



Crime Gun Intelligence Centers: Reviewing the Evidence

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What is the Bottom Line Up Front about CGIC Research?

Research plays a critical role in understanding and improving the crime gun intelligence center (CGIC) processes. It can identify effective strategies and opportunities for improvement, support data-driven decision making, provide operational and outcome transparency, and facilitate strategic goal accountability. Nineteen CGIC evaluations were identified and reviewed.

Of the 19 evaluations:

- 16 examined inputs, such as ballistic evidence and firearm collection and entry
- 18 examined outputs, such as timely evidence processing, National Integrated Ballistic Information Network (NIBIN) leads and/or hits, and eTrace hits
- 16 examined results, such as arrests and court dispositions
- 9 examined outcomes, such as fatal shootings, non-fatal shootings, and other crimes

A full listing of all evaluations examined, and their findings, can be found in the [Reviewing the Evidence Spreadsheet](#).

A key consideration for understanding any research effort is the strength of the research methods – this tells us how confident we should be in the results.

Research can generally be broken into the following categories, from strongest to weakest designs: experiments, quasi-experiments, pre- to post-test comparisons, and descriptive studies. Of the 19 studies reviewed, 13 are primarily descriptive or provide straightforward pre- to post-CGIC comparisons. These studies provide insight into what CGICs are doing and a sense of change in their activities over time but cannot rule out the possibility that something else also impacted the observed trends, such as other violent crime reduction tactics like focused deterrence. The other six CGIC studies used quasi-experimental designs, which include comparison conditions and account for outside factors that could otherwise explain observed trends. As such, quasi-experimental studies provide stronger evidence of the impact of CGICs than descriptive or pre- to post-CGIC assessments.

All these evaluations collectively suggest that CGICs:

- ↑ **Increase the number of NIBIN leads, NIBIN hits, and eTrace hits.**
CGICs increase evidence that can be leveraged to investigate gun offenses (inputs), which has increased the efficiency of evidence processing in many agencies and has generally resulted in higher numbers of NIBIN leads, NIBIN hits, and eTrace hits (outputs). These descriptive findings suggest that the CGIC model is operating as intended in many agencies.
- ↑ **Increase arrests for cases involving a NIBIN lead.**
Studies that have examined whether CGICs can increase case clearances, arrests, and prosecutorial charges (results) offer some positive support for CGICs with some studies finding

significant improvements in these outcomes post-CGIC implementation for NIBIN cases compared to those without NIBIN leads. Some of these evaluations used quasi-experimental methods, providing encouraging evidence that suggests CGICs can increase arrests. Findings related to case clearances and court outcomes were less consistent.

↓ **May decrease gun crime in some cases, but more research is needed.**

Both descriptive and quasi-experimental studies provide mixed findings on a CGICs impact on crime (outcomes). Some studies identify crime reductions, while others find no change or increases in crime. These findings should be interpreted cautiously due to research challenges that influenced even the most rigorous CGIC evaluations.

More research using stronger research designs is needed to determine how CGICs impact arrests, charges, and convictions – and ultimately crime. Most existing evaluations rely on relatively short post-CGIC implementation time periods, which may not capture the full benefits of CGICs. Given lengthy investigative and court processes, longer follow-up periods might provide more insight into whether CGIC-facilitated arrests are successfully removing prolific gun offenders from communities.

CGIC implementation and impact may be influenced by external factors, including broader crime trends, the COVID-19 pandemic, and other violence reduction efforts that took place in many communities. Future research should prioritize efforts to measure all elements of a CGIC model – inputs, outputs, results, and outcomes – to fully assess the functionality and impact of these centers. Collaborating with researchers can help ensure strong research designs are used to increase confidence in the findings. These practitioner-researcher partnerships can support continuous feedback loops to refine policies, training, and practices to maximize impact.

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CGIC Key Terms and Positions

CGIC Operations Personnel – Responsible for daily operations, activities of this team include, but are not limited to:

- Immediate collection and processing of crime gun evidence (cartridge casings and firearms).
- NIBIN data analysis and lead dissemination
- Investigation of criminal shootings linked by NIBIN
- Crime gun tracing and identification of crime gun sources by ATF.
- Firearms trafficking interdiction by ATF and law enforcement partners.
- Identification, disruption, and arrest of armed criminals by ATF and partner law enforcement agencies.
- Strategic prosecution of violent offenders at the federal, state, and local levels

CGIC Targeting – This process identifies the most violent, active armed offenders and their sources of crime guns using objective technologies, such as NIBIN, eTrace, gunshot detection systems, and dedicated investigative follow-up.

Crime Gun – This term refers to any firearm possessed, used, or intended to be used during or in relation to a crime.

Crime Gun Trace – This is the systematic tracking of the movement of a firearm recovered by law enforcement officials. The trace is conducted from the firearm's importation into or its manufacture in the United States, through the distribution chain of federal firearms licensees, to the point of first retail sale.

eTrace – This paperless ATF firearm trace submission system is readily accessible through the internet. The system provides the necessary utilities for submitting, retrieving, storing, and querying firearm trace-related information relative to the requestor's agency.

Integrated Ballistics Identification System™ (IBIS) – This automated ballistics imaging and analysis system populates a computerized database of digital ballistic images of bullets, ammunition, and cartridge casings from crime guns and crime scenes. The system assists forensic experts in making identifications for investigations and trials.

- **BRASSTRAX™** – An acquisition station that specializes in the entry of cartridge casing information onto the NIBIN network.
- **MATCHPOINT™** – An analysis station for reviewing the potential matches obtained from IBIS™ correlation algorithms.

Local Crime Gun Intelligence Center – An interagency collaboration focused on the timely collection,

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management, and analysis of crime gun evidence (e.g., cartridge casings) to identify shooters, disrupt criminal activity, and prevent future violence. The primary purpose of the local CGIC is to identify armed, violent offenders for investigation and prosecution.

National Integrated Ballistic Information Network (NIBIN) – The national database of digital images of spent bullets and cartridge casings found at crime scenes and test-fired from confiscated crime guns. ATF's NIBIN is the only interstate ballistic identification system that allows law enforcement partners to associate ammunition casings, crime guns, and crime scenes.

NIBIN Enforcement Support System (NESS) – ATF's NESS is a web-based investigative tool that provides law enforcement agency personnel with quick and easy access to NIBIN data, basic firearms tracing information, and law enforcement report information in one platform.

NIBIN Hit – Linkage of two or more pieces of ballistic evidence, such as crime scene cartridge casings or crime gun test-fire cartridge casing exemplars, through the use of NIBIN technology and confirmed by microscopic examination by two firearm and tool-mark examiners.

NIBIN Lead – Linkage of two or more pieces of ballistic evidence, such as crime scene cartridge casings or crime gun test-fire cartridge casing exemplars, through the use of NIBIN technology but **not** confirmed by microscopic examination by firearm and tool-mark examiners.

What is a CGIC and Why Should We Evaluate It?

Crime Gun Intelligence Centers (CGICs) are interagency collaborations between local police agencies, crime labs, probation and parole, crime analysts, community groups, the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF), local prosecutors, and the U.S. Attorney’s Office (USAO) focused on the comprehensive collection, processing, investigation, and prosecution of individuals who use crime guns. The CGIC model was first developed in Denver, Colorado in 2013 to intentionally bring information systems and technologies together to generate investigative intelligence that detectives could use to connect incidents related to the same firearm, with the intention of identifying and apprehending active shooters.¹ Other priorities include identifying networks of offenders involved in high proportions of gun violence through the use of shared firearms.²

This review highlights the current research examining the impact of CGICs. Research is critical for understanding and improving CGIC processes. It can identify effective strategies and opportunities for improvement, support data-driven decision making, provide operational and outcome transparency, and facilitate strategic goal accountability.

Learn More About CGIC

[Visit the CGIC Website](#)

[5 Things You Need to Know About CGICs](#)

As CGICs have continued to expand, some CGICs have taken a regional approach to enhance violence reduction. These regional approaches are discussed along with research limitations, opportunities for future research, and action items for researchers and practitioners looking to conduct future CGIC evaluations.

What is the CGIC Model Workflow?

The CGIC workflow begins with the exhaustive collection of cartridge casings and crime guns, which are entered into NIBIN and eTrace to link separate shooting incidents and identify crime gun sources. Investigative leads developed through this information are pursued through intelligence analysis, police agency investigations, and criminal justice stakeholder collaborations. These partners work with state or federal prosecutors to ensure the successful resolution of CGIC cases. Feedback about this process is then provided to all participants, from patrol officers who collect initial ballistic evidence to investigators and prosecutors responsible for suspect apprehension and case prosecution.

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Figure 1: CGIC Workflow



CGICs are comprehensive initiatives involving multiple phases, partners, resources, and activities. Logic models are useful for conceptualizing and evaluating these efforts by describing the intended inputs, outputs, results, and outcomes of the CGIC. **INPUTS ARE THE RESOURCES USED TO FACILITATE THE PROCESS, OUTPUTS ARE THE DIRECT RESULTS OF THOSE INPUTS, RESULTS ARE THE DIRECT CONSEQUENCES OF THOSE OUTPUTS, AND OUTCOMES ARE THE LONG-TERM IMPACTS OF THOSE PROCESSES.** Figure 2 describes each of these features in the CGIC model.

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Figure 2. CGIC Logic Model



The following sections synthesize the current research in each of the logic model steps. A key consideration for understanding any body of research is the strength of the research methods. This tells us how confident we should be in the results. Research designs generally fall into one of the following categories, from strongest to weakest:

- **Experiments:** Randomized controlled trials (RCTs) involve randomly assigning locations or cases to receive an intervention (such as a CGIC) or to serve as a control group (no change, business as usual). Randomization ensures that the only difference between groups is random chance. This gives us confidence that any change that occurs in the intervention group that does not occur in the control group is due to the intervention itself. Given the jurisdiction-wide nature of the CGIC model, none of the evaluations used RCTs.¹
- **Quasi-experiments:** These research designs do not use random assignments but still include a comparison group or time period and account for other potential explanations of change. Six evaluations used these methods. Common examples include:
 - *Time series models:* These studies compare trends before and after an intervention, while statistically controlling other factors like crime and time of year that could influence trends over time. These models can include treatment and comparison groups to increase confidence in findings.
 - *Difference-in-difference models:* Studies that measure patterns in both a treatment group and a control group before and after an intervention. This allows you to see whether the pattern in the treatment group differed from the pattern in the control group over the same time.

¹ Though an evaluation of the Phoenix, Arizona CGIC included a RCT of specialized patrol officer training as part of the broader evaluation. See Kaz et al. (2021) and Huff et al. (2024a).

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- **Pre- to post-implementation studies:** These compare patterns before and after an intervention, but do not include a comparison group or account for other factors that could influence trends over time. As such, these studies cannot establish whether the intervention itself led to change.
- **Descriptive studies:** These report raw counts or trends without assessing cause and effect. These approaches do not explain why change occurs.

Thirteen evaluations used pre- to post-implementation comparisons or were descriptive. Many studies also used surveys, interviews, and anecdotal success stories.

CGIC Inputs: Ballistic Evidence and Firearms

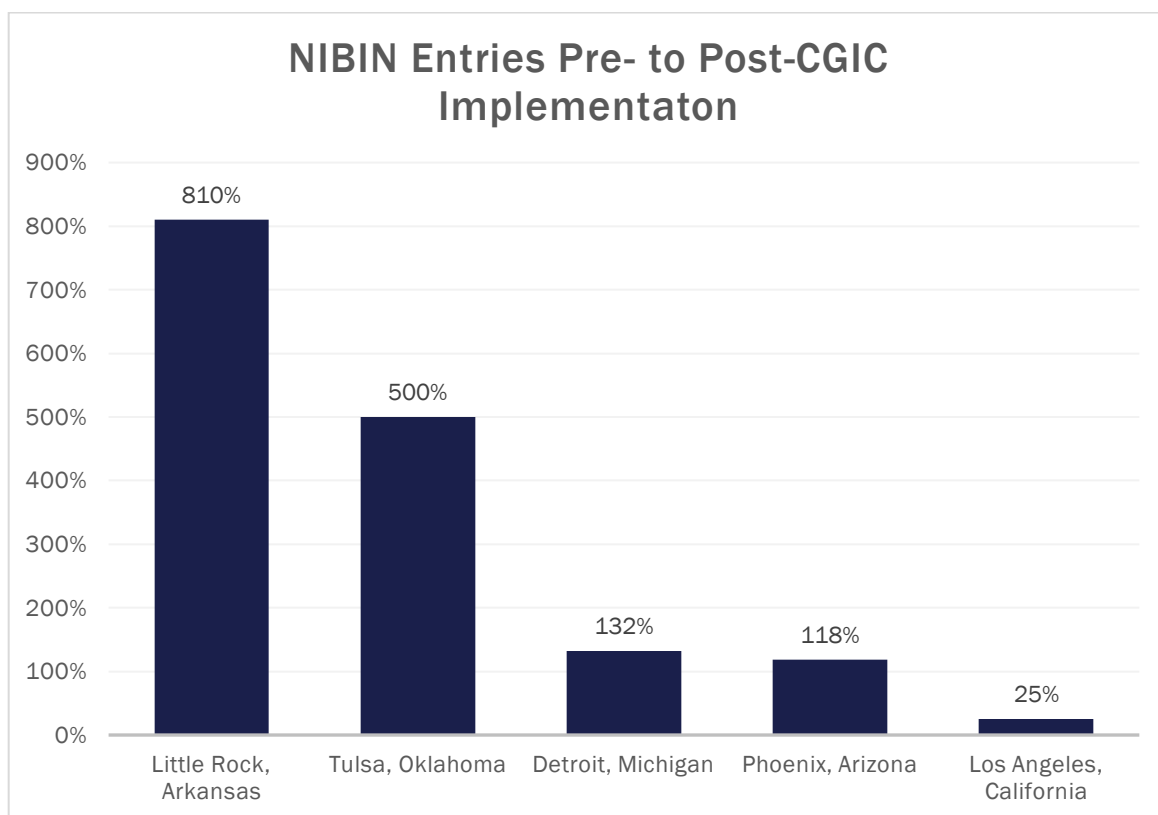
The CGIC model depends on the comprehensive collection of ballistic evidence and crime guns that can be used to generate intelligence. Prior research using data from 159 NIBIN sites confirms that sites that enter more evidence into NIBIN systems generate significantly higher numbers of NIBIN leads.³ CGIC evaluations often present descriptive measures of the amount of crime gun evidence collected and processed. Most studies show an increase in evidence collection and NIBIN entry after CGIC implementation. However, it is important to note that even when agencies were using NIBIN and eTrace before the CGIC, most studies relied on simple pre- to post-CGIC comparisons and did not use control groups or account for potentially confounding factors.

Casings Collected and NIBIN Entries

Most studies present descriptive information about the number of NIBIN acquisitions processed by a CGIC. In Winston-Salem, North Carolina, the number of acquisitions increased from 2,351 in 2020 to over **2,500** in each of the next three years.⁴ In Detroit, Michigan NIBIN acquisitions increased by **121%** and entries increased by **132%** from pre- to post-CGIC.⁵ NIBIN acquisitions also significantly increased from pre- to post-CGIC implementation in Indianapolis, Indiana, an important finding given that the Indianapolis Metropolitan Police Department was using NIBIN prior to becoming a CGIC site. Similar significant increases were identified in Kansas City, Missouri.⁶

Several evaluations also reported increased NIBIN entries. NIBIN entries increased by **810%** in Little Rock, Arkansas (Rhodes, 2021), **500%** in Tulsa, Oklahoma (Khojasteh, N.D.), **132%** in Detroit, Michigan (Rojek et al., 2022), and **118%** in Phoenix, Arizona two years post-CGIC implementation (Katz et al., 2021). The Los Angeles, California CGIC experienced more modest positive increases, with a roughly **25%** increase in casings collected and entered into NIBIN post-CGIC implementation (Uchida et al., 2019). In contrast, a quasi-experimental evaluation in Chattanooga, Tennessee identified a significant reduction in NIBIN entries after their CGIC was implemented.⁷

Figure 3: NIBIN Entries Pre- to Post-CGIC Implementation



Firearm Recoveries and Test Fires

The recovery of crime guns can also provide information to a CGIC when those firearms are test fired and entered into NIBIN or traced to identify the purchaser. Many evaluations also reported descriptive information or pre- to post-implementation comparisons of firearms recovered and traced. The percentage of recovered crime guns that were test fired increased from a monthly median of 87.2% pre- to **91.2%** post-CGIC in Detroit, Michigan.⁸ eTrace entries increased **13%** from year one to two post-CGIC implementation in Little Rock, Arkansas.⁹

In contrast, the number of firearms recovered in Palm Beach County, Florida declined over the study period, though the proportion of firearms test fired and entered into NIBIN increased by **14%** in the first year and **29%** between the second and third year of the CGIC.¹⁰ The opposite pattern was identified in Phoenix, Arizona, with a **13%** increase in firearms collected and a 58% decline in eTrace entries one-year post-CGIC, though both firearm recoveries and traces increased during the second year of CGIC implementation – a **10%** increase in firearms and an **84%** increase in traces compared to the year before the CGIC was implemented. This pattern was attributed to a new policy that prioritized firearm entry in the second year of the CGIC.¹¹ More research is needed to understand CGIC processes that

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influence increased evidence acquisition and entry.

Efforts to Increase Inputs

The methods used to increase ballistic evidence collection vary across individual CGICs. Some CGICs have deployed gunshot detection systems (GDS) to increase the amount of ballistic evidence that can be entered into NIBIN systems. A study in Phoenix, Arizona, found that this was a useful strategy, with significantly more evidence collected in the GDS area than in one control area and the rest of the city.¹² Kansas City, Missouri also used a GDS and directed officers to canvas for ballistic evidence in response to alerts; however, staffing levels and high call loads prevented thorough canvases when there was no other evidence of a crime occurring.¹³ In Baltimore, Maryland, K9 units were used to recanvas GDS alerts that did not lead to immediate evidence collection in an effort to bridge this gap, but this process was ended due to limited additional evidence gained as a result of these sweeps.¹⁴

Some agencies have trained patrol officers to respond to gun crimes, shots fired reports, and GDS activations to canvas scenes, collect ballistic evidence, and process ballistic evidence.¹⁵ A RCT of Crime Gun Liaison Program officers in Phoenix, Arizona found that these specially trained patrol officers collected significantly more casings, firearms, fingerprints, and DNA samples than control officers.¹⁶ As such, these training programs can increase the inputs that CGICs can leverage. Other agencies have created monthly awards patrol officers can receive during roll calls to recognize officers whose participation in gun crime evidence collection leads to successful case outcomes.¹⁷

CGIC Outputs: Timely NIBIN Results and eTrace Reports

The purpose of collecting all available ballistics evidence is to quickly enter this evidence into NIBIN and eTrace to obtain real time investigative leads that detectives can use to solve cases in a timely manner. As such, key outputs of the CGIC should include rapid evidence processing, NIBIN leads and hits, and firearm traces. Prior research examining each of these outputs is reviewed below. These studies have relied heavily on descriptive statistics and assessments of pre- to post-CGIC change.

Timely Evidence Entry

Many agencies used state crime labs to process ballistic evidence before establishing a CGIC. For example, prior to establishing the CGIC in Detroit, Michigan, the Michigan State Police would take weeks or months to process acquisitions and return case updates.¹⁸ Some agencies have increased their ability to provide faster intelligence by hiring additional personnel or training existing personnel to identify NIBIN leads as opposed to focusing on NIBIN hits. NIBIN leads can be returned faster because a technician can identify a lead, while confirming a NIBIN hit requires a firearms examiner to visually analyze the evidence.¹⁹ As such, hiring and training internal personnel and procuring NIBIN stations can dramatically reduce intelligence delays.

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Agencies have also reorganized their physical space and modified evidence collection policies to increase efficiency. In Indianapolis, Indiana, relocating the Crime Lab into the Correlation Center increased the number of available personnel who could process NIBIN evidence and enhanced the efficiency of the process.²⁰ In Washington, D.C., a CGIC 2.0 model pilot tested in one district resulted in all ballistic evidence being transferred to the Department of Forensic Sciences within 48 hours, regardless of how the evidence was obtained. Casings collected in the pilot district were processed faster than those collected in other districts, which were only transferred when it was convenient. Unfortunately, no district-level pre-pilot data was available to assess whether these patterns existed prior to implementing CGIC 2.0.²¹ Studies in Phoenix, Arizona; Kansas City, Missouri; and Detroit, Michigan all found that timely evidence entry significantly increased, even as the volume of evidence increased.²²

Although all ballistic evidence should be entered into NIBIN rapidly, this is not always possible. In Palm Beach County, Florida, delays in firearms processing were sometimes related to improper packaging that resulted in evidence being sent back to collecting officers for retagging. The department conducted a refresher training to try to overcome that issue.²³ In Chicago, Illinois, a triage process was created to ensure all casings related to a homicide are entered within one day, but those collected in response to a shots fired call without a victim might not be entered until months later, in order of receipt.²⁴ While this approach is not consistent with the ideal CGIC process, it was the most feasible option in Chicago given high levels of gun crime.² Further, many agencies experienced staffing challenges related to COVID-19, which resulted in backlogs that delayed timely evidence processing in agencies that were previously performing well.²⁵

Research to Action

Agencies should create sustainability plans to ensure sufficient personnel and resources are dedicated to processing crime gun evidence.

One of the primary motivators of rapid evidence processing and NIBIN lead returns is to provide investigative intelligence for detectives to pursue while cases are still active. Researchers have used detective surveys to ask about the timeliness and utility of NIBIN leads for specific investigations. Although some studies find that detectives who receive faster NIBIN leads are significantly more likely to perceive them as helpful, others did not find the same relationship.²⁶ Some research suggests that detectives might view NIBIN leads as helpful in general, but leads might not be helpful for every case,

² Prior research suggests that entering crime scene evidence before test fires can increase the odds of a hit, suggesting these triage processes can be evaluated to maximize impact (Wang et al., 2017).

regardless of time of receipt.²⁷

NIBIN Leads & Hits

One of the key outputs of a CGIC is a NIBIN lead or hit that links two separate shooting incidents together. A NIBIN lead is a preliminary match between pieces of ballistic evidence collected in relation to two or more crime gun incidents. A NIBIN hit is a confirmed NIBIN lead, in which a firearms examiner has physically inspected the evidence to visually confirm the match. These connections can reveal additional investigative opportunities that can be pursued to identify suspects. Research shows that NIBIN leads and hits occur more frequently when more evidence is entered into NIBIN.²⁸ These inputs are generated either through ballistic evidence collected at a crime scene, found in response to a GDS alert, or after a gun acquired by a police agency is test fired.²⁹ Most studies present descriptive trends related to the number of NIBIN leads and hits.

Many agencies were generating NIBIN leads prior to having a CGIC, but aligning their personnel and in-house technological resources, increased the number of leads generated. In Milwaukee, Wisconsin, relocating NIBIN processing from the state crime lab to an internal system resulted in a dramatic increase in the number of NIBIN links – **A TOTAL OF 970 LINKS WERE CREATED IN 3 YEARS INTERNALLY COMPARED TO JUST 298 LINKS CREATED BY THE STATE CRIME LAB IN THE PRIOR 10 YEARS.**³⁰ NIBIN leads increased by **163%** in Phoenix, Arizona and NIBIN hits increased by **146%** in Washington D.C. after CGIC implementation.³¹ In Kansas City, Missouri, the proportion of acquisitions that resulted in a NIBIN lead increased from 21% in the year before CGIC deployment to **32%** in the two years following its implementation, a statistically significant difference.³² NIBIN leads also significantly increased after CGIC deployment in Indianapolis, Indiana though the number of hits did not significantly change.³³

The generation of a NIBIN lead does not always mean that a case will be investigated. In Denver, Colorado, only 20% of NIBIN leads were referred to the CGIC for additional investigation due to limited personnel. This percentage was higher in Milwaukee, Wisconsin, where 30% of cases were assigned to CGIC investigators and 28% were assigned to either investigations or district personnel for follow up.³⁴ Detectives in Little Rock, Arkansas reported challenges keeping up with the amount of intelligence generated by the CGIC.³⁵

Research to Action

Agencies should craft specific policies to determine whether a NIBIN lead and/or hit should be investigated, who should be responsible for the investigation, and whether any time limits or workload considerations should be considered as part of the investigative assignment triage process.

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The information that an agency includes in a NIBIN lead also varies. Some lead reports contain fundamental information about related crime dates, types, and locations, while others have an analyst add advanced intelligence such as social media analyses and link analyses.³⁶ In Palm Beach County, Florida the Firearms Investigative Unit conducted social media reviews related to NIBIN cases to provide additional intelligence to investigators, but the processes were informal and the reviews were not provided for all leads.³⁷ A crime analyst was assigned to the Little Rock, Arkansas Crime Gun Intelligence Unit to provide link analysis for all NIBIN leads and eTrace hits.³⁸ Qualitative interviews in Baltimore, Maryland suggested that CGIC personnel valued the intelligence provided in lead reports to keep them informed about connected cases and resolutions.³⁹ Future research should examine whether the content of the NIBIN lead reports influences their impact in further investigations.

Firearms Traced

The number of firearms successfully traced to their owners is also an important output that could help investigators identify suspects.⁴⁰ An eTrace hit occurs when the purchaser of a firearm is successfully identified through eTrace. A quasi-experimental study in Chattanooga, Tennessee found that firearm traces and hits significantly decreased from pre- to post-CGIC implementation – although 84% of traces resulted in hits pre-CGIC, this declined to 30% post-CGIC.⁴¹ Descriptive research suggests that these outputs can increase after CGIC establishment in other places. In Winston-Salem, North Carolina, **68%** of crime guns entered into eTrace resulted in a hit.⁴² In Phoenix, Arizona, there was an **8%** increase in the number of firearms traced to a purchaser post-CGIC implementation.⁴³ Increases were also identified in Kansas City, Missouri and Denver, Colorado.⁴⁴ However, in Baltimore, Maryland, the volume of guns processed delayed efforts to upload processed firearm traces into the ATF system, in some cases up to three weeks.⁴⁵

Research to Action

Agencies should consider their capacity to process firearms to ensure their policies and practices align with agency priorities.

CGIC Results: Arrests and Prosecutions

Both NIBIN and eTrace are investigative tools that are intended to help police agencies identify offenders who use crime guns. CGIC outputs like NIBIN leads/hits and eTrace hits are expected to yield crucial results, such as suspect identification, arrest, case clearance, and prosecution. Most research that has examined these results used descriptive analyses or simple pre- to post-CGIC comparisons. A few studies examined whether crime gun evidence significantly increased these results by comparing cases with and without NIBIN leads.

Arrests and Clearances

Some studies have used quasi-experimental approaches to assess the impact of CGICs on arrest:

- **Phoenix, Arizona:** A study confirmed that NIBIN cases were **76%** more likely to result in an arrest than non-NIBIN cases post-CGIC implementation, a statistically significant difference.⁴⁶
- **Detroit, Michigan:** A study found significantly higher odds of case clearance when advanced NIBIN intelligence was available, but not for incidents only involving fundamental case information.⁴⁷
- **Washington, D.C.:** Descriptive statistics showed that cases with NIBIN hits in the CGIC 2.0 pilot district were more likely (**28.4%**) to be cleared by an arrest than those without NIBIN hits (20.8%). However, results of the quasi-experimental evaluation did not identify any significant differences in gun crime arrests, gun-related weapons arrests, or violent gun crime arrests in the CGIC 2.0 district compared to a synthetic control area.⁴⁸
- **Chattanooga, Tennessee:** An interrupted time series analysis identified an abrupt, permanent increase in arrests after the CGIC was implemented, but this change was not statistically significant.⁴⁹

Descriptive studies generally report positive impacts of CGICs on arrests:

- **Milwaukee, Wisconsin:** **816** arrests were made in connection to NIBIN related offenses and those arrested were involved in **1,335** total offenses.⁵⁰
- **Denver, Colorado:** **65** defendants suspected of being involved in **170** shootings were arrested between 2013 and 2016 because of CGIC investigations. Anecdotal evidence often demonstrates that individuals arrested and prosecuted because of CGICs were prolific offenders involved in high rates of crime in their communities.⁵¹
- **Little Rock, Arkansas:** Case clearance rates for gun-involved homicides more than doubled following CGIC implementation, however, case clearance rates remained stable for nonfatal shootings, gun-involved terroristic acts, and gun robberies over the same time period.⁵²
- **Palm Beach County, Florida, and Los Angeles, California:** Arrest rates were lower after CGIC implementation.⁵³

Given the descriptive nature of these studies, findings should be interpreted with caution.

These conflicting results suggest that more research is needed to understand whether and how CGICs can influence arrests. Given the small number of studies that have used quasi-experimental methods or multivariate statistical models, more research is needed to assess the impact of CGICs on arrest outcomes.

Though not an evaluation of the CGIC model, research conducted in Manchester, New Hampshire examined the impact of various types of evidence on arrests. Research found that firearm recovery was a strong predictor of arrest for gun crimes, nonfatal shootings, and shots fired cases. However, NIBIN

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was associated with a decrease in the odds of arrest for each of these outcomes, and a significant decrease for gun crime arrests. Further, there was no significant relationship between eTrace and arrests.⁵⁴ A study in Hartford, Connecticut, similarly examined the impact of various types of evidence on fatal and nonfatal shooting investigations. It found that NIBIN leads did not significantly influence the odds of a case being solved or cleared.⁵⁵

Court Outcomes

Leveraging forensic evidence and established law enforcement and prosecutorial partnerships is meant to increase prosecutions of crime gun offenders. CGICs should collaborate with state and federal prosecutors to determine which office can remove the individuals responsible for the highest rates of gun violence from the community for the longest periods of time. For example, a Hamilton County Assistant District Attorney was embedded in the Chattanooga, Tennessee, CGIC to attend biweekly meetings related to gun crimes to discuss prosecution for those offenses.⁵⁶ In Little Rock, Arkansas, **240** CGIC cases were adopted for federal prosecution for felon in possession, and **312** cases were adopted for county-level prosecution.⁵⁷ However, descriptive studies generally show a slight or limited impact of CGIC evidence in court.

In Washington, D.C., guilty pleas were slightly more likely in cases with a NIBIN hit than in those with some ballistic evidence, but not a NIBIN hit. Arrests in the CGIC 2.0 pilot district with NIBIN hits were more likely to result in charges (**62%**) than those with other ballistic information (47%). The percentage of cases with NIBIN hits and those with other ballistic evidence that resulted in formal charges were the same (45.6%) citywide. These results suggest limited impact of a CGIC on court outcomes, though detectives reported using NIBIN information gained through the CGIC in court.⁵⁸

In Phoenix, Arizona, researchers found a **161%** increase in the percentage of NIBIN leads that led to interagency cooperation with the Maricopa County Attorney's Office from pre- to 2-years post-CGIC implementation. However, the percentage of NIBIN-related cases that led to prosecutorial charges declined from pre-CGIC to the two years following CGIC implementation. It is important to note that similar declines occurred for non-NIBIN-related cases during the same time period. The percentage of NIBIN cases that led to convictions also slightly declined, from 95% before CGIC implementation to 87%, two years post-CGIC; however, conviction rates remained stable for non-NIBIN cases.⁵⁹ Quasi-experimental analyses comparing NIBIN to non-NIBIN cases identified statistically insignificant changes in charges and convictions post-CGIC implementation.⁶⁰ In contrast, the number of suspects charged and convicted significantly increased after the Chattanooga, Tennessee, CGIC was implemented.⁶¹ These divergent findings suggest that more research is needed to understand how collaboration between police agencies and prosecutors influences the outcomes of these cases.

Collaboration between law enforcement and state and federal prosecutors can be difficult to sustain. In Baltimore, Maryland, organizational changes within the State's Attorney's Office resulted in the office disengaging from the CGIC, a partnership that the CGIC has attempted to reestablish.⁶² Notably, many

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of the CGIC evaluations occurred during the COVID-19 pandemic, which also led to substantial changes in court processes that may have influenced these results. In Detroit, Michigan, and many other cities, the pandemic led to court shutdowns and a backlog in court cases.⁶³ The role of the pandemic in changing violence, policing, and court processing is challenging to disentangle from CGIC evaluations conducted during these time periods.

CGIC Outcomes: Impact on Crime

The ultimate intended outcome of a CGIC is crime reduction. Though some studies identified crime declines after CGIC implementation, results should be interpreted extremely cautiously given concurrent global crime declines during many of these studies. Further, most studies did not include a control group, so any change in crime from pre- to post-CGIC implementation cannot be attributed to the CGIC on its own.

A few quasi-experimental evaluations have assessed the impact of CGICs on crime:

- **Milwaukee, Wisconsin:** NIBIN-related arrests significantly reduced shootings by **3-12%**; however, the research reported mixed results across different statistical models examined.⁶⁴
- **Denver, Colorado:** The CGIC was associated with a significant impact on firearm-facilitated robbery trends, but not with serious violent gun crime, gun-involved aggravated assaults, or gun homicides.⁶⁵
- **Little Rock, Arkansas:** There were no significant changes in homicides, nonfatal shootings, or terroristic acts involving firearms, but there was a statistically significant reduction in gun robberies, a **35%** decline from pre- to post-CGIC implementation.⁶⁶
- **Washington, D.C.:** There were no significant changes in violent crime or gun crime rates using either a synthetic control or difference-in-differences approach.⁶⁷
- **Chattanooga, Tennessee:** The number of 911 calls related to shots fired and the number of confirmed shootings significantly declined after the CGIC was implemented. There was also an insignificant reduction in fatal shootings from pre- to post-CGIC deployment.⁶⁸

Descriptive studies of crime trends in CGIC sites show mixed results:

- **Palm Beach County, Florida:** Non-fatal shootings declined by **7%** and fatal shootings declined by **16%** after CGIC implementation.⁶⁹
- **Winston-Salem, North Carolina:** Raw counts of homicides, rapes, robberies, and aggravated assaults remained relatively stable between 2020 and 2023.⁷⁰
- **Los Angeles, California:** Gun homicides, robberies, and aggravated assaults increased from pre- to post-CGIC implementation in some target districts, while declining in others, offering mixed evidence of impact.⁷¹

These results suggest that CGICs could impact different crime types in unique ways.

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Other quasi-experimental evaluations offer similar mixed conclusions. An evaluation of the impact of the Baltimore, Maryland CGIC on crime in the Western and Southwestern Districts identified different patterns in each location. In the Western District, there were statistically significant monthly reductions in gun crimes (-1.43%), gun homicides (-4.47%), and shots fired (-3.94%), though there were no differences in gun-related aggravated assaults or robberies. However, these results should be interpreted cautiously because the CGIC was implemented at the same time as a focused deterrence strategy in that district, which may have also contributed to these reductions. There were no significant changes in any of the crime types examined in the Southwestern District, even when controlling for the beginning of the focused deterrence strategy.⁷² As such, it is unclear whether the reductions observed in the Western District, where researchers could not disentangle the CGIC from the focused deterrence strategy, are due to either intervention specifically or a combination of the two.

These quasi-experimental evaluations suggest limited impact of CGICs on crime trends. However, it is important to note that the evaluated time periods are short, often only a year or two after CGIC implementation. Fully realizing the crime reduction benefits of removing prolific gun offenders from communities could take longer to achieve due to lengthy court processes. Future research should use longer follow-up periods to assess the impact of CGICs on crime trends over time.

What are Regional Approaches to the CGIC Model?

After establishing the first CGIC in 2013, Denver, Colorado, personnel believed they could expand their impact on crime in the Denver metropolitan area by taking a regional approach. Working with leaders from neighboring law enforcement jurisdictions, the Regional Anti-Violence Enforcement Network (RAVEN) was established in 2019. This effort incorporated multiple existing task forces and specialty units under the unified mission of addressing violent crime.⁷³ Twelve law enforcement agencies assigned an investigator to RAVEN and increased NIBIN inputs as a result. **INTERVIEWS WITH RAVEN PERSONNEL REVEALED POSITIVE PERCEPTIONS OF THESE EFFORTS, WITH MOST REPORTING AN INCREASE IN AVAILABLE RESOURCES AND MORE EFFECTIVE INVESTIGATIONS.** Palm Beach County, Florida intentionally built a county-wide approach to CGIC, housed within the Sheriff's Office. This regional approach enabled eight jurisdictions within the county to submit ballistic evidence through the City of West Palm Beach Police Department.⁷⁴

Recognizing that many gun offenses in Phoenix were related to crimes occurring in neighboring jurisdictions, the Phoenix, Arizona, Police Department was one of the first agencies to take a regional approach to gun crime intelligence by establishing the Phoenix Metro NIBIN Program in 2010. As part of this effort, Phoenix trained personnel from other agencies to enter NIBIN data to increase the size of the NIBIN database. Phoenix also hosted monthly "shoots" where representatives from other agencies could test fire guns and directly enter their evidence into NIBIN. By 2013, more than **13** other agencies were participating in the Phoenix Metro NIBIN Program, and Phoenix had become a leading site for the

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number of acquisitions entered into NIBIN and the timeliness of NIBIN entries.⁷⁵ However, subsequent organizational restructuring and personnel reallocation led to fewer resources that could be devoted to NIBIN. These changes, and the volume of ongoing investigations delayed timely NIBIN hits, which require forensic examiners to visually examine evidence entered into NIBIN.

In Baltimore, Maryland, an existing CGIC team of analysts focused on NIBIN leads for the Baltimore Police Department and surrounding agencies in Maryland, Delaware, and Washington D.C. Many of the NIBIN leads identified in the Baltimore CGIC evaluation were related to incidents outside of Baltimore, most commonly in Baltimore County, Washington D.C., and Prince George's County.⁷⁶ As such, these regional approaches can increase intelligence for investigators. This is a key benefit of NIBIN since these connections between cases occurring in separate jurisdictions were unlikely to be identified without using a shared database and process.

Other agencies are in the beginning stages of establishing regional partnerships to increase the solvability of gun crimes. For example, in Winston-Salem, North Carolina, the department has set a goal to create a NIBIN hub that can be used to link crime guns used in Winston-Salem to other neighboring communities, like Greensboro, High Point, and Kernersville.⁷⁷ Research in Little Rock, Arkansas similarly recommended a regional expansion to maximize resources.⁷⁸ **IN THAT CASE, THERE WAS ONLY ONE NIBIN MACHINE LOCATED IN THE STATE, AND RECEIPT OF BJA FUNDING ALLOWED LITTLE ROCK PERSONNEL TO OBTAIN NIBIN TRAINING TO ENTER THEIR OWN EVIDENCE INSTEAD OF RELYING ON THE STATE CRIME LAB. TRAINED LITTLE ROCK PERSONNEL WERE ABLE TO CLEAR A LONGSTANDING FORENSIC PROCESSING BACKLOG THROUGH THIS PROCESS.** These expansions can be applied in other places to reduce burdens on state crime lab personnel.

Some smaller agencies are also applying lessons learned from the CGIC model and creating their own processes for using crime gun intelligence. The Manchester, New Hampshire Police Department uses NIBIN, eTrace, and regular meetings with ATF agents and prosecutors about cases with gun crime evidence to facilitate case investigation and prosecution, without having a formally established CGIC.⁷⁹ Importantly, consistent with the CGIC model, the Manchester Police Department prioritizes the comprehensive collection and processing of gun crime evidence in efforts to solve these offenses.

What are the Current Research Challenges and Opportunities for Future CGIC Research?

As highlighted above, many of the CGIC evaluations have been limited to descriptive studies or suffered from other methodological or practical challenges. These challenges and opportunities to bridge these gaps are discussed below.

Lack of Comparison Groups

Research Challenge: CGICs are city, county, or statewide interventions. As a result, it is often impossible to use randomization or to identify comparison conditions to assess the impact of CGIC related activities. Some studies examine the impact of enhancing existing CGICs, and others focus on agencies that have a long history of using NIBIN and other crime gun intelligence tools to assess change from pre- to post-CGIC implementation.⁸⁰ Further, many agencies were using elements of the CGIC model prior to establishing a formal CGIC, and their technological processes, capacity, partnerships, and policies continue to evolve over time. This complicates research's ability to isolate activities and results before and after CGIC implementation. As such, it is not possible to confidently conclude that a CGIC itself was associated with identified changes in these evaluations.

Research Challenge: Determining whether the impact of evidence provided from a NIBIN lead or CGIC investigation related to a desirable outcome can be challenging because multiple other pieces of evidence are often collected in relation to the same events.⁸¹ Some studies find that evidence, such as video surveillance, is more helpful for achieving case clearance than NIBIN leads, but fully accounting for the presence of all forms of evidence is often challenging.⁸² Other research suggests that increasing the information provided in a NIBIN lead can enhance its utility.⁸³

Future Research Opportunity: Future research should continue to use statistical matching and other approaches to examine the impact of CGIC-related efforts on outcomes of interest.

Future Research Opportunity: Research should also consider whether the content of a NIBIN lead influences its utility for investigators. Leads could be randomly assigned to receive supplemental analyses – such as social networks analysis or social media analysis – to be included with a lead report. Randomizing cases would allow for a test of the impact of lead content to determine whether it is worth allocating resources to provide supplemental information for every high-value investigative lead.

COVID-19

Research Challenge: Most of the CGIC evaluations that were reviewed were impacted by the COVID-19 pandemic in some form. As such, the pandemic created a unique challenge in assessing change over time. COVID-19 also led to organizational and staffing challenges for police agencies implementing CGIC models. In some cases, key stakeholders retired or were reassigned to other positions to facilitate ongoing agency functions. In Indianapolis, Indiana, this led to a three-week gap in the CGIC's ability to send evidence to the Crime Lab for processing.⁸⁴ Monthly interagency meetings between Little Rock, Arkansas Crime Gun Intelligence Unit detectives, ATF, the Federal Bureau of Investigations (FBI), and

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prosecutorial partners stopped as a result of the pandemic.⁸⁵ In Detroit, Michigan, substantial criminal court case backlogs due to pandemic related operational changes inhibited an evaluation of whether the CGIC increased arrests, prosecutions, and adjudications⁸⁶ These impacts on the criminal justice system could inhibit CGICs from operating as intended, and create challenges fully assessing the impact of CGICs during this time.

Future Research Opportunity: More research is needed to examine the impact of CGICs under various social conditions.

Anecdotal Evidence and Lack of Consistent Documentation

Research Challenge: Many studies relied on anecdotal success stories to demonstrate the impact of the CGIC. While these stories are compelling, they do not provide strong enough evidence to demonstrate that CGICs achieve benefits that would not otherwise occur. Some of the data points required to assess CGICs are not consistently gathered. For example, an evaluation in Palm Beach County, Florida, had to overcome several months of missing ballistic recovery information and low counts for many of the data points that were collected.⁸⁷ It is unclear whether those months involved no ballistics recovered or whether apparent increases in ballistics recovery later in the study period truly reflect increased collection, as opposed to increased reporting. An evaluation in Winston-Salem, North Carolina could not conduct pre- to post-CGIC comparisons because key performance metrics were not routinely collected prior to establishing the CGIC.⁸⁸ Similar limitations occurred in Washington, D.C..⁸⁹ Although gun crime is a key outcome to assess the impact of a CGIC, some agencies struggle to identify gun-involved crime using their existing computer-aided dispatch and records management systems.⁹⁰

Future Research Opportunity: Careful attention should be paid to defining and measuring inputs, outputs, results, and outcomes of the CGIC workflow. For more information on collecting CGIC data, check out the [CGIC Metrics Guide](#).

Other Efforts to Reduce Violence

Research Challenge: Most police agencies implement multiple strategies to reduce gun violence. In Detroit, Michigan, the police department implemented Detroit Ceasefire, Project Safe Neighborhoods, and Project Greenlight Detroit in the four years preceding CGIC establishment.⁹¹ In Denver, Colorado, a Gang Violence Intervention strategy was implemented in 2015 (two years after the CGIC) with an Impact Team including federal, city, local, and community partners to target gang activity.⁹² In Baltimore, Maryland, a focused deterrence Group Violence Response Strategy was implemented shortly after the

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CGIC, and members of the CGIC attended those meetings to share information.⁹³ As such, it is not possible to determine whether observed changes are due to the CGIC, Group Violence Response Strategy, or a combination of these efforts.

Research Challenge: In addition to multiple strategic efforts, it is difficult to isolate the impact of multiple technologies. GDS is often deployed to increase identification of gunshots, and these systems are sometimes expanded over time to cover more areas within communities.⁹⁴ Research has yet to disentangle the relationship between GDS, other gunshot response policies, and CGIC successes.⁹⁵ For example, the Denver, Colorado, CGIC also relies on information from license plate readers and surveillance cameras to identify suspects.⁹⁶

Research Challenge: Finally, increased collection of ballistic evidence post-CGIC could be due to concurrent violent crime increases. In Detroit, Michigan, there was a 33% increase in shootings after the CGIC was implemented.⁹⁷ Observed increases in ballistic evidence collection could be due to the availability of evidence, not just changes in procedures because of the CGIC.

Future Research Opportunity: While leveraging a combination of resources to solve gun crime cases is the goal of the CGIC model, shifting technological capacity complicates evaluation efforts when these changes are not thoroughly documented and accounted for in evaluations.

Future Research Opportunity: Future studies should adopt a holistic approach to understanding crime reduction efforts within a community, as well as the broader context in which these models are implemented.

Limited Research on Feedback Loops and Partnerships

Research Challenge: One of the central elements of a CGIC is the use of multiple personnel and agencies to provide inputs into the CGIC and leverage CGIC-generated intelligence. In Baltimore, Maryland, officers in the CGIC target districts were surveyed at two points about their familiarity with the CGIC and their engagement in various CGIC-related activities. Although officers in both districts were significantly more likely to report being aware of the CGIC in the second survey, there were no significant differences in their reported involvement in CGIC cases. Detectives interviewed in three waves following CGIC deployment in Washington, DC reported increasingly favorable perceptions of CGIC products over time, further suggesting that CGICs could become more impactful as policies and processes are solidified.⁹⁸ In Winston-Salem, North Carolina, CGIC and NIBIN training is part of the basic law enforcement training.⁹⁹

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In Detroit, Michigan, weekly NIBIN-related success bulletins were created to summarize investigations that were advanced because of CGIC involvement. Bulletins were shared with command staff, investigators, officers, and other stakeholders to provide feedback on the process and reinforce the importance of comprehensive evidence collection.¹⁰⁰ The Crime Analysis Unit in Chattanooga, Tennessee created a real-time dashboard to monitor gun crimes, assign investigative follow ups, and display NIBIN leads and link analyses. This dashboard was created for the Gun Team, but was also shared with patrol officers who were initial responders to these events.¹⁰¹ Phoenix, Arizona, automatically emails every officer who collects a casing that results in a NIBIN lead to thank them for their efforts and to remind them of the importance of their work.¹⁰² For more information on providing feedback in a CGIC, review the [CGIC Feedback Toolkit](#).

Future Research Opportunity: Though these descriptive results are compelling, future research should consider whether different feedback mechanisms can further enhance CGIC models.

Long-term Follow-up Studies

Research Challenge: Most of the CGIC evaluations reviewed were short in duration, often limited to a few years pre- and post-CGIC implementation. This limits the ability of these studies to identify impacts that take time to achieve. Increasing evidence collection and entry could have more gradual effects on arrests and crime that might not be captured with the one-year follow-up periods often used in these studies, because investigations and court processing can take considerable amounts of time.¹⁰³

Research in Phoenix, Arizona, collected case status information from the courts for CGIC-related cases, but many of these cases were still pending, which prevented a full assessment of case outcomes.¹⁰⁴ A study in Little Rock, Arkansas, found that some cases took several years to go through the full court process, often including multiple court dates prior to resolution.

Research Challenge: Similarly, it might take longer periods of time for the incarceration of prolific offenders to drive down community-wide crime trends.¹⁰⁵ The rarity of events like homicides and nonfatal shootings can create challenges in identifying changes in trends.¹⁰⁶

Future Research Opportunity: Long-term follow-up periods are particularly important for examining prosecutorial outcomes. Prosecutors reported that the increasing number of cases referred by the CGIC created workload challenges, and future research should explore ways to enhance these processes.¹⁰⁷

Future Research Opportunity: Longer-term follow-up periods are needed to address trend changes. CGICs have existed for over a decade, giving researchers much more data to work with and more opportunities to identify trends over time with sufficient statistical power. As evidence entered into NIBIN increases, the ability of this database to provide links continues to grow.¹⁰⁸ As a result, the benefits and impact of a CGIC could increase the longer it is in operation.

What Can Practitioners and Researchers Do to Further CGIC Research?

The CGIC workflow involves multiple interconnected components. This requires careful attention and strategic planning to conduct well-designed evaluations to ensure research findings are accurate and actionable for informing future policies and practices.

The following action items should be considered:

- **Define the CGIC workflow components to be implemented**
 - Examples include: NIBIN, eTrace, GDS, specially trained gun crime investigators, and interagency collaboration
- **Identify and engage relevant stakeholders throughout the process**
 - These may include federal law enforcement, local law enforcement, state crime labs, forensics personnel, and prosecutors, among others
 - Research partners should be engaged to help identify data sources, create logic models, develop evaluation plans, and inform ongoing assessment efforts
- **Identify intended measures of success**
 - These can include case clearances, arrests, charges, convictions, and gun crime reductions
- **Create a logic model to link CGIC processes to target goals**
 - This model should explicitly describe:
 - i. Inputs: resources, staffing, technology, etc.
 - ii. Outputs: direct results of inputs and activities, such as NIBIN leads/hits

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- iii. Results: short- and medium-term desired results of inputs and outputs, such as arrests and charges
- iv. Outcomes: the ultimate long-term intended goals of all program activities, such as gun crime reductions

☐ Identify or create data mechanisms to track each element of the logic model

- Data sources may include evidence acquisition logs, NIBIN and eTrace entries and results, case status information, court information, and crime incident data
- If an element of the logic model is not currently systematically tracked, a consistent reporting mechanism should be developed
- Data sharing agreements should be created, if necessary, for measures that need to be collected from outside agencies, such as other law enforcement partners or prosecutors' offices

☐ Create a comprehensive evaluation plan

- This should involve a realistic timeline to identify and account for pre-implementation trends and follow-up time to investigate and prosecute cases
- Consider other factors that could influence findings, such as broader crime trends, seasonal variation in crime, organizational changes, and other violence reduction efforts that need to be accounted for

☐ Ongoing assessments of performance metrics across the CGIC workflow

- Routinely assess inputs, outputs, results, and outcomes
- Adjust processes as needed and document changes

☐ Establish a feedback loop to keep stakeholders informed

- Provide information about current cases, successes, challenges, and areas for improvement to support continued engagement with the CGIC

As highlighted in the above checklist and in the [CGIC Metrics Guide](#), comprehensive CGIC evaluations depend on reliable data. The key metrics that need to be assessed in a CGIC evaluation are provided below, along with an explanation of their importance.

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Metric	Importance
Inputs	
Cartridge casings collected and firearms recovered	Assesses whether comprehensive collection is occurring. Defines the amount of evidence that can be leveraged through the CGIC process.
Evidence entered into NIBIN and eTrace	Indicates whether available evidence is being processed to obtain investigative leads as intended.
Outputs	
Time between evidence collection and entry	Determines whether resource allocation supports timely evidence processing.
Time between evidence collection and intelligence provided to investigators	Assesses whether CGIC processes provide intelligence to investigators in real time.
NIBIN leads/hits and eTrace hits	Measures whether evidence entry is generating usable intelligence.
Results	
Arrests and case clearances	Determines whether CGIC-generated intelligence contributes to suspect identification and apprehension.
Court Outcomes (e.g. charges, guilty pleas, and convictions)	Assesses whether interagency collaboration leads to successful prosecution.
Outcomes	
Crime (e.g. shootings, gun crime)	Evaluates whether CGIC-related efforts contribute to crime reduction and improve community safety.

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It is critical to measure CGIC inputs and outputs to understand whether CGICs are achieving intended results and outcomes. Without tracking each stage of the CGIC workflow, it is not possible to accurately evaluate impact. For example, assessing whether CGICs increase arrest requires first confirming whether comprehensive evidence collection, timely entry, and rapid dissemination of intelligence are consistently occurring. These foundational metrics provide crucial context for understanding downstream effects of CGICs, such as case clearance and successful prosecution. In short, it is not possible to determine whether a CGIC is achieving its goals without first establishing whether it is being implemented with fidelity.

Most evaluations successfully measure elements of the CGIC that can be captured using internal police data, like evidence acquisition, NIBIN/eTrace results, and arrests; however, fewer evaluations were able to measure court outcomes. This is a notable limitation in the current research because interagency partnerships and successful prosecution are considered core elements of the CGIC workflow. Evaluating each aspect of the CGIC model can identify which components are achieving intended benefits, and whether any activities are counterproductive.

Although some of the studies reviewed measured stakeholder perceptions of the CGIC, this remains an underdeveloped area of research. Understanding CGIC processes from an insider perspective can reveal benefits or drawbacks that cannot be identified relying solely on official data. For example, detectives in Washington, DC, often reported that NIBIN will not solve a case on its' own but still reported that the intelligence received was valuable for identifying suspects and other information to pursue.¹⁰⁹ Including stakeholder surveys and interviews can provide insight into elements of the CGIC model that are working well and where improvement might be needed.

Finally, partnering with a research team ensures an evaluation that can establish the impact of a CGIC. The multifaceted nature of the CGIC model requires careful consideration of appropriate comparison conditions and measurement of competing explanations for observed patterns. This often requires statistically accounting for multiple factors to isolate the effect of a CGIC. Research partners can also provide guidance on continued efforts to track implementation efforts and impact as part of structured CGIC feedback loops. Just as importantly, research partners must work closely with agency partners to ensure an accurate understanding of the data being used, CGIC policies and practices, and any other violence reduction efforts or organizational changes that might influence the findings.

The following list describes key considerations for establishing a research partnership:

□ Clarify evaluation goals

- Collaboratively define what is being assessed. Examples could include if the CGIC is being implemented as planned, whether it enhances investigations, long-term crime impacts, etc. Discuss with the agency what is realistic in terms of the assessment and what conclusions can be drawn from it.

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- **Identify metrics consistent with your evaluation goals**
 - Determine whether necessary data exists in existing law enforcement systems or if a new tracking process needs to be created.
- **Create data sharing protocols**
 - Collaborate with the agency and their IT personnel to identify efficient data sharing methods that limit disruptions for agency personnel.
- **Select appropriate comparison conditions**
 - Collectively consider whether some locations, time periods, or case types could serve as reasonable controls to assess the impact of CGIC activities.
- **Identify and account for other external influences**
 - Discuss with the agency whether other organizational changes or initiatives might influence evaluation findings.
- **Establish feedback loops**
 - Use interim reporting to help the agency refine CGIC processes and ensure implementation fidelity.

So, What Does It All Mean?

The CGIC evaluations reviewed identified some preliminary positive impacts of CGICs and several areas that require additional research.

- **Inputs:** Descriptive research and pre- to post-CGIC implementation assessments suggest that CGICs increase the number of casings and firearms collected and entered into NIBIN and eTrace. One RCT found that specially trained patrol officers collect more ballistic evidence than untrained officers.¹¹⁰
- **Outputs:** Descriptive research and pre- to post-CGIC implementation assessments suggest that CGICs can reduce evidence processing delays and increase the number of NIBIN leads, NIBIN hits, and eTrace hits. Few quasi-experiments have examined whether CGICs achieve intended outputs though one study identified a significant reduction in eTrace hits post-CGIC.¹¹¹
- **Results:** Descriptive research and pre- to post-CGIC implementation assessments suggest that CGICs can increase case clearances, arrests, and charges, but the results are inconsistent across studies. Quasi-experimental studies have identified mixed findings. A study in Detroit, Michigan identified significant increases in case clearances.¹¹² Research in Phoenix, Arizona, identified

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significant increases in NIBIN-related arrests post-CGIC implementation, but there were no significant changes in prosecutorial charges or convictions.¹¹³ Significant increases in the number of suspects identified, charged, and convicted were associated with the CGIC deployment in Chattanooga, Tennessee.¹¹⁴ Finally, a study in Washington, D.C., found no effect of a CGIC pilot enhancement on gun-related arrests.¹¹⁵

- **Outcomes:** Descriptive research and pre- to post-CGIC implementation assessments identify different findings across studies. Some report crime decreases, others report no change, and others find crime increases. Quasi-experimental research offers similarly mixed results. Shots fired calls for service and nonfatal shootings significantly declined in Chattanooga, Tennessee post-CGIC implementation.¹¹⁶ NIBIN-related arrests in Milwaukee, Wisconsin, might have significantly reduced shootings in the following months by 3-12%, but these findings were dependent on the specific statistical models examined.¹¹⁷ A study in Denver, Colorado, found significant reductions in robberies with a firearm post-CGIC implementation, but the CGIC was not associated with other serious violent gun crimes, gun homicides, or aggravated assaults with a gun.¹¹⁸ Similar trends were identified in Little Rock, Arkansas, where gun robberies significantly declined, but homicides, nonfatal shootings, and terroristic acts did not.¹¹⁹ In Baltimore, Maryland, there were significant reductions in gun crime, gun homicides, and shots fired in one CGIC district, but no significant changes in the other CGIC district examined.¹²⁰ There was no significant change in violent crime or gun crime in Washington D.C..¹²¹

In short, prior research descriptively supports early elements of the CGIC workflow, suggesting increased evidence collection, timely intelligence, and more investigative leads. Research examining the impact of CGICs on clearances, arrests, and court outcomes is less conclusive. Studies that used stronger research designs offer mixed evidence of impact across these areas. Finally, prior research has not identified consistent relationships between CGICs and crime. Although some studies have used strong research methodologies and identified crime reductions, most quasi-experimental studies found either no change or mixed results across different crime types or places. More research is needed to rigorously examine whether CGICs are achieving their intended goals.

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Findings		Strength of the Evidence
Inputs		
Cartridge casings and firearms recovered	Most studies find an increase in casings and firearms recovered after CGIC implementation.	Largely descriptive trends and pre-to post- CGIC comparisons.
NIBIN and eTrace entries	Most studies find an increase in NIBIN entries and eTrace searches after CGIC implementation.	Largely descriptive trends and pre-to post- CGIC comparisons.
Outputs		
Timeliness of NIBIN and eTrace entry and findings	Most studies find faster NIBIN and eTrace entry and results after CGIC implementation.	Largely descriptive trends and pre-to post- CGIC comparisons.
NIBIN leads and hits	Most studies find a large increase in the number of NIBIN leads after CGIC implementation. Results about NIBIN hits are less conclusive, with some finding increases and others finding no change.	Largely descriptive trends and pre-to post- CGIC comparisons, with a few statistical significance tests.
eTrace hits	One study found an increase in eTrace hits over time, another identified a decrease, and still others found limited change or only examined counts post-CGIC implementation.	Largely descriptive trends and pre-to post- CGIC comparisons.

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Results		
Arrests	Studies describe high numbers of arrests, with one quasi-experimental study finding a significant increase and two others finding no change in arrests post-CGIC.	Largely descriptive trends and pre-to post- CGIC comparisons, with a few quasi-experimental studies.
Prosecutorial outcomes	Limited indication that CGICs increase charges or convictions across studies, though one quasi-experimental study identified significant increases in both outcomes.	Largely descriptive trends and pre-to post- CGIC comparisons, with a few quasi-experimental studies.
Outcomes		
Crime	Studies report mixed findings, with some showing crime decreases, no change, or increases. Quasi-experimental studies find significant reductions in some cities for some crime types, and no change in others.	Largely descriptive trends and pre-to post- CGIC comparisons, with a few quasi-experimental studies.

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²¹ Mei, V., Owusu, F., Quinney, S., Ravishankar, A., & Sebastian, D. (2019). *An Evaluation of Crime Gun Intelligence Center Improvements Implemented in Washington, DC, 2016-2019* (p. 62). The LAB @ DC.

²² See X, VI, and V.

²³ See IX.

²⁴ Police Executive Research Forum. (2017, May). *The “Crime Gun Intelligence Center” Model: Case Studies of the Denver, Milwaukee, and Chicago Approaches to Investigating Gun Crime*. PERF. <https://www.policeforum.org/assets/crimegunintelligencecenter.pdf>

²⁵ See V.

²⁶ Huff, J., King, W. R., Katz, C. M., Hipple, N. K., Novak, K. J., & Patterson, S. (2024b). Timely Intelligence Enhances Criminal Investigations: Investigators’ Ratings of Ballistics Imaging Across Three Cities. *Crime & Delinquency*, 00111287241242484. <https://doi.org/10.1177/00111287241242484>. Also, see X and XIV.

²⁷ See VI.

²⁸ See III.

²⁹ See VI.

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³⁰ See XXII.

³¹ Flippin, M. R., Katz, C. M., & King, W. R. (2022). Examining the impact of a crime gun intelligence center. *Journal of Forensic Sciences*, 67(2), 543–549. <https://doi.org/10.1111/1556-4029.14952>. Also, see X and XIX.

³² See VI.

³³ See XIV.

³⁴ See XXII.

³⁵ See VIII.

³⁶ De Biasi, A. (2024). The impact of the Detroit crime gun intelligence center on fatal and nonfatal shooting clearance rates. *Journal of Criminal Justice*, 94. <https://doi.org/10.1016/j.jcrimjus.2024.102233>

³⁷ See IX.

³⁸ See VIII.

³⁹ See XIII.

⁴⁰ See XXXIV.

⁴¹ Se VII.

⁴² See IV.

⁴³ See X.

⁴⁴ See I and VI,

⁴⁵ See XXIII.

⁴⁶ See X.

⁴⁷ See XXXIV.

⁴⁸ See XIX.

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⁴⁹ See VII.

⁵⁰ See II.

⁵¹ See XXII.

⁵² See V.

⁵³ Uchida, C. D., Quigley, A., & Anderson, K. (2019). *Evaluating the Los Angeles Crime Gun Intelligence Center*. Justice & Security Strategies, Inc. Also, see IX.

⁵⁴ Bottema, A. J., & Barter, M. (2024). Taking aim at crime: Evaluating evidence in a crime gun intelligence approach. *Police Practice & Research*, 1–14. <https://doi.org/10.1080/15614263.2024.2410832>

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⁵⁶ See VII.

⁵⁷ See VIII.

⁵⁸ See XIX.

⁵⁹ See X.

⁶⁰ See X and XXIX.

⁶¹ See VII.

⁶² See XIII.

⁶³ See V.

⁶⁴ See II.

⁶⁵ See I.

⁶⁶ See VIII.

⁶⁷ See XIX.

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⁶⁸ See VII.

⁶⁹ See IX.

⁷⁰ See IV.

⁷¹ See XLVI.

⁷² See XIII.

⁷³ See I.

⁷⁴ See IX.

⁷⁵ See X.

⁷⁶ See XIII.

⁷⁷ See IV.

⁷⁸ See VIII.

⁷⁹ See L.

⁸⁰ See XXXIV, XIX, X, and XIV.

⁸¹ See II.

⁸² See L.

⁸³ See XXXIV.

⁸⁴ See XIV.

⁸⁵ See VIII.

⁸⁶ See V.

⁸⁷ See IX.

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⁸⁸ See IV.

⁸⁹ See XIX.

⁹⁰ See XXIX.

⁹¹ See V.

⁹² See XXII.

⁹³ See XIII.

⁹⁴ See II.

⁹⁵ Huff, J., Dunlap, B., & Pearson, R. L. (In press). Does acoustic gunshot detection technology reduce crime? A systematic review and meta-analysis. *American Journal of Criminal Justice*.

⁹⁶ See XXII.

⁹⁷ See V.

⁹⁸ See XIX.

⁹⁹ See IV.

¹⁰⁰ See V.

¹⁰¹ See VII.

¹⁰² See X.

¹⁰³ See VIII.

¹⁰⁴ See X.

¹⁰⁵ See XIX.

¹⁰⁶ See VIII.

¹⁰⁷ See VIII.

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¹⁰⁸ See II.

¹⁰⁹ See XIX.

¹¹⁰ See XV.

¹¹¹ See VII.

¹¹² See XXXIV.

¹¹³ See XXIX and X.

¹¹⁴ See VII.

¹¹⁵ See XIX.

¹¹⁶ See VII.

¹¹⁷ See II.

¹¹⁸ See I.

¹¹⁹ See VIII.

¹²⁰ See XIII.

¹²¹ See XIX.



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