

2016

# COST BENEFIT ANALYSIS: OPERATION PEACEMAKER



Photo: Courier Journal

Rachel Huguet, Janet Li,  
Caroline Servat, Katharine Stofer

**University of Southern California**  
Sol Price School of Public Policy

PPD 560

## Executive Summary

This study provides a cost-benefit analysis (CBA) of the Operation Peacemaker Fellowship instituted by the city of Richmond, California through the Office of Neighborhood Safety (ONS). In the wake of extreme violence, the intervention began in 2010 from the findings that a small number of offenders were committing a disproportionate amount of violent crime in the city. Characterized by a “pulling levers” approach to crime deterrence, the program uses a stipend proportionate to fellows’ participation in wrap-around social services, GED programs, and workforce training to incentivize their good behavior. The intervention is not without controversy; nevertheless, in the five years post-intervention, homicides in Richmond decreased by an average of 55%.

The analysis looked at four categories of costs and seven categories of benefits. The final calculations produced a net present value (NPV) of over \$500 million (roughly \$535,997,354) for the first five years of program impact. To test the robustness of the estimate, a variable-by-variable sensitivity analysis was conducted on five of the conditions. Across every category, the analysis produced a positive NPV, with some variation in the size of the net benefit.

It should be acknowledged that there were significant limitations in available data on this program or similar approaches and inherent challenges in connecting crime reduction to a single program intervention. However, the program’s costs are nominal when compared to the potential benefits, even in the most conservative estimates. Based on this analysis, it is recommended that the city of Richmond continue to fund the Operation Peacemaker Fellowship.

## Problem Statement

### Demographics of Richmond

Richmond, California is a city of approximately 110,000 people roughly 17 miles northeast of San Francisco (US Census, 2014). Richmond has what is termed a “majority minority population,” at 39.5% Latino, 31.4% white, and 26.6% African American (US Census, 2014). The target population for the Office of Neighborhood Safety (ONS) Operation Peacemaker Fellowship is African American males between the ages of 16-24. Approximately 14.2% of the population falls in this range (US Census, 2014). This group also makes up the majority of gun victims in Richmond. Between 2005 and 2012, the US Department of Justice found that 73% of homicide victims were male, 88% were African-American, and 36% were between the ages of 18 and 24 (US Department of Justice UCR data, 2007–2014). In fact, African American males in this age range nationwide are 30 times more likely to be the victims of gun violence than their white counterparts (Violence Policy Center, 2014). The city also suffers from a lack of economic opportunity, with 17.5% of the population living below the poverty line compared to the national average of 13.4% (US Census, 2014).

### Violent Crime in Richmond

In 2010, the FBI ranked Richmond as the sixth most dangerous city in America (FBI City Crime Rankings, 2010). In 2007, the year that ONS was established, the homicide rate in Richmond reached 45.9 per 100,000 residents compared to 4.7 per 100,000 in other similarly sized Californian cities (US Department of Justice UCR data, 2008). Anecdotal evidence of the rampant crime include a retaliatory gang shooting breaking out in the midst of Sunday services at a local church and the gang rape of a 16 year-old girl during a high school dance (Gilligan, 2014). Bullet holes smatter across the sides of houses throughout the city, testimony to the prevalence of drive-by shootings – which contributed to the homicide rate being nine times the national average at its peak in 2009 (Gilligan, 2014). The violence was so extreme that the City Council almost asked the Governor to declare a state of emergency and bring in the National Guard (Boggan, 2015). Richmond Police Department estimated that 70% of the violent crimes in 2009 were committed by anywhere from 17 (Motlagh, 2014) to 30 individuals (NCDD, 2015).

## Office of Neighborhood Safety and the Peacemaker Fellowship

This realization led the Richmond City Council to look into unconventional approaches to combat violence. The director of the program, Devonne Bogan, came across a community outreach method developed by epidemiologist turned crime researcher Gary Slutkin (Gilligan, 2014). The Office of Neighborhood Safety opened in 2007, which combined Slutkin's approach with wrap-around social services for the participants (Boggan, 2015). In 2010, Operation Peacemaker was launched, targeting the young men at highest risk for committing gun violence in the community and enrolling them in a voluntary, 18-month program which helps them achieve goals outlined in their "life map" in exchange for a commitment to refrain from illegal activity (Gilligan, 2014).

The program has drawn national attention for the controversial practice of paying participants up to \$1,000 a month during the last nine months of the fellowship (Boggan, 2015). Advocates argue that this is a nominal cost for the dramatic reduction in crime that they attribute to the program. However, it has engendered significant tension with the local authorities and some members of the city council (NCCD, 2015). The ONS conducts an annual, internal evaluation of their work and have paid for one external evaluation done by the National Council on Crime and Delinquency (NCCD), but, to date, there has not been an effort to conduct a cost-benefit-analysis of the program.

## Baseline Scenario

### Discount Rate

All calculations in this analysis apply a discount rate of 5%. This rate was chosen after reviewing the rates used by three organizations who do cost-benefit-analyses in this field:

- Office of Management and Budget (OMB) recommends 3 or 7%. 3% is the rate of return for the average consumer, and 7% is their estimate of the average rate of return for private investments.
- The Washington State Institute for Public Policy (WSPP) uses a 3% discount rate.
- The Urban Institute employs a discount rate of 5%.

Given this range, a rate of 5% is a reasonable middle ground to apply to this analysis. The sensitivity analysis explores the impact of using a discount rate of 3% or 7%.

## Time Horizon

A time horizon of five years was used in the baseline scenario, given that the operation of the program began in 2010 and the evaluations from the NCCD report extended to the third cohort of fellows, who completed the program at the end of 2014. Acknowledging that some of the programs may contribute lifelong benefits, a sensitivity analysis was used to determine a minimum increased NPV including certain benefits that can be calculated over a lifetime.

**Table 1: NPV by Category**

<b>Total Costs 2010-2014 by Category (2009\$)</b>	
Peacemaker Fellowship Budget	\$1,968,563.96
Opportunity costs for volunteers	\$50,561.36
Internal audits	\$101,138.63
External audit	\$242,155.88
<b>Total Costs</b>	<b>\$5,492,278.37</b>
<b>Total Benefits 2010-2014 by Category (2009\$)</b>	
Increased productivity from internships & employment	\$93,373.88
Increased productivity from GED	\$32,252.13
Reduced recidivism from GED	\$202,960.13
Reduced recidivism from college	\$40,495.72
Reduced recidivism from educational & re-entry programs	\$203,652.62
Reduced recidivism from CBT	\$324,883.61
Homicide reduction	\$540,356,800.88
<b>Total Benefits</b>	<b>\$541,489,632.81</b>
<b>NPV 2010-2014 (2009\$)</b>	<b>\$535,997,354.44</b>

## Costs

Costs include fellowship costs, opportunity costs, and costs of internal and external audits. Total costs of the ONS Peacemaker Fellowship program discounted over 2010 to 2014 came out to \$2,362,420 (Appendix 1).

### Fellowship Costs

From communication with an ONS Neighborhood Change Agent, the Peacemaker Fellowship costs approximately \$36,000 per fellow over the 18-month fellowship (Vaughn, 2016). This includes the costs of staffing, stipends, and travel. Adjusted for inflation and discounted over five years, this cost is \$1,968,564 in 2009 dollars (Appendix 1).

## Opportunity Costs for Volunteers

Members of the Elders Circle, a nonprofit based in Oakland, CA consisting of African American men over the age of 55, travel to Richmond twice a month for two-hour sessions to mentor fellows. Adding travel time, this constitutes roughly six hours per month. The cost of volunteers' time is based on the median weekly earnings for U.S. African American men over the age of 55, which is on average \$726 in 2016, or \$18/hour (Bureau of Labor Statistics, 2016). Adjusted for inflation, this is equivalent to \$16.22 in 2009 dollars. No information is available on the number of volunteer mentors who work with Peacemaker Fellows; the assumption was made that there are 10 volunteers for a total discounted opportunity cost of \$50,561 over 5 years (2009\$).

## Audits

Research shows that organizations of this type budget 10% of the total program costs for annual internal audits. Based on this research, the total discounted cost is \$101,138.63, adjusted to 2009 dollars. The ONS received repeated feedback suggesting an external audit be performed to determine the program's impact. In 2014, ONS hired The National Council on Crime and Delinquency (NCCS, 2015) to conduct this evaluation. This audit was performed in year 3 of the operation and cost \$300,000, discounted to \$242,155.88 (Johnson, 2012).

**Table 2: NPV by Year**

	<b>Annual Costs (2009\$)</b>	<b>Annual Benefits (2009\$)</b>
<b>2010</b>	\$227,747.42	\$466,408.18
<b>2011</b>	\$213,077.88	\$444,199.31
<b>2012</b>	\$199,106.86	\$665,203.95
<b>2013</b>	\$185,901.14	\$402,904.06
<b>2014</b>	\$173,129.02	\$383,719.34
<b>Totals</b>	\$998,962.33	\$2,362,419.84
	<b>NPV 2010-2014 (2009\$)</b>	<b>\$535,997,354.44</b>

## Benefits

### Categorization of Programs

To reduce gun violence, the Peacemaker Fellowship encouraged fellows to participate in a number of programs to ensure “a greater accessibility and connectivity to culturally competent, human, social, and economic service opportunities” (Johnson, 2012). The more frequently and consistently the fellows participated in programming, the greater stipend they received, ranging from \$300-\$1000 per month (NCCD, 2015).

For the analysis, the programs were separated into categories, and calculations were based on averages of the percentage of fellows from the total of 68 that participated from 2010-2014 (5 years) (Appendix 2). Based on research of attributing benefits to certain types of programs, five categories were determined: re-entry programs, cognitive behavioral therapy programs (CBT), college enrollment programs, GED programs, and employment programs (Wilson et al. 2005; Wilson et al., 2000). Re-entry programs include financial management classes, life skills classes, health care services, recreational services, educational services, and housing services, in which 62% of fellows participated in (NCCS, 2015). CBT programs included substance abuse programs, anger management classes and mental health programs, in total 44% of fellows. Some fellows participated in long-term personal development by completing a GED (20% of fellows received their GED during the fellowship) and 10% of the fellows enrolled in vocational or college courses. Internships involved 19% of fellows placed within community-based or city agencies. During their internship, they were regularly visited by NCA staff to encourage job retention.

Some fellows may be double-counted because the data was not disaggregated to determine which fellows participated in which programs. This is further discussed in limitations.

### CBT and Re-entry programs

Savings from the reduction in recidivism were monetized to calculate the benefits of CBT and re-entry programs. The reduction was determined through research on several meta-analyses (Wilson, 2000; Wilson, 2005; Pearson, 2000). Because they were already meta-analyses, these findings did not include standard deviations and were not weighted in that way. CBT programs were found to reduce the rate of recidivism by 26.8% and re-entry programs were estimated to reduce recidivism by 11.9% (Lipsey et al., 2001; Pearson et al.; 2002; Wilson et al. 2000; Wilson et al., 2005). These rates were multiplied by the annual cost of incarceration in California, taken from an average of two analyses done by the California Legislative Analyst's Office and the VERA institute (LAO, 2010; Vera, 2010). The total discounted benefits come out to \$203,652.62 for re-entry programs (Appendix 3) and \$324,883.61 for CBT programs (Appendix 4).

### GED Programs

GED programs were monetized from two different types of benefits: reduction in recidivism and increased productivity. A RAND meta-analysis found that GED lowers odds of recidivism by

30%. From the counterfactual of 51% recidivism for Contra Costa County, this gives a final recidivism rate of 15.3%. (Beard et al, 2014). Of the 14 fellows in the GED program, this means 2 would recidivate rather than 7. The benefits of the avoided reincarceration of 5 fellows at a 5% discount rate is estimated to be \$202,960 (Appendix 5).

Benefits of GED programs are also captured in increased wages, which are not a transfer payment but rather represent the net societal benefit of fellows' increased productivity. A meta-analysis revealed that obtaining a GED contributes to an average 11% hourly wage increase (Murnane et al, 2000; Murnane et al, 1999; Murnane et al, 1995) (Appendix 6). Fourteen fellows received their GED. Without data, the average previous wage of a fellow was assumed to be minimum wage (\$8 in CA from 2008-2014) at a part-time workload of 20 hours/week, for an annual income of \$8320. An 11% increase in this income equals \$9235.20 and represents \$915.20 in increased annual wages per person per year. Research suggests that the increased wages of GED holders will remain flat until 5 years in the workforce, after the length of the study's initial time horizon. Lifetime productivity benefits are explored in the sensitivity analysis. This scenario estimates GED productivity benefits of \$32,252 (Appendix 7).

### College Enrollment Programs

A 2013 RAND meta-analysis examines 50 studies to determine the effects of correctional education on recidivism (Davis, 2013). It finds that parolees in postsecondary education have 51% lower odds of being reincarcerated. In Contra Costa County, where Richmond is located, the recidivism rate is on average 65% for parolees three years out of prison (Beard et al, 2014). Of the three Peacemaker fellows enrolled in college, the counterfactual is the recidivating of two fellows; with college enrollment, this is reduced to one. This gives us an estimated benefit of \$40,496 (Appendix 8).

### Employment Programs

Increased productivity as a result of employment programs was estimated for fellows who participated in both employment services and internships, 41%, or 28 fellows. Although it would be ideal to conduct a meta-analysis of wage differentials for incarcerated or at-risk youth enrolled in similar programs, available research focused on the likelihood of being employed at all, rather than the improvement in hourly wages.

A study conducted by the Vera Institute, which targeted 16-21 year-old unemployed youth with previous involvement in the criminal justice system, found that treatment group participants earned, on average, \$47 more per month than the control group (Sadd et al, 1983). This comes out to a 32.5% increase in wage. Using this as the baseline, Peacemakers' annual wage increase ranges from \$1315 to \$1384, depending on the cohort (Appendix 9). The baseline scenario estimates total employment benefits of \$93,374. Due to a lack of longitudinal studies showing lifelong effects of this programming, potential lifetime productivity benefits are not estimated.

### Homicide Reduction

The benefit of avoided homicides uses a meta-analysis of crime costs conducted by the RAND Corporation's Center on Quality Policing in 2010. The RAND meta-analysis is based on three strongly cited cost-of-crime studies, two of which use an accounting or "bottom-up" method, which aims to capture the costs associated with victimization after the crime has occurred. The other study uses contingent valuation, a top-down approach which surveys willingness to pay and willingness to accept as an external measure of the cost of crime borne by taxpayers as a "reduced form estimate" (Chalfin 2013). RAND estimates the average cost of a homicide at \$8,667,278, adjusted to 2009 dollars.

Within the studies, the cost of incarceration is excluded for the purposes of the valuation due to the variance in state-by-state costs within the prison system. In these estimates, all studies have attempted to capture both the tangible and intangible costs of homicide (Appendix 10), the latter of which is the subject of much controversy, as it ranges from 66-87% of the overall cost of homicide (RAND 2010). The intangible costs involve "quality of life resulting from fear of crime" (ibid) and the subsequent psychological damage associated with a crime. Patricio Dominguez and Steven Raphael (2015) review recent cost-of-crime literature and reflect on the implications of capturing intangible costs:

*Few would argue that the true costs of victimization should be limited to out-of-pocket expenditures... However, one may legitimately question whether the decisions of juries reflect anything akin to the compensation and/or equivalent variation associated with the nontangible aspects of victimization. (p.44)*

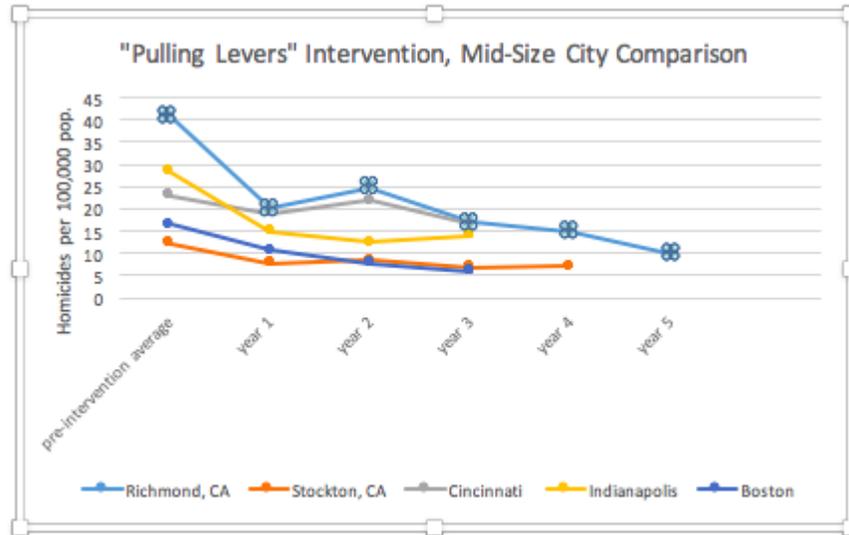
Due to this commonly identified uncertainty, the overall cost of homicide is incorporated in the

sensitivity analysis.

Having established an average cost of homicide, further meta-analysis on the efficacy of “pulling levers” interventions is extrapolated to establish the benefits of homicides avoided in Richmond as a result of Operation Peacemaker alone. Since a three-year program evaluation is currently in process, the average reduction associated with similar interventions is used as a proxy for Richmond. Anthony Braga of the Harvard Kennedy School conducts a meta-analysis on quasi-experimental evaluations of pulling levers interventions and other “focused deterrence strategies” (Braga et al 2012). Since the ten studies vary in stated purpose, the analysis uses an average of the 4 mid-sized city interventions most similar to Operation Peacemaker, focused on homicide deterrence. These interventions, holding all else constant, had an average overall effect of 35.5% reduction in homicides (Braga, 2012). A five-year average, mirroring the intervention time-frame, was used to establish a pre-intervention homicide rate of 40.6 murders per year. The total benefit of avoided homicides in Richmond from 2010 to 2014 is estimated at \$540,356,801 (Appendix 11).

Graph A provides a telling portrait of homicide reduction during the immediate post-intervention period for the four mid-size city comparisons selected from Braga’s meta-analysis. While the values represent actual homicide rates and not the findings of respective quasi-experimental evaluations, all five cities experienced a significant drop in the first post-year intervention, followed by a slight uptick in year 2 for three of the five cities, followed by a steady decline for all (Braga and Weisburd 2008; Braga 2012; Braga et al 2014; Chermak 2004; FBI Uniform Crime Reporting; Engel et al 2013).

Graph A: Pulling Levers Interventions



## Sensitivity Analyses

### Discount Rate

To address the inherent uncertainty of selecting a discount rate, a sensitivity analysis was performed. The range for this analysis was chosen based on the three rates described earlier in the paper from the OMB, the WSPP, and The Urban Institute. After performing this sensitivity analysis at high and low bounds, the NPV did not change signs and ranges from \$293,833,558 at a low bound to \$750,809,710 at a high bound (Appendix 12).

### Categorization of Programs

As described above, the benefits received by fellows were put into five categories: re-entry, CBT, college enrollment, internships, and GED. A sensitivity analysis was performed on grouping the re-entry and CBT programs together as one category because of their similarities and keeping GED, internships, and college enrollment as separate programs. The benefits of CBT and re-entry grouped together was \$282,714, a reduction in benefits of \$245,823, which does not significantly change the NPV (Appendix 13).

### GED Lifetime Benefit

GED is one program where lifetime benefits can be calculated. A longitudinal study by the American Council on Education finds that, after several years in the workforce, a GED holder's hourly wage is expected to increase by 2% each year (Song, 2011). The time horizon goes until 2057, given that a fellow is 20 years old on average and will stop working at the age of 67, the

age of retirement to receive social security benefits (SSA). For this analysis, these wage increases are estimated to begin five years after the fellow finishes his GED and is in the workforce, with the assumption that there will be no wage decreases from lowered productivity for aging fellows nearing retirement. This would add \$267,658 to the NPV of the lifetime horizon (Appendix 14). This additional benefit was not included in the original NPV because lifetime benefits could not be tracked across all programs.

### College Lifetime Benefit

Each year of completed college for a male high school dropout with a GED results in a 10.8% higher hourly wage (Murnane et al, 1999). After four years, a fellow with a college degree earns on average 43.2% more per hour, plus an additional 6.8% increase in wages for each additional year in the workforce (ibid). Using minimum wage as the starting point (\$8 in CA from 2008-2014) at 30 hours/week for 50 weeks/year, the pre-program annual income is estimated at \$12,000. One fellow from each cohort is assumed to enroll in college the year after graduating from the program, with benefits of full-time employment starting in 2016, 2017, and 2019. The lifetime benefits would add \$1,750,023 across the three cohorts (Appendix 15). This was not included in the NPV for the same reasons that GED lifetime benefits were not included.

### Homicides Avoided (Benefit)

The costs associated with a homicide are subject to significant disagreement among crime scholars; therefore the range of estimates within RAND's meta-analysis are considered to establish both the high and low bounds at \$4,718,237 and \$12,011,138. The high estimate produced an NPV of \$835,203,340 while the lower estimate produced an NPV of \$292,547,607 (Appendix 16a).

### Reduction in Crime Estimate

The low bound of the reduction in crime attributable to the Peacemaker Fellowship was selected as 28% from the low bound of the 95% CI of the Boston Ceasefire Evaluation (Braga et al 2014); the upper bound corresponds to the assumption that the entire reduction in homicides between the five-year pre-intervention average (40.6) and the 5 year post-intervention average (18.4) captures the impact of the intervention at the 55% reduction level (FBI Uniform Crime

Reporting). The high estimate produced an NPV of \$832,457,201, while the lower estimate produced an NPV of \$426,176,363 (Appendix 16b).

## Limitations

### Randomization in studies on program effectiveness

A randomized control trial would be the preferred method of evaluation; however, ethical standards associated with social research prohibit this. As one researcher explains: “The aspect of method that is usually of greatest concern for intervention studies is whether a randomized design was used...Only the intent-to-treat variable, indicating whether treatment dropouts were included in the outcome measures, was significantly related to effect size, and that relationship dissipated when other moderators were included in the analysis.” (Landenberger et al. 2005).

### Omitted Variable Bias

The degree of attrition from the program might suggest that the impact on homicide rates is caused by outside factors: “The amount of high quality research on CBT in representative correctional practice is not yet large enough to determine whether the impressive effects on recidivism found in this meta-analysis can be routinely attained under everyday circumstances” (Landenberger et al. 2005). Potential omitted variables include alternative law enforcement strategies that were in place over the duration of the ONS Peacemaker Fellowship. Criminal justice is dependent on the jurisdiction, and Richmond’s police department may have been more active in certain areas or with certain individuals who were not able to enroll in the Peacemaker Fellowship.

### Lack of data

Disaggregated data was not available on individual cohorts or fellows in the program. Additionally, data was not able to be accessed for pre-program employment, income, education, arrest, or incarceration of fellows, leaving a set of assumptions that had to be made for this analysis. These were made as accurately as possible, erring on the conservative side. The mission of ONS is to reduce firearm-related crimes; however, most city crime data does not include information about whether or not a firearm was involved, nor does FBI Uniform Crime Reporting include such distinctions. Therefore, the analysis focused on the benefits of avoided homicides, since data on firearm-specific assaults was unknown for recent years; it thus

represents a minimum NPV that would increase even more with the added benefits of reduction in other gun-related crime. Finally, while studies such as Braga's capture average effects of the "pulling levers" approach to crime reduction in the immediate post-intervention stage, there is insufficient scholarship pointing to longer term trends in behaviors of target groups.

### Capturing Risk

Change in risk is difficult to judge as fellows expressed different feelings of safety after becoming a fellow, with some feeling safer and others feeling more endangered due to their peers' perception of the program (NCCD, 2015). There is also no data on the money that fellows may have previously made through criminal activities, which they would lose once joining the program. Finally, due to limited research on the recidivism effects or other benefits of housing and parenting programs, these programs were not analyzed. There was limited information on the scope of these programs, which also had the lowest participation rates.

### Recommendations

Given that the cost-benefit analysis yielded a high positive net present value, it is recommended that the City of Richmond continue to fund the Office of Neighborhood Safety. However, it is also recommended that the Office collect disaggregated data on the individual program components to be able to conduct quasi-experiments and enable a better understanding of the impact of each approach. Further analysis would be needed to determine whether the "pulling levers" deterrence strategy can create a spillover effect on the level of violence perpetuated in other gangs or neighborhoods (Braga, 2014). The literature review revealed that there have been challenges in sustaining these programs over time (Braga, 2014). It is recommended that ONS continue to conduct frequent internal and external audits to be responsive to any potential diminishing impacts of their program.

## Appendices

### Appendix 1. Operation Peacemaker Fellowship Costs (2009\$)

Item	Cost/item	Number	Total (discounted)
Fellowship	\$36,000/fellow (2016\$)	68 fellows over 5 years	\$1,968,563.96
Volunteer opportunity costs	\$18/hr (2016\$)	10 volunteers * 6 hrs/mo over 5 years	\$50,561.36
External audit	\$300,000	conducted once at t=3	\$242,155.88
Internal audits	\$25,000	10% total ONS budget, 1x/year	\$101,138.63
		<b>TOTAL</b>	<b>\$2,362,419.83</b>

### Appendix 2. Operation Peacemaker Program Participation

Program	% Fellows Participating	# Fellows Participating
GED	21%	14
Employment Services	61%	41
Internships	20%	13
Life maps	100%	68
Life skills training	83%	56
Anger management services	77%	52
Help with financial management	77%	52
Mental health services	41%	28
Educational services	40%	27
Recreational services	34%	23
Transportation services	32%	22
Substance abuse counseling	16%	11
Housing services	14%	10
Parenting services	31%	21

### Appendix 3: Benefits of Recidivism from Re-entry programs

Benefit: Re-entry programs		Source
% reduction in rearrest (per participant)	11.90%	Wilson et al. (2000); Vera Institute CBA Justice Policy Toolkit; Pearson et al. (2002)
# of fellows participating	42.16	NCCD, 2015
Annual cost of incarceration	\$46,878.86	
Annual Benefit (2009\$)	\$47,038.62	
Discounted Benefit	\$203,652.62	

### Appendix 4: Benefits of Recidivism from CBT

Benefit: CBT Programs		Source
% reduction in re-arrest (per participant)	26.75%	Wilson et al. (2005); Pearson et al. (2002); Wilson et al. (2005)
Number of participants	29.92	NCCD, 2015
Annual Incarceration rate	\$46,878.86	
Annual Benefit (2009\$)	\$75,039.93	
Discounted Benefit	\$324,883.61	

### Appendix 5. Benefits of Recidivism from GED

	Fellows	Incarceration cost	Benefit (r = 5%)	Benefit (r = 3%)	Benefit (r = 7%)
2010	1	\$46,878.86	\$44,646.53	\$45,513.46	\$43,812.02
2011	1	\$46,878.86	\$42,520.51	\$44,187.82	\$40,945.82
2012	1	\$46,878.86	\$40,495.72	\$42,900.80	\$38,267.11
2013	1	\$46,878.86	\$38,567.35	\$41,651.26	\$35,763.66
2014	1	\$46,878.86	\$36,730.81	\$40,438.12	\$33,423.98
Total	5		<b>\$202,960.13</b>	\$214,691.45	\$192,212.98
			<b>Baseline</b>	High value	Low value

### Appendix 6. Benefits of Increased Productivity from GED: Meta-Analysis

Increased hourly wage of high school dropouts w/ GED compared to those w/o GED, holding other factors constant	Standard error	Study
13%	0.062	Murnane et al, 2000
24%	0.09	Murnane et al, 2000
6%	0.036	Murnane et al, 1999
4%	0.12	Murnane et al, 1999
5%	0.028	Murnane et al, 1995
<b>Weighted average = 11%</b>		

### Appendix 7. Benefits of Increased Productivity (to 2014) from GED

	# Fellows	Total cohort discounted increase in earnings to 2014 (r = 5%)	Total discounted benefits (r = 3%)	Total discounted benefits (r = 7%)
2010	2.8	\$11,094.54	\$11,735.77	\$10,507.00
2011	2.8	\$8654.01	\$9247.85	\$8112.09
2012	2.8	\$6329.69	\$6832.39	\$5873.85
2013	2.8	\$4166.06	\$4487.29	\$3782.03
2014	2.8	\$2007.83	\$2210.49	\$1827.07
Total	14	<b>\$32,252.13</b>	<b>\$34,513.79</b>	<b>\$30,102.04</b>
		<b>Baseline scenario</b>	<b>High value</b>	<b>Low value</b>

### Appendix 8. Benefits of Recidivism from College

Savings of 1 fellow not being incarcerated.			
	Benefit (discounted r = 5%)	Benefit (discounted r = 3%)	Benefit (discounted r = 7%)
2011	\$42,520.51	<b>High value = \$44,187.82</b>	\$40,945.81
OR 2012	<b>Baseline = \$40,495.72</b>	\$42,900.80	\$38,267.11
OR 2014	\$36,730.81	\$40,438.12	<b>Low value = \$33,423.98</b>

### Appendix 9. Benefits of Increased Productivity (to 2014) from Employment Programs

	Fellows	Increased wages/fellow, adjusted for inflation	Full cohort's benefits	Total benefits discounted & accrued to 2014 (r = 5%)	Total benefits (r = 3%)	Total benefits (r = 7%)
2010	5.5	\$1274.43	\$7009.37	\$31,732.57	\$33,592.43	\$30,029.40
2011	5.5	\$1314.66	\$7230.63	\$25,056.98	\$26,787.22	\$23,478.59
2012	5.5	\$1341.87	\$7380.29	\$18,498.59	\$19,971.65	\$17,163.07
2013	5.5	\$1361.52	\$7488.36	\$12,123.22	\$13,217.64	\$11,138.56
2014	5.5	\$1383.61	\$7609.86	\$5962.52	\$6564.33	\$5425.73
<b>Total</b>	<b>27.5</b>			<b>\$93,373.88</b>	\$100,133.27	\$87,235.35
				<b>Baseline</b>	High value	Low value

### Appendix 10. Tangible and Intangible Costs Associated with Homicide

Tangible	Intangible	% Total	Source
Medical Care Costs			
Lost Earnings			
Funeral and Burial			
Legal Costs- Tort			
<b>TOTAL</b>		13-34%	Miller, Cohen, and Wiersema 1996; McCollister et al 2010
	Pain and Suffering		
	Decreased Quality of Life		
	Psychological Treatment		
	<b>TOTAL</b>		

### Appendix 11. Homicide Reduction Benefits

Benefit: Homicide Reduction	Baseline Scenario	Source
5-year pre-intervention average	40.6	FBI Uniform Crime Reporting
Average Annual Reduction %	35.5%	Braga and Weisburd 2012
Average Homicides Avoided	14.4	
Cost of Homicide (2009\$)	\$8,667,278	Heaton 2010 (RAND)
Annual Benefit (2009\$)	\$124,808,803	
Discounted Benefit	\$540,356,801	

### Appendix 12. Sensitivity Analysis on Discount Rate

Benefit	Baseline Scenario	High value (7%)	Low value (3%)
Recidivism (Re-entry)	\$203,652.61	\$215,423.11	\$192,867.63
Recidivism (CBT)	\$324,883.63	\$343,660.91	\$307,678.53
Recidivism (GED)	\$202,960.13	\$214,691.45	\$192,212.98
Recidivism (College)	\$40,495.72	\$44,187.8	\$33,423.98
Homicide reduction	\$540,356,800.88	\$748,595,682	\$294,160,914
Productivity (GED)	\$32,252.13	\$34,513.79	\$30,102.04
Productivity (Employment)	\$93,373.88	\$100,133.27	\$87,235.35
Lifetime productivity (GED)	\$267,658.42	\$406,144.98	\$188,386.91
Lifetime productivity (College)	\$1,750,023.01	\$3,217,692.88	\$1,003,156.77
Total Benefits (2010-2014)	\$541,254,419	\$749,548,292	\$295,004,435
Total Benefits (including lifetime)	\$543,272,100	\$753,172,130	\$296,195,978
<b>NPV from 2010-2014</b>	\$538,508,281	\$746,802,153	\$292,258,295
<b>NPV (lifetime minimum)</b>	<b>\$540,525,961</b>	<b>\$750,425,991</b>	<b>\$293,449,839</b>

### Appendix 13: Sensitivity Analysis: Program Recategorization

Program categorization (re-entry/ CBT grouped)	
Re-entry	11.9%
CBT	26.8%
Average rate of reduction in recidivism	19.3%
Cost of incarceration (2009\$)	\$46,878.86
Percentage of participants	53.0%
Number of participants (average)	360
Money saved per participant	\$9059.34
Total money saved	\$65299.72
Discounted (2009\$)	<b>\$282,713.61</b>
<b>New NPV</b>	\$535,714,640.83

### Appendix 14. Lifetime Productivity Benefits from GED

	# Fellows	Total cohort discounted increase in earnings to 2057 (r = 5%)	Total discounted benefits (r = 3%)	Total discounted benefits (r = 7%)
Cohort 1 (2011)	4.67	\$96,285.42	\$143,856.35	\$68,985.50
Cohort 2 (2012)	4.67	\$90,779.19	\$137,325.18	\$64,103.52
Cohort 3 (2014)	4.67	\$80,593.82	\$124,963.46	\$55,297.89
		<b>\$267,658.42</b>	\$406,144.98	\$188,386.91
		<b>Baseline scenario</b>	High value	Low value

**Appendix 15. Lifetime Productivity Benefits from College**

	# Fellows	Total discounted increase in earnings to 2057 (r = 5%)	Total discounted benefits (r = 3%)	Total discounted benefits (r = 7%)
Cohort 1 (2011)	1	\$615,555.98	\$1,150,999.82	\$347,844.23
Cohort 2 (2012)	1	\$591,025.00	\$1,090,429.15	\$337,738.34
Cohort 3 (2014)	1	\$543,442.04	\$976,263.90	\$317,574.20
		<b>\$1,750,023.01</b>	\$3,217,692.88	\$1,003,156.77
		<b>Baseline scenario</b>	High value	Low value

**Appendix 16a & 16b. Sensitivity Table: Homicide Estimates**

<i>Appendix 16A</i>	<b>Baseline</b>	<b>Low Bound</b>	<b>High Bound</b>
Source	RAND (2010)	Miller, Cohen, and Wiersema (1996)	Cohen, Rust, et al. (2004)
Homicide Cost Estimate \$2009	\$8,667,278	\$4,718,237	\$12,011,138
<b>New NPV</b>	\$538,743,493.62	\$292,547,606.74	\$746,982,374.84

<i>Appendix 16B</i>	<b>Baseline</b>	<b>Low Bound</b>	<b>High Bound</b>
Source	Braga 2012	Boston Ceasefire Operation (Braga et al 2014)	Richmond pre-post reduction
% Reduction	35.5%	28%	55%
Homicides Avoided	14.4	11.4	22.3
<b>New NPV</b>	\$538,743,493.62	\$426,176,362.74	\$835,203,339.74

## References

- Beard, J. et al. Outcome Evaluation Report. California Department of Corrections and Rehabilitation, Office of Research. Jan 2014. p 19.
- Boggan, D. (2015) *To Stop Crime, Hand over Cash*. The New York Times. Retrieved from: [http://www.nytimes.com/2015/07/05/opinion/sunday/to-stop-crime-hand-over-cash.html?\\_r=0](http://www.nytimes.com/2015/07/05/opinion/sunday/to-stop-crime-hand-over-cash.html?_r=0) .
- Braga, A., and Weisburd, D. (2008) Pulling levers focused deterrence strategies to prevent crime. *Journal of Criminal Justice*, 36, 332–343.
- Braga, A., and Weisburd, D. (2012). The effects of focused deterrence strategies on crime: A systematic review and meta-analysis of the empirical evidence. *Journal of Research in Crime and Delinquency*, 49(3), 323-358.
- Braga, A. A., Hureau, D. M., & Papachristos, A. V. (2014). Deterring gang-involved gun violence: Measuring the impact of boston's operation ceasefire on street gang behavior. *Journal of Quantitative Criminology*, 30(1), 113. doi:10.1007/s10940-013-9198-x.
- Bureau of Labor Statistics. [www.bls.gov/news.release/pdf/wkyeng.pdf](http://www.bls.gov/news.release/pdf/wkyeng.pdf).
- Chalfin, A. (2013). The economic cost of crime. Encyclopedia of Crime and Punishment. Retrieved from: [http://achalfin.weebly.com/uploads/8/5/4/8/8548116/chalfin\\_econcost.pdf](http://achalfin.weebly.com/uploads/8/5/4/8/8548116/chalfin_econcost.pdf).
- Chermak, S. (2004). Problem-solving approaches to homicide: An evaluation of the Indianapolis Violence Reduction Partnership. *Criminal Justice Policy Review*, 15(2), 161-192.
- Cohen, M. A., & Piquero, A. R. (2009). New evidence on the monetary value of saving a highrisk youth. *Journal of Quantitative Criminology*, 25(1), 25-49. doi:10.1007/s10940-008-9057-3.
- Cohen, M.A. Rust, R. et al. (2004). Willingness-to-pay for crime-control programs. *Criminology*, 2(1), 89-109.
- Coin New Media Group LLC. (2008). US Inflation Calculator. Retrieved on April 4, 2016 from: <http://www.usinflationcalculator.com/inflation/consumer-price-index-and-annual-percent-changes-from-1913-to-2008>.
- Davis, L., Bozick, R., Stelle, J. Evaluating the Effectiveness of Correctional Education. RAND Corporation. Aug 2013.
- Dominguez-Riverta, P., and Raphael, S. (2015). The role of the costs- of- crime literature in bridging the gap between social science research and policy- making: Potentials and limitations. *American Society of Criminology*, 4(4), 589-632.

- Email from Sam Vaughn, Office of Neighborhood Safety Neighborhood Change Agent. March 30, 2016.
- Engel, R. S., Tillyer, M. S., & Corsaro, N. (2013). Reducing gang violence using focused deterrence: Evaluating the Cincinnati initiative to reduce violence (CIRV). *Justice Quarterly* : *JQ*, 30(3), 403.
- FBI (2010) 2010 City Crime Rankings retrieved from:  
[http://os.cqpress.com/citycrime/2010/City\\_crime\\_rate\\_2010-2011\\_hightolow.pdf](http://os.cqpress.com/citycrime/2010/City_crime_rate_2010-2011_hightolow.pdf)
- McCollister, K. E., French, M. T., & Fang, H. (2010). The cost of crime to society: New crime-specific estimates for policy and program evaluation. *Drug and Alcohol Dependence*, 108(1), 98-109. doi:10.1016/j.drugalcdep.2009.12.002.
- Gilligan, H. (2014) *How One California City Began Bringing Its Murder Rate Down—Without Cops*. The Nation. Retrieved from: <http://www.thenation.com/article/how-one-california-city-began-bringing-its-murder-rate-down-without-cops/>.
- Heaton, P. (2010). *Hidden in plain sight: What cost-of-crime research can tell us about investing in police*. RAND Corporation.
- Hirbyand, W (2010) What is the Average Cost to House Inmates in Prison. *The Law Dictionary*. Retrieved from: <http://thelawdictionary.org/article/what-is-the-average-cost-to-house-inmates-in-prison/>.
- LAO (2010) *How much does it cost to incarcerate an inmate?* The Legislative Analyst's Office. Retrieved from: [http://www.lao.ca.gov/PolicyAreas/CJ/6\\_cj\\_inmatecost](http://www.lao.ca.gov/PolicyAreas/CJ/6_cj_inmatecost).
- Lipsey, M. W., Chapman, G. L., & Landenberger, N. A. (2001). Cognitive-behavioral programs for offenders. *The Annals of the American Academy of Political and Social Science*, 578(1), 144-157. doi:10.1177/0002716201578001009.
- Mallar, C., Thornton, C. (1978). Transitional Aid for Released Prisoners: Evidence from the Life Experiment. *The Journal of Human Resources* Vol. 13, No. 2 (Spring, 1978), 208-236.
- Measure of America, HealthHappensinCA.org, The California Museum. Retrieved Apr 17, 2016.
- Miller, T.R., Cohen, M.C., and Wiersema, B. (1996). *Victim Costs and Consequences: A New Look*. Washington, D.C.: U.S. Department of Justice, Office of Justice Programs, National Institute of Justice.
- Motlagh, J. (2014) *A city that pays criminals to behave*. Al Jazeera America. Retrieved from: <http://america.aljazeera.com/watch/shows/america-tonight/articles/2014/6/6/a-city-that-payscriminalstobehave.html>.

- Murnane, R., Willett, J., Boudett, K. (1995). Do High School Dropouts Benefit from Obtaining a GED? Educational Evaluation and Policy Analysis. Summer 1995. Vol. 17, No. 2, 133-147.
- Murnane, R., Willett, J., Boudett, K. (1999). Do Male Dropouts Benefit from Obtaining a GED, Postsecondary Education, and Training? Educational Review, 10/1999, Vol. 23, Issue 5.
- Murnane, R., Willett, J., Tyler, J. (2000) Who benefits from obtaining a GED?: evidence from high school and beyond. NBER working paper series,
- National Council on Crime and Delinquency. (2015) *Process Evaluation for the Office of Neighborhood Safety*.
- Pearson, F. S., Lipton, D. S., Cleland, C. M., & Yee, D. S. (2002). The effects of Behavioral/Cognitive-behavioral programs on recidivism. *Crime & Delinquency*, 48(3), 476-496. doi:10.1177/0011128702048003006.
- Sadd, S., Kotkin, M., Friedman, S. (1983). Alternative Youth Employment Strategies Project: Final Report. Vera Institute of Justice.
- Sloboda, Z., editor, & Petras, H., editor. (2014). Defining prevention science (1;2014; ed.). New York: Springer. doi:10.1007/978-1-4899-7424-2.
- Song, W. (2011) Labor Market Impacts of the GED Test Credential on High School Dropouts: Longitudinal Evidence from NLSY97. American Council on Education. GED Testing Service Research Studies, 2011-12.
- United States Department of Justice, Federal Bureau of Investigation. Uniform Crime Reporting Program data [United States]: Supplementary homicide reports, 2006-2009. ICPSR 22401-v1 . Ann Arbor, MI: Inter-University Consortium for Political and Social Research.
- Vera (2010). *The Price of Prisons in California*. The VERA Institute of Justice. Retrieved from: <http://www.vera.org/files/price-of-prisons-california-fact-sheet.pdf>.
- Violence Policy Center (2014) *Lost youth: A county-by-county analysis of 2012 California homicide victims ages 10 to 24*. Violence Policy Center. Retrieved from: <http://www.vpc.org/studies/cayouth2014.pdf>.
- Weimer, David L., Vining, Aidan R. eds. (2009) Investing in the Disadvantaged : Assessing the Benefits and Costs of Social Policies. Washington, DC, USA: Georgetown University Press. ProQuest ebrary. Web. 22 March 2016.
- Willison, J. B., Bieler, S., & Kim, K. (2014). *Evaluation of the allegheny county jail collaborative reentry programs findings and recommendations*. ().Urban Institute.
- Wilson, D. B., Bouffard, L. A., & Mackenzie, D. L. (2005). A quantitative review of structured,

group-oriented, cognitive-behavioral programs for offenders. *Criminal Justice and Behavior*, 32(2), 172-204. doi:10.1177/0093854804272889.

Wilson, D. B., Gallagher, C. A., & Mackenzie, D. L. (2000). A meta-analysis of corrections-based education, vocation, and work programs for adult offenders. *Journal of Research in Crime and Delinquency*, 37(4), 347-368.

DRAFT

### **Note on Subsidies and Benefit against Recidivism**

A literature review on subsidies given to incarcerated or at-risk populations turned up few results, hence the innovative nature of Richmond's program. The most relevant study took place in Baltimore in 1972, sponsored by the U.S. Department of Labor and called Living Insurance for Exoffenders (LIFE) (Mallar, Thornton 1978). LIFE provided unemployment insurance of up to \$60 per week for 13 weeks to repeat male offenders. The study divided 432 inmates into four different treatment groups, testing the effects of financial aid, job placement programs, and a combination of the two. Using a probit model, LIFE found that recipients of financial aid alone had a 27% reduction in recidivism as compared to the control group, significant at the 5% level. Differences in arrest rates grew over the period of one year and stabilized by the second year.

In Richmond, 60% of fellows receive a stipend for the latter nine months of the fellowship, which can be as great as \$1000 a month but ranges on average from \$300 to \$700. This stipend is not as high as the LIFE stipend, which, at \$240 per month in 1972 dollars, would equal \$1252 per month in 2010. Given that the Peacemaker stipend is only 40% of the aid disbursed in LIFE, it is unreasonable to predict a similar reduction in recidivism for fellows from the stipend alone.