

Achieving Sound Policing

The Promise and Challenges of
Cost-Benefit Analysis of
Public Safety

2017

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Introduction

The last few years have seen notable—perhaps historically unprecedented—turmoil around policing. Events in Ferguson, Missouri following the death of Michael Brown raised sharp concern about the militarization of the police. Other police shootings have spawned protests, movements such as Black Lives Matter, and calls to re-examine the use of force. Disclosures about police use of various surveillance technologies—from drones to domain awareness systems—have prompted calls for oversight boards and privacy assessments. Litigation around stop-and-frisk in major metropolitan areas brought societal awareness of the practice, and engendered sharp debate.

All of this has had its predictable backlash. Black Lives Matter was met with Blue Lives Matter. Police officials warned of a “Ferguson effect” in which police officers under sharp scrutiny engage in “de-policing.” The new Attorney General of the United States ordered a review of existing DOJ efforts around policing reform, and made clear his view that to curb gun violence what is needed is more policing and less scrutiny of the police.

This may, on its face, seem like a classic political struggle. Debates about police and policing raise, in the minds of many, a tension between safety and security, on the one hand, and civil liberties on the other. They also point to fissures between those who want aggressive policing, and those who feel over-policed—typically poor communities, communities of color, and other marginalized groups. (Notably, these communities are also the ones in which crime is often most of a problem.)

However, it also could be a problem of research. Standing squarely in the way of sound reform, is the fact that much of the debate that is occurring over policing is happening in a state of relative lack of information, and in the absence of good and reliable science.

We spend over one hundred million dollars a year on public safety in this country (much more if counter-terrorism measures are included), and we know far too little about what works. Much of what we know, or think we know, is anecdotal, based on a few data points and without robust assessment. To be sure, there are committed academics working hard on some of these problems—we discuss some of their work below—but they are too few, and there is no clearly-directed project to find answers.

Elsewhere in government, on matters that often are far less grave than public safety—we employ some form of cost-benefit analysis to assess our policies and practices. Cost-benefit analysis is a valuable tool because it asks for a comprehensive assessment of all the relevant costs and benefits of a policy, including alternatives.

Yet, as a 2014 report from the Vera Institute for Justice pointed out, CBA is not widely used in the criminal justice field.

With generous funding from the Laura and John Arnold Foundation, and working in concert with the Police Foundation, the Policing Project has engaged in a two-phase project to invigorate the use of cost-benefit analysis around policing. Phase I involved bringing together talented academics from a variety of fields and disciplines to discuss the challenges of using CBA to assess policing practices. In Phase II, teams of academics will work with policing agencies to do preliminary CBAs around specific policing practices.

This is the report of the first phase of our work.



Before turning to the particulars, we draw an important bottom line. During Phase I, the participants agreed on one thing: the challenges inherent to conducting CBA in the policing world are solvable. We do not need to reinvent the wheel. We can synthesize existing techniques and apply them to this context. Most importantly, our assembled experts are chomping at the bit for an opportunity to study these questions. Many others we have contacted in the social sciences and law enforcement are of like mind. Our hope is that this report and the work that follows in Phase II will spark a major effort to understand how we can best keep our society safe, in ways that minimize the costs of doing so.

The State of the Field, and the Challenges of Public Safety CBA

To be clear, there are noted scholars doing work in the public safety space, and they have produced important work. Researchers like Anthony Braga, David Weisburd, Lawrence Sherman, Jeff Fagan, and others have analyzed the effects of certain policing tactics—like stop and frisk and hot spots policing—on public safety. Others, notably Cynthia Lum and Christopher Koper, also have done work on various police technologies, including license-plate readers. But given the importance of the issue, the work that is being done, and being funded, is a drop in the bucket of what is needed.

Even when we have some analysis of the effects of various policing practices on crime, we have almost no rigorous research on the broader effects of these practices on society as a whole. If CBA is the goal, we are doing a very partial job, at best.

Take, for example, stop-and-frisk. The practice has been a matter of deep public salience, featured even during the 2016 presidential debates. A number of studies have asked whether conducting large numbers of stops in high-crime areas “works” to reduce crime. Yet the evidence from these studies is contested and inconclusive. We need to apply more rigorous science to this question, science that has been well developed in other contexts.

Moreover, stop and frisk may negatively impact communities in a variety of ways, and the quantitative assessment of the practice almost never weighs these costs. We simply cannot say whether something “works” or not unless we take a full accounting of all costs and benefits, and try to assess them using a common metric of some sort. Again, in other contexts—from the environment to workplace safety to public health—great progress has been made in thinking about how

to assess the social harms or costs of various practices. What is needed is to apply these strategies in the context of policing.

Approaching policing from a CBA perspective can improve the way we think about how best to promote public safety. It forces us to ask the right questions on the front end, and take a stab at some answers. It channels our thinking toward unintended consequences, and the costs they can impose on society.

The Extent of the Problem

Cost-benefit analysis is valuable not only for policing practices that might be controversial. It is just as applicable to the countless mundane questions that policing agencies must tackle daily. And it is of inestimable value to municipal leaders—be they mayors, city managers, budget directors, or town councils—who must grapple with hard budgetary choices.

As a prelude to embarking on this project, the Police Foundation and Policing Project co-hosted a series of conference calls with Police Foundation Fellows and Executive Fellows. Given the decades of expertise these Fellows have in leadership roles in police departments nationwide, we asked them to tell us what practices they would like to see subjected to CBA. Their answers made clear that there is almost no area of policing without demand for high-quality CBA. Is it a good idea to use drones to map traffic accidents? Is it better to meet staffing needs by using overtime or hiring new officers? Are specialized units such as aviation or crime analytics worth the cost? As these, and the many other questions we were asked, indicate, policing officials are eager to see CBA on countless things they do and choices they must make.

The questions that policing officials are asking are only going to become more acute in the face of burgeoning technologies. Policing officials already are faced with a variety of tools to choose from, be it ShotSpotter or license plate readers or facial recognition software. Many of these tools can be quite expensive, and there is little hard data about how well they work. How should police and city officials decide what tools they need, and which they can do without?

For police officials, making smart and informed choices about new policing practices and technologies can pay large dividends in public trust and support. Every new police practice or technology presents a set of tradeoffs which must be weighed against the alternatives. Each community must decide whether a practice makes sense in their own specific context, and CBA is precisely the tool needed to ground these conversations in a common understanding.

The Approach, and a Guide to What Follows

To jumpstart this project, we gathered accomplished academics interested in discussing these issues. They came from a wide range of fields and methodologies. We had economists and data scientists and survey methodologists. They work in criminology, but also in environmental science, health science, psychology, and more.

To put this diverse group on the same page, and to focus attention on the questions we wished to discuss, we provided each attendee with a background memorandum. The memorandum also included some hypothetical fact patterns and a series of prompts. The participants responded to our prompts with short thought papers, which formed the basis for our conversations. Some of those papers are being published in the *Journal of Benefit-Cost Analysis*, whose editorial team was represented at the conference.

The report that follows summarizes our conversations over the course of two days in February 2017. We have written this report to be accessible to generalists who care about these issues, but also of value to methodologists who are working in this field or interested in doing so. In some instances, where we want to get down in the weeds, we indicate we are doing so—so that those who prefer the high grass can stay there.

The discussion that follows takes up the four topics we covered:

- ★ **Defining the Frame:** What are the goals of conducting CBA around policing? Who is the audience? What costs and benefits ought to be included? How should the various factors be weighed?
- ★ **Measuring the Effects of Policing:** How can we design studies to assess the policing policies and practices at issue? Randomized controlled trials are the “gold standard” of experimentation, but they are not always available when public safety is at issue. How can RCTs be maximized? And what alternatives are there, and how can they be used in the policing context?
- ★ **Putting a Value on the Costs and Benefits of Policing:** How do we value intangible costs and benefits like community trust or dignitary harms? How do we assess the extent to which a loss of legitimacy inhibits law enforcement?
- ★ **Where We Go from Here:** Where is a good place to dig in and start doing policing CBAs?

In the Weeds: Is CBA Really the Right Approach?

One question that came up at the conference is whether CBA is really the right analytic approach for the questions we are asking.

Some suggested that for certain questions, “management science” offers the better approach. As an example, they pointed to the question of whether to hire additional police officers or cover staffing shortages by relying on overtime, which we had used as a hypothetical in our conference materials. The advantage of a CBA perspective is that it would encourage departments to factor in some of the intangible costs of overtime, including the risk that officers working double shifts may be more likely to get injured, or incur complaints from the public. But as participants pointed out, these sorts of decisions often turn on a variety of factors—such as budget cycles and training academy schedules—that often cannot be described in cost-benefit terms. In these situations, different (though related) analytic approaches may be better able to get decisionmakers and policy makers the answers they need.



Director Barry Friedman speaking during the February 2017 CBA Conference

Part I: Defining the Frame

Before conducting a cost-benefit analysis of policing, one has to think about what costs and benefits to take into account. Policing policies and practices can have a wide range of potential effects—intended and unintended—and, by extension, a potentially unlimited set of costs and benefits for decisionmakers to consider. In addition, different decisionmakers may have broader and narrower decisionmaking frames. Compare, for example, the perspective of a police chief to that of a legislator. For these reasons, we begin our discussion by considering what frame applies.

At the conference, we opened the discussion with a brief hypothetical about License Plate Readers (LPRs), in order to illustrate the point. An LPR is a small car-mounted camera that continuously scans license plate numbers and alerts officers whenever there is a match to a law enforcement database. A match might indicate that the car was reported stolen, or that the driver has an outstanding warrant.

Some of the costs of LPRs include purchasing the equipment, storing the license plate “reads,” and officer time spent operating the units. On the benefits side, LPRs may help return stolen vehicles to their owners, provide leads in criminal investigations, and generally improve officer efficiency (thus saving department resources).

But cost-benefit analysis of acquiring LPR technology surely has to dig more deeply. LPRs may have some effect on individual privacy, or perceptions of privacy. And depending on how community members feel about police use of the technology, LPRs can either improve or undermine public perception of the police.

From there, though, one must consider the fact that LPRs also can produce a range of downstream benefits and costs. If an LPR flags a stolen vehicle, the driver may be arrested and eventually sent to prison. That means the government will need to pay the costs of trial (or time spent reaching a plea bargain), incarceration, and parole. The driver also will incur a variety of costs, including loss of liberty and employment. His or her family members may lose much-needed income. Children may start to do worse at school. This illustrates the point that the downstream costs can be quite diverse, and one must think about whether to, and where to, draw lines.

In conducting a benefit-cost analysis of policing, therefore, the first issue is which of these many benefits and costs to count.

Whose Perspective Matters?

In tackling this question, an essential place to start is by thinking about whose decision the CBA is meant to inform—and from what perspective it should be conducted.

In practice, many of the decisions described throughout this report—about deployment practices, new technologies, and various investigative techniques—are made by police chiefs or the people who work for them. Sometimes chiefs must justify their decisions to city managers or city council members, particularly if there are budgetary implications. On rare occasions, decisions are made legislatively at either the state or local level.

And this, of course, is separate from the very different question—which the Policing Project is working on in other contexts—of who should be making these decisions.

Each of these decisionmakers will have a different set of objectives—and thus a different perspective on the costs and benefits that count.

The Chief’s Perspective

Police chiefs are responsible primarily for promoting public safety. Chiefs are given a fixed budget. They must account for both the safety of the public, and the wellbeing of their rank and file. And they report to elected officials who, more often than not, evaluate their performance based on whether crime rates are going up or down. Their incentive, then, may be to maximize the gains to public safety given the various constraints they face. They may be less attentive to the intangible costs of strategies they pursue.

Some costs and benefits are likely to matter more to a chief than others. In deciding whether to use LPRs, for example, the chief will want to know how much the units will cost, how they’ll impact staffing decisions, and whether they will help address automobile theft or other crime. The chief also might think about the effect that LPRs are likely to have on community trust: if residents are unhappy about the units and become less willing to cooperate, the department may have a harder time meeting its public

safety goals. Some studies have suggested that community approval of LPRs drops as the use of the technology shifts from detecting auto theft to enforcing outstanding warrants for unpaid traffic tickets. On the other hand, a chief may be much less likely to focus on the costs of incarceration—which are paid for by other government actors. Then, there is the question of which costs or benefits chiefs should consider. Do we want chiefs to be thinking about the costs of incarceration in deciding whether to buy a new technology that can help solve more cases (and thus potentially send more people to prison)? If the costs of incarceration turn out to be too high, should the chiefs stop enforcing the law?

One argument is that police departments do not need to weigh the costs of incarceration because the legislature already has considered the costs and benefits of sending someone to prison when it set the penalties for various crimes. But as conference participants pointed out, this may not always have been the case. In addition, some policing strategies—like broken windows enforcement—may produce much higher incarceration rates than other strategies that focus less on enforcement activity. Chiefs often are faced with these sorts of strategic decisions. So, perhaps in making them, we would want chiefs to consider these sorts of downstream effects.

Law enforcement participants at the conference pointed out that occasionally police chiefs do in fact consider downstream costs. For example, a number of departments have adopted programs deemphasizing arrests—particularly in schools—in part because of the downstream impact on students. Others have partnered with substance abuse providers to develop diversionary programs for drug offenders for a similar set of reasons. On the one hand, if chiefs consider these costs in some contexts, why not in others? On the other, does the need to consider this wide

range of costs (or benefits) become debilitating to the need to simply make decisions?

Municipal Perspectives

An alternative perspective for a benefit-cost analysis is that of a mayor or city manager. City managers are responsible for the budgets of all city agencies—including municipal courthouses and jails—and are held accountable for a much broader range of societal objectives. City managers may be more attuned to the effects that policing practices may have on other measures of public welfare, like education, civic engagement, and overall neighborhood well-being.

At the same time, a city manager—like a police chief—may be less concerned about spillover effects on other jurisdictions, or with costs that are paid for by the state. A city manager is unlikely to focus on whether a particular tactic or strategy simply will drive wrongdoers into a different jurisdiction. Downstream costs like incarceration may not register because the state taxation system funds prison beds.

“Social Planner” Perspective

Often when people think about cost-benefit analysis, what they have in mind is the “social planner” perspective, which asks what the optimal policy is for society as a whole. A social planner approach includes a full accounting of all of the costs and benefits of a policy or practice, whether they are incurred by a government entity or by private citizens. This typically is the perspective that federal administrative agencies are required to take when they conduct CBAs of economic or environmental regulations. Some of the conference participants made the point that the best CBA studies do a full accounting of costs and benefits, and then allow the relevant decisionmaker to decide which costs or benefits to take into account.

Sidebar: Efficiency vs. Fairness

In conducting a cost-benefit analysis, it is important to keep in mind that the costs and benefits of policing are not always evenly distributed across different neighborhoods or community groups. Sometimes the costs of a particular policing practice may fall disproportionately on racial or ethnic minorities—while the benefits may accrue to society as a whole. When that is the case, a policy may appear to be “cost-beneficial,” but it may not be fair or just.

Again, our experts’ opinion was clear—a well-done CBA should indicate distributional inequality. By identifying up front all of the different communities or groups that are likely to be affected by a practice, a CBA then can consider what costs and benefits each group is likely to incur. In doing so, CBA has the ability to force a dialogue about issues of distribution and fairness before problems arise, and to give voices to traditionally underrepresented groups.

What Costs and Benefits Count?

Even from a “social planner” perspective, it still is not clear whether all of the potential downstream costs and benefits should be attributed to the policing practice in question. One goal in adopting LPRs, for example, is to solve more cases, which could lead to more arrests. This in turn can impose a variety of downstream costs both for the criminal justice system and the individuals involved.

There are difficulties with attributing all of these costs (or benefits) to LPRs.

First, there are many other actors who also could affect these costs and benefits. Legislators set the penalties that are associated with particular offenses.

Prosecutors have a great deal of discretion in deciding which offenses to charge. Judges often have leeway in sentencing. Cities and states can adopt a variety of social programs to help mitigate some of the collateral consequences of arrest and conviction.

Second, and we take this point up below when we discuss alternatives, if LPRs are not used, some offenders still may be apprehended by other means, incurring the same costs and benefits. The question may be what is the marginal change relevant to other options being employed.

One approach would be simply to ignore these downstream actors and ask what the best policing policy is for that jurisdiction, given what one can expect to other actors in the system to do. But this can potentially distort the analysis by making a particular technology or practice appear inefficient when the real inefficiencies are further downstream.

Ultimately, conference participants were unconcerned with this thorny question. Rather, they urged analysts just to count everything. They emphasized that the goal of CBA is not to come up with a single number to represent the net benefit of a particular policy or practice. Rather, the goal is to present a comprehensive picture of the various benefits and costs that one could expect.

This full picture of costs and benefits, moreover, has spillover benefits nation-wide. By fully characterizing the tradeoffs to a given practice, different departments can use the same analysis and potentially do no more additional work than reweighting based on their local communities’ contexts.



Hassan Aden, Police Foundation Senior Advisor on Policing

In The Weeds: Should One Include the Costs to Offenders?

One frequent question is whether to include the costs of arrest and incarceration to a person ultimately convicted of breaking the law. Most agreed that the answer is “it depends.” If someone steals a wallet, we typically count the “cost” to the wallet owner, but not the “benefit” to the thief. This is because the benefit is not legitimately obtained. For a similar reason, we may not want to count the “cost” to the thief of getting caught.

It is not easy to decide whether to count the longer-term costs to the offender such as the loss of employment from any arrest and incarceration. On the one hand, we may think that in determining the punishment for a crime, our legislatures already have performed informal CBAs, determining that the punishment benefits society more than any costs. On the other, this may not be the case, and a complete CBA may raise awareness.

Certainly, there are some costs to offenders that we do want to include. For minor offenses, for example, for which officers have a choice of issuing a citation or making an arrest, we may want officers or departments to consider the costs of an arrest for the person involved.

No matter what, if someone is wrongfully convicted because a policing practice produced false or unreliable evidence, the costs of arrest and incarceration should count.



Policing Project CBA Fellow Ryan Fackler

Considering the Alternatives

In assessing the costs and benefits of a particular practice, it also is important to consider the alternatives. Indeed, just sitting down to identify the alternatives can generate useful information on whether a policy or practice is likely to be worth it.

The right set of alternatives will depend on the goals that the department hopes to accomplish. If the goal is to address a particular crime problem—like automobile theft—alternatives to LPRs may include stepping up patrols in affected areas, or working with residents to improve security measures for their vehicles. If the goal is to improve overall public safety, the range of alternatives may be quite a bit broader.

Defining the alternatives can help focus attention on the costs and benefits that are the most important to measure—because they are the ones that are likely to differ the most depending on the approach that the department decides to take.

In the real world the choice of alternatives may be relatively limited, because some decisions may already have been made before questions of costs and benefits arise. Oftentimes, a department may acquire a particular technology and only then turn to the question of how best to use it. Or, a chief may have a very real practical problem that needs solving (like auto theft), and may try a mix of enforcement strategies to address that problem. Although we would always encourage a CBA to be conducted before large-scale decisions are made, close relationships between academics and police departments still can provide tremendous value even where some implementation decisions already have been made. These kinds of partially-implemented strategies are exactly what Phase II of our endeavor is seeking to study.

Part II: Measuring the Effects of Policing

The first step in assessing the costs and benefits of a policing practice is figuring out what effects the practice is expected to have. Does the technique bring down crime, and if so, by how much? To what extent do people feel safer as a result? What impact does it have on community complaints? Or trust in the police?

The question, initially—and importantly—is one of research design. How does one design a study that gets to the answers to those questions?

At the conference, much of the conversation about research design focused on gunshot detection systems—often referred to by the proprietary name ShotSpotter. The technology uses sensors, placed strategically throughout a particular area, to pinpoint the location of gunfire. Departments that adopt the technology hope that it can help them reduce gun violence and make communities safer. They say that ShotSpotter can alert officers to gunshots that would not otherwise be reported. And it can get officers to the scene much faster by directing them to the precise location. But the technology can be quite expensive—costing several hundred thousand dollars or more per year to maintain. To conduct a benefit-cost analysis of ShotSpotter, the first step is to determine what effects it actually has on outcome measures like police efficiency and violent crime.

What Are We Measuring?

In designing a study, it is important to consider not only the outcomes that must be measured, but also the means by which those outcomes will be achieved. This is what social scientists refer to as the “causal mechanism.” In the case of ShotSpotter, one possible outcome is a reduction in gun violence. But what about ShotSpotter makes that happen? One theory is that it enables officers to get to the scene more quickly, and thus catch the suspect or recover more evidence. This can improve clearance rates and get repeat offenders off the street. Another theory is that installing ShotSpotter may have some deterrent effect on gun crimes because people will know that they are more likely to get caught.

The choice of theory (or theories) has implications for the design of the study. Suppose the goal is deterrence. For deterrence to work, people will need to know that the sensors are in place. Therefore, one would not want to use a “double



Professor Cynthia Lum, George Mason University

blind” study, in which neither police officers nor community members know which areas have sensors in place. On the other hand, if the idea is that ShotSpotter will reduce crime by helping police catch suspects, public awareness would not necessarily impact measures of success.

Randomized Control Trials: The Gold Standard

Randomized control trials (RCT) are currently the “gold standard” of research design. In conducting an RCT, researchers identify a group of people or a set of neighborhoods, and then randomly assign some of them to receive the “treatment” (i.e. the policing practice or technology one wants to assess), and the rest to be the “control.” If the only difference between the two groups is that one is subjected to the policing practice while the other is not, then researchers can attribute any changes that result to the practice at issue. In the case of ShotSpotter, for example, an RCT might involve installing sensors in only half of the neighborhoods that have experienced problems with gun violence. If sensors already are in place, the department could temporarily and randomly turn some of the sensors off and see if there is any effect on crime.

Participants at the conference agreed that where RCTs are feasible, they should be deployed, and that closer partnerships

between academics and police departments can facilitate the wider use of RCTs in policing.

Unfortunately, RCTs are not always feasible when it comes to policing. Designing an RCT around a policing practice can present ethical or political concerns. Think about it this way. The assumption is that the practice being studied can reduce crime or make a neighborhood safer. Although it would be useful for the sake of study to use the practice or technology only in some randomly chosen locations, people reasonably might be troubled to learn that some communities got the treatment and others did not. Police chiefs understandably may be reluctant to allow potentially useful tactics to be employed only in some places.

The combination of ethical and political concerns also can diminish the value of RCTs by limiting the amount of time they can be run. Researchers may only be permitted to run a trial for a month or two, which may not be long enough to see any real effects. In order to test the effects of a particular policing practice, one may want a study that goes on for a longer period of time. But some of the examples of RCTs in the literature were time-constrained for just these reasons, and thus the studies may not have yielded the true effects of the technique being tested.

What Are the Alternatives?

While recognizing the undoubted value of RCTs—and expressing a preference for them if they are workable—conference participants repeatedly emphasized that one could learn a great deal about policing practices by employing a variety of quasi-experimental research designs in clever ways. These quasi-experimental alternatives often can be implemented without raising some of the ethical or political concerns raised by RCTs.

Rollouts

Researchers could approximate an RCT by taking advantage of a “rollout” (or a “rollback”, as the case may be). Often when a police department deploys a new practice or technology, it does so gradually, starting with one area before moving on to others. It may take time to train officers on a particular practice or technique, which can slow down implementation. Or a department may lack the resources to introduce a new technology city-wide. With ShotSpotter, for example, a department may only be able to afford a certain number of sensors, and thus decide to put them in just a handful of neighborhoods. Researchers can use a rollout

to assess whether anything changes in the neighborhoods that first get the technology—using comparable areas in other parts of the city as the control.

A problem with rollouts is that departments rarely deploy practices or technologies in a random fashion. A department will most likely first put ShotSpotter sensors in areas where shootings are more common, or deploy license plate readers to neighborhoods that have higher rates of automobile theft. In this case, the treatment and control groups will not be all that similar—and in fact, they are likely to differ along the precise outcome (crime rates) that researchers are trying to measure. This makes it much more difficult to tease out the effects of the practice or technology, as opposed to the many other factors that can influence crime. Researchers call this the “endogeneity problem.”

The “endogeneity problem” is by no means unique to policing, and our academics discussed the myriad of techniques their disciplines have developed over decades to address the problem. For example, researchers could ask the department to identify the next area in which it would wish to deploy the technology being studied if it could afford to do so—and the area that it would first cut if resources suddenly became more scarce. Crime rates and conditions in these two areas are likely to be quite similar to one another, which would make it easier to draw inferences about the effects that the policing practice or technology being studied has had. In a sense this approach identifies logical “control” locations.

Natural Experiments

Researchers sometimes can take advantage of what are called “natural experiments.” A natural experiment occurs when some other factor unrelated to crime rates or other outcome measures affects how the department deploys the policing practice at issue. For example, it often is hard to tell just by looking at historical crime data whether putting more officers in a particular neighborhood has had any effect on crime. This is because departments typically put more police officers in areas that for whatever reason are experiencing an uptick in crime, which means researchers cannot simply compare crime rates in these areas to other parts of the city. (This, again, is the endogeneity problem.) But suppose that additional (or fewer) officers were deployed in some neighborhoods for reasons entirely separate from the crime rate being studied. Perhaps they were deployed because there had been a terrorist threat in the neighborhood, or because illness had reduced staffing in some areas for a period of time. Because these reasons for deployment are

unrelated to ordinary street crime, researchers can be more confident in attributing subsequent changes in crime rates to the officers' presence or absence.

Temporal and Spatial Discontinuities

When rollouts or natural experiments are not an option, researchers can try to find temporal or spatial discontinuities in policing practices. A temporal discontinuity is an interruption, break, or sharp change in the use of a policing practice by a jurisdiction, ideally for some reason unrelated to the problem the practice is intended to address. For example, in March 2013, the NYPD's leadership issued a memo ordering patrol officers to change the way in which they reported investigative stops. The change required officers to complete much more extensive and time-consuming paperwork for each stop. There is good reason to believe that this change in the department's practice was the result of a brief submitted one day earlier by the plaintiffs in the Floyd stop and frisk litigation, which had recommended the new reporting practice. Investigative stops dropped dramatically the day the new reporting requirement went into effect, creating a temporal discontinuity in the department's use of investigative stops. Researchers can use temporal discontinuities such as this one to estimate the effect of policing practices on outcomes while largely avoiding the endogeneity problem.

A spatial discontinuity is a sharp change in the use of a policing practice at the boundary separating two administrative jurisdictions. Quite often, policing practices vary across jurisdictions, but jurisdictional boundaries may arbitrarily divide neighborhoods that are socially and economically quite similar. Researchers can then use the separation of a neighborhood across a jurisdictional boundary as quasi-experimental 'treatment' and 'control' groups, particularly if the researcher can study the areas closest to the jurisdictional boundary.

This approach may work more efficiently in some neighborhoods than others. Again taking New York City as an example, the E. 115th St. boundary between the 23rd and 25th Precincts – both in East Harlem – separates neighborhoods that are very similar in their social circumstances. If the 23rd and 25th Precincts pursue different policing strategies, researchers could use differing outcomes close to this border to identify effects of these varying strategies.

Differences in Differences

Sometimes researchers can use both temporal and spatial discontinuities in the same research design. When they do so, they use the technique of "differences in differences." The technique allows researchers to compare outcome measures—like crime rates—before and after a temporal discontinuity, across the border of a spatial discontinuity. To borrow the example used earlier, suppose that the 23rd and 25th Precincts in New York City deployed investigative stops differently before the change in reporting requirements in March 2013. For example, imagine that the 23rd Precinct eschewed the use of investigative stops as a crime control practice, while the 25th Precinct enthusiastically embraced the tactic. We would then expect the March 2013 memo ordering changes in the reporting requirements for investigative stops to have effected a large drop in investigative stops in the 25th Precinct, with little or no change in the 23rd Precinct. A researcher might then look at the differences in crime rates before and after the March 2013 memo, on either side of the E. 115th St. boundary separating the two precincts. Assuming that there are few socio-economic differences in the neighborhoods immediately adjacent to this border, we could plausibly attribute any post-memo changes in the crime rate on the 25th Precinct side of this border, relative to the post-memo changes in the crime rate in the 23rd Precinct side of this border, to the decrease in investigative stops in the 25th Precinct.

Sidebar: Choosing Outcome Measures

At the conference, some of the participants suggested that researchers should consider using community surveys about residents' perceptions of public safety as an alternative outcome measure to crime rates. They pointed out that crime rates—which often are based on reported crimes—are susceptible to various biases and measurement errors. In some communities, people may be reluctant to report crimes because they do not trust the police. If the relationship between the police and the community improves, reported crimes may start to go up—even though the actual crime rate remains the same or even goes down.

Studies in other contexts have shown that surveys of public sentiment can often be a good indicator of what actually is happening on the ground. For example, changes in consumer confidence often are a good predictor of economic downturns. By tracking residents' perceptions of public safety and policing over time, researchers could likewise learn what effects if any particular policing practices have had.

Part III: Putting a Value on the Costs and Benefits of Policing

The next challenge to conducting CBAs around policing is figuring out how to value benefits and costs using a common metric. Sometimes this is done by converting both costs and benefits into dollar figures; other times researchers simply report the tradeoffs posed by a particular practice. But it is not always easy to identify and value every cost and benefit, particularly in the realm of public safety. What is the “cost” of being stopped by the police? How much should we value the “benefit” of community cooperation, which the police need to function effectively?



Paul Heaton, Senior Fellow and Academic Director,
Quattrone Center

At the conference, conversation on this topic focused primarily on traffic and pedestrian stops, particularly when used “proactively” to combat crime. As participants pointed out, traffic and pedestrian stops are a routine tool of policing. Officers pull over drivers to issue traffic citations. And they occasionally approach pedestrians when investigating criminal activity. In some departments, however, officers are instructed to stop people as often as possible as part of a “proactive” enforcement strategy. The idea is that frequent stops—even for minor offenses—may turn up evidence of more serious wrongdoing. During a stop, an officer may ask the driver or pedestrian for permission to conduct a search (“consent search”). Or, if an officer suspects that the person has a weapon, the officer may conduct a patdown search or “frisk.” Some have argued that if people know they might be stopped and searched, they will leave their weapons at home.

Participants discussed a number of methods for valuing the many intangible costs and benefits to these sorts of encounters—as well as some of the considerations that analysts should keep in mind.

Picking Apart the Costs and Benefits

To start, it is important to carefully enumerate and unpack each of the costs and benefits that one is trying to measure. The “cost” of a traffic or pedestrian stop, for example, is really a number of costs, each of which needs to be valued.

Consider first the costs to the individual stopped.

A stop takes up time that the person could have spent doing something else. Many people understandably experience some anxiety or discomfort when stopped by the police. Both of these are costs that must be measured.

In a jurisdiction where racial minorities are stopped at a disproportionate rate, there may be additional costs as well. If a stop is racially motivated, the person stopped may experience dignitary or “targeting” harms. And even if a particular stop is not in fact racially motivated, the person stopped may suspect that it is—and experience similar harms as a result.

In communities where stops are frequent, people also may experience anxiety or dread about being stopped at some point in the future. This is an independent cost.

People who worry about being stopped may engage in “avoidance behaviors”—for example, by dressing differently or

taking a different route to work. Even police officers of color have described staying off certain roads (like the I-95 in Maryland and New Jersey) to avoid being stopped by state patrol officers. These too are costs that must be considered.

Finally, it is important to note that although some of these costs are specific to the person stopped, others may be shared by the community as a whole. Someone who has never been stopped—but knows others who have been—may still worry about being stopped in the future. And if people think the government is engaging in racial discrimination, they may experience this as a cost even if they themselves are not stopped or affected.

Each of these is an independent cost, each in its own right difficult to value.

Valuing Intangible Costs and Benefits

Analysts can use a variety of tools to try to measure intangible benefits and costs using a common metric. Sometimes it may be possible to look to analogous situations for which we do know the costs, or to instances in which people actually have spent money or time to avoid a particular outcome. Another approach is to use a survey-based technique called “contingent valuation”, which presents individuals with various hypotheticals and asks them to assess value. We discuss each briefly in turn.

Borrowing Values From Other Contexts

Sometimes it may be possible to find similar activities or situations for which we do know the cost—or at least can more easily assess it.

One place to look for estimates is jury awards. Juries often are asked to put a dollar figure on intangibles like “pain and

suffering” when deciding how much a defendant should have to pay to compensate a plaintiff for his or her injuries. A number of researchers have used jury awards to come up with estimates for the “cost” of various crimes to society, like homicide or assault.

The concern with jury awards is that individual cases often turn on a very specific set of factors—which makes it difficult to figure out precisely what is affecting the value that the jury comes up with. For example, studies show that juries find some plaintiffs much more sympathetic than others, and that jury awards can differ significantly based on the age and demographics of the people involved. Cases that make their way to a jury also may differ from the typical case in which a plaintiff experiences a particular injury (and it often is hard to know precisely which way that difference cuts).

In addition, one should be careful in presuming the analogous nature of something that may in fact be different. For example, someone who is assaulted by another member of the public may experience a different set of harms than someone who is assaulted by a police officer—even if the physical injuries are the same.

Looking to People’s “Revealed Preferences”

Sometimes it may be possible to estimate certain values by looking at decisions that people actually make about how to spend their money or time (economists call this “revealed preferences”). For example, some people pay to enroll in TSA pre-check, which cuts down on the time and intrusiveness of airport security. Others pay more for housing in order to live closer to work. And as noted above, some drivers may avoid certain roads where stops are frequent. Looking at these sorts of decisions can provide at least some estimate of the value that people put on their privacy or time. (One concern with these estimates, of course, is that people may not be able to afford to pay for things like time or privacy, even if they in fact value them a great deal.)

Sidebar: The Cost of Uncertainty

What if a particular stop was not racially motivated, but the person stopped suspects that it may have been? Uncertainty about whether one is being singled out unfairly may itself be a cost.

In other contexts, studies have shown that people of color sometimes wonder whether they are being treated a certain way—for example, followed by store security guards, or asked to sit in the back of a room—because of race or some other legitimate reason. Some individuals may even go out of their way to avoid these sorts of ambiguous encounters. Similarly, racial minorities subjected to policing may experience concern that race is playing a role when they are stopped or searched. These concerns themselves are a cost that requires quantification.

In the context of proactive policing, for example, it may be possible to look to housing markets to see if there is a drop off in housing prices or business activity in neighborhoods where stops are frequent. But one has to be careful to ensure those same effects are not the result of crime in the very neighborhoods subjected to policing.

Contingent Valuation

Another approach is to use “contingent valuation”—a survey-based technique that involves posing a variety of hypotheticals and asking respondents how much they would value a particular outcome. By varying the hypotheticals—for example, the probability of being stopped, or the description of what happens during a typical stop—researchers can begin to tease out the costs of different encounters.

At the conference, participants discussed this approach at length. By the end of the conversation, one clear message was that it would be possible to develop and implement a study (or studies) using contingent valuation that could go a significant way toward valuing some of the intangible costs and benefits of policing. Contingent valuation has its difficulties and critics, but participants felt that in a carefully-designed study these difficulties could be addressed and overcome.

There are two commonly accepted methods of contingent valuation: willingness to accept and willingness to pay. The former asks how much respondents would have to be paid in exchange for permitting the government to engage in a certain behavior (like proactive use of pedestrian stops). The latter asks how much they themselves would be willing to pay to avoid having something like a stop happen to them. (We discuss the difference between the two approaches “in the weeds.”)

In designing a contingent valuation survey, the most important thing is to ensure that the stories the respondent is told are plausible—and that they involve real tradeoffs that a person could imagine making. For example, because people often pay and receive money from the government through taxes, surveys often ask how much respondents would be willing to see their taxes go up (or down) in exchange for various changes in policy.

In asking these questions, however, one must be careful not to confuse the value one places on a practice as a citizen, from the value one places on it as the target. When asked about stop-and-frisk, for example, someone who is unlikely to ever be stopped will respond based on the value they attach as a citizen to reducing (or increasing) the number of coercive encounters. Someone who expects to be stopped will respond based on

how they think the proposed policy will affect them personally. For this reason, it is important to survey different groups to ensure each of these perspectives is taken into account.



Professor Mark Cohen, Vanderbilt University

In the Weeds: Willingness to Pay vs. Willingness to Accept

Although one might think that willingness-to-pay and willingness-to-accept questions should yield similar estimates, studies show that responses can vary a great deal. For example, if someone who generally values their privacy is asked how much the police department would need to pay them for permission to use a new surveillance technology, like LPRs, they may say \$100. But if that same person is instead told that the department already uses LPRs and is asked how much they would be willing to pay to get the department to stop, they may only say \$50. This is because people tend to value what they have over what they may receive.

Often, the right question to ask will depend on what is being measured. If the department is considering a new proactive enforcement policy, the appropriate question may be what the public is willing to accept to be subjected to the probability of random stopping. If the department is deciding whether to introduce de-escalation training, it may make more sense to ask what members of the public are willing to pay to reduce the likelihood that officers will resort to force.

A number of other factors also may affect people’s responses. For example, some people may have strong views about policing in general that could swamp their more fine-grained valuations of the specific practice at issue. Someone who thinks police budgets are too high may not be willing to pay higher taxes for de-escalation training—even though they generally think that such training would be a good idea. In designing a survey, researchers may need to include some preliminary questions that get at these baseline views—and then potentially tailor the hypotheticals in response.

In addition, people’s responses can vary based on their familiarity with the practice at issue. Someone who has been stopped and frisked in the past may give a different answer than someone for whom the question is more abstract. Someone who sees a video of a stop will assess it differently than someone who reads a bland description. And even the person who sees a video may give one value when asked immediately after, and another if asked a day or two later. Researchers describe this as the difference between “hot” and “cold” cognition. All of these are merely cautions, which themselves can be leveraged in survey design. One could learn a lot by doing a large-scale study, and segmenting out the groups along some of the variables discussed, in order to get a better sense of how precisely to price a practice.

Finally, in addition to using hypothetical scenarios, it also is possible to survey the public following real encounters. These are typically referred to as “contact surveys.” For example, one could take advantage of the fact that some people now receive traffic tickets by mail (e.g. from a red light camera) whereas others receive tickets from officers during a traffic stop. The difference in how people feel about their tickets in the two scenarios can give some sense of the cost of the stop itself.

Costs to the Police

In thinking about intangible costs, it is important to consider not only the costs to the public, but also to the police. For example, officers may experience different levels of job satisfaction depending on how they spend their time. At least one study has shown that officers become less willing to make stops as paperwork requirements increase.

Similarly, there is emerging evidence to suggest that aggressive policing reduces people’s willingness to cooperate with the police. Police depend on this cooperation to achieve their public safety mission. Reduced cooperation can have a tangible effect on the department’s budget (by requiring officers to spend more time to resolve any given case), as well as more intangible effects on how officers experience their jobs.

When Valuation is Very Hard

Finally, it may be possible to include certain intangible costs or benefits in a CBA without having to assign a precise value to them.

In some cases, decisionmakers can anticipate certain types of harms and put a value on measures required to avoid them. Say, for example, that a chief is concerned that a certain amount of racial profiling may follow from a decision to engage in proactive stops. The cost of that profiling is serious but difficult to value. The chief can reduce the risk of profiling by implementing a strong bias-free policing policy and carefully tracking demographic data on police encounters. These alternatives might be valued more easily.

Researchers also can employ “breakeven analysis,” which involves adding up all of the costs and benefits that can be measured, and then asking what the intangible values would need to be in order to tilt the decision one way or another. Breakeven analysis works best when one side of the cost-benefit equation is much easier to quantify than the other. Otherwise, one ends up with intangibles on both sides of the equation. Obviously, with regard to stop and frisk, neither side is particularly easy. But for some police practices, we know what the costs might be, or can reasonably value the benefits, which makes this a promising approach.



Part IV: Where Do We Go From Here?

As indicated at the outset, conference participants left the meeting confident that much progress could be made, and eager to participate in particular projects. Public safety personnel equally were enthusiastic about getting to work.

Since the conference, the Policing Project and Police Foundation have taken a number of steps to advance the use of CBA in policing, including starting on Phase II work. This final part details those efforts, and highlights what else can be done.

National Scholars' Network

We have begun to develop a national network of scholars eager to work on public safety CBA. This includes many of the conference participants, who responded to a post-conference survey on their willingness to work with us in this area. But we also have reached out to others, both scholars helping us on CBAs and related projects in other jurisdictions, and top people in the field whose work appears promising. (Among these scholars are policing officials with empirical training and interests.)

Phase II Projects

We have initiated projects in a number of jurisdictions and are continually exploring more.

With the help of the Police Foundation, we have identified and begun to work with police departments and scholars on the following projects:

- ★ ShotSpotter (St. Louis County PD)
- ★ De-escalation training (Asheville, North Carolina PD)
- ★ Pursuit policies (Roanoke City and Roanoke County PDs)
- ★ Crime analytics labs (Houston PD)

In addition, in Nashville, at the request of the Mayor's office, we are conducting the country's first full-scale analysis of the costs and benefits of the use of proactive traffic stops to fight crime and violence, including an assessment of the social costs of such stops.

Data Projects

During the course of our work on Phase I it became clear how much progress could be made working with enormous, untapped sources of administrative data. Some of the costs and benefits of policing practices presumably will be felt in any number of measures of civic progress, be it participation in the political process, educational progress and achievement, public health, and the like. In our Phase II projects, we have begun to explore, and analyze, these datasets in relation to policing practices.

Looking Ahead

It is clear from the work that went into Phase I and launching Phase II that there is a very real possibility of making progress on pressing questions that simply have not been addressed in a rigorous scientific way. We are excited at the possibility of seeing that change.

We are scheduling a convening in the Fall of 2018 to which we will be inviting our Phase II teams to share preliminary results and exchange ideas. We intend to invite interested scholars, law enforcement personnel, and others to join us in public sessions.

In addition, we are looking to expand our cost-benefit work, and seeking funding to do so.

We encourage anyone who is interested in participating in this work to contact us at info@policingproject.org

Finally, we once again acknowledge the support of the Laura and John Arnold Foundation. Without their interest, faith, and support, this endeavor would not have launched.

NYU Law Cost-Benefit Analysis Conference

February 9-10, 2017 at NYU School of Law

List of Participants:

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Glenn Blomquist, Carl F. Pollard Professor of Health and Economics and Professor of Economics and Public Policy, Gatton College of Business and Economics, University of Kentucky

Richard Brooks, Charles Keller Beekman Professor of Law, Columbia Law School

Jillian Carr, Assistant Professor of Economics, Krannert School of Management, Purdue University

Jen Carnig, Vice President, Spitfire Strategies

Richard Carson, Distinguished Professor, Department of Economics, University of California, San Diego

Tom Clark, Asa Griggs Candler Professor of Political Science, Emory College of Arts and Sciences

Mark Cohen, Justin Potter Professor of American Competitive Enterprise, Professor of Law, Vanderbilt Law School

Gregory DeAngelo, Assistant Professor of Economics, West Virginia University

Monica Deza, Assistant Professor of Economics, University of Texas at Dallas

Jeff Fagan, Isidor and Seville Sulzbacher Professor of Law, Columbia Law School, Professor of Epidemiology, Mailman School of Public Health, Columbia University

Amanda Geller, Director of the M.A. Program in Applied Quantitative Research; Clinical Associate Professor of Sociology, NYU

Jack Glaser, Professor, Goldman School of Public Policy, University of California, Berkeley

Rebecca Goldstein, Current Ph.D. student in Government, Malcolm Wiener Center for Social Policy, Harvard Kennedy School, Harvard University

Stuart Greer, Lieutenant, Morristown, NJ Police Department, Co-founder of American Society of Evidence-Based Policing

Michael Hanemann, Distinguished Sustainability Scientist, Julie Ann Wrigley Global Institute of Sustainability, Julie A. Wrigley Chair in Sustainability, School of Sustainability, Professor, School of Sustainability, Director, Center for Environmental Economics and Sustainability Policy, W.P. Carey School of Business, Arizona State University

Angela Hawken, Director of the Litmus Program, Professor of Public Policy, Marron Institute of Urban Management, NYU

Paul Heaton, Senior Fellow and Academic Director, Quattrone Center, University of Pennsylvania Law School

Christian Henrichson, Research Director, Sentencing and Corrections, Vera Institute of Justice

Michael Jacobson, Director, CUNY Institute for State and Local Governance

Tracie Keese, Deputy Commissioner of Training, NYPD

Jon Krosnick, Frederic O. Glover Professor in Humanities and Social Sciences, Professor of Political Science, Communication, and (by courtesy) Psychology, Director of the Political Psychology Research Group, Director of the Summer Institute in Political Psychology, Stanford University

Cynthia Lum, Associate Professor, Department of Criminology, Law and Society, Director of the Center for Evidence-Based Crime Policy, George Mason University

Emily Magid, Manager, Criminal Justice Communications and Special Projects, Laura and Arnold Foundation

Michael Mueller-Smith, Visiting Assistant Professor of Economics, University of Michigan, NICHD Post-Doctoral Scholar, Population Studies Center

Daniel Nagin, Teresa and H. John Heinz III University Professor of Public Policy and Statistics, Heinz College, Carnegie Mellon University

Rebecca Neusteter, Director of Policing, Vera Institute of Justice

Emily Owens, Associate Professor and Undergraduate Chair, Department of Criminology, University of Pennsylvania School of Arts & Sciences

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Barry Friedman, Jacob D. Fuchsberg Professor of Law and affiliated Professor of Politics, Director of the Policing Project, NYU School of Law

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Ryan Fackler, Policing Project Extern and current Ph.D. student in Economics, University of Pennsylvania

Elizabeth Janszky, Policing Project Extern and Furman Scholar, NYU School of Law

Hypotheticals and Writing Prompts

As we indicated in our original invitation letter, we have asked each of the participants to prepare a brief thought piece (approximately 5 single-spaced pages in length) that addresses a specific methodological challenge to evaluating the costs and benefits of policing practices. The hope is that these papers will help focus the discussion and make it more concrete. In addition, the *Journal of Benefit-Cost Analysis* has agreed to publish a subset of these papers in a special issue on cost-benefit analysis of policing. (At this stage, however, the papers need not be polished in the least.)

Toward that end, we have prepared two hypotheticals that describe actual choices facing departments (albeit in stylized form). Each hypothetical sets up the problem, and then provides a preliminary analysis of the sorts of costs and benefits that might need to be included in the assessment. Finally, we discuss briefly the sorts of data that might be available to support the analysis (though of course data collection practices vary widely by jurisdiction).

I. Proactive Enforcement

Ridgmont is a medium-sized city (~800,000) in the Southwest, approximately 2 hours from the border with Mexico. Like most cities in the region it is both economically and ethnically diverse. Approximately 40% of residents are Hispanic, 15% African American, 5% Asian, and the rest (40%) White. Crime is unevenly distributed throughout the city. Although overall crime rates are below average for a city of its size, Ridgmont has a number of high-crime neighborhoods that have been plagued by significant drug and gang activity in recent years.

Five years ago, as part of a broader crime reduction initiative, the Ridgmont Police Department (RPD) created an elite “proactive patrol” unit. Officers in the unit are deployed to high-crime areas and are instructed to make frequent use of automobile stops to create opportunities to search for weapons or drugs. Officers are trained to be on the lookout for suspicious persons or behavior (e.g. those with past involvement with drugs or gangs, people who fit the profile for drug or gang activity, individuals who appear unusually nervous when the officer drives by)—and then to use any one of a hundred possible traffic violations as a basis for making a stop. Once an officer pulls someone over, she can run a warrant check, engage the driver in conversation to potentially develop (or dispel) further suspicion, or ask the driver for consent to search the vehicle. Although people technically have the right to refuse consent to search, pretty much everyone says yes (including people with weapons and contraband in the car).

Although Chief Clyde Johnson had never conducted a thorough evaluation of the proactive patrol unit, anecdotal evidence suggested that it was a major success. In 2015 alone, the unit got 80 guns off the street, and confiscated over \$1,000,000 in either drugs or cash. Officers in the unit reported high levels of job satisfaction: constantly being on the lookout for potential targets added considerable excitement to routine patrol (and certainly was preferable to racing around town responding to calls for service).

However, just last month, an African American pastor from one of the churches in the area came in to file a complaint. He had been stopped while driving—unbeknownst to him, by an officer in the proactive patrol unit—and questioned for over 15 minutes about where he was going and why. The officer asked him for permission to search his vehicle, and when the pastor refused, the officer got pretty indignant. (The officer was not used to people saying no.) The pastor said he had been hearing similar complaints for years from others in the community.

Johnson asked one of his captains to pull what data they had on past stops made by the enforcement unit. Data showed that over 80% of stops made by this unit were of minority drivers. Officers were two times more likely to ask Black and Hispanic drivers for consent to search—but were in fact 50% less likely to find contraband as compared to searches of white motorists. Johnson also reviewed past complaints and found that a small number of community members had in fact complained about being singled out, though none of these complaints ultimately was sustained by internal affairs.

Johnson recently has heard from a number of chiefs who have disbanded or shifted the mission of similar units from proactive “enforcement” to more positive engagement between police and residents. He’s not sold on the idea, but is starting to wonder whether the benefits of the proactive enforcement unit are worth the costs.

Analysis of Costs and Benefits:

Proactive enforcement of this sort can be a powerful law enforcement tool, particularly when it comes to drug enforcement and gun interdiction. Often these are crimes for which it is difficult for officers to develop sufficient cause to go after someone directly. On the other hand, virtually every driver on the road is guilty of violating at least some traffic ordinance (e.g. drifting across a lane marker, changing lanes without signaling, not coming to a full stop at a stop sign, just to name a few). The Supreme Court has held that such “pretextual” stops and searches do not violate the Fourth Amendment: so long as the officer had an objectively reasonable basis for making the stop, the stop is valid, irrespective of the officer’s true motives for initiating the encounter.

The potential benefits of having a proactive enforcement unit include:

- Getting guns and drugs off the street;
- Enforcing outstanding warrants;
- Public safety, through either specific deterrence (by apprehending individuals involved in wrongdoing), or general deterrence (by sending a message to potential lawbreakers that they should leave guns and drugs at home);
- Traffic safety;
- Public perception of safety;
- Increased officer satisfaction.

On the other hand, as the hypothetical suggests, proactive enforcement also may impose significant costs, both on the department and the community:

- Staffing costs (including salary, benefits, and equipment);
- Administrative costs associated with handling any complaints that arise;
- Potential litigation costs (if any of the stops turn out not to be above board, or if plaintiffs bring a class action suit alleging a pattern of discriminatory enforcement; although such cases are extremely difficult to prove, litigation itself can be quite costly);
- Hassle costs for individuals stopped (including the time stopped, as well as any inconvenience that results from missed appointments, etc.);
- Privacy costs for individuals who are searched;
- Dignitary or psychological costs incurred by individuals who believe they were unfairly targeted;
- Community mistrust;
- Safety risk to officers and/or members of the public (approximately 15% of use of force incidents occur during traffic stops).

Then there are the additional considerations that we are unsure how to classify:

- Traffic fines and fees: Although municipalities often treat fines and fees recovered from traffic enforcement as a “benefit,” economists tend to see that classification as dubious, because fines and fees impose a cost on society (because it is money that otherwise would be put to some other use).
- Opportunity costs: Time spent engaging in proactive enforcement is time not spent answering calls for service, or engaging with community members in a more positive way. But that is always the case for any policy choice (and thus perhaps should not be taken into account).
- Arrest and Incarceration Costs: For individuals found in possession of drugs or contraband, the costs of the stop and arrest are just the beginning. The arrest itself can carry a number of collateral consequences, including loss of housing, employment, or child custody. If the person is convicted these costs can increase exponentially. Then there are the costs

incurred by the criminal justice system as a whole at all stages of the process from pretrial proceedings to guilt determination to custody to post-release supervision. One question is whether any or all of these costs should factor into the cost-benefit analysis. Our intuition is that they probably should, particularly if crime reduction counts as a benefit (after all, a substantial part of the crime reduction benefit likely is attributable to the incapacitation or deterrence effect of incarceration).

Available data:

One of the challenges to conducting cost-benefit analysis of policing is obtaining the necessary data. Below we highlight the sorts of data that agencies are likely to have on hand, as well as data that may be more difficult to come by. For some components of a cost-benefit analysis, such as incarceration or criminal justice system costs, it may be possible to rely on estimates derived elsewhere to at least approximate the relevant costs. You should assume that any partner agency on a cost-benefit project will share whatever data it has (even if the data is not otherwise made public). And this list is of course preliminary—we look forward to getting your input both on the sorts of data that may be necessary and the possible sources one could look to.

- **Administrative data:** Agencies can easily determine personnel costs, and could probably estimate the administrative costs associated with resolving various categories of complaints.
- **Traffic stop data:** A number of agencies require officers to keep track of all traffic stops. At the very least, these data include the location of the stop, race and gender of the person stopped, whether a search was performed, and whether a citation was issued or an arrest made. Some jurisdictions also track the length of the stop, whether any search that took place was consensual or based on probable cause, and the nature and quantity of contraband recovered.
- **Enforcement data:** Agencies with more sophisticated record management systems may be able to count the number of guns a particular officer or unit recovers in a given period, as well as the number of wanted suspects identified through warrant checks.
- **Crime data:** Agencies typically keep detailed data on reported crimes and calls for service. At a minimum, records include the date, time, and location of the crime, as well as the nature of the offense. Agencies also keep track of clearance rates.
- **Incarceration and criminal justice costs:** Although it may be difficult to obtain jurisdiction-specific data, there have now been a number of careful studies done on both the social and budgetary costs of incarceration that could be used to inform any cost-benefit assessment.

Prompts:

1. Some of the public safety benefits of proactive enforcement are fairly easy to measure (e.g. number of guns recovered, or number of warrants enforced), but difficult to quantify. How would you quantify the “benefit” of taking a gun off the street, or apprehending someone with an outstanding warrant? (And what data would you need to do this?)
2. Some of the other benefits of proactive enforcement are much more difficult to measure. Without conducting a randomized control trial, how would you assess whether proactive enforcement has had any effect on crime rates? (And what data would you need to do this?)
3. How would you monetize the dignitary cost of a stop to someone who believes they have been unfairly targeted on the basis of race?
4. How would you monetize the cost of a consent search?
5. Should arrest and incarceration costs be included as part of the cost-benefit analysis?
6. How would you measure—and quantify—the effect that proactive enforcement has on community trust?

II. License Plate Readers

In 2011, Westville Police Department (WPD) acquired ten automatic license plate recognition (LPR) devices. LPRs are attached at the rear of patrol cars. They use optical character recognition to scan in license plate numbers as they travel—and run the scanned plates against various law enforcement databases. When a “hit” occurs, the LPR notifies the officers in the patrol car, who can stop the vehicle and investigate.

The original goal of acquiring the LPR system was to aid with detecting and deterring auto theft. Over time, however, the WPD has found that LPRs may be used in three other ways:

- *Outstanding Warrants:* Anytime an arrest warrant is issued, the WPD automatically checks the suspect’s name against the state’s DMV database to identify any vehicles registered in that name. WPD officers have located a number of suspects in fairly major cases just by driving around on routine patrol.
- *Enforcing Municipal Fines:* In Westville, the same database that tracks outstanding warrants also tracks unpaid parking tickets and other municipal fines. As it turns out, the vast majority of “hits” that officers get while driving around in LPR-equipped vehicles are for these minor infractions. When an officer spots a car with unpaid tickets, the officer can pull the driver over and either issue a warning or take the person into custody.
- *Ordinary Criminal Investigations:* In addition to checking plates against existing databases, the department also can geo-code and store the scans to create a database of where vehicles were at what times. On a few occasions, this has proven useful to the WPD when investigating other crimes. Once, reports of a robbery from a convenience store indicated the culprits had entered a white van. Video from a stationary camera outside the store provided the license plate number for the van. By entering it into the LPR database, the WPD found that its patrol cars regularly passed the van at a particular street address. They located the van there, and after a stakeout they apprehended the robbery suspects. However, with just 10 units in a city of 1.5 million, the agency’s ability to use LPRs to solve crime depends largely on happenstance (had the robbery suspect not lived along a major thoroughfare it is unlikely that officers would have passed by the car enough to spot a pattern).

The WPD has decided it would like to have more LPR units, and plans to approach the city for funding. The WPD wants 15 additional mobile LPR units, as well as 30 “stationary” units, which it plans to place at major intersections as well as along major highways leading in and out of the City. The WPD Chief has heard that stationary units tend to be more accurate, and also typically scan a much larger volume of plates than can an officer on routine patrol. For this reason, stationary units are particularly useful in locating wanted suspects.

The City Council recently received a procurement request from the Chief, and is considering the proposal. The new units would be quite expensive—the equipment alone will easily cost up to \$1.5 million, and then there are the costs of storing all of the data that the units capture. On the other hand, the Chief has explained that the new units will help save hundreds of hours of officer time by enabling officers to locate suspects and stolen vehicles more quickly. The additional units also will enable the department to use the system in a more systematic way to assist in ongoing investigations.

One of the council members also expressed some concern about how the public would react to the new units. Although the WPD has heard few complaints, residents in nearby Pinemont recently raised a stink about that department’s system. Apparently a Pinemont deputy had used the LPR system to track his girlfriend’s whereabouts and learned she was having an affair with one of the mayor’s aides. After the deputy confronted her, the aide leaked the story about the deputy’s misdeeds to the press (which of course made everyone wonder who else the department was tracking).

Costs and Benefits

The potential benefits of license plate reader systems include:

- Public safety (both through specific and general deterrence);
- Public perception of safety;
- Recovery of stolen vehicles.

The potential costs include:

- Cost of the devices and data storage;
- Officer time;
- Officer training;
- Risk of data breach (and associated costs to those whose data is made public);
- Privacy (particularly if LPR data is retained for longer periods of time);
- Community trust and legitimacy.

Depending on how LPRs are used, a number of factors might appear either as a cost or a benefit (or both):

- **Intrusiveness:** LPRs could potentially reduce the need for more intrusive policing by enabling officers to rule potential suspects in or out by reviewing LPR data instead of using more intrusive tactics (i.e. if LPR data can help identify the specific white van involved in a robbery, it may reduce the need to stop 20 white vans to look for suspects). On the other hand, if officers use LPR “hits” as a basis for traffic stops they would not otherwise have made, use of LPRs may increase the overall number of police-citizen contacts.
- **Discrimination:** LPRs could potentially reduce the effects of implicit or explicit biases in policing by giving officers a more objective basis for deciding which vehicles to stop. However, LPRs also could potentially reinforce or even exacerbate the discriminatory effects of policing. In many jurisdictions, LPRs are deployed primarily in high-crime, minority neighborhoods. If they also are used for traffic enforcement it is likely that residents in these neighborhoods (who often are least able to pay fines) will bear the brunt of enforcement.

Finally, there are a number of considerations that we are unsure how (or whether) to include:

- **Efficiency:** One of the oft-cited benefits of LPRs is that they can improve officer efficiency. It would seem that any efficiency gains would be reflected in the reduced “cost” at which public safety “benefits” are attained—but we wonder if efficiency ought to be incorporated in some way into the analysis;
- **Traffic enforcement revenue:** As with proactive enforcement there is a question of whether revenue ought to count as a benefit.

Available Data

Although there is hard data on some aspects of LPR use, some of the oft-cited benefits of LPRs are purely anecdotal. Every chief we’ve spoken to about LPRs has at least one or two stories about major cases that LPRs helped crack, but as far as we can tell, no agency tracks the use of LPRs in criminal investigations in any systematic way. Two studies have used randomized control trials to examine the crime-reduction benefits of LPRs. Both studies found that LPRs had no appreciable deterrent effects (on either automobile theft or crime generally). One of the studies also examined clearance rates, and found that LPRs did make officers more efficient in tracking down violators and recovering stolen vehicles.

That said, agencies with robust auditing systems in place are likely to have the following data on hand:

- **Equipment and Staffing Costs:** Agencies should be able to provide data on the costs of equipment and storage, as well as the number of officers who are assigned either to operate LPR units or assist in maintaining the LPR system.
- **LPR Use:** Data on LPR use is likely to include the number of scans and hits, as well as the number of hits that result in a traffic stop or other enforcement action. Depending on how an agency’s record-keeping system is organized, agencies may be able to link specific enforcement actions (recovery of a stolen vehicle, arrest of a wanted suspect) to LPR use.
- **Crime data:** Agencies keep detailed crime data, including vehicles reported lost or stolen. As we note above, records typically include the date, time, and location of the crime, as well as the nature of the offense. Agencies also keep track of clearance rates.

Prompts:

1. One of the oft-cited benefits of LPRs is that they improve clearance rates for vehicle theft. How would you quantify the benefit of recovering a stolen vehicle and catching the perpetrator? (And what data would you need to do this?)
2. Another benefit of LPRs is that they could potentially provide an important lead in a criminal investigation (e.g. the convenience store robbery case described above). How would you monetize this benefit? How do you account for the fact that the crime might (or might not) have been solved in some other way? (And what data would you need to do this?)
3. The two existing studies on the efficacy of LPRs have focused primarily on whether they have some effect on crime rates. Without conducting a randomized control trial, how would you assess whether LPRs have had any effect on crime?
4. How would you monetize the privacy costs of deploying LPRs and retaining LPR data for at least one year? (And what data would you need to do this?)
5. How would you assess the effect that LPR deployment has on community trust? And how would you monetize that cost?