 77th Street and Devonshire areas purchased 2,244 guns, and these purchasers received the letter. Of these guns, 152 (6.8 percent) of them do not appear to be registered in AFS. These potential gun buyers paid $25 in nonrefundable DROS fees when they initiated the transactions, received the letter, and did not

take possession of the firearm. Between May 2007 and July 2007, residents of 77th Street and Devonshire areas initiated purchases of 287 guns, of which 4.5 percent were not picked up. Consistent with our expectations, the cancellation rate of gun transactions was higher for those who received the letter, although the difference is not statistically significant (p-value = 0.30).

Table 3.6 breaks down the cancellation rates into three periods and shows that the cancellation rates varied considerable over time. We separated those transactions in May 2006–July 2006 to match the same months as the "no-letter" period in 2007. In the initial months of the letter campaign, cancellation rates were near 10 percent (exceeding 12 percent in the first three months of the campaign). By May 2006, cancellation rates were quite low, at about 1 percent of the transactions. One year after the program began and continuing into 2007, after the letter mailings had stopped, the cancellation rates appeared to have stabilized at about 5 percent. The cancellation rate in the final phase, April 2006–December 2006, was significantly lower than the cancellation rate when the program began (p-value = 0.0002).

These results offer a mixed view of the letter campaign's impact. The initially high cancellation rate suggests that perhaps the letter might have had substantial impact in the beginning but that the effect wore off as the campaign continued. Comparing just the May–June 2006 period to the May–June 2007 period suggests that the letter might be counterproductive. An alternative explanation is that the use of straw purchasers diminished over this period, as a result of either the letter or external factors. If this is the case, this would be consistent with a decrease in cancellation rates and a decrease in the supply of illegal firearms.

Transfers of firearms between private parties requires the transaction to occur through a licensed firearm dealer, the filing of a new DROS record with the state, the payment of the $25 DROS fee plus up to a $10 charge to the dealer, and a ten-day waiting period and background check for the new gun owner (Calif. Penal Code §§12076, 12082, 12806). Such a process can encourage a normally law-abiding citizen to spend the time and money to properly transfer his or her firearm to another. These person-to-person transfers may be at high risk for providing a point of entry into the illegal firearm market. While no moves have been made to reduce the cost of transfers, local law enforcement is working to increase the cost of failing to properly

Table 3.6
Cancellation Rates, by Study Period

	Letter Recipients				No Letters
Transaction	August 2005–April 2006	May 2006–July 2006	April 2006–December 2006	Overall	May 2007–July 2007
Total	1,171	432	641	2,244	287
Cancelled	114	6	32	152	14
Cancellation rate (%)	9.7	1.4	5.0	6.8	4.9
Transferred	62	3	3	68	1
Transfer rate (%)	5.3	0.7	0.5	3.0	0.3
Reported lost or stolen	13	2	2	17	0
Reporting rate (%)	1.1	0.5	0.3	0.8	0.0

SOURCE: Compiled from data from ATF and the Los Angeles city attorney. No data were available for January 2007–April 2007.

transfer firearms. A collaboration between the state and Los Angeles law-enforcement agencies resulted in a policy that "when LAPD recovers a gun and finds in its investigation that the weapon is traceable to an owner [who] failed to file a DROS request, officers will notify the City Attorney's office, which will proceed with prosecution" (Office of the Attorney General, 2005). The letters serve to remind gun buyers of these potential costs and may serve to increase rates of properly reported transfers. The data indicate that 68 of the 2,242 guns (3 percent) were properly transferred in a secondary sale. Transfer rates seem to have declined over the study period and continued to decline even after the letters stopped. Again, the letter seems to have had its greatest impact in the initial period.

Lastly, a gun owner in Los Angeles must report a lost or stolen gun to police within 48 hours of learning that the gun is missing. Although California currently has no requirement that lost or stolen guns be reported, police and gun owners can report such guns to CalDOJ's Bureau of Firearms. Gun investigators have alleged that, when asked about crime guns, straw purchasers often report that the gun must have been stolen, and police and prosecutors have little recourse. The letters may encourage those who have lost their guns soon after purchase, or even those who have given their gun away, to officially report their guns as lost. The data indicate that 17 guns (0.8 percent) have been reported stolen in the short period between the purchase date and the date on which ATF checked the status of the gun. Notably, no guns were reported stolen during the no-letter period, although statistically this is not significantly different even from the first phase of the campaign (p-value = 0.08).

Summary and Conclusions

Using the FTPA software and analyses from other data sources, our working group analyzed crime-gun–trafficking data from the 77th Street police district in Los Angeles. We concluded that many guns may be straw purchased and transferred to prohibited gun owners. Our interagency working group developed an intervention intended to reduce the occurrence of these straw purchases. We sent letters to new gun buyers in an attempt to deter them from transferring these guns illegally.

Results from the letter campaign were mixed. Complications in the evaluation process prevent us from making any definitive statements about the letter campaign's success or failure. The observed decrease in cancellation rates over time (reported in Table 3.6) might be due to a weakening effect of the campaign over time or the decrease of straw purchasers in the supply side of the illegal firearm market. The idea has generated substantial interest locally, and plans are forming to expand the program citywide, which will be phased into neighborhoods in such a way to allow us to evaluate its effect from a properly measured baseline. State officials await the full evaluation before considering a larger program. Furthermore, at the end of 2007, the city attorney's office began mailing the letter to the target areas only on odd-numbered days. This design provides an easy-to-implement campaign while removing any correlation between exposure to the letter and any other factor (such as seasonal and economic factors) that might affect outcomes of interest. However, if the letter campaign has already had the effect of removing straw purchasers from the market in these neighborhoods, this analysis will imply that the letter is ineffective.

The letter campaign did expose problems with AFS's recordkeeping. While the system might be adequately maintaining the list of registered firearms, its inability to track informa-

tion about DROS cancellations revealed shortcomings in its utility for strategic analysis. A plan is now in place to modernize AFS, funded by a surplus in the DROS fees collected during a surge in the number of firearms sold in California in the past several years.

CHAPTER FOUR

The Criminal Purchase of Firearm Ammunition

Introduction

This chapter describes the final task for this study, an analysis of ammunition purchases in Los Angeles. Firearms have received most of the attention of regulators aiming to reduce gun violence, but the attention of some has turned to ammunition. One of the reasons we proposed to focus our study on the city of Los Angeles is that ammunition retailers within the city limits have been collecting data on all retail ammunition purchases since 1998 (LAMC §55.11), requiring proof of identification and a thumbprint. This section describes our analysis of the data collected in these logs.

Under federal law, those prohibited from possessing firearms are also prohibited from possessing ammunition (P.L. 99-308). California replicates this prohibition (Calif. Penal Code §12316). While instant background checks regularly disrupt retail sales of firearms to criminals, sales of ammunition are essentially unchecked, and the rate at which criminals acquire ammunition is unknown. In California, ammunition retailers are required only to check the purchaser's identification to verify that the purchaser is over 18 or, for handgun ammunition, over 21 (Calif. Penal Code §12316[a][1]). The city of Los Angeles further regulates ammunition sales, including prohibiting sales in the week prior to New Year's Day and Independence Day (LAMC 55.09) and requiring the previously mentioned documentation.

This section describes the ammunition market and estimates the rate at which criminals are acquiring ammunition. We found that individuals prohibited from purchasing firearms and ammunition continue to purchase ammunition through licensed dealers, because existing laws are rarely enforced or have no feasible way of being enforced. In the city of Los Angeles, between April and May 2004, prohibited individuals purchased 10,050 rounds of ammunition, 2.8 percent of all ammunition-sale transactions. These estimates suggest that monitoring ammunition-sale transactions may help reduce the supply of ammunition to criminals and the frequency of injuries from felonious gun assaults. Such a record can also provide information for generating leads on illegal firearm possession. Our analysis first appeared in Tita, Braga, et al. (2006). This section offers a slightly expanded analysis over the one presented there.

Background

From 1993 to 1996, emergency rooms in the United States treated an estimated 413,186 incidents of nonfatal firearm injuries stemming from causes ranging from gunshot wounds, injuries sustained while trying to elude gunfire, lacerations from recoil, and being struck by a firearm

(Hootman et al., 2000). Over this period, an estimated 7,630 persons were treated annually for injuries resulting from purposefully being struck by a gun. This number, however, pales in comparison to the nearly 87,000 injuries caused by being struck by a bullet fired from a gun. Clearly, guns without ammunition are much less dangerous than loaded ones, and, besides the fear that guns induce, the unloaded gun is no more dangerous than any other blunt object. Unlike the public-health view on drug policy, which recognizes the importance of limiting access to both the agent of harm (the narcotic) and the instrument of delivery (e.g., syringe), gun policy has focused primarily on limiting access to the instrument of delivery (firearms) while eschewing efforts to limit access to ammunition, the actual agent of harm.

Advocates on all sides of the gun-control debate in the United States agree that policies and interventions that make guns *and ammunition* less available to those who are prone to violence deserve high priority, will save lives, and reduce the burden of gun violence on society. One broad class of strategies is designed to vary access to weapons for different kinds of people (Zimring, 1991). The basic policy idea is to restrict "bad guys'" access to firearms and ammunition without denying access to the "good guys" (Cook, Moore, and Braga, 2002). Existing firearm regulations in the United States that prohibit certain individuals from purchasing or possessing a firearm also apply to the purchase and possession of ammunition (P.L. 99-308). While there has been considerable policy action at the federal, state, and local level to identify and screen out ineligible purchasers of firearms through criminal-background checks, there has been little action to identify and screen out disqualified buyers from illegally acquiring ammunition. Most countries restrict certain individuals, such as violent offenders and those with certain mental illnesses, from possessing firearms, but the United Nations Group of Governmental Experts on Tracing Small Arms notes that "measures to control small arms and light weapons would not be complete if they did not include ammunition and explosives" (UNSG and UN Department for Disarmament Affairs, 1999). Clearly, ammunition makes guns much more lethal. If gun-using criminals could be hindered from obtaining ammunition, it follows that the effects of gun violence may decline. Furthermore, recent research in Chicago noted that guns are more readily available for purchase than is ammunition (Cook, Ludwig, Venkatesh, and Braga, 2005) due to Chicago's strict ammunition ordinances and gun traffickers' fear of supplying bullets along with guns to their clients. This finding suggests that greater efforts to prevent criminal access to ammunition may be more effective in reducing firearm injury than further limiting access to firearms.

Regulating Ammunition Sales and Screening Ammunition Purchasers

A number of nations and other U.S. states currently require ammunition purchasers to have valid identification cards or firearm licenses (or both). Proposed legislation in California (Calif. Senate Bill 357, 2005) would have further required ammunition dealers in California to log all ammunition purchases and their purchasers in a state database. While this bill failed in 2005, state law has not preempted city ordinances enacted in Los Angeles, San Francisco, Oakland, and several other California cities to regulate ammunition commerce. These statutes have tougher proof-of-identification standards (state-issued identification card and the purchaser's fingerprint) and require the seller to retain documentation of all ammunition purchasers in a nonelectronic ammunition log.

Underpinning these legislative efforts is the belief that prohibited possessors are currently purchasing ammunition from licensed dealers and, through criminal-background checks and transaction records, would be prevented from buying ammunition. Currently, there is no direct research evidence to support this position, and efforts against this legislation have pointed out this lack of evidence. The Citizens Committee for the Right to Keep and Bear Arms (CCRKBA) correctly noted, following the 2004 defeat of California Senate Bill 1152, that "there is *no existing data* to suggest that an ammunition purchase registry will have any positive impact on crime" (CCRKBA, 2004; emphasis added). Similarly, CCRKBA reported that the National Association of Firearms Retailers criticized the measure, noting that "no valid public safety purpose will be advanced by burdening our members in California with keeping a registry of perfectly legal ammunition sales and law-abiding ammunition purchasers. We are aware of *no scientifically valid study* that concludes [that] an ammunition registry would be an effective law enforcement tool" (CCRKBA, 2004, emphasis added).

As noted, there is reason to believe that targeting retail ammunition sales will affect levels of firearm injury. Recent ethnographic research on the workings of illegal gun markets in Chicago suggests that it was more difficult for criminals to acquire ammunition than for them to acquire guns (Cook, Ludwig, Venkatesh, and Braga, 2005). Most youth reported trouble with securing ammunition and faced considerable price markups over the legal market. If it is true that, for many criminals, ammunition is scarce, then effective screening procedures or transaction recordkeeping for ammunition purchases at retail outlets could be used to good effect in reducing an important supply line of ammunition.

In this analysis, we sought to learn more about the retail market for ammunition by examining bullet and shotgun-shell purchases in the city of Los Angeles, which passed a city ordinance in 1998 requiring proof of identification and a thumbprint (LAMC 55.11). We examined the characteristics of sales conducted in the city of Los Angeles, with a particular focus on the purchasers' criminal history. We also explored the frequency with which prohibited possessors acquired ammunition from licensed dealers.

Data

Local ordinance requires every FFL in Los Angeles that sells ammunition to maintain ammunition-purchase logs on all transactions, which the LAPD gun unit periodically collects. The data recorded for each transaction are handwritten into the ammunition log and include purchase- and purchaser-specific data. Identifying information for each purchaser includes name, age, sex, date of birth, address, thumbprint, and a driver's license or state-issued identification number.[1] The data also include the type and quantity of ammunition purchased along with the date for each transaction.

Our study used ammunition-log data on purchases made during the months of April and May 2004. During the study period, 15 FFLs in Los Angeles sold ammunition: eight sporting-good stores, three firing ranges, two law-enforcement facilities, one military-surplus store, and one small business that reloads ammunition for sale. The LAPD gun unit collected the com-

[1] Law enforcement needs the purchaser's name, date of birth, and license or ID number to compare with prohibited-purchaser databases. The thumbprint is essential for use of the log as evidence in the acquisition of search warrants and presentation in cases.

pleted logs from ten businesses and turned these records over to SCRCGC. We excluded the two law-enforcement facilities, because they sell only to law-enforcement employees, who (by definition) may not have a criminal background. Limited availability of LAPD officers for collecting the data on ammunition purchases during the study period resulted in data not being collected from the ammunition-reload business, one of the sporting-good stores, and one of the firing ranges. As such, these ammunition dealers were excluded from our analyses. ATF personnel computerized the data from the ten remaining FFLs. For each transaction in the ammunition logs, ATF personnel checked whether the purchaser appeared in the NCIC data or in CalDOJ's criminal-history files. They recorded the full criminal histories of the complete sample of ammunition purchasers with criminal backgrounds.

Seven of the observed ammunition retailers are in the San Fernando Valley, the northern half of the city of Los Angeles. These retailers represent approximately 93 percent of the ammunition transactions recorded during the study period. Figure 4.1 shows the number of ammunition purchasers by place of residence in the greater Los Angeles area. The darkest areas fill in much of the San Fernando Valley. None of the business premises of the ten ammunition retailers was located near the high-crime South Los Angeles area of the city. While this area leads the city in total homicide and total gun crime, none of the "local" places to purchase ammunition actually falls within the Los Angeles city limits. According to the LAPD and ATF, the likely ammunition supply for this area consists of the nearly one-dozen ammunition dealers near South Los Angeles, which are located just outside of the city limits in the surrounding Los Angeles County municipalities and are therefore not required to record ammunition purchases. Therefore, our analysis of Los Angeles' ammunition data represents a snapshot of the ammunition market in the northern half of the city. Though it is only a portion of the city, in 2002, the San Fernando Valley's 1.4 million residents comprised 37 percent of the city's population. By itself, it would rank as the seventh-largest city in the United States.

Results

In April and May 2004, 2,031 unique purchasers made 2,540 transactions, which resulted in the sale of 4,823 boxes of ammunition that totaled 436,956 rounds (see Table 4.1).

Who Buys Ammunition?

Though most of the ammunition purchasers reside locally, a small number of non-California residents (n = 60) also purchased ammunition in the city. It is not clear whether these individuals purchased ammunition while visiting or whether these are new local residents who have not yet changed their official places of residence. Among the remaining 97 percent of purchasers (n = 1,971), Los Angeles city residents make up 70 percent of the purchasers, and another 19 percent reside in Los Angeles County. The overwhelming majority of purchasers live within the San Fernando Valley, which is to be expected, as ammunition prices are relatively stable across merchants. An informal survey of local ammunition dealers in and around Los Angeles indicated that a 500-round box of lower-end 0.22 ammunition ranged from $14 to $16, a difference for which we do not expect consumers to travel great distances, given that local gas prices peaked at $2.36 per gallon during this period.

While 92 percent of gun purchasers in Los Angeles County are male (VPRP, 2004), a slightly larger percentage (96 percent) of ammunition purchasers in the city is male. As shown

Figure 4.1
Ammunition Purchasers, by Residential ZIP Code

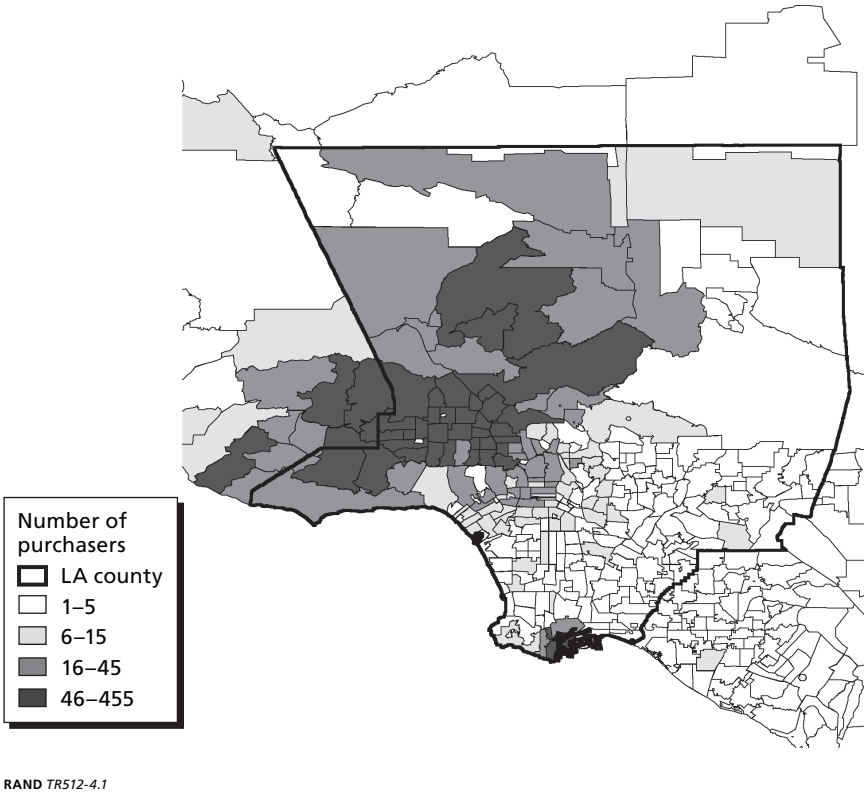

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Table 4.1
Volume of Los Angeles Ammunition Sales for April and May 2004

Measure	Number
Rounds	436,956
Boxes	4,823
Transactions	2,540
Unique purchasers	2,031

in Table 4.2, bullet purchasers are also more likely to fall into the 21–24 age category (15 percent) than are gun purchasers (9 percent).

Should They Be Allowed to Buy?

During the study period, 6.5 percent of ammunition purchasers had criminal records. A criminal record, however, is not sufficient for prohibiting a purchaser from buying ammunition. Federal law prohibits convicted felons and domestic-violence misdemeanants from acquiring ammunition. Additionally, California state law includes provisions that prohibit individuals convicted of violent misdemeanors from purchasing and possessing ammunition. Of the study's ammunition purchasers, 1.5 percent had prior felony convictions: 13 drug-related felonies; eight grand-theft or burglary felonies; two cases of felony check fraud; two weapon offenses;

Table 4.2
Age Distribution of Los Angeles County Handgun Purchasers and Los Angeles City Ammunition Purchasers

Age	Handgun (county) (%)	Ammunition (city) (%)
21–24	9.0	15.4
25–34	23.5	28.6
35–44	25.3	24.1
45–54	24.1	18.0
55–64	12.9	8.7
65+	5.2	2.9

and one case each of extortion, stalking, and sex with client (details of two other felony convictions were unknown). An additional 1.1 percent of the purchasers had other conditions (e.g., misdemeanor assault or an active restraining order) that prohibited their purchases. Table 4.3 summarizes these findings.

These prohibited possessors made 2.8 percent (71 out of 2,540) of all transactions and collectively purchased 2.3 percent (10,050 out of 436,956) of the rounds sold in the two-month study period. They generally purchase the same kinds of ammunition as legal purchasers did. For example, among prohibited possessors, 40 percent purchased 9mm ammunition, while 38 percent of legal purchasers bought 9mm ammunition. By comparison, the Violence Prevention Research Program (2004) reported that, in 2000, 0.8 percent of attempted gun purchases statewide involved a prohibited possessor, but the background check and ten-day waiting period interrupted those purchases. While the Los Angeles ammunition ordinance requires ammunition transactions to be recorded, there is no instant check, and, prior to 2004, the logs were referenced only when police were following up on specific crimes. As a result, prohibited possessors were able to purchase ammunition with little risk of detection.

Table 4.3
Criminal Backgrounds of Ammunition Purchasers

		Percentage During Study Period (95-percent confidence interval [CI])[a]		
Purchaser	N	Percentage	Low	High
Unique	2,031			
With a criminal record[b]	133	6.5	5.5	7.6
Prohibited from purchasing ammunition	52	2.6	1.9	3.2
Felony conviction	30	1.5	1.0	2.0
Nonfelony offense	22	1.1	0.6	1.5

[a] The 95-percent CI is computed as if April and May were representative of a stationary process of ammunition purchasing.

[b] Having a criminal record does not necessarily prohibit ammunition purchase.

Connecting Ammunition Purchases and Firearm Traces

In Southern California, ATF comprehensively collects data on recovered firearms. We were able to link 51 ammunition purchasers to firearms traced through ATF. The reason for initiating a trace was variable. The most frequent reason the 51 firearms were traced applied to firearms that were recovered for safe keeping (11), but the other cases were more serious, including, for example, carrying a concealed weapon (seven), illegal possession (seven), and aggravated assault (four). Furthermore, in 40 of the cases, the ammunition purchaser linked to the traced firearm was the firearm purchaser but not the possessor. As we discuss next, such information could be helpful to law enforcement investigating the illegal firearm market in Los Angeles.

Summary and Conclusions

We analyzed the purchase of ammunition in two parts of Los Angeles. One key finding was that 2.6 percent of ammunition purchasers were legally prohibited from possessing firearms or firearm ammunition. This result suggests that, despite having to identify themselves by showing a driver's license, leaving a fingerprint, and creating a record of the transaction, prohibited purchasers still buy ammunition from Los Angeles dealers. Though some ineligible buyers may be deterred by these requirements and make purchases at dealers beyond the city limits, the lack of enforcement of existing laws means that prohibited persons still complete the required elements of the transaction and walk out of the store with ammunition.

In an attempt to stem the flow of ammunition to prohibited purchasers, policymakers might consider extending instant background checks to include ammunition purchases. A criminal-background check would be an unnecessary inconvenience in about 97 percent of ammunition transactions in Los Angeles. However, in just two months, prohibited persons acquired some 10,050 rounds through retail outlets. A background check would eliminate illegal ammunition transactions at retail outlets, and the denied ammunition-purchase rate would probably converge to around 0.8 percent, the denial rate for firearms. Similar to the illegal-market substitution effects associated with the passage of the Brady law (Ludwig and Cook, 2000; Cook and Braga, 2001), prohibited purchasers seem likely to exploit alternative sources of ammunition, such as unregulated private sellers operating in the secondary firearm markets.

An alternative policy to the instant criminal-background check would be to use the ammunition-transaction records as an intelligence-gathering tool for law enforcement. Routine examination of ammunition purchasers could be used to identify prohibited persons who illegally possess ammunition and, most likely, illegally possess firearms as well. The ammunition logs have been used as a basis for developing probable cause in securing search warrants, some of which have resulted in the recovery of illegal firearms.[2]

Future research needs to include a cost-benefit analysis that compares the value of ammunition background checks with value of using ammunition logs to generate leads.

At present, the key impediment to the utility of the Los Angeles ammunition log for law enforcement is that it is restricted to dealers located within the city limits. Los Angeles residents can easily cross into other areas of the county and purchase untraceable ammunition. Given the dearth of purchasers residing in South Los Angeles and that these neighborhoods

[2] Conversation with the supervising attorney of the gun-violence section of the Los Angeles city attorney's office.

have severe gun-violence problems, it is clear that Los Angeles retailers are not the source of this area's ammunition supply. Illegal street sales, mail-order purchases, and retail purchases outside the city limits are all possible ammunition sources, none of which is monitored currently. A first step in turning the ammunition log into a useful intelligence tool for South Los Angeles would be to have neighboring municipalities cooperate in a concerted effort to collect similar data on ammunition transactions. While our study focused on two parts of Los Angeles, our findings have implications for other states and nations that monitor firearm sales but not ammunition purchases; without monitoring or enforcement, prohibited purchasers are not completely deterred from purchasing ammunition.

Implication for Prevention

Relative to firearms and ammunition in legal hands, guns and ammunition in a prohibited possessor's hands are at high risk of being used in violent crime (Mona A. Wright, Wintemute, and Claire, 2005). Monitoring ammunition transactions can reduce that risk either by following those criminal purchasers back to their firearms or by interrupting criminal purchases at the point of sale with an instant background check. Expanding the monitoring to the county or state level may result in FFLs beyond the legislation's reach becoming easy sources for illicit ammunition purchases. Due to less stringent gun controls, dealers in Nevada and Arizona are already noteworthy out-of-state sources of crime guns recovered in Los Angeles (ATF, 2002) and seem likely to become illicit sources of ammunition. A statewide program might push illegal ammunition purchases out of the state and, therefore, increase the effective price of illegal ammunition sales on the streets of Los Angeles (Moore, 1973).

Increasing the costs associated with the illegal acquisition of ammunition may cause criminals to economize on firearm use and, in turn, reduce gun violence. The potential for substitution to alternative, black-market sources is a concern for any gun-market intervention (Wellford, Pepper, and Petrie, 2005). One could imagine that criminals would adapt to the policy by recruiting family and friends into making straw purchases of ammunition. Nonetheless, given the heavy burden of gun violence, policymakers need to consider policy interventions that remove easy opportunities for violent, gun-using criminals to arm themselves.

Progress on Ammunition Issues

Prompted by this study, on February 5, 2007, the Los Angeles city council agreed to support state legislation that would require other California cities to emulate a Los Angeles law that requires gun dealers to maintain a log of all ammunition sales. The city appears to be rejecting the idea of a background check for ammunition purchasers and favoring the strategy of developing ammunition logs as an intelligence tool. During the deliberations, LAPD reported that "ammunition logs have been a valuable investigative source to identify persons prohibited from possessing firearms and ammunition." After the study period, investigations by LAPD's gun section has led to 29 criminal filings; nine arrests; 18 search warrants; and the recovery of 24 handguns, 12 shotguns, nine rifles, and six destructive devices. The City of Sacramento is developing legislation that requires retailers to notify the police department by email within 72 hours of an ammunition transaction.

In recent years, the California legislature has turned its attention to sources of ammunition used in crimes. In the past, the California state legislature has been unsuccessful at requiring ammunition logs statewide, in part due to a lack of data on the rate at which residents make illegal purchases, but there is renewed interest in the legislation following our results. In Octo-

ber 2007, California Assembly Bill 1471 was signed into law requiring that, by 2010, semiautomatic pistols sold in California will microstamp shell casings so that police will be able to link casings to guns and, presumably, to perpetrators. Assembly Bill 362, currently being debated, prescribes several changes to ammunition sales in the state. Aside from regulations on the business processing of ammunition, the bill would take the ammunition log statewide. Furthermore, it would require that, starting in July 2011, to buy ammunition, a purchaser must show a handgun-ammunition permit that will be built into the state's driver's license, effectively a background check. The bill's author statement cited our ammunition analysis as motivation for the legislation (de León, 2007).

New Jersey's State Commission of Investigation (2007) reported on a study similar to the one we ran in Los Angeles. It found that 43 of 60 retail outlets surveyed had sold ammunition to individuals with criminal records (though those records alone might not have prohibited the sale) and that, at one store, more than 15,000 rounds of handgun ammunition were sold to 42 convicted felons over a four-year period.

Limitations

This study used administrative data from ten of 13 non–law-enforcement ammunition retailers in the city of Los Angeles over a two-month period. Therefore, this study's findings may not be representative of all ammunition transactions in the greater Los Angeles area nor in other cities around the country. While the Los Angeles city ordinance requires dealers to document all ammunition transactions, there may be noncompliance. Compliance could be associated with whether the purchaser is eligible to possess ammunition. ATF completed the background checks for all purchasers based on names and state-issued IDs from the hand-written logs collected from the retailers. Accurate criminal-history checks depended on this information being written correctly and clearly on the forms.

CHAPTER FIVE

Conclusions

The broad lesson that this research reiterates is the value added to the development of crime-prevention strategies by in-depth problem analysis. For public-safety officials, this research underscores that a combination of useful firearm laws, good data sources, the expertise of local agencies, and careful analysis can result in new interventions with the potential to disrupt the supply of illegal firearms. For complex problems, such as the illegal diversion of firearms, a deep understanding of the nature of the problem is crucial in framing appropriate responses. The problem-analysis exercise described here benefited greatly from a solid working partnership between criminal-justice practitioners and academic researchers. The research team essentially provided real-time social science aimed at refining the interagency working group's understanding of illegal gun markets, creating information products for both strategic and tactical use, and testing—often in an elementary but important fashion—prospective intervention ideas. Clearly, practitioner-academic partnerships add much value to the understanding of crime problems and the development of appropriate responses. Unfortunately, such partnerships are uncommon. The challenge remains to encourage these collaborations through the education of police practitioners and researchers in the principles and methods of problem-oriented policing and the benefits of working together.

FTPA and the gun-trafficking indicators developed in this research allowed law enforcement to assess the investigative potential of particular gun traces so they can focus their limited resources on the parts of the illegal gun market comprised of direct supply lines of guns from retail sources to criminals and youth. The resulting analyses and gun-trafficking indicators essentially focused investigators on gun sales and purchasing patterns that should receive closer scrutiny. The nature of illegal gun markets varies across states and metropolitan areas, and, as such, other local law-enforcement agencies partnered with ATF field divisions will want to tailor these indicators appropriately.

By analyzing the nature of particular gun-trafficking problems, law enforcement can develop a systematic plan to shut down supply lines rather than simply pursuing ad-hoc enforcement actions focused on specific individuals. For example, these analyses revealed that the 77th Street area was the site of a large number of unrelated, small-scale straw purchases. Due to limited enforcement resources, the interagency working group felt that pursuing enforcement actions against a large number of individual straw purchasers was not feasible. Nevertheless, after this problem was identified, an alternative approach was crafted. The resulting new gun-buyer–notification program was an innovative and systematic attempt to address diffuse sources of illegal guns to criminals. Whatever forms such problem-solving responses take, strategic analyses of firearm-trace data and other information resources, supported by the working

knowledge of front-line law-enforcement agents, can go far in developing an appropriate and effective plan.

We understand that the important pathways of gun trafficking for particular types of offenders at any given moment may not be important in a year's time. For example, if law enforcement shuts down the supply of new, trafficked guns to criminals and their demand for firearms remains constant, we recognize that another source of guns, perhaps stolen firearms, may absorb much of the demand and that existing interventions focused on close-to-retail diversions may not have a net reduction in the availability of guns to criminals. This is precisely the reason that developing new crime-intelligence methodologies to analyze local gun markets is key to improving the capacity of local jurisdictions to respond to illegal gun trafficking. If proven methodologies exist to identify pathways of gun trafficking, law-enforcement agencies can reassess the situation, diagnose the alternative supply channel, and implement a response to reduce the flow of guns to the street. This fits well with the problem-oriented–policing philosophy and advances a key component of the process—the analysis of problems.

APPENDIX A

Data Dictionary of Variables Incorporated in the FTPA System

Table A.1 describes the variables in the FTPA system.

Table A.1
Variables in the FTPA System

Variable Type	Variable	Method[a]
Trace: firearm-trace data	ATF-assigned trace number	
	Time to crime1 in years (gun-recovery date) minus retail purchase date or FFL acquisition date	C
	Time to crime1 in days (gun-recovery date) minus retail purchase date or FFL acquisition date	C
	Time to crime2 in years (gun-recovery date) minus retail purchase date	C
	Time to crime2 in days (gun-recovery date) minus retail purchase date	C
	ATF project code	
	Proximity of gun purchaser's age to gun possessor's age, in years	C
	Female purchaser + male possessor	C
	Crime code, based on Common Integrated Justice System (CIJS) categories	
	ATF completion code indicating final disposition of the trade request	
	Date on which law enforcement recovered the firearm	
	Date on which the law-enforcement agency submitted a trace request for the firearm	
	Combined recovery-request date with request data substituted, if recovery date is missing	C
	Recovery street address of traced firearm[b]	R
	Recovery city of traced firearm	R
	Recovery county of traced firearm	R
	Recovery state of traced firearm	R
	Recovery ZIP code of traced firearm	R
	Local law-enforcement case number for traced firearm	
	ATF case number for traced firearm	
	Traced firearm was found or acquired by law enforcement for safe keeping	C
	Name of gang potentially associated with possessor	
	Date on which FFL sold the traced firearm	
	Traced firearm is recorded in AFS (California-recovered guns only)	

Table A.1—Continued

Variable Type	Variable	Method[a]
Dealer: dealer data	Last inspection date for FFL associated with the traced firearm	
	License name of last FFL associated with the traced firearm (available more often than business name)	
	Business name of last FFL associated with the traced firearm	
	Street address of last FFL associated with the traced firearm	
	City of last FFL associated with the traced firearm	
	State of last FFL associated with the traced firearm	
	ZIP code of last FFL associated with the traced firearm	
	Business status of the last FFL associated with the traced firearm (in or out of business)	
	Location of last FFL associated with the traced firearm (same as or different from recovery state	
	License type of last FFL associated with the traced firearm (e.g., retail, pawn)	
	Traces from the last FFL associated with the traced firearm to a given recovery city	
	Multiple-sale firearms by the last FFL associated with the traced firearm, 1999	C
	Multiple-sale firearms by the last FFL associated with the traced firearm, 2000	C
	Multiple-sale firearms by the last FFL associated with the traced firearm, 2001	C
	Multiple-sale firearms by the last FFL associated with the traced firearm, 2002	C
	Multiple-sale firearms by the last FFL associated with the traced firearm, 2003	C
	Multiple-sale firearms by the last FFL associated with the traced firearm, 2004	C
	Multiple-sale firearms by the last FFL associated with the traced firearm, 2005	C
	Shelf life of the traced firearm	C
	Shelf life of the traced firearm, for only those dealers currently in business	C
	No retail purchaser identified for the traced firearm	C
	ATF federal firearm license number of last prior dealer in chain of commerce (e.g., wholesaler)	
	FFL reported never receiving traced firearm	
	FFL reported that traced firearm was stolen from dealer	

Table A.1—Continued

Variable Type	Variable	Method[a]
Purchaser: purchaser data	Purchaser name	
	Purchaser street address	R
	Purchaser city	R
	Purchaser state	R
	Purchaser ZIP code	R
	Purchaser age (years)	C
	Purchaser sex	
	Purchaser date of birth	
	Purchaser race	
	Whether traced firearm's purchaser and possessor are the same person	C
	Traces from a purchaser's home ZIP code to a given recovery city	C
	Purchaser and possessor of traced firearm have the same surname but are not the same person	C
	Traces associated with a given purchaser	C
	Purchaser ID-1	
	Purchaser ID-2	
	Purchaser reported traced firearm stolen	
	Purchaser country of birth	
Possessor: possessor data	Possessor name	
	Possessor street address	R
	Possessor city	R
	Possessor state	R
	Possessor ZIP code	R
	Possessor age (years)	C
	Possessor sex	
	Possessor date of birth	
	Possessor race	
	Possessor criminal history	
	Possessor ID-1	
	Possessor ID-2	
	Possessor country of birth	

Table A.1—Continued

Variable Type	Variable	Method[a]
Associate: associate of possessor	Associate criminal history (felony record or not)	
	Associate name	
	Associate street address	R
	Associate city	R
	Associate state	R
	Associate ZIP code	R
	Associate age	C
	Associate sex	
	Associate race	
	Whether associate is the original purchaser of the traced firearm	C
	Associate date of birth	
Weapon data	Type of firearm traced	
	Manufacturer of traced firearm	
	Serial number of traced firearm	
	Caliber of traced firearm	R
	Whether traced firearm was part of a multiple-purchase transaction	
Distance: computed, distance-related data[c]	Distance from the address of the dealer that sold the firearm to the purchaser's home address	C
	Distance from the address of the dealer that sold the firearm to the possessor's home address	C
	Distance from the address of the dealer that sold the firearm to the firearm-recovery address	C
	Distance from the purchaser's home address to the possessor's home address	C
	Distance from the purchaser's home address to the associate's home address	C
	Distance from the firearm purchaser's home address to the firearm-recovery address	C
	Distance from the firearm possessor's home address to the firearm-recovery address	C
Additional variables: additional geography-related variables	City in which law enforcement recovered the traced firearm	C
	County in which law enforcement recovered the traced firearm	C

[a] C = the variable was computed from the other data sources or information. R = the variable is a recoded or cleaned version of the original ATF variable.

[b] *Traced firearm* refers to all firearms that law enforcement recovered and submitted to ATF for tracing.

[c] All distance calculations are based on the distance between the centroids of the two locations in question.

APPENDIX B

Trafficking and Suspicious-Behavior Indicators in the FTPA System

Table B.1
FTPA Trafficking and Suspicious-Behavior Indicators

Indicator		Indicator Notes
01	Time to crime in years (sale)	This indicator is based on firearm-recovery date (with request date substituted if there is no recovery date) and the retail purchase date of the firearm (usually the first retail purchase date). If no retail purchaser was identified for this trace, this indicator is not calculated.
02	Time to crime in days (sale)	This indicator is based on firearm-recovery date (with request date substituted if there is no recovery date) and the retail purchase date of the firearm (usually the first retail purchase date). If no retail purchaser was identified for this trace, this indicator is not calculated. In a report that you produce, you may see a few traces that have a computed time-to-crime of zero days. This may be due to incorrect recovery- or purchase-date data, or it may mean that the trace was the result of a sting operation and thus is already part of an investigation.
03	Time to crime in years (sale or transaction date)	This indicator is based on firearm-recovery date (with request date substituted if there is no recovery date) and the retail purchase date of the firearm (usually the first retail purchase date) or, if there is no purchase date, the date the firearm was acquired by the last-known dealer to possess the firearm, i.e., the transaction date. Thus this indicator will have data if there is either a purchase date or a transaction date for a trace.
04	Time to crime in days (sale or transaction date)	This indicator is based on firearm-recovery date (with request date substituted if there is no recovery date) and the retail purchase date of the firearm (usually the first retail purchase date) or, if there is no purchase date, the date the firearm was acquired by the last-known dealer to possess the firearm, i.e., the transaction date. Thus this indicator will have data if there is either a purchase date or a transaction date for a trace. In a report that you produce, you may see a few traces that have a computed time-to-crime of zero days. This may be due to incorrect recovery- or purchase-date data, or it may mean that the trace was the result of a sting operation and thus is already part of an investigation.
05	Number of traces from a dealer to a recovery city	This indicator is calculated as the number of traces from a given dealer to a given recovery city for all retail traces (i.e., all traces for which a purchaser was identified). For this version of the prototype, it is based on all firearms recovered for the period we received data from ATF, January 1, 1999, to May 15, 2006. In future versions of the system, it is possible to compute different time frames for this indicator if desired. An operational, Web-connected version this system would have user-definable time frames. This type of flexibility is not possible in the prototype.
06	Number of multiple-gun sales (2005)	This indicator is calculated as the number of multiple-sale firearms sold by a given dealer during 2005. This allows analysts to identify whether traces recovered in their cities originated from dealers with high volumes of multiple-sale transactions in 2005.

Table B.1—Continued

Indicator		Indicator Notes
07	Number of traces from purchaser ZIP code to recovery city	This indicator is calculated as the number of traces from a given ZIP code (based on the purchaser's residence) to a given recovery city. This allows an analyst to examine whether certain neighborhoods (i.e., purchaser ZIP codes) are a source of firearms to his or her city. For this version of the prototype, it is based on all firearms recovered for the period we received data from ATF. It is calculated only for traces that have ZIP code information for the purchaser's residential location.
08	Number of traces to a purchaser	This indicator is calculated as the number of firearms traced to a given purchaser recovered from any location throughout the country. This allows an analyst to identify traces recovered in his or her city that were associated with high numbers of traced-firearm purchasers. It should be noted that the indicator is based on all traces recovered from any location (both within and outside of your city) and associated with a given purchaser.
09	Part of a multiple-gun sale	Indicates that the traced firearm was purchased as part of a multiple-sale transaction.
10	Gun shelf life for all dealers	This indicator is calculated as (1) the date on which a private citizen purchased a firearm in a retail sale (purchase date) minus (2) the date on which the dealer acquired the firearm (transaction date). Firearms with a shelf life of more than two years have been found to have shorter times-to-crime.
11	Distance from possessor to purchaser (≥)	Calculated for traces for which a valid residential address has been identified for both the purchaser and possessor of a traced firearm. This indicator is calculated as the distance between the centroids of the ZIP codes of these two addresses.
12	Distance from possessor to purchaser (≤)	Calculated for traces for which a valid residential address has been identified for both the purchaser and possessor of a traced firearm. This indicator is calculated as the distance between the centroids of the ZIP codes of these two addresses.
13	Distance from associate (of the possessor) to purchaser (≥)	Calculated for traces for which a valid residential address has been identified for both the purchaser and an associate of the possessor of a traced firearm. This indicator is calculated as the distance between the centroids of the ZIP codes of these two addresses.
14	Distance from associate (of the possessor) to purchaser (≤)	Calculated for traces for which a valid residential address has been identified for both the purchaser and an associate of the possessor of a traced firearm. This indicator is calculated as the distance between the centroids of the ZIP codes of these two addresses.
15	Purchaser is (or is not) the possessor	For traces with both purchaser and possessor information, this variable identifies whether the purchaser and possessor are the same person. This determination is made using a fairly restrictive, unique person identifier that is based on combining information from the first three letters of the first name, the first two letters of the last name, year of birth, month of birth, and the state of residence for both the purchaser and for the possessor. Where data is available on each of these items (for both the purchaser and possessor), they are combined together into what is considered to be a unique person identifier. Using this identifier, a comparison is made between the purchaser and possessor for a traced firearm. If identifiers match, the purchaser and possessor are considered to be the same person. If they do not match, they are considered to be different persons. If any of the items of information used in constructing the unique identifier (for either for the purchaser or the possessor) is missing in a trace report, no determination is made on the relationship between the purchaser and possessor for that trace. The criteria we use to create unique identifiers are fairly restrictive, but this represents a reasonable compromise for the prototype system, given the existing data contingencies in firearm-trace data. An operational version of the FTPA system would be able to take advantage of a broader range of matching techniques and data-cleaning procedures.

Table B.1—Continued

Indicator		Indicator Notes
16	Same last name (purchaser and possessor have the same last name)	This indicator can be used to identify whether firearms may have been transferred between family members. The variable is computed by comparing the last name of a purchaser and possessor and their years of birth. If the last names are the same but the years of birth differ, the trace is classified as a same-last-name (for purchaser and possessor) but different person trace. Some misidentifications may occur due to inaccuracies in date-of-birth data (due to recording errors or intentional obfuscation) for the same person.
17	Associate of possessor is (or is not) the purchaser	This indicator can be used to identify whether firearms may have been transferred to the possessor from an associate (who was also identified as the purchaser). There are not many such transactions, but, when they occur, they may provide very useful leads. The matching key used in this comparison is the relatively unrestrictive key made up of the first three letters of the first name and the last two letters of the last name. A less restrictive approach was adopted because comparisons are being made only within traces (versus across all traces) and associate-of-possessor date-of-birth information is likely to be less available or less accurate than the birth data for other actors in the tracing system. Once again, some misidentifications may occur because of the matching criteria we have used to make these comparisons.
18	Female purchaser (male possessor)	The two selection categories for this indicator are (1) female purchaser + male possessor and (2) female purchaser + female possessor. They are available for all traces with purchaser and possessor data (sex data is almost always reported when a purchaser or a possessor is identified).
19	Dealer status	Inactive Active
20	In AFS (Calif. only)	Not in AFS In AFS
21	Dealer never received gun	This indicator is based on completion code D5.
22	Dealer reported gun stolen	This indicator is based on completion code D2.
23	Purchaser reported gun stolen (Calif. only)	Available only for California.
24	Gun found or turned in for safe keeping	Based on NCIC crime code 5599
25	Dealer missing purchaser name	
26	Distance from dealer to recovery location (≥)	Calculated for traces to a retail purchaser with valid dealer and recovery-address information. This indicator is calculated as the distance between the centroids of the ZIP codes of these two addresses.
27	Distance from dealer to recovery location (≤)	Calculated for traces to a retail purchaser with valid dealer and recovery-address information. This indicator is calculated as the distance between the centroids of the ZIP codes of these two addresses.
28	Distance from purchaser to recovery location (≥)	Calculated for traces to a retail purchaser with valid dealer and purchaser address information. This indicator is calculated as the distance between the centroids of the ZIP codes of these two addresses.
29	Distance from purchaser to recovery location (≤)	Calculated for traces to a retail purchaser with valid dealer and purchaser address information. This indicator is calculated as the distance between the centroids of the ZIP codes of these two addresses.

APPENDIX C

Database-Query and Information-Request Form

DATABASE QUERY & INFORMATION REQUEST FORM, CHECK LIST

BUREAU OF ALCOHOL, TOBACCO, FIREARMS & EXPLOSIVES

Please place completed forms in my In-Box, fax to (213)534-1085 or email to SCRCGC@ATF.gov
For immediate assistance call (213) 534-5050

Date of Request:		Requestor's Name		Investigation#			
Subject's Last Name		First Name		Middle Initial		DOB	

Negative Results Printed		Urgent		Routine		Comments	

PLEASE DO NOT WRITE OR TYPE IN GRAY AREAS

Query Description	Check Box	Result	Details
Autotrack (Asset & Subject Locating Database)			
AFS (California Registered Firearms)			
DMV (Driver History, Registered Vehicles)			
Cal-Photo (DMV and/or Booking Photos)			
Criminal History (California & NCIC)			
Online Lead/FIRES (Multiple Firearms Purchases, Firearms Recoveries & Trace Summaries)			
Wants/Warrants (California & NCIC)			
TECS (Subject History for ATF, USSS, IRS, & Customs)			
Certified Documents (Conviction/Disposition, Fingerprints, Inmate History– Specify)			

NSPECT (ATF Industry Operations FFL/Explosives Inspection Records)			
DMV Address Search (All Registered Drivers at a Specified Address-Provide Address in Comments)			
Utility Subscriber Query (Provide Address in Comments)			
NFA (National Firearms Act Registry)			
Border Crossings (International Travel)			
Cash Transaction Reports (Cash Transactions Over $10,000)			
FLS (FFL Holders & Explosives Licensees)			
Cal-Gang (Documented LA Gang Members)			
Postal Query (All Individuals Receiving Mail at Address-Provide Address in Comments)			
Social Security Number Verification (SSN Validity Query-Determine if SSN is Assigned to Subject)			
Telephone Carrier Search (Subpoena Locations for Phone Records-Provide Phone # in Comments)			
Assault Weapon Query (California Registered Assault Weapons, Provide Serial # in Comments)			
Arrest Reports (Police/Sheriff's Arrest Reports-Provide Department Name & Arrest Date)			

APPENDIX D

Letter to City of Los Angeles Gun Buyers

Office of the Attorney General for the State of California
Office of the Los Angeles City Attorney
Los Angeles Police Department

July 29, 2005

Name
Address
Los Angeles, CA 90001

Dear Mr./Ms. Name,

As you know, gun violence is a serious problem in Los Angeles. We understand that you have recently purchased a gun. It is important that we all do our part to store guns safely and keep guns out of the hands of kids and criminals. We are working in collaboration with the federal program called Project Safe Neighborhood (PSN).

As partners in keeping the streets safe in your neighborhood we want to remind you of your obligations as a gun owner.

If you ever decide to sell or give your gun to someone, you must complete a "Dealer Record of Sale" (DROS) form. These forms can be obtained and completed at any gun store. Remember, it is a crime to transfer a gun to anyone without first filling out this form.

If the police recover a gun that was involved in a crime, the Los Angeles City Attorney will prosecute the gun's previous owner if that owner did not complete the "Dealer Record of Sale" form. Please make sure you go to a firearms dealer and fill out that form if you want to sell or give away your firearm.

You can help us make Los Angeles a safer community by preventing your gun from ending up in the wrong hands.

Thank you,

Rockard J. Delgadillo
Los Angeles City Attorney

Bill Lockyer, Attorney General
State of California

William J. Bratton, Chief
Los Angeles Police Department

Office of the Attorney General for the State of California
Office of the Los Angeles City Attorney
Los Angeles Police Department

July 29, 2005

Name
Address
Los Angeles, CA 90001

Estimado Sr/Sra Name:

Como usted sabe, violencia con arma de fuego es un problema serio en Los Ángeles. Nosotros entendemos que usted recientemente compró una arma de fuego. Es importante que todos nosotros hagamos nuestra parte para guardar las armas de fuego en una manera segura y mantener las armas de fuego afuera de las manos de niños y criminales. Nosotros estamos trabajando en colaboración con el programa federal llamado Project Safe Neighborhood (PSN).

Como compañeros en nuestros esfuerzos para mantener las calles fuera de peligro en su comunidad, nosotros queremos recordarle de sus obligaciones como dueño de una arma de fuego.

Si usted decide vender o regalar su arma de fuego a alguien, usted necesita completar el formulario "Dealer Record of Sale" (DROS). Este formulario se puede obtener y completar en cualquier negocio de armas de fuego. No se olvide, es un crimen transferir una arma de fuego a cualquier persona sin primero completar este formulario.

Si la policía recupera una arma de fuego que fue envuelto en un crimen, el procurador municipal de Los Ángeles proseguirá el dueño anterior de la arma de fuego si el dueño anterior no completó el formulario "Dealer Record of Sale". Por favor no se olvide ir a un negocio de armas de fuego y completar ese formulario si usted vende o regala su arma de fuego.

Usted puede ayudarnos hacer Los Ángeles una comunidad mas segura en no permitir que su arma de fuego llegué a manos peligrosas.

Gracias,

Rockard J. Delgadillo
Los Angeles City Attorney

Bill Lockyer, Attorney General
State of California

William J. Bratton, Chief
Los Angeles Police Department

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