IDENTIFYING EFFECTIVE INVESTIGATIVE PRACTICES

A National Study Using Trajectory Analysis, Case Studies, and Investigative Data

[FINAL REPORT]
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Practitioner’s Brief

A law enforcement guide to Identifying effective investigative practices: A National Study Using Trajectory Analysis, Case Studies, and Investigative Data by Lum, Wellford, Scott, Vovak and Scherer (2018).

This project examines three important questions about investigations: 1) Are there discernible patterns in the rates of clearance for serious crimes in large agencies over time? 2) Do organizational characteristics play a role in clearances? And, 3) How do organization characteristics interact with case-level factors to determine whether cases are resolved?

To examine these questions, this study uses a multimethod, multiagency approach. First, the clearance rates of all U.S. agencies with 100 or more officers, as well as a subsample of the largest 100 agencies, were examined over a 32-year period using a technique called trajectory analysis. This analysis revealed substantial variations in clearance rate trends over time across these agencies, with some performing well above or well below national averages of clearance rates for different crime types. Our analysis also indicates that these trends are unrelated to levels of crime or numbers of sworn officers or investigators within agencies. Despite prior cynicism about the ability of investigators to impact crime clearance rates, our trajectory analysis suggests that certain organizations may employ specific practices that improve their ability to solve crimes.

Using that analysis we systematically sampled four very high performing (HP) and four very low performing agencies (LP) in terms of their long-term clearance rate trends. With the cooperation of those agencies (which remain unnamed in this study), we conducted semi-structured interviews of key individuals in each of these eight agencies to gain a sense of their current investigative practices. We linked this analysis with a systematically-chosen sample of homicide, robbery, aggravated assault, and burglary investigative case files from seven of these eight agencies to examine whether organizational or case characteristics were related to case resolution.

Our analysis revealed that solvability factors inherent in crime events (such as whether a weapon was recovered or the suspect was identified) are not the only factors which contribute to case resolution. In particular, organizational factors also play an important role in an agency’s clearance rates across different types of crimes. For example, our interviews and focus group comparisons between high (HP) and low performing (LP) agencies indicate that high performing agencies

- have more structured oversight and formal interactions between investigative units and agency leadership;
• are more likely to have investigative units that have good relationships with other units and that share information well with other units;
• have investigative units that have specific goals and performance metrics for both the unit and for investigators within that unit;
• tend to assign most, if not all, serious crimes to an investigator, at least for preliminary review. While this is expected for homicides, HP agency investigative units also tend to do this with robbery, burglary, and aggravated assaults cases;
• have investigators who more frequently respond to the initial crime scene shortly after crimes have been reported;
• have investigators who either have (or are required to have) specialized experience before joining investigative units or are expected to be trained on specific skills once they join those units;
• often have standard operating procedures for investigations, where cases are managed carefully and have requirements for completion;
• tend to support their investigative units, both in terms of resources, as well as symbolically (units are viewed as prestigious and investigations are seen as a priority); and
• have better relationships with their community, even if no specific community-oriented campaign or initiative exists between investigative units and community groups.

Our exploratory models for homicide investigations indicate a direct effect of some of these organizational best practices on whether cases are closed. Additionally, our analysis of specific investigative case files indicates that different types of offenses may have different solvability factors that could be used to identify practices that lead to successful investigations. For example, this study confirms that the identification of a suspect or a recovery of a weapon are natural solvability factors for homicide, robbery, aggravated assault and burglary. However we also discovered that robberies and burglaries are more likely to be solved if victims are medically treated or if a motive is known. For homicides and burglaries, initial witness cooperation (although not subsequent witness follow-up) is key to case resolution. For aggravated assaults and robbery, collection of cell phone data appears important. Interestingly, for both aggravated assaults and robbery, the presence of an investigative supervisor at the scene may also lead to an increased likelihood that cases will be resolved.

Overall, our findings indicate that law enforcement agencies can develop the policies, practices, and resources needed to solve crime that go beyond using solvability factors to triage cases for investigations.
I. Can Law Enforcement Impact Clearance Rates?

INTRODUCTION

One of law enforcement’s most important functions is the investigation and resolution of crime. Police agencies devote significant amounts of resources—often 10 to 20% of their annual budgets—to investigations, especially for serious violence or property offenses. In the last half century, American police agencies have also seen a great deal of advancement and innovation in criminal investigations, including the standardization and computer automation of case documentation and processing, improvements in forensic science and investigative technologies to identify suspects more accurately and quickly, and the employment of crime analysts to help solve crimes and identify repeat offenders. In recent years, the use of closed-circuit television (CCTV) videos, cell phone and computer device data, and body-worn camera video have also increased exponentially in criminal investigations.

Despite these recent advances in investigations, the resolution or clearance of crime in the United States is arguably low. In the latest year for which complete data are available (2016), there were approximately 1.25 million serious violent crimes reported to the police, of which 54% were not cleared by an arrest or exceptional means, including 7,000 homicides. In addition, of the nearly 7.92 million serious property crimes that occurred in 2016, 6.47 million remained unsolved (about 82%). In total, this amounts to over three-quarters of all serious crimes that did not result in some kind of resolution for victims (United States Department of Justice, Federal Bureau of Investigation, 2017).

Perhaps even more provocative is that the average clearance rates in the U.S. for specific crime types have not changed much over the years (Braga, Flynn, Kelling, & Cole, 2011). For example, in our initial analysis (see Lum, Wellford, Scott, & Vovak, 2016), we examined yearly clearance rates for homicide, robbery, aggravated assaults, burglary, vehicle theft, and larceny as a proportion of the number of occurrences of those crimes per year for all U.S. agencies with 100 or more officers. As Figure 1 illustrates, from 1981 through 2013, clearance rates for aggravated assaults have hovered around 60% (with a slight decline); robbery in the 32-38% range; and burglary staying relatively stable between 14-15%. Clearance rates for vehicle theft and larceny have slightly declined or increased, respectively, but average around

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1 At the time we began our study, complete clearance rate data at the specific agency level was only available through 2013 from the Federal Bureau of Investigation.
20%. Homicide clearances for all agencies nationwide have been on the decline from the 1960s, from 92% to 65% today (see discussion by Cronin, Murphy, Spahr, Toliver, & Weger 2007). We see a similarly downward trend in our data.

**Figure 1. Yearly Crime Clearance Rates for All Law Enforcement Agencies in the U.S. with 100 or More Officers (1981-2013)**

The stable (and sometimes slightly declining) clearance rates are also evident when looking at the 100 largest agencies in the U.S. (Figure 2) and more specifically for homicide, robbery, aggravated assault and burglary (the four crimes examined in this project). Here we see the decline in homicide clearance and aggravated assaults, and relatively more stable clearance rates for robbery and burglary. These stable trends seem to persist despite the aforementioned improvements in investigative technologies, forensics, and police information technologies.
The long-term stability (and in some cases, declines) of clearance rates despite advances in policing and investigative strategies or even major fluctuations in crime has led some to question whether the police can do anything to improve their ability to solve crimes (Braga et al., 2011, p. 8; Travis, Western, & Redburn, 2014, pp. 48-49). Research conducted during the 1970s and 1980s by the RAND Corporation and others raised questions about the utility of investigations by showing that the outcomes of criminal investigations typically depend on information obtained about the crime event by patrol officers or detectives who first respond to the scene (often referred to as “solvability factors”), and that follow-up activities by detectives appeared to add little to the apprehension of offenders (Greenwood & Petersilia, 1975).

However, concern over the ability of police investigations to impact crime rates and crime clearances has led researchers to examine what might contribute to crime clearances and in turn, how criminal investigations could be improved through better management, training, policies, and investigative techniques (e.g., Braga & Doussealt, 2018; Coupe, 2016; Cronin, et al., 2007; Eck, 1983; Higginson, Eggin, & Mazerolle, 2017; Keel, Jarvis & Muirhead, 2009; Ritter, 2008; Wellford & Cronin, 1999). These studies seem to indicate that aside from inherent solvability factors of crimes themselves, the application of investigative resources may also influence whether crimes can be solved, and suspects apprehended. There has also been
growth in the use of data systems, crime analysis, and forensic techniques that might help improve investigations (e.g., see Danziger & Kraemer, 1985; Roman et al., 2008; Zaworski, 2004). For example, research on solvability factors indicates that while solvability characteristics of burglary cases (i.e., victim-suspect characteristics and relationships, situational or case factors) may be a strong factor in whether burglaries are solved, the investment of resources may impact the discovery of those factors (Coupe, 2016).

More recent research, especially on homicide investigations, shows that there may be investigative factors in addition to case characteristics that may impact whether a case is resolved. These factors may include, for example, how cases are investigated, the resources invested into cases, and organization-level factors such as supervision and case management. Comparative studies (Wellford & Cronin, 2000) and case studies (Carter & Carter, 2016) have identified variations in policing strategies that are associated with variations in agency clearance rates. For example, Wellford and Cronin (2000) collected homicide case files from four large American cities that differed in their homicide (high vs. low) and total (high vs. low) clearance rates between 1994 and 1995. They found 51 factors that were significantly associated with closing a homicide case, of which 37 were deemed within the control of the police. Particularly important were the number of detectives assigned to the case, how fast detectives arrived to the scene, and the use of various types of computer checks. A systematic review by Higginson and colleagues (2017) point to the collecting and testing of DNA and physical evidence, computer and file checks, interviews, lineups, and crime scene visits as important to successful investigations.

As Higginson et al. (2017) emphasize, there is very little empirical research that tests the effects of adjusting investigative efforts to improve clearance rates. For example, in the Evidence-Based Policing Matrix (see Lum & Koper, 2017; Lum, Koper & Telep, 2011), almost all of the evaluation studies related to police crime control interventions have been conducted on the activities of patrol or specialized units, and not on investigations. However, recent research conducted by Braga and Dusseault (2016) found that by analyzing the reasons associated with success (and failure) in clearing homicides in a specific agency, and then making changes suggested by that analysis, clearance rates can be improved. While they caution against a single investigative approach to be applied for all cases, their findings indicate that such practices as increasing the number of personnel dedicated to a case, conducting computer checks on homicide places, collection and testing physical evidence, properly handling homicide scenes, or interviewing witnesses after the scene, can improve investigative outcomes.
More research is needed to better understand what types of actions investigative units and their organizations can take to improve their ability to resolve crimes. This research should go beyond discussions of the characteristics of a crime that might predict its chances of being resolved. Rather, if organizational, procedural, and investigative actions can, in addition to solvability, determine clearance rates, then identifying those factors will be important for agencies who are trying to improve their clearance rates.

The current project adds to this growing research evidence-base for effective investigative practices through a multi-method, multi-agency study. Our study is designed to systematically understand and characterize long-term patterns in crime clearance rates across all larger agencies in the U.S., and then use that analysis to identify case study agencies to discern organizational and investigative casefile factors that may contribute to that agency’s ability to resolve crimes. Toward these goals, we conducted our project in three phases. In the first phase, we carried out a national trajectory analysis of case clearance data, already reported in our interim report (Lum et al., 2016) and summarized below. Using that trajectory analysis, we then systematically identified eight agencies—four high performing and four low performing—with regard to their long-term clearance rate trajectories for four types of serious crimes. During the second phase of the project we conducted extensive interviews and focus groups with those eight agencies through intensive site visits to understand differences in organizational practices and policies between high and low performing agencies. For the third phase of the project, we gained permission from seven of the eight agencies to sample robbery, aggravated assaults, burglary, and homicide incidents from their case files to discern if characteristics of the investigations themselves, or if organizational characteristics contributed to whether cases were closed.

**TRAJECTORY ANALYSIS OF CRIME CLEARANCES**

Our analysis in Phase I of this project revealed that the seemingly stable clearance rate trends shown in Figures 1 and 2 actually mask significant variations in agency-level trends of crime clearance, especially for homicide, robbery, aggravated assault and burglary (see Lum et al., 2016; Scott et al. (forth); Vovak (2016); see also Worrall, 2016). Using data derived from the “Offenses Known and Clearances by Arrest”, summary data as reported to the Federal

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2 Coincidentally, while we were conducting our trajectory analysis, a similar analysis was being conducted by John Worrall and published at the same time (see Worrall, 2016).
Bureau of Investigation (FBI) Uniform Crime Reporting (UCR) program, and a statistical technique known as trajectory analysis (see full description in Lum et al., 2016), we created yearly trends from 1981 - 2013 for all U.S. agencies with 100 or more officers, as well as the 100 largest agencies in the U.S. within this sample.

Figures 3, 4, 5, and 6 show the results of the trajectory analysis for homicide, aggravated assault, robbery, and burglary, respectively, for the largest 100 agencies in the United States. Our results show that not all agencies perform similarly with regard to their long-term clearance rates. Some agencies fall within trajectories that are above national averages while others below. Some agencies appear consistently improving over time, while others have declining clearance rates over time. In other words, when examining individual agencies over long periods of time, the story about the stability of clearance rates is challenged. These empirical variations in clearances, along with the growing research on investigations, seems to indicate that agencies are not fated to stable and low clearance rates; some agencies seem to do better than others and for long periods of time.

**Figure 3. Trajectories of Homicide Clearance (n=92)**

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3 Due to the lengthy time period of data needed, the UCR data was obtained from the Inter-university Consortium for Political and Social Research (ICPSR) website (http://www.icpsr.umich.edu/).

4 Note that given missing values, the sample for each crime type does not equal 100.
Figure 4. Trajectories of Aggravated Assault Clearance (n=86)

Figure 5. Trajectories of Robbery Clearance (n=92)
In summary, our analyses revealed substantial agency-level variation in clearance rate trajectories different types of crime. Our findings are similar to Worrall’s (2016), although we analyze more crime types over longer periods of time. Additionally, this project was the first to apply multi-trajectory modeling, a recent advancement in group-based trajectory modeling, to the study of clearance rates (see Scott et al., forth). This analytic technique provided for the selection of agencies that differed greatly in long-term case resolution performance in a methodologically-rigorous way. Overall, these trajectory analyses continue to raise the important question for law enforcement as to why some agencies have very high crime clearance rates over time while others are consistently low. We now turn to our analysis of specific agencies to explore possible answers to that question.
II. Identifying Effective Investigative Practices

CLASSIFYING AGENCIES BY CLEARANCE RATE PERFORMANCE

In the second phase of our project, we sought to identify up to eight agencies in which to conduct more in-depth organizational analysis given our findings from our trajectory analysis. We took a “most-different” case study approach (see Przeworski & Teune, 1970) by identifying four agencies that consistently performed much higher than national averages with regard to their long-term clearance rates for homicide, robbery, aggravated assault and burglary, and four agencies who performed much lower than national averages. We describe in detail our method of sampling these agencies below. We note that given human subjects’ protections and agreements with the agencies who consented to participate, we do not identify the specific agencies selected for our study.

Because our initial trajectory analysis was conducted for each crime type, we needed a method to describe and identify agencies across crime types with regard to their investigative performance based on their long-term clearance rate trajectory grouping within crime types. Ideally, we wanted high performing agencies to consistently have much higher than average clearance rate trends for all of the crime types examined (homicide, robbery, aggravated assault, and burglary), and similarly for low performing agencies. We employed three different methods which gave us similar results and therefore confidence in our selection of our final sample. The first method involved using ordinal labels for each trajectory group and summing these labels across each agency. For example, the robbery clearance solution in Figure 5 above consisted of 5 trajectories. The lowest clearance trajectory was counted as 1, and the highest as 5 (a process which was repeated for the trajectory solutions for homicide, aggravated assault and burglary). We then summed the ordinal label across crime types for each agency. The highest summed numbers were considered “high performing” clearance agencies and the lowest summed numbers were “low performing” clearance agencies.

A second method we attempted was similar to the first, but utilized the probability weighting provided to us by our initial trajectory analysis. Specifically, when an agency is assigned to a trajectory grouping in trajectory analysis, that agency is given a probability of belonging to that particular group (between 0-1). For each agency we multiplied the probability of an agency belonging to that trajectory, then divided by four. The results were highly consistent with the first method.
In our third method we used multi-trajectory modeling, a technique that estimates trajectory groups for multiple outcomes simultaneously. We believed this might provide us with a more manageable way of describing group-based heterogeneity in longitudinal clearance rate trajectories across all four crime types. To see whether our results differed greatly from the single outcome models, we compared group assignments in the multi-trajectory model to sum probability-weighted and hard counts from the single outcome models. We found that the agency groupings from the multi-trajectory model consistently corresponded to placements in the ordinal and weighted distributions of summed group numbers across the single outcome models.

Overall, these three methods provided us confidence in demonstrating which agencies fell into low and high clearances rate trends across the four crime types. For simplicity, we relied on the first method of ordinal labeling to rank order agencies from highest performing to lowest performing with regard to clearance rate performance across the four crime types.

SELECTING THE EIGHT AGENCIES FOR IN-DEPTH CASE STUDY

We then began contacting the agencies at the extreme ends of our list—those that had consistently high clearance rate trajectories over long periods of time across our four crime types, and those with very low long-term clearance rate trajectories. We began by approaching the highest ranking officer (i.e., the chief, sheriff, or public safety director) for those agencies. If agencies were tied with each other with regard to rankings, the principal investigators reached out to the agencies in which they had a contact. When approaching agencies, the research team provided the chief executive officer with a one-page summary of the project and a request to carry out a case study in their agency. We also assured agencies of their confidentiality, given that clearance rates and investigator effectiveness are often highly sensitive topics amongst police agencies and leaders.

Figure 7 illustrates the ten lowest and highest rankings of the largest 100 agencies in the U.S. based on our ordinal analysis of combining trajectories described above. The highlighted rows indicate the eight agencies that ultimately agreed to, and were selected for, our study. In the previous trajectory analysis, each of these agencies were in homicide, robbery, burglary, and aggravated assault trajectories that collectively were either the lowest or highest (or second lowest or highest) performing trajectories shown in Figures 3-6.
The eight agencies selected come from large agencies with between 500 and 3,000 officers. They are geographically dispersed, and do not cluster in any particular region in the United States. The populations of these eight cities range from approximately 250,000 to 1 million, and are often diverse, some with proportions of nonwhite populations of over 50%. While all of the agencies have hierarchical ranks and structures, they vary in terms of where each investigative unit of interest (i.e., homicide, robbery, aggravated assault and burglary) is located within the organization.

While our initial analysis indicated that an agency’s trajectory membership was unrelated to its long-term crime rate trends (See Vovak, 2016), the eight agencies selected do differ in terms of their average crime rates for the four crimes of interest. For example, the highest performing (HP) agencies selected for our study have generally (with one exception) lower homicide, robbery, aggravated assault and burglary rates per 100,000 population in 2016 than the lowest performing (LP) agencies selected.
SEMI-STRUCTURED INTERVIEWS AND FOCUS GROUPS

After receiving cooperation from each of the selected eight agencies, we then scheduled two to three-day site visits with each agency to interview multiple people and groups involved in investigations in the agency. Specifically, our goal for each agency was to interview the following individuals:

- high ranking commanders overseeing investigations such as a deputy chief, major or colonel in charge of the investigative bureau and any other commanders in charge of investigations generally;
- commanding officers of investigative units, overseeing the investigation of homicide, robbery, aggravated assaults, and burglary;
- shift commanders or supervisors involved in direct supervision of investigators for each of our four crime types;
- detectives who investigate homicide, robbery, aggravated assaults and burglaries;
- patrol first line supervisors who would understand the relationship and requirements of patrol for investigations of homicide, robbery, burglary and aggravated assaults; and
- individuals from investigative support services such as crime scene investigators, crime analysts, forensics officers, other units that provide regular investigative support services.

The interview instruments we used are provided in Appendix A. To create these instruments, the research team relied heavily on both prior literature on investigations and clearances as well as team member experience in investigative research and practice. The research team also consulted with three subject matter experts who have extensive law enforcement and investigative experience to develop and review the interview and focus group instruments. These experts also helped with interviews and provided feedback for the overall project.

The interview instruments were specific to the rank and unit of the interviewees, and the questions could be grouped into five major themes in which our findings are organized:

1. Organizational Structures: This includes the overall structure of the organization and where detective units are positioned in that structure; the division of labor; the connectivity of detectives to other units; the infrastructure for information sharing with other units and with patrol; and the resources given to investigations.
2. **Leadership and Resources**: This theme focuses on the leadership, supervision, and accountability of investigators; the performance measures and expectations set for detectives and how they are used; and how detective resources are deployed and prioritized.

3. **Selection, Training and Performance Review**: This theme included questions about how investigators and their supervisors are selected and trained (including requirements to become a detective); whether they receive special pay and incentives to be a detective; how investigators and supervisors are evaluated and reviewed (and whether they can be removed for poor performance);

4. **Case Assignment and the Investigative Process**: We also asked detailed questions about investigative processes including how cases are initially assigned to investigations; whether agencies have formal processes for investigations; the activities at the initial crime scene; the initial response of investigators; their subsequent investigative process including interviews; support from other units (e.g., forensics, intelligence); technologies or other innovative tools used in investigations; the relationship with the states attorney/prosecutor’s office; and whether victim and witness services are available. For homicide specifically, questions about handling cold cases were asked.

5. **Community Interaction**: We also probed agencies about the extent to which investigative units engaged with the community in any way. This could include the use of social media to provide information on cases; engaging with community groups to strengthen cooperation or involvement in investigations; or other specific initiatives.

In total we interviewed 155 individuals across the eight departments during our visits (Figure 8). For each visit one principal investigator and at least one research assistant were present. In some cases, a subject matter expert was also present. This allowed for all interviews to be conducted and detailed notes to be typed simultaneously in most cases. At the start of the interviews, the research team would briefly describe the project and the purpose of our visit, as well as ensure that the identity of individuals and their agencies would be kept confidential. The usually one hour-long interviews were conducted in semi-structured style. Once all of the interviews were completed, we then took the detailed notes from the interviews and numerically coded findings according to our themes (our coding instrument is provided in

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5 In one agency our in-person visit was canceled due to an unexpected serious event experienced by that organization. While the agency could not accommodate our visit during those days, they agreed to be interviewed through videoconferencing.
Appendix B). We also followed up with agencies about specific questions that remained unanswered from our visits through phone and email. These results are presented in Chapter III.

Figure 8. Number of Individuals Interviewed across the Eight Agencies

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<th></th>
<th>High ranking commanders</th>
<th>Investigative Commanders</th>
<th>Investigative Supervisors</th>
<th>Investigators</th>
<th>Patrol Personnel</th>
<th>Support Services</th>
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EXAMINING INDIVIDUAL INVESTIGATIVE CASES

While the interviews and focus groups provided important organizational insights about high and low performing agencies with regard to investigative practices, we also sought to examine individual investigative cases to determine if differences between high and low performers might be revealed in processes of actual investigations as well as the relationship between those processes and organizational factors. Toward this goal, for the final phase of our project we obtained permissions from seven of the eight agencies we visited to randomly sample cases selected from both open and closed cases for each of our four crime types. Given that our data collection occurred in 2017, we asked agencies for data from 2014 (or 2015 if 2014 data was unavailable) to ensure that most cases had enough time to be resolved or were no longer being actively investigated.

To select a sample of cases from each agency, we asked each agency to provide us with 2014 crime incident data for all homicides, robberies, aggravated assaults and burglaries that had occurred in that year. We then conducted analytic checks to ensure that the records provided from each agency did not have duplicates, and most importantly, that the cases had

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6 In our proposal we proposed obtaining cases for “up to 8” agencies, anticipating that some of the agencies we conducted case studies upon would not provide us with their specific case-level data. One agency refused to grant access to specific investigative case folders and records.
been assigned to an investigator (given that in some agencies, not all of these crimes—except for homicides—would have been investigated). After removing duplicates and also cases that were not assigned to an investigator, we applied the following sampling framework to obtain approximately 200 cases from each agency.

Our sampling framework was specific to each crime type. Given that homicides are rarer compared to robberies, assaults, and burglaries, we sampled all homicides in the provided year if the agency had 50 or fewer homicides. For agencies with more than 50 homicides, a random sample of 50 homicides was taken. One agency had 56 homicide cases in 2014, so for that agency we examined all homicides for that year. After subtracting the number of homicides collected from 200, we then equally divided the remaining difference by three, attempting to sample an equal number of robbery, burglary and aggravated assaults cases. We also attempted to randomly sample equal numbers of open and closed cases for each crime type (except for homicide) for purposes of comparison.

Figure 9 shows the total number of cases sampled from each agency. The number of open and closed cases is not precisely equal for some agencies for two reasons. For those agencies in which we examined all homicide cases for 2014, we examined all open and closed cases. For the crimes of robbery, assault and burglary, upon examining specific case files, we discovered that some of these cases were not open or closed as originally designated in the crime report data or had too much missing data to be included in our analysis. It should be noted that only one of the low performing agencies have a high homicide rate and that our trajectory analysis shows that agencies with high homicide levels can fall in either “high” or “low” performing classifications.

In total we collected 1,409 cases, which included 395 robbery cases, 391 aggravated assault cases, 387 burglary cases, and 242 homicide cases. For robbery, aggravated assault and burglary, the number of open and closed cases sampled were mostly similar, and for homicide, there were almost twice as many closed cases as there were open cases collected for reasons aforementioned. Multiple elements of each case were coded (see Appendix C for that coding instrument). These analyses of these cases are presented in Chapter IV.
Figure 9. Number of Cases Sampled from Each Agency (n=1,409)

<table>
<thead>
<tr>
<th>Agency</th>
<th>Robbery</th>
<th>Assault</th>
<th>Burglary</th>
<th>Homicide</th>
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<tr>
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<td>391</td>
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<td>242</td>
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*Note, Agency 2 did not agree to participate in this portion of the study.*
III. Differences in Investigative Practices between High and Low Performers – Results from Agency Visits

In this chapter we present the results from the second phase of our research project—the interviews and focus groups of personnel across eight agencies. As described in Chapter II the interview instruments are provided in Appendix A and the coding of these instruments in Appendix B. These instruments focused on approximately 150 agency-level characteristics associated with investigations as informed by existing research as well as in consultation with our subject matter experts. Once all interviews were completed for each agency, they were coded for each of our four crime types across the 150 agency-level characteristics for the analysis below, and in conjunction with our investigative cases analysis in Chapter IV.

The differences between responses to our semi-structured interviews of personnel from high and low performing agencies were notable. Below, we organize our findings into our four crime types of interest—homicide, robbery, burglary, and aggravated assault. For each, we consolidate our findings from our five interview areas: organizational structure, leadership and resources, selection, training, and performance review, case assignment and investigative process, and community interactions.

HOMICIDE

Organizational Structure

While high (HP) and low performing (LP) agency homicide units were similar in that they were all centralized investigative units, they differed in many organizational ways. High-performing units were much more likely to describe their oversight structure as highly structured (all of the high performing agencies as compared to two of the low). They were also more likely to report being highly connected to other units in their agency (three HP agencies reported this and none of the LP), and more likely to share information with patrol officers during the investigation. The high and low performers did not differ in their description of the level of formality that patrol used to provide information to detectives. In sum, high-performing units were centralized, highly structured, highly connected to other units in the agency, had strong relationships with patrol and had a greater variety of ways to share information with other units.
Leadership and Resources

With regard to leadership and supervision of detective units, including an agency’s use of performance metrics and resource allocation, high and low performing agencies differed on many dimensions. Leadership in high-performing agencies were more likely to meet with investigative units on a regular basis and to describe these meetings as formal as opposed to informal. In HP agencies leadership provided specific clearance goals for the unit (two of the four high performers), while in low performing agencies there were no instances of leadership conveying specific clearance goals. In high-performing agencies the specific goals included clearances, the amount of time cases remain open, and the quality of the investigation. In all high-performing agencies leadership used workload analysis to set the number of investigators and supervisors. This was reported not to occur in any of the low performing agencies. Information sharing by leadership to investigators was reported in high-performing agencies to be extensive and variable in its form, while low performing agencies reported less information sharing and primarily through emails or patrol bulletins. In two of the four high-performing agencies it was reported that leadership conveyed that investigations were a priority for the agency. None of the low performing agencies reported that leadership considered investigations a priority. High-performing agencies reported that they were well (two) or adequately (two) resourced. None of the low performing agencies reported that they were well resourced, three reported that they were adequately resourced (with regard to cars, phones, computers, and equipment), while one reported it was poorly resourced. In high-performing agencies it was clear that successful investigations were a priority.

Selection, Training and Performance Review

In three of the four HP agencies, detectives had to have some investigative experience to become a homicide detective. This was only required in one of the LP agencies. Similarly, three of the four high-performing agency investigators were required to have specific training but this was not reported as a requirement in any of the low performing agencies. Finally two of the four high-performing agencies investigators were required to have a specific number of years of experience in the department while this was required in only one of the low performing agencies.

While there were not substantial differences in the ways in which investigators were selected in high and low performing agencies, there were differences in the selection of supervisors of investigators. In both high and low performing agencies the modal category for how investigators are selected (job announcements and formal application process) and who makes that selection (commanders above the homicide unit supervisor) were the same. In high-
performing agencies (two of four) investigators have a special rank and receive extra pay (three of four), whereas none of the low performing agencies provided special ranks for investigators and only one LP agency provided extra pay. For investigative supervisors, prior experience in supervising investigations was required in two of the high-performing agencies in order to be appointed as a supervisor, this was not a requirement in any of the low performing agencies. Two of the high-performing agencies compared to one of the low performing agencies required specific training for appointment as a supervisor. Interestingly, two LP agencies and no HP agency required investigative supervisors to have a certain number of years of experience in the agency to be appointed as a supervisor.

In three of the four high-performing agencies investigators are required to attend formal training while this was not a requirement in any of the low performing agencies, which tend to rely primarily on informal training. While there are no training officers in either high or low performing units, in both, investigative supervisors are required to evaluate their investigators and monitor their successful completion of training. Both high and low performing agencies support additional training for investigators. In only one high-performing and low performing agency were investigators trained in the science of solvability. Finally, three of the four HP and LP agencies had two or more command levels between the head of the homicide unit and the chief executive. Removal of investigators for consistently having inadequate investigations and/or low clearance rates does not occur often in either high or low performing agencies. Evaluations of detectives are similar to the evaluations used for all other personnel in the agencies in both high and low performing agencies.

**Case Assignment and Investigative Process**

As expected, in all agencies homicides are assigned to an investigator and in all cases investigators and supervisors report to the crime scene when notified. Also in all agencies homicide investigators were available 24/7. On-call investigators have take-home cars to be on call in equal proportions in high and low performing agencies. Overtime is available in all agencies, approval of overtime is by the investigative supervisor in all agencies, and there are no limits on overtime use in all but one of the HP agencies. In all agencies the rotational system is used to assign cases and the modal category for number of detectives assigned to a case is two (although one HP and one LP agency homicide units assign three detectives). There are differences in the average caseloads for detectives in high and low performing agencies. All of the agencies met the conventional standard of less than six new cases per investigator per year. However, high-performing agencies were on average lower than that standard (average
caseload of 2.75), while low performing agencies averaged 4.1 new cases per investigator per year.

After the case is assigned there are important differences in the way those cases are investigated in high and low performing agencies. HP agencies are more likely to have detailed standard operating procedures for the investigation (all of the HPs but only two of the LP agencies), use an investigative case management system (all of the HPs and three of the LP), use solvability factors for case assignment (two of four HP agencies and none of the LP agencies), have mandatory and regular reviews of case progress (all HP agencies, two LP agencies), and maintain a crime scene log (all high performers and three of four low performers). While high and low performing agencies reported high levels of support from the forensics, crime scene units, and fugitive task forces, the levels of support from other units in the agency differ. HP agencies reported high levels of support from intelligence units (all), crime analysis (all), assistance with digital evidence (three of the four), and the use of a fugitive task force or warrant apprehension squad (all). LP agencies were much more likely to report lower or no support from intelligence units, two of four reported low crime analysis support, and two of four reported little to no support for digital evidence collection. In both HP and LP agencies investigators usually attended autopsies, and an initial report is required and is reviewed by the investigative supervisor.

All of the high-performing agencies reported that later stages of the investigation are handled collaboratively by members of the homicide unit. Only one low performing agency reported always using a collaborative investigative model (most used it on an ad hoc basis). In high-performing agencies investigators had departmental issued smart phones (two of four), tablets or laptops (all), digital cameras (all), and voice recorders (all). In LP agencies two agencies reported that investigators had smart phones and tablets or laptops, and all reported having digital cameras and voice recorders. All HP agencies reported the use of tape recording of all interviews while three of the four low performing agencies did so. All high and low performing agencies indicated that they utilized double-blind identification procedures. Three of the four low and high-performing agencies reported the existence of some type of witness protection program, even if only provided by the District Attorney’s Office during trial. All four of the high-performing agencies reported that they had a well-supported victim/witness services unit within their agency, while two of the low performing units reported that they had victim witness services that were minimally supported and one indicated they had no such programs. None of the HP or LP agencies were required to have permission from their prosecuting attorney prior to making an arrest in a homicide case. Three of the HP agencies
reported good relationships with their prosecuting attorney’s office, while only two of the four LP agencies described their relationship as “good.” Two of the four high and low performing agencies had a cold case squad or investigator.

**Community Interactions**

In all areas we assessed high performing agencies engagement in more varied and extensive community interactions specifically directed at improving homicide clearances than low performing. Three HP agencies reported that leadership engages with the community to assist in homicide investigations while two of four LP agencies reported this level of support. All HP and three LP agencies reported using social media to interact with the community about solving cases of homicide. Three of the four HP and LP agencies reported that leadership uses community meetings to assist with homicide investigations. When asked about the homicide units relationship with the community all four of the high-performing agencies reported that relationship was good. Two of the four low performing agencies reported a good relationship, while the other two described the relationship as mixed. It also appears that most of these units try to have specific initiatives to improve investigation-community relationships (all four HP agencies and three of the four LP agencies). Three of the four high-performing agencies reported specific initiatives to bring witnesses forward to testify, while two of the low performing agencies engaged in these efforts.

**Summary of Homicide Unit Findings**

When we asked agency representatives to explain the trends their agency has experienced in homicide clearances there were differences in the responses of high and low performing agencies. In high-performing agencies the explanations focused almost exclusively on aspects of the agency and the homicide unit. These representatives discussed efforts they were undertaking or had been undertaken in the past to maintain high levels of homicide clearances. Low performing agencies explained their trends primarily in terms of factors external to the agency, most frequently lack of witness cooperation and difficulties with prosecutors. Our interviews and reviews of agency’s policies and practices demonstrate what prior research has also found, there is no “silver bullet” to explain homicide clearance levels. High-performing agencies are not always engaged in what might be considered best practices but in every instance we reviewed, they were performing collectively better than low performing agencies. High-performing agencies look within their operations to determine how they can do better, while low performing agencies focus more on external sources of their problems. High-performing agencies worked with the community to gain cooperation, they use a collaborative approach, they provided more oversight of investigations, they provided more
resources including numbers of detectives for these investigations, they were more systematic in their selection and training of detectives and supervisors, and they placed greater emphasis on documenting their policies and reviewing documents describing case progress. We are not yet ready to determine that these differences alone account for variations in clearance. Those conclusions await our analysis of agency, case characteristics, and investigative effort in a more comprehensive way.

ROBBERY

Organizational Structures

Although homicide investigations are almost always centralized and jurisdiction-wide, this is not often the case for other types of crimes, especially those that happen frequently such as robberies and burglaries. In the case of robbery, six of the eight agencies we visited had a centralized robbery detective unit, which was responsible for investigations for the entire jurisdiction. Three of these were high performing (HP) agencies and three were low performing (LP). However, high and low performing agencies differed on a number of other organizational characteristics. All of the HP agencies had a highly structured oversight structure for the investigation of robberies, with a clear chain of command. However, for the LP agencies, this oversight was more mixed, with two agencies much more loosely structured in terms of supervision and oversight of their robbery units.

With regard to the robbery units’ information sharing relationship and connectivity with other investigative units, units in HP agencies tended to have better and more regular exchanges with both patrol and other investigative units. Personnel in HP agencies were more likely to describe themselves as “highly connected” to other units, sharing information more often, and in more formalized ways. HP agencies tended to have a wider variety of information sharing methods that they cited, and were also more likely to describe their relationship with patrol as “good”, while LP agency robbery units described their relationship with patrol in neutral or negative ways.

Leadership and Resources

With regard to leadership and supervision of detective units, including an agency’s use of performance metrics and resource allocation, robbery units in HP and LP agencies differed on many dimensions. While both types of agencies have robbery units that meet with leadership, meetings are more formalized in HP agencies compared to their LP counterparts.
Leadership in two HP agencies we examined went so far as to set specific robbery clearance goals for their units, while this was not regularly the case in any of the LP agencies. For all of the four HP agencies, the leadership was much more likely to use some form of workload analysis to set the number of investigators needed for the unit, while this was less of a consideration in LP agencies. Relatedly, HP agencies were more likely than LPs to use some type of performance metric for their robbery units (usually the amount of time cases remained opened or not cleared), although the types of performance metrics varied. High performing agencies were also more likely to use performance metrics for training or promotion compared to the LP agencies.

Unsurprisingly given previous research, high performing agency detectives and supervisors felt they were adequately or well-resourced to do their jobs, and leaders from two of the HP agencies asserted that robbery investigations was an agency priority. This was not the case of robbery units in LP agencies, who expressed many more complaints about resources during our site visits. LP agency investigators and supervisors also argued that their leadership was much less open to hearing about complaints or feedback compared to their HP counterparts. Additionally, leadership in HP agencies tended to provide more support and methods in ensuring that information is shared across units (i.e., Compstat meetings, emails, bulletins, via crime analysis, real time crime centers, intelligence units), which was much less diverse for LP agencies who rely more on bulletins and email.

**Selection, Training, and Performance Review**

When comparing robbery units within HP and LP agencies on dimensions of detective selection, training, and performance review, interesting differences were found, especially at the detective level. For example, while all of the agencies had some formal application process in which officers or detectives initiated their move into investigative units, at least two HP agencies require robbery detectives to have some experience with investigations, and/or specific training in investigations. In none of the LP agencies was this the case, except for one LP agency that required specific training. Two of the four HP agencies compared to none of the LP counterparts had special ranks for investigators, and three of the four HP agencies provided investigators with extra pay. Robbery detectives in all of the HP agencies viewed being in the robbery unit as a prestigious assignment, while this was not clearly the case in all of the low performing agencies. There were fewer differences found amongst supervisors of detective units. While two HP agency robbery supervisors were more likely to have specific training when it came to investigations (compared to no LP agency robbery unit supervisors), the opposite was the case with regard to seniority (two LP agencies required a certain number of years of experience as a supervisor before coming into investigations as a supervisor).
Once detectives are selected, HP agencies were more likely to require more formalized training for their detectives compared to LP agencies. The length of this training, when done, varied across the eight agencies we visited. All agencies—whether low or high performing with regard to crime clearances—had some form of mentoring system in place for new detectives once they entered the robbery units. Neither LP nor HP agencies consistently express serious difficulty in obtaining future training opportunities. This training did not often include training on solvability factors, although two of the four HP agency supervisors did say that they had receive this type of training.

Every agency except for one had systems of evaluation of robbery investigators, which are usually carried out by immediate supervisors. When speaking to supervisors in HP agencies, detectives and supervisors seem to be evaluated on their thoroughness of investigation, teamwork and dedication, or the amount of time cases remain open. LP agencies are less likely to evaluate robbery detectives on performance measures, and one agency evaluated them on the absence of complaints. LP agency robbery supervisors were more often evaluated on administrative issues and case management. In three out of the four HP agencies, supervisors were also evaluated based on the unit’s performance and clearance rates, while this was only the case in one LP agency.

Case Assignment and the Investigative Process

One major difference between high and low performing agencies with regard to robbery investigations is that for all of the HP agencies we visited, all robbery cases are at least initially assigned to an investigator, even if the amount of investigation applied might be low. Robbery units are primarily notified by patrol of new robbery cases, and in three of the four HP agencies, robbery units act as “first responders” (i.e., when available they will go to the robbery scene shortly after the crime occurs). This was not the case in LP agencies—three of the four agencies did not assign all robbery cases to an investigator, and varied between approximately 25 – 70% of cases being assigned. The fact that HP agencies tend to assign investigators to most robbery cases may also be the reason why detectives from HP agencies tend to interview victims in the hospital more frequently, and witnesses more quickly, than in LP agencies.

In LP agencies, supervisors might receive updates about new cases that occurred the prior day or over the weekend, and supervisors often decides whether cases are assigned to an investigator. These assignments are usually made using informal assessments by the supervisor based on his or her beliefs about the solvability of a case. In no instance did agencies use a formal solvability tool to make these decisions. Unlike in LP agencies, the lag time in an investigative response can be days, depending on when (or whether) a robbery is assigned. LP
agency robbery detectives do not normally serve as first responders, unless a very high-profile or serious robbery occurs. In both high and low performing agencies, cases that are not assigned or no longer investigated after an initial review are usually not investigated further (cases are neither sent back to patrol or reviewed at a later date).

In terms of response resources, overtime, and workloads assigned to investigators there were fewer differences between HP and LP agencies. Three of four LP agencies and two of four HP agencies had take-home vehicles for robbery detectives. Most of the HP agencies had access to tablets, laptops, digital cameras and voice recorders. LP agency detectives said that they had less access to these technologies (although all had voice recorders). Some agencies paid detectives additional wages for being on-call, but no consistent pattern emerged between HP and LP agencies. Overtime was provided “as needed” in both HP and LP agencies, and no pattern emerged as to either limiting the use of overtime. However, it was clear that LP agencies have much higher caseloads per detectives, despite not being assigned all robbery investigations. This was probably due to the LP agencies being much higher crime jurisdictions than the HP agency counterparts. HP agencies assigned cases based on either a rotational system or the amount of caseload detectives had at any given time, while LP agencies used geographic or multi-method approaches. Only one HP agency had robbery detectives who also handle other types of investigations.

In terms of the actual investigative process, detectives from both HP and LP agencies used a variety of standard investigative practices, including scene and forensics processing, interviewing witnesses, and the like. All of the agencies we visited had some form of case management system for robberies. All of the HP agencies had detailed standard operating procedures for the investigation of robbery as well as investigative checklists, while only two of the four LP agencies had detailed SOPs and only one maintained case file checklists. For those robberies in which investigators respond to the scene, HP agencies are more likely to keep crime scene logs as well as require the responding patrol officer to write a report. This was not consistently found for LP agencies. HP agency detectives compared to their LP agency counterparts are also more likely to receive a variety of support during their investigations. Supervisors also seem more involved in HP agencies. Investigators are also more likely to cite high levels of support from forensics (and digital forensics), intelligence, crime analysis, or fugitive or warrant task forces. However, HP and LP agencies do not seem to differ in terms of how they carry out interviews or conduct lineups, nor in their use of technologies such as license plate readers, shot spotter, or other types of technologies. In all of the high performing agencies we visited, robbery detectives remarked that their relationship was generally good.
with prosecutors, while two of the four LP agencies remarked this relationship was more neutral (and the other two, good).

Community Interactions

Detective units across all of the agencies we visited were not in the regular practice of engaging with the community in the way that patrol officers do. However, there were some interesting findings among robbery detectives under this theme. For example, although the differences were not stark enough to draw definitive conclusions, it appears that HP agencies use social media more to interact with the community about solving robbery cases, and that agency leadership often asks for community help to solve robberies. However, there were not clear differences in the relationship between robbery detectives and community members; many agencies remarked that this can change over time, and that relationships could be mixed. Two HP agencies had specific initiatives to improve the relationship between robbery investigators and the community; this was not found in LP agency robbery units.

Summary of Robbery Unit Findings

Although there were some similarities between high and low performing agencies in our sample with regard to robbery investigators, units, and investigations, there were some interesting differences. Most significantly, high performing agencies with regard to crime clearance tend to more likely assign all robbery cases to a detective, even if that investigation is minimal. More attention (and more immediate attention) seems to be allocated to robberies in agencies with higher robbery clearance rates. High performing agencies tended to have organizational structures that supported information sharing between robbery units and other units, and this was also reflected in the unit resources that HP agency robbery units were able to garner within an investigation. While there were some differences in resources allocated for robbery investigations, and also differences in workload, other resources such as overtime, extra wages for being on-call, or technological resources were not that different. Rather differences between high and low performers appeared to rest on the prioritization of robbery investigations, and the support and supervision that robbery investigators received.

When we asked robbery detectives to explain their patterns of robbery clearance to us, agencies with higher clearance rates for robbery had more positive outlooks about the job; they felt they were adequately resourced, that the leadership was committed to dealing with robbery, and many described a positive agency culture. Low performing agency robbery units tended to focus on a lack of resources and training, or difficulty recruiting young and experienced investigators.
BURGLARY

Organizational Structures

Agencies often decentralize burglary investigations to the district level, and this was the case for four of our eight agencies, without any clear pattern between high and low performing agencies. However, as with robbery, the oversight structure for high performers were much more highly structure than for the low performers, in which two of the four agencies were loosely structured.

One pattern that did emerge which was similar to our findings with robbery investigators is that burglary detectives from high performing agencies, whether centralized or decentralized, tend to have better information sharing relationships with other investigative units and with patrol. In HP agencies burglary detectives and supervisors pointed to a higher level of connectivity with other units, and at least three share information often with patrol. In LP agencies, this connectivity was less frequent or nonexistent. HP agency burglary detectives also used more variety of information sharing approaches than LP agencies. HP agency burglary investigators often cited their relationship between patrol and investigations as either positive or at least neutral, while LP agency detectives tended to be more negative in their assessment.

Leadership and Resources

Three of the four LP agency burglary units and two of the four HP agency burglary units meet “weekly” with their relative commands while the other agencies meet on an ad hoc basis. These meetings can be either formal or informal, and no clear pattern emerges. However, while only one of the low performing agencies indicated that leadership specified clearance goals for their units, two HP agencies did. However, all of the HP agency burglary units did use other performance measures, including general and investigative-specific performance metrics, the amount of arrests made, whether cases remained opened, or in one agency, how long it took to contact victims. LP agencies were much more vague on performance metrics that were used by burglary units. In two of the HP agencies, performance metrics were used for a variety of purposes, including promotions. This specific use of performance measures was less evident in low performing agencies. For all four HP agencies, burglary units use workload analysis to set the number of investigators/supervisors for each unit, while this was not detected in LP agencies with regard to burglary.

Burglary detectives, like their robbery counterparts, also uniformly suggested that patrol, not investigations was the priority in their agencies, although two HP agency burglary detectives and supervisors sited investigations as the priority. Additionally, as with robbery,
burglary detectives and supervisors from LP agencies were much more likely to complain that investigations are more poorly resourced, compared to their counterparts in HP agencies.

**Selection, Training, and Performance Review**

Selection of burglary detectives across all of the agencies were usually done by some formalized process that includes applications and/or interviewing. This was also the case with investigative supervisors. However, although not consistently the case, burglary units in high performing agencies sometimes required more specialized skills, experience, and training compared to their LP agency counterparts. Specialized training for supervisors, however, was not always required; only in low performing agencies were burglary detective supervisors required to have a certain number of years in service.

Once individuals become detectives in burglary units, two of the four high performing agencies have a special rank or title given to their burglary detectives, while this was never the case in low performing agencies (aside from their existing rank). Three of the four HP agencies also give their investigators pay incentives, compared to only one of the LP agencies. Burglary detectives in HP agencies consistently viewed their position in the agency as prestigious, while none of the detectives with whom we spoke to in LP agencies did. Once individuals become burglary detectives, those in HP agencies are more likely to have formal training compared to their LP agency counterparts. However, both groups use informal mentoring systems to train detectives as well. Despite the research that has been generated on burglary solvability factors, only one HP and one LP department indicated that they specifically train their investigators on solvability, although two HP agency burglary supervisors said that they had been trained on solvability factors.

Evaluation and review of burglary detectives for both high and low performing agencies usually is conducted by supervisors. Individual detectives in three of the eight agencies (two HP and one LP agency) were judged by their ability to clear cases. Both high and low performing agencies have systems in place to remove burglary detectives from their posts for poor performance, although such removal has not frequently occurred.

**Case Assignment and the Investigative Process**

Burglary detectives in high performing agencies most likely learn about burglaries directly from patrol, although one HP agency detectives received cases from their supervisor. However, in LP agencies, investigators primarily receive their cases from their supervisors, who triage burglary cases. This aligns with the robbery findings: HP agency burglary units tend to at least examine most, if not all, burglary cases (with the exception of one agency), while none of
the LP agencies were assigned all burglary cases for preliminary review. In two LP agencies, less than half of all burglaries are actually assigned a detective, and cases that are not assigned are “redlined”, meaning that they are no longer investigated or followed up on. The decision to redline, as with robbery as described above, seems to be done using an experiential approach in which a supervisor determines that a case has low solvability. Burglary detectives from HP agencies are also more likely to act as first responders and/or go to burglary scenes, at least to respond as needed. This was not the case for burglary detectives in LP agencies, who were not considered first responders and did not often go to the scene. For both HP and LP agencies, however, there may be a lag time before a case is assigned a detective. Most HP agencies have a deadline for subsequent reports related to burglary investigations to be submitted, while this was the case for only one LP agency. Again these findings may be because three of four HP agencies have lower burglary rates compared to their LP counterparts. However, for the HP agency with a high burglary rate comparable to the low performing, high-crime agencies, those investigators do at least investigate (however lightly) all burglaries initially.

Investigators from both HP and LP agencies do not seem to differ on whether they receive overtime compensation (both groups of agencies usually do), or whether there are overtime limits for investigators. Burglary detectives from low performing agencies tend to more likely have take-home vehicles when on call, but for the most part, officers assigned to on-call status are not given additional wages. While six of the eight agencies assign one investigator per burglary, two HP agencies sometimes assign more than one investigator.

In terms of the investigative process, all of the burglary units in the HP agencies have standard operating procedures for burglary investigations, as well as two LP agencies. Three of the HP agency burglary units maintain case file checklists, while two LP agencies do. Three of the HP agency burglary units also keep logs at crime scenes, a practice not done in any of the LP agencies. However, all agencies did have a case management system for burglaries (except for one LP agency) as well as specific policies on the use of exceptional clearances. More specifically, HP agencies usually require investigative supervisor approval for exceptional clearances, while only one burglary unit in a LP agency indicated this. Death of an offender is often the most common type of exceptional clearance used by all agencies examined, although burglary units in HP agencies also indicated that if a state’s attorney declined to prosecute or if the victim refused to cooperate, this could also lead to an exceptional clearance.

Burglary units in HP agencies tend to have high levels of support from forensics, intelligence, and crime analysis units, which is not the case with LP agencies. HP agencies also appear to have more support with digital evidence collection as well, which is similar to
detectives of robbery and assault in these agencies. Both HP and LP agencies often have access to voice recorders and cameras, although HP agencies were more likely to have access to tablets or laptops. The recording of interviews for burglary investigations occur in all of the HP agencies, and only in one of the LP agencies. In both types of agencies, information technologies are regularly used, including regional databases. License plate readers are rarely used to investigate burglaries in either the HP or LP agencies we visited.

Community Interactions

Burglary units in HP agencies were more likely to engage in some form of community outreach and engagement compared with their LP agency counterparts. All HP agencies had burglary units who more regularly used social media as well as community meetings to help with investigations, while two LP agency burglary units do. The majority of HP agencies tend to link investigative deployment to concepts of community policing, while for LP agencies, only one burglary unit seemed to do this. Detective units across all of the agencies we visited were not in the regular practice of engaging with the community in the way that patrol officers and supervisors did.

The overall relationship however, described by burglary detectives between their agencies and the community is best described as “mixed” (sometimes good, sometimes no relationship, and sometimes both positive and negative). Only two HP agencies had specific initiatives to improve community-burglary unit relationships.

Summary of Burglary Unit Findings

Overall, some differences between burglary units in high versus low performing agencies stand out. Burglary units in high performing agencies tend to have stronger information sharing relationships between other units and patrol. HP agency burglary units also seem to have more expectations required of, and performance metrics used for, both the unit and individual detectives. Burglary detectives in HP agencies view their jobs as prestigious. As with robbery in HP agencies, a greater proportion of cases (if not all) were at least reviewed by a detective, which was not the case in LP agencies. Burglary detectives in HP agencies also seem to receive better support from forensics, intelligence, and analytic units. They also are more likely to be more positive about their agency's relationship with the community. Detectives from HP agencies also talked about having leadership that cares about their work, and management that is engaged. They often spoke of teamwork and a positive culture in the agency. LP agencies often cited the lack of resources, training, or experience as possible explanations for low clearance rates, as well as an inability to attract officers to investigations.
AGGRAVATED ASSAULT

In this study, we developed clearance rate trajectories of aggravated assaults (not all assaults). The FBI’s Uniform Crime Reporting (UCR) Program defines aggravated assault as “an unlawful attack by one person upon another for the purpose of inflicting severe or aggravated bodily injury. The UCR Program further specifies that this type of assault is usually accompanied by the use of a weapon or by other means likely to produce death or great bodily harm. Attempted aggravated assault that involves the display of—or threat to use—a gun, knife, or other weapon is included in this crime category because serious personal injury would likely result if the assault were completed.”

In all of the eight agencies examined, each have serious assault investigative units, and those units handle nonfatal shootings as well as other serious assaults. If an assault turns into a homicide, that case is then transferred to the homicide investigative units in all of these agencies.

Organizational Structures

Interestingly, most high performing agencies have decentralized assault units, while the opposite is true for low performing agencies, whose assault investigative units are mostly centralized. The oversight structure of both high and low performing agencies can vary; HP agencies are moderately to highly structured while low performing agencies can be loosely to highly structured. However, as with our findings from robbery and burglary units, HP agencies are more likely to report greater connectivity to other investigative units and with patrol, more methods to share information, and a stronger and more positive culture of information sharing compared to their LP counterparts. Both use informal information sharing methods. No LP agency expressed a good relationship with patrol, but instead were more neutral or negative in their assessments of this relationship.

Leadership and Resources

For both HP and LP agencies, leadership tends to meet with assault units regularly, although the meetings appear to be more formal in HP agencies. While two HP agency assault units set specific clearance goals and while all HP agencies use some type of performance measure for their assault units, no LP agency seemed to set specific clearance goals, and two of the four LP agencies did not use unit-level performance measures. One LP agency did not track the progress of aggravated assault investigations unless they were nonfatal shootings. HP

agencies also tend to use unit-level performance measures for training and promotion, a finding we did not see in LP agencies. The HP agencies tend to use workload analysis and the number of cases to guide performance and management; we did not observe any LP agency using such workload analyses for their assault units.

In terms of prioritizing resources for aggravated assault, two HP agencies and all of the LP agencies indicated that patrol is more a priority than investigations. However, HP assault units were much more likely to say that they were adequately resourced (one agency said their unit was particularly well-resourced). Three of the four LP assault units stated they were poorly resourced, while one said they were adequately resourced.

**Selection, Training, and Performance Review**

High and low performing agencies differed with regard to the selection, training, and performance review process for their detectives in assault units. While a formal application process is used across almost all agencies, LP agencies are more likely to include an interview process. However, HP agencies were more likely to require specific experience in investigations, more years of service, and specialized training for new assault investigators compared to their LP counterparts. These differences were somewhat mirrored in the selection of supervisors, but like robbery and burglary, the differences between HP and LP agencies at the supervisory level were not as stark. LP agencies tended to have much higher-level command staff being involved in the selection of aggravated assault investigators, while in HP agencies, both investigative supervisors and unit commanders were also more involved. Two HP agencies provided a special rank or title for serious assault investigators, but the remainder of agencies did not. HP assault investigators, however, are more likely to receive special pay for their work and are more likely to view their assignment as prestigious.

Once investigators are selected, all agencies use more informal mentoring systems for new detectives with the exception of one HP agency that had a more formal system. Investigators from all HP agencies and three of the four LP agencies all indicated that their department supported specialized training for them. None of the units we spoke to indicated that they had training officers specifically assigned in their unit, and we found only one HP and one LP agency that trained on solvability factors.

All agencies also have a procedure to evaluate and remove investigators, although removal rarely happens. HP agencies are more likely to be evaluated on specific performance measures such as thoroughness of investigation or the time cases remain open, although almost all agencies did mention that individual investigators were not judged on whether a case
was solved. Supervisors are appraised by unit commanders across the agencies, and HP agency investigative supervisors appeared more likely to be evaluated on performance measures such as case management compared to their LP agency counterparts.

**Case Assignment and the Investigative Process**

In all eight agencies, patrol units often notify assault units directly of serious assaults, especially nonfatal shootings. All HP agencies assign an investigator to all serious assaults, whereas assignment was more varied with LP agencies. One LP agency assigns all cases, another LP only assigns nonfatal shootings, and another assigns approximately over half of the serious assault cases to an investigator that are brought to their attention. As with robbery in many of the LP agencies, an investigative supervisor decides whether a case is assigned or to “redline” the case for no further investigation. HP agency assault detectives are also more likely than their LP counterparts to respond to the scene of aggravated assaults. On the other hand, we noticed that LP agencies sometimes have a lagged response, which can range from a few hours to a few days. Because of this, HP assault investigators tend to be available around the clock, or have investigators on call for overnight occurrences. This was much more varied in LP agencies, and in two LP agencies, assault investigators were only available during the weekdays during normal business hours. HP agencies are also more likely to assign more investigators per case compared to their LP counterparts. LP agencies assign one investigator to one case. Two HP agencies also do this, however the other two assigns two or more investigators per case. In two HP and two LP agencies, assault investigators also may be assigned to handle other types of cases. Both LP and HP agencies provide overtime to assault investigators as needed and two HP agencies are paid additional wages for being on-call compared to one LP agency.

The process of the investigation itself varies somewhat between HP and LP assault units, although there are also similarities. If responding to a scene, assault investigators are typically in charge of the scene once they arrive for both HP and LP agencies. HP agencies appeared more likely to keep a log at the crime scene than their LP counterparts, often with the assistance of patrol officers. These logs keep track of officer and detective actions, and two HP agencies that use logs also require those who are on the log to submit reports. Detectives from HP agencies were more likely to cite strong support from crime scene units, intelligence units, crime analysis divisions, and digital evidence collection. Detectives from HP agencies were also more likely to use collaborative approaches with other units to solve crimes. In contrast, LP agencies were much more varied in their support. For shootings, only one LP agency assault unit cited high levels of support from crime scene units, while three claimed “some” or “little”
support. LP agency assault units also cited lower levels of support from intelligence, crime analysis units, and in digital evidence collection.

The resources available to HP and LP agencies vary. HP agencies had access to agency-funded cell phones, laptops or tablets, and digital cameras. These were less frequently available in LP agency assault units, although all were equipped with voice recorders. However, all agencies use both local and regional information technology databases for their investigations. All HP agencies use social media for their investigations, while this seemed only apparent in two LP agencies. Gunshot detection systems were not available in any HP agencies, while two LP agencies use this technology. Both assault units access camera footage of various kinds, whether from body-worn cameras or CCTV. License plate readers are rarely used in any of the agencies that we examined. In both HP and LP agencies, interviews were either audio or video recorded, and were done either in the field or within a police station or at headquarters. All agencies use double-blinded lineups.

Almost all the agencies have some case management system except for one LP agency. Case file checklists are used in three HP agencies, which are also reviewed, while two LP agencies maintain a checklist that is reviewed. Most HP agencies have a deadline for both the initial report and subsequent reports; this was only the case in one LP agency. In all agencies, supervisors are required to review reports. Interestingly, we discovered that HP agencies tended to have a broader policy towards the use of exceptional clearance, to include the death of the offender, a decline of prosecution by the state’s attorney, if a suspect is incarcerated, or if a victim is uncooperative. LP agencies appear more limited in their use of exceptional clearance, with one LP agency assault unit using it only if the offender dies. Both HP and LP agencies required approval, however, for the use of exceptional clearances. Whether these findings about exceptional clearances drives the overall long-term clearance rate trends of an agency is unknown; the UCR does not distinguish between exceptional and non-exceptional clearances, unfortunately. There is no cold case squad for aggravated assaults in any agency we visited. For all agencies, the state’s attorney’s permission is not required to make an arrest, and investigators in both HP and LP agencies remarked that they had a good or neutral relationship with their state’s attorneys.

Community Interactions

As with robbery and burglary, HP and LP agency assault units have limited engagement with the community (outside of interviewing victims, witnesses, or gathering evidence for cases). However, some differences did emerge. Investigators from HP agencies were more likely to talk about community engagement and cite a good relationship with the community.
compared to investigators from LP agencies. HP agencies were also more likely to use social media and community meetings to interact with the community about solving crimes compared to their LP counterparts. Two HP agencies and one LP agency try to link investigations to community policing efforts, and may involve community policing units in specific investigations. These agencies tended to also have specific initiatives to improve their relationship with the community, or to encourage witnesses and victims to testify.

Summary of Aggravated Assault Unit Findings

Findings between HP and LP aggravated assault units were similar to robbery and burglary units with some important caveats. As with robbery and burglary, HP agency assault units tended to have better information sharing and interactions with other units and patrol, and were also more likely to use collaborative approaches with multiple units—whom they have good relationships with—to solve crimes. HP units were also more likely to set performance goals for both the unit and investigators and have ways to measure the performance of detectives and, also, supervisors. HP agencies are also more likely to require more experience from applicants to the assault units.

A consistent finding with aggravated assaults that also was found with robbery and burglary, is that LP agencies tend not to assign all cases to a detective, even for minimal investigation or follow-up. LP agencies are much more likely to triage cases, and then redline those that an investigative sergeant does not feel warrants any further investigation. HP agency assault unit detectives are also more likely to respond (and respond more quickly) to initial crime scenes, and may have more structured approaches to recording their investigative process at the crime scene. The finding related to broader definitions of exceptional clearance for HP agencies was interesting, although it is unclear how much this drives long-term clearance rate trends.

Finally, as with robbery and burglary units in both HP and LP agencies, there appears to be limited engagement between these units and the community, outside of normal investigative processes. However, it does appear that HP agencies tend to have more positive views about the community, as well as more specific initiatives focused on community policing and encouragement of witnesses testifying.
SUMMARY

Overall, high performing agencies appeared different from low performing agencies with regard to their homicide, robbery, burglary, and aggravated assault investigative practices and organization. Further, differences found between HP and LP agencies within crime types appeared mostly consistent with a few exceptions. In summary, high performing agencies

- have more structured oversight and formal interactions between investigative units and agency leadership;
- are more likely to have investigative units that have good relationships with other units and that share information well with other units;
- have investigative units that have specific goals and performance metrics for both the unit and for investigators within that unit;
- tend to assign most, if not all, serious crimes to an investigator, at least for preliminary review. While this is expected for homicides, HP agency investigative units also tend to do this with robbery, burglary, and aggravated assaults cases;
- have investigators who more frequently respond to the initial crime scene shortly after crimes have been reported;
- have investigators who either have (or are required to have) specialized experience before joining investigative units or are expected to be trained on specific skills once they join those units;
- often have standard operating procedures for investigations, where cases are managed carefully and have requirements for completion;
- tend to support their investigative units, both in terms of resources, as well as symbolically (units are viewed as prestigious and investigations are seen as a priority); and
- have better relationships with their community, even if no specific community-oriented campaign or initiative exists between investigative units and community groups.
IV. Differences between Open and Closed Cases—Results from the Case-Level Analysis

Our agency-level analysis in Chapter III suggests that there are qualitative differences between high and low clearance rate agencies with regard to their organization, leadership, resources, selection and training, case processes, and community relationships. To further explore differences between high and low performing agencies, we sampled and compared open and closed investigative cases from seven of the eight agencies we visited. We also examined the relationship between individual investigative file data and the agency-level information we collected from our interviews.

To examine characteristics of individual case files that may contribute to case closures, we randomly selected approximately 200 cases from each agency we visited that occurred in either 2014 or 2015 (so that by 2017, most of these cases were no longer being actively investigated). As described in Chapter II, we examined all homicides in agencies with around 50 homicides or less, and then an equal number of robbery, aggravated assault, and burglary cases that were investigated by a detective. We took care to randomly sample equal numbers of open and closed cases, given that our main interest was to detect differences in investigative processes between still-open and closed cases. For cases with more than 50 homicides we took a random sample of 50 homicides, and then a random sample of 50 robbery, aggravated assault, and burglary cases, equally sampling open and closed cases.

We reprint Figure 9 below from Chapter II, which enumerates the number of cases we were able to obtain across the seven agencies, for each of the four crime types, and that were open or closed at the time we collected the data in 2016 – 2017. In total we collected 1,409 cases, which included 395 robbery cases, 391 aggravated assault cases, 387 burglary cases, and 242 homicide cases. For robbery, aggravated assault and burglary, the number of open and closed cases sampled were mostly similar, and for homicide, there were almost twice as many closed cases as there were open cases collected for reasons aforementioned.

8 Again, with one exception: one agency had 56 homicides, and we included all homicides for that agency.
Figure 9. Number of Cases Sampled from Each Agency (n=1,409)

<table>
<thead>
<tr>
<th>AGENCY 1</th>
<th>Robbery</th>
<th>Assault</th>
<th>Burglary</th>
<th>Homicide</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open</td>
<td>27</td>
<td>27</td>
<td>28</td>
<td>9</td>
<td>90</td>
</tr>
<tr>
<td>Closed</td>
<td>27</td>
<td>28</td>
<td>28</td>
<td>21</td>
<td>104</td>
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<tr>
<td>AGENCY 3*</td>
<td>55</td>
<td>55</td>
<td>50</td>
<td>50</td>
<td>210</td>
</tr>
<tr>
<td>Open</td>
<td>29</td>
<td>25</td>
<td>31</td>
<td>25</td>
<td>91</td>
</tr>
<tr>
<td>Closed</td>
<td>26</td>
<td>30</td>
<td>19</td>
<td>25</td>
<td>80</td>
</tr>
<tr>
<td>AGENCY 4</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>46</td>
<td>196</td>
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<tr>
<td>Open</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>26</td>
<td>91</td>
</tr>
<tr>
<td>Closed</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>20</td>
<td>90</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>TOTAL</th>
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</thead>
<tbody>
<tr>
<td>Robbery</td>
</tr>
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<tr>
<td>Total Open</td>
</tr>
<tr>
<td>Total Closed</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

*Note, Agency 2 did not agree to participate in this portion of the study.
Multiple elements of each investigative case file were hand-coded (see Appendix C). As with the interview instruments, the selection of these variables were heavily influenced by previous case analysis research, specifically the work of Wellford and Cronin (1999) and Carter (2013) as well as subject matter expertise. Specific variables selected for inclusion in the analysis were those identified in this research as potentially impacting clearance. Additionally, variables identified as influencing clearance in case studies of homicide units conducted by a similar study by the Police Executive Research Forum in which one of the principal investigators (Wellford) is also involved were also used.9 Cases often were missing various elements, and not all elements were used in the analysis below.

Below, we present two sets of analyses. The first reflects the initial work proposed to the LJAF and includes an analysis of case factors that may be related to a case continuing to be opened (0) or closed (1) for each of our four crime types. The second analysis includes additional preliminary analyses not initially proposed. This includes exploratory research linking our organizational factors collected in our interviews and focus groups with the individual case-level information. We present the findings for this additional analyses for homicide only, as this reflects extra effort that we plan to continue once our obligations on the current project are complete.

**INDIVIDUAL CASE FACTORS CONTRIBUTING TO CASE CLOSURE**

**Homicide**

Of the 242 cases collected, 238 had enough data to be included in the analysis. Using logistic regression, we regress case status (opened = 0, closed = 1) on a variety of variables collected, including:

- whether a gun was used (TYPEWEAPONGUN)
- whether a weapon was recovered (WEAPONRECOVERED)
- whether law enforcement knew the mode of entry (KNOWMODEENTRY)
- whether the offender was identified at the time of the response (OFFENDERID)
- whether the suspect knew the victim (SUSPECTKNOWNVIC)
- whether the victim cooperated (VICTIMCOOPERATE)
- whether medical treatment was provided to the victim (MEDTXVIC)

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9 Some instruments were shared across these two projects under the supervision of P.I. Wellford, who is also working on the PERF study.
Identifying Effective Investigative Practices

- whether the witness(es) had a relationship with the victim (WITNESSRELATVIC)
- whether the witness(es) had a relationship with the suspect (WITNESSRELATESUS)
- whether the witness(es) cooperated (WITNESSCOOPERATE)
- whether there was identifying information on a suspect’s vehicle (SUSPECTVEHICLE)
- whether the crime occurred at a residence (RESIDENCE)
- whether the motive was known to law enforcement (MOTIVEKNOWN)
- whether there were initial leads regarding a motive (HOMICIDELEADS)
- whether confidential informants came forward with information (HOMICIDE_INFORMANTS)
- whether a relatively large number of police employees, as determined via a median split, responded to the scene (MANYEMPLOYEES)
- whether a relatively large number of detectives, as determined via a median split, responded to the scene (MANYINVEST)
- whether physical evidence was collected (PHYSICALEVIDENCE)
- whether a victim’s statement was obtained (VICTIMSTATEMENT)
- whether an investigative supervisor was present at the initial response (INVSUPERVISOR)
- whether a crime scene log was collected (CSLOG)
- whether a relatively large number of detectives, as determined via a median split, were assigned to a follow-up investigation (MANYINVESTIGATOR)
- whether investigators followed up with the victim (VICTIM_FOLLOWUP)
- whether investigators followed up with any witnesses (WITNESS_FOLLOWUP)
- whether additional evidence or technologies were used later in the investigation (ADDITIONALEVIDENCE)
- whether a specialized unit provided help with the investigation (UNITASSISTANCE)
- whether social media was used in the investigation (SOCIALMEDIA)
- whether a cell phone was investigated (CELLPHONE)

The full model is shown in Figure 10. All the covariates in the model are binary, so the odds ratio is calculated by dividing the odds of clearing a case if the covariate equals 1 by the odds of clearing a case if the covariate equals zero. A coefficient of 1.0 means the odds are the same in both conditions (similar to a coefficient of zero in an OLS regression). An odds ratio (OR) above 1.0 indicates moving from zero to one on a given covariate increases the odds of solving a case. An OR below 1.0 means moving from zero to one on a given covariate decreases
the odds of solving a case. In each analysis, we clustered standard errors by agency to correct for heteroscedasticity in general and statistical dependence within the departments.

**Figure 10. Logistic Regression Results for Homicide**

<table>
<thead>
<tr>
<th>Case Element</th>
<th>Odds Ratio</th>
<th>Robust S.E.</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPEWEAPON GUN</td>
<td>1.626</td>
<td>0.583</td>
<td>0.175</td>
</tr>
<tr>
<td>WEAPONRECOVERED</td>
<td>14.685</td>
<td>11.311</td>
<td>0.000***</td>
</tr>
<tr>
<td>KNOWMODEENTRY</td>
<td>0.873</td>
<td>0.475</td>
<td>0.802</td>
</tr>
<tr>
<td>OFFENDERID</td>
<td>8.035</td>
<td>3.694</td>
<td>0.000***</td>
</tr>
<tr>
<td>SUSPECTKNOWNVIC</td>
<td>24.558</td>
<td>15.590</td>
<td>0.000***</td>
</tr>
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<td>VICTIMCOOPERATE</td>
<td>0.016</td>
<td>0.021</td>
<td>0.001**</td>
</tr>
<tr>
<td>MDTXVIC</td>
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<td>0.330</td>
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<td>0.917</td>
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<td>0.001**</td>
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<td>SUSPECTVEHICLE</td>
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<td>0.452</td>
</tr>
<tr>
<td>WITNESS_FOLLOWUP</td>
<td>0.285</td>
<td>0.096</td>
<td>0.000***</td>
</tr>
<tr>
<td>ADDITIONAL EVIDENCE</td>
<td>1.092</td>
<td>0.634</td>
<td>0.880</td>
</tr>
<tr>
<td>UNITASSISTANCE</td>
<td>1.734</td>
<td>1.010</td>
<td>0.345</td>
</tr>
<tr>
<td>SOCIALMEDIA</td>
<td>1.101</td>
<td>0.401</td>
<td>0.793</td>
</tr>
<tr>
<td>CELLPHONE</td>
<td>0.473</td>
<td>0.359</td>
<td>0.324</td>
</tr>
<tr>
<td>CONSTANT</td>
<td>0.133</td>
<td>0.135</td>
<td>0.047</td>
</tr>
</tbody>
</table>

Number of Observations = 238; Log pseudolikelihood = -73.853171; McFadden’s Pseudo R² = 0.5290
***p<.001; **p<.01; *p<.10

10 For all of the independent variables, we treated missing values and cases where the response was not applicable as equal to zero. Using the witness cooperate covariate as an example, a zero could indicate that either there was no witness to cooperate, there was a witness who did not want to cooperate, or there was a witness who cooperated but the information was not included in the case file for the detective to read. The rational for this is that we cannot discern why information was not included. So, for each covariate, the coefficients should technically be interpreted as whether a detective had that information (e.g., knowing a gun was recovered) and not whether the event actually occurred (e.g., a gun was recovered).
There are many ways to present results from a logistic regression (Liao, 1994). We focus on the sign and relative magnitude of the statistically significant coefficients. First, note that McFadden’s Pseudo R² (see McFadden, 1974), which measures goodness of fit, equals 0.5290. This stronger fit provides further confidence that the selection of characteristics of investigations is based on what previous research and best practices have indicated.11

Because of our relatively small sample size, we utilized the more liberal standard of 0.1 or below as our measure of statistical significance. For example, the first significant coefficient shown in Figure 10 is for whether a weapon was recovered (WEAPONRECOVERED). The OR is 14.68 indicating recovering a weapon is associated with an increase in the odds of clearing a case by 1368% holding all the other covariates constant. If the offender was identified at the time of the response, the odds of clearing the case increase by over 700% net the other covariates. For homicide cases where the suspect knew the victim, the odds of clearing the case increased by 2356%. For those few cases where the victim survived long enough to cooperate (n = 14), the odds of solving the murder went down by 98%. Solving a homicide was 480% more likely when a witness cooperated holding all other factors constant. The presence of an initial lead regarding the motive increased the chance of solving the case by 515%. The regression coefficient for MANYEMPLOYEES shows that when many law enforcement employees (officers, detectives, support personnel) responded to the scene (in terms of the median number), the chance that the homicide was solved increased by 142%. The odds of solving the homicide was even higher when many investigators responded to the scene, as this increased the odds of solving the homicide by 239%. The last significant variable in the model is for whether or not the detective followed up with the witness. The odds ratio suggests following up with a witness who were not initially cooperating was associated with a 71.5% decrease in the odds of solving the murder, net all other factors. This points to the fact that clearance is not best understood in terms of individual factors but is rather understood by considering the full characteristics of the case and the investigation.

Aggravated Assaults

Moving to the 380 aggravated assaults that had enough data to be included in this analysis, we conducted the same regression analysis, but excluded the two variables specific to homicide. Additionally, the variables MANYINVEST and SOCIALMEDIA were dropped from the

11 It should be noted that Pseudo R² should not interpreted as the R² is interpreted in linear regression. McFadden’s R² should be interpreted as a goodness of fit statistic, one which indicates a reduction in error variance, rather than a measure of variance explained (Allison, 2014). Thus, caution should be exercised in comparing the Pseudo R² across different data sources.
model because they perfectly predicted the outcome. Aside from those four variables, the analytic model is the same as the one presented for homicide. The findings from the aggravated assault analysis are presented in Figure 11.

**Figure 11. Logistic Regression Results for Aggravated Assaults**

<table>
<thead>
<tr>
<th>Case Element</th>
<th>Odds Ratio</th>
<th>Robust S.E.</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPEWEAPONGUN</td>
<td>0.613</td>
<td>0.084</td>
<td>0.000***</td>
</tr>
<tr>
<td>WEAPONRECOVERED</td>
<td>4.773</td>
<td>2.564</td>
<td>0.004**</td>
</tr>
<tr>
<td>KNOWMODEENTRY</td>
<td>1.591</td>
<td>0.912</td>
<td>0.418</td>
</tr>
<tr>
<td>OFFENDERID</td>
<td>7.709</td>
<td>4.753</td>
<td>0.001**</td>
</tr>
<tr>
<td>SUSPECTKNOWNVIC</td>
<td>1.624</td>
<td>0.423</td>
<td>0.063*</td>
</tr>
<tr>
<td>VICTIMCOOPERATE</td>
<td>2.307</td>
<td>0.503</td>
<td>0.000***</td>
</tr>
<tr>
<td>MEDTXVIC</td>
<td>1.035</td>
<td>0.299</td>
<td>0.904</td>
</tr>
<tr>
<td>WITNESSRELATEVIC</td>
<td>1.231</td>
<td>0.652</td>
<td>0.695</td>
</tr>
<tr>
<td>WITNESSRELATESUS</td>
<td>0.782</td>
<td>0.462</td>
<td>0.678</td>
</tr>
<tr>
<td>WITNESSCOOPERATE</td>
<td>1.989</td>
<td>0.863</td>
<td>0.113</td>
</tr>
<tr>
<td>SUSPECTVEHICLE</td>
<td>0.745</td>
<td>0.325</td>
<td>0.499</td>
</tr>
<tr>
<td>RESIDENCE</td>
<td>1.392</td>
<td>0.387</td>
<td>0.233</td>
</tr>
<tr>
<td>MotiveKnown</td>
<td>0.654</td>
<td>0.307</td>
<td>0.365</td>
</tr>
<tr>
<td>MANYEMPLOYEES</td>
<td>1.842</td>
<td>1.123</td>
<td>0.317</td>
</tr>
<tr>
<td>PHYSICALEVIDENCE</td>
<td>0.549</td>
<td>0.210</td>
<td>0.118</td>
</tr>
<tr>
<td>VICTIMSTATEMENT</td>
<td>0.801</td>
<td>0.417</td>
<td>0.670</td>
</tr>
<tr>
<td>INVSUPERVISOR</td>
<td>10.127</td>
<td>11.320</td>
<td>0.038*</td>
</tr>
<tr>
<td>CSLOG</td>
<td>1.588</td>
<td>0.463</td>
<td>0.113</td>
</tr>
<tr>
<td>MANYINVESTIGATOR</td>
<td>0.913</td>
<td>0.881</td>
<td>0.925</td>
</tr>
<tr>
<td>Victim_followup</td>
<td>0.527</td>
<td>0.183</td>
<td>0.064*</td>
</tr>
<tr>
<td>Witness_followup</td>
<td>0.652</td>
<td>0.229</td>
<td>0.224</td>
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<tr>
<td>AdditionalEvidence</td>
<td>1.012</td>
<td>0.571</td>
<td>0.983</td>
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<tr>
<td>UnitAssistance</td>
<td>1.021</td>
<td>0.705</td>
<td>0.977</td>
</tr>
<tr>
<td>Cellphone</td>
<td>4.454</td>
<td>2.023</td>
<td>0.001**</td>
</tr>
<tr>
<td>Constant</td>
<td>0.120</td>
<td>0.047</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Number of Observations = 380; Log pseudolikelihood = -194.42043; McFadden’s Pseudo $R^2 = 0.2597$

***p<.001; **p<.01; *p<.10

Here, the fit of the model is not as high as that of homicide (Pseudo $R^2 = 0.2597$). Most of the research and best practices in this area tend to inform homicide, not other crimes, which informed our model development. Our continued research will focus on exploring alternative models that may improve fit, but use a similar model here for purposes of comparisons.

Eight case-level factors significantly predicted the likelihood of solving an aggravated assault. If the assault involved a firearm, the likelihood of the case being solved was reduced by 39% holding all else constant. However, if a weapon was recovered, the likelihood of solving the
assault increased by 377% net other factors. If the offender was identified at the time of the response, the suspect knew the victim, or the victim cooperated, the chances of solving the crime went up. Cases where an investigative supervisor was present at the time of the response were 10 times as likely to be solved as those without an investigative supervisor present, holding all other factors constant. Surprisingly, cases where the investigator(s) followed up with the victim were almost half as likely to result in a clearance. This may be the result of victims being followed-up with in cases that are harder to resolve. Finally, if investigators analyzed a cell phone the case was more likely to be solved.

Robbery

Our model for the 387 robbery cases that had enough data to be included in this analysis is identical to the one we presented for homicide, excluding the two homicide-specific measures (Figure 12).

Figure 12. Logistic Regression Results for Robbery

<table>
<thead>
<tr>
<th>Case Element</th>
<th>Odds Ratio</th>
<th>Robust S.E.</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPEWEAPON GUN</td>
<td>0.538</td>
<td>0.207</td>
<td>0.107</td>
</tr>
<tr>
<td>WEAPON RECOVERED</td>
<td>14.326</td>
<td>9.312</td>
<td>0.000***</td>
</tr>
<tr>
<td>KNOWMODE ENTRY</td>
<td>0.681</td>
<td>0.392</td>
<td>0.505</td>
</tr>
<tr>
<td>OFFENDER ID</td>
<td>2.182</td>
<td>0.793</td>
<td>0.032*</td>
</tr>
<tr>
<td>SUSPECT KNOWN VICTIM</td>
<td>2.933</td>
<td>1.679</td>
<td>0.060*</td>
</tr>
<tr>
<td>VICTIM COOPERATE</td>
<td>2.559</td>
<td>2.616</td>
<td>0.358</td>
</tr>
<tr>
<td>MEDTX VICTIM</td>
<td>0.303</td>
<td>0.087</td>
<td>0.000***</td>
</tr>
<tr>
<td>WITNESS RELATE VICTIM</td>
<td>0.639</td>
<td>0.272</td>
<td>0.293</td>
</tr>
<tr>
<td>WITNESS RELATE SUS</td>
<td>3.823</td>
<td>4.203</td>
<td>0.223</td>
</tr>
<tr>
<td>WITNESS COOPERATE</td>
<td>1.292</td>
<td>0.408</td>
<td>0.417</td>
</tr>
<tr>
<td>SUSPECT VEHICLE</td>
<td>0.829</td>
<td>0.486</td>
<td>0.749</td>
</tr>
<tr>
<td>RESIDENCE</td>
<td>0.626</td>
<td>0.266</td>
<td>0.271</td>
</tr>
<tr>
<td>MOTIVE KNOWN</td>
<td>0.299</td>
<td>0.108</td>
<td>0.001**</td>
</tr>
<tr>
<td>MANY EMPLOYEES</td>
<td>1.176</td>
<td>0.493</td>
<td>0.698</td>
</tr>
<tr>
<td>MANY INVEST</td>
<td>1.699</td>
<td>1.642</td>
<td>0.583</td>
</tr>
<tr>
<td>PHYSICAL EVIDENCE</td>
<td>1.730</td>
<td>0.397</td>
<td>0.017*</td>
</tr>
<tr>
<td>VICTIM STATEMENT</td>
<td>1.603</td>
<td>1.557</td>
<td>0.627</td>
</tr>
<tr>
<td>INVSUPERVISOR</td>
<td>2.664</td>
<td>1.343</td>
<td>0.052*</td>
</tr>
<tr>
<td>CSLOG</td>
<td>0.833</td>
<td>0.679</td>
<td>0.822</td>
</tr>
<tr>
<td>MANY INVESTIGATOR</td>
<td>2.773</td>
<td>2.506</td>
<td>0.259</td>
</tr>
<tr>
<td>VICTIM FOLLOW UP</td>
<td>0.431</td>
<td>0.187</td>
<td>0.052*</td>
</tr>
<tr>
<td>WITNESS FOLLOW UP</td>
<td>2.227</td>
<td>1.357</td>
<td>0.189</td>
</tr>
<tr>
<td>ADDITIONAL EVIDENCE</td>
<td>5.069</td>
<td>3.384</td>
<td>0.015*</td>
</tr>
<tr>
<td>UNIT ASSISTANCE</td>
<td>0.605</td>
<td>0.280</td>
<td>0.278</td>
</tr>
<tr>
<td>SOCIAL MEDIA</td>
<td>2.119</td>
<td>2.019</td>
<td>0.430</td>
</tr>
</tbody>
</table>
As with aggravated assaults, the fit of our model is smaller (Pseudo R²=0.2835) compared to homicide. Similar to our assault model (but again unlike homicide), the use of a gun was associated with a decline in the likelihood of solving a case, although this effect was slightly above the .1 p-value cutoff. Recovering a weapon, however, increased the odds of clearing the robbery by over 1300% net other factors. Identifying an offender at the time of response and cases where the offender knew the suspect were both associated with over a 100% increase in the odds of solving the case. Cases where medical treatment was provided to the victim were almost 70% less likely to be solved holding all other variables constant. If law enforcement knew the motive behind the crime, the robbery was 70% less likely to be solved. Collecting physical evidence and having an investigative supervisor present during the initial response increased the likelihood that the crime was solved. Collecting additional evidence later in the investigation increased the likelihood of solving the crime by 400%. Analyzing a cell phone as part of the investigation increased the odds of solving the robbery by 300%. Finally, like with assaults, cases where a victim was followed up with were about half as likely to result in a case clearance. Again, as with aggravated assaults, this may be the result of follow-ups occurring for harder-to-resolve cases.

Burglary

For our last crime type, we analyzed 373 cases of the burglary cases that had enough data to be included in this analysis using the same model we constructed for the other crime types. In addition to excluding the homicide-specific measures, we excluded the variables MANYINVEST, INVSUPERVISOR, MANYINVESTIGATOR, AND CELLPHONE because they perfectly predicted the outcome. Results from this model are presented in Figure 13.

Figure 13. Logistic Regression Results for Burglary

<table>
<thead>
<tr>
<th>Case Element</th>
<th>Odds Ratio</th>
<th>Robust S.E.</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPEWEAPONGUN</td>
<td>1.295</td>
<td>0.948</td>
<td>0.724</td>
</tr>
<tr>
<td>WEAPONRECOVERED</td>
<td>6.992</td>
<td>7.845</td>
<td>0.083*</td>
</tr>
<tr>
<td>KNOWMODEENTRY</td>
<td>1.445</td>
<td>0.719</td>
<td>0.459</td>
</tr>
<tr>
<td>OFFENDERID</td>
<td>14.597</td>
<td>7.316</td>
<td>0.000***</td>
</tr>
<tr>
<td>SUSPECTKNOWNVIC</td>
<td>1.107</td>
<td>0.472</td>
<td>0.811</td>
</tr>
<tr>
<td>VICTIMCOOPERATE</td>
<td>0.923</td>
<td>0.725</td>
<td>0.918</td>
</tr>
<tr>
<td>MEDTXVIC</td>
<td>0.053</td>
<td>0.066</td>
<td>0.018*</td>
</tr>
<tr>
<td>WITNESSRELATEVIC</td>
<td>0.371</td>
<td>0.311</td>
<td>0.237</td>
</tr>
<tr>
<td>Variable</td>
<td>Coefficient</td>
<td>Standard Error</td>
<td>z Value</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------</td>
<td>----------------</td>
<td>---------</td>
</tr>
<tr>
<td>WITNESSRELATESUS</td>
<td>9.265</td>
<td>12.245</td>
<td>0.092*</td>
</tr>
<tr>
<td>WITNESSCOOPERATE</td>
<td>3.637</td>
<td>2.604</td>
<td>0.071*</td>
</tr>
<tr>
<td>SUSPECTVEHICLE</td>
<td>1.059</td>
<td>0.488</td>
<td>0.902</td>
</tr>
<tr>
<td>RESIDENCE</td>
<td>0.646</td>
<td>0.360</td>
<td>0.434</td>
</tr>
<tr>
<td>MOTIVEKNOWN</td>
<td>2.638</td>
<td>1.541</td>
<td>0.097*</td>
</tr>
<tr>
<td>MANYEMPLOYEES</td>
<td>6.564</td>
<td>2.377</td>
<td>0.000***</td>
</tr>
<tr>
<td>PHYSICALEVDSIENCE</td>
<td>0.901</td>
<td>0.404</td>
<td>0.816</td>
</tr>
<tr>
<td>VICTIMSTATEMENT</td>
<td>0.773</td>
<td>0.561</td>
<td>0.723</td>
</tr>
<tr>
<td>CSLOG</td>
<td>4.725</td>
<td>7.048</td>
<td>0.298</td>
</tr>
<tr>
<td>VICTIM_FOLLOWUP</td>
<td>0.550</td>
<td>0.361</td>
<td>0.362</td>
</tr>
<tr>
<td>WITNESS_FOLLOWUP</td>
<td>0.255</td>
<td>0.134</td>
<td>0.009**</td>
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<td>ADDITIONALEVIDENCE</td>
<td>3.216</td>
<td>2.380</td>
<td>0.114</td>
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<tr>
<td>UNITASSISTANCE</td>
<td>2.679</td>
<td>1.069</td>
<td>0.013*</td>
</tr>
<tr>
<td>SOCIALMEDIA</td>
<td>0.579</td>
<td>1.922</td>
<td>0.869</td>
</tr>
<tr>
<td>CONSTANT</td>
<td>0.298</td>
<td>0.379</td>
<td>0.342</td>
</tr>
</tbody>
</table>

Number of Observations = 373; Log pseudolikelihood = -189.29554; McFadden’s Pseudo $R^2 = 0.22675$

***p<.001; **p<.01; *p<.10

Again, as with our assault and robbery models, the fit of this model is weaker than our homicide model ($Pseudo R^2=0.22675$). These findings showed that recovering a weapon and identifying an offender at the time of response greatly increased the odds of closing a burglary case net the remaining factors. Recovering a weapon increased the likelihood of closing the case by almost 600%, whereas identifying an offender increased the odds by 1360%. If there was a witness related to either the victim or the suspect, the odds of solving the case increased by 9.3 times and 3.6 times, respectively, net other factors. Cases where medical treatment was provided to the victim were 95% less likely to be cleared. Cases where law enforcement knew the motive behind the crime were 2.6 times more likely to be solved compared to burglaries where the motive was unknown. When many employees responded to the scene of a burglary, the crime was 6.6 times more likely to result in a case resolution. Surprisingly, following up with a witness was associated with a 75% decrease in the likelihood of solving the burglary. And, finally, if another unit provided assistance with the investigation, the likelihood of solving the burglary increased by 168%.

Figure 14 presents all of the findings in a single table, showing similarities and differences in what case elements predict whether a case will remain open or successfully close. All effects indicate when a variable might increase the likelihood of a case closure, except when indicated by “(-)”, which indicates that the case element decreases the likelihood of a case closure. As already mentioned, our selection of model covariates fits well for homicide, and less well for other crimes. Our continued research will explore this further, but for
figure 14. summary of logistic regression results

<table>
<thead>
<tr>
<th>Case Element</th>
<th>Homicide</th>
<th>Aggravated Assaults</th>
<th>Robbery</th>
<th>Burglary</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE_WEAPON_GUN</td>
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<td>*** (-)</td>
<td></td>
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<td>**</td>
<td>***</td>
<td>*</td>
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<td>KNOWMODEENTRY</td>
<td>***</td>
<td>**</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>OFFENDERID</td>
<td>***</td>
<td>**</td>
<td>***</td>
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<td>SUSPECTKNOWNVIC</td>
<td>***</td>
<td>*</td>
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<tr>
<td>VICTIMCOOPERATE</td>
<td>** (-)</td>
<td>***</td>
<td></td>
<td></td>
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<td>MEXTXVIC</td>
<td>***</td>
<td>*</td>
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<td>WITNESSRELATEVIC</td>
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<td>WITNESSCOOPERATE</td>
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<td>*</td>
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<td>MOTIVEKNOWN</td>
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<td>*</td>
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<td>HOMICIDE_LEADS</td>
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<td>VICTIMSTATEMENT</td>
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<td>INV SUPERVISOR</td>
<td>*</td>
<td>*</td>
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<td></td>
</tr>
<tr>
<td>CSLOG</td>
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<td></td>
</tr>
<tr>
<td>MANYINVESTIGATOR</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>VICTIM_FOLLOWUP</td>
<td>* (-)</td>
<td></td>
<td>* (-)</td>
<td></td>
</tr>
<tr>
<td>WITNESS_FOLLOWUP</td>
<td>*** (-)</td>
<td></td>
<td>** (-)</td>
<td></td>
</tr>
<tr>
<td>ADDITIONALEVIDENCE</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>UNITASSISTANCE</td>
<td></td>
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</tr>
<tr>
<td>SOCIALMEDIA</td>
<td></td>
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<tr>
<td>CELLPHONE</td>
<td>**</td>
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<td></td>
<td></td>
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<tr>
<td>CONSTANT</td>
<td></td>
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</tbody>
</table>

Number of Observations 238 380 387 373
Log pseudolikelihood -73.853171 194.42043 -192.19446 -189.29554
Pseudo $R^2$ 0.5290 0.2597 0.2835 0.22675

***p<.001; **p<.01; *p<.10

Interesting similarities and differences are found in terms of characteristics of specific investigations that may predict case resolution. For example, while the use of a firearm decreased the likelihood of an aggravated assault case being cleared, what appears consistently important to case clearance is whether a the weapon (or tool in the case of burglary) was
recovered or found. Consistent with the literature, whether an offender was identified (and for homicides and aggravated assaults—whether the victim and the suspect knew each other) will also predict whether a case will be cleared, with the exception of robbery, where the chance of identifying the perpetrator are much lower. Interestingly, following up with victims or witnesses appears to reduce the odds of a case being resolved. Again, this may likely indicate that follow-ups are often pursued in cases that are harder to resolve.

Interestingly, some case elements are particular to robbery and burglary, where the likelihood of identifying the suspect or resolving cases is often much lower than for homicides and aggravated assaults. For example, when victims receive some sort of medical treatment, the likelihood of cases being cleared is higher. This may be due to the injuries heightening the seriousness of the offense to investigators, or that more evidence is available to them, both which may increase the probability that a case will be resolved. Additionally, when a motive is known, this also seems to increase the likelihood that a robbery or burglary would be cleared. Interestingly, when an investigative supervisor is present, it is more likely for an aggravated assault or robbery to be cleared. Another factor important to the clearance of aggravated assault and robbery is when cell phone data is accessed.

**THE INFLUENCE OF ORGANIZATIONAL FACTORS ON CASE-LEVEL ANALYSIS**

We have begun to extend our analysis by linking the rich organizational data collected from our interviews and focus groups of the eight agencies to the individual level data. This is a new contribution to the literature; studies often only examine case and investigator level information in terms of either solvability or contributions to case clearance. Here we explore this analysis for homicide only.\(^\text{12}\)

Toward this goal, we took lessons learned from our interview data and from existing research to develop a set of best practices at the organizational level with regard to homicide investigations. These best practices include:

- whether the homicide unit is centralized;

\(^\text{12}\) Future studies that we are engaged in will use similar models for aggravated assault, robbery, and burglary. However, given that the scope of this project only included analysis of the case level data, we provide this additional analysis for homicide only as a preliminary finding.
• whether the oversight structure for homicide investigations is highly structured;
• whether the homicide unit shares information often with other investigative units;
• whether the homicide unit routinely shares information with patrol;
• whether patrol officers have a formal method of providing information to detectives;
• whether there is a good relationship between patrol units and the homicide unit;
• whether the homicide unit routinely shares information with other investigative units;
• whether leadership meets with the homicide unit on a weekly basis;
• whether leadership-homicide unit meetings are formal management meetings;
• whether leadership conveys specific clearance goals for the homicide unit;
• whether there are any performance measures used for the homicide unit;
• whether leadership conveys investigations to be a priority over patrol; and
• whether the homicide unit claims to be well-resourced.

These were developed into a twelve-point scale for each agency, which was then assigned to each homicide case from that agency. As with previous analyses, we clustered standard errors by the agency to correct for heteroscedasticity in general and statistical dependence within the departments. As an exploratory quantitative test of the influence of agency unit characteristics on case clearances, we added this scale to the homicide case-level regression presented earlier in Figure 10. The results are presented in Figure 15.

**Figure 15. Logistic Regression Results for Homicide with Organizational Best Practices Scale Included**

<table>
<thead>
<tr>
<th>Case Element</th>
<th>Odds Ratio</th>
<th>Robust S.E.</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPEWEAPONGUN</td>
<td>1.329</td>
<td>0.465</td>
<td>0.417</td>
</tr>
<tr>
<td>WEAPONRECOVERED</td>
<td>18.110</td>
<td>17.038</td>
<td>0.002**</td>
</tr>
<tr>
<td>KNOWMODEENTRY</td>
<td>1.191</td>
<td>1.054</td>
<td>0.235</td>
</tr>
<tr>
<td>OFFENDERID</td>
<td>8.945</td>
<td>4.573</td>
<td>0.000***</td>
</tr>
<tr>
<td>SUSPECTKNOWNVIC</td>
<td>40.214</td>
<td>29.481</td>
<td>0.000***</td>
</tr>
<tr>
<td>VICTIMCOOPERATE</td>
<td>0.002</td>
<td>0.003</td>
<td>0.000***</td>
</tr>
<tr>
<td>MEDTXVIC</td>
<td>0.297</td>
<td>0.190</td>
<td>0.057*</td>
</tr>
<tr>
<td>WITNESSRELATEVIC</td>
<td>0.265</td>
<td>0.239</td>
<td>0.141</td>
</tr>
<tr>
<td>WITNESSRELATESUS</td>
<td>0.875</td>
<td>0.653</td>
<td>0.858</td>
</tr>
<tr>
<td>WITNESSCOOPERATE</td>
<td>8.552</td>
<td>6.453</td>
<td>0.004**</td>
</tr>
<tr>
<td>SUSPECTVEHICLE</td>
<td>0.412</td>
<td>0.442</td>
<td>0.409</td>
</tr>
<tr>
<td>RESIDENCE</td>
<td>1.009</td>
<td>0.463</td>
<td>0.984</td>
</tr>
<tr>
<td>MOTIVEKNOWN</td>
<td>1.184</td>
<td>0.789</td>
<td>0.800</td>
</tr>
<tr>
<td>HOMICIDE_LEADS</td>
<td>7.610</td>
<td>4.347</td>
<td>0.000***</td>
</tr>
</tbody>
</table>
As Figure 15 shows, the direct effect of organizational best practices on case status is positive and statistically significant. In other words, cases are more likely to be cleared if they are within organizations that have more best practices when it comes to homicide investigations. Treating this variable as continuous, the odds ratio suggests for each one-unit increase in the number of organizational best practices a department adheres to there is a 95% increase in the likelihood of solving a homicide. When looking at the other coefficients, one can interpret them similarly, but now each relationship is estimated holding the agency’s value on the organizational scale constant. One can see that compared to the nine significant effects in the previous model, there are now 16 significant effects not including the effect of the organizational best practices scale. The nine effects from the previous model retain their significance, but now seven new variables significantly predict the case status outcome. The fit of this model also improves from the initial homicide model in Figure 10.

Specifically, the new results suggest that holding organizational best practices constant, the odds of solving a homicide go down by 70% when medical treatment is provided to a victim. Having an investigative supervisor present during the initial response, collecting a crime log, and having many investigators (more than the median) assigned to investigate the case all reduced the odds that a homicide was solved. If additional evidence or technologies were used later in the investigation, the odds of solving the homicide increased by 189%. If a specialized unit helped with the investigation, the odds of solving the case increased by 159%. Finally, cases where a cell phone was investigated were 87% less likely to be closed. In the next set of results,
we include an interaction between the organizational scale and the three significant case-level predictors from the case-level homicide regression as an exploratory test of whether organizational best practices translate into higher clearance rates through the application of more investigative effort.

Interactions

Investigations occur within organizations and as such are influenced by the policies and practices of those organizations. For example, if an agency requires full collaboration throughout an investigation, the number of detectives and others at a crime scene will be larger than in an agency that only requires the lead and secondary detective to be at the scene. The more structured the investigative resources and policies of an agency the more they will impact investigations practices and clearance.

To explore this aspect of the factors influencing clearance, we present a further exploratory analysis with homicide in Figure 16. Here, we created three cross-level interactions between the organizational best practices scale and the case-level variables of whether many employees went to the scene, whether many investigators went to the scene, and whether investigators followed up with any witnesses. These three case-level measures were the only statistically significant predictors of case resolution in the early homicide model that involved some level of organizational effort on the part of the department. We hypothesized that the organizational structure of the homicide unit may moderate the effects of these indicators of case-level effort on case resolution, though the expected direction of these cross-level interactions was unclear. It could be that agencies that follow best practices in terms of how their homicide unit is organized receive more returns for the effort they put in to solving murders. However, it could also be that adhering to more organizational best practices provides its own benefits in terms of case resolution (see previous results), thereby weakening the marginal returns of exerting more effort to solve a case. For this reason, we included these interactions as part of an exploratory effort to see whether case-level and agency-level features interact to predict the successful resolution of a homicide.

Figure 16. Logistic Regression Results for Homicide with Organizational Best-Practices Scale and Interaction Terms Included

<table>
<thead>
<tr>
<th>Case Elements</th>
<th>Odds Ratio</th>
<th>Robust S.E.</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPEWEAPONGUN</td>
<td>1.171</td>
<td>0.470</td>
<td>0.694</td>
</tr>
<tr>
<td>WEAPONRECOVERED</td>
<td>19.378</td>
<td>18.234</td>
<td>0.002**</td>
</tr>
<tr>
<td>KNOWMODEENTRY</td>
<td>1.492</td>
<td>1.149</td>
<td>0.603</td>
</tr>
<tr>
<td>OFFENDERID</td>
<td>18.039</td>
<td>14.827</td>
<td>0.000***</td>
</tr>
<tr>
<td>SUSPECTKNOWNVIC</td>
<td>46.123</td>
<td>30.937</td>
<td>0.000***</td>
</tr>
</tbody>
</table>
Including interaction terms slightly improves the fit of our model from that presented in Figure 15. The only statistically significant cross-level interaction occurred between the organizational best practices scale and the number of investigators that went to the scene. The odds ratio for this interaction is below one, which indicates that the positive effect of having many investigators go to the scene on solving a homicide is reduced when the homicide unit follows more best practices as an organization. For those departments that follow fewer best organizational practices, it is more important to send a larger number of investigators to the scene of the homicide. While this analysis is exploratory, this finding could occur because organizations that have better practices and stronger homicide investigative processes may not need as many investigators because of the strong support from patrol, support units, and supervisors.
V. Conclusions

This research project has addressed three fundamental questions: 1) Are there discernible patterns in the rates of clearance for serious crimes in large agencies over extended periods of time? 2) Do organizational characteristics play a role in clearances? And, 3) How do organization characteristics interact with case-level factors to determine whether cases are cleared?

Using group-based trajectory analysis, we are able to show that there are variations in the patterns of clearance that persist over 32 years for homicide, aggravated assault, robbery, and burglary that can be masked by national average clearance rate trends. For homicide, robbery, aggravated assault and burglary, different trajectories were identified and in some cases, differences in the levels of clearances across trajectories were substantial. We discovered this variation in our analyses of both the largest 100 agencies as well as agencies with 100 officers or more, and we could not find discernible reasons for these variations, including longitudinal crime rate patterns (see Vovak, 2016). The trajectory analysis alone indicates that organizational policies, practices, and approaches to investigations may indeed matter to the successful resolution of crimes.

Additionally, our trajectory analysis provides a systematic and empirical foundation for selecting agencies for future analysis with regard to investigative practices, rather than using convenience sampling often employed by prior studies. While we have long known that agencies differ in how they structure and resource their investigative units, this work has been characterized by case studies of usually poor performing agencies. Although the number of agencies visited was relatively small, they were selected using a systematic approach based on dramatically different agencies based on their trajectory grouping. Our data collection and coding was also structured. As a result, we are better positioned than previous studies to use our case studies to examine organizational differences between agencies that do poorly with regard to crime clearance and those that do exceptionally well. Our results show that high and low performing agencies differ on many characteristics that past work has suggested are best practices for investigations. Furthermore, the characteristics of these organizations add, net of all other dimensions, to the explanation of clearance. Thus, in addition, to being concerned with investigative policies and practices and the resources devoted to investigations, law enforcement agencies should pay careful attention to organizational structure and policies for investigative units that impact and interact with other explanations of clearance.
Our case-level analysis reinforces our finding that organizational practices may play an important role in solving cases, above and beyond using solvability factors to allocate investigative resources. For homicide more specifically, we conclude that homicide clearances are influenced by a variety of factors that we have summarized under the categories of organizational characteristics, investigative policies practices and resources, and the likelihood that a case can be solved. This is supported by not only the good fit of our initial models that include more than just solvability factors, but also improvements in model fit when we add organizational best practices into our homicide models. Further research we are conducting will help to better specify these organizational and case-level cross-models. We will also continue to use the results of our trajectory analysis to further explore specific robbery-unit level characteristics across a larger sample of agencies.\textsuperscript{13}

Overall, our findings indicate that law enforcement agencies can have an impact on their crime clearance rates. Just as we now know that police can be effective in preventing crime (see National Research Council, 2014; National Academy of Sciences, 2017), so too can law enforcement agencies develop the policies, practices, and resources needed to solve crime. While this is especially true for homicides, it is reasonable to assume that if law enforcement agencies developed more offense specific policies and practices, they could also improve clearances for other serious crimes.

\textsuperscript{13} This analysis was not part of the original proposal to LJAF, but reflects another our many efforts to expand and sustain our research efforts in this area.
VI. References


VII. Appendices

APPENDIX A: INTERVIEW INSTRUMENTS

APPENDIX B: CODING SHEET FOR AGENCY INTERVIEWS AND FOCUS GROUPS

APPENDIX C: CODEBOOK FOR INVESTIGATIVE CASE FILE CODING
PERSONNEL WE WILL NEED TO SPEAK WITH:

- Highest ranking commanders overseeing investigations (i.e., deputy chief, major of investigations)
  - 1 interview with Deputy Chief or Major of Investigations
  - Any other relevant interviews with senior command
- Commanding officers of investigative units, specifically for Homicide, Robbery, Aggravated Assaults and Burglary
  - 1 interview with Commanding officer for homicide
  - 1 interview with Commanding officer for robbery
  - 1 interview with Commanding officer for aggravated assault
  - 1 interview with Commanding officer for burglary
- Shift commanders or supervisors of shifts/squads for these units involved in direct supervision of investigators
  - 1 interview with Lieutenant (or first line supervisor) from homicide
  - 1 interview with Lieutenant (or first line supervisor) from robbery
  - 1 interview with Lieutenant (or first line supervisor) from assault
  - 1 interview with Lieutenant (or first line supervisor) from burglary
- Investigators from each of these four crimes: Homicides, robbery, aggravated assaults, and burglary (perhaps 2-3 investigators for each crime type in interview groups)
  - 1 group interview with 2-3 homicide detectives
  - 1 group interview with 2-3 robbery detectives
  - 1 group interview with 2-3 aggravated assault detectives
  - 1 group interview with 2-3 burglary detectives
- Patrol first line supervisors who would understand the relationship and requirements of patrol for investigations of homicide, robbery, burglary and aggravated assaults
  - 1 interview with 1-2 patrol supervisors, especially during middle shift (may need to do these separately)
- If time: Individuals from investigative support services: crime scene investigators, crime analysts, forensics, other units that provide regular investigative support services
  - 1 interview with 1 crime analyst who works with detectives; maybe 1 person from forensics/other investigative support services

SOME NOTES:
- TOTAL INTERVIEWS: Approximately 15 over two days, can do evenings if needed.
- INTERVIEW TIMING: 1 hour time slots, with 10 minute breaks, with time for lunch
- Also, would like an earlier meeting to be with chief or deputy chief to explain project and ask generally about investigations.
Items to be obtained before visit

a. DOCUMENTS AND POLICIES
   o Are there available policies, training manuals and/or checklists that can be obtained about investigations?

b. COMPENSATION AND OVERTIME
   o Are detectives paid when on call or to be on call?
   o In what way are detective’s compensated when on call? (for ex. time off vs overtime?)
   o Do they have take-home cars?
   o What is the overtime approval process when cases are being investigated?
   o Did they get a clothing allowance or other benefit specific to investigators?

c. STAFFING AND PRIORITIZATION: [Could obtain this information ahead of time]
   o What is the ratio of investigators to uniformed patrol officer who are assigned to answering calls for service?
   o What determines these levels of investigative staffing? If based on workload analysis, when was this last completed?
   o How much of the department’s budget is allocated specifically to investigative officer salaries and overtime versus patrol salaries and overtime?
Deputy Chiefs, Commanders, Lieutenants: Agency Level Characteristics Related to Investigations

a. ORGANIZATIONAL STRUCTURE
   - Describe the organizational structure of the agency, and more specifically where investigative units fit into that structure.
   - How are investigative units for homicide, robbery, aggravated assault and burglary proportioned, divided, and deployed in this agency?
   - Are they centralized or decentralized?
   - Are there district level investigators, and if so, what do they handle and how do they related to centralized detectives?
   - How do detectives share information and utilize other investigators or patrol in their investigations?

b. DIVISION OF LABOR
   - What types of cases does each unit handle?
   - How are cases assigned to each unit?
   - Are all cases of homicide, robbery, aggravated assault and burglary assigned an investigator? When are cases not assigned?
   - Are these units available around the clock? Who handles cases when units are not available?
   - How are cold cases handled?
   - Are cases initially triaged using solvability factors or are resources allocated using solvability factors?

c. STAFFING AND PRIORITIZATION
   - How are investigators recruited, selected, and promoted?
   - Is the detective rank considered a promotion or higher status?
   - Are detectives rotated? In what way?
   - Does the department have a rotation policy for supervisors and managers of investigative units?
   - Are detectives for homicide, robbery, aggravated assault and burglary specifically assigned to those units, or do they serve other functions (for example, are they also uniformed patrol officers?)

d. TRAINING
   - What type of training are investigators required to receive and when?
   - Is additional training available to investigators? Do some investigators seek their own training?
   - How often do investigators take advantage of training?
   - Who pays for training (is there a specific budget line for detective training, or do officers pay for it themselves)?
   - Who makes decisions about training and why criteria are used to determine who gets training?
   - How are standards and expectations maintained for investigations?
   - When officers complete training, is that training recorded in their personnel file?
Do detectives receive any training on and use of solvability factors?

e. SUPPORT FOR INVESTIGATIONS
  o What units (beside patrol) support investigations? For example, forensics, crime scene units, crime analysis, intelligence, narcotics and gang units, fugitive/warrant apprehension teams?
  o Under what conditions are support units deployed as part of the preliminary investigation?
  o How is drug, narcotics, burglary crew/gang intelligence shared with investigators?
  o Does the agency deploy street crime units and if so, how do they interact with investigators on specific cases?
  o What is the competency and skill level of these units, and does the agency prioritize their training, resources, expertise?
  o How available are these units?
  o What cases receive support services – for example, processing at crime lab, crime analytic support, crime scene analysis, phone, computer, video forensics?
  o Who directs the use of these resources for any given case?
  o What is the training, expertise, experience, or resources available to these support units?
  o Is information relevant to crime prevention shared among units?

f. SUPERVISION AND ACCOUNTABILITY
  o What is the overall supervision structure of investigations?
  o What is expected from each level of investigative supervision? What role do supervisors play in investigations?
  o How are investigators, investigative sergeants and above, held accountable (e.g., Compstat, statistics, other meetings)?
  o To what outcomes or performance metrics are they held accountable (e.g., clearance, crime rates, arrests, timing of clearance, etc.)?
  o Can a detective be removed from a unit? How often does this happen?
  o What measures are in place to limit wrongful identification or arrest?
  o Are there structures of formal or informal mentorships of investigators available?
  o Is there a system or requirement for supervisory review of cases, e.g. case management system? Checklists? Is there a system of external review of investigations or cases?

g. COMMUNITY INTERACTIONS
  o Is there an agency-level expectation for investigative units to interact with the community, and in what way (not regarding individuals to solve specific crimes, but more generally or strategically)?
  o Is the community regularly called upon to provide information (and in what ways)?
  o Does the agency use social media/networks, or other techniques (crime stoppers, Facebook citizen tips, etc.) on a regular or required basis to interact with the community and for what purpose?
o Do they use media analysis and capture? Who does this, how are they trained?
  o For each of four crimes we are interested in, do they interact with community in different ways, or more or less intensely?
  o How would you describe the overall relationship that investigators in this agency have with the community?

h. VICTIMS
  o Is there a victim-witness advocate?
  o Is there survivor support for homicide victim’s families?
  o Is there policy and practice related to following up with victims, and in what way?
  o Is there a witness protection program?

i. INVESTIGATORS AND THE COURTS
  o What is the relationship between investigators and prosecutors?
  o Who makes decision to arrest? (Are prosecutors involved in approving arrest warrants?)
  o If prosecutors are involved, is there an appeals process if PD disagrees?
  o Are there standards and policies that govern relationship between investigators and prosecutors?
  o Are all notes and other information provided to prosecutors?

j. EXCEPTIONAL CLEARANCES
  o When is exceptional clearance used for a case (how is it determined)?
  o How are exceptional clearances documented and managed?

k. CLEARANCE RATES
  o Talk about clearance rate trends in the PD over time and their perceptions of agency performance
  o Ask views about what might contribute to clearance rate trends over time
Investigative Unit Detectives and Immediate Supervisors: Practices and Policies of Investigative Units

a. RECEIVING CASES
   - Describe how this unit receives its cases, and then what is the process of dealing with that case, including the investigator’s initial response and follow up response?
   - Are cases handled even when the victim does not want to continue (how are those coded)?
   - When does a unit decide that an open case that has not been solved is no longer investigated, or moved to a cold case squad?
   - Which units (homicide, burglary, robbery, aggravated assault) have a cold case squad or access to cold case resources?
   - Is there a cold case squad for your unit? If so, what does it do and how is it staffed?
   - If there is no cold case unit, how is information handled that comes in for older cases? How are old cases handled?

b. INVESTIGATIVE PROCESS
   - Is there a structure for each investigation that must be completed (i.e., case folder checklist/requirements that we could see?)
   - How is that structure supervised and how are detective’s held accountable to those requirements?
   - Is there a review process for your cases by a supervisor or external unit? Describe.
   - How much discretion do investigators have within that structure?
   - Is everything usually filled out for each case folder?
   - Which items are usually not obtained?
   - Are case folders completed on paper or electronically?

c. WORKLOADS
   - What are typical detective workloads for this unit?
   - What are the expectations of how much time should be spent on investigations?
   - How many detectives are assigned to each case?
   - How are cases assigned to individual detectives as they come in?

d. UNIT DYNAMICS
   - Do investigators in this unit work on their own or do they use team approach?
   - Is there division of labor across units (for example, more experienced interviewers are used for interviewing) or are cases handled by each individual investigator?

e. TRAINING AND LEARNING: How do new detective’s gain experience?
   - What type of training are investigators required to receive and when?
   - Is additional training available to investigators?
   - How often do investigators take advantage of training?
   - Who pays for training (is there a specific budget line for detective training, or do officers pay for it themselves)
f. DETECTIVE PERFORMANCE
   - Do you receive mentoring and coaching, is it formalized or informal?
   - What expectations do current investigators have of newer detectives?
   - How do detectives learn the craft of investigations when they first enter a unit?
   - Do you think detectives increase their ability to clear and resolve cases over time and with experience? If yes, how do you know this?
   - Have you received any formal training on interacting with citizens, such as procedural justice training?

h. INFORMATION SHARING
   - What are the purposes of investigators sharing information?
   - Describe the information sharing between detectives and patrol –
     - How is this accomplished (describe specific mechanisms, and if formal or informal)?
How strong is that relationship?
How is this built into investigations?
Which investigations?
What role do officers on the street play in various aspects of the investigation?

- Do different detective units share information?

### i. EXTERNAL AND COMMUNITY SUPPORT
- Describe whether and how your unit seeks external help from:
  - Patrol officers
  - the community
  - other units
  - Other federal agencies?
  - Different jurisdictions in ways other than interviewing witnesses of a crime?

- Describe the type and nature of support you receive, and whether it is ad hoc or routine.
- Do you think the community’s willingness to provide you with information for your cases has changed over time? If so, in what ways?
- Have recent events in the U.S. regarding police-community relationships and officer involved shootings, changed the way people respond to you individually?
- Is your unit expected to engage with the community (not regarding individuals to solve specific crimes, but more generally or strategically)?
- Is the community regularly called upon to provide information (and in what ways)?
- How would you describe the overall relationship that investigations in this agency have with the community?

### j. SOCIAL MEDIA
- Describe how you use social media/networks, or other techniques (crime stoppers, Facebook citizen tips, etc.) on a regular or required basis to interact with the community and for what purpose?
- Do you use social media to connect with informants, witnesses, community members?
- Do you conduct investigations of social media accounts to link suspects to other individuals, groups, propensity to offender or resort to violence, etc.?

### k. FORENSICS AND INFORMATION TECHNOLOGY
- What is average investigator’s knowledge and use of information resources (RMS, LinX, other info; computers, NCIC, firearms, NIBIN and other types of tracing, etc.)?
- Are there requirements to use this information when completing a case investigation?
- Is DNA analysis done regularly (and for which of the four crimes in question)?
- Fingerprint analysis?
- Video footage attempted?
Does this unit regularly use any other technological innovations (for example, LPR, BWC, Shot Spotter, etc?)

1. INTERVIEWS AND INTERROGATION
   - What are common interview and interrogation practices used by your unit?
   - Do you use any innovative approaches?
   - What types of approaches seem to work best, and are these regularly used in your unit?
   - Are polygraphs or lie detection techniques used?
   - Are interviews and interrogations taped and for which of the four cases of interest (homicide, robbery, aggravated assaults, burglary)?

m. RESOURCES: Are investigators supported for overtime,
   - on-call pay,
   - take home cars,
   - Tablets, smartphones, and other needed technologies?
   - Do you feel the agency prioritizes resources for your unit compared to other units?

n. EXCEPTIONAL CLEARANCES
   - When do you “exceptionally clear” a case?
   - Do you need supervisor approval to exceptionally clear a case?
   - What training have you received on when you can exceptionally clear a case?

o. SOLVABILITY FACTORS:
   - Have you received any training on and use of solvability factors?
   - Are cases triaged using solvability factors or are resources allocated using solvability factors?
   - To what extent are you aware of research regarding investigative practices?

p. PREVENTION AND PROBLEM SOLVING
   - Is there any preventative aspect of this investigative unit? For example, is there any attempt to clear multiple crimes at once using analytic techniques?
   - Are there any proactive approaches used by this unit to prevent future crimes or to launch parallel investigations?
   - Is information relevant to crime prevention shared with other units?
First line Patrol Supervisors: Policies and Practices of Patrol and Patrol’s Interaction with Investigations

a. INVESTIGATIVE RESOURCE
   - For what types of crimes are investigators called to the scene or asked to participate? [ask specifically about homicide, robbery, aggravated assault and burglary].
   - Are investigators called to the scene as part of the preliminary investigation (first responders)?
   - Is there any strategy in patrol to preserve and recover fingerprints, or DNA (and for which of our crimes)?

b. INITIAL RESPONSE
   - For those cases handled by investigators, in what ways do patrol officers set the stage for the investigation (i.e., securing crime scene, initial gathering of evidence, attempt to locate suspect, victim, witnesses, canvass activities? Seeking out video footage?
   - What are regular practices for each of the four crimes, and expectations?
   - Are they different for four crimes, and in way?

c. PATROL RESOURCES
   - Are different levels of resources assigned within patrol for different types of investigations?
   - Within crime types, are there variations of how much patrol resources are assigned?

d. OFFICER EXPECTATIONS
   - What is expected of officers for investigations?
   - Are they aware of solvability factors?
   - Do they play any role in follow ups of investigations?
   - How often do investigators seek patrol’s assistance later on in the investigative process (not during the first response)?
   - What types of quality controls are in place for report writing by officers for cases that are handled by investigators?
   - For investigations of each of our crimes of interest, is there supervisory or detective guidance provided for writing reports and preliminary response?
APPENDIX B: CODING SHEET FOR AGENCY INTERVIEWS AND FOCUS GROUPS

ORGANIZATIONAL STRUCTURE

1. Which best describes the organization of the investigation of this crime type?
   1 = Centralized
   2 = Decentralized
   3 = Mixed

2. What is the oversight structure for the investigation of this crime type?
   1 = Highly structured
   2 = Moderately structured
   3 = Loosely structured

3. How is the connectivity of this investigative unit to other units?
   1 = Highly connected – share information often
   2 = Somewhat connected – share information sometimes
   3 = Not at all connected – does not share information

4. Does the investigative unit share information with patrol?
   1 = Yes, routinely
   2 = Sometimes, ad hoc
   3 = Rarely or no
   a. If yes, how is investigative information provided to patrol?
      1 = Patrol briefings at shift change
      2 = Emails
      3 = Casual conversation
      4 = Other
   b. Number of methods for investigative information to go to patrol
      1 = 1 method
      2 = multiple methods
      0 = no method

5. Do patrol officers have a method of providing information to detectives (formal or informal)?
   1 = Formal
   0 = Informal

6. What is the relationship between patrol units and this investigative unit?
   1 = Good relationship
   2 = Neutral relationship
   3 = Bad/Strained relationship
   4 = No relationship

7. Do investigative units share information with other investigative units?
   1 = Yes, routinely
   2 = Sometimes, ad hoc
   3 = Rarely or no
   a. If yes, how is investigative information provided to other investigative units?
      1 = Formal briefings or meetings
      2 = Emails
      3 = Casual conversation
LEADERSHIP AND RESOURCES

1. How frequently does leadership meet with investigative units?
   1 = Weekly
   2 = Monthly
   3 = As needed/ad hoc

2. Are these meetings formal management meetings or informal?
   1 = Formal
   2 = Both formal and informal
   0 = Informal

3. Does leadership convey specific clearance goals for each unit?
   1 = Yes
   0 = No

4. What are the performance measures used for each unit?
   1 = Clearances
   2 = Arrests
   3 = Amount of time cases are open
   4 = Other________________________
   5 = No performance measures

4a. What are the number of performance measures used?
   1 = 1 performance measure
   2 = 2 or more performance measures
   0 = no performance measures

5. How does the unit use performance measures?
   1 = Bonuses
   2 = Other privileges
   3 = Training
   4 = Other
   5 = No use of performance measures
   6 = multiple uses of performance measures

6. Does leadership use work load analyses to set number of investigators/supervisors for each unit?
   1 = Yes
   0 = No

   a. How is workload defined?
      1 = Number of cases
      2 = Other

7. How has leadership assured that information sharing occurs in the department to assist investigations?
   1 = Bulletins to patrol
2 = Email system to provide information
3 = Compstat
4 = Crime analysis
5 = Real time crime center
6 = Crime intelligence unit
7 = Other
8 = N/A

a. What are the number of methods that leadership uses to ensure information sharing occurs in the department?
   1 = 1 method
   2 = 2 methods
   3 = 3 or more methods
   0 = no methods

8. Is leadership open to requests or ideas from investigative units?
   1 = yes
   0 = no

9. Did leadership convey whether it believes investigations to be a priority in the department, or is patrol the priority?
   1 = Investigations priority
   2 = Patrol priority
   3 = Not conveyed
   4 = Unknown

10. Are the investigative units for this crime type well resourced (or do they complain about under-resourced with regard to cars, phones, computers, equipment?)
    1 = Well resourced
    2 = Adequately resourced, with some complaints
    3 = Poorly resourced, with many complaints

SELECTION, TRAINING, PERFORMANCE, AND REMOVAL OF INVESTIGATORS

1. To be an investigator must the person have the following:
   a. Experience in investigations, and special skills related to investigations?
      1 = yes
      0 = no
   b. Specific training?
      1= yes
      0 = no
   c. A certain number of years of experience in the police department?
      1 = yes
      0 = no

2. How are investigators selected?
   1 = Leadership selects at their discretion
   2 = Job announcements with a formal application process
   3 = Assessment center process
   4 = More than 1 way investigators can be selected
   5 = Other ________________________________
a. Is there an interview process to apply to be an investigator for this crime type?
   1 = Yes
   0 = No

3. Who makes the final decision on selection of investigators?
   1 = Investigative supervisors (i.e., first line supervisors)
   2 = Unit commander
   3 = Higher-level command staff (Chief)
   4 = Unit commander and higher level command (Chief)
   5 = Other________________________

4. Do investigators try to move to other types of investigative units they view as higher status?
   1 = yes (EXPLAIN_____________________________________)  
   0 = no
   2 = sometimes or it depends

5. Do investigators have a special rank?
   1 = yes
   0 = no

6. Do investigators receive extra pay?
   1 = yes
   0 = no

7. Is this investigative unit seen as a prestigious assignment?
   1 = yes
   0 = no

8. To be an investigative SUPERVISORS must the person have the following:
   a. Experience in supervising investigations, and special skills related to supervising investigations?
      1 = yes
      0 = no
   b. Specific training related to supervision of investigations?
      1= yes
      0 = no
   c. A certain number of years of experience as a supervisor in the police department?
      1 = yes
      0 = no

9. How are investigator SUPERVISORS selected?
   1 = Leadership selects at their discretion
   2 = Job announcements with a formal application process
   3 = Assessment center process
   4 = Supervisors are selected using two or more of the above methods
   5 = Other________________________
   a. Is there an interview process to apply to be an investigative SUPERVISORS for this crime type?
      1 = Yes
10. Who makes the final decision on selection of investigative SUPERVISORS?
   1 = Unit commander
   2 = Higher-level command staff
   3 = Other

11. Immediately upon selection, is there any training for investigators that is required?
   1 = yes, formal training
   2 = yes, informal on the job training
   3 = no training, informal or formal
   4 = formal and informal training
   a. If investigators receive formal training, what type of training do they receive?
      1 = Interrogation training
      2 = Warrants training
      3 = Training related to offense type
      4 = multiple types of formal training
      5 = Other training

12. Describe how long does the training period last for investigators?

13. Who evaluates how new investigators did during their initial or early stages of
    training/being in the unit?
   1 = Investigative supervisor evaluates
   2 = Unit commander evaluates
   3 = There is no formal evaluation

14. Does this unit have formal or informal mentoring systems in place?
   1 = Formal mentoring system in place
   2 = Informal mentoring for investigators
   3 = No mentoring

15. Is there a procedure to remove investigators from the unit who are not performing
    well?
   1 = Yes
   0 = No
   a. If yes, describe.
      1 = Move to another investigative unit
      2 = Move out of investigations
      3 = Both 1 & 2 are options
      4 = Other
   b. How often has it been used in the past five years?
      1 = Often
      2 = Occasionally
      3 = Rarely

16. Are investigators evaluated on the basis of their ability to clear cases assigned to
    them?
   1 = yes
   0 = no
17. Are investigators evaluated on the basis of other performance measures?
   1 = yes (DESCRIBE____________________________)
   0 = no

18. How are investigators kept appraised of their performance?
   1 = Immediate supervisor
   2 = Unit commander
   3 = Other (DESCRIBE____________________________)

19. Are investigative SUPERVISORS evaluated on the basis of their unit’s ability to clear cases assigned to them?
   1 = yes
   0 = no

20. Are investigative SUPERVISORS evaluated on the basis of other performance measures?
   1 = yes (DESCRIBE____________________________)
   0 = no

21. How are investigative SUPERVISORS kept appraised of their performance?
   1 = Unit commander
   2 = Higher commanding officer
   3 = Other (DESCRIBE____________________________)

22. Are investigators rotated to other units or back into patrol?
   1 = yes (AND INPUT LENGTH OF ROTATION PERIOD)
   0 = no
   a. If no to rotation, how long do people remain in investigations?
      INPUT LENGTH OF TIME IN INVESTIGATIONS

23. Is there a training officer designated for this investigative unit
   1 = yes (THEN DESCRIBE)
   0 = no

24. Does the department regularly support additional training for investigators?
   1 = yes
   0 = no

25. Have investigators in this unit been formally trained on the science of solvability factors?
   1 = yes
   0 = no

26. Have investigative supervisors for this unit been formally trained on the science of solvability factors
   1 = yes
   0 = no

27. What is the overall supervision structure of investigations?
   1 = Direct report to the chief by head of unit
   2 = One command level between chief and head of unit
   3 = Two or more command levels between head of unit and chief

CASE ASSIGNMENT

1. For this crime type, how do investigative units come to learn about the case?
1. Patrol units notify the investigative unit
2. Investigative supervisor receives regular updates about new cases
3. Dispatch notifies investigators directly
4. both 1 and 2 are options: patrol and investigative supervisor
5. Other DESCRIBE ________________________________

2. Are all cases of this crime type assigned to an investigator?
   1 = Yes
   0 = No

3. Approximately what proportion of total cases per year of this crime type are assigned to an investigator?
   1 = All cases are assigned to an investigator
   2 = Most cases are assigned (more than half)
   3 = About half of the cases are assigned
   4 = Less than half of cases are assigned
   5 = Only a small proportion (less than 10%) are assigned

4. If the proportion of cases assigned to investigations for this crime type are known, enter it here: ________________%

5. For this crime type, who decides whether cases are assigned to an investigator?
   1 = All cases are assigned to an investigator
   2 = Investigative supervisor
   3 = Unit commander
   4 = Other personnel (i.e., clerk/civilian)
   5 = Patrol supervisor/personnel

6. Describe for this crime type, what happens to cases that are NOT assigned for investigation?
   1 = Case is returned to patrol for patrol officers to further investigate
   2 = Case is no longer investigated by any unit (i.e., “redlined” or set aside)
   3 = Case is assigned to a different unit (i.e., cold case, community units, other investigative units, etc.)

7. For cases that are not assigned to a full investigation, does the investigative unit conduct a minimal investigation?
   1 = yes
   2 = no

8. For this crime type, are investigators “first responders” (do they immediately go out to the scene once the crime is reported?)
   1 = yes
   2 = sometimes, depending on the circumstances
   0 = no
      a. If not, then what is the time lag of their response? DESCRIBE in terms of hours/days ______________

9. What is the availability of investigators for this crime type?
   1 = 24/7, with investigators in the office (not on call)
   2 = 24/7, with investigators on call overnight
   3 = Only M-F, 24/7 (no weekend availability)
   4 = Only M-F, portion of day that doesn’t include overnight
   5 = When available (may vary, depending on shift)
10. Do on call investigators have take home cars?
   1 = Yes
   0 = No
11. Are they paid additional salary/wages to be on call?
   1 = Yes
   0 = No
12. Can investigators receive overtime compensation in this unit?
   1 = Yes
   0 = No
   a. Who determines if overtime can be used?
      1 = Investigative supervisor
      2 = Unit commander
      3 = High-level command
   b. What are criteria for use of overtime?
      1 = Special circumstances
      2 = As needed
   c. Is there a limit on overtime for units?
      1 = Yes
      0 = No
   d. Is there a limit on overtime for individuals?
      1 = Yes
      0 = No
13. For this crime type, what are the typical workloads (in terms of numbers of cases?)
    Input average workload
14. How many detectives are assigned to each case being investigated?
    1 = One investigator
    2 = Two investigators
    3 = Three or more investigators
15. How are cases assigned to each detective when they come in?
    1 = Rotational system
    2 = Schedule-based
    3 = Geographically
    4 = Specialty based
    5 = multiple methods of case assignment from above list
    6 = Other _______________________________
16. Do investigators for this crime type also handle other types of cases?
    1 = Yes
    0 = No
    a. Did investigators give hints as to the extent of this burden?
    DESCRIBE

THE INVESTIGATION

1. What elements of structured investigation system does the agency maintain:
   a. Detailed SOPs;
      1 = Yes
1. Investigative case management system (such as computerized case management)
   1 = Yes
   0 = no
2. Solvability factors for case assignment;
   1 = Yes
   0 = no
3. Case file checklist
   1 = Yes
   0 = no
4. Mandatory and regular reviews of case file checklist or progress
   1 = Yes
   0 = No
5. Involvement of states attorney is specified and/or required
   1 = Yes
   0 = no

At the scene of a crime, if the investigator responds, who becomes in charge of the scene?
1. Investigators
2. Investigative supervisors or commanders
3. Patrol supervisors or commanders
4. Initial Patrol Officer
5. Other ____________________________________________________________________

Is a log kept at the scene as to who responded and what their role was
1 = Yes
0 = no

a. By whom?
   1 = Investigators
   2 = Investigative supervisors
   3 = Patrol supervisors
   4 = Patrol Officers
   5 = Other
b. Are those on the log required to submit a report?
   1 = Yes
   0 = no

Does the investigative supervisor go to the crime scene with the investigator?
1 = Yes
0 = No

Does the supervisor play any other initial role when an investigator first receives a case? DESCRIBE ________________________________________

What level of support does the forensics/crime scene unit provide for this type of crime investigation?
1 = High support
2 = Medium support
3 = Low support
4 = No support

7. What level of support does the intelligence unit provide for this type of crime investigation?
   1 = High support
   2 = Medium support
   3 = Low support
   4 = No support

8. What level of support does the crime analysis unit provide for this type of crime investigation?
   1 = High support
   2 = Medium support
   3 = Low support
   4 = No support

9. What assistance do investigators have with digital evidence collection (CCTV, Phones, etc.)?
   1 = High support
   2 = Medium support
   3 = Low support
   4 = No support

10. What assistance does a fugitive task force or a warrant apprehension squad provide for this type of crime investigation?
    1 = High support
    2 = Medium support
    3 = Low support
    4 = No support

11. For HOMICIDES ONLY do investigators attend the autopsy?
    1 = Yes
    2 = Sometimes
    0 = No

12. For PERSONS CRIMES (Homicide, Assault, Robbery), does the investigator attempt to interview the victim in the hospital?
    1 = Yes
    0 = No

13. Is there a deadline for the first initial investigative/crime report (is there time urgency)?
    1 = Deadline available for report
    0 = No deadline for report
    a. Who reviews the initial report?
       1 = Investigative supervisor
       2 = Unit commander
       3 = Other
       4 = No one reviews the reports
       5 = Investigative supervisor and unit commander both review report

14. Is there a deadline for subsequent reports for this crime type?
    1 = Deadline available for report
    0 = No deadline for report
a. Who reviews supplemental reports?
   1 = Investigative supervisor
   2 = Unit commander
   3 = Other
   4 = No one reviews the reports
   5 = multiple levels of investigative supervision reviews reports

15. Is the investigation restricted to the assigned detectives or is a collaborative investigative approach used?
   1 = Collaborative approach used always
   2 = Collaborative approach used if needed
   0 = No collaborative approach – only assigned investigators

16. Do investigators have ready access to the following? Yes/No
   a. Smartphone
      1 = Yes
      2 = Use their own phone
      0 = No
   b. Tablet/Laptop
      1 = Yes
      0 = No
   c. Digital Camera
      1 = Yes
      0 = No
   d. Voice Recorder
      1 = Yes
      0 = No

17. Are all interviews recorded?
   1 = Yes
   2 = Some
   0 = No
   a. How?
      1 = Tape recording
      2 = Video recording
      3 = use both tape and video
   b. where?
      1 = In-field
      2 = Interrogation room (headquarters)
      3 = both in-field and in office

18. Do they double-blind line-up identification?
   1 = yes
   0 = No

19. How do they generate line-ups?
   1 = blind detective
   2 = leading detective
   3 = other staff
   4 = unknown
   5 = multiple methods used to generate line-ups
20. Describe specifically when a case can be cleared by exception in this unit (such as death of offender, prosecution declined, refusal of extradition, person already incarcerated, other circumstances?
   a. When can a case be cleared by exception?
      1 = death of an offender only
      2 = typical UCR definition (multiple measures)
      3 = some other unit policy
      4 = not used

21. Is there a specific policy that describes when cases can be cleared by exception?
   1 = yes
   0 = No
   b. What is the approval process for such a clearance?
      1 = Investigative supervisor approval
      2 = Unit commander approval
      3 = Higher-level command approval
      4 = Other DESCRIBE ______________________
      5 = No approval needed/investigator can exceptionally clear a case
      6 = both investigative supervisor and unit commander approval

22. Are license plate readers regularly used by investigators for this crime type?
   1 = Yes
   2 = sometimes
   0 = No

23. Are information technologies/databases regularly used by investigators for this crime type?
   1 = Yes
   0 = No

24. Are regional databases (multi-city/state) regularly used by investigators for this crime type?
   1 = Yes
   0 = No

25. Are social medial platforms regularly used by investigators for this crime type?
   1 = Yes
   0 = No

26. Is Shot Spotter regularly used by investigators for this crime type?
   1 = Yes
   0 = No

27. What other technologies or innovations are regularly used by investigators that have not been described here? DESCRIBE

28. How involved are patrol or community/neighborhood policing units in investigations for this crime type?
   1 = High involvement
   2 = Medium involvement
   3 = Low involvement
   4 = No involvement

29. Is there currently some form of witness protection or witness help program in place?
1 = Yes, PLEASE DESCRIBE SPECIFICALLY
0 = No

30. Are there specific programs or policies to improve victim/witness service (like advocate/survival support, following up, etc.)
   1 = Yes, well-supported programs
   2 = Minimally supported programs
   3 = No programs
   4 = through DA’s office only at time of trial

31. Do investigators need permission from the States Attorney to make an arrest on a case?
   1 = Yes
   0 = no

32. What is the relationship between investigators and states attorneys for each crime type?
   1 = Good relationship
   2 = Neutral relationship
   3 = Bad/Strained relationship
   4 = No relationship

COLD CASES

1. Does the department have a cold case squad?
   1 = Yes, FOR WHAT CRIME TYPES __________________
   2 = inactive squad
   0 = no

2. If yes, when was the cold case squad created?
   Input year

3. How is the cold case squad staffed?
   1 = Dedicated investigator to unit
   0 = No dedicated investigator

4. How are cases assigned to the cold case squad
   1 = Once a case becomes too old, it gets shifted from investigative unit to CC squad
   2 = When/if new information arises for cases no longer being investigated
   3 = Testing of old evidence
   4 = investigative supervisors decide

5. Once assigned, how is case handled?
   a. Is there an SOP for cold cases?
      1 = Yes
      0 = no
   b. What resources are available to the unit?
      1 = DNA
      2 = crime analysis
      3 = other
      4 = multiple resources
   c. What duties other than investigating cold cases are assigned to the unit?
      1 = Other investigative duties
0 = No other duties

COMMUNITY INTERACTIONS

1. Does leadership engage with community policing outreach to assist with investigations for this crime type?
   1 = Yes
   2 = sometimes
   0 = No

2. Does the agency use social media to interact with community about solving cases and investigations for this crime type?
   1 = Yes
   2 = sometimes
   0 = No

3. Does leadership use community meetings to assist with investigations for this crime type?
   1 = Yes
   2 = sometimes
   0 = No

4. Is there any attempt in the agency to link investigations/investigative deployment for this crime type to community policing or community priorities?
   1 = Yes
   0 = No

5. How did this unit and its investigators describe its relationship with the community?
   1 = Good
   2 = Bad
   3 = Mixed
   4 = Nonexistent (the unit does not have any relationship with community)

6. Are there specific initiatives to improve investigation-community relationships for this crime type?
   1 = Yes
   0 = No

7. Are there specific initiatives to reduce “stop snitching” campaigns, or improve getting witnesses to come forward for this crime type?
   1 = Yes
   0 = No

8. Does the agency use social media SPECIFICALLY to interact with community about solving cases and investigations for this crime type?
   1 = Yes
   2 = sometimes
   0 = No

CLEARANCE RATE QUESTION

1. Did the unit or agency have any explanation for its clearance rate trends historically for this crime type? (fill in answer)
## APPENDIX C
Codebook for Investigative Case File Coding

<table>
<thead>
<tr>
<th>Field</th>
<th>Coding Scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td>Excluded for anonymity</td>
</tr>
<tr>
<td>Case agency ID</td>
<td>Excluded for anonymity</td>
</tr>
<tr>
<td>ID</td>
<td>Excluded for anonymity</td>
</tr>
</tbody>
</table>
| Case status                                | 0 = Open
|                                            | 1 = Closed                                              |
| Date incident                              | String variable                                         |
| Time incident                              | String variable                                         |
| Date reported                              | String variable                                         |
| Time reported                              | String variable                                         |
| Time first response                        | String variable                                         |
| Response time (from report)                | Number of minutes                                       |
| Detective scene (initial)                  | 0 = no
|                                            | 1 = yes                                                 |
| Date detective arrive                      | String variable                                         |
| Time detective arrive                      | String variable                                         |
| Detective time (from response)             | Number of minutes                                       |
| Date detective activity                    | String variable                                         |
| Time detective activity                    | String variable                                         |
| Date reported dead (homicide only)         | String variable                                         |
| Time reported dead (homicide only)         | String variable                                         |
| Days until investigation                   | String variable                                         |
| Date of arrest                             | String variable                                         |
| Arrest info                                | String variable                                         |
| Type of crime                              | 1 = homicide
|                                            | 2 = aggravated assault
|                                            | 3 = robbery
|                                            | 4 = burglary                                            |
| Crime description                          | String variable                                         |
| Type of weapon – gun                       | 0 = no
|                                            | 1 = yes                                                 |
| Type of weapon – knife                     | 0 = no
|                                            | 1 = yes                                                 |
| Type of weapon – hand                      | 0 = no
|                                            | 1 = yes                                                 |
| Type of weapon – other                     | 0 = no
|                                            | 1 = yes                                                 |
| Weapon recovered                           | 0 = no
|                                            | 1 = yes                                                 |
| Mode of entry                              | 0 = suspect’s home or already inside residence/establishment
<p>|                                            | 1 = primary door/entrance                               |
|                                            | 2 = secondary door/entrance                             |</p>
<table>
<thead>
<tr>
<th>Entry description</th>
<th>String variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of victims</td>
<td>Numeric variable</td>
</tr>
<tr>
<td>Victims description</td>
<td>String Variable</td>
</tr>
<tr>
<td>Victim age (for up to 5 victims)</td>
<td>Numeric variable</td>
</tr>
<tr>
<td>Victim sex (for up to 5 victims)</td>
<td>M = male</td>
</tr>
<tr>
<td></td>
<td>F = female</td>
</tr>
<tr>
<td>Victim race (for up to 5 victims)</td>
<td>A = Asian</td>
</tr>
<tr>
<td></td>
<td>B = Black</td>
</tr>
<tr>
<td></td>
<td>H = Hispanic</td>
</tr>
<tr>
<td></td>
<td>O = Other</td>
</tr>
<tr>
<td></td>
<td>U = unknown</td>
</tr>
<tr>
<td></td>
<td>W = White</td>
</tr>
<tr>
<td>Offender ID (at time of response)</td>
<td>0 = no</td>
</tr>
<tr>
<td></td>
<td>1 = yes</td>
</tr>
<tr>
<td>Offender ID description</td>
<td>String variable</td>
</tr>
<tr>
<td>How offender ID</td>
<td>String variable</td>
</tr>
<tr>
<td>Nobody identified offender</td>
<td>0 = no</td>
</tr>
<tr>
<td></td>
<td>1 = yes</td>
</tr>
<tr>
<td>Victim identified offender</td>
<td>0 = no</td>
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<tr>
<td></td>
<td>1 = yes</td>
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<tr>
<td>Witness identified offender</td>
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<td>1 = yes</td>
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<td>Police identified offender</td>
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<td>1 = yes</td>
</tr>
<tr>
<td>Other identified offender</td>
<td>0 = no</td>
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<td></td>
<td>1 = yes</td>
</tr>
<tr>
<td>Number of suspects (at response)</td>
<td>Numeric variable</td>
</tr>
<tr>
<td>Number of suspects description</td>
<td>String variable</td>
</tr>
<tr>
<td>Number of suspects later (in investigation)</td>
<td>Numeric variable</td>
</tr>
<tr>
<td>Number of suspects later description</td>
<td>String variable</td>
</tr>
<tr>
<td>Offender age (for up to 5 suspects)</td>
<td>Numeric variable</td>
</tr>
<tr>
<td>Offender sex (for up to 5 suspects)</td>
<td>M = male</td>
</tr>
<tr>
<td></td>
<td>F = female</td>
</tr>
<tr>
<td>Offender race (for up to 5 suspects)</td>
<td>A = Asian</td>
</tr>
<tr>
<td></td>
<td>B = Black</td>
</tr>
<tr>
<td></td>
<td>H = Hispanic</td>
</tr>
<tr>
<td></td>
<td>O = Other</td>
</tr>
<tr>
<td></td>
<td>U = unknown</td>
</tr>
<tr>
<td></td>
<td>W = White</td>
</tr>
<tr>
<td>Suspect known to victim</td>
<td>0 = no</td>
</tr>
<tr>
<td></td>
<td>1 = yes</td>
</tr>
<tr>
<td>Suspect relationship to victim</td>
<td>1 = romantic partner</td>
</tr>
<tr>
<td></td>
<td>2 = family member</td>
</tr>
<tr>
<td>Field</td>
<td>Value</td>
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<tr>
<td>--------------------------------------------</td>
<td>------------------------</td>
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<tr>
<td>Suspect identified (eventually)</td>
<td>0 = no</td>
</tr>
<tr>
<td></td>
<td>1 = yes</td>
</tr>
<tr>
<td>Suspect identified how</td>
<td>String variable</td>
</tr>
<tr>
<td>Nobody identified offender_2</td>
<td>0 = no</td>
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<td></td>
<td>1 = yes</td>
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<tr>
<td>Victim identified offender_2</td>
<td>0 = no</td>
</tr>
<tr>
<td></td>
<td>1 = yes</td>
</tr>
<tr>
<td>Witness identified offender_2</td>
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</tr>
<tr>
<td></td>
<td>1 = yes</td>
</tr>
<tr>
<td>Police identified offender_2</td>
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</tr>
<tr>
<td></td>
<td>1 = yes</td>
</tr>
<tr>
<td>Other identified offender_2</td>
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<tr>
<td></td>
<td>1 = yes</td>
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<tr>
<td>Suspect arrested (on scene)</td>
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<td></td>
<td>1 = yes</td>
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<td>Suspect arrested description</td>
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<td>Suspect ID info given</td>
<td>0 = no</td>
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<td></td>
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<td>Reported crime (who?)</td>
<td>String variable</td>
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<td>Victim reported</td>
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<tr>
<td>Witness reported</td>
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<td></td>
<td>1 = yes</td>
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<tr>
<td>Citizen reported</td>
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<td>1 = yes</td>
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<tr>
<td>Other reported</td>
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</tr>
<tr>
<td></td>
<td>1 = yes</td>
</tr>
<tr>
<td>Victim cooperated</td>
<td>0 = no</td>
</tr>
<tr>
<td></td>
<td>1 = yes</td>
</tr>
<tr>
<td>Victim cooperated description</td>
<td>String variable</td>
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<tr>
<td>Victim injured</td>
<td>0 = no</td>
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<tr>
<td></td>
<td>1 = yes</td>
</tr>
<tr>
<td>Victim injured minor</td>
<td>0 = no</td>
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<td></td>
<td>1 = yes</td>
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<tr>
<td>Victim injured major</td>
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<td>1 = yes</td>
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<tr>
<td>Victim injured fatal</td>
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<td></td>
<td>1 = yes</td>
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<tr>
<td>Injury type victim description</td>
<td>String variable</td>
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<td>Suspect injured</td>
<td>0 = no</td>
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<td></td>
<td>1 = yes</td>
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<tr>
<td>Injury type suspect</td>
<td>1 = minor injury</td>
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<tr>
<td></td>
<td>2 = major injury</td>
</tr>
<tr>
<td></td>
<td>3 = not injured</td>
</tr>
<tr>
<td>Feature</td>
<td>Description</td>
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<tr>
<td>----------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
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<tr>
<td>Injury type suspect description</td>
<td>4 = other</td>
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<tr>
<td>Medical treatment victim</td>
<td>0 = no, 1 = yes</td>
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<tr>
<td>Medical treatment suspect</td>
<td>0 = no, 1 = yes</td>
</tr>
<tr>
<td>Witnesses</td>
<td>0 = no, 1 = yes</td>
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<tr>
<td>Witness relationship to victim</td>
<td>0 = no, 1 = yes</td>
</tr>
<tr>
<td>Witness relationship to victim description</td>
<td>String variable</td>
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<tr>
<td>Witness relationship to suspect</td>
<td>0 = no, 1 = yes</td>
</tr>
<tr>
<td>Witness relationship to suspect description</td>
<td>String variable</td>
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<tr>
<td>Witness identified self</td>
<td>0 = no, 1 = yes</td>
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<tr>
<td>Witness identified by victim(s)</td>
<td>0 = no, 1 = yes</td>
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<tr>
<td>Witness identified by police</td>
<td>0 = no, 1 = yes</td>
</tr>
<tr>
<td>Witness identification description</td>
<td>String variable</td>
</tr>
<tr>
<td>Witness cooperated</td>
<td>0 = no, 1 = yes</td>
</tr>
<tr>
<td>Witness cooperated description</td>
<td>String variable</td>
</tr>
<tr>
<td>Suspect vehicle (any identifying information)</td>
<td>0 = no, 1 = yes</td>
</tr>
<tr>
<td>Type location of crime</td>
<td>0 = commercial/business, 1 = residence, 2 = street, 3 = gas station, 4 = bar, 5 = park, 6 = car, 7 = other, 8 = hotel, 9 = school/church/bank/govt. building</td>
</tr>
<tr>
<td>Type location of crime description</td>
<td>String variable</td>
</tr>
<tr>
<td>Date case was closed</td>
<td>String variable</td>
</tr>
<tr>
<td>Date closed description</td>
<td>String variable</td>
</tr>
<tr>
<td>Case disposition</td>
<td>0 = unfounded, 1 = open, 40 = closed by exception, 50 = closed by arrest, 70 = pending/assigned, 75 = pending/not assigned</td>
</tr>
<tr>
<td>Disposition of case description</td>
<td>String variable</td>
</tr>
<tr>
<td>Property stolen</td>
<td>0 = no</td>
</tr>
<tr>
<td>Description</td>
<td>Type</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>---------------</td>
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<tr>
<td>Property stolen description</td>
<td>String variable</td>
</tr>
<tr>
<td>Property stolen value</td>
<td>Numeric variable</td>
</tr>
<tr>
<td>Motive retaliation</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Motive drug-related</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Motive taking of property</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Motive killed during crime</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Motive self-defense from offender</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Motive bystander killed inadvertently</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Motive conflict over money</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Motive rivalry over lover</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Motive killed by authority figure</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Motive gang-related</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Motive other conflict</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Motive other description</td>
<td>String variable</td>
</tr>
<tr>
<td>Motive unknown to police</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Homicide initial leads RE motive</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Homicide characteristics</td>
<td>String variable</td>
</tr>
<tr>
<td>Homicide CI come forward with information</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Burglary police surveillance of locations to sell property</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Burglary police use crime pattern analysis</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Burglary police surveillance of known burglars</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Burglary police questioned neighbors</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Burglary initial call a burglary in progress</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Burglary victim has alarm system</td>
<td>0 = no 1 = yes</td>
</tr>
<tr>
<td>Burglary victim has a pet</td>
<td>0 = no 1 = yes</td>
</tr>
</tbody>
</table>
| Burglary how did suspect enter | 1 = broken window  
2 = open window  
3 = unlocked front door  
4 = locked front door  
5 = unlocked secondary entrance  
6 = locked secondary entrance  
7 = other |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Burglary property (description)</td>
<td>String variable</td>
</tr>
</tbody>
</table>
| Burglary property quantified | 0 = vehicle  
1 = apartment/duplex  
2 = single family home  
3 = warehouse/commercial  
yard/construction site  
4 = store/business  
5 = garage/shed/residential yard  
6 = parking lot/parking garage  
7 = hotel room  
8 = school/church  
9 = storage unit  
10 = residential unspecified |
| Burglary property surroundings (description) | String variable |
| Burglary property surroundings quantified | 0 = residential  
1 = commercial  
2 = industrial  
3 = alley  
4 = park |
| Burglary crime part of a serial burglary pattern | 0 = no  
1 = yes |
| Number of police employees (responded to scene) | Numeric variable; 77 = crime reported by phone or at precinct |
| Patrol supervisor present (initial response) | 0 = no  
1 = yes |
| Initial canvas (response) | 0 = no  
1 = yes |
| Suspect in custody | 0 = no  
1 = yes |
| Number of investigators (responded to scene) | Numeric variable |
| Crime scene investigators processed scene | 0 = no  
1 = yes |
| Other than CSI processed the scene | 1 = investigator  
2 = police officer  
3 = other  
4 = investigator and police officer |
| Crime scene other description | String variable |
| Physical evidence collected (initial response) | 0 = no  
1 = yes |
| Physical evidence type (separate responses for each kind) | 0 = no  
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 = yes</td>
</tr>
<tr>
<td>Physical evidence other description</td>
<td>String variable</td>
</tr>
</tbody>
</table>
| Victim statement(s) obtained (initial response)           | 0 = no  
|                                                          | 1 = yes|
| Witness statement(s) obtained (initial response)         | 0 = no  
|                                                          | 1 = yes|
| LPR used (initial response)                               | 0 = no  
|                                                          | 1 = yes|
| Investigative supervisor present (initial response)       | 0 = no  
|                                                          | 1 = yes|
| Video footage available and retrieved (any time)          | 0 = no  
|                                                          | 1 = yes|
| Crime scene log collected (initial response)              | 0 = no  
|                                                          | 1 = yes |
|                                                          | 2 = CAD/RMS collects |
| Follow-up investigation conducted                          | 0 = no  
|                                                          | 1 = yes |
| Number investigators assigned (follow-up)                 | Numeric variable |
| Investigators follow up with victims                      | 0 = no  
|                                                          | 1 = yes|
| Type of follow up if so                                   | 1 = telephone/email/mail |
|                                                          | 2 = in-person visit |
|                                                          | 3 = both 1 and 2 |
| Investigators follow up with witnesses                    | 0 = no  
|                                                          | 1 = yes|
| Type of follow up if so                                   | 1 = telephone/email/mail |
|                                                          | 2 = in-person visit |
|                                                          | 3 = both 1 and 2 |
| Additional evidence collected (later in investigation)    | 0 = no  
|                                                          | 1 = yes|
| Additional evidence description                           | String variable |
| Specialized unit assisted (follow-up)                     | 0 = no  
|                                                          | 1 = yes|
| If so, which unit (separate responses for each type)      | 0 = no  
|                                                          | 1 = yes|
| Special unit other description                            | String variable |
| Social media used (follow-up)                             | 0 = no  
|                                                          | 1 = yes|
| Cell phone investigated (follow-up)                       | 0 = no  
|                                                          | 1 = yes|
| Search warrant executed (follow-up)                       | 0 = no  
|                                                          | 1 = yes|
| Community group/leader contacted (follow-up)              | 0 = no  
|                                                          | 1 = yes|
| Investigator contacted patrol (follow-up)                 | 0 = no  
<p>|                                                          | 1 = yes|</p>
<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
</table>
| Suspect found if not identified at scene (any time) | 0 = no  
1 = yes                                    |
| Suspected confessed (any-time)                | 0 = no  
1 = yes                                    |
| Extra case information                        | String variable                                  |
| Duplicates (by ID)                            | 0 = unique observation                           
1 = duplicate exists                          |