



# National Case Closed Project:

## Summarizing the State of the Evidence on Effective Shooting Investigations

### Summary and Purpose

The National Case Closed Project is a nationwide program led by the Bureau of Justice Assistance (BJA) that supports law enforcement agencies in improving crime clearance rates, with an emphasis on fatal and nonfatal shooting cases.<sup>1-2</sup> This brief summarizes research on agency-level factors related to investigations and clearance rates and translates what we know regarding effective policies and practices for responding to and successfully investigating violent crimes. Our emphasis is on agency and investigative factors within the control of law enforcement that are linked to case clearance, with a focus on fatal and nonfatal shootings. It is important to note that some findings are based on recent studies, whereas others are based on studies conducted a decade or more ago.

### Background

U.S. law enforcement agencies (LEAs) spend a significant amount of time and resources investigating violent crime. Across the nation's LEAs, between 9%–10% of full-time sworn officers are detectives according to data from the 2016 and 2020 waves of the Law Enforcement Management and Administrative Statistics (LEMAS) survey (US DOJ, 2020). Despite the resources dedicated to investigations, clearance rates have remained stable for decades and, in the case of homicide, have declined (Lum et al., 2018; Scott et al., 2018).

Research shows that agency investigative practices can meaningfully impact crime clearance rates, which suggests that building or maintaining an effective investigations capacity is worth the investment (Braga, 2021; Prince et al., 2021; Wellford et al., 2019). However, while there is a body of research on the policies, practices, and technologies that are most effective for clearing homicides, we know much less about what works best in investigating other violent crimes, including nonfatal shootings.

One of the most complicated nuances about case closures is that the factors affecting case closure can differ across types of crimes. For example, in

gang-related homicides, clearance rates are lower because of the difficulty in establishing victim-offender relationships and finding cooperative witnesses, as well as the higher probability of firearms being used (Armstrong et al., 2013; Braga et al., 2018). Situational factors are elements usually out of an investigator's control that have also been shown to make offenses more or less likely to be solved. Commonly known as "solvability factors," these factors may include the victim-offender relationship, the type of weapons used in a crime, the amount and type of evidence left at the crime scene, and the presence of witnesses.

### *Initial Response to Scene*

Research shows that an LEAs response time to a reported crime and the length of time it takes for detectives to arrive on scene are both related to the likelihood an incident is cleared (Vidal et al., 2018; Wellford & Cronin, 1999). In addition, the number of personnel that respond to a crime scene and the specific number of responding investigators are each independently related to the likelihood that a homicide is cleared (Wellford & Cronin, 1999).

These findings indicate that investing in an organized and appropriately staffed response to all shooting scenes, including nonfatal shootings, can increase clearance rates. Agencies typically dedicate fewer resources to nonfatal shooting scenes as compared with fatal shootings, which is likely one of the reasons why far fewer nonfatal shootings are cleared compared with fatal ones (Braga, 2021; Cook et al., 2019).

### *The Concept of Investigative Effort*

The concept of investigative effort refers to the types of activities and actions that investigators undertake as part of the response and follow-up to a reported crime. Generally, research finds that increased investigative effort is related to higher clearance rates, specifically for homicides and aggravated assault shootings (Alexander, 2012; Braga & Dusseault, 2018; Carter & Carter, 2015; Coupe, 2014). For example, Braga and Dusseault (2018) tested an intervention used by the Boston

Police Department (BPD) to improve homicide clearance rates. The BPD intervention sought to structure and increase departmental actions related to developing engaged witnesses, collecting more physical evidence, and conducting more forensic testing, among other investigative activities. The BPD initiative was found to have increased investigative action, which in turn, increased homicide clearances by 23%.

### ***Investigator Experience, Skills, and Training***

Evidence on the impact of individual-level factors on investigative outcomes, including the experience and skill level of investigators, is somewhat mixed. Some studies have found that investigative experience is unrelated to homicide clearances (Chaiken et al., 1977; Puckett & Lundman, 2016), whereas other research has found that years of experience can have an impact, though it may depend on the type of experience (Goodison, 2021). Regarding investigator skills, those related to interviewing victims, witnesses, and suspects appear especially important as they relate to violent crime clearance rates (Brookman et al., 2018; Mount & Mazerolle, 2021; Westera et al., 2014). Evidence shows that detectives with strong interpersonal skills and the ability to develop good rapport with interviewees are likely to clear more violent crimes than investigators who lack these skills (Kelly & Meissner, 2015; Westera et al., 2014).

Investigator training has also been highlighted as an important component of LEAs that have successfully achieved high clearance rates (Carter & Carter, 2015; Wellford, 2018). In addition to training received through experience in the field, Carter and Carter (2015) recommended formal trainings on homicide crime scene investigation, death investigation, and interviewing for new homicide investigators. They also found that other competencies, including training on digital evidence collection, contributed to success in clearing crimes (Carter & Carter, 2015). These findings align with previous research by Keel et al. (2009), who found the availability and requirement of formal training for homicide detectives improved clearance rates. The BPD Homicide Clearance Project (Braga, 2021; Braga & Dusseault, 2018) also found that additional advanced training for investigators, crime scene staff, and forensic analysts increased homicide case clearance rates. Training content included advanced investigative techniques, crime scene response to improve collection and processing of evidence from the scene, and how to implement a peer review process for homicide investigations (Braga & Dusseault, 2018, pp. 10-11).

### ***Caseload, Case Assignment, and Staffing***

The lack of systematic data on investigative unit staffing levels, caseload sizes, assignment types, and investigator clearance rates for a large sample of LEAs has limited research on this topic. For instance, there is little empirical evidence on the optimal method for assigning cases to investigators to achieve a high clearance rate. We cannot say whether a rotational case assignment method is more effective than assigning cases to investigators based on attributes of the case and investigator, or whether assigning cases to an individual lead detective is more effective than assigning cases to a small team of investigators.

There are some studies that establish a linkage between smaller caseloads and higher clearance rates (Braga, 2021). Findings from BJA's Homicide Investigations Enhancement Training and Technical Assistance Project suggest that a target caseload for homicide detectives should be between four to six new cases per year (Carter, 2013; Police Executive Research Forum, 2018). According to Braga (2021), an agency's "ability to clear homicides is a function of the resources applied to conduct investigations and how its efforts are organized" (p. 5). The BPD Homicide Clearance Project (Braga, 2021; Braga & Dusseault, 2018) expanded sworn and civilian staffing available to work homicide cases, which improved case clearance rates. Specifically, the homicide unit was expanded by adding a detective to each squad, adding a civilian crime analyst to enhance the ability to search databases to provide investigative leads, and adding a second victim-witness resource officer to strengthen connections to victim assistance organizations and relationships with victims' families and witnesses. These staffing enhancements were compared with aggravated assault units that investigated nonfatal shootings in Boston, which did not benefit from small caseloads, access to resources, or extensive follow-up action beyond the first two days after an incident.

### ***Managing Investigations***

Research suggests that, in order to enhance clearance rates, responding agencies should have detailed documentation of the crime scene, a quick mobilization by forensic technicians to collect and process evidence, and detectives rapidly working to substantiate statements made by witnesses (Braga, 2021). This last point is especially important because witnesses to drug- and gang-related homicides may engage with investigators beyond the on-scene interviews following the shooting incident. In Boston, successful homicide investigations were more likely to include an

engaged eyewitness (28% of homicide clearances compared with 14% of nonfatal shooting clearances) and to include at least an attempt to collect and follow up on physical evidence, including ballistic and video evidence, latent prints, and phone records. One or more of these evidentiary factors was mentioned as the key to success more than 100 times for cleared homicide cases but only 24 times in cleared nonfatal shooting cases. Given the effect of witness statements and evidence on case clearance, investigations must be effectively managed so that no investigative leads are missed or ignored.

Part of effectively managing cases also includes maintaining effective case documentation, processes for promoting consistency in recommended processes, and routine case reviews. Anecdotal evidence links these practices to case clearance (Police Executive Research Forum, 2018, pp. 51-53), and it is logical to expect that they could impact the prosecution outcomes as well. Standardized processes that help promote consistency in recommended investigative practices can be important for increasing case clearance rates. Protocols including checklist forms can provide guidance for supervisors and frontline staff on steps to be completed during each stage of the process. A set of protocols was developed as part of the BPD Homicide Clearance Project (Braga, 2021; Braga & Dusseault, 2018) to reduce variation in practices such as witness identification, the deployment of forensic technicians to the scene, the collection and processing of evidence, and the way in which investigators worked with prosecutors to prepare cases for a grand jury. Another process that can increase clearance rates is the implementation of a peer review process for open investigations. For example, in the Boston project, a case review process consisting of monthly sessions for all open investigations was used to increase accountability and ensure that all investigative leads were followed. Relatedly, researchers who surveyed 55 LEAs found that greater managerial oversight was correlated with higher homicide clearance rates (Keel et al., 2009).

Cold case units designed to reinvestigate and solve past cases that remain unsolved are another critically important resource for solving cases. Cold case units vary across agencies in how they are staffed and how cases are assigned. There is also little consistency in how cases are initiated or by whom (Davis et al., 2011). Cold case units generally require significant resources, including trained staff, to follow up on leads and reexamine evidence (Turner & Kosa, 2003; Walton, 2017). A survey of

LEAs about cold case investigative procedures (Davis et al., 2011) found that about one in five cold cases were cleared and that agencies with the highest cold case clearance rates were those with funding available to support the case work, including funding for travel to follow up on leads and to access investigative databases (e.g., Violent Criminal Apprehension Program). Walton (2017) recommends that cold case investigators should not be assigned to other duties and that their caseload should not exceed one case at a time. Yet empirical evidence is lacking on whether these criteria translate to better cold case clearance rates.

### ***Technology and Data***

Technology can play an important role in law enforcement and there are important findings regarding the impact of specific types of technology on investigative success. For example, research has shown that DNA collection and testing lead to more suspects being identified and arrested, more cases being accepted for prosecution, and more cases being cleared (Dunsmuir et al., 2008; McEwen & Regoeczi, 2015; Roman et al., 2009). Among homicides specifically, cases with more physical forensic evidence are more likely to be cleared (McEwen & Regoeczi, 2015). In the BPD Homicide Clearance Project (Braga, 2021; Braga & Dusseault, 2018), homicide clearance rates increased after new forensics technology, such as 3D shooting reconstruction technology, was acquired. Other technologies, such as surveillance cameras, have also been found to increase the clearance rates of burglary (Coupe & Kaur, 2005) and other crimes (Ashby, 2017). Preliminary research has shown that body-worn cameras can increase suspect detection and clearance rates, though more research is needed to replicate these findings (Ellis et al., 2015; Lum et al., 2019; Morrow et al., 2016).

One technology that is especially relevant to shooting investigations is advancements in ballistic imaging and the introduction of the National Integrated Ballistic Information Network (NIBIN). If law enforcement agencies promptly enter images of ballistic evidence into NIBIN, the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) can apply imaging technology to quickly provide NIBIN leads to investigators to advance crime investigations (ATF, 2023, Part I). Specifically, law enforcement agencies can use the potential matches that NIBIN produces to detect links between shootings and other firearm-related incidents across jurisdictions. Several studies have examined the effectiveness of ballistic imaging technology and the value of NIBIN in clearing shooting cases (Braga & Pierce,



2004, 2011; King et al., 2013; King et al., 2017; U.S. Department of Justice, 2005). Additionally, there have been evaluations of the ATF's Crime Gun Intelligence Centers (CGICs), which are designed to collect, analyze, and distribute data on crime guns across jurisdictions and use NIBIN as a central component of their models. Research conducted at CGIC sites in Milwaukee, Denver, and Chicago have reported encouraging findings suggesting that an agency's use of NIBIN improves investigative success as defined by increased clearance outcomes (Koper et al., 2019; Police Executive Research Forum, 2017; Uchida et al., 2020). Based on the evidence, law enforcement investments in crime gun intelligence and the use of NIBIN seems likely to improve shooting clearance rates. As a database, NIBIN becomes an even stronger tool when more agencies use it and submit evidence; the more NIBIN is employed, the more useful it becomes in investigations.

The increased speed at which investigators receive, process, and use information has also been shown to increase clearance rates in several studies (Ioimo & Aronson, 2003; Wellford & Cronin, 1999). For example, the implementation of mobile field computing in policing increased overall crime clearance rates (Ioimo & Aronson, 2003). Furthermore, computer checks on suspects and relational databases were found to increase clearance rates (Schroeder & White, 2009; Wellford & Cronin, 1999). Other technologies, including fingerprint identification systems and profiling technologies, have shown promise in increasing crime clearance rates (Fox & Farrington, 2012, 2015; Hsu, 2007; Lee, 2020; Mastrobuoni, 2020). NIBIN is also directly relevant to this area, as ballistic evidence can be used through the network to increase the efficiency of investigations and provide leads to agencies quickly (ATF, 2023, Part I).

Importantly, given the pace of technology adoption, the field also needs to increase the amount of rigorous research studies across a range of jurisdictions to determine how much specific technologies impact investigative outcomes and under what circumstances LEAs can maximize their success. A related component is how technologies can be used together and paired with specific types of strategies or approaches to improve case outcomes. One example is NIBIN engagement teams, which are teams of law enforcement agents who are not actively assigned to cases but who are tasked with proactively addressing gun violence using NIBIN and following up on those leads. There are also challenges that must be acknowledged regarding research on the impact of technology on

investigations. For instance, technology is seldom implemented in isolation of other agency changes, making it more difficult to know whether any changes in clearance rates uncovered in this body of research were caused by using the technology in question. LEAs should continue to work with researchers to evaluate the impact of promising investigative technologies to guide the field.

### ***Police-community Engagement***

When community residents feel as though their local law enforcement agency is legitimate (in other words, that they can effectively do their jobs, they can be trusted, and they will help), they are more likely to report crimes and are more likely to participate as witnesses in investigations and court proceedings (Hinds & Murphy, 2007; Sunshine & Tyler, 2003). Specifically, research finds that police legitimacy (Tyler, 2004) and legal cynicism (Kirk & Papachristos, 2011) can influence the willingness of crime victims and third-party witnesses to engage with the criminal justice system (Bolger & Walters, 2019; Carr et al., 2007; Kirk & Matsuda, 2011). Of course, even if law enforcement agencies are trusted in communities, they must still work with their local, state, and federal partners to protect witnesses from intimidation or retaliation (Wilkinson et al., 2019).

Strong partnerships between law enforcement agencies and community- and faith-based organizations appear to be linked to crime and clearance rates (Braga et al., 2008; Brunson et al., 2013), although the mechanisms of these relationships are not fully known. Studies find that investigators and agency leaders who believe that their organizations have good relationships with local communities often have higher clearance rates (Carter & Carter, 2015; Lum et al., 2018). Stronger relationships may prompt greater community trust in law enforcement, increasing the likelihood that residents will report crimes or participate in investigations as witnesses (Boateng, 2018; Kwak et al., 2019).

### ***Organizational Factors***

Organizational factors include things like the structure and operation of law enforcement agencies and investigative units, the frequency and type of communication, and coordination within and outside of the agency; the funding and staffing resources dedicated to various law enforcement functions, programs, and equipment; and leadership and management practices. In an analysis of seven LEAs that differed greatly in their index crime clearance rates over a 33-year

period, researchers found large organizational differences between high- and low-performing agencies. Specifically, high-performing agencies were more likely to have more structured oversight of investigations, stronger connectivity between their units, better information sharing between patrol officers and investigators, and more active leadership (Scott & Wellford, 2021; Wellford, 2018). Additionally, there is an association between the quality of the relationship between local law enforcement agencies and prosecutors' offices and crime clearance (Keel et al., 2009; Wellford, 2018), and prosecutor office practices likely play a role (Spohn & Tellis, 2019). Importantly, organizational factors like these may also explain, at least in part, the higher clearance rates for murder compared with nonfatal shootings in many agencies (Braga, 2021).

## Conclusion

A review of the research on the factors that matter most in predicting higher case clearance rates reveals some key findings and implications. It is important to acknowledge that most of what is known pertains to homicide investigations. More work is needed to understand whether these findings translate to nonfatal shooting cases.

These findings include:

- Timely, organized, and sufficiently staffed responses to the initial scene of a crime, as well as thorough documentation of the scene, puts the investigation on solid footing.
- More effort expended by law enforcement agencies in the investigation process (e.g., through developing key witnesses, collecting evidence, and performing forensic analysis) translates to better case outcomes.
- The process for selecting investigators and the supervisors that manage investigative units is important for better clearance outcomes.
- Access to and requirements for formal investigator training on investigative procedures and analytics is linked to higher clearance rates.
- Evidence suggests that smaller investigator caseloads are associated with higher case clearance rates. Ideal caseload targets that have been recommended include four to six new cases per year for homicide investigations and one case at a time for cold cases. Yet these guidelines have not been studied empirically for their impact on clearance outcomes.

- Standardizing protocols and procedures around shooting investigations has been shown to improve clearance rates by reducing the variation in investigation practices across individuals, districts, and units and provide structure to ensure that every investigation follows best practices to maximize the chance for success.
- Training on and use of technology to process physical and digital evidence is associated with improved clearance outcomes in some studies. Additional evaluations are needed to determine the effectiveness and return on investment of many investigative tools.
- Strong partnerships between law enforcement agencies and the communities they serve can improve case clearance outcomes through engendering trust and willingness to report crimes and serve as witnesses.
- Organizational factors, such as having structured oversight in investigations, information sharing between patrol officers and detectives during investigations, a good quality relationship between the agency and local prosecutor's office, and more, have been linked to agencies with high case clearance rates.
- Characteristics of local community conditions, including the community's level of cohesion and willingness to intervene in bad behavior, can affect clearance outcomes.

We appeal to the nation's law enforcement community to continue expanding partnerships with researchers to extend the evidence based on the factors that increase the likelihood of clearing violent crimes so that recent, quality evidence can guide agency investigative practices and decision-making. Moving forward, there are clear areas where new research could better inform investigative practices, policies, and procedures. These include:

- More rigorous evaluations of law enforcement agency policies and programs and their impact on crime clearance rates and court outcomes as well as the development of improved measures for investigative activity and case success.
- Research to better understand how best to leverage technology and data in investigations, particularly with advancements in forensic and data-related technologies (Wellford & Cronin, 1999; Westveer, 2002).

- Evaluations to understand the costs and benefits of investigative tools and strategies, such as license plate readers, internal mobile subscriber identity-catchers, and social network analysis.
- Research that can determine causal links between residents, communities, and law enforcement and the ability to clear crimes, including whether certain types of programs or initiatives are beneficial toward improving community trust and the willingness of community members to engage with law enforcement as witnesses.

<sup>1</sup> According to the Federal Bureau of Investigation's Uniform Crime Reporting Program's definition of clearance, law enforcement agencies should consider a crime as being cleared when (1) they arrest a suspect (or issue a summons), charge the suspect with the commission of the offense, and turn the suspect over to the court for prosecution or (2) certain exceptional circumstances prevent them from taking these steps when they would otherwise be able to (Federal Bureau of Investigation, 2004).

<sup>2</sup> The National Case Closed Project defines a nonfatal shooting as a criminal incident where a weapon with a powder discharge was fired at a victim with criminal intent and a victim suffered a nonfatal penetrating wound from the firearm's projectile (McGarrell et al., 2019, p. 5). This definition does not include aggravated assaults in which a victim is shot at but not struck by a projectile.

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