

THE BOSTON GUN PROJECT: IMPACT EVALUATION FINDINGS*

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PROBLEM-ORIENTED POLICING AND YOUTH VIOLENCE IN BOSTON

Problem-oriented policing holds great promise for creating strong responses to crime, fear, and public safety problems. It aspires to unpack such problems and to frame strategic responses using a wide variety of often untraditional approaches.¹ Using a process of problem identification, analysis, response, evaluation, and adjustment of the response, problem-oriented policing has been effective against a wide variety of crime, fear, and order concerns.²

The Boston Gun Project was a problem-oriented policing initiative expressly aimed at taking on a serious, large-scale crime problem—homicide victimization among young people in Boston. Like many large cities in the United States, Boston experienced an epidemic of youth homicide between the late 1980s and early 1990s. Boston youth homicide (ages 24 and under) increased 230—from 22 victims in 1987 to 73 victims in 1990 (see Figure 1). Youth homicide remained high well after the peak of the epidemic. Boston averaged about 44 youth homicides per year between 1991 and 1995.

Sponsored by the National Institute of Justice and directed by David M. Kennedy, Anthony A. Braga, and Anne M. Piehl of Harvard University's John F. Kennedy School of Government, the Project included: 1) assembling an interagency working group of largely line-level criminal justice and other practitioners; 2) applying quantitative and qualitative research techniques to create an assessment of the nature of, and dynamics driving, youth violence in Boston; 3) developing an intervention designed to have a substantial, near-term impact on youth homicide; 4) implementing and adapting the intervention; and 5) evaluating the intervention's impact. The Project began in early

1995 and implemented what is now known as the “Operation Ceasefire” intervention, which began in the late spring of 1996.

Core participating agencies, as defined by regular participation in the Boston Gun Project Working Group over the duration of the project, included the Boston Police Department; the Massachusetts departments of probation and parole; the office of the Suffolk County District Attorney; the office of the United States Attorney; the Bureau of Alcohol, Tobacco, and Firearms; the Massachusetts Department of Youth Services (juvenile corrections); Boston School Police; and gang outreach and prevention “streetworkers” attached to the Boston Community Centers program. Other important participants, either as regular partners later in the process or episodically, have included the Ten Point Coalition of activist black clergy, the Drug Enforcement Administration, the Massachusetts State Police, the office of the Massachusetts Attorney General, and others.

THE NATURE OF YOUTH HOMICIDE AND FIREARMS VIOLENCE IN BOSTON

A new understanding of the city’s youth violence problem was created by the Boston Gun Project research activities. The research involved was an unusual combination of quantitative and qualitative analyses. Project research showed that firearms associated with youth, especially with gang youth, tended to be semiautomatic pistols, often ones that were quite new and apparently recently diverted from retail.³ Many of these guns were first sold at retail in Massachusetts as well as being smuggled in from out of state.

Project research also showed that the problem of youth homicide was concentrated among a small number of chronically offending gang-involved youth

(Boston's "gangs" were typically small, relatively disorganized, neighborhood-based groups, not Los Angeles- or Chicago-style gangs). In the summer of 1995, Boston had 61 gangs comprised of only about 1300 gang members— less than 1% of their age group citywide and less than 3% of their age group in Boston neighborhoods with gang turf. Although there were relatively few gang-involved youth in Boston, these 61 gangs were responsible for at least 60% of all the youth homicide in the city. The gangs were well known to the authorities and streetworkers; many gang members also were well known and tended to have extensive criminal records.⁴ Chronic disputes, or “beefs,” among gangs appeared to be the most significant driver of gang violence.⁵ While not all of this information was entirely new—many front-line practitioners, for example, knew perfectly well that Boston had a youth gang problem—the full picture, and its specificity, was new. For example, youth violence in the city previously had not been characterized as a problem occurring largely within a small population of chronic, gang-involved offenders, along a pattern of gang antagonisms, and carried out in considerable part with a stream of new, often locally-sourced firearms.

The research findings were discussed and analyzed within the Working Group problem-solving process and were instrumental in the development of an operational strategy. The research findings and the Working Group process thus led to the “Operation Ceasefire” intervention. Operation Ceasefire included two main elements: 1) a direct law-enforcement attack on illicit firearms traffickers supplying youth with guns, and 2) an attempt to generate a strong deterrent to gang violence. The Working Group framed a set of activities intended to systematically address the patterns of firearms trafficking identified by the research. These included the following:

- Expanding the focus of local, state, and federal authorities to include *intrastate* trafficking in Massachusetts-sourced guns, in addition to interstate trafficking;
- Focusing enforcement attention on traffickers of those makes and calibers of guns most used by gang members;
- Focusing enforcement attention on traffickers of those guns showing short time-to-crime, and thus most likely to have been trafficked. The Boston Field Division of ATF set up an in-house tracking system that flagged guns whose traces showed an 18-month or shorter time-to-crime;
- Focusing enforcement attention on traffickers of guns used by the city's most violent gangs;
- Attempting restoration of obliterated serial numbers, and subsequent trafficking investigations based on those restorations;
- Supporting these enforcement priorities through analysis of crime gun traces generated by the Boston Police Department's comprehensive tracing of crime guns, and by developing leads through systematic debriefing of, especially, arrestees involved with gangs and/or involved in violent crime.

The “pulling levers” strategy, as the second element came to be known by Working Group members, involved deterring violent behavior by chronic gang offenders by reaching out directly to gangs, saying explicitly that violence would no longer be tolerated, and backing that message by “pulling every lever” legally available when violence occurred.⁶ Simultaneously, streetworkers, probation and parole officers, and later churches and other community groups offered gang members services and other kinds of help. The Ceasefire Working Group delivered this message in formal meetings with gang members; through individual police and probation contacts with gang members; through meetings with inmates of secure juvenile facilities in the city; and through gang outreach workers. The deterrence message was not a deal with gang members to stop violence. Rather, it was a promise to gang members that violent

behavior would evoke an immediate and intense response. If gangs committed other crimes but refrained from violence, the normal workings of police, prosecutors, and the rest of the criminal justice system dealt with these matters. But if gang members hurt people, the Working Group focused its enforcement actions on them.

When gang violence occurred, the Ceasefire agencies addressed the violent group or groups involved, drawing from a menu of all possible legal “levers.” The chronic involvement of gang members in a wide variety of offenses made them, and the gangs they formed, vulnerable to a coordinated criminal justice response. The authorities could disrupt street drug activity, focus police attention on low-level street crimes such as trespassing and public drinking, serve outstanding warrants, cultivate confidential informants for medium- and long-term investigations of gang activities, deliver strict probation and parole enforcement, seize drug proceeds and other assets, ensure stiffer plea bargains and sterner prosecutorial attention, request stronger bail terms (and enforce them), and focus potentially severe Federal investigative and prosecutorial attention on, for example, gang-related drug activity. The multitude of agencies involved in the Working Group assessed each gang that behaved violently and subjected them to such “crackdowns.” These operations were customized to the particular individuals and characteristics of the gang in question, and could range from probation curfew checks to DEA investigations.⁷

The Ceasefire crackdowns were not designed to eliminate gangs or stop every aspect of gang activity, but to control and deter serious violence. To do this, the Working Group explained its actions against targeted gangs to other gangs, as in “this gang did violence, we responded with the following actions, and here is how to prevent anything

similar from happening to you.” The ongoing Working Group process regularly watched the city for outbreaks of gang violence and framed any necessary responses in accord with the Ceasefire strategy. As the strategy unfolded, the Working Group continued communication with gangs and gang members to convey its determination to stop violence, to explain its actions to the target population, and to maximize both voluntary compliance and the strategy’s deterrent power.

A central hypothesis within the Working Group was the idea that a meaningful period of substantially reduced youth violence might serve as a “firebreak” and result in a relatively long-lasting reduction in future youth violence.⁸ The idea was that youth violence in Boston had become a self-sustaining cycle among a relatively small number of youth, with objectively high levels of risk leading to nominally self-protective behavior such as gun acquisition and use, gang formation, tough “street” behavior, and the like: behavior that then became an additional input into the cycle of violence.⁹ If this cycle could be interrupted, a new equilibrium at a lower level of risk and violence might be established, perhaps without the need for continued high levels of either deterrent or facilitative intervention. The larger hope was that a successful intervention to reduce gang violence in the short term would have a disproportionate, sustainable impact in the long term.

The Boston Gun Project Working Group began meeting in January 1995. By the fall of that year, the Project's basic problem assessment had been completed and the elements of the Ceasefire intervention mapped out. Street operations began in earnest in early 1996, the first comprehensive gang crackdown began in March, and the first meeting, or "forum," between the Working Group and gang members was held on May

15, 1996. A second major crackdown occurred in late August 1996, with other core Ceasefire activities— numerous forums, direct warnings to gangs, several lesser crackdowns, and gun trafficking investigations —continuing through to the present. The height of operational Ceasefire activity, however, occurred during 1996 and 1997.¹⁰

KEY EVALUATION FINDINGS

Without the support of a formal evaluation, Operation Ceasefire has been hailed in the media as an unprecedented success.¹¹ The well-known large reduction in yearly Boston youth homicide numbers certainly suggests that something noteworthy happened after Operation Ceasefire was implemented in mid-1996. As discussed earlier, Boston averaged 44 youth homicides per year between 1991 and 1995. In 1996, the number of Boston youth homicides decreased to 26 and then further decreased to 15 youth homicides in 1997. Although these numbers demonstrate that there was a sudden large decrease in Boston youth homicide, they do not provide a rigorous assessment of whether Operation Ceasefire was associated with the decrease. Consequently, our impact evaluation focused on four key questions:

1. Were there significant reductions in youth homicides and other indicators of non-fatal serious gun violence associated with the implementation of Operation Ceasefire in Boston?
2. Did the timing of Boston's significant reduction in youth homicide coincide with the implementation of Operation Ceasefire?
3. Were other factors responsible for Boston's reduction in youth homicide?
4. Was Boston's significant youth homicide reduction distinct relative to youth homicide trends in other major U.S. and New England cities?

Like most evaluations of crime prevention programs,¹² our evaluation design departs from the desirable, randomized controlled experimental approach.¹³ The Operation Ceasefire strategy was aimed at all areas of the city with a serious youth violence problem. There were no control areas (or control gangs) set aside within the city because of the following: 1) the aim was to do something about serious youth violence wherever it presented itself in the city; 2) the target of the intervention was defined as the self-sustaining cycle of violence in which all gangs were caught up and to which all gangs contributed; and 3) the communications strategy was explicitly intended to affect the behavior of gangs and individuals not directly subjected to enforcement attention.¹⁴ Therefore, it was not possible to compare areas and groups affected by the strategy to similar areas and groups not affected. Our analysis of impacts within Boston associated with the Ceasefire intervention followed a basic one-group time series design.¹⁵ We also used a non-randomized quasi-experiment to compare youth homicide trends in Boston to youth homicide trends in other large cities in the United States.¹⁶

The key outcome variable in our assessment of the impact of the Ceasefire intervention was the monthly number of homicide victims ages 24 and under. The Ceasefire intervention mostly targets violence arising from gang dynamics; our earlier research suggests that most gang members in Boston are ages 24 and under.¹⁷ Therefore, our impact evaluation focused on the number of youthful homicide victims in this age group. The Boston Police Department's Office of Research and Analysis provided the homicide data used in these analyses. The youth homicide impact evaluation examined the monthly counts of youth homicides in Boston between January 1, 1991, and May 31,

1998. The pre-intervention period included the relatively stable, but still historically high post-epidemic years of 1991-1995 (see Figure 1).

In addition to preventing youth homicides, the Ceasefire intervention was designed to reduce other forms of non-fatal serious gun violence. Therefore, our evaluation also examined monthly counts of citywide “shots fired” citizen calls for service data and citywide official gun assault incident report data. These data were available for a slightly shorter time period than our homicide data set due to lags in the Boston Police Department’s (BPD) data collection and preparation procedures. The non-fatal gun violence data were examined for the period January 1, 1991, through December 31, 1997. The computerized BPD incident data have what is, for our purposes, an important shortcoming— the records do not capture the age of the victim (this is, of course, also true for “shots fired” calls for service). In order to assess the effects of the intervention on gun assaults in specific age groups, we collected information on the age of the victim from hard copies of gun assault incident reports for the study time period. Since the collection and coding of this information was a time-consuming task, we chose to collect these data only for one high-activity police district. District B-2 covers most of Boston’s Roxbury neighborhood and has a dense concentration of gangs: 29 of 61 identified gangs (47.5%) had turf in B-2.¹⁸ Furthermore, there were 217 homicide victims ages 24 and under in Boston between 1991 and 1995; a third of these victims were killed in B-2 (71 of 217, 32.7%).

Were there significant reductions in youth homicides and other indicators of non-fatal serious gun violence associated with the implementation of Operation Ceasefire in Boston?

In these analyses, we selected May 15, 1996, the date of the first direct communications with Boston gangs, as the date Ceasefire was fully implemented, since all elements of the strategy—the focus on gun trafficking, a special interagency response to gang violence, and the communications campaign with gangs—were in place as of that date. For convenience, we selected the start of the “post” period as June 1, 1996. Figure 2 presents the monthly counts of youth homicides in Boston during the study time period. The time series shows a 63% reduction in the mean monthly number of youth homicide victims from a pre-test mean of 3.5 youth homicides per month to a post-test mean of 1.3 youth homicides per month. This simple analysis suggests that Operation Ceasefire was associated with a large reduction in Boston youth homicides. In any time series, however, intervention effects could be obscured by trends, seasonal variations, and random fluctuations.¹⁹ Therefore, rigorous time series models were used to analyze the data.²⁰ Since the underlying data were counts, Poisson regression time series models were used to analyze the monthly counts of citywide youth homicide incidents, citywide shots fired calls for service, citywide gun assault incidents, and youth gun assault incidents in District B-2.²¹ Our analyses suggest that the Ceasefire intervention was associated with statistically significant reductions in all time series, including:

- 63% decrease in the monthly number of youth homicides in Boston;
- 32% decrease in the monthly number of citywide shots fired calls;
- 25% decrease in the monthly number of citywide gun assault incidents;

- 44% decrease in the monthly number of District B-2 youth gun assault incidents.

Did the timing of Boston's significant reduction in youth homicide coincide with the implementation of Operation Ceasefire?

Although our time series analyses revealed that implementation of Operation Ceasefire was associated with a significant reduction in youth homicide, the time series models do not establish whether the reduction actually started before or after the commencement of the program. In other words, it is possible that the large drop in youth homicide started several months earlier or several months later than the June 1996 commencement date. If this was the case, our ability to associate Operation Ceasefire with the observed youth homicide reductions would be weakened. An alternative approach to the standard time series impact assessment methodology is to examine the entire time series for the point in time that experiences the maximal significant increase or decrease, if one exists.²² To implement this test, we ran a model that checked for significant changes in the entire time series for each successive month.²³ These analyses suggested that the maximal significant decrease in the Boston youth homicide time series occurred in June 1996— about the same time Operation Ceasefire was fully implemented.²⁴ These results reinforce our observation that the implementation of the Boston program was associated with significant reductions in youth homicide.

Were other factors responsible for Boston's reduction in youth homicide?

The youth homicide and gun violence reductions associated with the Ceasefire intervention could have been caused or meaningfully influenced by other causal factors. We therefore controlled for changes in Boston's employment rate as measured by the

Massachusetts Department of Employment and Training, changes in Boston's youth population ages 14 to 24 as measured by the U.S. Bureau of the Census, changes in citywide trends in violent Index crimes as measured by the Federal Bureau of Investigation Uniform Crime Reports, changes in homicide victimization among older victims (ages 25 and older), and changes in youth involvement in street-level drug market activity as measured by Boston Police Department arrest data. Admittedly, these controls are far from ideal. For example, measuring changes in Boston's citywide youth population does not directly measure population changes among our target audience—gang-involved youth offenders. However, these variables represent the best available information on these alternate explanations for Boston decrease in youth homicide. When these control variables were added to our models, our findings did not substantively change. The significant reductions in youth homicide, shots fired calls for service, gun assault incidents, and youth gun assault incidents in B-2 associated with Operation Ceasefire remained when the control variables were added to our Poisson regression time series models.²⁵

It is worth discussing some of the other initiatives that have been associated with the noteworthy decline in youth violence in Boston. In a series of editorials and public statements, Dr. Deborah Prothrow-Stith and other public health practitioners made the case that public health initiatives were responsible for the fall in youth homicide in Boston.²⁶ It seems unlikely to us, however, that public health interventions were primarily responsible for Boston's decline in youth homicide. Although there may be some unmeasurable indirect effects, there is no evidence that the public health interventions had a direct effect on youth homicide in Boston. The period covered by

these interventions, nearly two decades beginning in the early 1980s, covers the ramping up of youth homicide in the city, its peak in 1990, and the period 1991-1995 in which youth homicide was lower but historically high before the period of abrupt began (Figure 1). While these interventions may have had impact over this time, nowhere do they seem to show the reach into youth violence demonstrated by whatever in fact caused the abrupt decline in rates of youth homicide and youth gun assault in 1996. There was, in Boston through the summer of 1996, a small (on a citywide scale) but meaningful group of chronic, gang-involved offenders who, as demonstrated by their violent behavior, had demonstrably not been reached by years of public health and similar interventions. Only a few months later, their behavior had changed. No proponent of the view that public health interventions caused the overall decline in violence has suggested a mechanism by which this particular change might have been accomplished. Moreover, various components of the Boston public health interventions have been evaluated, in Boston and in similar settings elsewhere.²⁷ Nowhere have they shown strong impact on violent behavior and victimization.

Similarly, Operation Night Light, Boston's innovative probation/police partnership, and Boston's Ten Point Coalition have variously been credited with direct responsibility for Boston's dramatic reductions in youth violence.²⁸ Here, too, the strong claims seem unlikely. Both Operation Night Light and the activities of the Ten Point Coalition date from 1992. No diminution in homicide is evident between 1992 and mid-1996. Had either venture had immediate strong impacts on violence, those impacts should have been evident. Neither did the program activities of either Night Light or the Ten Point Coalition change significantly in mid-1996, when the declines in violence

commenced. Thus, directly attributing the declines to either seems unwarranted.

Probation officers involved with Operation Night Light were key members of the Boston Gun Project Working Group, and Night Light operations were tightly integrated into many Ceasefire interventions and made valuable contributions to the problem-solving process. Although they were valuable partners, the Ten Point Coalition did not become involved in Ceasefire operations until late 1996, after the key gang interventions, and after the large downward shift in street violence, described above.

Finally, there is the question of what degree, if any, of violence reduction in Boston should be attributed to the prevention of illegal firearms trafficking. Trafficking was, of course, one of the principal original foci of the Gun Project, and attention to trafficking one of Operation Ceasefire's two fundamental planks.

Evaluating the particular contribution of supply-side interventions in Boston is, we believe, essentially impossible. Anti-trafficking efforts were implemented at the same time as violence deterrence efforts, and both might be expected to influence, for example, gun carrying, gun use, and the mix of illegal guns found on the street. A stand-alone trafficking prevention intervention would not face these difficulties, and could lead to definitive answers on the impact of supply-side interventions. Operation Ceasefire, however, was not a stand-alone trafficking prevention intervention.

Here, as well, the distinctive characteristics of the decline in homicide and shootings in Boston offer the best insight into what might have happened. Two things are certain. First, supply-side efforts cannot be responsible for the abrupt reductions in gun-related violence over the summer and fall of 1996. Boston trafficking cases *follow* that reduction, rather than anticipate it. Second, anti-trafficking efforts in Boston did nothing

to reduce the *existing stockpile* of illegally acquired and possessed firearms in Boston. Those guns held by gang members in Boston in May of 1996 were, for the most part, still held by them several months later when the violence reached its new, lower equilibrium. The change that had occurred was not in the extent of gun *ownership*, but in gun *use*. The principal impact therefore was nearly certainly a demand-side, deterrence-based effect, rather than a supply-side effect. It may well be that anti-trafficking efforts strengthened and prolonged that impact. Whether any such effects were large or small cannot be independently established in this case.

Was Boston's significant youth homicide reduction distinct relative to youth homicide trends in other major U.S. and New England cities?

Although the within-Boston analyses support the conclusion that a large reduction in youth homicide and gun violence was associated with the Ceasefire intervention, it is necessary to distinguish youth homicide trends in Boston from national or regional trends in youth homicide. Many major cities in the United States have enjoyed noteworthy reductions in homicide and non-fatal serious violence.²⁹ Violence reductions in other cities could be associated with a number of complex and tightly interwoven endogenous or exogenous factors such as positive changes in the national economy, shifts in the age distribution of offending populations, or the stabilization of urban drug markets. Moreover, many cities, most notably New York,³⁰ have implemented crime prevention interventions that have been credited with substantial reductions in violence. Since many U.S. cities experienced varying decreases in homicide, we felt that it was important to determine whether other cities experienced a similar sudden, large decrease in youth homicide during the same time period Boston experienced its significant reduction. The

following analyses provide insight into whether Boston's reduction in youth homicide was part of national youth homicide trends and whether the program impact associated with the Ceasefire intervention was distinct in magnitude from other youth homicide reductions occurring at the same time as the Ceasefire intervention or at some time during the time series period.

To examine these important issues, we obtained monthly counts of the number of homicide victims ages 24 and under for Boston, 29 major New England cities,³¹ and 39 major United States cities³² from Supplementary Homicide Report (SHR) data for the time period of January 1991 through December 1997. In order to compare youth homicide trends in Boston relative to youth homicide trends in major U.S. and New England cities, we built a model that maximized our ability to control for the various trends, seasonal variations, and random fluctuations in the time series of each city. We used a Poisson regression model that predicted monthly youth homicide counts as a function of simple linear trends within each city time series, non-linear trends within each city time series, month effects within each city time series, intervention effects within each city time series, and a simple autoregressive component for each city time series.³³ Using the June 1996 intervention date, these models revealed that only Boston experienced a significant reduction in the monthly count of youth homicides coinciding with the implementation of the Operation Ceasefire program.

Of course, other cities may have experienced a significant decrease in youth homicide either before or after Boston experienced its significant decrease in youth homicide. Therefore, we conducted an exploratory analysis to identify significant youth homicide reductions in other months during the time series. We performed our main

analysis of youth homicides in 39 major U.S. cities and 29 major New England cities with a varying intervention point for each month in the time series.³⁴ Only 5 out of 68 cities experienced a similar sudden significant youth homicide reduction at some point in the time series. These cities included Seattle (WA), Tucson (AZ), Tulsa (OK), Oklahoma City (OK), and Springfield (MA). Although these cities experienced sudden large reductions in youth homicide, it is difficult to make a link between youth homicide trends in the six cities and Boston as the trends across cities look different (see Figures 3 – 7). The significant reduction in Oklahoma City youth homicides occurred in month following the tragic 1995 bombing. Seattle, Tucson, and Tulsa have been identified by the Office of Juvenile Justice and Delinquency Prevention (OJJDP) as communities that implemented promising strategies to reduce gun violence during this time period.³⁵ Youth homicides in Springfield are very rare events and trends in these cities could be sensitive to small changes in youth offending patterns. Careful within-city studies are necessary to unravel the youth homicide trends in the six cities. Although some cities may have experienced a similar decrease, these analyses do suggest that Boston's significant youth homicide reduction associated with Operation Ceasefire was distinct when compared to youth homicide trends in most major U.S. and New England cities.

DISCUSSION

We believe that the research presented here shows that the Boston Gun Project was a meaningful problem-oriented policing effort, bringing practitioners and researchers together in new ways, leading to a fresh assessment of the youth violence problem in Boston, and leading to operational activities that were a substantial departure from

previous practice. The principal intervention, Operation Ceasefire, was likely responsible for a substantial reduction in youth homicide and youth gun violence in the city. At first blush, the effectiveness of the Operation Ceasefire intervention in preventing violence may seem unique to Boston. Operation Ceasefire was constructed largely from the assets and capacities available in Boston at the time and deliberately tailored to the city's particular violence problem. Operational capacities of criminal justice agencies in other cities will be different and youth violence problems in other cities will have important distinguishing characteristics. However, we believe that the Working Group problem-solving process and the "pulling levers" approach to deterring chronic offenders are transferable to other jurisdictions. A number of cities have begun to experiment with these frameworks and have experienced some encouraging preliminary results. These cities include Minneapolis (MN), Baltimore (MD), Indianapolis (IN), Stockton (CA), Lowell (MA), Los Angeles (CA), Bronx (NY), High Point (NC), Winston-Salem (NC), Memphis (TN), New Haven (CT), and Portland (OR).³⁶

The Boston Gun Project applied the basic principles of problem-oriented policing to a substantial public safety problem. Addressing this problem required the involvement of multiple agencies and the community, as well as substantial investments in analysis, coordination, and implementation. The experience of the Gun Project suggests that deploying criminal justice capacities to prevent crime can yield substantial benefits. The problem-solving orientation of the project means that the problem definition, the core participants, and the particulars of the intervention evolved over the course of the collaboration. Operation Ceasefire itself was highly customized to the goals of the collaboration, the particular nature of the youth violence problem in Boston, and the

particular capacities available in Boston for incorporation into a strategic intervention. Therefore, Operation Ceasefire as such is unlikely to be a highly specifiable, transportable “technology.” However, certain process elements of the Boston Gun Project, such as the central role of the line-level working group and the use of both qualitative and quantitative research to “unpack” chosen problems, should be generally applicable to other problem-solving efforts. Using the working group problem-solving approach, criminal justice practitioners in other jurisdictions will develop a set of intervention strategies that fits both the nuances of their youth violence problem and their operational capacities. Although the resulting package of interventions may not closely resemble the tactics used in Operation Ceasefire, the frameworks will be similar.

The “pulling levers” deterrence strategy at the heart of Operation Ceasefire was designed to influence the behavior, and the environment, of the chronic-offender, gang-involved youth, whom Gun Project research identified as the core of the city’s youth violence problem. Where problem-oriented policing efforts are aimed at violence—and when that violence is rooted in chronic offenders, groups of chronic offenders, and dynamics involving such offenders and groups—“pulling levers” approaches may have something to offer to other jurisdictions. The Operation Ceasefire intervention is, in its broadest sense, a deterrence strategy. Much of the literature evaluating deterrence focuses on the effect of changing certainty, swiftness, and severity of punishment associated with certain acts on the prevalence of those crimes.³⁷ In addition to increasing certainty, severity, and swiftness of sanctions associated with youth violence, the Operation Ceasefire strategy sought to gain deterrence through the *advertising* of the law

enforcement strategy and through the personalized nature of its application. It was crucial that gang youth understood the new regime that the city was imposing.

The “pulling levers” approach attempted to prevent gang violence by making gang members believe that consequences would follow on violence and gun use and choose to change their behavior. A key element of the strategy was the delivery of a direct and explicit “retail deterrence” message to a relatively small target audience regarding what kind of behavior would provoke a special response and what that response would be. Law enforcement agencies in Boston increased the cost of gang-related violence. Knowledge of what happened to others in the target population was intended to prevent further acts of violence by gangs in Boston. The Operation Ceasefire Working Group understood that law enforcement agencies generally do not have the capacity to “eliminate” all gangs in a gang-troubled jurisdiction, nor do they have the capacity to respond in a powerful way to all gang offending in such jurisdictions.³⁸ Pledges to do so, though common, are simply not credible. Therefore, the Working Group recognized that, in order for the strategy to be successful, it was crucial to deliver a credible deterrence message to Boston gangs. Because the Working Group could deploy, at best, only a few severe crackdowns at a time, the Ceasefire intervention targeted those gangs that were engaged in violent behavior, rather than expending resources on those who were not. Through this focused application of deterrence principles, Operation Ceasefire suggests a new approach to controlling violent offenders.

Figure 1.
Boston Homicide Victims Ages 24 and Under

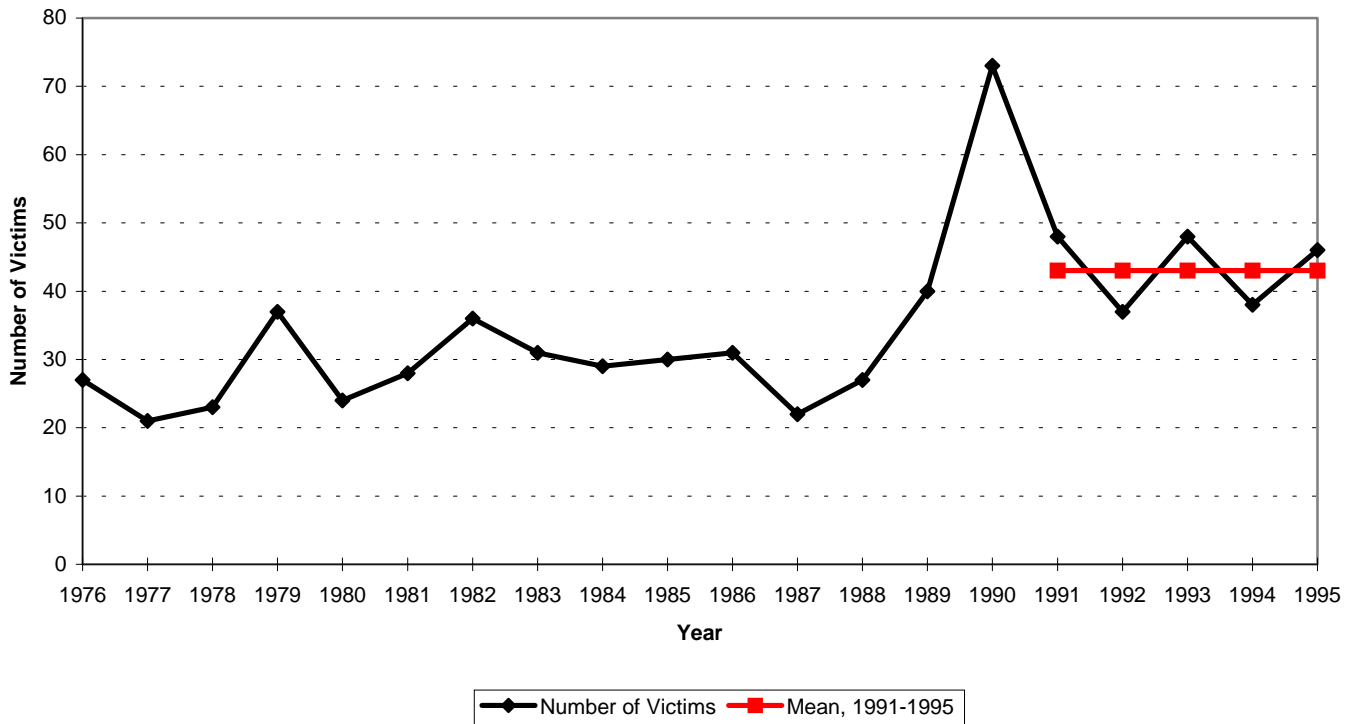


Figure 2. Monthly Counts of Youth Homicides in Boston

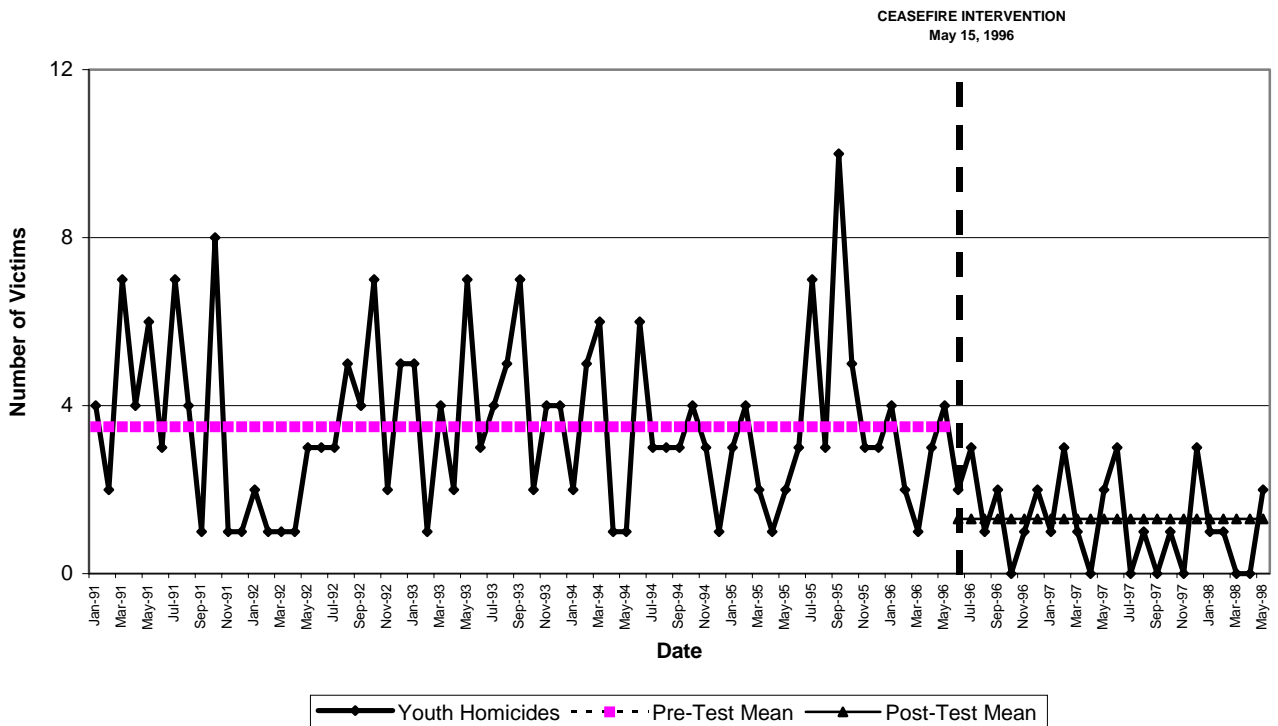


Figure 3

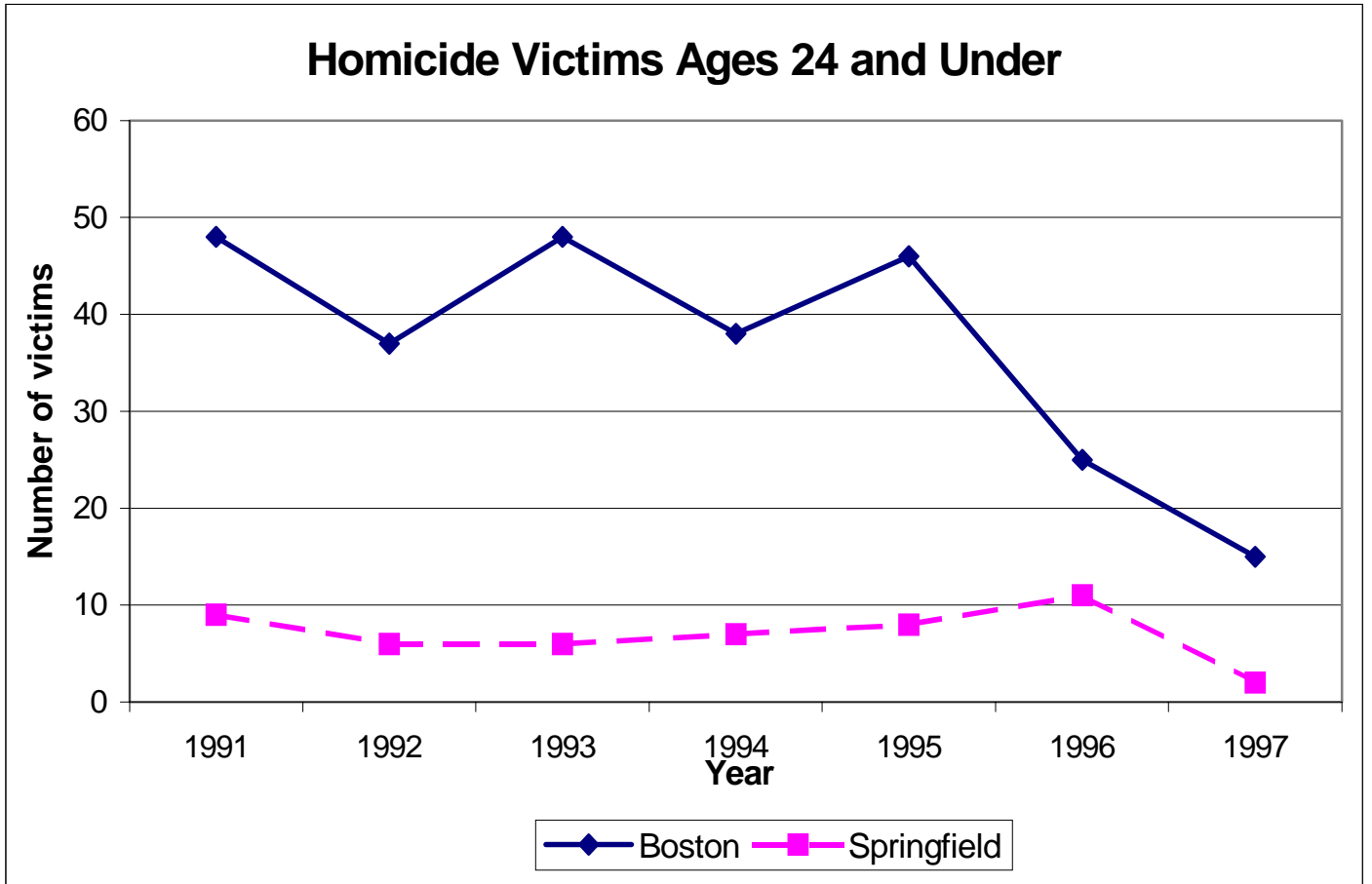


Figure 4

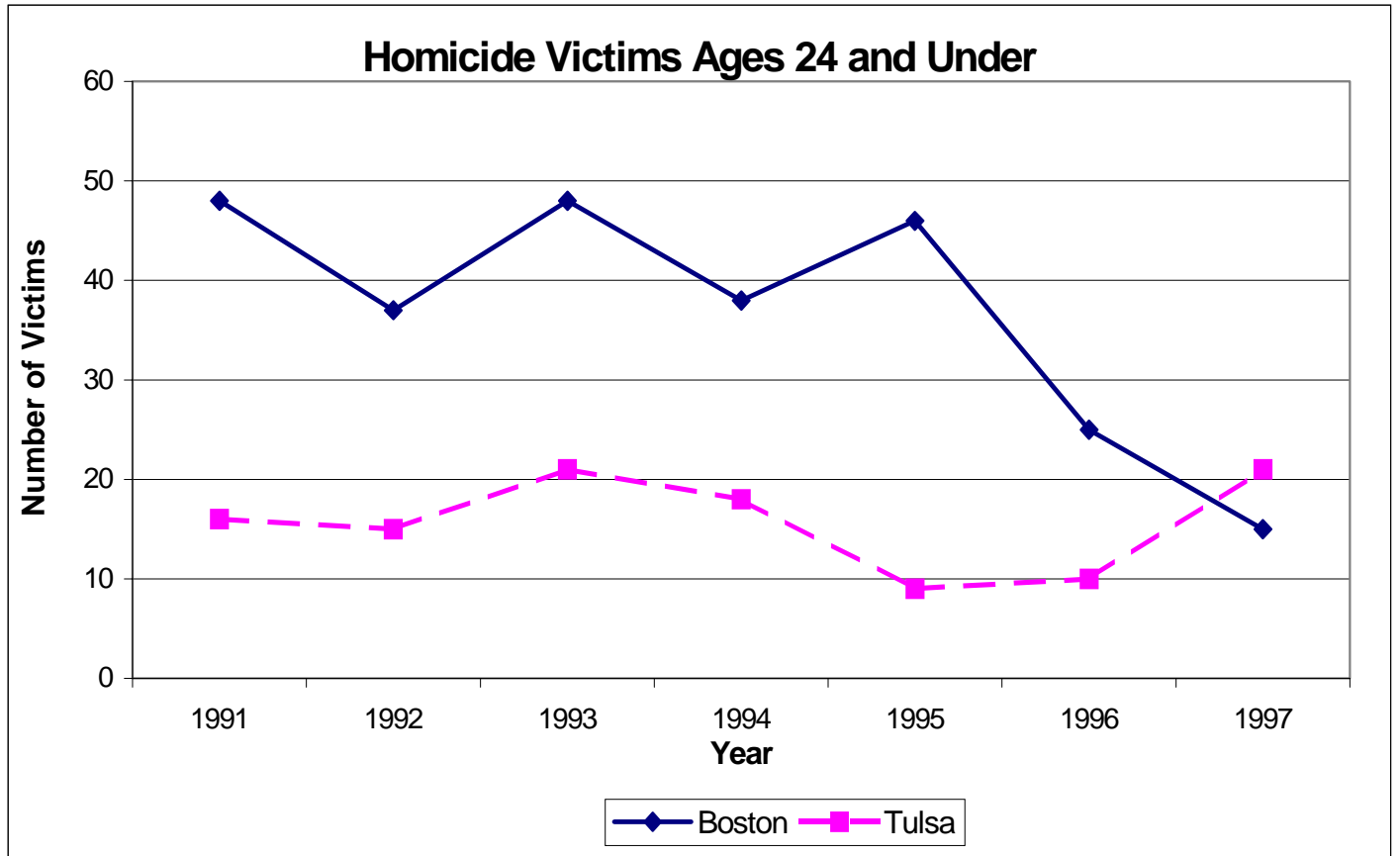


Figure 5

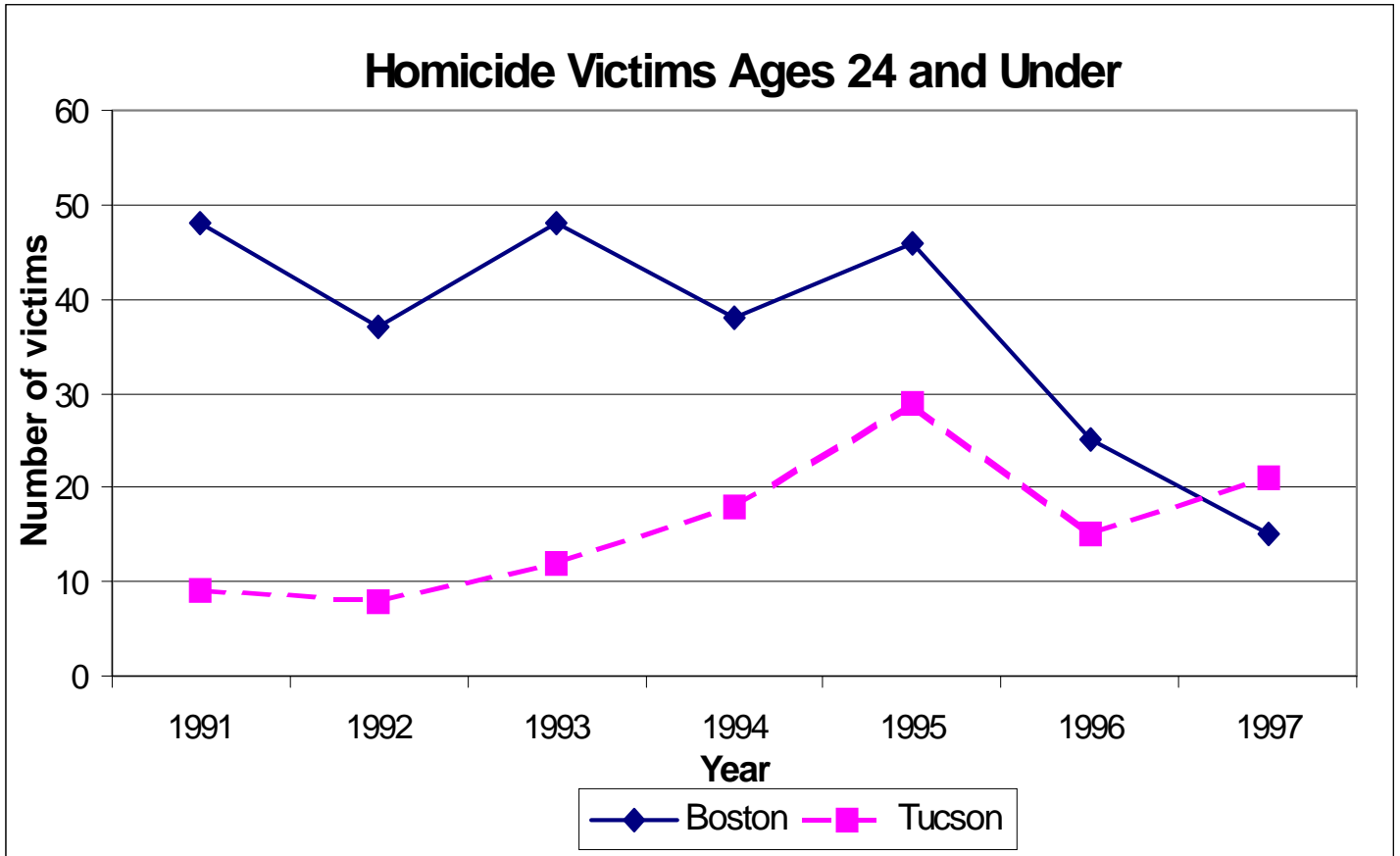
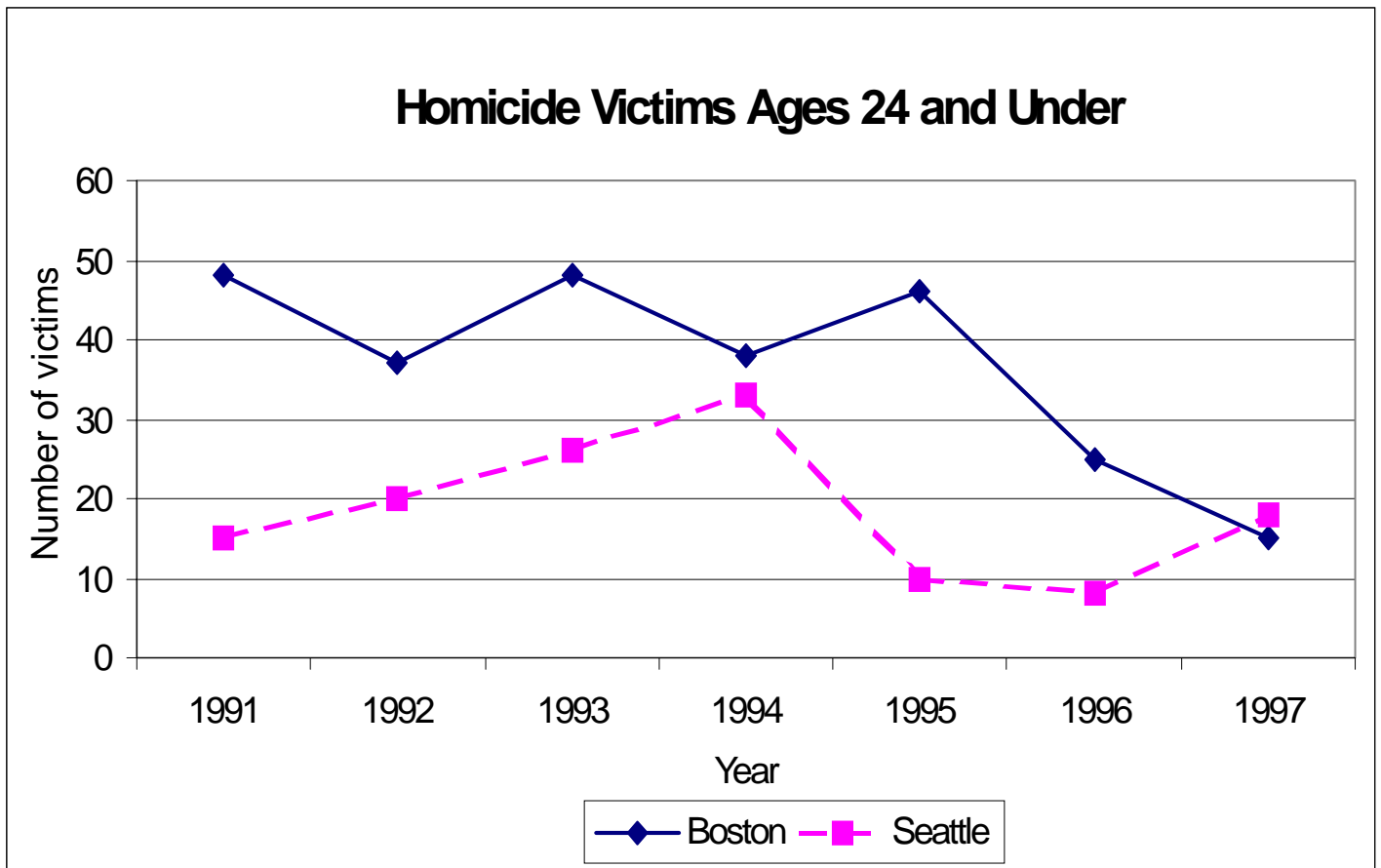
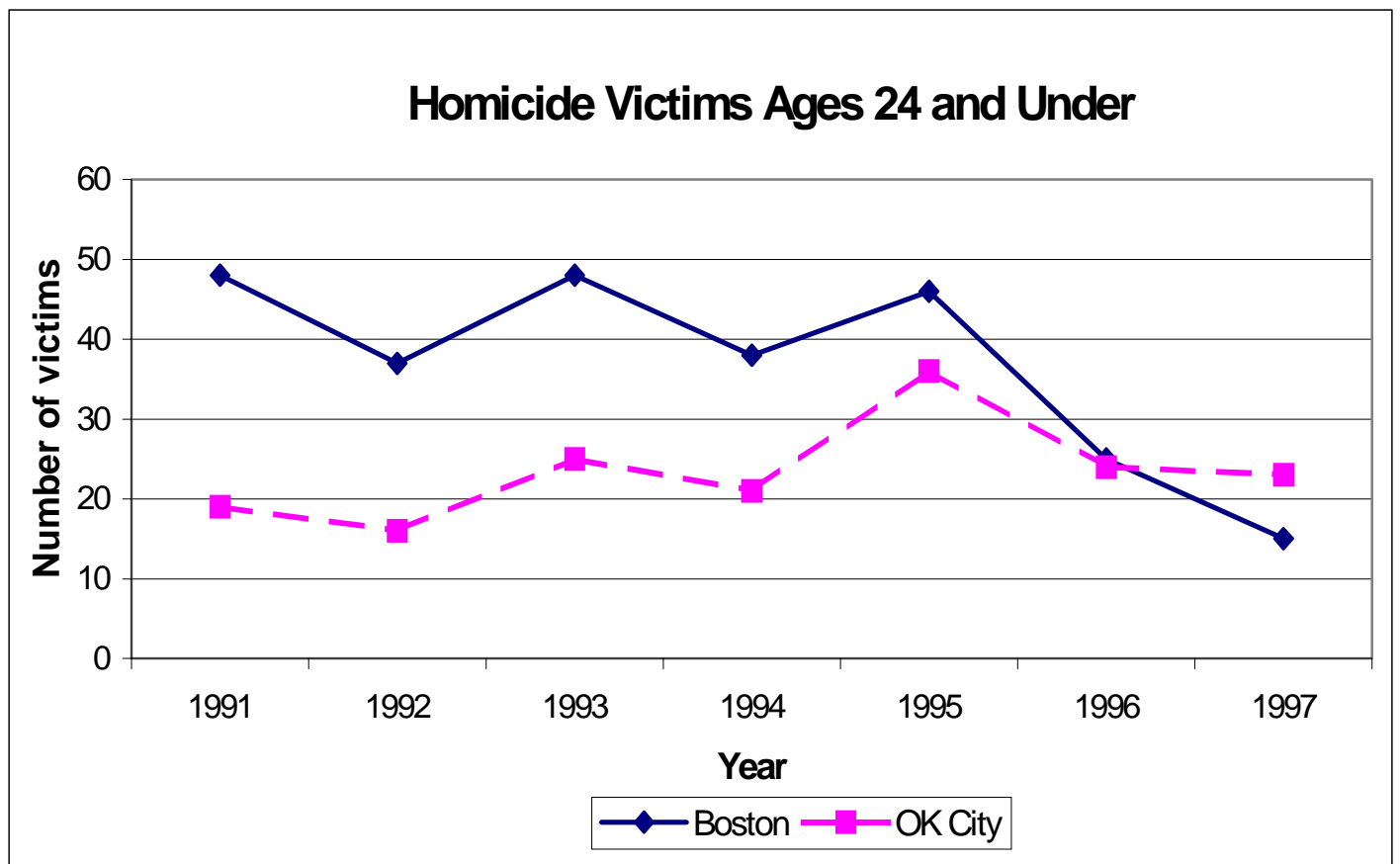


Figure 6





NOTES

¹ Herman Goldstein. 1979. "Improving Policing: A Problem-Oriented Approach." *Crime & Delinquency* 25: 236-258.

² Herman Goldstein. 1990. *Problem-Oriented Policing*. Philadelphia: Temple University Press; John Eck and William Spelman. 1987. *Problem-Solving: Problem-Oriented Policing in Newport News*. Washington, DC: National Institute of Justice; Anthony A. Braga, David L. Weisburd, Elin J. Waring, Lorraine Green Mazerolle, William Spelman, and Francis Gajewski. 1999. "Problem-Oriented Policing in Violent Crime Places: A Randomized Controlled Experiment." *Criminology* 37: 541- 580.

³ David M. Kennedy, Anne M. Piehl, and Anthony A. Braga. 1996. "Youth Violence in Boston: Gun Markets, Serious Youth Offenders, and a Use-Reduction Strategy." *Law and Contemporary Problems* 59: 147-196.

⁴ Kennedy et al., 1996; David M. Kennedy, Anthony A. Braga, and Anne M. Piehl. 1997. "The (Un)Known Universe: Mapping Gangs and Gang Violence in Boston." Pp. 219-262 in *Crime Mapping and Crime Prevention*, edited by David L. Weisburd and J. Thomas McEwen. New York: Criminal Justice Press.

⁵ Anthony A. Braga, Anne M. Piehl, and David M. Kennedy. 1999. "Youth Homicide in Boston: An Assessment of Supplementary Homicide Report Data." *Homicide Studies* 3: 277 – 299.

⁶ David M. Kennedy. 1997. "Pulling Levers: Chronic Offenders, High-Crime Settings, and a Theory of Prevention." *Valparaiso University Law Review* 31: 449 – 484; David M. Kennedy. 1998. "Pulling Levers: Getting Deterrence Right." *National Institute of Justice Journal* July: 2 – 8.

⁷ There were, in fact, only two major Ceasefire crackdowns. In May 1996, the Vamp Hill Kings were subjected to a multi-agency operation that included: street drug enforcement and drug market suppression, warrant service, stepped-up street enforcement by the Boston Police Department (10 arrests), Operation Night Light probation visits to suspected gang members (38 home visits, 10 probation surrenders), parole visits, 4 DYS surrenders, seizure of pit bull dogs by animal control, special bail conditions established for cases presented to Massachusetts district courts, 4 cases accepted for prosecution by the US Attorney (3 pled guilty, one was deported). In August 1996, the Intervale Street Posse was subjected to a similar multi-agency operation that included: 15 federal arrests on drugs and homicide conspiracy charges (those federally charged were held out of state on pretrial detention) and 8 state drug arrests prosecuted by Suffolk County District Attorney.

⁸ Kennedy et al., 1996.

⁹ Kennedy et al., 1996.

¹⁰ David M. Kennedy, Anthony A. Braga, and Anne M. Piehl. 1999. "Operation Ceasefire: Problem Solving and Youth Violence in Boston." Research Report submitted to the National Institute of Justice. Cambridge, MA: John F. Kennedy School of Government, Harvard University; John Buntin. 1998. "A Community Responds: Boston Confronts an Upsurge in Youth Violence." Case Study C15-98-1428.0. Cambridge, MA: John F. Kennedy School of Government, Harvard University.

¹¹ See, e.g., Fox Butterfield. 1996. "In Boston, Nothing is Something." *New York Times*, November 21: A20; Gordon Witkin. 1997. "Sixteen Silver Bullets: Smart Ideas to Fix the World." *US News and World Report*, December 29: 67.

¹² Paul Ekblom and Ken Pease. 1995, "Evaluating Crime Prevention." In *Building a Safer Society. Crime and Justice*, Vol. 19, edited by Michael Tonry and David Farrington. Chicago: University of Chicago Press.

¹³ See, e.g., Lawrence Sherman. 1997. "Thinking About Crime Prevention." In *Preventing Crime: What Works, What Doesn't, What's Promising*, edited by the University of Maryland, Department of Criminology and Criminal Justice. Washington, DC: Office of Justice Programs, U.S. Department of Justice.

¹⁴ Kennedy et al., 1996.

¹⁵ Donald T. Campbell and Julian Stanley. 1966. *Experimental and Quasi-Experimental Designs for Research*. Chicago: Rand McNally; Thomas Cook and Donald Campbell. 1979. *Quasi-Experimentation: Design and Analysis Issues for Field Settings*. Boston: Houghton Mifflin.

¹⁶ Peter H. Rossi and Howard E. Freeman. 1993. *Evaluation: A Systematic Approach*. Fifth Edition. Newbury Park, CA: Sage Publications; Cook and Campbell, 1979.

¹⁷ Kennedy et al., 1996; Kennedy et al., 1997.

¹⁸ Kennedy et al., 1997.

¹⁹ David McDowall, Richard McCleary, Errol Meidinger, and Richard Hay. 1980. *Interrupted Time Series Analysis*. Sage University Series on Quantitative Applications in the Social Sciences. Newbury Park, CA: Sage Publications.

²⁰ The general class of Auto Regressive Integrated Moving Average (ARIMA) models can be used to good effect in detecting these three sources of noise in a time series (McDowall et al., 1980). We used ARIMA models to unravel the error structure of the pre-intervention time series for each outcome measure in order to guide us in accounting for these sources of noise in our generalized linear models. ARIMA models were not used to assess the impact of the intervention. The important findings of this exercise are discussed here and the details are available upon request from the authors. All outcome measure time series exhibited varying seasonal effects; that is, all time series had either seasonal moving averages (a shock that is felt once each season and then disappears); seasonal autocorrelation (e.g., August 1991 figures correlated with August 1992, August 1993, and so on); or both. In order to account for these seasonal effects in our models, we included dummy variables for each month. None of the time series data showed significant non-seasonal autocorrelation (i.e., monthly counts serially correlated); therefore, we did not estimate a non-seasonal autoregressive component in our models. The pre-intervention time series varied in whether a trend was present. Youth homicides and youth gun assault incidents in B-2 were relatively stable during the pre-intervention time series while citywide shots fired calls and citywide gun assault incidents in B-2 exhibited simple linear downward trends. To account for trends in the series, we included a simple linear trend variable in the model.

²¹ Generalized linear models, configured as Poisson regressions in log linear models, were used in our deeper analysis of impacts associated with the Ceasefire intervention to analyze the time series data; see Annette Dobson. 1990. *An Introduction to Generalized Linear Models*. New York: Chapman and Hall; Peter McCullagh and John Nelder. 1989. *Generalized Linear Models*. 2nd Edition. New York: Chapman and Hall. For the details of the models and a full discussion of the resulting parameter estimates, see Anthony A. Braga, David M. Kennedy, Elin J. Waring, and Anne M. Piehl. 2000. "Problem-Oriented Policing, Youth Violence, and Deterrence: An Evaluation of Boston's Operation Ceasefire." Working paper. Cambridge, MA: John F. Kennedy School of Government, Harvard University. Inserting youth homicides as the dependent variable, the basic model was as follows: Monthly youth homicide count = Intercept + intervention + trend + month dummy variables + error. The SAS Genmod procedure was used to analyze these data; see SAS Institute. 1993. *SAS/STAT Software: The GENMOD Procedure*. Release 6.09. Technical Report P-243. Cary, NC: SAS Institute, Inc.

²² For the details of applying tests of structural breaks to evaluate changes over time, see Donald Andrews. 1993. "Tests for Parameter Instability and Structural Change with an Unknown Change Point." *Econometrika* 61: 821-56.

²³ These models excluded months at the very beginning and the very end of the series to allow enough data to control for trends and seasonal variations in the time series data. See Anne M. Piehl, Suzanne J. Cooper, Anthony A. Braga, and David M. Kennedy. 1999. "Testing for Structural Breaks in the Evaluation of Programs." NBER Working Paper No. 7226. Cambridge, MA: National Bureau of Economic Research.

²⁴ Piehl et al., 1999.

²⁵ For the details of these analyses, see Anthony A. Braga, David M. Kennedy, Elin J. Waring, and Anne M. Piehl. 1999. "Problem-Oriented Policing and Youth Violence: An Evaluation of the Boston Gun Project." Final report submitted to the National Institute of Justice. Cambridge, MA: John F. Kennedy School of Government; Anne M. Piehl, David M. Kennedy, and Anthony A. Braga. 2000. "Youth Violence and Problem Solving: A Pre/Post Evaluation of the Boston Gun Project." *American Law and Economics Review*, 2 (1): 68 – 106.

²⁶ Deborah Prothrow-Stith and Howard Spivak. "Turning the Tide on Violence" Op-Ed, *The Boston Globe*, November 24, 1996: D7; Deborah Prothrow-Stith and Howard Spivak. "With Youth Crime Down in Boston, What Do We Do For an Encore?" Op-Ed, *The Boston Globe*, March 2, 1997: D7.

²⁷ Marc Posner. 1994. "Research Raises Troubling Questions About Violence Prevention Programs." *The Harvard Education Letter* 10(3); Alice Hausman, Glenn Pierce, and LeBaron Briggs. 1996. "Evaluation of Comprehensive Violence Prevention Education: Effects on Student Behavior." *Journal of Adolescent Health* 19: 104-110.

²⁸ On the Ten Point Coalition, see Christopher Winship and Jenny Berien. 1999. "Boston Cops and Black

Churches." *The Public Interest*. Summer: 52- 68; John Leland with Claudia Kalb, "Savior of the Streets," *Newsweek*, U.S. Edition, June 1, 1998,: 20. On Operation Night Light, see Fox Butterfield. "In Boston, Nothing is Something." *New York Times*, November 21, 1996: A20.

²⁹ See, e.g., Alfred Blumstein and Richard Rosenfeld. 1998. "Explaining Recent Trends in U.S. Homicide Rates." *Journal of Criminal Law and Criminology*, 88: 1175-1216.

³⁰ George L. Kelling and William J. Bratton. 1998. "Declining Crime Rates: Insiders' Views of the New York City Story." *Journal of Criminal Law and Criminology*, 88: 1217- 1232.

³¹ We selected all New England cities with populations over 60,000. These 28 cities included Bridgeport (CT), Danbury (CT), Hartford (CT), New Britain (CT), New Haven (CT), Norwalk (CT), Stamford (CT), Waterbury (CT), Brockton (MA), Cambridge (MA), Fall River (MA), Framingham (MA), Lawrence (MA), Lowell (MA), Lynn (MA), New Bedford (MA), Newton (MA), Quincy (MA), Somerville (MA), Springfield (MA), Worcester (MA), Portland (ME), Nashua (NH), Manchester (NH), Cranston (RI), Pawtucket (RI), Warwick (RI), and Providence (RI). Although it has only 50,000 residents, we included Burlington (VT) in this pool because it was the only major "city" in Vermont.

³² We ranked the top 40 cities according to U.S. Census population estimates in 1990 and 1996. In this procedure we observed that Fresno (CA) and Tulsa (OK) were not in the top 40 in 1990 but were in the top 40 in 1996. St. Louis (MO) and Oakland (CA) were in the top 40 in 1990, but not in the top 40 in 1996. Rather than exclude either pair of cities we decided to keep both pairs in the sample. After Boston was removed from this group of populous cities, we were left with 41 cities. After a close examination of these data, two cities (Washington, DC and New Orleans) were excluded due to extensive missing data. This left us with 39 major U.S. cities in the comparison group. The final pool of major U.S. cities included: Albuquerque (NM), Atlanta (GA), Austin (TX), Baltimore (MD), Charlotte (NC), Chicago (IL), Cleveland (OH), Columbus (OH), Dallas (TX), Fort Worth (TX), Fresno (CA), Honolulu (HI), Houston (TX), Indianapolis (IN), Jacksonville (FL), Kansas City (MO), Los Angeles (CA), Long Beach (CA), Memphis (TN), Milwaukee (WI), Nashville (TN), New York (NY), Oakland (CA), Oklahoma City (OK), Philadelphia (PA), Phoenix (AZ), Portland (OR), San Antonio (TX), San Diego (CA), San Francisco (CA), San Jose (CA), Seattle (WA), St. Louis (MO), Tucson (AZ), Tulsa (OK), and Virginia Beach (VA). See Braga, Kennedy, Waring, and Piehl, 1999.

³³ After a number of analyses, we decided on the following model: Monthly count of youth homicide = Intercept + trend + trend-squared + month dummy variables + intervention + autoregressive (1) component + error. *Trend* controls for simple linear trends within each time series; *trend-squared* controls for non-linear trends within each time series; *month dummy variables* control for monthly seasonal effects within each time series; *intervention* estimates the effect of the intervention within each time series; and *autoregressive (1) component* estimates a AR(1) serial lag-one correlation components for each time series. The SAS GENMOD procedure does not allow the estimation of an autoregressive component in generalized linear models. However, the SAS GLIMMIX macro allows autoregressive components to be estimated in generalized linear mixed models. Mixed models are generally used by statisticians to estimate random effects in statistical models. However, they can also be used to estimate a variance component that is different from that assumed by generalized linear models. In our fixed-effects model, the GLIMMIX macro simply allowed us to estimate a variance component that includes an AR(1) coefficient in a generalized linear Poisson regression model. See Ramon C. Littell, George A. Milliken, Walter W. Stroup, and Russell Wolfinger. 1996. *SAS System for Mixed Models*. Cary, NC: SAS Institute, Inc.

³⁴ The intervention point only could vary from month 12 to month 72, rather than the full time period of month 1 to month 84. A 12 month window was used to assure enough points to identify trends and autocorrelation in the time series. See Braga, Kennedy, Waring, and Piehl, 1999.

³⁵ Office of Juvenile Justice and Delinquency Prevention. 1999. *Promising Strategies to Reduce Gun Violence*. Washington, DC: Office of Justice Programs, U.S. Department of Justice.

³⁶ See, e.g., Veronica Coleman, Walter C. Holton, Kristine Olson, Stephen Robinson, and Judith Stewart. 1999. "Using Knowledge and Teamwork to Reduce Crime." *National Institute of Justice Journal*, October: 16-23; David M. Kennedy and Anthony A. Braga. 1998. "Homicide in Minneapolis: Research for Problem Solving." *Homicide Studies* 2(3): 263-290.

³⁷ See, e.g., Philip J. Cook. 1980. "Research in Criminal Deterrence: Laying the Groundwork for the Second Decade." In *Crime and Justice: An Annual Review of Research*, Vol. 2, edited by Norval Morris and Michael Tonry. Chicago: University of Chicago Press; Alfred Blumstein, Jacqueline Cohen, and Daniel Nagin (eds.). 1978. *Deterrence and Incapacitation: Estimating the Effects of Criminal*

Sanctions on Crime Rates. Washington, DC: National Academy of Sciences; Raymond Paternoster. 1987. "The Deterrent Effect of the Perceived Certainty and Severity of Punishment: A Review of the Evidence and Issues." *Justice Quarterly* 4: 173-217.

³⁸ Malcolm Klein. 1993. "Attempting Gang Control by Suppression: The Misuse of Deterrence Principles." *Studies on Crime and Crime Prevention* 2: 88-111.