

June 3, 2005

The Honorable F. James Sensenbrenner, Jr.
Chairman
Committee on the Judiciary
House of Representatives

Subject: *Interim Report on the Effects of COPS Funds on the
Decline in Crime during the 1990s*

Dear Mr. Chairman:

The enactment of the Public Safety Partnership and Community Policing Act of 1994, Title 1 of the Violent Crime Control and Law Enforcement Act (VCCLEA),¹ authorized appropriations of \$8.8 billion to advance the practice of community policing as an effective strategy in communities' efforts to improve public safety. It had as a goal adding 100,000 new police officers nationwide.² The Attorney General created the Office of Community Oriented Policing Services (COPS) to administer community policing grants. VCCLEA was enacted shortly after a period of increasing violent crimes such as murder, rape, robbery and aggravated assault. For example, from 1983 to 1992—the year before the nationwide volume of violent crime began to decline—the number of violent crimes known to the police increased from less than 1.3 million to more than 1.9 million (or about 54 percent), and the violent crime rate per 100,000 population increased from 538 to 758 (or about 41 percent).

In December 1993, the Department of Justice (DOJ) began making community policing grants to state and local law enforcement agencies.³

¹Pub. L. 103-322 (1994), 42 U.S.C. § 3796dd.

²The act contained other provisions to address violent crime, such encouraging states to increase the use of incarceration for violent offenders through the Violent Offender Initiative and Truth-in-Sentencing grants, enhancing penalties for gang crimes, and expanding the number of federal death penalty offenses.

³Prior to the enactment of VCCLEA, DOJ awarded grants under the Police Hiring Supplement Program, established by the Supplemental Appropriations Act of 1993 ((P.L. 103-50 (1993)). Grants made under this program were funded by DOJ's Bureau of Justice Assistance and monitored by the COPS Office. In this report, COPS grants refer to both these grants and community policing grants authorized under VCCLEA.

By 2001, COPS grants totaling \$7.3 billion in obligations had been made to state and local law enforcement agencies, and these agencies had expended about \$5 billion of these obligated amounts.⁴ The COPS grant expenditures amounted to about 1 percent of total local law enforcement expenditures from 1994 through 2001. During the time that agencies were spending COPS funds, violent crimes declined. For example, between 1994 and 2001, the number of violent crimes declined from about 1.9 million to about 1.4 million (or about 23 percent), and the violent crime rate per 100,000 population declined from 714 to 504 (or about 29 percent). While the less than 1 percent of total local law enforcement expenditures contributed by COPS funds during this period is unlikely in itself to have generated the 29 percent decrease in the violent crime rate, the questions of whether and, if so how much, the roughly \$5 billion in COPS expenditures contributed to the decline in crime merit attention.

One recent study of the effects of COPS grants on crime concluded that the COPS grants contributed to reductions in crime in the 1990s.⁵ However, we previously reviewed the study and reported that its methodological limitations were such that the study's results should be viewed as inconclusive.⁶ Moreover, neither the study we reviewed nor a second study of the effects of COPS grant funds on crime analyzed specific ways by which COPS funds could affect crime.⁷ For example, the two studies did not examine whether reductions in crime were associated with the additional police officers that COPS funds provided or whether they

⁴Grants were also available to other public enforcement agencies, Indian tribal governments, other public and private entities, and multi-jurisdictional or regional consortia that employ sworn law enforcement officers.

⁵Zhao, J., and Thurman, Q., *A National Evaluation of the Effect of COPS Grants on Crime from 1994 to 1999* (December 2001).

⁶Our review of this study was reported in: *Technical Assessment of Zhao and Thurman's 2001 Evaluation of the Effects of COPS Grants on Crime*, [GAO-03-867R](#) (Washington, D.C.: June 13, 2003).

⁷In addition to the Zhao and Thurman work cited above, David Muhlhausen has assessed the effects of COPS funds on crime rates. Using county-level data, Muhlhausen found that other than the various grants used to fund specific actions such as targeting domestic violence and gang activities, COPS grants used to hire additional officers and redeploy current officers were not associated with reductions in crime. See Muhlhausen, D. *Do Community Oriented Policing Services Grants Affect Violent Crime Rates* (Washington, D.C.: The Heritage Foundation, May 25, 2001). An updated version of the Zhao and Thurman study can be found at Zhao, J., and Thurman, Q., "Funding Community Policing to Reduce Crime: Have COPS Grants Made a Difference from 1994 to 2000?" Report submitted to the Office of Community Policing Services, U.S. Department of Justice, July 2004.

were associated with changes in policing practices that may have been stimulated by COPS funds.

In response to the inconclusive results of the study we reviewed, you asked us to undertake our own independent evaluation of the impact of COPS grants on the decline in crime that occurred during the 1990s. This report provides results to date from our evaluation regarding three inter-related questions about the extent to which, if any, that COPS grants affected the decline in crime in the 1990s: (1) How were the COPS grant funds distributed among local law enforcement agencies, and to what extent did the distribution of funds correspond to the distribution of total crime and violent crime? (2) Were COPS grants associated with changes in policing practices such as proactive problem identification and intervention, collaboration between police and their communities, and a focus on specific places with high concentrations of crime? (3) Did COPS grant funds lead to increases in the number of sworn police officers, and if so, what was the impact of these COPS-funded officers on the decline in crime during the 1990s? Our final report on our evaluation—due for release in fall 2005—will assess additional aspects of these research objectives, such as other distributional issues related to the flow of funds, officers, and crime; cost-effectiveness issues; and the relationship between policing practices and crime.

To address our reporting objectives, we created and analyzed a database consisting of data on 13,133 local law enforcement agencies that had reported complete crime data for at least 1 year during the years from 1990 through 2001. We organized the database as a panel data set, in that it contained information on multiple units of analysis (law enforcement agencies) over multiple years. For each agency, we obtained data on COPS and other federal law enforcement grant obligations and expenditures from the DOJ's Office of Justice Programs (OJP), and data on index crimes and the number of sworn officers from the Federal Bureau of Investigation's (FBI) Uniform Crime Reporting (UCR) Program. Index crimes include the violent crimes of murder and non-negligent manslaughter, forcible rape, robbery, and aggravated assault, and the property crimes of burglary, larceny-theft, motor vehicle theft, and arson.⁸ We obtained data on some of the factors that the research literature on crime suggests are related to changes in crime. From the Department of Commerce's Bureau of Economic Analysis, we obtained data on local economic conditions—including employment rates and per capita

⁸We excluded arson from our analyses because according to the FBI, there is limited reporting of arson offenses to the UCR Program by law enforcement agencies.

income—and from the Census Bureau, we obtained data on demographic variables—including the percent of the population aged 15 to 24, and the racial and gender composition of the population. We also obtained data from two surveys of nationally representative samples of police departments on the policing practices that they reportedly used. Each survey was administered to its respective sample of agencies in 2 separate years, thereby allowing for analyses of changes in policing practices.⁹ Using agency and year identifiers, we matched and merged data on funds, crime, officers, and economic and demographic conditions from our database with the agency-level records in each of the surveys. Prior to developing our database, we assessed the reliability of each data source and in preparing this report, we used only the data that we found to be sufficiently reliable for the purposes of our report. See enclosure I for more information on the data that we used and the procedures we undertook to assess the reliability of the data.

We analyzed the data on COPS and other federal grant obligation and expenditure amounts to describe how many agencies received COPS grants and the types and amounts of grants and expenditures. We compared the amounts of COPS grants with selected characteristics of each agency's community, such as its population size and volume of crime. To address the relationship between COPS grants and changes in policing practices, we analyzed data from the two surveys by comparing changes in reported policing practices between agencies that received COPS grants and those that did not receive them. To assess the effects of COPS expenditures on the number of officers and crime, we developed and estimated fixed-effects regression models to determine the size and significance of these relationships. The fixed-effects models assisted us in controlling for unobserved factors that are not accounted for by the control variables included in the models. Our regressions estimated the effects of COPS and other federal law enforcement grant expenditures on

⁹The first survey was The National Survey of Community Policing Strategies which was administered at two time points, in 1993 and 1997 (Rosenthal, Arlen M., and Fridell, Lorie. *National Survey of Community Policing Strategies Update, 1997, and Modified 1992-1993 Data* [Computer file]. Inter-university Consortium for Political and Social Research (ICPSR) version. Calverton, Md: ORC Macro International, Inc. [producer], 2002. Ann Arbor, MI: ICPSR [distributor], 2002). In the remainder of this letter, we refer to the two administrations of this longitudinal survey as the Policing Strategies Survey. The second survey was conducted by the National Opinion Research Center for the Urban Institute in 1996 and 2000 as part of the National Institute of Justice-funded implementation evaluation of the COPS program. See Roth, J., et al., *National Evaluation of the COPS Program—Title I of the 1994 Crime Act*, Washington, D.C.: National Institute of Justice, August 2000. In the remainder of this letter, we refer to the two administrations of this second longitudinal survey as the National Evaluation of COPS Survey.

officers and crime, respectively, while controlling for differences among agencies in their pre-COPS program trends in crime rates and sworn officers, and for differences over time in socio-economic factors that could affect both the number of police officers and crime rates, such as unemployment and per-capita income, and changes in population composition. We used agency-level fixed-effects to control for systematic cross-sectional differences, and we used year-fixed effects to control for time-specific differences between the agencies. In addition, we used state-by-year fixed effects to control for changes in state-level practices that could affect crime, such as changes in incarceration, sentencing practices, or other state programs. Because of the complexity of the statistical models that we used to estimate the effects of COPS grants on crime, we reviewed our approach and methods with a group of experts in the field of policing and crime. The group consisted of criminologists, economists, statisticians, and practitioners, and was convened for us by the National Research Council of the National Academies to enable participants to offer their individual advice as experts in the field. See enclosure I for additional details on our methods.

We conducted our work between January 2004 and June 2005 in accordance with generally accepted government auditing standards.

Background

The COPS Office distributed grants in about 30 different grant program funding categories. The largest grant program category was the COPS hiring grants,¹⁰ which required agencies to hire new officers and at the same time to indicate the types of community policing strategies that they intended to implement with the officers that they were to hire with these grants. The hiring grants paid a maximum of \$75,000 per officer over a 3-year period (or at most 75 percent of an officer's salary) and generally required that local agencies cover the remaining salary and benefits with state or local funds. The next largest grant category was the Making Officer Redeployment Effective (or MORE) grant program, which provided funds to law enforcement agencies to purchase equipment and hire civilians, with the goal of expanding the amount of time spent on community policing. Additional COPS grant programs provided funds for specific innovations in policing. For example, the Distressed

¹⁰Hiring programs authorized under VCCLEA and administered by the COPS office included the Phase I program, which funded qualified applicants who had applied for the Police Hiring Supplement but were denied because of the limited funds available; COPS AHEAD (Accelerated Hiring, Education, and Deployment) for municipalities with populations 50,000 and above; and COPS FAST (Funding Accelerated for Smaller Towns) for towns with populations below 50,000. In June 1995, Phase I, COPS AHEAD and COPS FAST were replaced by the Universal Hiring Program.

Neighborhoods Pilot Project grants provided funds to communities with high levels of crime and/or economic distress to hire officers and implement a variety of strategies to improve public safety, and the Methamphetamine Initiative provided funds to state and local agencies to support a variety of enforcement, intervention, and prevention efforts to combat the methamphetamine problem. COPS also provided grants for a variety of other purposes, including funding to meet the community policing training needs of officers and representatives of communities and local governments (through a network of Regional Community Policing Institutes), and grants to law enforcement agencies to hire and train school resource officers to help prevent school violence and improve school and student safety (the COPS in Schools Program).

Each year COPS was required to distribute half of the grant funds to agencies in communities whose populations exceeded 150,000 persons and half of the grant funds to agencies in communities with populations of 150,000 or fewer persons.¹¹

The COPS program aimed to affect change in policing practices. For example, in the application for COPS hiring grants, agencies were asked to report the types of practices that they planned to implement with their grants, such as identifying crime problems by looking at records of crime trends and analyzing repeat calls for service, working with other public agencies to solve disorder problems, locating offices or stations within neighborhoods, and collaborating with community residents by increasing officer contact with citizens and improving citizen feedback. The types of practices that agencies planned to implement with their grants correspond with general approaches to policing. For example, problem-solving policing practices may rely on crime-analysis tools to identify crime problems in developing solutions to these problems. Place-oriented practices attempt to identify the locations where crime occurs repeatedly and to implement procedures to disrupt these recurrences of crime. By collaborating with community residents, agencies attempt to improve citizen feedback about crime problems and the effectiveness of policing efforts to address these problems.

Assessing whether COPS funds contributed to the decline in crime during the 1990s is complicated by many factors. Nationwide, the decline in crime

¹¹Of funds available in any fiscal year, up to 3 percent may be used for technical assistance or for evaluations or studies carried out or commissioned by the Attorney General. The requirement to allocate the funds by size of agency population applies to the remaining funds in any fiscal year (42 U.S.C. § 3793(a)(11)(B)).

began in 1993 before the COPS program made its first grants, and the general decline in crime makes it difficult to isolate the effect, if any, of COPS funds on crime. COPS grants were distributed in ways that make rigorous evaluations of their causal impacts difficult to implement. For example, the majority of police agencies in our analysis—82 percent—received at least one COPS grant. This wide distribution of COPS grant recipient agencies limits the number of agencies that could be used as comparison agencies against which to assess the effects of COPS grant funds on the decline in crime. Further, the amount of funding certain agencies receive may also relate to the agency's ability to combat crime. For example, certain police chiefs may be more capable than others at acquiring funds and also more up-to-date on policing methods. Therefore, to assess the effects of COPS funds on crime, it is necessary to attempt to control for an agency's underlying ability to address crime problems and obtain funds, as well as other unobserved factors.

Appropriate methodologies from research on crime have been developed to address these constraints. For example, fixed-effects regression models that use a panel of data—or repeated observations on the same units, such as police agencies, over several time periods—allow for assessing changes in the number of sworn officers and crime rates that are associated with variation in the timing and amount of COPS grant expenditures. These regression methods also allow for the introduction of controls for unobserved pre-existing differences between units (agencies) and differences over time within units. In addition, methods incorporating the underlying trajectories in crime rates and sworn officers in each agency into the modeling of the effects of COPS funds allow for explicit comparisons within groups of agencies sharing similar trajectories. By identifying and explicitly modeling the mechanisms through which a program could have its effects—such as COPS funds leading to increases in the number of officers and their effects on crime—the possibility of a spurious relationship between inputs (such as COPS funds) and outcomes (such as crime) can be minimized.

Results

Of the \$6.01 billion in total COPS grant funds obligated to agencies in our sample between 1994 and 2001, the majority was obligated in the form of hiring grants, which accounted for about \$4.05 billion, or 67 percent of all obligations.¹² About 82 percent, or about 9,100, of the agencies in our

¹²The sample consisted of 11,187 agencies out of the 13,133 agencies in our entire sample of agencies with at least 1 complete year of crime data. The 11,187 agencies are those for which we were able to link crime, COPS, and other federal law enforcement expenditures' data. The 11,187 agencies accounted for about 86 percent of the reported index crimes in the United States from 1990 through 2001.

sample received at least one COPS grant, of any type, during this period, and about 75 percent received at least one hiring grant. By 2001, about 70 percent of the obligated amounts had been spent by the agencies that received the grants.¹³ In the sample of COPS grantee agencies for which we obtained population and crime data and could make comparisons, we found that the COPS Office distributed about half of the grant money to agencies covering populations of more than 150,000 and half to agencies with populations of less than 150,000. Because crime may not be directly related to population, one potential effect of the statutory requirement to allocate funds based upon population is that funds might not necessarily be allocated in relation to the volume of crime. We found that, in the aggregate, COPS grant funds were distributed in proportion to the total volume of index crimes, but they were not distributed in proportion to the volume of violent crimes in the agencies that fell into these two population categories. For example, agencies serving populations of less than 150,000 persons received about 53 percent of COPS funding, but they accounted for about 38 percent of violent crimes reported to the police. The disparity was even greater for agencies serving the smallest populations (such as places with populations of fewer than 25,000 persons).

Our analysis of changes in policing practices shows that agencies that received COPS grant funds reported on average larger increases in policing practices than those agencies that did not receive a COPS grant. However, it may be the case that the receipt of COPS grants resulted from agencies' efforts to change policing as opposed to being the cause of the change in policing practices.

We compared the pre-COPS grant program (i.e., 1993) levels of reported policing practices overall, and for four types of policing practices—problem-solving practices, place-oriented practices, crime analysis, and community collaboration—with their reported levels during the COPS program (i.e., in 1997) in the Policing Strategies Survey sample of police agencies. We found that there were larger increases in the reported use of policing practices among the agencies that received at least one COPS grant in this period than occurred among the agencies that did not receive a COPS grant. The average increase in the level of reported use of all

¹³We obtained a total of \$7.32 billion in COPS grant obligations from 1994 through 2001 among all agencies in our database that received at least one federal law enforcement grant from 1990 through 2001 regardless of whether these agencies could be matched with the UCR crime data. Of this total, \$4.69 billion was in the form of hiring grants. Not all COPS obligated amounts were expended in the same years that agencies received grants. This may be due to lags between the time of the receipt of a grant and the hiring of officers or purchasing equipment.

policing practices among the COPS grantee agencies was about 31 percent, while among the agencies that did not receive a COPS grant, the increase was about 17 percent. For example, the mean level of reported practices among agencies that received a COPS grant increased from 9.9 to 12.9 practices, while among the non-grantee agencies the mean level increased from 8.3 to 9.8 practices.¹⁴ In addition, the agencies that received COPS grants also had larger increases in the average levels of reported use of problem-solving, place-oriented, and community-collaboration practices than did the agencies that did not receive a COPS grant. For example, among agencies that received COPS grant funds in this period, the average level of reported use of problem-solving practices increased by about 35 percent, as compared to about a 20 percent increase among the non-grantee agencies. The increase in place-oriented practices among COPS grantee agencies was about 32 percent, as compared to about 13 percent among the non-COPS grantee agencies.

Our analysis of the National Evaluation of COPS Survey data on policing practices in 1996 and in 2000 also showed that agencies that received COPS grants reported larger increases in the use of policing practices than did non-COPS grantee agencies. We found this relationship regardless of when an agency received its first COPS grant. For example, for the agencies that received their first COPS grant prior to 1996, the average increase in reported use of policing practices from 1996 to 2000 was about 22 percent, and for the agencies that received their first COPS grant between 1996 and 2000, the average increase in reported use of policing practices was about 16 percent. By contrast, for the agencies that had not received a COPS grant by 2000, there was about a 2 percent increase in the reported use of policing practices from 1996 to 2000.

Our regression models for estimating the effects of the variation in the timing and amount of COPS hiring grant expenditures per capita on the levels of sworn officers over the years from 1991 through 2001 showed that COPS hiring grant expenditures were associated with increases in the net number of sworn police officers. We obtained these results after controlling for agency-level differences in the timing and amount of other COPS grant expenditures and other federal law enforcement grant expenditures; after controlling for annual changes in local economic and demographic conditions in the county in which an agency was located; and after controlling for changes in state-level factors that could affect the

¹⁴Reported changes in this paragraph are based on statistical tests of differences in levels of policing practices from 1993 to 1997 between agencies that received a COPS grant and those that did not receive a COPS grant in this period.

level of sworn officers. Specifically, from our analyses of data for police agencies serving populations of 10,000 or more persons we estimated that each \$25,000 in COPS hiring grant expenditures per year added about 0.6 of a sworn officer to the net number of sworn officers. We assessed the effects of all COPS grant expenditures in specific years on the level of sworn officers in these years, compared to the baseline, pre-COPS program year of 1993. In 1998 through 2000—the 3 highest years of COPS expenditures—we estimated that COPS expenditures were responsible for an increase in the number of sworn officers per capita of about 3 percent above the levels that would have been expected without the funds.¹⁵ Upon projecting the results from our analysis of our sample of agencies to the entire U. S. population, we estimated that, in the years from 1998 to 2000, COPS grant funds were associated with about 18,000 officers in each year.

Using COPS hiring grants as a statistical link between the change in the number of sworn officers and the change in crime, we estimated that COPS-funded increases in sworn officers per capita were associated with declines in the rates of total index crimes, violent crimes, and property crimes in our sample of agencies serving populations of 10,000 or more persons.¹⁶ These effects held after we controlled for the effects of other federal law enforcement grant program expenditures by agencies, local socio-economic and demographic changes that could affect crime, and state-level factors—such as increases in incarceration, changes in sentencing practice, and state-level changes in other programs such as welfare—that could also affect crime.¹⁷ The effects of COPS funds on crime varied among specific categories of index crimes. We calculated that a 1 percent increase in the level of sworn officers per capita was associated with reductions in the rates of specific index crimes from about 0.1 percent to about 2 percent. For example, a 1 percent increase in the level of officers was associated with about a 2 percent reduction in robbery rates, about a 0.5 percent reduction in the rate of aggravated assaults, and about a 0.1 percent reduction in the larceny-theft rate.¹⁸

¹⁵COPS expenditures were \$785 million in 1998, \$790 million in 1999, and \$869 million in 2000.

¹⁶In addition, in our analyses of the effects of sworn officers on specific categories of crimes, we found reductions in the rates of murder and non-negligent manslaughter, aggravated assault, robbery, burglary, larceny, and motor vehicle theft.

¹⁷While our results are based upon statistically significant findings, uncertainties associated with model formulation are always of potential concern.

¹⁸In our analyses, COPS expenditures were not associated with reductions in the rate of forcible rape.

In our analysis, the total effect of COPS grant expenditures on crime rates depended upon the level of all COPS grant expenditures in a given year, and level of expenditures varied from year to year. For the years from 1998 through 2000—when COPS grant expenditures were at their peak levels—and among the agencies in our sample, we estimated that COPS grant expenditures were associated with about 1 percentage point of the annual reduction in the index crime rate from its 1993 level, and about 3 percentage points of the annual reduction in the violent crime rate from its 1993 level. When we projected these results from the analysis of our sample to the entire U. S. population, we estimated the annual reductions in crimes attributable to COPS funds nationwide. For the years 1998 through 2000, we estimated that COPS grant expenditures were associated with reductions in index crimes from their 1993 levels that ranged from about 200,000 to 225,000 index crimes, and about one-third of these were violent crimes and about two-thirds were property crimes. In 1998—when COPS grant expenditures amounted to about \$785 million or 1.5 percent of all local law enforcement expenditures—we estimated that the crimes reduced due to COPS grant expenditures amounted to about 8 percent of the total decline in index crimes and about 13 percent of the total decline in violent crimes from their 1993 levels. During the years 1999 and 2000—when COPS expenditures averaged about \$829 million per year, or also about 1.5 percent of all local law enforcement expenditures—and crime continued to decline, we calculated that the COPS-funded reductions in crimes accounted for about 5 percent of the total reduction in index crimes and about 10 percent of the total reduction in violent crimes from their 1993 levels.

Agency Comments and Our Evaluation

We requested comments on a draft of this report from the Attorney General. Department of Justice officials informed us that the agency did not have any comments on the report.

As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution of it until 30 days from the date of this report. We will then send copies of the report to the Attorney General and will make copies available to others upon request. In addition, the report will be available at no charge on GAO's web site at <http://www.gao.gov>.

If you or your staff have any questions concerning this report, please contact Laurie Ekstrand at (202) 512-8777 or by e-mail at Ekstrandl@gao.gov or Nancy Kingsbury at (202) 512-2700 or by e-mail at Kingsburyn@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report.

In addition, William J. Sabol, Tom Jessor, David Lilley, and Benjamin Bolitzer made major contributions to this report.

Sincerely yours,



Laurie Ekstrand, Director
Homeland Security and Justice Issues



Nancy Kingsbury, Managing Director
Applied Research and Methods

Enclosures - I

Enclosure I: Elements of the Database Used in Our Analysis and Methods Used to Address Our Research Objectives

We constructed a database—our primary analysis database—that consisted of up to 12 years of data (covering the period from 1990 through 2001) for each of 13,133 law enforcement agencies that reported at least 1 complete year of crime data to the FBI’s Uniform Crime Reporting (UCR) Program. These agencies represented about 71 percent of the roughly 18,000 to over 19,000 agencies that were included in the data that we received from the UCR. The 13,133 agencies covered about 88 percent of index crimes reported in the UCR. We constructed our database in the form of a panel, in which we obtained repeated measures on key variables in each agency over time.

The database contained information on federal law enforcement grant amounts, reported crime, number of police officers, and socio-economic and demographic factors associated with crime. The types of information contained in our database were:

- Grant obligation amounts to and annual amounts expended by each recipient of a community-oriented policing (or COPS) grant.¹
- Annual amounts of other federal local law enforcement grants expended both by agencies that received COPS funds and those that did not.
- Annual data on the number of index crimes and seven categories of index crimes, along with annual data on the number of such crimes per 100,000 persons.
- Annual observations on the number of sworn police officers and the number of officers per 10,000 persons.
- Annual data on economic and demographic factors that are related to crime, such as employment, per-capita income, relative number of persons in the 15 to 24 age group—an age group associated with high crime rates—the gender and racial composition of populations, and total population.

We linked data from the various sources to each law enforcement agency contained in our sample of agencies. The sources of data used to compile

¹In this report, COPS grants refer both to DOJ grants awarded through the Police Hiring Supplement Program and the COPS Office’s community policing grants authorized under VCCLEA.

the annual observations from 1990 through 2001 on local police departments included:

- The UCR—Annual data files on the number of crimes and sworn officers reported by each agency to the UCR. We analyzed data for the violent crimes of murder and non-negligent manslaughter, forcible rape, robbery, and aggravated assault, and the property crimes of burglary, larceny-theft, and motor vehicle theft. In addition, the data on sworn officers represent the reported number of full-time officers in each agency on October 31 of each year. We used the originating agency identifier (or ORI) variable and place codes to link crime and officer data to other data sources.²
- Office of Justice Programs (OJP) Financial Data—Annual data on the amounts obligated and paid (expended) from each grant awarded by OJP. Because OJP and COPS share data, these OJP data also included COPS grant expenditures. We used information about place codes and OJP vendors to link these data to our other sources.
- Bureau of Economic Analysis (U.S. Department of Commerce)—County level data on per capita income and employment. We linked these data to agency-level data using place codes. Local economic conditions within each county are applied to each agency within a county.
- Population Estimates Program (U.S. Census Bureau)—For each county, we obtained population totals and population breakdowns by gender, race, and age. We linked these data using place codes.

In addition to the sources above that provided annual data on local policing agencies, we obtained and analyzed data from two separate surveys of nationally representative samples of local law enforcement agencies about the types of policing practices that they reportedly used. Both surveys consisted of two administrations or waves of observations on the agencies in their respective samples. The first survey, the National Survey of Community Policing Strategies (or “Policing Strategies Survey”), was administered in 1993 and again in 1997. The Police Foundation administered the 1993 wave of the survey, and Macro International, Inc.

²We used Federal Information Processing Standards codes (or FIPS codes), which identify named population places and are issued by the National Institute of Standards and Technology.

administered the 1997 wave of the survey.³ We identified agencies in the Policing Strategies Survey that responded to both waves of the survey, and of these, we were able to link the data from 1,035 agencies to our larger database on crime, officers, money, and economic conditions.⁴ We used the Policing Strategies Survey data to compare reported changes in the types and levels of policing practices that occurred during the COPS program with pre-COPS levels of practices.

The second survey, which we termed the National Evaluation of COPS Survey, was conducted by the National Opinion Research Center for the Urban Institute in its national evaluation of the implementation of the COPS program.⁵ We used the two waves of the survey from 1996 and 2000, and we were able to link the data from 1,001 agencies that responded to both of these waves of the survey to our larger database on crime, officers, money, and economic conditions.⁶ We used the data from this survey to compare changes in reported policing practices occurring during the period of the COPS program.

Prior to developing our database, we assessed the reliability of each data source. To assess the reliability of the various data sources, we (1) performed electronic testing for obvious errors in accuracy and completeness; (2) reviewed related documentation, including data dictionaries, codebooks, and published research reports that made use of the data sources; and (3) worked closely with agency officials to identify any data problems. When we found discrepancies (such as nonpopulated fields or what appeared to be data entry errors) we brought them to the agencies' attention and worked with them to correct the discrepancies before conducting our analyses. We determined that the data were sufficiently reliable for the purposes of our report.

³The 1993 survey was designed to provide information on what was occurring and what needed to occur in the development and implementation of community policing. The 1997 survey was designed to provide information on the most current practices and trends in community policing.

⁴These agencies represented about 82 percent of the agencies that responded to both waves of the Policing Strategies Survey.

⁵See Roth, J., et al., *National Evaluation of the COPS Program—Title I of the 1994 Crime Act*.

⁶These agencies also represented about 79 percent of the agencies that responded to both waves of the National Evaluation of COPS Survey.

In addition, we assessed potential biases of using UCR reported crime data for our estimates of the effects of COPS funds on crime. The crime data in the UCR consist of crimes brought to the attention of law enforcement agencies. These crimes are a subset of all crimes. Underreporting crimes by citizens could introduce bias in our results if the rate at which citizens reported crimes to the police declined during our study period. Under such a scenario, the true crime rate would diverge from the reported crime rate, and our results, which are based on the reported crime rate in the UCR, could attribute reductions in crime to COPS expenditures when in fact the true crime rate diverged from the reported crime rate. We assessed the direction of potential biases associated with reporting of crimes to the police and concluded that, if the rate of reporting crimes increased or remained the same, then our estimates of the effects of COPS expenditures on crime would underestimate the true effects of COPS expenditures. However, if the rate that citizens reported crimes to the police declined, then our estimated effects would overstate the true effects of COPS expenditures on crime. To assess possible bias in reporting crimes to the police, we analyzed data from the National Crime Victimization Survey (NCVS). These data, which are drawn from a nationally representative sample of households, report on individuals' experiences as victims of crimes. If respondents had been victimized, they were asked if they or others reported the criminal victimization to the police. The NCVS data show that during the 1990s, victims generally increased the rate at which they reported crimes to the police, especially if they had been the victim of a violent crime. Given these findings, it appears that our model is more likely to underestimate than overestimate the effect of COPS funds on changes in the true crime rate.

We conducted our work between January 2004 and June 2005 in accordance with generally accepted government auditing standards.

Methods Used to Analyze the Flow of COPS Funds

In analyzing the flow of COPS funds to local law enforcement agencies, our objectives were to assess how COPS funds were distributed in relation to population and crime. We used the OJP financial data to compute the amount of COPS funds obligated by COPS grants and the amount expended by local police agencies during the period from 1994 through 2001. To describe the overall COPS funding trends by grant type, we analyzed the universe of agencies in the OJP data that received any federal law enforcement grant during the period from 1990 through 2001, regardless of whether or not the agency received a COPS grant during the period and regardless of whether we were able to link the data from these agencies to records in the UCR. For the 1990 through 2001 period, the OJP data show that 13,332 agencies received any federal law enforcement grant. For analyses of COPS funds by agency population sizes and for

comparisons of funding levels with levels of violent and total index crime, we limited our analysis to the subsample of agencies whose crime and population data we were able to link to the OJP data. This resulted in a sample of 11,187 agencies—or 85 percent—of the 13,133 agencies in our primary analysis database. These 11,187 agencies accounted for 86 percent of the reported index crimes in the United States from 1990 through 2001.

Methods Used to Analyze Changes in Policing Practices

To address whether COPS grants were associated with changes in the use of policing practices, we analyzed the Policing Strategies and National Evaluation of COPS survey data. We compared differences in the reported levels of policing practices between agencies that received COPS grants and those that did not receive grants during the 2 periods covered by the surveys. With the Policing Strategies Survey, we compared pre- and within-COPS program differences in the reported use of policing practices (or from 1993 to 1997), and with the National Evaluation of COPS Survey, we compared changes in the reported use of policing practices that occurred during the COPS program (or from 1996 to 2000).

Each of the surveys reported data on the policing practices used by agencies. Survey responses were obtained from knowledgeable officials within each agency, such as the police chief or the chief's designee. The number of items related to policing practices differed between the two surveys. For the data in each survey, we classified items into four categories of policing practices: problem-solving practices, place-oriented practices, community collaboration activities, and crime analysis activities.

We used 30 items on policing practices from the Policing Strategies Survey. We combined eight practices pertaining to increasing officer contact with citizens and improving citizen feedback into a community collaboration index. We used items on the crime analysis units within police departments to create our index of crime analysis. We combined seven practices pertaining to increasing enforcement activity or place management in buildings, neighborhoods, or other specific places into an index of place-focused practices. And we compiled the data on 12 items that reflected organizational efforts to reduce or interrupt recurring mechanisms that may encourage crime into a problem-solving practices index. The classification of items from the Policing Strategies Survey into our four indexes of types of policing practices is shown in table 1.

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Table 1: Categories of Policing Practices and Specific Items within Each Category in the Policing Strategies Survey

Community collaboration
Agency uses foot patrol as a specific assignment
Agency uses foot patrol as a periodic expectation for officers assigned to cars
Agency uses citizen surveys to determine community needs and priorities
Agency uses citizen surveys to evaluate police service
Patrol officers conduct surveys in area of assignment
Patrol officers meet regularly with community groups
Supervisors maintain regular contact with community leaders
Agency uses citizens as volunteers within the police agency
Crime analysis
Agency has a decentralized crime analysis unit/function
Agency has a centralized crime analysis unit/function
Supervisors manage crime analysis for geographic area of responsibility
Place-oriented practices
Agency designates some officers as "community" or "neighborhood" officers
Agency uses building code enforcement as a means of helping remove crime
Geographically based crime analysis made available to officers
Command or decision-making responsibility tied to neighborhoods or beats
Patrol officers enforce civil and code violations in area
Fixed assignment of patrol officers to specific beats or areas
Agency uses other regulatory codes to combat drugs and crime
Problem-solving practices
Specific training provided officers for problem identification and resolution
Training for citizens in problem identification or resolution
Landlord/manager training programs for order maintenance
Interagency involvement in problem identification and resolution
Agency has revised procedures to deal with neighborhood problems
Multidisciplinary teams to deal with special problems such as child abuse and neglect
Specialized problem-solving unit
Patrol officers work with citizens to identify and resolve area problems
Organization has been redesigned to support problem solving efforts
Line supervisors make final decision about which problems are to be addressed
Line supervisors make final decision about how to handle most community problems

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Line supervisors make final decision about application of agency resources to solve problem in geographic area of responsibility

Source: Policing Strategies Survey, 1993 and 1997.

Note: Each individual item is coded dichotomously (yes/no) to indicate whether an agency implemented the specific practice.

We used 19 items on policing practices from the National Evaluation of COPS Survey, and we classified these items into the same categories of practices as we did with the Policing Strategies Survey data (table 2).

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Table 2: Categories of Policing Practices and Specific Items within Each Category in the National Evaluation of COPS Survey

Community collaboration
Regular community meetings to discuss crime
Surveys of citizens to determine general community needs and satisfaction with agency
Citizen action/advisory councils in precincts or beats
Officers analyze community residents' comments to identify recurring patterns of crime and disorder on their beats
Considering neighborhood values in creating solutions or planning projects
Varying styles of preventive patrol (e.g., bike patrol, walk-and-talk patrol)
Joint projects with local businesses to reduce disorder or petty crime
Crime analysis
Analyzing crime patterns using computerized geographic information systems
Officers analyze and use crime data to identify recurring patterns of crime and disorder on their beats
Place-oriented practices
Clean up/fix up projects with community residents
Joint projects with community residents to reduce disorder such as loitering, public drinking
Beat or patrol boundaries that coincide with neighborhood/community boundaries
Alcohol, housing, or other code enforcement to combat crime and disorder
Problem-solving practices
Designating certain recurring patterns as "problems" or "projects" requiring non-traditional responses
Analyzing problems with business or property owners, school principals, or property managers or occupants
Analyzing problems with probation/parole officers or others who monitor offenders
Using agency data to measure effects of responses to problems
Using citizens' input to measure effects of responses to problems
Team approach instead of chain of command for prevention, problem-solving, and law enforcement

Source: National Evaluation of COPS Survey, 1996 and 2000.

Note: Each individual item is coded dichotomously (yes/no) to indicate whether an agency implemented the specific practice.

From each of the surveys, we developed summary indexes of the overall number of reported policing practices and the number of practices within each of the four categories of policing practices. We then computed and compared changes in the mean levels of reported policing practices between the COPS grantee and non-grantee agencies. We tested whether

the differences in reported increases in levels of practices between the COPS-grantee and non-grantee agencies were statistically significant using one-way analysis of variance techniques.

Methods Used to Estimate the Effects of COPS Funds on Sworn Officers

To estimate the effects of COPS funds on officers, we used fixed-effects regression methods that permitted us to assess changes in the levels of sworn officers per 10,000 persons as a function of the timing and amount of COPS expenditures, other federal expenditures, local economic conditions, and changes in the age, gender, and racial composition of local populations. The fixed effects regression models allow us to control for two sources of unmeasured variation (i.e., omitted variables): The pre-existing differences among the agencies in our sample that are constant within agencies over time and the differences within agencies over time in relation to the overall trends in variables. By adopting these models, we are able to control for the effects of unmeasured variables that vary over time between agencies and that might be correlated with our dependent variables. We introduced fixed effects at the level of the local law enforcement agency. In addition, to control for state-level influences on officers that we were unable to observe directly—such as changes in state sentencing practices—we also introduced state-by-year fixed effects into our models.

To control for underlying trends in the pre-COPS grant period in sworn officers and crime, we estimated regressions that analyzed these trends, and then we classified each agency's trend within population size groups. This allowed us to compare agencies within population size categories that had similar trends in officers and crime prior to the COPS program. Specifically, we separated the agencies in four groups based on the growth rate in both officers and in crime during 1990-1993, which is prior to the implementation of the COPS program. We constructed each combination of these groups, which produced 16 cells. We then interacted these cells with each of the 11 years of data used in the regressions that analyzed the effects of COPS funds on sworn officers and with 5 population categories to yield a total of 880 effects. In essence then, each agency is being compared with another agency that had a similar trajectory—or growth rate pattern—of crime and officers in the pre-COPS period.⁷

We analyzed the data for 4,509 police agencies with populations of 10,000 or more persons. We estimated several regressions of the effect of COPS funds on sworn officers, and we included as time-varying independent

⁷This approach was first implemented by Evans, W., and Owens, E., "Flypaper COPS," (College Park, Md.: University of Maryland, April 2005).

variables the per capita amounts of COPS hiring grants, COPS MORE grants, COPS grants for innovative programs, other COPS grants, Edward Byrne Memorial State and Local Law Enforcement Assistance Discretionary Grants, Local Law Enforcement Block Grants (LLEBG), the employment to population ratio, per capita income, the percent of the population that was male, the percent of the population that was nonwhite, and the percent of the population that was between the ages of 15 and 24. All of our economic and demographic measures were observed at the level of the county that contained the local law enforcement agency. Our regressions included the agency-level fixed effects, year fixed effects, controls for the pre-COPS Program trends in the growth of officers and crime, population weights (to allow us to estimate national-level effects), and state-by-year fixed effects.

We projected our results to the nation as a whole to obtain an estimate of the change in the national level of officers attributable to COPS expenditures in a given year. We did this by multiplying the population of the United States by our estimate of the per capita effects of COPS expenditures on officers in our sample.

Methods Used to Estimate the Effects of COPS Funds on Crime through Sworn Officers

We estimated the impact of COPS expenditures on crime through these funds' effects on changes in officers. We made use of the fact that, unlike the other COPS grant types, hiring grants were earmarked specifically for the hiring of officers. Consequently, given the number of officers, variation in hiring grant expenditures should be unrelated with other changes in crime. Taking advantage of this, we used variation in COPS hiring grant expenditures to identify the relationship between sworn officers and crime rates.

We then estimated population-weighted regressions of the impact of the flow of COPS expenditures on crime rates, net of pre-existing trends in crime rates and growth of officers, and net of economic conditions, population change, and other amounts of funding for local law enforcement. We used the population weights to allow us to develop estimates for the nation as a whole. We estimated our regressions on the same sample of 4,509 agencies with populations of 10,000 or more that we used in our officers equations. We estimated crime equations separately by type of crime. Under the assumption that hiring grants can be used as an instrument, we used the results from the two regressions—officer rate on COPS funds and crime rate on COPS funds—to calculate the elasticity of crime with respect to officers (i.e., percent change in crime rates attributable to the percent change in officers).

More specifically, we estimated the effect of COPS hiring expenditures on crime controlling for measures of specific types of COPS grant funds (e.g., MORE, grants for innovation, and other COPS grants) expended, measures of other federal grant funds expended, and the controls for socio-economic and demographic changes in the population. We included the 880 variables that controlled for pre-COPS trends in officers and crime, and we introduced agency-level, year-level, and state-by-year fixed effects. The state-by-year fixed effects allow us to control for unmeasured state-level sources of variation with crime, such as increases in state incarceration rates, changes in state sentencing practices, and changes in other state programs—such as welfare reform—that could affect crime rates. We estimated regressions separately for the index crime rate and by type of index crime.

After obtaining the coefficients from our officers and crime regressions, and to obtain estimates of the effects of COPS funds on crime through officers, we then calculated the elasticity of crime with respect to officers in any given year. The elasticity of crime with respect to officers provides an estimate of the effect of a 1 percent change in the level of sworn officers per capita on the per capita crime rate. Using these elasticities, we then apportioned the amount of the reduction in crime that we could attribute to COPS funds. To project the effects of COPS funds on crime to the nation as a whole, we then weighted the estimates of COPS effects on crime in our sample up to the nation as whole.

We projected our results to the nation as a whole to obtain an estimate of the change in the national level of crimes attributable to COPS expenditures in a given year. We did this by multiplying the population of the United States by our estimate of the per capita effects of COPS expenditures on each category of crime in our sample.

Review of Our Approach by Experts

We reviewed our approach and methods with a group of experts in the fields of policing and crime. The group was convened for us by the National Research Council of the National Academy of Sciences, and consisted of criminologists, economists, statisticians, and practitioners. The members of the group offered their views on our data and methods, and offered suggestions about additional statistical tests that we could conduct to determine if our results held under different formulations of our models. For example, in the information that we presented to the experts, our regressions of the effects of COPS expenditures on officers and crime did not include the state-by-year fixed effects, which were suggested as a way to control for state-level changes in incarceration or sentencing practices. We included these effects in the regressions on which we reported in this correspondence.

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