Evaluation of the Detroit Crime Gun Intelligence Center

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Michigan Justice Statistics Center

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EXECUTIVE SUMMARY

Evaluation of the Detroit Crime Gun Intelligence Center

In its ongoing efforts to reduce firearm violence, the Detroit Police Department (DPD) implemented a Crime Gun Intelligence Center (CGIC) in 2019 with the support of the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF). Supported through a federal grant from the Bureau of Justice Assistance (BJA), the Detroit CGIC (DCGIC) created in-house technology and analytical capacity to process evidence obtained from firearm crimes. This new technology included equipment allowing the test-firing of recovered crime guns and the submission of cartridge cases into the National Integrated Ballistic Information Network (NIBIN), and was supported by the ATF's NIBIN National Correlation and Training Center (NNCTC). The NNCTC can rapidly compare NIBIN submissions to provide evidence that originated from the same firearm (herein referred to as "crime gun"). Known as NIBIN leads, connections between NIBIN submissions support investigations of firearm crime incidents by increasing the number of crime scenes from which detectives can identify suspects. They also support a more comprehensive understanding of the criminal use histories of recovered crime guns. The data developed through the DCGIC were supported by the NIBIN Enforcement Support System (NESS), which integrated NIBIN records with DPD's records management system.

The DCGIC followed a strategic planning model whereby key personnel in DPD and partnering agencies, particularly ATF, established goals and objectives, performed a gap analysis, and developed a systematic plan for the development of the DCGIC. The systematic plan included the establishment of policies and procedures, hiring of personnel, training, and identification of performance metrics. This plan was reviewed and approved by an external group of technical assistance providers as part of the BJA grant program.

This report presents the results of an evaluation of the development and implementation of the DCGIC. The report was developed by a team of researchers at Michigan State University and Wayne State University who served as the research partner as the DCGIC was implemented. The evaluation focused primarily on the implementation of the DCGIC and the types of outputs identified in the strategic plan and generated by the DCGIC. Much of 2019 was devoted to this planning period, as well as implementation. The DCGIC was fully operational in January 2020.

Among the key findings of the study:

- The DCGIC met the procedural objectives established in the strategic plan, including establishing formal policies, hiring personnel, internal training of DCGIC staff, and external training throughout the department on topics such as ballistic evidence collection. The strategic plan also included 34 operational objectives, which were developed in consultation with the national technical assistance providers.
- A primary focus of the DCGIC was to enhance the collection of crime guns and ballistic evidence, increase the timeliness of the processing and analysis of this evidence, and disseminate intelligence to investigators, task force officers, command staff, and prosecutors to support investigations and tactical and strategic intelligence that inform efforts to reduce firearm violence.

- Where possible, the evaluation compared metrics across these dimensions for the 30 months prior to the implementation of DCGIC with a 30 month period since its implementation in January 2020.There were clear findings of dramatic increases in the comprehensive collection and timely processing of ballistic evidence associated with the implementation of the DCGIC. Specifically:
  - The number of NIBIN acquisitions increased by 121% (from 11,616 to 25,624).
  - The number of test-fires of recovered crime guns entered into NIBIN increased by 114% (from 7,193 to 15,369).
  - The number of cartridge cases entered into NIBIN increased by 132% (from 4,423 to 10,255).
  - This increased collection and processing of ballistic evidence had its desired effect on NIBIN leads, with the number of NIBIN leads increasing by 229% (from 1,921 to 6,313).
  - Even before the DCGIC, DPD had prioritized improving the timeliness of ballistic evidence and increasing the proportion of recovered crime guns processed, with in-house correlation reviews taking an average of 2.8 days to perform. Following the implementation of DCGIC, correlation reviews were reduced to an average of 1.8 days. Additionally, the percent of recovered crime guns that were test-fired increased from 80% to over 90% with the implementation of the DCGIC. Perhaps most impressive is that the increases in timeliness of processing evidence occurred at the same time that the amount of evidence being processed had more than doubled.

The above metrics suggest a very effective implementation of the DCGIC. The DCGIC supported the dissemination of intelligence produced through NIBIN leads to investigators to support firearm crime investigations, as well as to command staff and other personnel responsible for developing violent crime reduction strategies. The intelligence bulletins contained additional intelligence information generated by the DCGIC analysts to support investigations and focus enforcement strategies. These efforts represent major achievements in the long-term goal of reducing firearm violence.

The DCGIC strategic plan links this increased ballistic evidence, NIBIN leads, and intelligence to the arrest and prosecution of violent offenders, and reduced levels of firearm violence through incapacitation of repeat shooters and deterrence for those who might be involved in firearm crime. Unfortunately, the COVID-19 pandemic precluded the ability to analyze the DCGIC's impact on prosecution and levels of firearm violence. The pandemic resulted in a suspension of court operations and then a major backlog in criminal court cases. Although we were able to show that NIBIN leads were connected to specific arrests and prosecutions, it was not possible to conduct a pre- and post-comparison of arrests, prosecutions, and adjudications.

Similarly, the pandemic precluded the ability to assess the impact of DCGIC on violent crime and shootings, specifically. As noted, the DCGIC became fully operational in January 2020. In March 2020, the pandemic resulted in personnel losses within DPD due to illness and quarantine, and the suspension of court operations. During the summer of 2020, like many other U.S. cities, Detroit experienced a period of social unrest following the in-custody death of George Floyd in

Minneapolis. Following patterns observed throughout the U.S., Detroit experienced a significant increase in fatal and non-fatal shootings beginning in spring/summer of 2020 and remaining until the second half of 2021. This external factor makes any analysis and interpretation of the trend in shootings related to the implementation of DCGIC impossible.

Indicators of DCGIC's impact on arrest and prosecution were available through the review of success stories generated by the DCGIC. Numerous examples existed whereby ballistic and crime gun evidence processed by DCGIC generated leads linking incidents, identifying individuals and groups involved in the shootings, and leading to arrests and prosecutions that may not have occurred absent the NIBIN evidence and intelligence. There were also clear indicators of intelligence being developed about individuals and groups involved in shootings and illegal firearms purchasing and trafficking to suggest the promise of the DCGIC.

Given the clear evidence of enhanced comprehensive collection of ballistic evidence, the timely processing of evidence, and the timely development of leads and intelligence, the DCGIC appears to be an important tool in Detroit's effort to reduce firearm violence and prevent fatal and non-fatal shooting victimizations. Ideally, continued assessment of the impact on prosecution and adjudication, and ultimately on the level of firearm crime, will be possible in a way not feasible during the pandemic period.[1]

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[1] Detroit has also invested in firearm detection technology. The roll-out of this technology complements the DCGIC. Additionally, the roll-out of the technology and the availability of data from the DCGIC, creates a valuable opportunity to evaluate the impact of the firearms detection technology.

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The establishment of the National Integrated Ballistic Information Network (NIBIN) in 1999, and subsequent growth in linked ballistic acquisition terminals placed in local agencies, has greatly expanded the capacity to address firearm violence in the United States (U.S.)[2]. The imaging technology completely altered the expediency in processing ballistic evidence to inform active investigations and improved the situational awareness of firearms violence within jurisdictions. The creation of the Crime Gun Intelligence Center (CGIC) model has provided the next step to enhancing the situational awareness of firearms violence while contributing to enhanced tactical and strategic intelligence on these offenses. This model represents a model for a federal and local partnership centered on streamlining the collection, processing, and dissemination of knowledge "in real time, in an effort to identify shooters, disrupt criminal activity, and prevent future violence."[3]

The multiple activities within the CGIC model are distilled into seven core steps:[4]

1. **Comprehensive Collection of Cartridge Cases and Crime Guns[5]** – The success of the CGIC model depends on the ingestion of all possible ballistic evidence from firearm crimes in order to provide links between guns and multiple shootings and shooters. This input of evidence is dependent on officers and investigators collecting all cartridge cases and guns left at crime scenes, along with conducting test-fires on recovered crime guns to collect cartridge cases to link events.

2. **NIBIN Entry/Correlation and Crime Gun Tracing** – To create timeliness in aiding investigative and intelligence efforts related to firearm crimes, the CGIC model sets the goal of entering all recovered cartridge cases and test-fired cartridge cases into NIBIN within 24 hours, along with submitting all recovered crime guns to the ATF National Tracing Center within 24 hours of recovery for purposes of eTrace processing.

3. **Crime Gun Intelligence Analysis** – NIBIN lead and eTrace results are analyzed by ATF and local law enforcement with the focus on providing the rapid dissemination of information to investigators of links between crime guns, crimes and offenders.

4. **NIBIN Lead/Hit Assignment and Analysis** – NIBIN leads are triaged and assigned to investigators, and results are shared with other area CGIC stakeholders to identify violent offenders.

5. **Law Enforcement and Prosecution Collaboration and Offender Arrest** – Investigators work with federal and local prosecutors to establish probable cause for firearm crime offender arrest.

6. **State or Federal Prosecution** – A strong partnership between federal and local prosecutors is important for supporting investigators and determining the venue of crime gun prosecution. Ideally, a local and federal prosecutor should be dedicated to work with the local CGIC to support appropriate prosecution of firearm crime offenders.

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[2] King, W. Wells, W., Katz, C., Maguire, E. & Frank, J. 2013. Opening the Black Box of NIBIN: A Descriptive Process and Outcome Evaluation of the Use of NIBIN and Its Effects on Criminal Investigations, Final Report. National Institute of Justice.

[3] National Policing Institute. CGIC Concept. http://cgici.wpengine.com/cgic-concept/.

[4] National Police Foundation. What is a Crime Gun Intelligence Center?: Overview for Local Law Enforcement. https://crimegunintelcenters.org/wp-content/uploads/2019/07/CGIC-Guidance-6.21.19.pdf.

[5] The term "crime gun" is used to refer to a firearm that has been used or is suspected to have been used in a crime, as well as a firearm that was illegally possessed.

7. **CGIC Feedback to Process Participants** – The CGCI feedback involves tracking the development of leads and the identification of suspects, arrests, and prosecution outcomes. Feedback on cases and the process is shared with stakeholders contributing to the CGIC effort to maintain involvement and continuous quality improvement.

Since the inception of the CGIC model, the Bureau of Justice Assistance (BJA) within the Office of Justice Programs has awarded funding to forty-six local sites to establish CGICs. This report focuses on the activity of the Detroit CGIC. This review starts with an overview of violence in Detroit, with specific consideration of firearm crimes and relevance to the CGIC model. This overview is followed by description of the CGIC development in Detroit to include the timeline of activities, processes, and practices. The outputs and outcomes of the Detroit CGIC (DCGIC) that align with the proposed model are then examined, with consideration of data limitations.

Gun Violence in Detroit

Detroit has long wrestled with high levels of violence, particularly homicide.[6] However, the number of homicides has been trending downward over the past two decades. Figure 1 presents the number of homicides in Detroit reported to the Uniform Crime Reporting (UCR) collected by Federal Bureau of Investigation from 1995 through 2019. The highest number of homicides was observed in 1995 with 475 reported, and the lowest in 2018 with 261. This is consistent with the overall decline in homicides experience by other large cities in the U.S. since the early 1990s[7].

Figure 1. Detroit Homicides 1995-2019
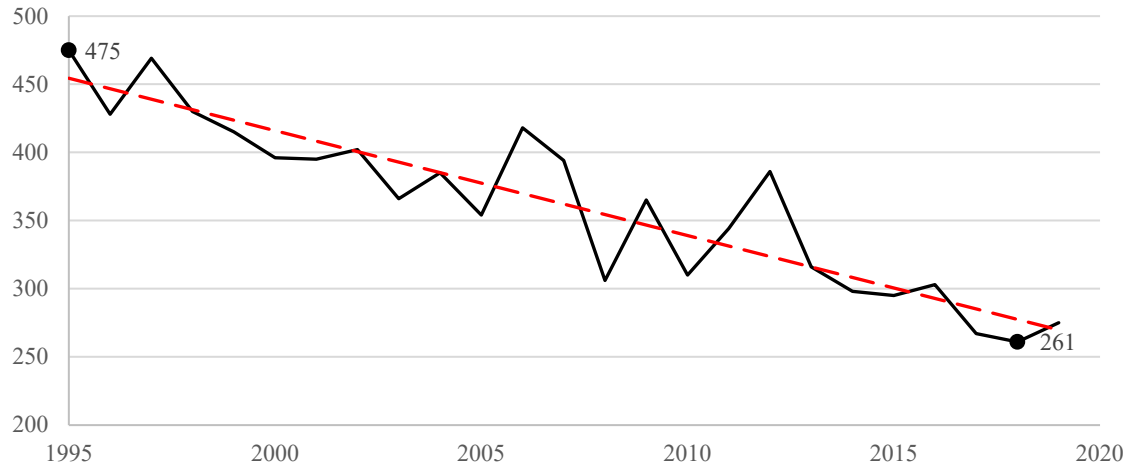
While this decline reflects positive news, annual homicide counts do not account for changes in population that may affect this trend. This acknowledgement is particularly relevant in the case of Detroit, which has experienced significant population declines. Based on the UCR population

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[6] Grommon, E., McCluskey, J.D. and Bynum, T.S. 2017. From Theory to Practice. In The Handbook of Homicide (eds F. Brookman, E.R. Maguire and M. Maguire). Circo, G. M., Krupa, J. M., McGarrell, E., & De Biasi, A. 2021. Focused Deterrence and Program Fidelity: Evaluating the Impact of Detroit Ceasefire. *Justice Evaluation Journal*, *4*(1), 112-130.

[7] Cooper, A., & Smith, E. L. 2011. Homicide trends in the United States, 1980–2008. *Washington, DC: Bureau of Justice Statistics*.

data, the Detroit population was 997,297 residents in 1995 compared to 663,502 residents in 2019. Figure 2 accounts for this population change by showing the homicide rate per 100,000 residents in Detroit from 1995 to 2019. The trend in the homicide rate over this period is relatively flat, with the highest rate observed in 2012 of 54.6 homicides per 100,000 residents and the lowest rate observed in 2009 of 33.8 homicides per 100,000 residents. Thus, the relative number of homicides per residents who have stayed in the city has remained stable.

Figure 2. Detroit Homicide Rate 1995-2019
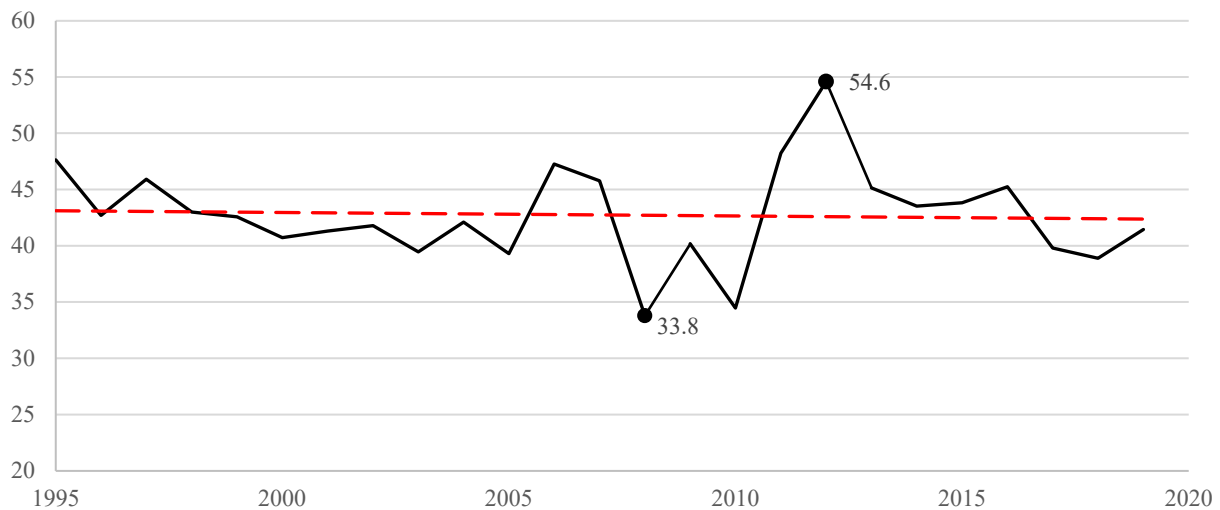
Although it is welcome news that the homicide rate for Detroit has fallen from its peak in 2012, the consistent rate of over 40 homicides per 100,000 residents is well above the national average (5.0 per 100,000 residents in 2019; 9.6 per 100,000 residents for cities over 250,000 population)[8] and Detroit is consistently among the U.S. cities with the highest homicide rates.

Additionally, what is absent in the above homicide trends is the number of these offenses that were committed with a firearm. At the national level, more than 70% of homicides were committed with a firearm in 2019, and the percent of homicides committed with a firearm over five years (2015-2019) ranged between 66% and 74%.[9] For more than four decades scholars have highlighted the prominent role of firearms in Detroit homicides.[10]

Of additional concern, for every homicide there were approximately 3-4 non-fatal shooting victims. That is, a shooting where someone is struck (i.e., injured) by a bullet but is not killed.[11] Table 1 presents the number of fatal and non-fatal shooting victims in Detroit from 2016 to 2019. Non-fatal shooting victims comprise the largest percentage of all shooting victims each year. During this period, Detroit has implemented a number of violence reduction strategies, including

[8] Federal Bureau of Investigation. 2019. Uniform Crime Reporting. https://ucr.fbi.gov/crime-in-the-u.s.-2019/tables/table-16

[9] Federal Bureau of Investigations. 2019. Uniform Crime Reporting. https://ucr.fbi.gov/crime-in-the-u.s/2019/crime-in-the-u.s.-2019/tables/expanded-homicide-data-table-8.xls.

[10] Fisher, J. C. 1976. Homicide in Detroit the role of firearms. *Criminology*, *14*(3), 387-400.McDowall, D. 1991. Firearm availability and homicide rates in Detroit, 1951–1986. *Social Forces*, *69*(4), 1085-1101.

[11] Hipple, N. K., Huebner, B. M., Lentz, T. S., McGarrell, E. F., & O'Brien, M. 2020. The Case for Studying Criminal Nonfatal Shootings: Evidence from Four Midwest Cities. *Justice Evaluation Journal, 3*(1), 94-113.

Detroit Ceasefire, Project Safe Neighborhoods, and Project Greenlight Detroit.[12] The good news, as illustrated in Table 1, is a downward trend in shooting victims from 2016 to 2019. It also reflects a continued downward trend since 2011 when there were 1,533 fatal and non-fatal shooting victims in Detroit.[13]

Table 1. Annual Number of Shooting Victims and Gun Recoveries in Detroit 2016-2019

Year	Fatal shooting victims	Non-fatal shooting victims	Total shooting victims	Number of recovered crime guns
2016	249	957	1,206	3,716
2017	220	841	1,061	3,901
2018	222	752	974	3,900
2019	228	765	993	3,780

From the CGIC perspective, it is important to note that the number of shooting victims presented in Table 1 only captures those that resulted in injury or death. Table 1 does not capture shootings where no individuals were hit. In addition, Table 1 shows that nearly 4,000 crime guns were recovered each year by the Detroit Police Department (DPD) through such incidents involving their illegal possession or use in a shooting event.

Despite these declines in the number of homicides and shootings, Detroit still maintains one of the highest levels of violent crime relative to other large cities. Table 2 provides a comparison of select offenses across Detroit and five comparable large Midwest cities. The population figures and the crime data are drawn from the UCR data and represent the averages from 2015 to 2019, with the crime data representing the rate per 100,000 residents. Detroit ranks only behind St. Louis, Missouri, in homicide, with a rate of 41.8 homicides per 100,000 residents compared to 62.1. As Table 2 illustrates, the remaining cities are notably lower than these top two cities. However, Detroit has the highest rate of aggravated assaults and overall violent crime relative to the five comparison cities. In 2020, Detroit ranked second behind Memphis, Tennessee, for having the most violent crime for cities with more than 100,000 residents based on UCR data.[14]

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[12] Circo, G. J. Krupa, E.F. McGarrell, and A. De Biasi. 2020. "The Individual-level Deterrent Effect of 'Call-in' Meetings on Time to Re-Arrest." *Crime & Delinquency,* 66(11), 1630-1651. Circo, G., Krupa, J., McGarrell, E.F., & De Biasi, A. 2021. Focused Deterrence and Program Fidelity: Evaluating the Impact of Detroit Ceasefire. *Justice Evaluation Journal* 4,1:112-130. Circo, G., McGarrell, E.F., Rogers, J.W., Krupa, J., & De Biasi, A. 2022. Assessing Causal Effects under Treatment Heterogeneity: An Evaluation of a CCTV Program in Detroit. *Journal of Experimental Criminology.*

[13] Circo, et al. Focused Deterrence, 118.

[14] Hunter, G. & Harding, H. (2021). Detroit remains among nation's most violent big cities, FBI statistics show. The Detroit News, September 27. https://www.detroitnews.com/story/news/local/michigan/2021/09/27/detroit-most-violent-big-us-cities-fbi-uniform-crime-report-2020/5883984001/.

Table 2. Five Year Average Comparative Crime Rates (2015-2019)

	Detroit	Cleveland	Columbus	Indianapolis*	Milwaukee	St. Louis
Population	669,693	384,518	876,232	869,599	596,460.6	309,856
Crime Rates (Per 100,000)						
Homicide	41.8	27.3	9.1	17.6	20.1	62.1
Robbery	408.7	607.1	264.2	412.6	473.6	552.1
Aggravated Assault	1,404.7	778.9	177.9	809.2	924.8	1,202.5
Violent Crime	1,967.2	1,538.5	546.3	1,317.3	1,494.4	1,908.1
Index I Crime	10,869.9	11,151.8	8462.7	10,633.6	8,596.5	14,129.0

* Note. Based on four-year average 2015-2018 as 2019 was not available.

In response to its ranking as one of the most violent cities in the U.S., Detroit has implemented several violence reduction strategies. These include a focused deterrence strategy (Ceasefire), focused and prioritized enforcement (Project Safe Neighborhoods), and a place-based strategy utilizing camera technology and a Real-Time Crime Center (Project Greenlight Detroit). In an effort to expand these violent crime reduction strategies, the city decided to implement a technology and intelligence-based strategy through a partnership between DPD and ATF. In this context, the CGIC model offers potential value for understanding and countering violence, specifically gun violence, that continues to impact Detroit. This is particularly relevant when considering the approximately 4,000 crime guns recovered annually. When combined with ballistic evidence from all incidents involving shots fired, the CGIC model was considered a potential excellent resource for developing investigative leads, and tactical and strategic intelligence in Detroit's efforts to prevent and reduce firearm violence.
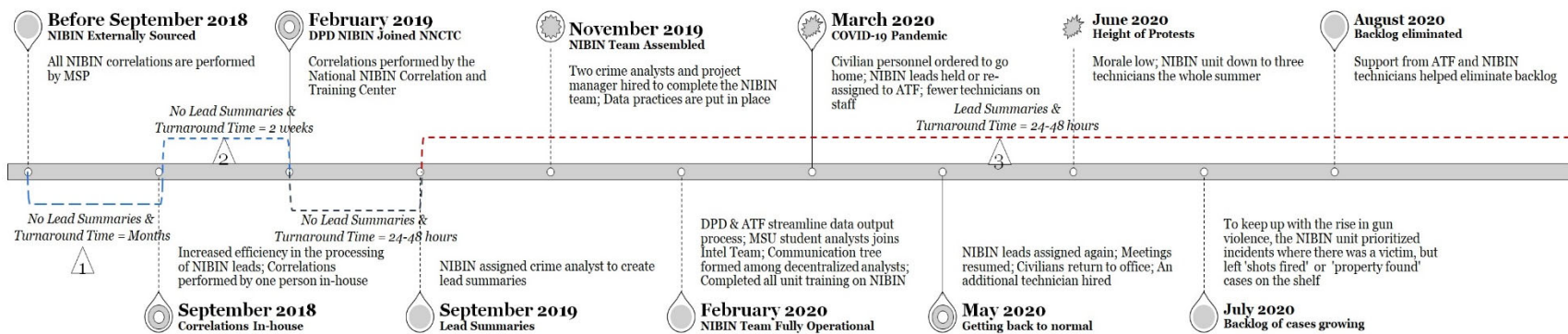
Detroit Crime Gun Intelligence Center

The DPD was awarded funding as a CGIC site in Fall 2018. At the time the department submitted its proposal, it was actively engaged or recently engaged in a number of funded violence reduction programs, such as Ceasefire, Project Safe Neighborhoods, GunStat, and Project Green Light Detroit. The Department had also been involved in pilot programs with the Michigan State Police for processing ballistic evidence and in the process of obtaining a NIBIN system (BRASSTRAX and MATCHPOINT) to be housed at DPD, along with entering into an MOU to support the system and related processes. The proposed plan for supporting DCGIC implementation involved hiring a program manager and crime analyst to support the management of leads, analytic efforts, and related intelligence dissemination. Additional components involved assigning task force officers to support training and the establishment of policy and procedures to support the DCGIC effort. The DCGIC would also be supported through a partnership with the Wayne County Prosecutors' Office, The Bureau of Alcohol, Tobacco, Firearms, and Explosives, Michigan Department of Corrections, and Michigan State University (MSU - Research Partner).

The implementation of the DCGIC initiative required a number of efforts before going operational. Figure 3 provides some of the key points in the implantation timeline. One of the critical steps came at roughly the same time when DPD was awarded the CGIC funding. Specifically, the department was provided equipment to establish NIBIN processing in-house in September of 2018. Prior to this point, all ballistic evidence related to NIBIN for Detroit was handled by the Michigan State Police (MSP). Historically, the MSP labs were responsible for processing ballistic evidence for all law enforcement agencies in the state. This was fine in terms of the mission of forensic evidence to be used in court proceedings but was problematic in terms of providing timely leads and intelligence to enhance investigations. As Figure 3 notes, it would take weeks and sometimes months for scene cartridge cases or cartridge cases from test-fires to be processed in light of MSP being responsible for all ballistic processing and given staffing and equipment constraints.

In February 2019, the DPD participated in a National Resource and Technical Assistance Center (NRTAC) assessment managed by the National Police Foundation[15] to review existing DCGIC related policies and processes. This provided a gap analysis to support the further development of the CGIC model in the department. The NRTAC provided thirty-four recommendations that the DPD incorporated as needed to fit the development of their CGIC model.

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[15] National Policing Institute is formally known as the National Police Foundation. The Institute provided training and technical assistance for BJA's CGIC funding program.

Figure 3. Timeline of DCGIC Implementation

Before September 2018
NIBIN Externally Sourced

All NIBIN correlations are performed by MSP

No Lead Summaries & Turnaround Time = 2 weeks

No Lead Summaries & Turnaround Time = Months
①

No Lead Summaries & Turnaround Time = 24-48 hours
②

February 2019
DPD NIBIN Joined NNCTC

Correlations performed by the National NIBIN Correlation and Training Center

September 2018
Correlations In-house

Increased efficiency in the processing of NIBIN leads; Correlations performed by one person in-house

November 2019
NIBIN Team Assembled

Two crime analysts and project manager hired to complete the NIBIN team; Data practices are put in place

NIBIN assigned crime analyst to create lead summaries

September 2019
Lead Summaries

March 2020
COVID-19 Pandemic

Civilian personnel ordered to go home; NIBIN leads held or re-assigned to ATF; fewer technicians on staff

Lead Summaries & Turnaround Time = 24-48 hours
③

DPD & ATF streamline data output process; MSU student analysts joins Intel Team; Communication tree formed among decentralized analysts; Completed all unit training on NIBIN

February 2020
NIBIN Team Fully Operational

June 2020
Height of Protests

Morale low; NIBIN unit down to three technicians the whole summer

NIBIN leads assigned again; Meetings resumed; Civilians return to office; An additional technician hired

May 2020
Getting back to normal

August 2020
Backlog eliminated

Support from ATF and NIBIN technicians helped eliminate backlog

To keep up with the rise in gun violence, the NIBIN unit prioritized incidents where there was a victim, but left 'shots fired' or 'property found' cases on the shelf

July 2020
Backlog of cases growing

The DPD then established the strategic plan for the DCGIC in September 2019. The plan articulated the implementation of a four-prong approach:

1. **Timely Processing of Evidence** – processing all evidence and disseminate related leads within 48 hours of the crime in an effort to provide real-time results. This would be supported by processes that would streamline this effort and cross-training personnel for the efficiencies in having individuals who could perform multiple tasks. Included was the establishment of a NIBIN Lead triage process for prioritizing investigative efforts.
2. **Collaboration Across Investigations** – fostering communication across different investigative units within the department and outside law enforcement by sharing intelligence, evidence and other resource assisting in linking firearm crimes to identify trigger pullers/serial shooters.
3. **Investigated Straw Purchases and Firearm Trafficking** – moving beyond the identification of individual trigger pullers/serial shooters for given firearm crimes to address the supply of firearms used in crimes through partnerships with other agencies to conduct follow-on investigations to address the network of offenders that make straw purchases and traffic firearms.
4. **High Impact Prosecution** – work collaboratively with federal and local prosecutors to determine the prosecution path that will have the greatest impact in the interest of justice and promote deterrence to other potential crime gun offenders by seeking the highest possible sanctions.

By Novembers 2019 the project manager and two crime analysts were hired to support the DCGIC, and a student intern analyst from the MSU research partner would join the Center by February 2020. Thus, by January 1, 2020, the strategic plan, personnel, policies, training, and various analysis and dissemination practices where largely in place for the DCGIC to be operational. However, in March 2020 the DCGIC, DPD generally, and its partners were impacted by the COVID-19 pandemic along with the rest of the nation and world. As illustrated in Figure 2, civilian staff were ordered to go home in March 2020, but returned in May 2020. However, the DCGIC also experienced turnover in staff, shortages of personnel to accomplish tasks from reduced staffing and temporary furloughs and increased demand on department resources with the succession of post-Floyd protests occurring in the city. This resulted in a backlog of acquisitions to process in the summer of 2020 that the center was able to eventually eliminate with the assistance of the ATF.

The following sections of this report examine the measurable activity of the unit. The first section examined the acquisition and lead activity, which represent some of the key outputs of DCGICs. In order to evaluate any change in output, activity 30 month prior to January 1, 2020 and 30 months after this date are examined. The following section assesses impact of the DCGIC through a series of outcome measures, related adjudication activity, and a more nuanced review of select individual cases handled by the DCGIC.

NIBIN Acquisitions and Lead Activity

We adopt a pre-post (or before-after) design to evaluate the output activity of the DCGIC on four key NIBIN metrics.[16]

1. *NIBIN Acquisitions*. NIBIN acquisitions are pieces of ballistic evidence submitted into NIBIN at a NIBIN acquisition station. Test-fires and cartridge cases are two types of ballistic evidence.
2. *Test-fires*. When a crime gun is recovered, it is test-fired and its cartridge case submitted into NIBIN at a NIBIN acquisition station. The test-fired cartridge case is referred to as a "test-fire."
3. *Cartridge Cases*. Cartridge cases are collected at the scene of shooting events and submitted into NIBIN at a NIBIN acquisition station.
4. *NIBIN Leads*. NIBIN leads are identified by NIBIN technicians from a correlation analysis of ballistic evidence submitted into NIBIN. NIBIN leads connect two or more shooting events (see ATF [2021], for a detailed description of the process by which NIBIN leads are identified).

In total, the pre- and post-periods capture 60 months, which are split equally among the periods. Specifically, the pre-period begins July 2017 and ends December 2019. During this period, DPD relied heavily on the Michigan State Police to fulfill its NIBIN requests until September of 2018 and was without the support of the NIBIN National Correlation and Training Center (NNCTC) until February 2019. The post-study period begins January 2020 and ends June 2022. While DPD received funds to support the DCGIC in the Fall of 2019, it was not until the following year that it was fully operational. During the post-period, the DCGIC was held to the minimum required operating standards (MROS) for NIBIN sites and received the support of the NNCTC.[17]

NIBIN Acquisitions

Figure 4 shows the monthly number of NIBIN acquisitions during the pre- and post-periods. While more pronounced in the post-period, the monthly number of NIBIN acquisitions declines each year during the winter holiday months. This trend may reflect a lag in the processing of NIBIN acquisitions while staff are on holiday and is observed for all NIBIN metrics. The pre-period captures a total of 11,616 NIBIN acquisitions, with a median of 381 NIBIN acquisitions per month. The monthly number of NIBIN acquisitions remained relatively stable during this period, reaching a peak of 653 NIBIN acquisitions in August 2017. In comparison, the monthly number of NIBIN acquisitions grew remarkably during the post-period, steeply rising during the initial months of the DCGIC and reaching a peak of 1,335 NIBIN acquisitions in August 2020. Furthermore, the post-period captures a total of 25,624 NIBIN acquisitions, reflecting a 121% increase from the pre-period total. The median number of NIBIN acquisitions per month was 850, which is over twice as high as the pre-period median.

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[16] These data were made available from NESS by the Detroit Police Department to support the academic research team in the DCGIC assessment. These data should be treated as preliminary and may be subject to change as ballistic evidence is updated in NIBIN and new data management practices are adopted.

[17] Bureau of Alcohol, Tobacco, Firearms, and Explosives. (2018). Minimum required operating standards audit for National Integrated Ballistic Information Network sites. Author. https://www.atf.gov/file/133581/download

Figure 4: Monthly Number of NIBIN Acquisitions.
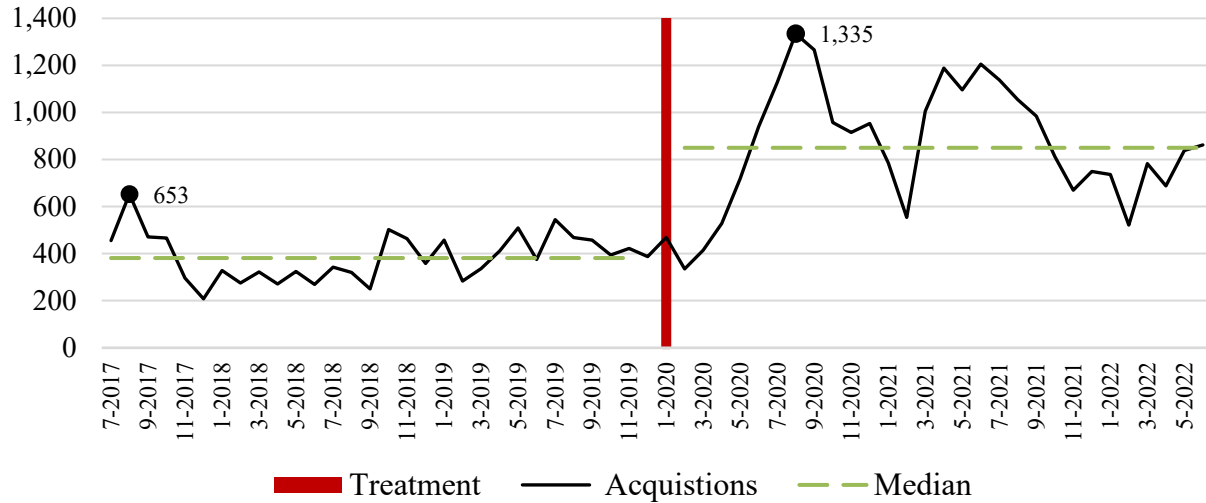
Test-fires & Cartridge Cases

For ease of comparison, Figure 5 shows the monthly number of test-fires and cartridge cases submitted into NIBIN during the pre- and post-periods. With few exceptions, the monthly number of test-fires exceeds the monthly number of cartridge cases. In the pre-DCGIC period 38.1 percent of acquisitions were from cartridge cases compared to 61.9 percent from test-fires. Similarly in the post-test period, 40 percent of acquisitions were from cartridge cases and 60 percent from test-fires. Figure 5 also illustrates an increase in both test-fire and cartridge cases in the post-DCGIC period.
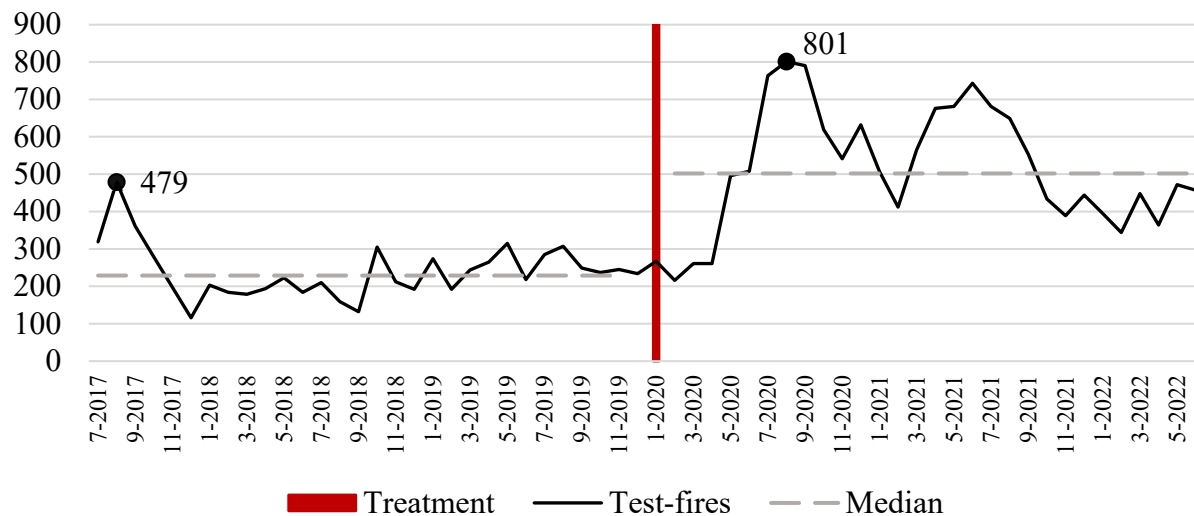
Figure 5: Monthly Number of Test-fires and Cartridge Case.
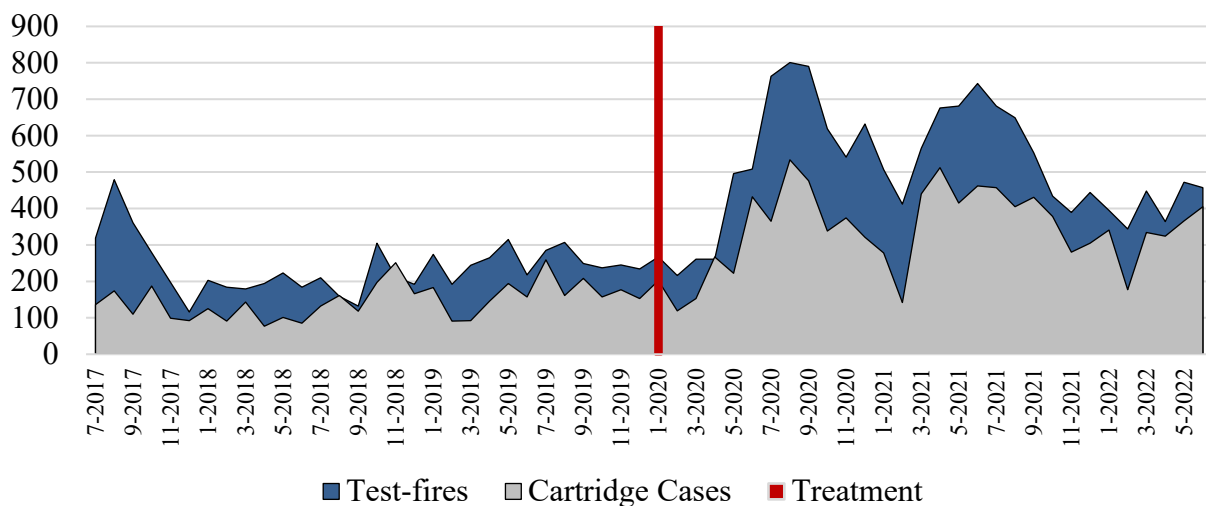
Figure 6 shows the monthly number of test-fires submitted into NIBIN during the pre- and post-periods. The pre-period captures a total of 7,193 test-fires, with a median number of 229 test-fires per month. Following a steep decline from a peak of 479 test-fires in August 2017, the monthly number of test-fires remained relatively stable for following months of the pre-period. In comparison, the post-period captures 15,369 test-fires, reflecting a 114% increase from the pre-period total. During the initial months of the pre-period, the monthly number of test-fires experienced tremendous growth, reaching a peak of 801 test-fires in August 2020. Furthermore, the median number of test-fires per month was 502, which is over twice as large as the pre-period median.

Figure 6 Monthly Number of Test-fires.

Figure 7 shows the monthly number of cartridge cases submitted into NIBIN during the pre- and post-periods. The pre-period captures a total of 4,423 cartridge cases, with a median number of 150 cartridge cases per month. The monthly number of cartridge cases experienced little change during the pre-period, reaching a peak of 259 cartridge cases in July 2019. In comparison, the post-period captures 10,255 cartridge cases, reflecting a 132% increase from the pre-period total. Following the trend in the monthly number of test-fires, the monthly number of cartridge cases grew rapidly during the initial months of the post-period, reaching a peak of 534 cartridge cases in August 2020. Furthermore, the median number of cartridge cases per month was 353, which is over twice as large as the pre-period median.

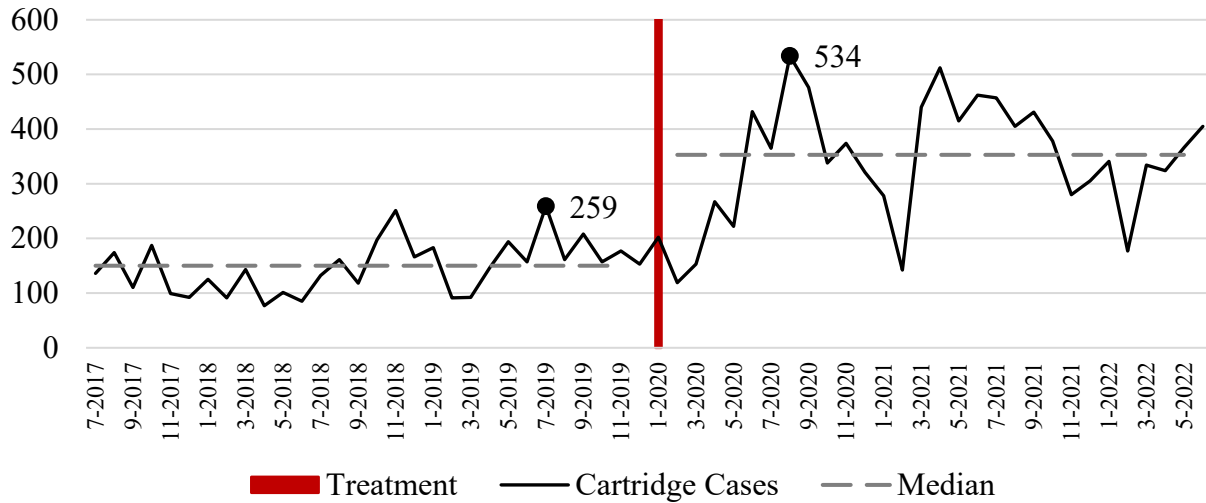Figure 7: Monthly Number of Cartridge Cases.

Figure 8 shows the monthly number of NIBIN acquisitions for which a NIBIN lead was identified during the pre- and post-periods. The pre-period captures a total of 1,921 NIBIN leads, with a median of 52 NIBIN leads per month. As more ballistic evidence was submitted into NIBIN, the monthly number of NIBIN leads slowly grew during the period, achieving a peak of 122 NIBIN leads in November 2019. In comparison, the monthly number of NIBIN leads drastically increased during the post-period, steeply rising during the initial months of the DCGIC and reaching a peak of 329 NIBIN leads in April 2021. Furthermore, the post-period captures a total of 6,313 NIBIN leads, reflecting a 229% increase from the pre-period total. The median number of NIBIN leads per month was 221, which is over four times as large as the pre-period median.

Figure 8 Monthly Number of NIBIN Leads.
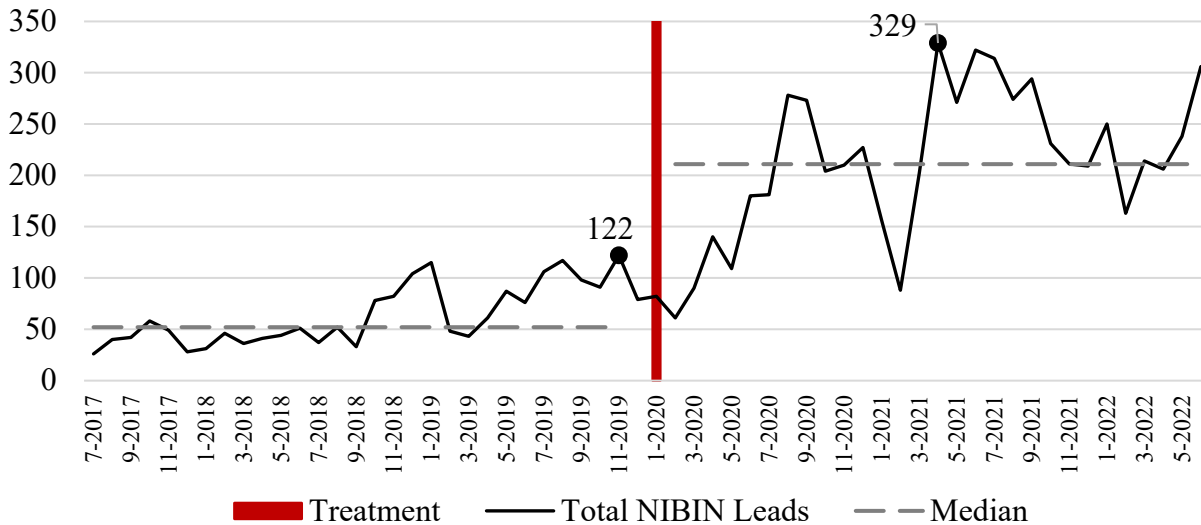
Impact of the Detroit Crime Gun Intelligence Center

The data on NIBIN acquisitions and NIBIN leads provide evidence of a clear increase in this activity from the DCGIC once the center became operational. An important consideration in reviewing this data is whether the change is due to the center increasing the capacity of the department to process ballistic evidence that previously was not being accomplished or whether the change is due to another factor driving an increase in ballistic evidence after January 2020. In relation to this last possibility, there has been a measurable increase in firearm violence observed nationally since the onset of the COVID-19 pandemic and specifically following the May 2020 period of social protests following the in-custody death of George Floyd in Minneapolis[18] These trends have also been witnessed in Detroit.[19] Figure 9 presents the number of fatal and non-fatal shooting victims over the pre- and post-DCGIC periods (July through September 2022 was added beyond the thirty month post-CGIC period in Figure 9 to illustrate the seasonal pattern, but assessment is based only on thirty month prior to DCGIC implementation and thirty months after). In the pre-DCGIC period there were a total of 2,509 fatal and non-fatal shooting victims in Detroit, with July 2019 present the peak month of shooting with 131 incidents. By comparison, there were 3,345 fatal and non-fatal shooting victims in the thirty-month post-DCGIC period, with a peak of 215 shooting victims in June 2020. This reflects at 33% increase in shootings during the post-DCGIC period.

Figure 9. Number of Fatal and Non-Fatal Shooting Victims.
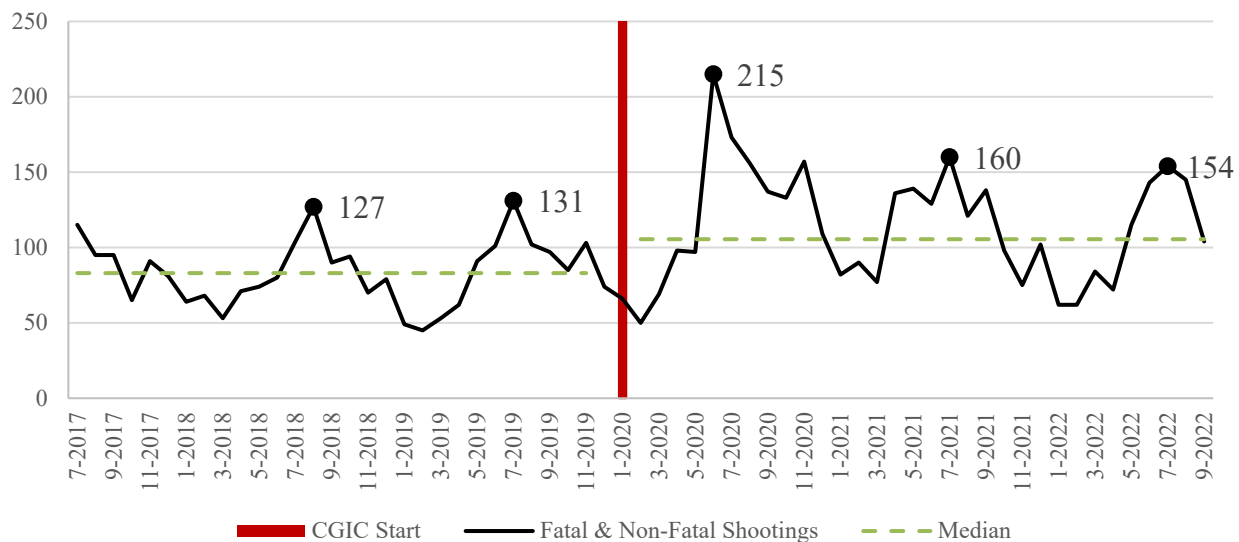
This would suggest some part of the increase in acquisitions processed by the DCGIC was driven by a sizable increase in the number of shootings that occurred during the post-DCGIC period. This would further suggest that the DCGIC was allowing the DPD to process a higher volume of ballistic evidence

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[18] Schleimer, J. P., McCort, C. D., Shev, A. B., Pear, V. A., Tomsich, E., De Biasi, A., ... & Wintemute, G. J. 2021. Firearm purchasing and firearm violence during the coronavirus pandemic in the United States: a cross-sectional study. *Injury epidemiology*, *8*(1), 1-10.
[19] De Biasi, A., Circo, G., Krupa, J., Rzotkiewicz, A., & Liebler, J. 2022. An investigation of the impact of the pandemic era on shooting victimizations in Detroit, Michigan. *Journal of Crime and Justice*, 1-17.

resulting from the increase in firearm crimes. Yet, as was shown in the prior sections, the increase in ballistic evidence processed and leads generated since the inception of the DCGIC is well above the increase in fatal and non-fatal shooting incidents indicating the DCGIC is processing more ballistic evidence and producing leads beyond that from the increase in shooting incidents.

Ideally, the implementation of a CGIC in a given jurisdiction would reduce levels of firearm violence over time. An underlying assumption of the CGIC model is there are serial shooters active in communities and the linking of ballistic evidence will identify these individuals. The subsequent effective prosecution of these individuals will lead to their removal from the community and reduce violence. Unfortunately, the increase in violence in Detroit and nationwide due to larger external influences precludes the ability isolate the impact of CGIC on firearms violence. Given CGIC was introduced as a department-wide initiative rather than being introduced in select precincts, there is also no ability examine the impact on firearms violence across CGIC and non-CGIC precincts.

Despite these limitations in evaluating the impact of the DCGIC on firearm violence, there are other important impacts of the DCGIC implementation that can be examined. Did the implementation lead to more efficient processing of ballistic evidence? Did implementation increase the collection of ballistic evidence in the field and from seized crime guns? Where there prosecuted cases that involved evidence generated by DCGIC activity (e.g. NIBIN leads)? Who prosecuted these cases and what were the types of criminal charges? What are examples of how DCGIC activity, such as NIBIN leads, provided information that assisted in active investigations or contributed to the situation awareness of firearm crime in the city?

Change in Acquisition Practice

As articulated above, the timeliness of processing ballistic evidence is central to the CGIC model. The first goal in the DCGIC strategic plan calls for processing of evidence and dissmenation of related leads within 48 hours of the crime. Figure 3 above illustrates that prior to September 2018, all DPD ballistic evidence was triaged and processed into NIBIN by MSP, with a turnaround time that was weeks or months. It also notes how this timeframe was shortened to two weeks and eventually 24 to 48 hours with the placement of a NIBIN acquistion station at DPD and trained personnel. Figure 10 provides more detail on these changes, showing the monthly trend in the median number of days between when an offense occurred and when related ballistic evidence was triaged and entered into the NIBIN system.This trend is shown relative to indicators of when the NIBIN acquistion station was installed in September 2018 and DCGIC was operational in January 2020.

Figure 10. Median Number of days from offense incident to acquisition by month
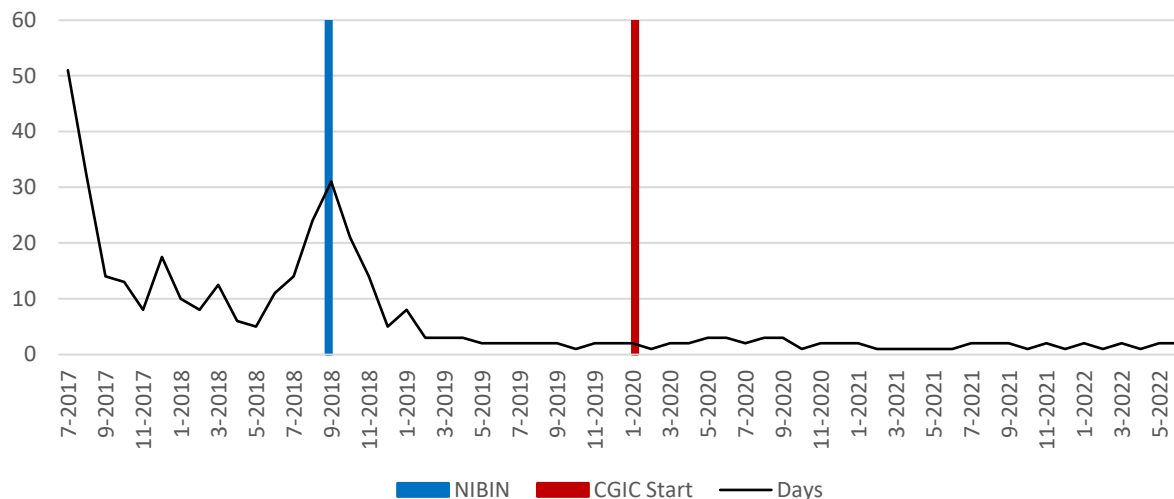
In the period before the NIBIN station or DCGIC, the department was requesting MSP to process bewteen 653 and 208 cartridge cases per month (see Figure 4). The monthly median crime to acquistion ranged from 51 to 5 days, with a mean between the months of 10.8 days.[20] In the month leading up September 2018, the median number of days per month increased and precipitously dropped after this date, suggesting a backlog while waiting to transition to processing in-house and quickly reducing this backlog. By early 2019, the median number of days was ranging from 1 to 3 days leading up to DCGIC becoming operational, a mean across the months of 2.8 days.[21] During the post-DCGIC period, when the total number of acquistion had more than doubled, the center increased efficiency with a processing time from crime to system acquisitions to a mean of 1.8 days. In fact, there were 11 months after the DCGIC became operational where the median was one day, where this only occurred once after the NIBIN station was operation before DCGIC and never occurred before the NIBIN station.

Along with increasing efficiency, a CGIC should incentivize department personnel beyond the designated CGIC unit to increase the volume of evidence collected and by doing so its potential to lend investigative support and situation awareness. This would mean test-firing all NIBIN eligible recovered crime guns, as defined by ATF's MROS for NIBIN sites, and improving the diligence of officers in the field to collect cartridge cases at the scene of shootings.[22] The data provided on DCGIC outputs show that roughly 60% of acquisitions across the pre-/post-DCGIC period come from test-fires, with both the number of recovered crime guns and test-fires increasing considerably shortly after DCGIC became operational. Figure 11 shows the monthly number of recovered crime guns along with the monthly number of test-fires before and after the implementation of DCGIC. The trends in the number of recovered crime guns and test-fires largely mirror one another and suggest that a large portion of recovered crime guns were test-fired.

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[20] Based on 11 months, with 3 months removed for being considerably above the trend

[21] Based on 13 months, with 3 months removed for being considerably above the trend

[22] Bureau of Alcohol, Tobacco, Firearms, and Explosives. (2018). Minimum required operating standards audit for National Integrated Ballistic Information Network sites. Author. https://www.atf.gov/file/133581/download

Figure 11. Number of recovered crime guns and number of test-fires by month
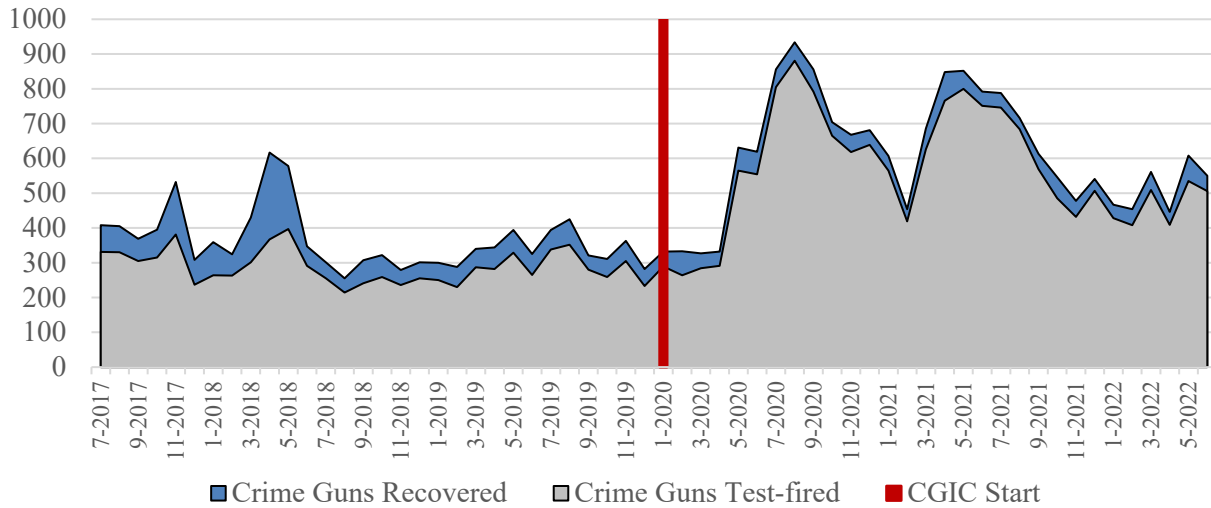
Further supporting this claim, Figure 12 shows the monthly percent of recovered crime guns that were test-fired for before and after DCGIC implementation. Prior to the implementation of the DCGIC, the median percent of test-fired recovered crime guns was 80.6%, with September of 2019 having the highest percent at 87.2%.[23] After the DCGIC became operational, the median percent of test-fired recovered crime guns was 91.2%. This finding suggests by policy and practice that the implementation of the DCGIC created the incentive to increase the number of test-fires.

Figure 12. Percent of Recovered Crime Guns that were test-fired by month
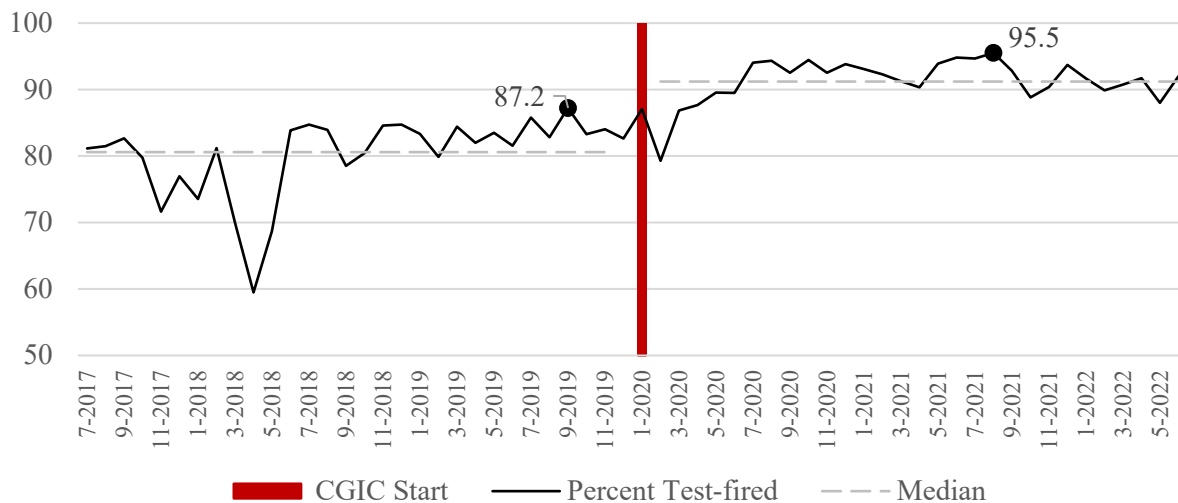
The increase in ballistic evidence from cartridge cases retrieved from the scene of shootings offers an even greater potential than what is found with test-fires from DCGIC implementation. Prior to the implementation of DCGIC, the department already conducted test-fires of most recovered crime guns. As

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[23] Based on 29 months, with 1 month (April 2018) removed for being considerably below the trend

a result, there is only a marginal increase under the incentive to increase ballistic evidence for the CGIC model that can be gained before reaching a 100 percent of guns being test-fired. Alternatively, shooting incidents may have a variety of outcomes: fatal, non-fatal wounding, rounds hitting property (e.g., dwelling or vehicle) but no injuries, and incidents with no injuries or evidence of property damage. It is reasonable to assume the department has long had incentive to collect cartridge cases when present for a fatal or non-fatal shootings as it aids in the investigation and potential prosecution of a serious offense. It is also reasonable to assume that with high levels of overall crime in the city and limited resources for managing this activity, there may be less of an incentive for officers to spend time canvasing the scene for cartridge cases or department dedicating crime scene personnel for this effort for non-injury shootings. This difference in evidence collection efforts for type of shooting subsequently reduces the potential shootings that can be linked via NIBIN.

The commitment to implement the DCGIC should incentivize the department to increase collection of cartridge cases from non-jury incidents to increase the investigative and intelligence capacity of the Center. Figure 13 presents the monthly number of fatal/non-fatal shooting victims over monthly number of cartridge cases recovered from shootings incidents. Shootings with cartridge cases for one or more guns is counted as one incident to be comparable to the fatal/non-fatal victim shootings counts. As a result, the totals for shooting incidents with cartridge cases reflects a lower count than cartridge case acquisitions in the above output examination, which is measured at the gun level. Moreover, the data on for shooting incidents with cartridge cases and fatal/non-fatal shooting victims are not linked. Rather the former is the DPD NESS data and the latter a separate fatal/non-fatal shooting victim database.

The assessment of this data rests on the assumption that if there is little difference in the monthly counts of both data, then there is likely little effort to collect cartridge cases evidence beyond fatal/non-fatal shooting victimizations, whereas a number of cartridge cases recovered being much greater that fatal/non-fatal shooting victimizations would be evidence of a more comprehensive cartridge case evidence collection effort. Figure 13 shows that trends in shooting incidents where cartridge cases were recovered generally mirror the number of fatal/non-fatal shooting victimizations prior to the DCGIC becoming operational. However, after implementation, there is considerable visual divergence where the number of shootings incident where cartridge cases were recovered greatly increases relative to the number of fatal/non-fatal shooting victimizations.

Figure 13. Fatal/non-fatal shooting victims and shooting incidents with cartridge cases acquired
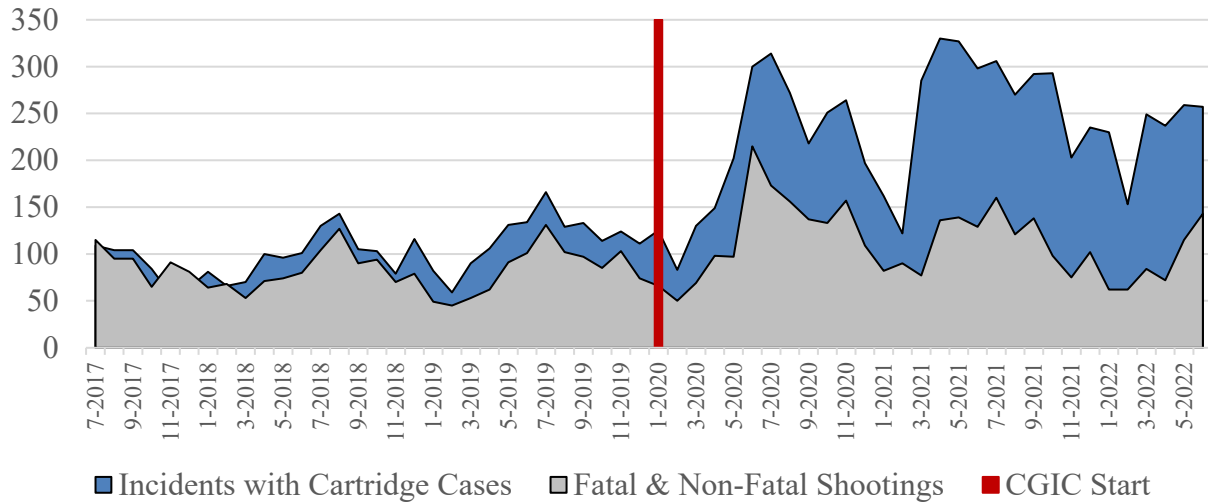

Figure 14 provides a more direct comparison by looking at the monthly ratio of shooting incidents where cartridge cases were recovered over the number fatal/non-fatal shooting victimizations. Prior to the DCGIC being operational, the median ratio across the thirty months was 1.26, with the highest ratio of 1.71 in April 2019. By comparison, the median for the 30 months after DCGIC was operation was 2.03, with the highest ratio 3.71 in January 2022. This would suggest the implementation of the DCGIC created an incentive for the DPD to implement policy and practice that increased the collection of cartridge case evidence from shooting scenes well beyond the fatalities or non-fatal wounding.

Figure 14. Ratio of number cartridge cases acquired by number of fatal/non-fatal shootings
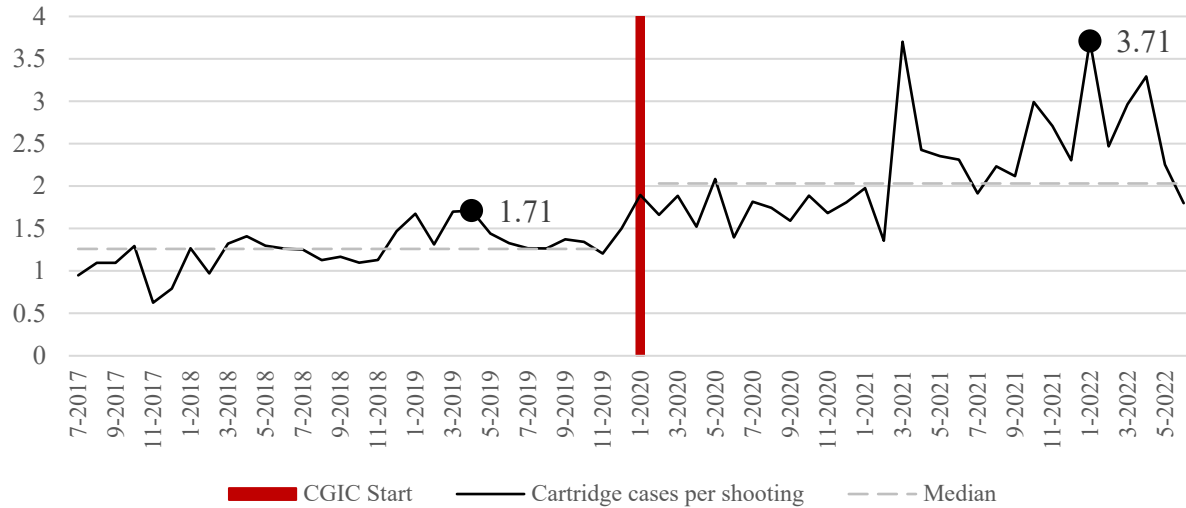
Adjudication

The DCGIC developed an adjudication tracker to capture cases where a NIBIN lead was provided and where there was some form of prosecutorial effort. There are limitations to the data that restrict analysis. Of prime concern are the delay from incident to arrest and eventual disposition of the case. This concern was magnified due to the impact of the COVID-19 pandemic on court operations. The court system was suspended for most operations for much of 2020 and into 2021. This resulted in a significant backlog of cases. Partly due to these pandemic-related effects, but also due to information system limits in prosecution and court systems, the final disposition of a prosecutorial effort was not consistently captured, restricting the ability to accurately look at the number of individuals convicted and sentenced. In addition, it is unknown to what degree a NIBIN lead played in the investigation and eventual prosecution. The NIBIN lead may have been immaterial to the case, collaborated other evidence, or been the critical link to make the case.

Despite these limitations, the adjudication data does provide some insights. One of the goals of the national CGIC model and the DCGIC is to build collaborative relationships with federal and local prosecutors to identify the best path for prosecution of related gun offenses. There were 676 individuals charged with offenses that were tied to a NIBIN lead.[24] Figure 15 illustrates there was involvement of federal and local prosecutors in these cases that reflect this collaboration. A total of 6% of prosecutions of individuals were adopted at the federal level (n=40) and 94% were handled at the state prosecution level (n-636).[25]

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[24] 135 of the individuals that were tied to NIBIN leads that data between February 2019 and December 2019, prior to DCGIC fit the definition of operational in this report. There were also 16 cases of individuals prosecuted where the lead was received between July 1, 2022 and July 11, 2022.

[25] As part of Detroit's Ceasefire, Project Safe Neighborhoods, and GUNSTAT programs, Wayne County Prosecutors and Assistant U.S. Attorneys (federal prosecutors), supported by DPD investigators and ATF agents, jointly review all firearm crime incidents to determine the appropriate prosecution venue. With the implementation of DCGIC, this review process receives additional intelligence from DCGIC analysts.

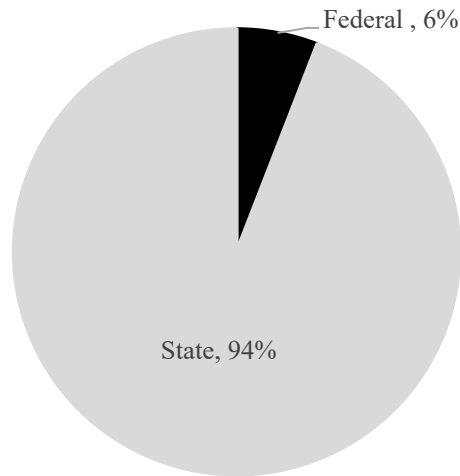Figure 15. Level of prosecution for cases with NIBIN lead

Federal , 6%

State, 94%

Table 3 presents number of charges by offense category for the individuals prosected. Given some individuals faced multiple charges, the total number of offenses exceeds the 647 prosecuted individuals captured in this table.[26] The most frequent charges were for weapon possession offenses (e.g., illegal carrying conceal firearm, felon in passion of a firearm) at 739 charges, which may have been in conjunction with another violent offense or stand-alone charge. This was following by use of a firearm in commission of a felony and assault offenses (e.g., assault with intent to commit murder, assault with great bodily injury).

It is important to note that in the period that is captured with this adjudication data (February 2019-June 2022) there were 904 fatal shootings, yet there were only 66 charges for homicide related offenses. A number of fatal shootings may be unsolved, with no identified suspect to prosecute, and some smaller portion of cases may have occurred later in this time period where a prosecution of an identified suspect has not moved forward. However, it also suggests there are a number of fatal shootings not tied to a prior shooting, and thereby does not have a NIBIN lead that would result in its inclusion in Table 3.

Table 3. Number of charges by offense type for cases with NIBIN lead.

OFFENSE TYPE	NUMBER OF CHARGES
Homicide Offenses	66
Assault Offenses	339
Other Violent Offenses	139
Use of Firearm in Commission of Felony	414
Weapon Possession Offenses	739
Other Offenses	198

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[26] 29 individuals were dropped from this analysis as they had no listed charges.

Given the limitations with the prosecution and adjudication data, further analysis of the impact of DCGIC on arrest, prosecution, and sentencing in a post-pandemic environment is warranted.

Success Stories

Beyond the increased collection and processing of ballistic evidence, the increase in leads, and the impact on arrest and prosecution, the DCGIC identified NIBIN-related success stories and included summaries of the incidents in a weekly bulletin. The bulletin typically summarized multiple incidents whereby investigations were enhanced through ballistic evidence submitted to the DCGIC and resulting intelligence that emerged (e.g., leads generated, link analysis from associated incidents, trace information, etc.). The bulletins were shared with command staff, investigators, officers, and other key stakeholders. The bulletins served the function of providing feedback on the impact of comprehensive collection, NIBIN analysis, intelligence bulletins, and the entire DCGIC process on investigations and associated enforcement and intervention actions. The criteria for identifying success stories included:

- Disruption of Serial Shooters
- Carrying Concealed Weapon (CCW) Arrest Linked to Other Incidents
- Solved a Violent Crime
- Identification of Shooters
- Public and Officer Safety

The DCGIC analysts also collected additional data related to the success factors. These included the following factors:

- Gang Related
- Guilty Plea
- Sentencing
- Video Evidence
- Gun Recovery
- Warrant Status
- Multiple Suspects

Characteristics of DCGIC Success Stories

In an effort to better understand the impact of DCGIC, we reviewed DCGIC bulletins produced from January 31, 2020 (the initial bulletin) to September 16, 2022. We had bulletins for 100 weeks over this time period.[27] The majority of the bulletins presented two success stories, with an occasional bulletin containing just one or up to three success stories. The summaries typically described the links between two or more criminal incidents that were linked through cartridge cases and seized crime guns processed by the DCGIC. The 100 bulletins reviewed covered 203 success stories, which reported the linking of anywhere from two to seven firearm crime incidents.

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[27] No bulletins were available for 37 weeks. This appeared to be due to holiday periods, vacations, and where other demands on DCGIC staff precluded the production of a bulletin.

We reviewed the success stories for the type of crimes involved in each of the firearm crime incidents, the outcome as it relates to the furtherance of the investigation, and whether the cases involved in the success stories highlighted had a gang nexus.

The review of the crimes involved in the success stories used a hierarchical ranking of firearm crime incidents per firearm crime event within each success story:

1. Homicide
2. Assault with a firearm – reflecting a shooting where a victim was struck by a bullet.
3. Shooting at property – reflecting a shooting with no person victim, but a dwelling, business, or vehicle was struck by a bullet
4. Shots fired – reflecting a shooting with no victim or reported property damage.
5. Possession of firearm offense
6. Other – non-firearm crime offenses (e.g., stolen vehicle with firearms seizure)

We used this approach as the description of each crime within a success story did not capture all criminal violations in the incident, but did highlight the relevant firearm crime that factored into the designation of a success story. As a result, we classified each primary firearm crime using the following ranking, with homicide being the highest ranked offense and "other" the lowest rank. As a result, if a crime gun incident involved a homicide and an assault with a firearm, the primary crime for the event would be a homicide.

Table 4 presents the comprehensive count of firearm crime incidents captured in the 203 success stories. Given the success stories contained more than one crime incident per success story, the total reported number of primary firearm crimes exceeded the number of success stories. As demonstrated, assault with a firearm, many of which involve a non-fatal shooting[28], was the most common firearm crime incident identified in the success stories (40%). Shots fired at property accounted for 20 percent of the incidents with homicides, shots fired, and possession of a firearm the other most common incidents.

Table 4. Primary firearm crime for incidents with the success stories.

Crime	Number of cases	Percent
Homicide	67	13%
Assault with a firearm	206	40%
Shooting at property	103	20%
Shots fired	60	12%
Possession of firearm offense	62	12%
Other	11	2%
Total	509	100%

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[28] Assault with a firearm can include incidents where the victim is not actually struck with a bullet. Thus, the category is broader than non-fatal shooting incidents.

Table 5 presents the primary or most serious offense captured in the success stories. Where Table 2 captures all the primary firearm crime for each incident across the success stories, Table 5 captures the most serious offense across all incidents within each success story. In short, it highlights the most serious offense the work of DCGIC contributed to addressing. As displayed in the Table, assaults with a firearm and homicides were the most serious incidents accounting for 85% of the success stories.

Table 5. Primary firearm crime that was the focus of the success story.

Crime	Number	percent
Homicide	58	29%
Assault with a firearm	113	56%
Shooting at property	26	13%
Shots fired	6	3%
Total	203	100%

Table 6 presents the primary outcome of the investigative process reported in the success stories. Several caveats are important to keep in mind when interpreting Table 6. First, this is the outcome at the time that the bulletin was produced. Thus, for example, the NIBIN evidence may have linked two or more gun cases but at the time of the bulletin there may not have been a warrant or an arrest(s) made. Second, and like the reported firearm crime incidents in each success story, there were multiple outcomes in some success stories. For example, a lead connecting multiple cases and identification of possible suspects, may have also led to a warrant and an arrest. In such instances, the primary outcome for each success story was identified by a ranking of investigative outcomes, where the reporting of actions that led to arrest was ranked as the "highest" action. The outcomes listed in Table 4 reflect this hierarchy from highest to lowest. Given the nature of investigations, this hierarchy should be interpreted cautiously given that the linking of multiple firearm crime incidents, both within DPD and involving external agencies, may be step one in identifying suspects, seeking warrants, and then making an arrest. Here we see that the most common outcome at the time the bulletin was produced was that two or more DPD firearm crime cases were linked, with a search warrant being the next most frequent outcome.

Table 6. Primary outcome of the success story

Outcome	Number	Percent
Led to arrest	22	11%
Led to search warrant	64	32%
Led to suspect being identified	20	10%
Produced lead on possible suspect	18	9%
Connected 2 or more firearm crime cases with external agencies	6	3%
Connected 2 or more DPD firearm crime cases	73	36%
Total	203	100%

Prior analysis suggested that a significant proportion of Detroit's firearm crime involves gangs and groups. Indeed, this has resulted in Detroit employing "Detroit Ceasefire," a group-based violence

reduction strategy employing a focused deterrence model.[29] Given this focus, we considered the percentage of the 203 success stories that reported some level of gang involvement (see Figure 1). As indicated in Figure 16, 13 percent of the success stories indicated some level of gang involvement. This may be an under-estimate as it is likely that further investigation would reveal additional gang connections. It does suggest that DCGIC intelligence supports DPD's violence reduction strategies by generating leads and information about gangs involved in firearm crime.

Figure 16. Percent of success stories that reported having a gang nexus
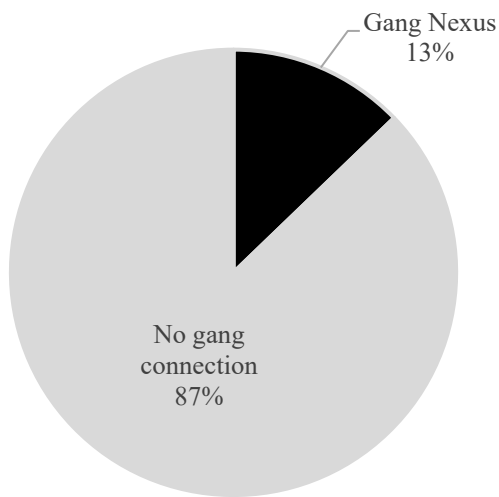
Examples of the Types of Success Stories

In this section, we include sample cases from the above categories to illustrate the types of incidents where the availability of NIBIN evidence and intelligence produced by the DCGIC supported investigations and related violent crime reduction strategies and tactics. In many incidents, several of the above criteria were evident. For example, an incident where ballistic evidence led to the identification of shooters, disruption of serial shooters, and the solution of a violent crime.

Disruption of Serial Shooters

One of the criteria for identifying success stories was whether the incident resulted in identification and disruption of serial shooters. An example involved a homicide that occurred at a large party. The incident report indicated limited cooperation among witnesses at the incident but ballistic evidence from two different crime guns were collected at the scene. The ballistic evidence was connected to another incident that resulted in the identification of the shooter in the homicide who was subsequently arrested and convicted.

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[29] Circo, G. et al. The Individual-level Deterrent Effect. Circo, G. et al. Assessing Causal Effects.

A prime example of a success story involved aggravated assaults and shots fired calls where no suspects or witnesses were at the scene of the incident, or where witnesses were uncooperative. In one incident, 9-millimeter cartridge cases were recovered at the scene of a shots fired call where officers discovered a non-fatal shooting victim. Witnesses at the scene refused to cooperate. Ballistic evidence was recovered and entered into the NIBIN system. The evidence was connected to an existing NIBIN lead that involved four non-fatal shootings. During investigations of these incidents, an individual was arrested for carrying the firearm without a permit. The person arrested for the CCW violation is now a suspect and person of interest in the non-fatal shootings. Absent the collection of the ballistic evidence and the entry of evidence into the NIBIN system, it is unlikely that the CCW arrest would have been connected across the four non-fatal shootings and the shots fired incident.

In some instances, the evidence did not result in the identification of a specific shooter nor an arrest, but the firearms-related evidence revealed additional intelligence. One example was a homicide that involved blunt trauma to the head. Thus, not immediately indicating a firearm. However, officers responding to the scene recovered a 9-millimeter firearm with obliterated serial numbers, implying its criminal use NIBIN intelligence connected the crime gun to a robbery of a local restaurant. During the robbery, two suspects wearing clown masks shot into the wall of the restaurant, leaving ballistic evidence. Additional investigation indicated that members of the Latin Counts gang were involved in either or both the homicide and the robbery. This intelligence was provided to the investigators of these incidents as well as to inform DPD's Ceasefire strategy that employs a focused deterrence strategy to reduce gang- and group-related violent crime.

A similar incident involved a "shots fired" call. While responding officers did not find any suspects, they recovered cartridge cases from a .45 caliber firearm that were connected through NIBIN to three prior incidents and a gang.

Carrying Concealed Weapon Charge Linked to other Incidents

Many of the success stories involve Carrying Concealed Weapons (CCW) charges. A common scenario is that a CCW arrest leads to the recovery of a crime gun, submission of a test-fire into NIBIN, and the identification of one or more NIBIN leads. An example involved a series of four incidents that occurred over two weeks, three of which involved shooting events. The first incident involved multiple shots fired at a residence. In the second incident, a pedestrian on a bicycle was followed by a group in a vehicle. The group then shot at the individual, who consequently sustained a non-fatal firearm injury. The third incident also involved a drive-by shooting that resulted in a non-fatal firearm injury. Finally, the fourth incident involved a traffic stop where a person in possession of a firearm was arrested on CCW charges. Upon its recovery, the crime gun was test-fired and entered into NIBIN to reveal NIBIN leads linking it to the prior three shooting events. The arrestee was held on the CCW charges and became a prime suspect in the prior shootings. Absent comprehensive collection and NIBIN, it is unlikely that the connection across these incidents would have been made by investigators.

Solved a Violent Crime & Identification of Shooters

Additional examples demonstrated how NIBIN evidence, DCGIC intelligence, and investigative work, sometimes result in convictions in multiple violent crime incidents that were unlikely to be connected absent the complementary sources of evidence and intelligence. One example involved a homicide where investigators identified several suspects and obtained a search warrant. The search warrant resulted in the arrest of four individuals and the recovery of two handguns. The handguns were then processed through the NIBIN system that connected the guns to a quadruple non-fatal shooting as well as another non-fatal shooting in a nearby jurisdiction that participates in the regional DCGIC. Three individuals were arrested and guilty pleas obtained.

In July 2020, bullet cartridge cases were collected in an armed robbery where the suspects shot at but missed the robbery victim. No arrests were made in this case. In August, an arrest was made of an individual for carrying a concealed weapon. NIBIN analysis indicated that the 9-millimeter involved in the concealed carry arrest was the same weapon used in the July robbery. The individual charged in the concealed carry arrest, when confronted with the NIBIN evidence, admitted to involvement in the robbery and identified his co-offender in the robbery. Both pled guilty and were convicted, though absent the NIBIN evidence it was unlikely that the concealed carry arrest would have resulted in a conviction for the prior armed robbery.

In July 2019, police were called to a scene where they discovered a homicide victim who had been shot inside a car. Cartridge cases were retrieved from the crime scene and entered into NIBIN. No witnesses were available and no suspects were identified in the homicide. Several days later, police responded to an armed robbery and carjacking. During the robbery, the victim's cell phone was stolen. Officers tracked the cell phone to a location where they arrested a suspect who was armed with a handgun. Through a NIBIN lead, the recovered crime gun was linked to the earlier homicide. The suspect was charged and convicted.

This type of case was among the more common successes. A violent crime occurs, but with limited information to identify the shooter. Subsequently, a CCW charge leads to ballistic evidence that connects the CCW to the violent crime incident. In one of these cases, a traffic stop by Michigan State Police Troopers, uncovered a handgun. NIBIN testing connected the handgun to a prior non-fatal shooting investigated by DPD officers. The driver of the vehicle was then identified by the shooting victim as the offender in the prior incident, resulting in an arrest.

Public & Officer Safety

Arguably, all the incidents described herein that involve crime guns have implications for public safety as well as for the safety of responding officers. Several incidents, connected through NIBIN, in summer of 2019 reflected these safety concerns. In July, officers responded to a shooting where the victim died with no information on the shooter and no leads. Ballistic evidence, however, was retrieved and entered into NIBIN. The following month officers responded to a reported robbery. As they attempted to apprehend the suspect, the suspect started shooting at officers. The suspect fled but was later arrested with a handgun. Ballistic evidence connected the handgun to both the prior homicide as well as the

shooting at the officers. The suspect was convicted of charges that included attempted murder of law enforcement officers.

A tragic incident was solved at least partially through NIBIN. Police were investigating several incidents that involved shootings whereby suspects accosted people in their vehicles. Ballistic evidence was collected from the shootings. Police responded to a double homicide. One suspect was observed but not apprehended. Two days later officers responded to a home invasion. Officers pursued the suspect who shot and killed one officer and wounded a second officer. One suspect was arrested, and two crime guns recovered. The NIBIN evidence linked these multiple incidents and led to search warrants. The investigation revealed that one of the suspects had forced a 16-year-old into prostitution. The 16-year-old informed police of an additional homicide and police later discovered the body. Further investigation yielded arrests of co-conspirators and the connection across these incidents were confirmed through NIBIN evidence.

The threat to the public was also evident in a series of incidents connected by ballistic evidence. One incident involved a shooting and attempted robbery of two people who were inside their car in a fast food carry out line. The second incident involved multiple shootings at vehicles driving down a street where the shooters were in another moving vehicle. The vehicle suspected of being the one with the shooter was identified through Detroit's Project Greenlight that includes camera technology that feeds images to a Real Time Crime Center. The video evidence resulted in identification of a suspect. Warrant searches uncovered a handgun that was later linked to the fast-food robberies and the series of shootings at vehicles. The suspect was charged on 14 firearm-related charges.

NIBIN was also critical to solving a series of shootings and robberies that involved a crew that was using a social media app to lure gay men to meet-up locations where they were robbed and, in several instances, shot. One of the incidents resulted in a homicide. The ballistic evidence connected several of the incidents and identified a suspect. When confronted with the ballistic evidence, the suspect admitted that he and his crew had committed at least 20 robberies.

In addition to the criteria identified above, incidents categorized as success stories also demonstrated the integration of multiple intelligence sources including NIBIN, eTrace, and Shotspotter (see also above Project Greenlight Detroit incident). Similarly, several success stories indicated the value of NIBIN for linking incidents that cross jurisdictions.

NIBIN and Trace Intelligence

Over the course of several months in late 2020 and early 2021, a large number of incidents including non-fatal shootings, robberies, and shootings where no one was struck yielded ballistic evidence. These incidents were connected to suspects where handguns were retrieved from traffic stops and search warrants. The multiple crime guns identified in these incidents were investigated using the eTrace system. This resulted in a suspected straw purchasing investigation. The investigation led to the arrests of suspects who were using false identities gathered from motel guests where one of the suspects worked, to purchase multiple weapons that were then sold on the black market. The resulting investigations, built

upon the NIBIN and E-Trace intelligence, led to arrests for the leaders of the weapons trafficking operation as well as suspects involved in several of the shooting incidents.

Shotspotter

Shotspotter refers to shots fired technology that DPD had deployed in two precincts and more recently expanded. Several of the success stories involved responses to shots fired as detected through this technology. For example, officers responded to a Shotspotter incident. The investigation revealed that multiple shots were fired into a house. Ballistic evidence indicated four crime guns involved in the shooting. Officers later responded to a non-fatal shooting where one of the victims was observed throwing a gun that was carried off by another individual that fled the scene. The non-fatal shooting and the shooting of the home were connected through the ballistic evidence that furthered the investigation of both incidents.

Over the course of five months, six shooting incidents were connected through ballistic evidence entered into NIBIN. Two of the incidents involved officers responding to Shotspotter calls and collecting ballistic evidence. Investigators using evidence across the six incidents believed these involved a series of retaliatory shootings with the evidence yielding a suspect otherwise unlikely to be identified.

Shotspotter and NIBIN were also used to develop intelligence. One example came from a specific location that had been identified through multiple Shotspotter reports. In one month, 42 Shotspotter reports were connected to this address. Police gathered ballistic evidence that was then linked to felonious assaults at other locations.

Officers responded to a homicide in July 2021. Video evidence of a vehicle of the suspected shooters was retrieved from a Greenlight camera located at a nearby church. Additionally, crime gun ballistic evidence was retrieved from four crime guns. Several months later officers responded to a shots fired call. Video evidence indicated the same vehicle as in the prior incident. Although this did not immediately lead to an arrest, the evidence from this shots fired incident yielded new leads for the investigation of the prior homicide that was connected by NIBIN evidence as well as the images of the vehicle provided through camera technology.

Linking Incidents across Jurisdictions

As noted elsewhere, the Crime Gun Intelligence Center has developed a regional intelligence approach through outreach to area law enforcement agencies. The advantages of regional participation were evident in a series of fatal and non-fatal shootings crossing boundaries. The first incident was a shots fired incident investigated by the Washtenaw County Sheriff's Office. No one was struck in the shooting but ballistic evidence was gathered and entered into the DCGIC. Two months later a non-fatal shooting occurred in Inkster, Michigan. The victim and a witness were uncooperative, and no suspects were identified. Ballistic evidence was entered into the DCGIC. Ten days later, DPD responded to a shooting. The victim in the shooting, who later died, was believed to be returning fire in the incident and the crime gun was linked to the incidents in Washtenaw County and Inkster. This evidence was central to the homicide investigation as well as the incidents in the other two jurisdictions.

Finally, we note, consistent with Table 6 and Figure 16 above, that review of the incident narratives revealed multiple incidents whereby NIBIN evidence, along with investigation leads and other sources of intelligence, connected dimensions across incidents related to gang involvement, multiple suspects, outstanding warrants, and often resulting in arrests and prosecution.

Conclusion

The CGIC model offers a framework for integrating emerging technology with general police practice to increase situational awareness of firearm crime in a community and support active investigations. The model reflects a multi-step process for efficiently collecting and processing ballistic evidence, developing investigative and intelligence products, and fostering collaboration across agencies to support effective investigations and prosecution. The implementation of the CGIC model in the DPD incorporates a number of actions and practices that align with these broad goals.

The first steps of the DCGIC development involved the establishment of functional capacity. The DPD had already been in the process of receiving an in-house NIBIN system. Subsequent to receiving the CGIC award in fall of 2018, the department engaged with the NRTAC to conduct an assessment of current practices and provide a gap analysis to serve as a guide for additional actions to support a successful CGIC implementation. By late fall 2019 the department had hired the DCGIC project manager and two crime analysts for the center. In addition, a strategic plan was created to guide the center with specified goals, objectives, policies, practices, and performance metrics. In short, the DCGIC was fully operational by January of 2020.

The assessment of DCGIC performance for this evaluation centered on thirty months prior to the DCGIC becoming fully operational on January 1, 2020 and thirty months after this point (e.g., pre-DCGIC and post-DCGIC). The data show a large increase in acquisition activity processed by the center in the post-DCGIC period from both test-fires of recovered crime guns and cartridge cases collected at the scene of shootings when compared to the pre-CGIC period. A considerable portion of this increase is explained by the large increase in shootings that impacted the city starting in late spring/summer of 2020 and a related increase in the number of crime guns recovered by officers.

However, there was a considerable increase in the number of acquisitions in the post-CGIC period beyond what would be expected by the increase in shootings, when compared to the acquisition patterns in the pre-CGIC period. Specifically, it appears there was an increased effort department-wide to collect cartridge cases from as many shootings as possible, including the numerous shootings that do not involve fatally and non-fatally wounded victims. Further, a higher percentage of recovered crime guns were test-fired in the post-CGIC period. Along with this increase in acquisition activity, there was also a more than 200% increase in the number of NIBIN leads in the post-CGIC period.

Despite this increase in acquisition activity, and associated increase in workload, there was also a decrease in the time from evidence collection to entry into NIBIN. Specifically, the period from evidence collection to entry was reduced to less than 48 hours, providing the ability for more timely information to support active investigations and intelligence on firearm crime.

Beyond these productivity measures, the success stories provide examples of how NIBIN leads that come through the DCGIC inform investigations. The stories illustrate the different ways in which NIBIN lead information is developed, contribute to a greater understanding of how firearm crimes are related, and in some cases how they led to tangible actions (e.g., identification of a suspect or arrest). The data on prosecution does not provide the ability to assess how much DCGIC data contributed to the success of an

investigation or led to prosecution. However, NIBIN lead data was tied to criminal changes for more than 600 individuals.

Collectively, the above activity provides evidence the CGIC model was successfully implemented in the Detroit Police Department. As the DCGIC continues to operate, additional evaluation can provide the opportunity follow-up on a gap analysis to identify policies, procedures, and practices that will allow for the continued improvement in the center's effectiveness and efficiency.

Ultimately, the DCGIC will be assessed based on its impact on arrest, prosecution, sentencing, and on public safety. As indicated throughout the report, we were unable to conduct a systematic evaluation of the impact of DCGIC on these outcomes due to the effect of the COVID-19 pandemic, as well as the unrest associated with the George Floyd in-custody death in Minneapolis, on police staffing, court operations, and levels of violent crime in Detroit, and nationally. Given these limitations we recommend consideration be given to further evaluation in a post-pandemic context that would include:

- Further analysis of the impact of DCGIC on arrest, prosecution, and sentencing in firearm crime incidents.
- Analysis of the impact of the DCGIC on violent crime, and fatal and non-fatal shootings specifically.
- Analysis of the impact of shots fired technology (Shotspotter) on DCGIC outcome measures (e.g., NIBIN acquisitions, test-fires, cartridges entered, leads) as well as on the impact on arrest, prosecution, and sentencing.