



Crime and Justice Policy Lab
UNIVERSITY *of* PENNSYLVANIA

San Francisco Violence Reduction Initiative Assessment: Interim Report

Lisa M. Barao, Ph.D.
Anthony A. Braga, Ph.D.
Stephen Douglas, Ph.D.

October 2024

Executive Summary

The City of San Francisco and San Francisco Police Department (SFPD), with technical support from the California Partnership for Safe Communities, implemented the Violence Reduction Initiative (SF VRI) in District 10. The VRI's initial deployment focused on this sector of the city due to the high level of violence within the district and among its associated area gangs. This community violence intervention initiative blended social service provision and law enforcement to change the behaviors of high-risk individuals driving violence in this area.

Initial SF VRI work started in 2020. Like other similar focused deterrence strategies, the SF VRI experienced some noteworthy implementation challenges that were eventually overcome. In 2021, SFPD launched focused enforcement actions in District 10. In 2022, after an extended period of planning and training, community mobilization and social service provision components were launched.

Analyses of program data show that direct communications with high-risk people, enrollment in VRI programming, and case management hours invested in clients increased notably between 2022 and 2023. Importantly, the data suggests that these services were delivered to individuals who were most at-risk of suffering violent gun injury or committing shootings in District 10.

Statistical analyses further indicate that SF VRI was successful in reducing serious violence. A comparative trend analysis revealed the program was associated with a 50% reduction in homicides and nonfatal shootings in District 10 relative to the rest of San Francisco after implementation. While these results should be interpreted with caution, San Francisco should continue to support the VRI implementation in District 10 and consider expansion to other areas suffering from serious violence.

Introduction

San Francisco's Violence Reduction Initiative (VRI) was launched in 2020 with the primary goal of reducing gun violence citywide while diminishing the use of arrests and enhancing police-community trust. The VRI was initially funded with a \$1.5 million dollar California Violence Intervention & Prevention (CalVIP) grant from the Board of State and Community Corrections (BSCC) in 2020, and the San Francisco Police Department received an additional \$6 million CalVIP grant in 2022 to continue these efforts. Leveraging these resources, SFPD, the City of San Francisco, the California Partnership for Safe Communities (CPSC) and an array of public agency and community partners developed and implemented the Violence Reduction Initiative in San Francisco's community District 10.

Prior to developing and implementing the VRI and following an observed increase in violence, the City of San Francisco, San Francisco Police Department (SFPD), and CPSC conducted a problem analysis to assess the individuals, places, and problems that were driving violence. Researchers reviewed all homicides occurring between January 1, 2017 and June 30, 2020, and all nonfatal injury shootings occurring between January 1, 2019 and December 31, 2019.

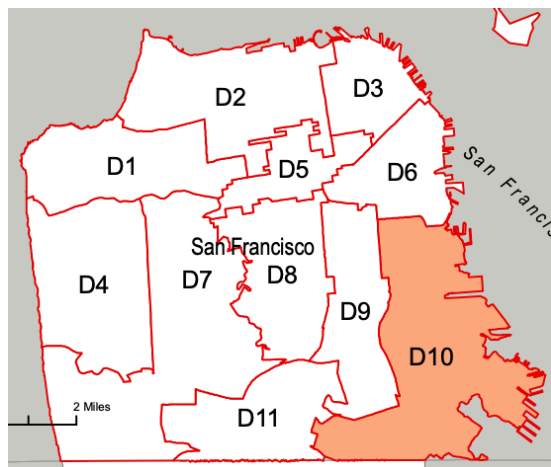
This problem analysis showed that the victims and suspects of gun violence were primarily between the ages of 18-34. Both victims and suspects tended to have extensive criminal justice system involvement – more than 70% of homicide victims and suspects had been arrested an average of 15 times. Findings also underscored that violence in San Francisco disproportionately impacted Black and Latino men. About 67% of homicide victims and suspects, and 85% of shooting victims and suspects, were Black or Latino males. Finally, a large share of victims and suspects had social connections to high-risk groups or gangs and related conflicts. At least 36% of homicides and at least 45% of shootings were confirmed to have involved group or gang members as victims, suspects, or both.

These findings led to the initial development of the SFPD's VRI in Fall 2020. The VRI uses focused deterrence¹ and community violence intervention strategy that is guided by procedural justice principles. This blended strategy has a central focus on providing services, support and opportunities to individuals at the highest risk of gun violence, with the largest portion of grant funding going to service provision. The strategy leverages close partnerships between city and community partners to connect high-risk individuals with resources and support to help break the cycles of gun violence. Due to the historic and

¹ Focused deterrence strategies seek to change offender behavior by understanding underlying crime-producing dynamics and conditions that sustain recurring crime problems, and implementing a blended set of law enforcement, community mobilization, and social service actions. See Braga, A., & Kennedy, D. (2021). *A framework for addressing violence and serious crime: Focused deterrence, legitimacy, and prevention*. Cambridge University Press.

current high level of violence associated with District 10 and associated area gangs, the VRI's initial deployment has focused on this sector of the city.

Figure 1. San Francisco Supervisorial District 10



The Violence Reduction Initiative Approach

The VRI strategy involves six key components. Shooting reviews² lead to robust collaborations with law enforcement partners and the identification of individuals at high-risk for involvement in gun violence. Identified individuals are vetted with internal units to understand criminal ties and potential investigative leads and are then engaged through direct communications led by law enforcement with community partners supporting these efforts. When those individuals agree to receive services, clients are connected with life coaches who provide intensive case management and offer consistent and ongoing resources and support. As highest-risk clients, support networks are created with other city and community partners to reduce at-risk behaviors

Direct Communications

Direct Communications are formal meetings with potential program participants in which they are provided a message of support and deterrence, as well as a referral to life coaching services through the VRI's program partner, the Street Violence Intervention Program (SVIP). While not all individuals contacted with Direct Communications enroll in the VRI program, all receive a message of support, deterrence from violence, and a referral to life coaching services. When recipients of direct communications do enroll in the VRI

² Shooting reviews are an important component of the ongoing problem analysis needed to manage focused deterrence strategies. In brief, these sessions involve the convening of knowledgeable practitioners to share and collect systematic information on the individuals involved in the incident, the motives that generated gunfire, and the dynamics that preceded the violent event. See Braga, A., Hureau, D., & Grossman, L. (2014). Managing the group violence intervention: Using shooting scorecards to track group violence. Washington, DC: U.S. Department of Justice, Office of Community Oriented Policing Services.

program, the SVIP delivers tailored intervention, services, and support. The SVIP has worked throughout the City and County for the past ten years, but within the VRI program, they provide intensive mentorship and life coaching specifically to those identified as being at high risk for involvement in gun violence.

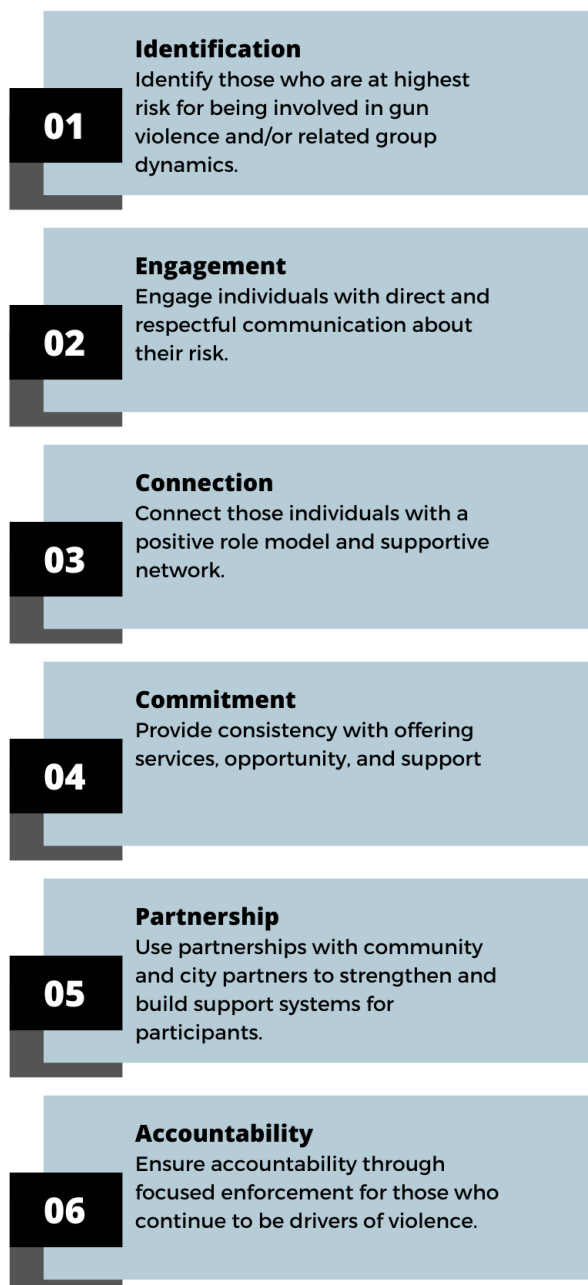
Initiative Expansion & City Coordination

The VRI unit also coordinates the Street Violence Response Team (SVRT) – a multi-agency collective that meets weekly to review violent incidents in San Francisco and serves as the central hub to ensure that victims receive coordinated support and services for both immediate and long-term recovery. In the weeks and months that follow a violent incident, this team helps ensure victims have access to resources like mental health services and ongoing case management. The work of the SVRT is an integral part of the VRI strategy, and these partnerships are leveraged to further support VRI participants and their communities.

Services & Support

When clients engage with SVIP and receive life coaching, they are provided with access to a range of resources, including financial incentives. If immediate relocation is needed, the SVIP is able to provide assistance to ensure safety in volatile, high-risk situations. Beyond immediate safety planning, the SVIP aids with numerous other supports including housing support, educational enrichment including navigating higher education systems. Employment assistance is available to assist clients with resume making, job applications, and referrals for job opportunities. The SVIP also refers clients to mental health services through partners like the Trauma Recovery Center, which is part of the Wraparound Project from UCSF, and Instituto Familiar De La Raza. Though these represent the core services of

Figure 2. VRI Strategy Components



the SVIP, weekly case consultation meetings allow team members to consistently review client progress and engage in problem-solving to address and respond to additional needs.

Criminal Justice System Response

Though the VRI aims to reduce the use of arrest by supporting individuals in turning away from violence, focused responses by criminal justice system partners are crucial for groups and individuals who continue to perpetrate gun violence despite direct communications and intervention attempts.

Within the SFPD, the Community Violence Reduction Team (CVRT), formed in 2021, focuses on intelligence collection, analysis, and proactive investigations of gun violence. The CVRT collaborates with the SFPD's Crime Gun Intelligence Center (CGIC), community partners and stakeholders, and justice system partners.

When group or gang related violence occurs, the CVRT conducts exhaustive investigations and works to identify suspects and associated gangs. The CVRT often relies on technology, intelligence gathering, and multi-unit and/or multi-agency partnerships to build cases, execute warrants, and secure arrests. The CVRT also works closely with the San Francisco District Attorney's Office to ensure accountability for individuals who perpetrate violent gun offenses.

Data & Methods

Planning and initial implementation of the VRI program began in 2020. The CVRT enforcement component of the VRI strategy was launched in 2021 but full strategy implementation was not achieved until 2022. The BSCC Cohort 3 Evaluation Report provides a thorough review of the factors that delayed implementation.³ Namely, the SFPD struggled to gain the trust and collaboration of community leaders and stakeholders who expressed skepticism in the City's and SFPD's commitment and ability to sustain the strategy. Many of these community stakeholders believed that previous violence reduction strategies lost momentum or dissolved completely whenever political leaders and priorities shifted. Alongside these challenges, the COVID-19 pandemic impacted launch, and the original VRI management team lacked direction, authority, and accountability in their initial implementation community mobilization and social service provision efforts. SFPD resources were also focused on pressing issues of homelessness and increasing drug overdoses. The management team also endured several significant transitions and did not fully stabilize until 2023. Due to these delays, the implementation description focuses on a period of full implementation from January 2022 – December 2023. The impact assessment considers the effects of the 2021 CVRT enforcement component and the 2022 full implementation on homicides and nonfatal shootings.

³ <https://www.bscc.ca.gov/wp-content/uploads/2024/06/BSCC-Cohort-3-San-Francisco-LER.pdf>

To conduct this program implementation description, the SFPD provided data on all recipients of direct communications and VRI enrollees from January 2022 – December 2023. This data includes subject demographics, dates of contact, and notes on contact and/or program outcomes. The SFPD also provided aggregate outreach, service delivery, and case management hours for the 2022-2023 period of their Cohort 4 CalVIP grant program. Finally, the SFPD provided citywide homicide and nonfatal shooting incident data from January 2019 – December 2023, including date and location of occurrence.

Several limitations to these datasets exist that limit the analyses we are able to perform in this report. First, there are no individual-level measures of dosage for case management and service delivery. Second, due to missing individual identifiers, we are unable to link victims and suspects of violence, direct communications recipients, and VRI enrollees across datasets. Finally, this program does not include a control group, and these factors as a whole limit our ability to pursue certain comparative analyses. Therefore, outcomes described in this report should be considered descriptive rather than inferential.

For this program implementation description, we first use descriptive statistics of programming and service delivery data to explore the growth of the VRI from 2022-2023. We also explore alignment between the VRI client population and those at the highest risk for violence according to the 2017-2020 violence problem analysis. For the impact assessment, we analyze geocoded fatal and nonfatal shooting data from 2019-2023 to assess differences in trends in treated District 10 relative to all other districts.

Findings

Direct Communications

In the two-year period of VRI implementation, the number of direct communications conducted increased 48% from 136 in 2022 to 201 in 2023 (Figure 3). Direct communications in 2022 aligned with monthly gun violence trends overall but decreased notably through the summer (Figure 4). Direct communications in 2023 also aligned with trends in gun violence with the highest volume conducted from July to September amidst a spike in incidents in July.

Figure 3. Direct Communications by Year

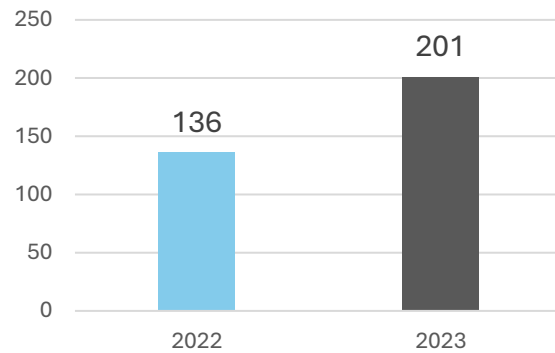
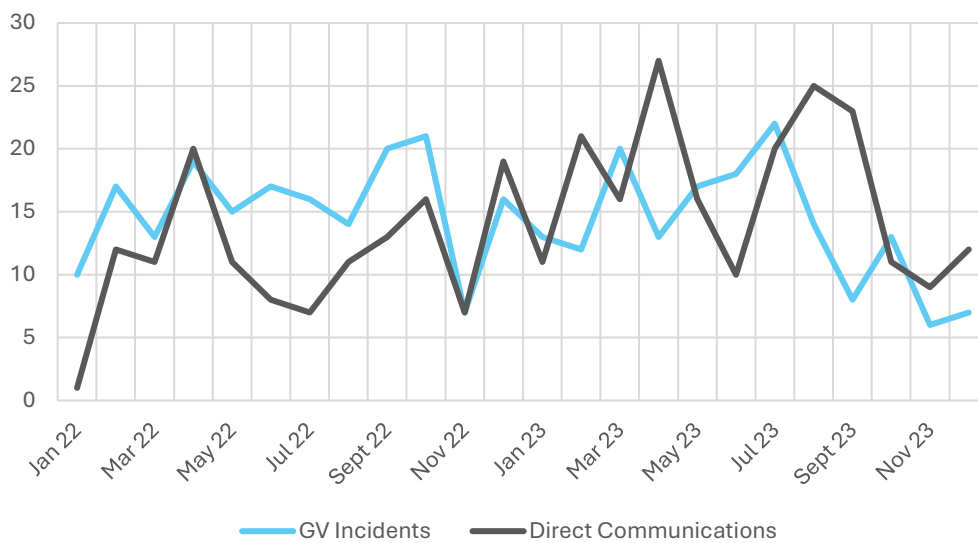


Figure 4. Gun Violence and Direct Communications by Month, 2022-2023



Since individuals may be impacted by multiple gun violence incidents, direct communications may be conducted multiple times with one individual. There were 337 direct communications given to 232 unique individuals from 2022 to 2023. Nearly 75% of individuals received only one direct communication and almost 16% received two direct communications (Table 1). Nearly 10% of individuals received three or more direct communications. Those who receive multiple direct communications have been closely impacted by or involved in gun violence more than once, and these are likely to be very high-risk individuals.

Table 1. Number of Direct Communications per Recipient, 2022-2023

Number of Direct Communications	N	Percent
1	173	74.6%
2	37	15.9%
3	12	5.2%
4+	10	4.3%
Total	232	100.0%

To maximize the effectiveness of the VRI strategy, direct communications recipients should be those at the highest risk for involvement in gun violence. Similar proportions of unique direct communication recipients (95.7%) were male when compared to the victims and suspects of gun violence included in the 2017-2020 problem analysis (91.1%). About 73% of gun violence victims and suspects and 66% of direct communication recipients were between the ages of 18 – 34. While 50% of citywide gun violence victims and suspects were Black, more than 89% of direct communication recipients in District 10 were Black. The VRI strategy is focused solely in District 10, which has a significantly higher Black population than other neighborhoods of San Francisco. Additionally, gun violence in District 10 is more closely connected to street group dynamics than other San Francisco neighborhoods, and the majority of active groups in this area are comprised of Black individuals. A higher proportion of Black direct communication recipients in District 10 likely reflects this context and suggests alignment between intervention efforts and the local population in greatest need.

Table 2. Comparison of Gun Violence Victims and Direct Communication Recipients

Victims & Suspects of Fatal & Nonfatal Shootings, 2017-2020 (n=348) ⁴			Recipients of Direct Communications, 2022-2023 (n=232)		
Characteristic	N	Percent	Characteristic	N	Percent
Sex			Sex		
Male	317	91.1%	Male	222	95.7%
Female	30	8.6%	Female	10	4.3%
Non-Binary	1	0.3%	Non-Binary	0	0.0%
Race			Race		
Black	174	50.0%	Black	207	89.2%
Hispanic	113	32.5%	Hispanic	15	6.5%
White	18	5.2%	White	1	0.4%
Pacific Islander	11	3.2%	Pacific Islander	8	3.4%
Other	32	9.2%	Other	1	0.4%
Age Category			Age Category		
17 & under	13	3.8%	17 & under	55	23.7%
18 - 24	141	40.9%	18 - 24	83	35.8%
25 - 34	110	31.9%	25 - 34	70	30.2%
35 - 44	47	13.6%	35 - 44	12	5.2%
45 - 54	23	6.7%	45 - 54	8	3.4%
55 & over	11	3.2%	55 & over	1	0.4%
Known Group Association	148	42.5%	Known Group Association	214	92.2%

⁴ Includes victims and suspects of fatal shootings 1/1/17 – 6/30/20 and victims and suspects of nonfatal shootings 1/1/19-12/31/19.

VRI Enrollment

Once individuals receive direct communications, they may or may not choose to enroll in the VRI program to receive services and life coaching from the SVIP. During the two-year period of VRI implementation, program participants increased by 469% from 13 enrollments in 2022 to 74 enrollments in 2023 (Figure 5). This includes six individuals who participated in the VRI program more than once during this period. VRI enrollments were 4-9 times higher every month of 2023 relative to 2022 (Figure 6).

Figure 5. VRI Enrollments by Year

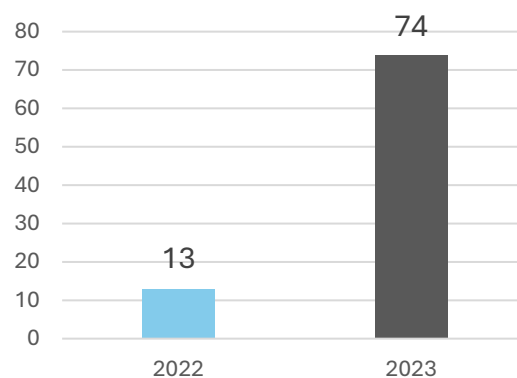
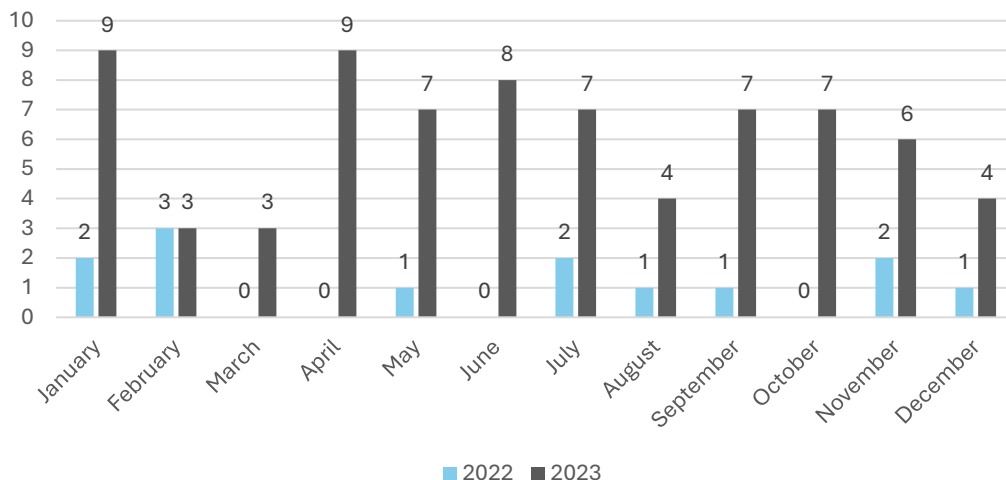


Figure 6. VRI Enrollments by Month and Year



When compared to victims and suspects involved in gun violence, VRI participants also share similar characteristics. Nearly 83% of VRI participants were between the ages of 18-34 and nearly 93% of VRI participants were Black. The racial composition of VRI participants mirrors proportions of direct communication recipients and reflects the composition of active groups and gangs in District 10.

When compared to those who do receive direct communications and do not enroll in programming, VRI enrollees were slightly younger (Table 3). Just over 55% of enrolled VRI participants, relative to 45% of unrolled direct communication recipients, were under the age of 25. Relative to VRI participants, data suggests that Hispanic direct communication recipients were less likely to enroll in the program. Whereas 33% (74 of 224) Black individuals contacted enrolled in the VRI program, just under 11% (2 of 19) Hispanic individuals contacted enrolled.

Table 3. Comparison of Unenrolled Direct Communication Recipients and Enrolled VRI Participants

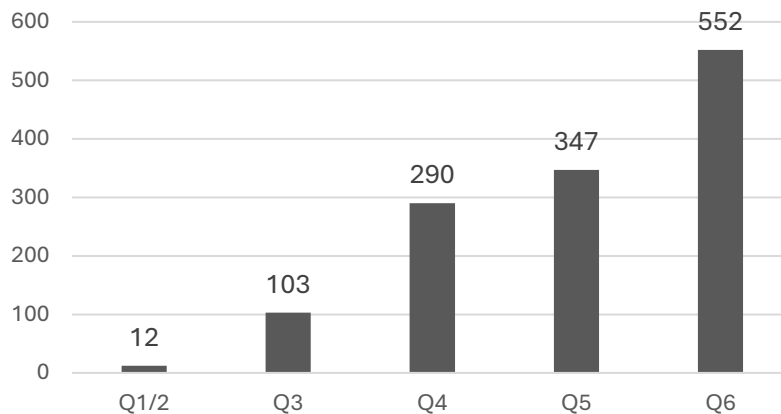
Unenrolled DC Recipients, 2022-2023 (n=186)			VRI Enrolled Participants, 2022-2023 (n=80)		
Characteristic	N	Percent	Characteristic	N	Percent
Sex			Sex		
Male	173	93.0%	Male	74	92.5%
Female	10	5.4%	Female	6	7.5%
Unknown	3	1.6%	Unknown	0	0.0%
Race			Race		
Black	150	80.6%	Black	74	92.5%
Hispanic	17	9.1%	Hispanic	2	2.5%
White	1	0.5%	White	0	0.0%
Pacific Islander	9	4.8%	Pacific Islander	4	5.0%
Other/Unknown	9	4.8%	Other/Unknown	0	0.0%
Age Category			Age Category		
17 & under	28	15.1%	17 & under	9	11.3%
18 - 24	56	30.1%	18 - 24	35	43.8%
25 - 34	78	41.9%	25 - 34	31	38.8%
35 - 44	16	8.6%	35 - 44	5	6.3%
45 - 54	6	3.2%	45 - 54	0	0.0%
55 & over	1	0.5%	55 & over	0	0.0%

VRI Participant Outcomes

Once enrolled in the VRI program, the SVIP serves as a hub for clients to access a variety of services (e.g., housing assistance, education resources, employment resources) and provides life coaching. SVIP case management hours have increased markedly each quarter of the VRI program, from 12 hours in the last six months of 2022 to 552 hours in the last three months of 2023 (Figure 7).⁵

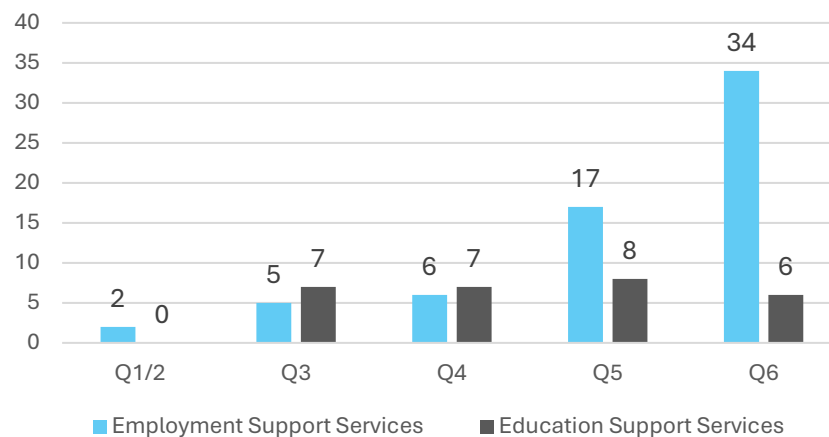
⁵ Data collected for the Cohort 4 (2022) CalVIP grant. Case management data prior to July 1, 2022 is not comparable as it was recorded by number of participants rather than number of hours for the Cohort 3 (2020) CalVIP grant.

Figure 7. SVIP Case Management Hours for VRI Participants, 7/1/22 – 12/31/23



Though the SVIP also directs individuals to housing, individual development, and life skills training, the primary services used by clients are employment and education support services. Much of the increase in case management hours from October to December of 2023 appears to have been dedicated to employment support services, and the SVIP reported that during that period, 46 clients obtained work ready documents like identification and/or driver's licenses (Figure 8).

Figure 8. VRI Participants Receiving Employment and Education Services, 7/1/22 – 12/31/23



One of the key goals of the VRI is to reduce recidivism and victimization. VRI program personnel record recidivism when a participant is rearrested for a violence-related incident and record victimization when a participant is the victim of a gun violence incident. Victimization was a rare event and less than 5% of all VRI enrollees (N=4) were victimized by gun violence during the study period. Overall, about 26% (21 of 80) of VRI enrollees recidivated (Figure 9).⁶ Recidivism or victimization was noted for more than 22% (2 of 9) of 2022 participants and nearly 27% (19 of 71) of 2023 VRI participants. Of those who recidivated, nearly 43% (9 of 21) were arrested more than once following VRI enrollment. When recidivism occurred, about 67% of these instances occurred within six

⁶ As of April 19, 2024.

months of enrollment (Table 4). Time to recidivism ranged from 15 to 454 days, and the average time to recidivism was 173 days, or about 5.7 months.

The relatively small number of program participants during the study period prevents us from making inferences about VRI efficacy in reducing recidivism and victimization.⁷ As the number of program participants grows, this will become possible. It is also important to note that future assessments of the VRI implementation will need to identify an equivalent group of untreated high-risk people to make comparisons with the treated group on recidivism rates, time to recidivism, victimization rates, and other outcome measures.

Figure 9. Percentage of VRI Participants with Recidivism, 2022-2023

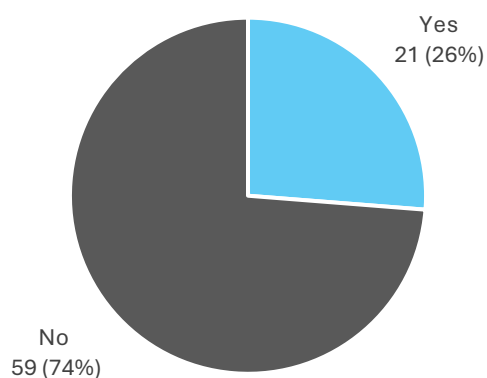


Table 4. Time to VRI Participant Recidivism, 2022-2023

Time to Recidivism/Victimization	N	Percent
1 - 30 days	1	4.8%
31 - 90 days	4	19.0%
91 - 180 days	9	42.9%
181 days - 1 year	5	23.8%
More than 1 year	2	9.5%

Of the participants who enrolled in the VRI from 2022-2023, 35% (28) exited the program (Figure 10),⁸ including 11 individuals previously noted with recidivism or victimization. In sum, exactly 50% (40 of 80) of VRI participants enrolled in 2022-2023

⁷ Statistical power is the likelihood that a research design detects a program effect if it actually exists. The current number of treated cases is inadequate to detect a program effect. In addition to sample size, other factors influence research design sensitivity such as subject variability, strength and integrity of treatment, type of statistical analysis, and so forth. See Lipsey, M. (1990). Design sensitivity: Statistical power for experimental research. Sage Publications.

⁸ As of April 19, 2024.

either exited the program, were rearrested for violent offenses, and/or were victimized by gun violence.

The 28 exits include four individuals who later re-enrolled in during the assessment period. More than 64% of those who exited the program dropped out or lost contact with the SVIP team (Figure 11). An additional 25% were arrested and/or incarcerated.

Figure 10. Percentage of VRI Participants Exiting the Program, 2022-2023

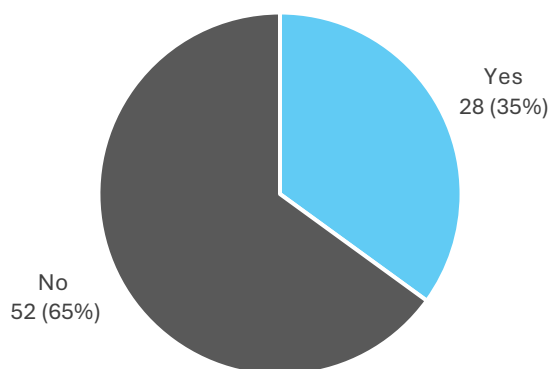
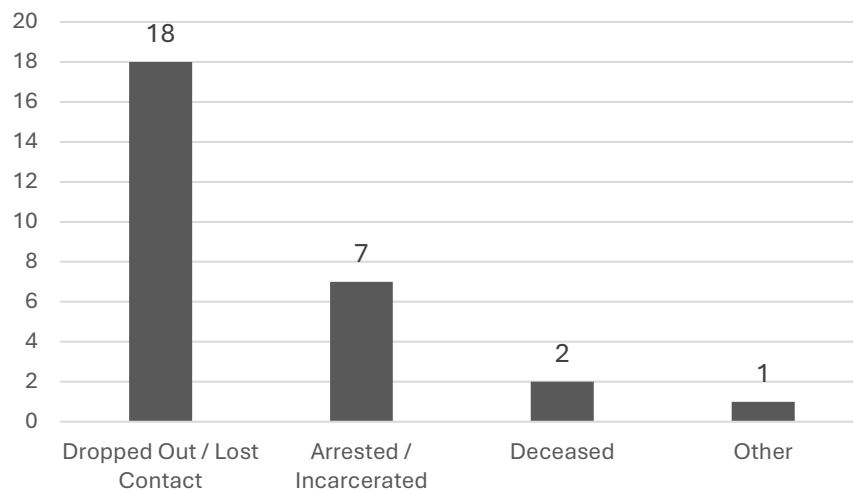


Figure 11. Reason for VRI Participant Exit, 2022-2023



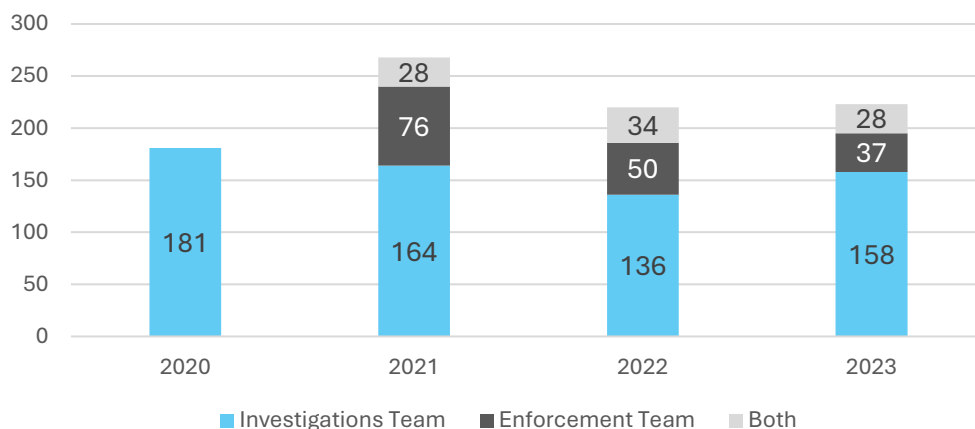
Community Violence Reduction Team (CVRT) Cases

CVRT is comprised of two integral teams that specifically focus on intelligence stemming from gangs or group on group dynamics. The Investigative Team responds to shootings and critical firearm related incidents, while the Enforcement Team focuses on

intelligence gathered through other avenues, such as through social media activity and tips. However, both teams work together to support each other's efforts in ensuring strategic and intentional enforcement with those individuals who continue to contribute to gang and gun violence experienced in the City, including District 10. The Investigations Team is comprised of sergeants and the Enforcement Team is comprised of officers. If the Enforcement Team is able to build robust cases from their avenues of intelligence, the case is turned over to the Investigative Team to ensure fidelity of the investigation for potential prosecution. These teams continue to support one another through the duration of an investigation, as the Enforcement Team is tasked to performs surveillance, execute warrants and makes the arrests. It should be noted that while the Investigations Team has collected data since 2020, the Enforcement Team was not formed until January 2021.

Taken as a whole, CVRT cases reflect the number of 1) police-initiated, intelligence-based investigations, 2) investigations of shootings and other critical firearm-related incidents. Figure 12 reflects the number of cases attributed to the Investigations Team, Enforcement Team, and the collaborative cases of both teams. Overall, the number of CVRT cases decreased 17% from 2021 to 2023 citywide, despite an increase in cases worked by the Investigative Team in 2023. With the VRI strategy fully implemented, the unit refocused its efforts to ensure strategic, deliberate, and intentional enforcement in line with the initiative. This data is notable because although the SFPD is an integral leader of the VRI program, gun violence reductions appear to have occurred without an increase or overreliance on enforcement activity. Still, the CVRT and other criminal justice partners play a critical role in gathering and disseminating intelligence while also undertaking investigations and operations that are hyper-focused on those at the greatest risk for engaging in gun violence.

Figure 12. CVRT Cases, 2020 - 2023

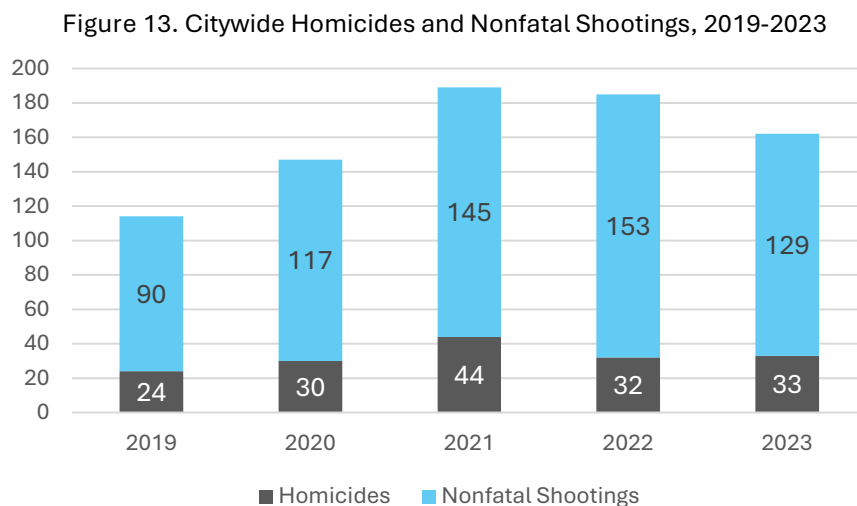


Gun Violence Trends

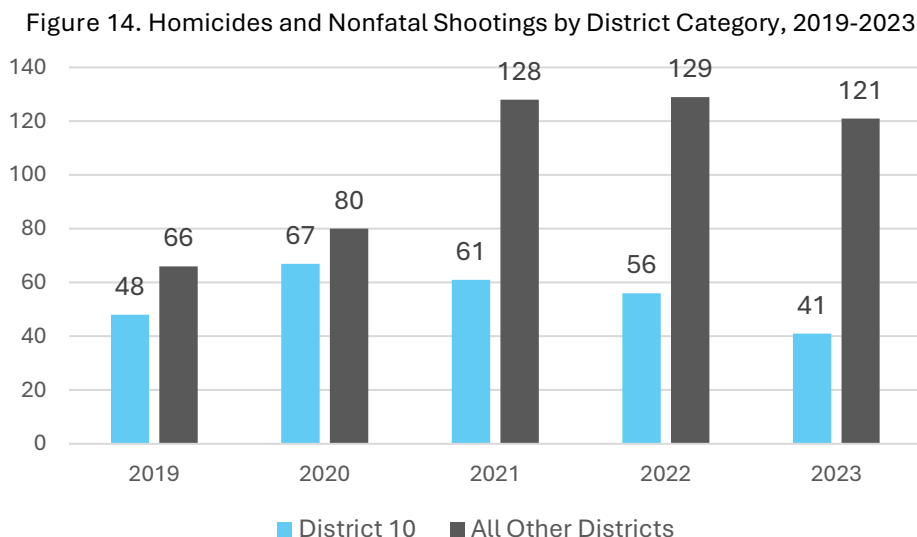
Though the VRI's full implementation period began in January 2022, the city had partially implemented the strategy through 2021 although management structures,

accountability mechanisms, and partnerships were lacking. Due to this implementation process, we use a five-year period from 2019-2023 to examine gun violence trends and explore impacts of the VRI program. This period includes two years of pre-implementation (2019-2020), one year of partial implementation (2021), and two years of full implementation (2022-2023).

Fatal and nonfatal shootings citywide increased 66% from 2019 to 2021. Gun violence began to decrease in 2022, and there was a 14% reduction in fatal and nonfatal shootings in 2023 relative to 2021 (Figure 13).



However, homicides and shootings in District 10 increased nearly 40% from 2019 to 2020 before decreasing every year thereafter (Figure 14). By 2023, District 10 had experienced a 39% reduction relative to 2020. In all other districts, gun violence increased sharply from 2020-2021 and has remained at these higher levels. By 2023, gun violence in all other districts was 51% higher relative to 2020.



These differences can also be observed in spatial analyses of homicides and nonfatal shootings over time (Figure 15). Kernel density estimation conducted for the VRI pre-implementation period of 2019 - 2020 shows the city's largest hot spot centering in the Bayview area of District 10. A gradual shrinking of this density in District 10 can be seen in both the partial implementation period (2021) and full implementation period (2022 – 2023).

To explore these observations further, we created a time series dataset using the sum of homicides and nonfatal shootings per month in District 10 and in all other districts. A graph of these time trends suggests that gun violence trends in District 10 relative to all other districts began to diverge during the pre-implementation period (2021) (Figure 16). These trends continue, and District 10 gun violence continued to decrease, throughout the full implementation period (2022-2023).

Figure 15. Homicides and Nonfatal Shootings: Kernel Density Estimation by Period

a. 2019-2020

b. 2021

c. 2022-2023

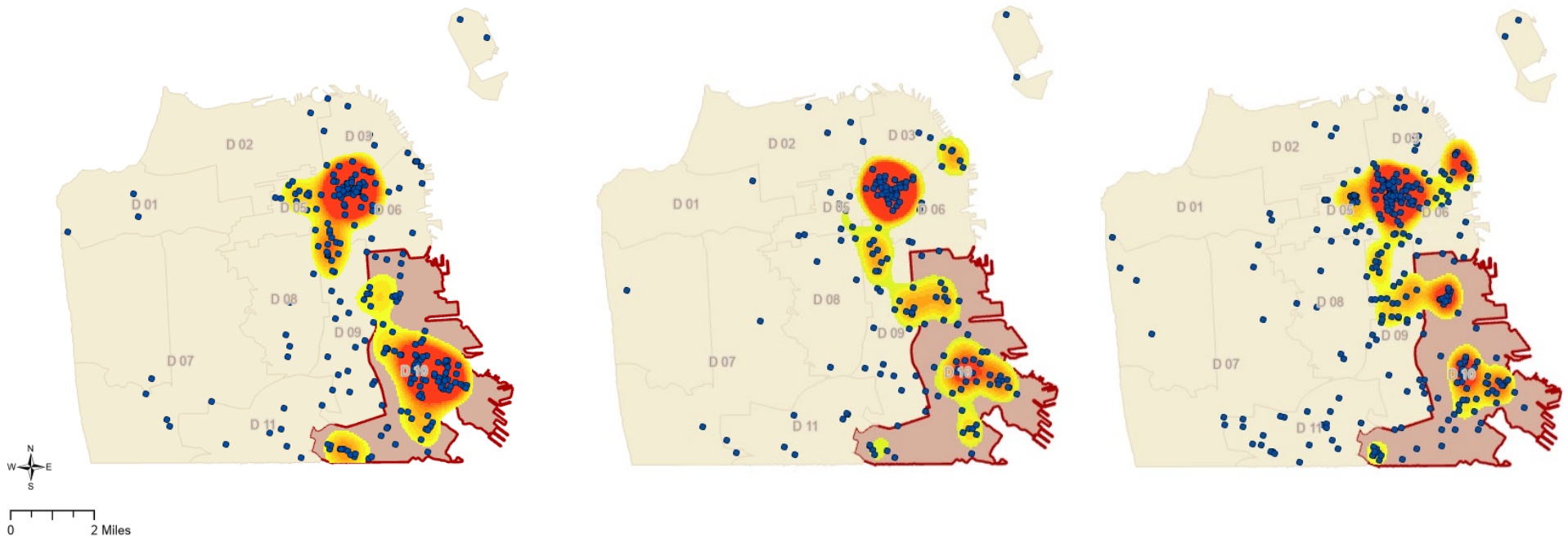
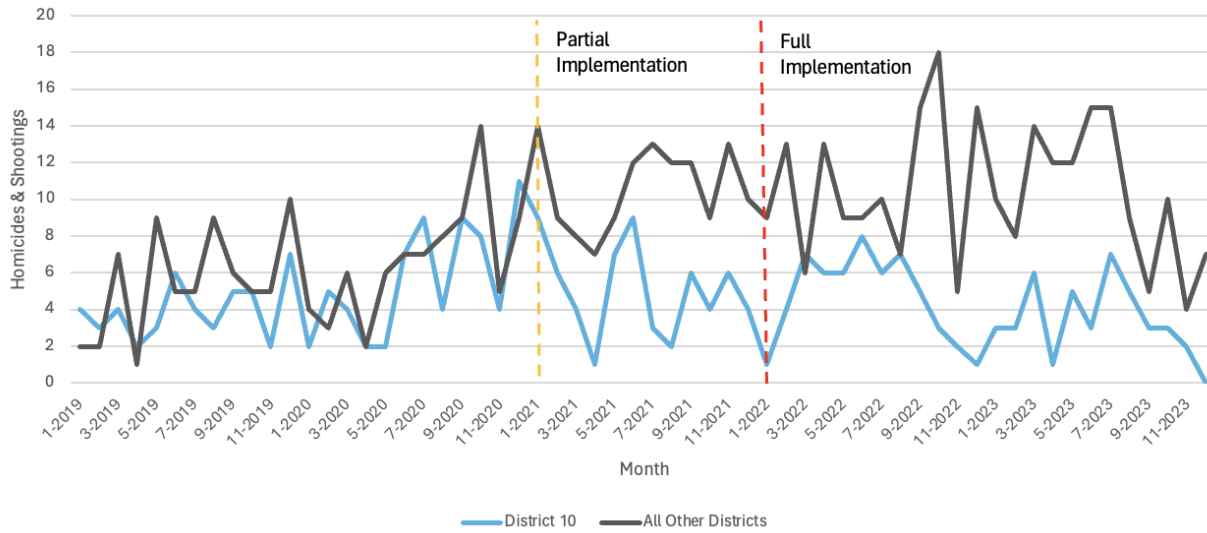


Figure 16. Homicides and Nonfatal Shootings by Month and District Category, 2019-2023



Statistical Analysis of Gun Violence Trends

A variation of a multi-level regression model was used to analyze the monthly change in homicides and nonfatal shootings for the treatment area (District 10) and a comparison aggregate of all other SFPD Districts over the five-year observation period. More specifically, random effects models were used to estimate area changes in outcomes over the observation period.⁹ The model estimated adjusts for the fact that the areas may have a different average propensity for a given outcome. The longitudinal analysis of the effects of SF VRI on District 10 relative to all other untreated districts considered monthly counts of homicides and nonfatal shooting victimizations over 5 years (2 areas * 12 months * 5 years = 120 observations) between 2019 and 2023.

This analysis involved the estimation of the impact of partial implementation and eventual full implementation of VRI on homicides and nonfatal shooting victimizations in the treatment area relative to homicides and nonfatal shooting victimizations in the comparison area during the study period via the difference-in-differences (DID) estimator.¹⁰ The DID method estimates the difference in the treated area post-intervention outcome at time t compared to its pre-intervention outcome, relative to the same

⁹ Singer, J. D., & Willett, J. (2003). Applied longitudinal data analysis: Modeling change and event occurrence. Oxford University Press.

¹⁰ The parallel trends assumption, requiring that the difference between treatment gangs and comparison gangs is constant over time, is critical to the internal validity of the DID model. Figure 16 suggests that the parallel trends assumption was met. Angrist, J., & Pischke, J. S. (2009). Mostly harmless econometrics. Princeton University Press.

difference for the untreated area in the study (see, e.g., Ridgeway et al., 2019).¹¹ As such, the random effects regression model consisted of the following form:

$$(1) \quad Y_{it} = \beta_0 + \beta_1 VRI_full_i + \beta_2 VRI_partial_i + \beta_3 Post_t + \beta_4 VRI_full_i \times Post_t + \beta_5 VRI_partial_i \times Post_t + \beta X_{it} + \alpha_i$$

In this model, Y_{it} represents the number of homicides and shooting events for an area that occurred in a given month during the five-year study period. The regressor VRI_full_i is a dummy variable identifying whether the treated area experienced the full VRI intervention (1) or not (0), while $VRI_partial_i$ is a dummy variable identifying whether the treated area experienced the partial enforcement only VRI implementation (1) or not (0). The reference group in each case comprises the other districts that did not experience the VRI treatment. The regressor $Post_t$ is a dummy variable for whether the month is during the post-intervention period (1) or during the pre-intervention period (0). The timing of the exact month that the treated area was exposed to the partial or full VRI implementation was used to determine the start of the post-intervention period. The coefficients β_4 and β_5 , conforming to the product of the group dummies with the post-intervention period, are the DID estimates of the full and partial effects of VRI, respectively. The model also controlled for linear trends, nonlinear trends, and seasonal variations that may be correlated with the outcome measure, and β represents the vector of estimates of the matrix of attributes (X). The random effects intercept term is represented by the term α .

Stata 18 statistical software was used to calculate the maximum likelihood estimate of the parameters for the DID estimator and to compute the associated probability values. Poisson panel regression models were used to estimate the effects of full and partial VRI implementation on monthly homicide and nonfatal shootings as these outcomes were distributed as rare event counts. The Poisson regression parameter estimates were expressed as incidence rate ratios (IRR), or the ratio of change in the monthly counts of homicides and nonfatal shootings. Robust standard errors clustered at the area level were used to account for unmeasured dependence within areas over time and overdispersion.¹² As a robustness check, all count models were also estimated with a negative binomial variant of the Poisson regression and the substantive results did not change. Following convention, the two-tailed .05 level of significance was selected as the benchmark to reject the null hypothesis of “no difference.”

As reflected in Table 5, during the VRI’s partial implementation in District 10 in 2021, fatal and nonfatal shootings decreased significantly by a factor of 0.605 ($z=-2.55$, $p=.011$), net all other variables. This suggests that the enforcement-only component of VRI reduced homicides and non-fatal shootings by 39.5% in District 10 relative to the rest of city during

¹¹ Ridgeway, G., Grogger, J., Moyer, R. A., & Macdonald, J. M. (2019). Effect of gang injunctions on crime: A study of Los Angeles from 1988–2014. *Journal of Quantitative Criminology*, 35, 517-541.

¹² Berk, R., & MacDonald, J. (2008). Overdispersion and Poisson regression. *Journal of Quantitative Criminology*, 24(3), 269 – 284.

2021. During the VRI's full implementation in District 10 during 2022-2023, fatal and nonfatal shootings also decreased significantly by a factor of 0.493 ($z=-4.02$, $p=.000$), while holding all other variables constant. This suggests that the full VRI reduced homicides and non-fatal shootings by 50.7% in District 10 relative to the rest of city during 2022-2023.

Table 5. Difference-in-Differences (DID) Poisson Regression of Homicides & Nonfatal Shootings by Month and District (N = 120 "area-months")

Variable	IRR	RSE	z	p
Period - Partial Implementation (1=Treatment: 2021)	1.191	0.189	1.10	0.269
District (1=District 10)	0.788	0.098	-1.91	0.056
VRI Partial Implementation Impact	0.605	0.119	-2.55	0.011 *
Period - Full Implementation (1=Treatment: 2022-2023)	1.272	0.312	0.98	0.327
VRI Full Implementation Impact	0.493	0.087	-4.02	0.000 *
Trend	1.053	0.014	3.88	0.000 *
Trend-Squared	0.999	0.000	-3.97	0.000 *
Season [†]				
Spring (March – May)	0.960	0.104	-0.38	0.705
Summer (June – August)	1.174	0.113	1.67	0.096
Fall (September – November)	1.037	0.114	0.33	0.741
Constant	3.409	0.642	6.51	0.000 *
Wald	186.01			
Prob	0.000			
Pseudo R2	0.202			
Log pseudolikelihood	-278.283			

* $p<.05$, ** $p<.01$

[†]Winter (1) is the reference category for season

IRR = Incidence Rate Ratio, RSE = Robust Standard Errors

Discussion & Conclusion

Focused deterrence strategies, such as SF VRI, are designed to change violent gun offender behavior by understanding underlying violence-producing dynamics and conditions that sustain recurring shooting problems, and implementing a blended set of law enforcement, community mobilization, and social service actions.¹³ The evaluation

¹³ Braga, A., & Kennedy, D. (2021). A framework for addressing violence and serious crime: Focused deterrence, legitimacy, and prevention. Cambridge University Press.

literature suggests that focused deterrence is effective at reducing gun violence by gangs and other criminally active groups.¹⁴ However, these strategies are also notoriously difficult to implement and sustain.¹⁵ There is an extensive history of failed implementations of focused deterrence, and successful programs discontinued after leadership changes.¹⁶

Like other focused deterrence programs, the SF VRI experienced implementation challenges. In 2020, planning and initial VRI program work began and, in 2021, the CVRT enforcement component was implemented in District 10. The full VRI focused deterrence strategy, including social service provision components, was implemented in 2022. The delayed adoption of these critical program components was due to community and social service provider concerns about the city's commitment to the strategy and lingering trust issues involving the enforcement component of the strategy.

The City of San Francisco and the SFPD were able to successfully navigate these challenges and eventually launch a robust violence prevention program in District 10. Our implementation assessment revealed that key VRI program activities, such as direct communications with high-risk people, enrollment of high-risk people in programming, and case management hours invested in program participants steadily increased between 2022 and 2023. Further analysis of VRI data suggests that subjects who received direct communications and enrolled in VRI programming shared very similar characteristics to the individuals most at risk of being shot or committing a shooting in District 10.

The impact assessment suggests that the SF VRI resulted in significant gun violence reductions and these preventive benefits strengthened as the social service components were implemented. During the enforcement-only phase of the project, District 10 experienced a roughly 40% reduction in homicides and nonfatal shootings in 2021 relative to homicides and nonfatal shooting trends in the rest of the city. When the VRI focused deterrence strategy was fully implemented, District 10 experienced a 50% reduction in homicides and nonfatal shootings in 2022-2023 relative to homicides and nonfatal shooting trends in the rest of the city. These results should be interpreted with caution for at least two reasons. First, the impact assessment did not use a randomized experimental design and offers limited causal evidence on VRI program effects. While CJP researchers

¹⁴ Braga, A., Weisburd, D., & Turchan, B. (2018). Focused deterrence strategies and crime control: An updated systematic review and meta-analysis of the empirical evidence. *Criminology & Public Policy*, 17(1), 205 – 250; National Academies of Sciences, Engineering, and Medicine. (2018). *Proactive policing: Effects on crime and communities*. The National Academies Press.

¹⁵ Circo, G., Krupa, J., McGarrell, E., & DeBiasi, A. (2021). Focused deterrence and program fidelity: Evaluating the impact of Detroit Ceasefire. *Justice Evaluation Journal*, 4(1), 112-130; Engel, R., Skubak Tillyer, M., & Corsaro, N. (2013). Reducing gang violence using focused deterrence: Evaluating the Cincinnati Initiative to Reduce Violence (CIRV). *Justice Quarterly*, 30(3), 403 – 439.

¹⁶ Kennedy, D. M. (2011). *Don't Shoot*. Bloomsbury; Kennedy, D. M. (2019). Policing and the lessons of focused deterrence. In D. Weisburd & A. A. Braga (Eds.), *Police Innovation: Contrasting Perspectives* (205-226). Cambridge University Press.

utilized a quasi-experimental design with statistical controls to assess the impact on VRI on neighborhood violence trends, this cannot completely rule out the impact of other potential factors in these reductions. Second, further analytical work is needed to determine whether people subjected to direct communication, social service resources, enforcement, programming, and other VRI program activities changed their behavior and were less likely to be violently victimized. Additional research is needed to more rigorously establish program impacts by determining whether these promising results are robust to alternative statistical modeling approaches. The research team will also examine gun violence trends in proximate areas to whether there were any diffusion or displacement effects occurred. In the coming months, the city and our evaluation team will continue to gather and analyze additional program and outcome data and update this report as appropriate.

Despite limitations to the research design, the results of the statistical analyses are very promising. The available data suggests that the City of San Francisco and SFPD successfully implemented a focused deterrence (and CVI) program in District 10 that helped reduce gun violence. Preliminary data from January through June shows that program activity continues to increase in 2024. During this six-month period, there were 106 additional direct communications and 13 new VRI enrollments. Case management hours also increased significantly, with the SVIP program logging nearly 5,030 hours during this period. This reflects a 460% increase in case management hours when compared to the last six months of 2023. Given the implications of this initial evaluation, the City should continue to support the SF VRI and consider expansion into other high risk settings in San Francisco.