CNA

Final Report

MINNEAPOLIS POLICE DEPARTMENT AND EMERGENCY COMMUNICATIONS CENTER STAFFING AND OPERATIONS ASSESSMENT AND REVIEW OF PROBLEM NATURE CODES

Zoë Thorkildsen, Bryce Peterson, Keri Richardson, Monique Jenkins, Allie Land, Jocelyn Cox, Bill Komiss, and Ed Flynn

This document contains the best opinion of CNA at the time of issue.

CNA Document Number: IRM-2021-U-031461

January 2022

Acknowledgments

This page intentionally left blank.

Contents

Introduction

The City of Minneapolis requested a study to evaluate the current staffing and operational efficiency of the Minneapolis Police Department (MPD) and recommend improvements. In addition, the City recognized the need for a review of the Minneapolis Emergency Communications Center's (MECC's) use of problem nature codes to characterize incidents. CNA has executed both studies, and the results are presented in this report. This important effort will inform the City regarding whether the MPD's personnel resources effectively align with current and anticipated demand for public safety services and with emerging and best practices for public safety delivery. It will also assess fidelity of use of problem nature codes in the MECC, make recommendations to improve the use of these codes, and provide an understanding of the relationship between the codes and operational outcomes.

Goals and objectives

This analysis will achieve the following:

- Recommend staffing resources that can effectively and efficiently meet the demand for service.
- Review internal business processes and identify gaps and areas for improvement.
- Inform needs for resource allocations that are aligned with City needs and demand for public safety services.
- Position the MPD for future success by providing the tools to further adapt staffing and processes to future changes in demand for service.

Areas of focus and approach

Our report is organized into four major focus areas: staffing analysis, operations analysis, and problem nature code analysis, and business processes analysis.

- **Staffing analysis.** Using a workload-based approach, CNA produced estimates of the staffing required to support the MPD's current patrol workloads and evaluated the use of different shift lengths. In addition, we analyzed breakouts by specific call response types to estimate the effects of changing response policies (e.g., implementing alternate response models for mental health calls and property crimes) on staffing needs.
- **Operations analysis.** Using data collected from personnel interviews as well as review of the literature and peer agency practices, CNA assessed MPD operations and policies, including the use of one- versus two-person patrols, relative levels of civilianization, alternative response models (which also have implications for the staffing analysis), and information technology enterprise system use.

- **Problem nature code analysis**. Using calls-for-service data, including 9-1-1 call data, CNA reviewed the use of problem nature codes in the MECC using an exploratory descriptive analytical approach.

- **Business process analysis**. Using information from personnel interviews as well as review of operational documents, CNA assessed business processes in the MECC, Patrol Bureau, specialty units, and the investigative functions at MPD. We used a process mapping and pain points identification approach to map how business processes currently function and areas to improve the effectiveness and efficiency of these processes.

Across each of these focus areas, CNA relied on both quantitative and qualitative data from the MPD and MECC. These data sources included calls-for-service and 9-1-1 call data from 2016 through 2020, staffing data, documentation of MPD and MECC policies and procedures (including training materials), and information gathered through interviews with MPD and MECC personnel. Data sources and analytical techniques are described in more detail in each of the sections below.

For most of the quantitative analyses in the report, we used data from 2016 through 2020. As a result of the COVID-19 pandemic as well as changes in policing practice and policy after the death of George Floyd, policing response in 2020 differed from preceding years in substantive ways. Specifically, in Minneapolis as well as other cities across the country, nearly all measures of police activity were lower in 2020. However, we included 2020 in our analyses for the following reasons:

- Despite being unusual, 2020 represents the most recent year of data available at the time we performed analysis, and timely data are almost always preferable to older data.

- For the majority of our analyses, we relied on a five-year period of data, and thus the inclusion of 2020 did not drive the results.

- Trends seen in 2020 continued into 2021 for agencies nationwide; it is unclear whether or when police activity levels will return to pre-2020 levels, so to discount 2020 data as irrelevant would be improper.

Overview of the report

This report contains six sections, including this introductory section. Following this section are sections presenting analysis, findings, and recommendations related to the staffing analysis, operations analysis, problem nature code analysis, and business processes analysis. The report closes with a brief conclusion section.

Section 1: Staffing Analysis

Approach

CNA conducted a staffing analysis for the MPD to systematically determine patrol staffing needs based on actual workforce demand. Although there are several common approaches to staffing analyses, workload-based analysis provides the most accurate and objective way to determine current and future staffing needs (Wilson & Weiss, 2012). In line with the approach outlined by Wilson and Weiss (2012), our analysis involved the following six tasks.

1. **Analyze the distribution of calls for service**. Calls for service can differ by the hour of the day, day of the week, and month of the year. The MPD's peak call times have implications for resource allocation decisions, such as the use of overtime and scheduling training activities. Findings from this analysis will help the City understand when the highest levels of patrol staffing are needed.

2. **Analyze the nature of calls for service**. Understanding the nature of the MPD's calls for service, including the seriousness of calls based on their problem nature codes and priority levels, provides important information on the types of police work being conducted in the agency. The nature of calls for service also varies across precincts, requiring the MPD to staff areas accordingly.

3. **Review the time used for calls for service**. This task involves determining how long calls for service typically take from initial response to final paperwork, which is key to understanding how much time officers spend responding to calls for service during their shifts.

4. **Calculate the shift-relief factor**. The shift-relief factor is the relationship between the maximum number of patrol days officers are available to work and the number that they actually work. The shift-relief factor is a critical piece of data in estimating the number of officers that should be assigned to a patrol shift to ensure that the bureau is optimally staffed. This task involves calculating the shift-relief factor by dividing the total number of hours necessary to be fully staffed in a shift by the total number of off hours (i.e., hours outside of shift assignments) to which an officer is entitled.

5. **Identify performance objectives**. This task involves identifying commonly used performance objectives regarding the fraction of an officer's shift that should be devoted to calls for service and the fraction that should be devoted to other activities. This analysis provides critical information to the City about how varying performance objectives affect overall patrol staffing projections.

6. **Estimate staffing levels**. Drawing on results from the previous tasks, this task involves estimating the number and distribution of officers required to answer calls for service, accounting for the proposed performance objectives as well as the fact that data are unlikely

to capture calls that require multiple officer dispatches. We also estimated staffing levels for several subgroups of calls that could potentially be serviced by an alternative nonpolice response.

To execute these tasks, CNA primarily analyzed calls-for-service data provided by the MECC, the City's 9-1-1 call dispatch center. These data included all calls initiated by Minneapolis community members for police services between January 1, 2016, and December 31, 2020 (five complete years of data). We chose to use five years of data for most of the staffing analyses to provide a better overall representation of calls for service and police activity in Minneapolis. However, note that the most recent year of data (2020) is likely different from the overall reporting period because of the COVID-19 pandemic and the social unrest that occurred in Minneapolis after the killing of George Floyd. Therefore, this section also notes when the results of the analyses using only 2020 data differ from those using the 2016–2020 data.

Calls for service are received by the MECC and dispatched to responders. The calls-for-service data also included "onsites," which are officer-initiated activities such as traffic stops, foot beats, and business checks. These are called into dispatch by the officer and added into the department's computer-aided dispatch (CAD) system. In total, the 2016–2020 data included 1,794,408 calls for service. Of these, 1,558,145 calls involved an MPD officer being dispatched to the scene. Some calls involved crimes or complaints outside of the MPD's jurisdictional area and were thus transferred to the appropriate emergency dispatch center. Other calls could be resolved directly by the dispatcher and did not require an officer to be dispatched.

The data also included detailed information about each call, such as the location where the call originated; the date and time the call was received and completed; the incident type, priority level, and disposition of the call; and other administrative indicators. By providing a detailed overview of the demand for police service in the city, these data allow CNA to better estimate the MPD's workload and staffing needs. We cleaned the calls for service data and analyzed them using descriptive statistics.

In addition to calls for service, CNA collected and analyzed timesheet data from the department to calculate the shift-relief factor (task four). These data covered all the planned and actual shift deployments for MPD personnel for the most recent complete year of data available (i.e., January 1 to December 31, 2020).[1] Information in this dataset included officers' rank, assignments, staffing activity, and shift start and end times. Findings from our analyses are organized by the six tasks listed above and presented in the following section.

---

[1] This is the only analysis we restricted to 2020 data. To ensure the robustness of our results, we conducted the shift-relief factor analysis using 2019 data as well, but we found that the results did not differ substantively from those seen in 2020. Thus, we opted to use the most recent year of data available. See further explanation on page 16 for more information.

Findings

Task one: analyze the distribution of calls for service

Figure 1 shows the aggregate of the MPD's calls for service between 2016 and 2020 across its five precincts. [2] The MPD received more than 1.5 million total calls for service over this period, which means that the MPD dispatched officers to roughly 853 calls for service on an average day over this five-year period. Figure 1 also illustrates the variation in calls for service among the MPD's precincts. The 3rd and 4th precincts had the most demand for police services, whereas the 2nd precinct had the lowest volume of calls for service.

Figure 1. Calls for service by MPD precinct (2016–2020)
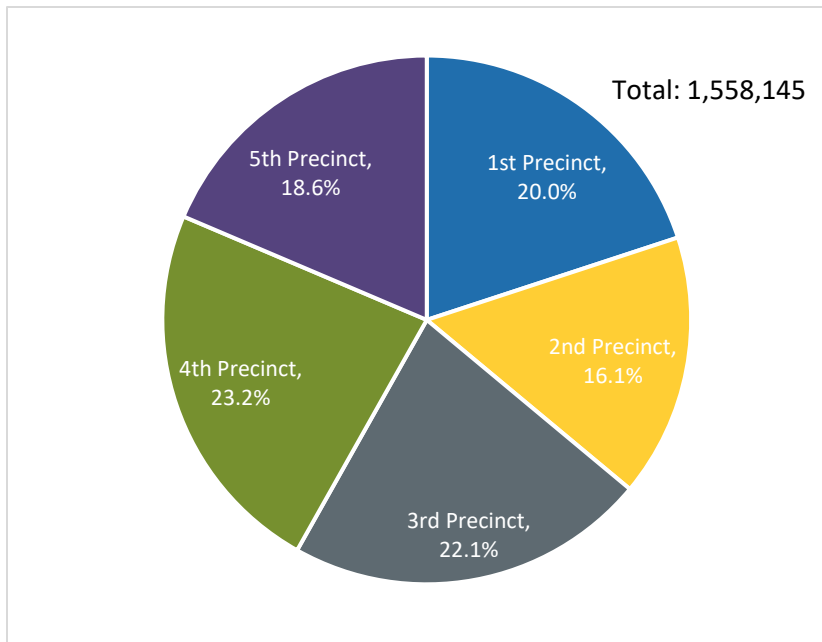
Figure 2 shows the MPD's aggregate calls for service by time of the day over the same reporting period. The peak hours of demand for MPD services appear to be between 11 a.m. and midnight, with the most active hour of the day between 9 and 10 p.m. Calls for service are generally less frequent in the early morning hours, particularly between 3 and 7 a.m. These findings are consistent with those observed in other police agencies across the country and consistent across the five years of MECC data.

---

[2] MPD responded to 34,810 calls for service that were outside city boundaries over this period. Thus, the aggregate of calls in figures in this section does not add up to 1,558,145.

Figure 2. Calls for service by hour of the day (2016–2020)

Hour	Calls
12am	63,835
1am	62,308
2am	55,884
3am	36,674
4am	24,467
5am	18,661
6am	18,471
7am	35,871
8am	44,200
9am	54,187
10am	64,341
11am	79,674
12pm	79,324
1pm	80,192
2pm	79,660
3pm	78,724
4pm	75,907
5pm	86,566
6pm	85,477
7pm	84,440
8pm	79,766
9pm	93,219
10pm	90,919
11pm	85,378
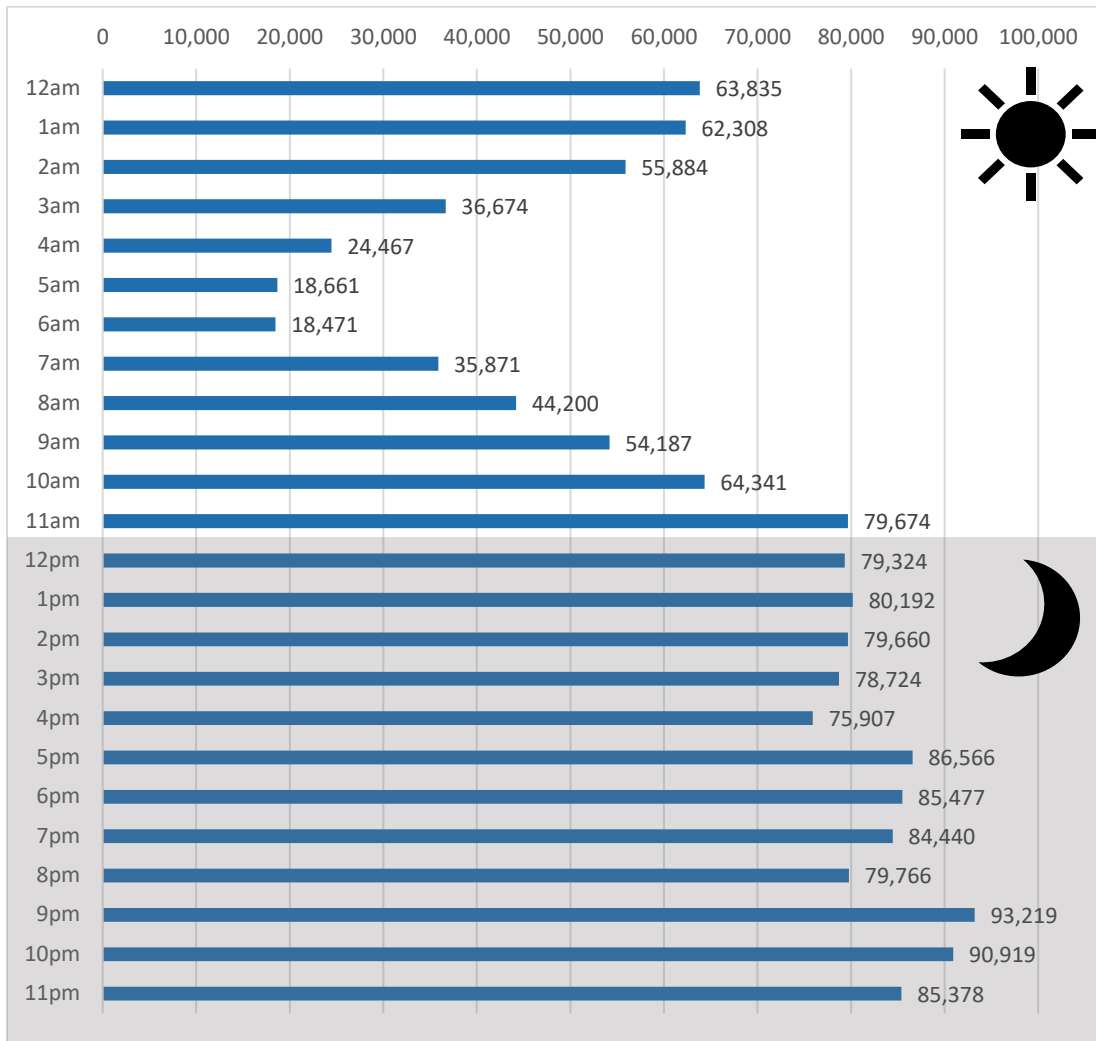
The distribution of calls for service by day of the week is presented in Figure 3. Across the five years of data analyzed for this report, the MPD experienced the most calls for service on Fridays and the fewest on Sundays. However, Tuesday through Friday, on average, experienced higher amounts of calls for service (totals between 234,997 and 238,118) than Saturday through Monday (totals between 187,915 and 219,398). These trends are also consistent within each of the five years of available data.

Figure 3. Calls for service by day of the week (2016–2020)
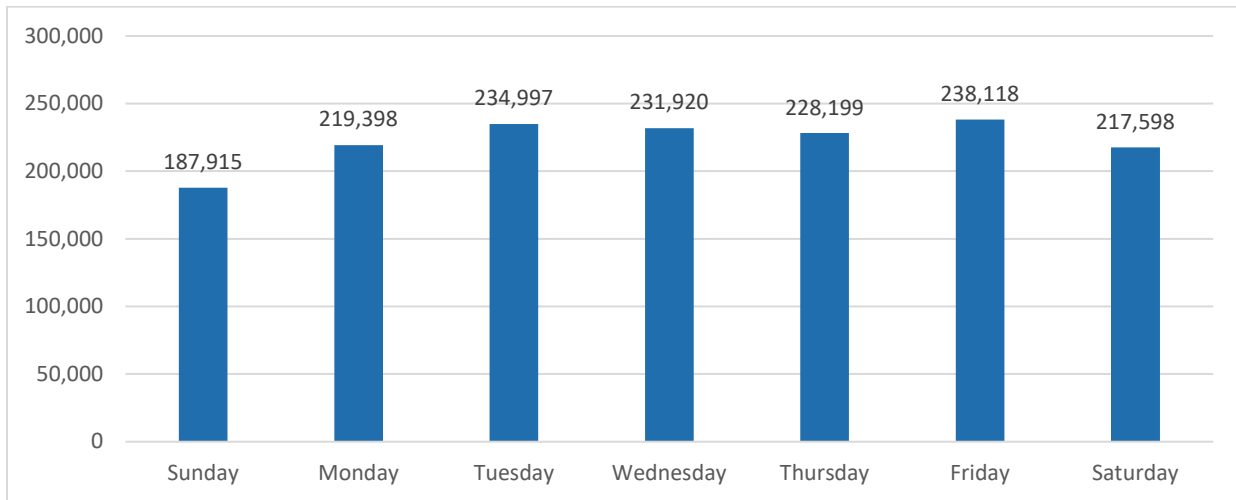
Next, CNA examined the number of calls for service by month (Figure 4). Analyses of crime and police activity data consistently find that demand for law enforcement services increases in summer months when the weather is warmer. These trends are reflected in the MPD's calls-for-service data: peak call levels occurred between May and August, with the lowest levels occurring in November through February. Of note, this trend is consistent across all the years examined for this analysis except for 2020. In 2020, the number of calls for service was proportionally lower during the summer months relative to the previous four years of data. In fact, every month in the second half of the year (June through December) experienced fewer calls for service than any month in the first half of the year (January through May). This trend corresponds to the timeline of George Floyd's killing and the following social unrest in the city, which likely affected community members' calls for police services. Fewer officers were also working during this period because of departures and because many were working in specialized units to respond to unrest.

Figure 4. Calls for service by month of the year (2016–2020)
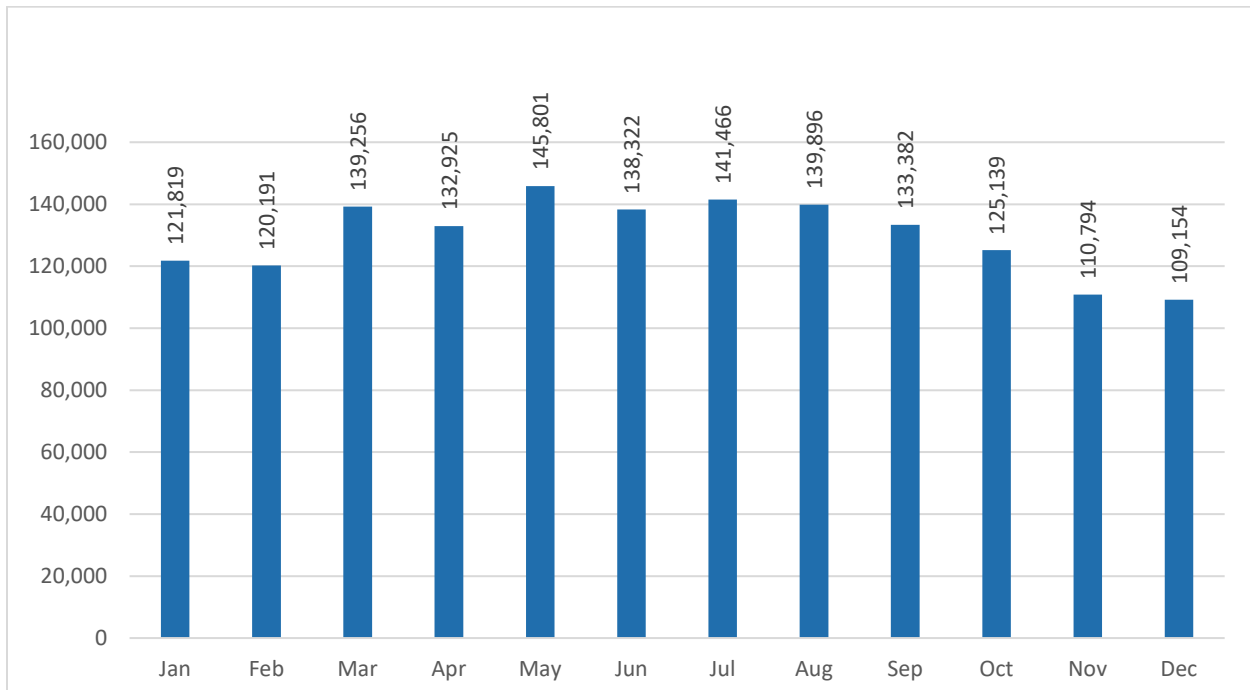
These analyses indicate that calls are not evenly distributed across geographic areas or time periods. Thus, to best meet the service demands of the City, the MPD's staffing allocations and shift assignments should reflect these distributions. For example, based on this five-year data reporting period, the MPD should have proportionally more officers assigned to the 3rd and 4th precincts, on Tuesdays through Fridays, and on shifts that cover the late morning through late evening hours (11 a.m. to midnight).

Task two: analyze the nature of calls for service

The next task involved analyzing the nature of the MPD's calls for service. This task is critical in determining the nature of calls for service within a jurisdiction as well as the type and scope of responses provided by the police department. Results from this task, particularly those regarding the problem nature codes, will also inform the final task (the estimation of staffing levels).

Problem nature codes

There were 158 distinct categories assigned as the final problem nature code (PNC) in the calls-for-service data. The top 20 categories, accounting for more than 70 percent of all calls for service, are listed in Figure 5. The most common PNC was directed patrol activities, which involves assigning officers to patrol areas within the city where crime is expected to occur based on internal analysis of crime reports and other intelligence gathered by the department. The other most common PNCs were business checks, traffic enforcement, responding to disturbances, checking on suspicious persons or vehicles, and welfare checks.

The most common PNC categories were similar in the 2020-only data, but the ordering was different. Most notably, directed patrol activities was the 20th most common PNC in 2020, whereas it was the

most common across all five years of data. This finding is consistent with findings from CNA's interviews with MPD personnel, who indicated that the number of directed patrol and other officer-initiated activities has dropped since the summer of 2020.

Figure 5. Calls for service by final problem nature code (2016–2020)
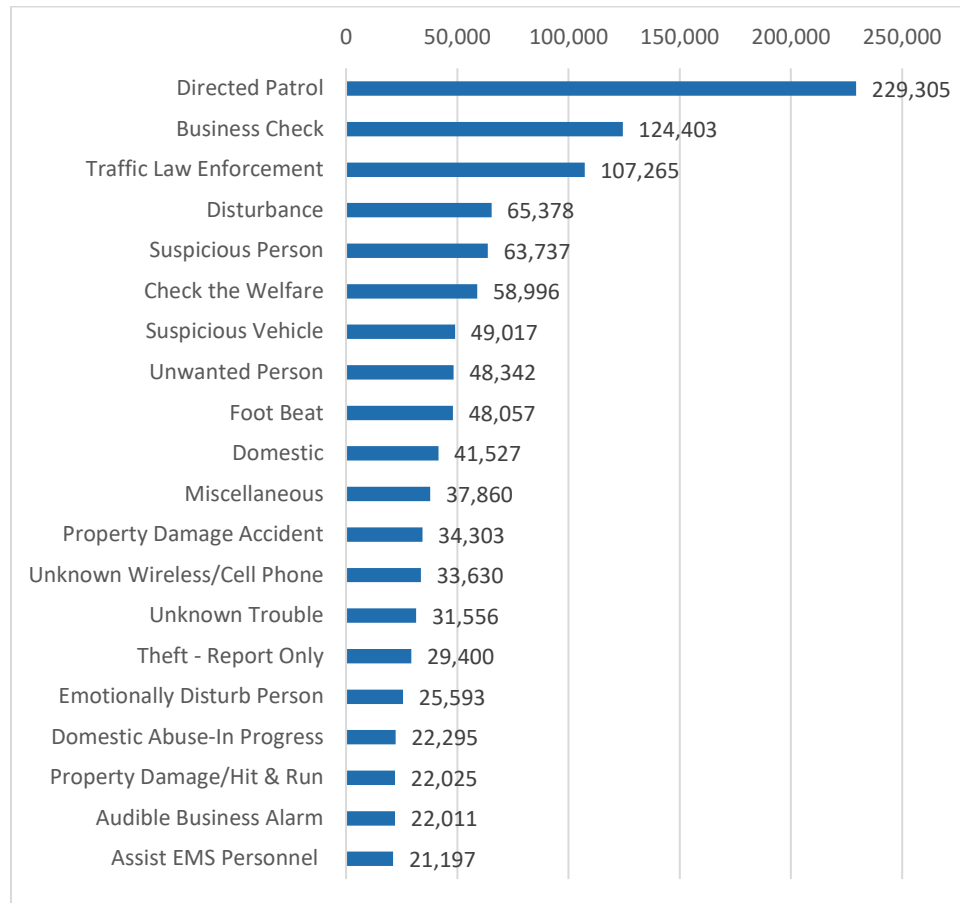
In addition to examining the most common PNCs, CNA examined the frequency of four PNC subgroups. These subgroups are *exclusive* in the sense that no PNC falls in more than one of these groups but they are not fully *inclusive* of all PNCs, some of which were not included in the subgroup analyses. A complete list of PNCs within in each subgroup is included in Appendix C.

1. **Police officer statute PNCs**. This subgroup includes all calls for service with a PNC that requires a sworn officer response by state law. This subgroup includes many of the PNCs that involve life-threatening situations (e.g., assaults, shootings, and domestic abuse) as well as calls that generally require a police response (e.g., directed patrol activities, business checks, triggered alarms, suspicious persons or vehicles, and crimes in progress).

2. **Behavioral health PNCs**. This subgroup includes incidents involving a person who appears to lack essential reasoning faculties or who exhibits bizarre behavior as well as requests from friends or relatives to check on old, sick, or vulnerable persons. As discussed in more detail in Section 2, these types of calls could be handled through alternative response models that do not necessarily involve police response.

3. **Theft-reporting PNCs**. This subgroup includes calls in which a person is reporting a property-related crime after it has already been committed (i.e., not a crime in progress). This subgroup includes reporting on a theft, forgery, burglary, or incident resulting in property damage. These calls also represent a category of responses that could be handled by means other than sworn officer response.

4. **Other alternative response PNCs**. This subgroup includes all calls not included in the previous two subgroups to which an alternative agency or group could reasonably respond. This subgroup includes complaints about unoccupied parked vehicles, reports of road hazards, requests to check abandoned buildings or construction sites, animal control incidents (e.g., bites, off-leash or aggressive animals, animal fights), and general disturbances (e.g., loud noises, consumption of alcohol in public, public urination, idling vehicles).

These subgroups allow for a better understanding of the types of services that require a police presence versus those that could potentially be handled by an alternative entity (e.g., a community group or non–law enforcement City or county agency). For some of these subgroups, the City is already piloting nonpolice responses. In late 2021, for example, the City began its partnership with Canopy Mental Health and Consulting to deploy behavioral health response teams. These teams are dispatched to some of the behavioral health PNCs in lieu of MPD officers.

Table 1 presents the aggregate calls for service for these PNC subgroups across the five-year data collection period. Calls that statutorily required a police officer response accounted for 1,126,515 calls, or 72.3 percent of all calls for service during this period. Each of the other three subgroups accounted for between 5.4 and 6.6 percent of all calls for service. In other words, approximately 17.6 percent of all calls for service between 2016 and 2020 that involved MPD officers being dispatched could potentially have been handled through a nonpolice response.

Table 1. Summary of final problem nature code subgroups (2016–2020)

	Total	Percentage of All Calls[3]
Police officer statute PNCs	1,126,515	72.3%
Behavioral health PNCs	84,589	5.4%
Theft-reporting PNCs	87,867	5.6%
Other alternative response PNCs	102,658	6.6%

Response types

CNA also examined the distribution of calls for service by the type of response from MPD officers. The MPD employs both one-officer squad cars and two-officer squad cars in its patrol shifts. The MECC priority policy states that the type of response to calls for service is determined by the resources needed to respond to the initial incident. Thus, the CAD software makes recommendations based on each call's initial PNC. For example, based on an analysis of the 2016–2020 data, more than 98 percent of calls assigned an initial PNC of "assault in progress" received a two-officer squad response,

---

[3] Note that the total does not sum to 100 percent, as not all PNCs are included in the subgroup analyses.

whereas more than 90 percent of calls assigned a PNC of "assault report only" (i.e., a call in which a community member wanted to report an assault after it had taken place) received a one-officer squad response. Likewise, more than 98 percent of disturbances, welfare checks, and suspicious person calls received two-officer responses, whereas nearly all parking problem, property damage, and theft-reporting calls received a one-officer response. In addition to the one-officer or two-officer response assigned by the MECC when a community member initiates a call for service, the MECC categorizes officer-initiated calls (e.g., business checks, community engagement activities, directed patrol, traffic law enforcement) as "Miscellaneous/Administrative."

As shown in Figure 6, the most common type of response was a two-officer squad car (nearly 50 percent of all calls). The next most common response category was Miscellaneous/Administrative (roughly 32 percent of all calls), followed by one-officer responses (fewer than 19 percent of all calls).

Figure 6. Calls for service by response type (2016–2020)
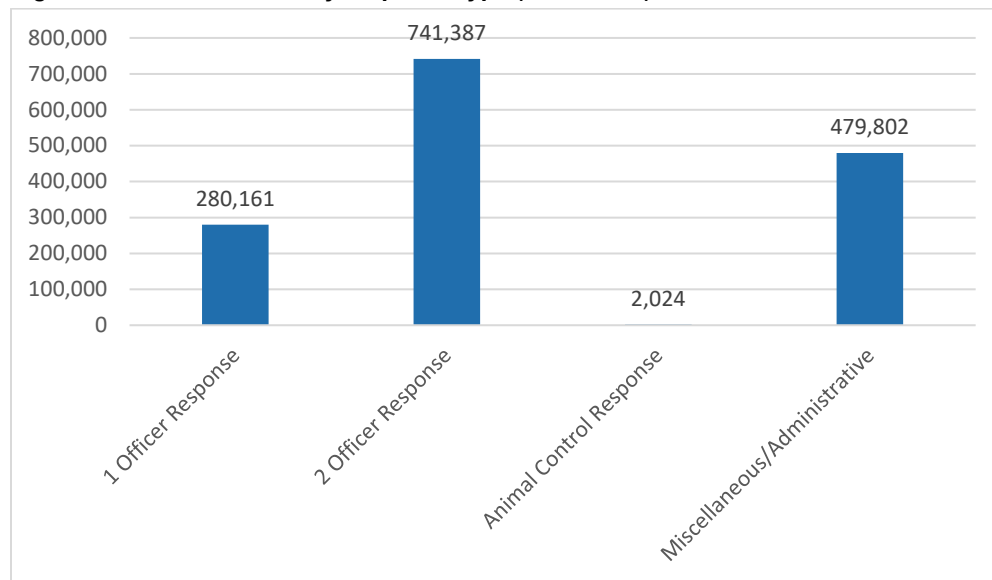
Priority levels

Next, the assessment team examined how calls for service were distributed among the MPD's priority categories. According to the MECC priority policy, call prioritization is meant to (1) establish common working definitions about the urgency of any situation to facilitate service delivery, (2) organize calls in a dispatcher's pending queue, and (3) provide a measurable method to assess the delivery of public safety services. Calls are assigned an initial priority, which affects the scope and speed of the police response. However, the priority may be raised or lowered as the situation evolves and after officers arrive on scene to assess the situation. The MECC uses five priorities:

- Priority 0 is assigned to calls involving a known crisis that threatens the life of an individual. This priority is preassigned to only a few types of calls. It is the highest possible priority and is meant to elicit the fastest possible response times.

- Priority 1 is assigned to calls involving situations in which risk to personal safety or health or risk of loss or damage to property exists and conditions at the scene of the call are

unstable. Speedy responses are important to protect personal safety or limit property damage.

- Priority 2 is assigned to calls involving situations in which no immediate threat of harm exists. Officers are supposed to be dispatched to these calls within 10 minutes, when available.
- Priority 3 is assigned to calls involving stable conditions that may be handled at the convenience of available units as competing demands permit.
- Priority 9 is assigned to "onsite" calls initiated directly by an officer in the field.

Figure 7 shows the distribution of calls for service by their initial priority level in the five-year period between 2016 and 2020. Very few calls were assigned priority 0 over this period, compared with 29 percent of calls being assigned priority 1, 28 percent priority 2, and just under 10 percent priority 3. This finding suggests that calls from residents are about equally likely to be serious in nature as they are to be less volatile. Almost exactly one-third of calls were assigned priority 9, which includes policing activities that are generally simple or low risk (e.g., business checks and foot beats) but also those that could have moderate or serious risk depending on the circumstances (e.g., traffic stops, directed patrols, driving while intoxicated home visits, and predatory offender checks).

Figure 7. Calls for service by initial priority level (2016–2020)
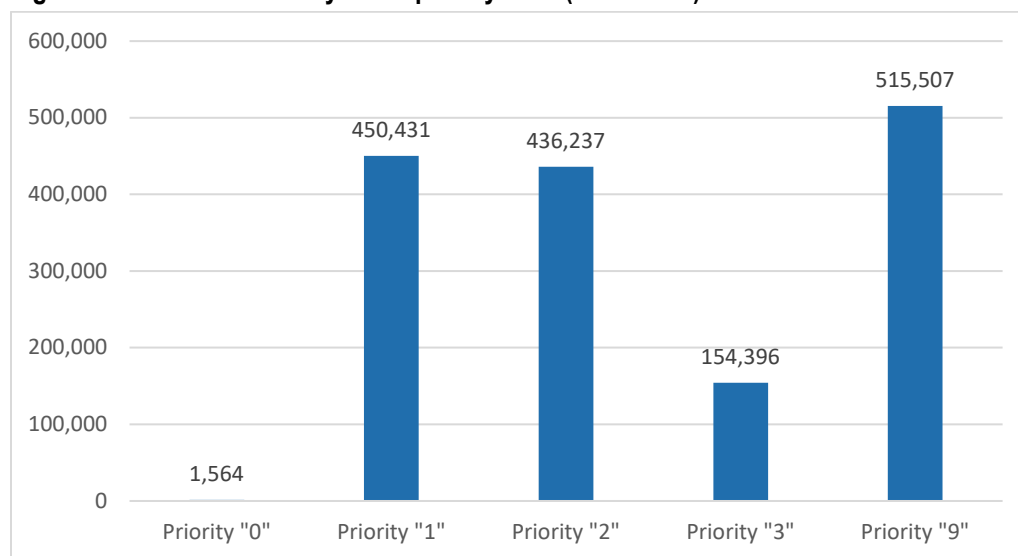
Although the data in Figure 7 are based on the initial priority of calls, it is worth noting that an analysis of final priority levels indicates that many of the calls initially assigned priority 1 were reassigned to lower priority levels once officers arrived on scene and assessed the situation. In fact, although 450,431 calls were initially given a priority 1, only 342,882 calls had a final priority of 1. Subsequently, the final priority categories 2, 3, and 9 increased by 54,007 calls, 5,764 calls, and 47,515 calls, respectively.

Of further note, the initial priority levels of calls for service in 2020 differ from those in the previous years of data. Specifically, MPD officers engaged in much less self-initiated activity in 2020, resulting in proportionally fewer priority 9 calls (14.4 percent) than in previous years. As a result, a higher

percentage of 2020 calls were priority 1 (37.8 percent), 2 (34 percent), or 3 (13.7 percent) than in the full five-year data.

Figure 8 shows the distribution of priority levels across MPD precincts. There are notable differences across precincts. For instance, the 3rd and 4th precincts experienced more high-priority calls during this period (i.e., many more priority 1 and 2 calls) than other precincts. Of note, although the 3rd and 4th precincts also had the highest volume of total calls for service (Figure 1 above), they also experienced a larger *percentage* of high-priority calls relative to the other districts. For instance, more than 34 percent of the calls in both precincts were priority 1, whereas only 19.7 to 31.1 percent of the calls in other precincts received that level of priority.

Figure 8. Calls for service, by initial priority level and precinct (2016–2020)
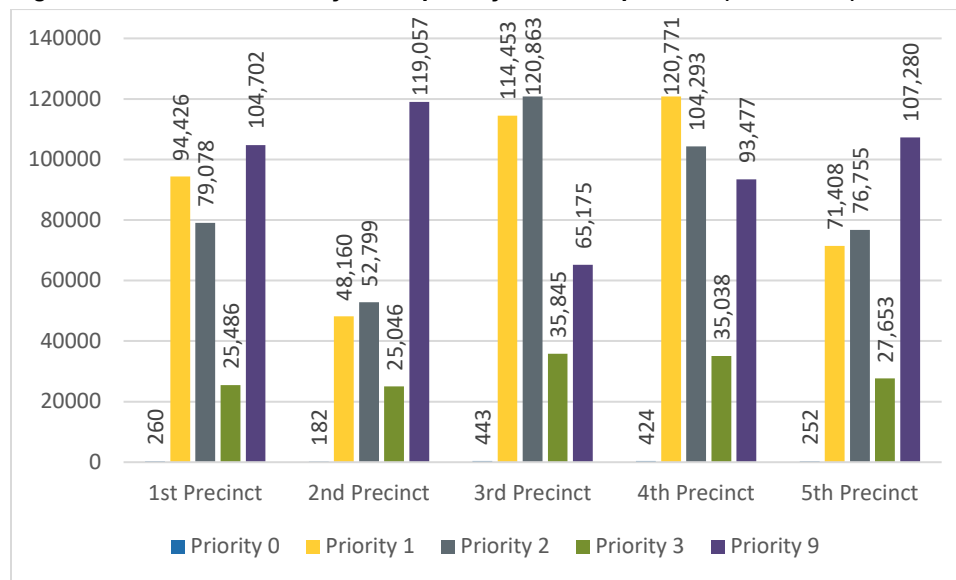
Task three: review the time used for calls for service

Next, CNA estimated the average length of time MPD officers take responding to and handling calls for service, calculated as the total number of minutes between the time the first unit was assigned to respond to a call and the time the call was closed. This calculation provides a better understanding of how much time officers likely spend on calls for service during their shift. Figure 9 provides the average time used for calls for service by initial priority.

Figure 9. Average time per call in minutes by initial priority (2016–2020)
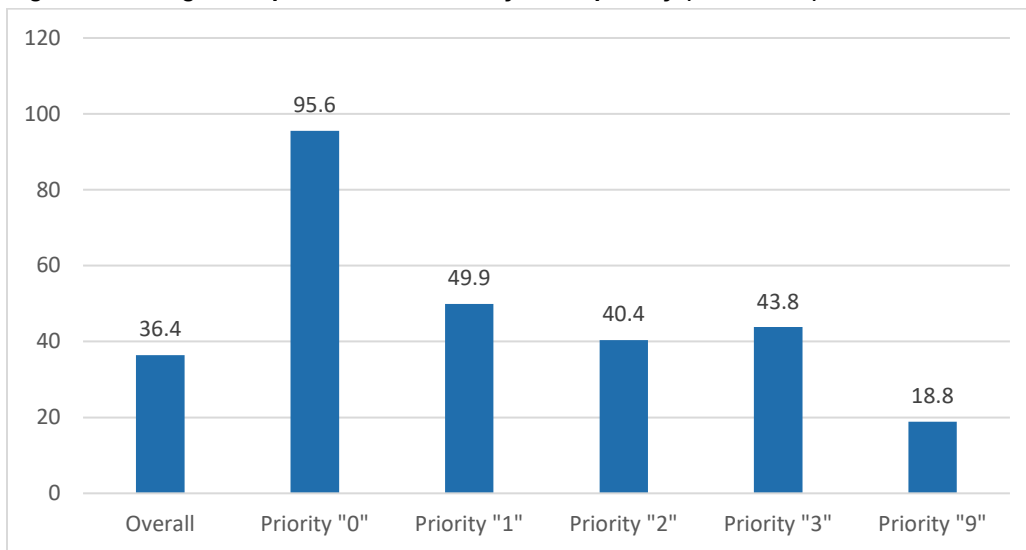
Overall, officers spent an average of 36 minutes on each call between 2016 and 2020.[4] Priority 0 calls took the most time, more than 95 minutes on average to complete. This finding makes sense because these are the highest priority calls and the most likely to require substantial resources and engagement on scene. Priority 1, 2, and 3 calls required much less time to complete. Priority 9 calls required fewer than 20 minutes to complete, on average. This time is lower than calls of other priority levels, perhaps partially because the dispatcher enters the call into the system at the same time as the officer arrives on scene.

Figure 10 breaks out the average times spent on calls by MPD precinct. These estimates exhibit similar trends across precinct. The overall average time to complete calls for service was similar across precincts, ranging from 33.7 minutes (2nd precinct) to 38.7 minutes (4th precinct). The 2nd and 5th precincts took longer on average to complete priority 0 calls than the other precincts, but, as indicated in Figure 8, these calls make up a very small percentage of all calls for service.

---

[4] The average presented here is the mean, which has a standard deviation of 58.6 minutes. Thus, some calls took substantially longer to address than other calls, which is typical in police response data. Half the calls took officers fewer than 17 minutes to complete (the median is 16.9 minutes), and 75 percent of calls required fewer than 40 minutes to complete. CNA chose to use the mean for this analysis because it is the only measure that accounts for this distribution. If we had used the median, the staffing estimates presented below would underestimate the levels of staffing required to handle calls for service in the City.

Figure 10. Average time per call in minutes by initial priority and precinct (2016–2020)
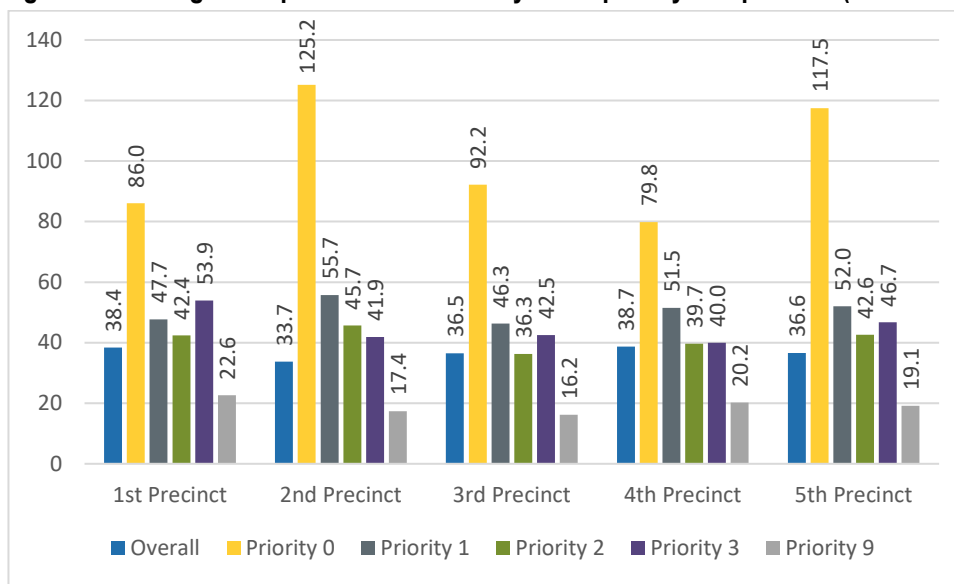
PNC subgroups

Using the categories described in task two above, CNA also examined the time spent on calls for the four PNC subgroups (police officer statute PNCs, behavioral health PNCs, theft-reporting PNCs, and other alternative response PNCs). Figure 11 provides the average time spent on calls across these subgroups. On average, MPD officers spend less time on calls that require a police response by state law than on those that could be handled by nonpolice entities, except for calls that fall into the other alternative response PNC subgroup. In particular, calls that involve taking reports for theft and other property crimes take nearly twice as long for officers to complete than those they are statutorily required to handle (69.2 minutes versus 33.9 minutes).[5]

---

[5] We further explore the time spent on calls, only considering the primary responding vehicle, in Section 3.

Figure 11. Average time per call in minutes by PNC subgroup (2016–2020)
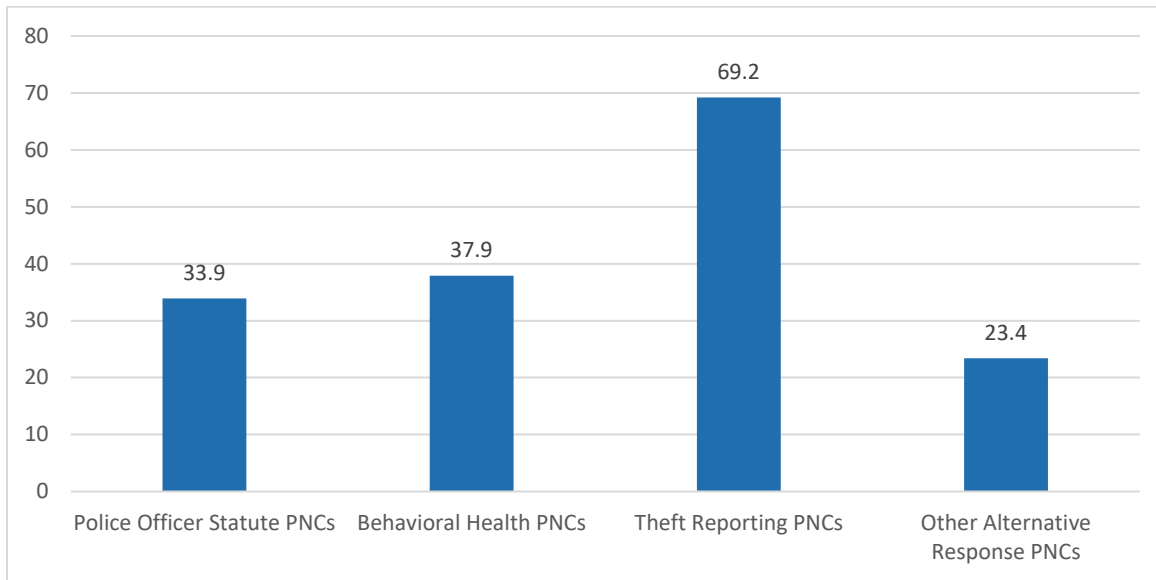
Task four: calculate the shift-relief factor

CNA's next task was to calculate the shift-relief factor. The shift-relief factor is an estimate of the number of officers that must be assigned to each shift to ensure it is adequately covered. It estimates how much time officers will actually spend on shifts by accounting for the number of hours officers take in paid or unpaid time away from patrol. That is, when a person who is regularly assigned to a shift is unavailable because they are occupied elsewhere (on leave, attending training, injured, etc.), additional staff must be allocated to that shift to ensure enough officers are available to respond to calls for service. The shift-relief factor accounts for these factors to produce an updated staffing estimate.

As noted above, CNA used MPD timesheet data from calendar year 2020 for this calculation. However, given that much of 2020 occurred after the start of the COVID-19 pandemic, which could have affected the amount of time officers took off for sick leave or vacation, we replicated the analysis with 2019 data. Overall, the results from the 2019 and 2020 analysis were very similar;[6] thus, this section focuses on results from the 2020 data.

The first step in calculating the shift-relief factor is to estimate the amount of benefit time off used by MPD line officers. Benefit time off includes administrative leave, sick leave, family leave, parental leave, vacation, holidays, compensatory time, training, military leave, and other paid or unpaid activities that take officers away from their regular patrol duties. In keeping with standard staffing analysis practices, benefit time off does not include time spent working specialty assignments, since those hours could be increased or decreased through a variety of policy and procedural levers. Within

---

[6] As shown later in this section, the shift-relief factor estimates for 2020 are 2.39 for the 4-day, 10-hour shift assignment; 1.91 for the 5-day, 8-hour shift assignment; and 3.30 for the 3-day, 12-hour shift assignment. The 2019 shift-relief factor estimates for the same shift assignments are 2.34, 1.88, and 3.24, respectively.

the MPD, 633 personnel with the rank of "police officer" were reported in the MPD timesheet data at any point in 2020. The benefit time for these individuals is shown in Table 2. On average, officers spent a little over 566 hours during 2020 engaging in one of these benefit time activities.

Table 2. Summary of benefit time for MPD police officers (2020)

Benefit Time Off	Hours	Average per Officer
Vacation	75,264.8	118.9
Holiday	70,667.0	111.6
Family and personal leave	56,915.0	89.9
Sick/medical leave	49,561.5	78.3
Training	34,836.8	55.0
Administrative leave	21,157.0	33.4
Military	17,510.0	27.7
Comp time	15,074.6	23.8
Special duty	10,375.3	16.4
Injury	7,312.0	11.6
Total	**358,673.9**	**566.6**

The next step is to calculate the total number of regular hours MPD officers had off during this period. Because most MPD officers work a 4-day, 10-hour shift assignment, they are expected to receive 1,560 "regular" off hours per year (i.e., 10 hours × 3 days off × 52 weeks = 1,560 hours). Thus, the total time off for officers is 2,126.6 hours (i.e., 566.6 benefit hours off + 1,560 regular hours off = 2,126.6 hours).

Shift-relief factor calculations

Using these inputs, the shift-relief factor calculation is as follows:

    366 × shift length/(366 × shift length − total time off)

where 366 is the number of days in 2020 and the shift length is the number of assigned hours per shift. Thus, the MPD had a 2020 shift-relief factor of

    3,660/(3,660 − 2,126.6) or

    3,660/1,533.4 or

    2.39

This number estimates how many officers MPD supervisors would need to assign to a shift to ensure that enough officers would be available to work. For example, if MPD supervisors wanted 10 officers to be on duty during a particular shift, they would need to assign 24 officers to the shift (i.e., 10 × 2.4 = 24).

Note that the shift-relief factor is specific to the 4-day, 10-hour shift assignment; it would be different if the MPD had opted to use an alternative approach. For example, the shift-relief factor for a 5-day, 8-hour shift assignment is as follows:

366 × 8/(366 × 8 − [566.6 + 832]) or

2,928/(2,928 − 1,398.6) or

2,928/1,529.4 or

1.91

And the shift-relief factor for a 3-day, 12-hour shift assignment is as follows:

366 × 12/(366 × 12 − [566.6 + 2,496]) or

4,392/(4,392 − 3,062.6) or

4,392/1,329.4 or

3.30

Based on these calculations, the shift-relief factor for 8-hour shifts is much lower than that for the 10-hour shifts currently used by the MPD or the hypothetical 12-hour shifts. However, a department would need to consider many factors before deciding to implement different shift assignments. For instance, the department would need to staff only two shifts a day under a 12-hour model instead of the three needed for an 8-hour model. The shift-relief factor calculations above suggest that the MPD would need 6.6 officers to ensure at least one can be scheduled for both shifts in a day under the 12-hour model (i.e., 2 shifts × 3.3 = 6.6), whereas the MPD would require only 5.72 officers to ensure at least one can be scheduled under the 8-hour model (i.e., 3 shifts × 1.91 = 5.72).[7] Twelve-hour shifts can also lead to more officer fatigue than 10-hour or 8-hour shifts, which is compounded when officers remain on their shifts longer to complete calls or work overtime.

Task five: identify performance objectives

The fifth task was to identify possible performance objectives regarding the fraction of an officer's shift that should be devoted to calls for service and the fraction that should be spent on other activities. No standardized approaches exist for establishing this metric. As outlined by Wilson and Weiss (2012), the International Association of Chiefs of Police introduced one of the earliest workload-based models more than three decades ago, which suggested that patrol officers should spend approximately one-third of their time responding to calls for service, with the other two-thirds split between proactive activities and administrative duties.

More recently, the International City/County Management Association (ICMA) outlined the "rule of 60" in their review of staffing allocation and deployment in 62 police agencies (McCabe, 2013). This rule suggests that departments should not dedicate more than 60 percent of their resources toward workload (which includes not only calls for service but also proactive and officer-initiated activities, directed patrol time, and administrative duties), with the remaining 40 percent used primarily for

---

[7] It is difficult to create an apples-to-apples comparison of how many officers are needed to cover shifts under a 4-day, 10-hour model such as the one currently used in Minneapolis because 10-hour shifts overlap with one another throughout the day.

undirected patrol as well as training, time between calls, and other non-workload activities. McCabe (2013) found that, on average, departments committed less than one-third of their patrol resources to community-initiated calls for service. In other workload-based staffing analyses, performance objectives have been established at one-fourth, one-third, or one-half of officers' time dedicated to calls for service (see Weiss, 2015; Wilson & Weiss, 2012). Based on this variation, the assessment team used both the one-third and one-half metrics to produce the staffing recommendations in the following task.

Task six: estimate staffing levels

Staffing estimate for current 4-day, 10-hour shift assignment

Task six involved creating an estimate of MPD staffing levels in the five police precincts. This work was completed using the MPD's current 4-day, 10-hour shift assignment model as well as two alternate shift assignment models (5-day, 8-hour shift assignments and 3-day, 12-hour shift assignments).

The MPD's current shift assignment has shifts including daywatch (0600 to 1600), middlewatch (1600 to 0200), and dogwatch (2000 to 0600). Because of the overlap between shifts, it is impossible to break out the number of calls for service within each shift without duplication. Still, using the findings generated in the five previous tasks, CNA created an estimate for the staffing levels based on the 4-day, 10-hour shift assignment (Table 3).

Table 3. Patrol staffing estimates based on current 4-day, 10-hour shift assignments

	Calls for Service[a]	Adjusted (×1.6)	Hours on Calls	Officers Needed	Staffing Estimate (50% Objective)		Staffing Estimate (33% Objective)	
					×2	×2.39	×3	×2.39
1st Precinct	39,209	62,734.4	38,058.9	10.4	20.8	50	31.2	75
2nd Precinct	33,021	52,833.6	32,052.4	8.8	17.5	42	26.3	63
3rd Precinct	51,040	81,664.0	49,542.8	13.5	27.1	65	40.6	98
4th Precinct	55,539	88,862.4	53,909.9	14.7	29.5	71	44.2	106
5th Precinct	38,805	62,088.0	37,666.7	10.3	20.6	50	30.9	74
Total						**278**		**416**

[a] Calls-for-service data from 2020 only.

The first column in Table 3 shows the total calls for service that occurred in each of the five MPD precincts in 2020. The second column adjusts this number to account for calls for which more than one officer was dispatched. As indicated in Figure 6 above, the MPD deploys two-officer squad cars for nearly half of all calls. In addition, many calls involve the dispatch of multiple squad cars to a single scene. Because CAD data have limited ability to determine how many calls involve the dispatch of more than one squad car, common practice is to add a multiplier (such as 25 percent, see Wilson & Weiss, 2012) to the total number of calls. Given the high percentage of MPD calls that already involve two-officer squad car responses, CNA decided to apply a multiplier of 1.6 to the total calls for service to get the adjusted calls for service in the second column.

The third column estimates the amount of time required to complete the calls by multiplying the adjusted number of calls by the average time spent on calls calculated above in task three, which was 36.4 minutes or 0.607 hours (see Figure 9 above). The fourth column estimates the number of officers required to handle the 2020 calls for service. To calculate this estimate, CNA divided the expected number of hours to complete the calls (column four) by the available hours an individual officer could potentially work over the year. In other words, based on the 10-hour shift assignment, an officer working 10 hours a day every day in 2020 would have worked a total of 3,660 hours (366 × 10 hours).

The value in the fourth column is the number of officers needed in each precinct to answer calls, assuming that the officers only answered calls for their entire shift and worked every day. Thus, the final four columns make further adjustments to provide more-realistic estimates of the number of officers needed to handle the calls for service in each precinct, using the two different performance objectives established in the previous task (i.e., 50 percent of officers' time spent on calls for service versus 33 percent of their time). Under the 50 percent performance objective, the estimates in column four are multiplied by 2 and then multiplied by the previously calculated shift-relief factor for the 4-day, 10-hour shift assignment (2.39; see task four above). Under the 33 percent performance objective, column four estimates are first multiplied by 3 and then by the shift-relief factor.

Based on the model presented in Table 3, the MPD would require 278 police officers assigned to patrol duties in its five precincts under the 50 percent performance objective and 416 officers under the 33 percent performance objective. Based on the varying volume of calls across precincts, the 3rd and 4th precincts would need significantly more patrol officers than the other three precincts.

Note that, based on staffing numbers provided by the MPD to CNA in December 2021, the department currently has 289 patrol officers assigned to one of the three patrol watches across the five precincts (as well as another 10 assigned to critical response team shifts, 69 assigned to other nonpatrol duties, and 30 on leave). This number is closely aligned to the staffing estimates produced under the 50 percent performance objective model but is 138 officers short of the estimate produced under the 33 percent performance objective model.

Staffing estimates for alternate shift assignments

Next, CNA created patrol staffing estimates for the two alternative shift assignments. Table 4 presents patrol staffing estimates for a hypothetical 5-day, 8-hour shift assignment model. Under this model, the MPD could schedule officers for one of three shifts: 0700 to 1500, 1500 to 2300, and 2300 to 0700. The inputs across the columns in this model follow the same logic as the previous model: calls for service are adjusted by 60 percent to account for multiofficer dispatches, multiplied by 0.607 hours to estimate the time on call, divided by the available hours an individual officer could potentially work over the year (in this case, 366 × 8 hours = 2,928), multiplied by the corresponding performance objective multiplier, and multiplied by the appropriate shift-relief factor (in this case 1.91).

Results from this model are similar to those presented in Table 3. Under a 5-day, 8-hour shift assignment model, the MPD would require either 281 or 420 patrol officers, depending on the chosen performance objective.

Table 4. Patrol staffing estimates based on projected 5-day, 8-hour shift assignments

	Calls for Service[a]	Adjusted (×1.6)	Hours on Calls	Officers Needed	Staffing Estimate (50% Objective)		Staffing Estimate (33% Objective)	
					×2	×1.91	×3	×1.91
1st Precinct								
0700–1500	14,055	22,488.0	13,642.7	4.7	9.3	18	14.0	27
1500–2300	15,762	25,219.2	15,299.6	5.2	10.5	20	15.7	30
2300–0700	9,392	15,027.2	9,116.5	3.1	6.2	12	9.3	18
2nd Precinct								
0700–1500	9,431	15,089.6	9,154.4	3.1	6.3	12	9.4	18
1500–2300	14,267	22,827.2	13,848.5	4.7	9.5	19	14.2	28
2300–0700	9,323	14,916.8	9,049.5	3.1	6.2	12	9.3	18
3rd Precinct								
0700–1500	18,094	28,950.4	17,563.2	6.0	12.0	23	18.0	35
1500–2300	21,696	34,713.6	21,059.6	7.2	14.4	28	21.6	42
2300–0700	11,250	18,000.0	10,920.0	3.7	7.5	15	11.2	22
4th Precinct								
0700–1500	17,736	28,377.6	17,215.7	5.9	11.8	23	17.6	34
1500–2300	24,933	39,892.8	24,201.6	8.3	16.5	32	24.8	48
2300–0700	12,870	20,592.0	12,492.5	4.3	8.5	17	12.8	25
5th Precinct								
0700–1500	14,670	23,472.0	14,239.7	4.9	9.7	19	14.6	28
1500–2300	14,984	23,974.4	14,544.5	5.0	9.9	19	14.9	29
2300–0700	9,151	14,641.6	8,882.6	3.0	6.1	12	9.1	18
Total						**281**		**420**

[a] Calls-for-service data from 2020 only.

The patrol staffing estimates based on the proposed 3-day, 12-hour shift assignment model are presented in Table 5. This model would require only two shifts per day, such as 0600 to 1800 and 1800 to 0600. The inputs of this model again follow the logic of the previous two models. Results indicate that to implement this model, the MPD would need to employ either 323 or 482 officers to meet the patrol needs of its five precincts, which is less efficient than the current staffing model.

Table 5. Staffing estimates based on projected 3-day, 12-hour shift assignments

	Calls for Service[a]	Adjusted (×1.6)	Hours on Calls	Officers Needed	Staffing Estimate (50% Objective)		Staffing Estimate (33% Objective)	
					×2	×3.3	×3	×3.3
1st Precinct								
0600–1800	20,756	33,209.6	20,147.2	4.6	9.2	31	13.8	46

	Calls for Service	Adjusted	Hours on Calls	Officers Needed				
1800–0600	18,453	29,524.8	17,911.7	4.1	8.2	27	12.2	41
2nd Precinct								
0600–1800	14,216	22,745.6	13,799.0	3.1	6.3	21	9.4	32
1800–0600	18,805	30,088.0	18,253.4	4.2	8.3	28	12.5	42
3rd Precinct								
0600–1800	27,636	44,217.6	26,825.3	6.1	12.2	41	18.3	61
1800–0600	23,404	37,446.4	22,717.5	5.2	10.3	35	15.5	52
4th Precinct								
0600–1800	27,697	44,315.2	26,884.6	6.1	12.2	41	18.4	61
1800–0600	27,842	44,547.2	27,025.3	6.2	12.3	41	18.5	61
5th Precinct								
0600–1800	20,678	33,084.8	20,071.4	4.6	9.1	31	13.7	46
1800–0600	18,127	29,003.2	17,595.3	4.0	8.0	27	12.0	40
Total						**323**		**482**

[a] Calls-for-service data from 2020 only.

Staffing estimates for PNC subgroups

Finally, CNA created similar staffing estimates for the four PNC subgroups described above. Because the 4-day, 10-hour shift assignment model currently used by the MPD was most efficient, CNA used that as the basis for the subgroup analysis. Therefore, the inputs in the subgroup model are the same as those presented in Table 3 above except that column three ("hours on calls") in the subgroup model uses the average time spent on calls within each PNC subgroup rather than the overall average. That is, the "police officer statute PNCs" multiplier was 33.9 minutes, the "behavioral health PNCs" multiplier was 37.9 minutes, the "theft-reporting PNCs" multiplier was 69.2 minutes, and the "other alternative response PNCs" multiplier was 23.4 minutes (see Figure 11 above).

The results of the subgroup staffing estimates are presented in Table 6. Under the 50 percent performance objective, the MPD would require 172 police patrol officers just to respond to the calls that explicitly require a police response by state law. Under the 33 percent performance objective, the MPD would need at least 255 patrol officers for these calls.[8] These models also indicate that the MPD could free up 73 or 106 patrol positions if the City strictly allocated calls in the other three PNC subgroups to nonpolice groups or agencies. This allocation could potentially free up patrol officers to focus more attention on responding to calls for service that require a police presence.

Table 6. Patrol staffing estimates for PNC subgroups based on 4-day, 10-hour shift assignments

	Calls for Service[a]	Adjusted (×1.6)	Hours on Calls	Officers Needed	Staffing Estimate (50% Objective)		Staffing Estimate (33% Objective)	
					×2	×2.39	×3	×2.39
1st Precinct								

---

[8] Note that not all calls for service fit in these four categories, so the sum of police and nonpolice estimates in Table 6 does not equal the estimates for the full department presented in Table 3. Some calls do not require a police response by statute but are not well suited for an alternative response model. In the current dataset, these PNCs include unwanted persons, the recovery of property or vehicles, and the reporting of assaults, among others.

Police statute	24,133	38,612.8	21,816.2	6.0	11.9	29	17.9	43
Behav. health	3,663	5,860.8	3,702.1	1.0	2.0	5	3.0	8
Theft report.	1,826	2,921.6	3,369.6	0.9	1.8	5	2.8	7
Other alternat.	3,071	4,913.6	1,916.3	0.5	1.0	3	1.6	4
2nd Precinct								
Police statute	22,908	36,652.8	20,708.8	5.7	11.3	28	17.0	41
Behav. health	2,128	3,404.8	2,150.7	0.6	1.2	3	1.8	5
Theft report.	1,842	2,947.2	3,399.1	0.9	1.9	5	2.8	7
Other alternat.	2,788	4,460.8	1,739.7	0.5	1.0	3	1.4	4
3rd Precinct								
Police statute	32,192	51,507.2	29,101.6	8.0	15.9	39	23.9	58
Behav. health	3,963	6,340.8	4,005.3	1.1	2.2	6	3.3	8
Theft report.	3,347	5,355.2	6,176.3	1.7	3.4	9	5.1	13
Other alternat.	4,262	6,819.2	2,659.5	0.7	1.5	4	2.2	6
4th Precinct								
Police statute	38,395	61,432.0	34,709.1	9.5	19.0	46	28.5	68
Behav. health	3,232	5,171.2	3,266.5	0.9	1.8	5	2.7	7
Theft report.	2,292	3,667.2	4,229.5	1.2	2.3	6	3.5	9
Other alternat.	5,403	8,644.8	3,371.5	0.9	1.8	5	2.8	7
5th Precinct								
Police statute	25,260	40,416.0	22,835.0	6.2	12.5	30	18.7	45
Behav. health	2,905	4,648.0	2,936.0	0.8	1.6	4	2.4	6
Theft report.	2,498	3,996.8	4,609.6	1.3	2.5	7	3.8	10
Other alternat.	3,386	5,417.6	2,112.9	0.6	1.2	3	1.7	5
Total police						**172**		**255**
Total non-police						**73**		**106**

[a] Calls-for-service data from 2020 only.

The above analysis reflects data from a particular time period, as noted. For the MPD to predict future staffing needs, which depend on the considerations (performance objectives, use of two-person cars, etc.) used in each task above as well as the volume of calls-for-service data overall, the assessment team will provide a spreadsheet-based tool that can be used to reproduce this analysis under different future scenarios. This tool will be more useful to the agency than our team positing possible hypotheticals because it can be used at any point based on real-world data.

Limitations

When considering the patrol staffing analysis, the precise number of officers needed depends on several policy decision points, primarily the desired percentage of discretionary time for patrol officers and the use of one- versus two-person patrol car staffing, as noted above. Adjusting these factors in various combinations leads to the conclusion that the MPD's patrol division is either appropriately staffed or substantially understaffed. Determining the ideal values for these inputs is

grounded in local context, community expectations, and operational goals and goes beyond the scope of this assessment, although we do discuss these issues further in the next section to provide context to inform those decisions.

The primary limitation to our staffing analysis lies outside the patrol function. The assessment team had planned to perform similar analyses for the Investigations Bureau, Forensic Division, investigations staff within the Patrol Bureau, and Professional Standards Bureau. However, none of these divisions record personnel "deployment" information in a manner that allows for a workload-based staffing analysis. This is not atypical; most law enforcement agencies collate information in those divisions to track the process and progress of tasks, as the MPD does. However, to conduct a staffing analysis, knowing the time spent per task and the time spent within a task on subtasks is critical to developing workload-based personnel requirement estimates. We provide a recommendation below on the type of data the MPD would need to begin collecting to facilitate such an analysis in the future.

In addition, the assessment team had expected to conduct a related analysis of the current use of overtime in the Patrol Bureau as well as the aforementioned units. Unfortunately, the data available on overtime use were not sufficient to produce defensible analysis or recommendations.

Recommendations

Recommendation 1: The MPD and the City should identify a performance objective for the percentage of time officers spend responding to calls for service. As depicted in the analyses above, applying common metrics such as one-third or one-half results in very different recommendations for staffing levels. To that end, the City should consider how much time it would like MPD officers to engage in other typical police functions, such as patrolling the streets in their precincts or engaging in community policing activities. Although these activities may not be as critical as responding to calls for service, they are considered core functions in many police departments.

Recommendation 2: After identifying this objective, the MPD should consider the staffing levels for its patrol precincts. The staffing analyses revealed that, under the current 4-day, 10-hour shift assignment, the MPD's current staffing levels are appropriate if patrol officers are expected to spend one-half of their time responding to calls for service (i.e., the 50 percent performance objective). However, if the MPD or the City expects these officers to spend more of their time on undirected patrol, community engagement, or other activities, the MPD would need to consider increasing its patrol staff or otherwise reallocating personnel to best meet the demand for service in each precinct and the City at large.

Recommendation 3: If further efficiencies are needed in the short term, the MPD could consider reducing the number of two-officer squad cars dispatched to calls in favor of one-officer squad cars. As noted in Figure 6, nearly half of all calls that occurred during the study period involved a two-officer response. Research has generally shown that one-officer squads are not less safe for officers than two-officer squads, whereas one-officer squads can improve

overall staffing efficiency (e.g., Anderson & Dossetor, 2012). However, the ability for the department to make this change may vary across shifts and precincts. For example, shifts that put officers at greater risk might require more two-person patrols than other shifts. Likewise, the necessity for two-person patrols may vary across the department's precincts.

Recommendation 4: The City should examine the feasibility of implementing nonpolice response options for the PNC subgroups described above or expanding existing programs that serve this purpose (such as the behavioral health response teams). As noted in Table 6, the department could free up between 73 and 106 patrol positions if all these calls for service were handled by community groups or other nonpolice agencies.

Likewise, the MPD could examine how it uses its own personnel to respond to some nonemergency calls for service. As noted in Figure 7, most calls for service were lower priority calls for which no immediate threat of harm existed. Some of these calls could possibly have been handled without a patrol officer responding to the scene. For instance, in some police departments, patrol officers who are unable to participate in patrol duties (e.g., those on limited duty or other administrative assignments) address these calls by phone, thereby reducing the need for an officer to be dispatched on scene. MPD has implemented such a system, but its staffing levels have been inconsistent.

Recommendation 5: The current analyses focused on developing staffing estimates specifically for patrol officers, but CNA was unable to produce similar estimates for the department's other divisions (e.g., investigations). If the MPD would like to create similar staffing estimates for these divisions, it would need to collect additional data, specifically detailed information on how much time investigators spend on relevant activities throughout their day, such as driving to crime scenes, interviewing suspects or witnesses, analyzing evidence, and so forth. Note that this data collection would be a complex undertaking; these data are not commonly collected by other police departments, so there are no standard approaches for creating staffing estimates outside of patrol.

Recommendation 6: When developing a patrol performance metric to guide the deployment of uniformed officers, this model cannot factor in the several units staffed by uniformed officers that have been greatly reduced or eliminated because of staffing constraints. These include Community Response Teams, the Community Engagement Team, the Crisis Intervention Team, the Police Activities League, school resource officers, bicycle patrols, and foot beats. All at one time had strong support from segments of the community and had a role in crime prevention, mental health–related calls, community outreach, and fear reduction. We strongly recommend that, in the aftermath of the recent referendum, the City inventory these programs for their prior effectiveness and level of community support and determine whether the recommended number of call-response officers is sufficient to reproduce some of these services and activities or whether these units could potentially be staffed by civilian personnel (see Section 2 for more discussion of civilianization).

Recommendation 7: The reintroduction or reactivation of any special unit, or, for that matter, foot and bicycle beats, depends on the development of appropriate metrics and the ability to

assess the effectiveness and support of these units. Business districts, for example, may highly value foot and bicycle beats for their fear reduction and order maintenance capabilities. This information could be ascertained through targeted community surveys. Separate metrics (and the ability to extract relevant data from information systems) must be applied to units such as Community Response Teams, the Community Engagement Team, and the Police Activities League. Their effectiveness and support should be measured to inform current and future staffing needs.

Section 2: Operations Analysis

Methods

CNA conducted 23 semi-structured interviews with relevant personnel, including representatives from the three MPD bureaus and the MECC, to develop an understanding of formal policies and procedures as well as to gain insights into the agency culture and community relations. MPD interviewees included individuals from the Deputy Chief to line officer levels, and MECC interviewees included individuals at the manager and dispatcher levels. The interviews provided qualitative data for our assessment of business processes, policing practices, communication structure, culture, and leadership, expanding our understanding of the agency's current capacity and unique dynamics. Because of the COVID-19 pandemic, our team conducted all interviews virtually, in accordance with national public safety guidelines. In line with best practices, we ensured the anonymity of those who participated in our interviews.

In addition, for each topic, assessment team analysts reviewed the literature to provide background information on the subject, summarize the evidence base, and gather lessons learned and best practices. These literature reviews were produced using standard methods such as keyword searches and iterative referencing (i.e., reviewing reference lists and "cited by" lists to identify additional sources). The literature reviews included both academic peer-reviewed literature as well as "grey" literature (i.e., reports published outside of peer-reviewed journals). The inclusion of grey literature is particularly important in criminal justice because an extremely robust set of publications is produced directly by agencies and by analysts working in nonacademic research organizations as well as by entities such as the Bureau of Justice Assistance and the Office of Community Oriented Policing Services (COPS Office).

Findings in this section have implications for the staffing and business process analyses, and we note these when appropriate. These summaries are not directly informed by those analyses.

Civilianization

Findings from the field and research

Over the last several decades, civilians have become increasingly important to law enforcement operations. Historically, civilians performed relatively unsophisticated tasks, including record keeping and janitorial functions, and comprised a very small portion of employees. More recently, however, civilian roles have expanded into areas that had been primarily assigned to sworn officers. This process, known as *civilianization*, is defined as "a law enforcement agency's hiring of nonsworn personnel to replace or augment its corps of sworn officers, typically with the aims of reducing costs and improving service" (Forst, 2000). Civilianization in policing first began to increase in the 1930s (Davis et al., 2013) and increased again in the 1950s. By 1950, civilian staff comprised an estimated

8 percent of police employees. The 1967 President's Commission on Law Enforcement and the Administration of Justice identified civilianization as a primary method to increase community confidence in police. As a result, civilian representation in large law enforcement agencies grew 259 percent from 1955 to 1995 (Davis et al., 2013, p. 4). Civilianization continued to increase modestly from 1995 to 2008, when it leveled off at around 31 percent (Davis et al., 2013, p. 4). The increase was most substantial in sheriff's departments from 1987 to 2003; civilian representation in sheriff's offices increased 158 percent during that time (Davis et al., 2013). Davis et al. (2013) attribute the rise of civilian employees in law enforcement to three distinct time periods in which American policing underwent significant transformations: 1840 to 1955, 1955 to 1995, and 1995 to 2008.

Civilianization in policing has several possible causes. Generally, an increase in civilian staff has been attributed to budget cuts and an insufficient number of sworn staff to perform a variety of functions (Cox, 2012; Davis et al., 2013). In some jurisdictions, rapid population growth increased the demand for law enforcement personnel, and agencies struggled to keep up with that demand. Departments responded in several ways, one of which included hiring more civilians to conduct nonenforcement-related tasks (Cox, 2012). The 1967 President's Commission on Law Enforcement concluded that specific tasks would be better performed by civilians, including communications, planning, and forensic work (Kiedrowski et al., 2019). The Commission also recommended that law enforcement agencies create a community service officer (CSO) position to be filled by civilian staff (Davis et al., 2013). As the community policing movement grew in the 1970s, many departments began implementing CSO positions and associated programs. Civilianization was supported by the federal government through grant programs that required the employment of civilian staff, such as the Violent Crime and Law Enforcement Act and COPS Office grants (Davis et al., 2013).

As civilian roles in law enforcement grew, so too did civilian expertise in certain functions. According to Quattlebaum and Tyler (2020), civilians were increasingly hired by law enforcement to perform specific functions related to their expertise rather than as generalists. Forst (2000) argues that sworn officers are hired as generalists who are trained and rotated from one assignment to the next, whereas civilians are hired to perform specialized functions. Civilians are not only occupying roles with greater frequency than in the past but also increasingly being hired to fill traditionally sworn positions, including high-level leader, public information officer, crime and intelligence analyst, grant writer, information technology specialist, trainer or coordinator in training academies, traffic and motor vehicle crash investigator, forensic technician, investigator, and budgeting and fiscal manager (Davis et al., 2013). Here, we focus primarily on the role of civilians in investigations, forensics, and community engagement. Few best practices or lessons learned have emerged about civilianization in other roles, mainly because some are obvious and noncontroversial fits for civilian staffing (e.g., grant writers), some are relatively minor in terms of overall police operations and have received little attention (e.g., crash investigators), and some have only recently and very infrequently been staffed by civilians (e.g., leadership roles), so little research and few best practices have been documented.

Civilians in investigations

Civilians have come to occupy various roles in investigations, including cybercrime investigations, property crime investigations, and crime scene investigations (Davis et al., 2013; Kiedrowski et al.,

2019). In Canada, investigative positions were created specifically for civilians to assist detectives with major cases and serve as informational liaisons to the Crown (Kiedrowski et al., 2019). In the United States, the recession in 2008 and resulting budget cuts forced agencies to reconsider their staffing operations, and police organizations began using civilians to conduct property crime and fraud investigations (Davis et al., 2013). This practice allowed sworn personnel to focus their efforts primarily on patrol and the crime problems in their communities. In England and Wales, civilian investigators were introduced into policing in 2002 by the Police Reform Act in order to enhance the police's investigative capacity (Rice, 2019). Rice's 2019 study is the only one of its kind to examine the role of civilian "junior partners" as investigators and found that civilian investigators engaged in the coproduction of investigative functions as equal partners more often than as junior partners or assistants. Despite the placement of civilian employees into investigative roles, little research has examined the effectiveness of civilians in these positions across a range of outcomes (Davis et al., 2013).

Civilians in forensics

Crime scene and forensic analysis functions are increasingly being civilianized to allow detectives to focus on investigative work. This shift toward civilianization is most evident in large American police departments like those in Los Angeles, San Francisco, and San Diego. Crime scene investigative tasks are being conducted more often by civilians under the Criminalist civilian classification. The San Jose Office of the City Auditor (2010) estimated that one department could save approximately $15,000 per forensic technician to civilianize the forensic investigator role.

In the Knoxville, Tennessee, Police Department, civilian forensic technicians process all crime scenes (Kiedrowski et al., 2015). Sworn personnel are responsible for securing the location and interviewing witnesses while forensic technicians collect physical evidence and document the crime scene. Once these processes are complete, the sworn investigators and civilian forensic technicians work together to assess the evidence. Other forensic roles filled by civilians include forensic electronic/audio/video analyst, forensic administrative assistant, fingerprint examiner, and image analyst (Kiedrowski et al., 2015).

Civilians in community engagement

The civilian role in community engagement policing programs is based on the idea that civilians are better able to relate to the communities in which they live and therefore better equipped to reduce crime in those communities (Cordner, 1997; Davis et al., 2013; Hennessy, 1976). Others, such as Skolnick and Bayley (1986), view civilianization as a process in which the community and police can work together to increase community policing and reduce crime. Hiring civilians to engage in community outreach strategies is thought to be the most effective when civilians reside in the communities in which they are "policing," providing them with linguistic cues and a nuanced understanding of the cultural perspectives present in neighborhoods (Davis et al., 2013). Civilians serving in positions such as CSO may facilitate connections between the police and community groups that are traditionally isolated from police services because of language and cultural barriers (Maguire & King, 2004). Civilianization of community outreach programs has the potential to

increase police legitimacy and enhance the perspectives of citizens about police work in those neighborhoods (Davis et al., 2013).

Benefits of civilianization

Civilian staff are beneficial to law enforcement agencies in several ways. First, hiring more civilian personnel allows sworn police officers to deploy to field assignments (Davis et al., 2013). Civilian personnel are more often specialists than generalists, which allows them to leverage their skills and talents more effectively. One of the most cited benefits of civilian employees relates to cost (Cox, 2012; Davis et al., 2013; Forst, 2000; Kiedrowski et al., 2019; Quattlebaum & Tyler, 2020). Despite having a relatively comparable salary to sworn personnel, civilian employees do not require an intense training program or an academy and have cheaper fringe benefits, have lower insurance costs, have fewer equipment costs, have lower overhead costs, and are easier to replace than sworn personnel (Davis et al., 2013; Quattlebaum & Tyler, 2020). According to Davis et al. (2013), a police officer in California costs about twice as much as a civilian employee. In the Houston, Texas, Police Department, hiring civilian personnel instead of sworn officers saves the department an estimated $50,000 per officer (Quattlebaum & Tyler, 2020). The Chicago Inspector General suggested that the department saves between 16 and 41 percent per position through civilianization (Quattlebaum & Tyler, 2020). Civilian personnel are also easier to hire, whereas recruiting for sworn positions has become increasingly challenging in recent years. The applicant pool for civilian employees is larger because there are fewer disqualifying screening factors, less training is required, and there are no licensing requirements (Cox, 2012). Finally, civilian employees can make contributions almost immediately upon hire as opposed to nearly a year later, as is the case with most sworn personnel (Cox, 2012).

Drawbacks of civilianization

Despite the cited benefits of employing civilians in traditionally sworn positions, civilianization is not without limitations. Kiedrowski et al. (2019) cited several limitations related to the hiring and retention of civilian personnel. Because of the nature of the jobs (i.e., specialization), civilian staff have limited career mobility and lower reported job satisfaction and morale than sworn officers. Sworn personnel are likewise not as receptive to civilian staff as they are to other sworn personnel and may not accept them as true partners. Although not inherently a drawback of civilianization, this divide between civilian and sworn staff does present particular challenges that agencies must address in order to expand civilianization, particularly beyond traditionally civilian roles. Some researchers suggest that this divide contributes to tension and may result in turnover among civilian staff (Kiedrowski et al., 2019). In a 2006 study conducted in Britain, civilian employees were surveyed to assess satisfaction with their job functions (Alderden & Skogan, 2014). The survey found that civilians faced widespread bullying by sworn personnel, they expected unequal status to continue, and they felt undervalued relative to their sworn counterparts (Loveday, 2006). The Major Cities Chiefs Association (2009) suggests an increase in the recognition of teamwork and interdependence between civilian and sworn personnel roles to combat these negative perceptions.

Conclusion

Civilianization in policing has become an increasingly popular way for law enforcement leadership to address issues related to budget and personnel and to increase the efficiency of operations. Substituting civilian for sworn personnel occurs across several domains, including law enforcement leadership, crime and intelligence analysis, research and analytics, investigations, forensics, and community engagement. Although civilianization has numerous cited benefits, especially reduced costs, research on civilianization is dated. In addition, some research suggests that civilian employees face unique challenges in law enforcement positions, which can affect long-term retention rates of civilians. Ultimately, more research is needed to understand how civilians can benefit law enforcement operations and the extent to which specific roles could be effectively transitioned to civilian staff.

Findings from personnel interviews

A common theme described in the interviews with MPD personnel was challenges related to staffing. Across precincts and departments, the MPD is experiencing attrition in both sworn and civilian personnel. Interviewees have largely attributed the loss of employees to the stress associated with the death of George Floyd, treatment by the community, and post-traumatic stress disorder. Below, we describe some of the sentiments expressed by MPD personnel as they relate to civilian and sworn staffing changes in the department.

Across the five precincts, approximately 420 officers were assigned to patrol in 2021. In 2017, 576 employees were assigned to patrol, 560 of which were sworn. Similarly, the investigations bureau has experienced a loss of 61 investigators from 2017 to present day, bringing total staff in the bureau to 97 (of which 14 are civilian) in 2021. The precincts have tried to maintain programs and the resources they had available, which has become extremely challenging. As the number of sworn personnel decreases, the MPD has come to rely more heavily on civilian personnel. For example, with the disbandment of the Community Engagement Division, civilian staff have taken on some responsibilities related to community outreach. These "community navigators" are responsible for building community engagement and trust on behalf of the department. An additional position, the crime prevention specialist, is tasked with working with the community on implementing crime prevention through environmental design (CPTED) strategies, preparing for crime stat meetings, and reaching out to community members. The City Council has since voted to move these positions outside of the police department, and MPD personnel expressed that they did not understand the reasoning for this decision.

In addition to patrol, the MPD uses civilian personnel in several other functions currently. We highlight these to describe the MPD's current civilian personnel usage as well as to underscore some of the benefits and drawbacks of civilianization that MPD is currently experiencing. The Business Technology Unit (BTU) has experienced a loss in civilian staff. In 2017, the BTU comprised four sworn and six civilian personnel. The BTU has since lost two civilian staff, who operated as the body-worn camera and taser coordinators in the unit. They also have an open auditor position for a sworn staff

member. The unit is seeking to keep these open positions civilian and not fill them with sworn personnel.

Civilians fulfill several other department functions, including fleet management, evidence property management, crime lab tasking, and central records management. The current fleet manager is a civilian employee and works with the City garage for all department needs related to fleet maintenance. The evidence property room is open Monday through Friday and is run solely by 11 civilian staff. The crime lab has mostly civilian staff as well. In addition, 13 civilian staff comprise the central records division; the department is seeking more civilian personnel for clerical work because of their efficiency.

MECC roles typically filled by civilian staff, such as police dispatch, are also facing major staffing shortages. Police dispatch typically experiences quite a bit of turnover, but staff report that this turnover has increased of late. Dispatch currently has open positions for an interim director, operations manager, and quality assurance specialist. Dispatchers reported that the MECC is never fully staffed on the floor.

The MPD is currently experiencing challenges related to resources and staffing of both sworn and nonsworn personnel. In the face of these shortages, the department has continued its patrol operations in all five precincts, but through our interviews, we repeatedly heard concerns from personnel about understaffing and its effects. Staff report that several programs (including, notably, the Community Engagement and Outreach Bureau) have been disbanded or cut to meet demands for service elsewhere. Although some divisions have been able to use civilian staff to fulfill traditionally sworn positions, the department could potentially employ civilian staff more broadly to address the vacancies that currently exist departmentwide.

Recommendations

Recommendation 8: The MPD should continue to expand the use of civilian personnel to fulfill positions as appropriate within the agency, particularly in units such as community outreach, forensics, and information technology.

Recommendation 9: The MPD and the City should explore the possibility of implementing civilianization in additional roles outside the patrol function; however, the City and MPD should remain mindful that civilianization outside the roles listed in the previous recommendation is not (yet) widespread and little-to-no information is available about best practices or outcomes and effects. It would be beneficial to both the MPD and the broader field to carefully document such civilianization efforts and perform process and impact evaluations of them.

Recommendation 10: The MPD and MECC should develop recruitment strategies specific to civilian personnel and by role and focus area. These strategies should include mechanisms for reaching qualified applicants; considerations for diversity, equity, and inclusion in the hiring process; and proactive methods for promoting the MPD and MECC as progressive, fulfilling

workplaces with opportunities for career advancement. We recommend reviewing COPS Office publications for specific guidance on these topics.[9]

Recommendation 11: The MPD and MECC should collect data allowing for workload-based analysis of civilian roles within their organizations to ensure that these positions are staffed appropriately based on organizational priorities and activity levels. Please refer to Recommendation 5 for more details on the type of data required for this task.

Alternative response models

Findings from the field and research

Law enforcement responds to calls for service concerning a wide range of matters. They must be equipped to interact with community members in various physical, emotional, and psychological states. Researchers have studied multiple approaches to both address increasing calls-for-service volumes and ensure that the correct entities are responding to calls for service. Recently, there has been particular attention to the potential to implement alternative response models for law enforcement responses to low-level calls involving property crimes and calls involving individuals experiencing mental health crises in which responders must attempt to deescalate the situation and provide resources. The three most popular alternative response models are crisis intervention teams (CITs), mobile crisis teams (MCTs), and community service officers (CSOs).

The CIT model was developed in 1988 by Dr. Randolph Dupont and Major Sam Cochran of the University of Tennessee, Memphis, and the Memphis Police Department. It consists of officers who are trained in identifying signs and symptoms of mental health conditions and providing individuals with access to mental health services (Dupont & Cochran, 2000). More than 2,700 law enforcement agencies operate a CIT program in some capacity, and many of these provide all officers with basic CIT training (National Alliance on Mental Illness, n.d.). Researchers have shown that this model can lead to improved law enforcement attitudes toward those living with serious mental health conditions (Compton et al., 2006), earlier treatment for those individuals experiencing crisis (Strauss et al., 2005), and cost benefits (Cowell et al., 2004). Furthermore, there is evidence that CIT-trained officers are less likely to use force with individuals experiencing a mental health crisis (Compton et al., 2015).

MCTs are pairs or groups comprised of clinicians, social workers, and/or law enforcement officers who respond to calls involving individuals with mental health conditions. One such MCT model is the Crisis Assistance Helping Out On The Streets (CAHOOTS) program, which began in Eugene, Oregon. Paramedics and mental health crisis workers respond to nonviolent mental health–related calls to assist community members (White Bird Clinic, n.d.). In 2017, this team responded to 17 percent of the City's calls for service, saving it 8.5 million dollars (White Bird Clinic, 2020). Other models pair

---

[9] The COPS Office resource page on recruitment, hiring, and retention can be found here: https://cops.usdoj.gov/recruitment_hiring_and_retention.

an officer and licensed mental health professional. These teams have been shown to be effective in addressing situations with higher potential for violence (Lamb et al., 1995).

CSOs are typically civilians employed by a law enforcement agency who complete tasks that do not require sworn personnel, such as traffic enforcement and report writing. Cities such as Akron, Ohio (Nethers, 2021), Fort Worth, Texas (Gordon, 2021), and Charlotte, North Carolina (Kuznitz & Zhou, 2020) are implementing programs to use civilians to respond to low-level calls for service, such as abandoned cars, burglaries, and noise complaints. Other cities, such as Birmingham, Alabama, also use CSOs to respond to calls involving individuals experiencing mental health crises. One study showed that this model, as compared to CITs and MCTs, has a higher likelihood of resolving situations on scene rather than transporting the individual to a hospital or psychiatric facility (Shapiro et al., 2015).

Recently, with increased scrutiny on law enforcement, other cities have chosen to implement programs that do not involve direct law enforcement engagement at all. For example, the County of Santa Clara Behavioral Health Services Department is currently funding an effort to implement a community mobile response program for individuals experiencing mental health crises. This program would be a completely community-led effort addressing groups with "historical trauma due to police brutality" and those who have been "historically unserved, underserved, and inappropriately served" by police (National Alliance on Mental Illness Santa Clara County, n.d.).

Findings from personnel interviews

All MPD officers are mandated to receive 40 hours of CIT training in the academy. Interviewees noted that, in the past, the MPD operated a co-responder model unit with Hennepin County's Community Outreach for Psychiatric Emergencies (COPE) unit and Child Crisis unit. The COPE unit comprised two mental health specialists and one officer who followed up on EDP calls from 9 a.m. to 5 p.m. The unit was later disbanded. MPD personnel perceived that it was disbanded because the involved organizations were wary of association with the MPD, although the MPD spokesperson cited insufficient staffing as the primary reason (Saint Louis, 2021).

More recently, new efforts have been made to incorporate alternative response models. Canopy Mental Health, a local organization comprised of civilians, began responding to EDP calls December 13, 2021. One interviewee expressed that, although they believed this effort is generally positive, a police response is still necessary in some situations. This sentiment reflects aspects of the national conversation about alternate response models.

Interviewees also expressed concerns about the availability of community-based resources for community members experiencing mental health crises. These concerns again mirror challenges identified across the nation in fully implementing alternate response models. Local organizations may not always have the capacity and resources to respond to the number of incidents occurring in a community. Another MPD member shared that surrounding suburbs in Hennepin County have begun embedding social workers into their police departments, a strategy the MPD is also interested in developing. As of mid-2021, the City has allocated funds to a provider, Canopy Mental Health, to respond to certain mental health emergencies. This strategy is currently underway and being evaluated (Jany, 2021).

Consistent with the recurrent theme of understaffing, most interviewees agreed that finding effective methods of diverting calls for which sworn law enforcement response is not necessary, such as calls involving quality-of-life issues and nonviolent mental health crises, would ameliorate burnout and morale issues.

Recommendations

Recommendation 12: Recognizing that MPD personnel may still be required to respond to some mental health crisis calls (those with threats of violence or those in which officers respond initially while mental health response teams are dispatched), the MPD should continue to maintain crisis intervention and other applicable training programs and ensure all officers have basic competency in these areas, as is the current practice in the department.

Recommendation 13: The City should commit resources to undertake an objective, rigorously designed evaluation of Canopy's mental health crisis team response model, including a process and impact evaluation as well as an analysis of costs and staffing implications.

Centralization of specific functions

Findings from the field and research

Research in policing has generally overlooked the effect of a police department's organizational structure on efficiency of operations. Research has focused on the issue of centralization vs. decentralization as a primary difference in structure. In centralized departments and units, all individuals working in a particular role are typically co-located and report to a single supervisor. For example, crime analysts who work together in the same room producing analytical reports under a single director. In decentralized structures, in contrast, individuals working in a specialized role are typically located in precincts or districts and while they may still report to a centralized supervisor, their day-to-day tasking is at least in part directed by the commander of that district or precinct. For example, crime analysts who work in a precinct, producing analyses specific to that precinct and in response to requests and needs identified by that precinct's command staff and officers.

A great deal of research in this area has focused on investigatory functions and whether centralization or decentralization result in superior outcomes. Thus far, it is unclear whether the centralization of any investigatory functions affects case outcomes, including clearance rates and crime levels (McCluskey et al., 2014). Early research in this field indicated that investigative structures have little effect on case clearance (Kenney et al., 2010). Despite this finding, various policing models support both centralization and decentralization of investigatory functions, and most agencies report employing a centralized model of investigatory functions (Horvath et al., 2001). Manning (1992) and Sanders (1977) recommended centralization of investigative functions because of the breadth of information processing conducted by detectives, whereas the community policing model supports decentralization to allow for stronger community ties and greater information flow. Benefits of centralizing personnel and resources for investigative purposes include enhancing

connections among detectives, increasing information sharing, and possibly improving some investigative outcomes (McCluskey et al., 2014). Although centralization is the norm in policing, an advantage of decentralization is the ability to strategically deploy investigators in the communities in which they operate (McCluskey et al., 2014). Separating investigators by division can also facilitate relationships between investigators, patrol officers, and the community, resulting in increased awareness of the division's crime problems. Although the empirical literature is sparse, a few studies have examined the effect of organizational structure across a range of outcomes.

One of the earliest studies to address centralization and decentralization was the 1975 RAND report on the criminal investigation process. The report was a large multisite study of police departments and their investigative processes. Since then, a handful of studies have examined the state of centralization in policing. Horvath et al. (2001) conducted a national survey of police departments and sought to build on the findings from the RAND report. Horvath et al. (2001, p. 26) found that 83 percent of all agencies had centralized investigative functions, regardless of department size, and that investigators were more centrally located than reported in past studies. Of the agencies that reported decentralization of investigatory functions, 48 percent of investigators were assigned to district stations, 20 percent were assigned to neighborhood substations, and 6 percent were assigned to mobile community substations (Horvath et al., 2001).

McCluskey et al. (2014) examined the restructuring of a decentralized robbery investigative unit to a centralized model in a single department. Specifically, they examined the effect on two outcome measures: case clearance rates and crime reduction, hypothesizing that centralizing robbery investigations would improve both outcome measures because of increased information flow. Following centralization, the researchers observed a statistically significant increase in case clearance rates as well as a reduction in robberies committed. Qualitative data support these findings; robbery investigators felt that centralizing their arrest processes and functions improved investigative efficiency.

Research on police investigations and outcomes is not well represented in the academic literature. Early studies determined that investigative practices have little effect on case outcomes, and later studies have suggested the opposite. One way in which investigations can affect case outcomes is through centralization, but more research is needed to support these findings beyond the study site.

Findings regarding decentralization of property crimes investigations in the MPD

Unlike the violent crime investigators in the MPD, property crimes investigators are not centralized. Each precinct houses its own property crimes unit as part of the patrol bureau. Property crimes investigators are considered detectives; all hold the rank of sergeant. Property crimes investigations encompass all property crimes, including missing persons and all nonviolent crime.

Like other areas in the MPD, property crime units are severely understaffed, and this understaffing is exacerbated by the low levels of patrol staffing. One interviewee noted that in their precinct, officers have received job offers for other police departments and that the precinct forecasts having

to close the property crimes unit altogether to be able to answer calls for service at the patrol level. Another precinct has just two property crimes investigators, down from 10 before the pandemic and protests. One interviewee suggested that property crimes are a major point of concern in their precinct, with automobile thefts increasing.

Interviewees provided some commentary on the way in which property crimes information is passed to patrol officers in their respective bureaus. If a property crimes investigator wants specific information relayed to patrol, they will send it to an intelligence analyst to be placed in the dib (daily information brief), which is located on the MPD homepage. Supervisors typically go through the dib each day and brief their officers in roll call if something is relevant to the precinct. This information is also accessible via the citywide homepage.

Finally, MPD personnel discussed some of the benefits of a decentralized property crimes unit. Namely, investigators housed in the patrol bureaus have the advantage of knowing their area and community. If an uptick in a property crime type, such as burglaries, occurred, the investigators in that precinct would benefit from knowing the "key players" in that area. Decentralization allows sergeants to become specialists in their communities, whereas a centralized property crimes unit may not afford the same benefits.

Recommendations

Recommendation 14: Based on personnel input, the current practice of decentralizing property crimes investigations at the precinct level seems to operate well and have no noted drawbacks. These personnel, as with others at the MPD, are currently challenged by workloads and understaffing. Because the assessment team was unable to conduct a formal staffing analysis for this role, we cannot recommend a specific staffing level quantitatively, but we recommend increasing staffing and continuing to gather feedback from personnel in this role.

Enterprise service usage

Findings from personnel interviews

During our personnel interviews, we inquired about information technology enterprise systems used within the MPD. These included specialized systems used almost exclusively by the MPD and MECC (such as CAD/records management systems) as well as general software deployed on computers and mobile devices. Interviewees shared that they did not struggle with an overlap in existing enterprise systems. An individual shared one example of redundancy (driver's license information can be extracted from multiple systems) but could not identify others. The assessment team learned that the MPD technology support department has a favorable view of the information technology department within the City of Minneapolis and believes that they work effectively together.

Recommendation 15: At this time, it does not appear that changes are required regarding enterprise systems used by the MPD. We recommend continuing with current operations and developing a regular cadence for internal reviews of enterprise system use in the future.

One- versus two-person patrol car use

Findings from the field and research

Police department staffing has become a particularly complex challenge in recent years. A shrinking applicant pool, public sentiment toward the police, increasing law enforcement responsibilities, and retention issues have all contributed to this challenge. In addition, departments have struggled to identify the number of officers needed to serve their community and how those officers should be deployed (i.e., one- versus two-officer patrol units). Although staffing analyses can assist agencies with these important questions, many agencies do not have the funds or resources to hire external organizations to conduct them (Wilson & Weiss, 2012). In addition, multiple methods exist for determining department staffing. In the United States, law enforcement traditionally determines staffing models by one of four methods: a per capita approach, minimum-manning levels, authorized or budgeted levels, and workload-based models (McCabe, 2013; Wilson & Weiss, 2012). Per capita models are relatively simple to calculate, and the data are readily available; however, agencies using this method risk a biased determination of department and community needs. The minimum-manning approach requires the department to estimate a sufficient number of patrol officers to maintain officer safety and protect the public, but there are no objective standards for doing so, which could result in underdeployment of officers when workload is high or overdeployment when workload is low. An authorized level approach relies on budget allocations to identify a set number of patrol officers who can be deployed and is typically driven by resource availability. This method reflects a budgeting process rather than objective criteria related to policing operations. Finally, the workload-based approach is more comprehensive in determining staffing models because it relies on demand for service indicators, estimates of future staffing needs, and current levels of activity. Workload-based models can be conducted at every level of the police department and for all functions; however, no universally accepted standard exists for these types of assessments (Wilson & Weiss, 2012).

The debate over whether one- or two-officer patrol units are most beneficial has been a core concern of staffing strategies in policing (Long, 2014). Factors typically considered in this decision include officer safety, community and citizen safety, crime rates, efficiency, cost, and available resources. Studies on patrol staffing are dated; have typically focused on response times, officer perceptions, and staffing models; and have often produced inconsistent results. Carmen and Guevara (2003) examined officer perceptions of the effectiveness of one- versus two-officer patrol units. They found that officers felt that two-officer units should be used at night and in locations where levels of police mistrust are high but that two-officer units do not accomplish twice as much as one-officer units. Officers also expressed that two-officer patrol units are more likely to be injured because of potential distractions and did not agree that one-officer units would result in less backup. Perceived benefits

of two-person units included better on-scene observations and quicker response times. Officers also expressed that two-officer patrols offer greater visibility, are an effective deterrent to crime and disorder, increase police visibility to the community, and provide training opportunities for new officers (Carmen & Guevara, 2003). Additional cited benefits of two-officer cars included the cost-effectiveness of having half as many patrol vehicles and better quality service (Kaplan, 1979).

One-officer units have their own benefits and challenges. In a dated United States Department of Justice study, Kaplan (1979) determined that one-officer units decrease response time significantly because more units are available. Chelst (1981) examined response times between one- and two-officer units and found that one-officer units took 30 percent less time to respond to Type 1 calls and 40 percent less time to respond to Type 2 calls.[10] Kaplan (1979) also found that in San Diego, the risk of injury to an officer was equal between the two patrol types. Regarding cost savings, the study concluded that switching from two- to one-officer units would cost an additional $2.51 per hour per unit, and the author suggested that maximum use of one-officer units is the favored approach (Kaplan, 1979). Green and Kolesar (1984) conducted a study to estimate the number of one-officer cars required to achieve the same level of performance as two-officer vehicles. Although dated, the study demonstrated that the one-officer program requires 35 percent more patrol vehicles, resulting in 32 percent fewer police officers in patrol vehicles (Green & Kolesar, 1984, p. 977), arguably resulting in cost savings by requiring fewer officers (although the study did not include a formal cost analysis). Law enforcement agencies typically make intuitive deployment decisions, rather than basing deployment decisions on the specific evidence-based pros and cons of one- vs. two-person patrols (Wilson & Weiss, 2012).

Findings from personnel interviews

The MPD does not have a formal policy mandating one- or two-officer patrol units. Shift supervisors determine patrol car assignments on any given shift. An average shift has at least one two-officer unit on patrol, but the department typically gravitates toward two-officer cars for the night shifts. The department also deploys a two-officer response car that is primarily responsible for responding to officer help calls and assisting other precincts as required. Because of the current staffing limitations, the department is not well positioned to implement and evaluate an overarching policy on one-versus two-officer patrol deployment. Currently, the choice to deploy one- versus two-person patrol units is understandably driven in many cases by staffing levels rather than by procedural or policy-based decision-making. For example, one interviewee discussed how decreased staffing affects his ability to deploy two-officer units. During the week (Sunday through Thursday), the staffing minimum is seven, and on the weekend (Friday and Saturday), it is eight. With four sectors in the precinct and one officer needed at the desk, it is not feasible to send out two-officer units on weekdays. During the weekend, however, the interviewee can manage to deploy 3 two-person units with one officer at the desk.

---

[10] In this study, Type 1 calls require only one officer to respond and Type 2 calls require two officers to respond.

Recommendations

Recommendation 16: The MPD should formalize policy and structure regarding the use of two-person patrol units. Committing entirely to one-person or two-person patrols is not a typical practice; instead, the MPD should weigh various factors to develop a policy for when two-person patrols will be used. Specific factors that should be considered are time of day, day of week, and time of year (and related volume and types of responses); location (and related volume and types of responses); community engagement priorities and strategies; officer safety; and special circumstances (such as preplanned events, disasters, and other crisis situations). Such a policy will allow for more predictable staffing requirements and ensure that supervisors and officers understand when they will and will not be assigned in two-person units.

Recommendation 17: Based on the determined policy, the MPD should review the staffing analysis and revise the required staffing if needed to adjust for the predicted rates of two-person patrol units. The MPD should ensure sufficient sworn positions are filled to adhere to policy.

Proactive time proportion

An agency's ability to maintain sufficient staffing levels is critical to its ability to promote public safety. Over the years, agencies have taken different approaches to identify staffing levels, and a critical part of that determination is understanding how officers' time is allocated. Many agencies refer to the time that officers are not using to respond to calls for service as "uncommitted" or "discretionary" time. This time is used for other important activities in law enforcement agencies' missions, most importantly informal nonenforcement interactions with the community that the officers serve. During this time, officers can meet community members, engage with business owners, and learn more about the neighborhoods in which they work. Officers can also use this time to engage in collaborative problem-solving with community members, a model called problem-oriented policing that is central to community engagement according to the COPS Office (2014). Officers also frequently use this time to complete paperwork, review internal memos and communications, and stay apprised of analysis about crime trends and other critical information. Research has found a wide range in the amount of uncommitted time an officer has on their shift by agency and by role. Literature from researchers and practitioners provides data to estimate the appropriate uncommitted time allocation for law enforcement officers.

Findings from the field and research

Researchers and law enforcement practitioners gather information about how much of officers' time is uncommitted to understand how much time officers have to conduct proactive activities. Research methods to examine the questions of how much time is uncommitted and how much should be uncommitted include examining police CAD data, observing officers, and reviewing police

operational procedures (Lum et. al, 2020; McCabe, 2013). Studies have evaluated staff workload, officer deployment, and response times to calls for service.

Proactive policing activities include conducting traffic stops, patrolling high-crime areas, conducting radar checkpoints, and issuing parking violations (Koper et al., 2020; Lum et al., 2020). Note that many agencies define proactive activity differently, which can make it difficult for researchers to properly analyze. For example, some agencies define proactive time as time spent conducting self-initiated activities, and others define it as uncommitted time used to conduct administrative work or meet with other officers (Cordner, 1981; Wilson & Weiss, 2012).

The National Academies of Sciences Committee on Proactive Policing has also developed a definition for *proactivity*, defining it as "strategies that have as one of their goals the prevention or reduction of crime and disorder and that are not reactive in terms of focusing primarily on uncovering ongoing crime or on investigating or responding to crimes once they have occurred" (Weisburd et al., 2019). Researchers have found that many agencies have different guidance for officers on how they should be spending their proactive time, whereas other agencies provide no guidance at all (Koper et al. 2020).

Overall, a significant portion of officers' shifts is spent on activities other than responding to calls for service or doing administrative tasks. Research has shown that on average, officers spend about 20 percent of their total shift time responding to calls for service (Famega et al., 2005; Koper et al. 2020). One study found that about 74 percent of an officer's patrol shift is spent on activities other than responding to calls for service (Famega et al., 2005). Another study found that about 54 percent of officers' patrol shifts did not involve responding to calls for service (Cordner, 1981).

Although studies find a wide range in the amount of officers' uncommitted time during patrol, they do offer guidance as to how much of an officer's time should be uncommitted. The ICMA published a report on police department staffing suggesting that no more than 60 percent of available patrol officer time be spent responding to calls for service, which includes the time responding to the call as well as associated activities (driving time, necessary paperwork), referred to as the Rule of 60.[11] We use this same definition in our staffing analysis, to the degree possible (if some officers make a practice of closing the call before completing paperwork, we are not able to discern that in the data). The report adds that the remaining 40 percent of the time should be discretionary time for officers to be available to address community problems and respond to major emergencies.

Other reports on officer staffing have suggested that about one-third of officers' time be uncommitted time for proactive patrol activities (Koper et al. 2020; Wilson & Weiss, 2012). Another one-third of time would be obligated to administrative tasks, with the remainder available for responding to calls for service.

---

[11] ICMA's analysis actually proposes two interrelated "Rules of 60"; the assertion that 60 percent of an officer's time should be uncommitted is the one typically referred to in common parlance. The other suggests that 60 percent of department personnel should be assigned to patrol duties.

Having agencies, researchers, and practitioners understand the appropriate time allocation for officers will help organizations properly staff law enforcement personnel. During a time when many agencies struggle with staffing challenges, understanding the necessary time allocation is more critical than ever. Research has shown that officers often have a large amount of time that is uncommitted to responding to calls for service. Through interviews, and as we have noted throughout this report, officers reported having very little proactive time available currently, and we see this trend reflected in decreasing levels of self-initiated activity (see Section 3).

Recommendations

Recommendation 18: The MPD should determine an appropriate level of discretionary time, and ensure staffing levels sufficient to support patrol officers in having that level of discretionary time on most or all shifts. It may be the most appropriate to allow a relatively higher level of discretionary time for shifts covering late afternoon and early evening (when most community engagement activities take place) as opposed to overnight and early in the morning. In addition, the MPD may wish to prioritize additional discretionary time availability in the near term as the agency focuses on reprioritizing community engagement and relationship building.

Recommendation 19: As the MPD is able to return to higher levels of discretionary time and, in turn, increased levels of proactive officer activity, it is critical to document and assess the use of discretionary time. To that end, the MPD and MECC should collaboratively develop processes and procedures to assign a priority code to these activities and create protocols for dispositions, metrics for effectiveness, and protocols for supervisory oversight. These are necessary to verify that these activities occur and have the desired effects.

Section 3: Problem Nature Code Analysis

In this section, we present analysis and findings related to calls for service (including 9-1-1 calls), with specific attention to the use of PNCs to categorize calls for service. Using five years of calls-for service data from 2016 through 2020, we used an exploratory descriptive approach to understand responses to incidents, MECC coding of PNCs, and the relationship between such variables of interest as response times, priority levels, incident lengths, and other incident characteristics. An exploratory descriptive approach explores summary and cross-tabulation data to uncover trends and associations that have practical and policy relevance, letting the data drive the analysis. Exploratory descriptive approaches are commonly used in situations in which describing complex data is of primary importance and comparative statistical analysis is not appropriate. They are also used to answer questions that are broader and more open ended than other quantitative research questions. They are also appropriate when the analysis will likely uncover more questions during the process of exploring the data. This in comparison to quantitative statistical analysis where an analysis plan is developed in advance and applied.

To complete the analysis, our assessment team performed several data cleaning tasks on the five years of data. Note that each individual incident could have multiple lines of data in the original dataset—we distinguish between "incidents" and "incident lines" to reflect these two different ideas. In the PNC analysis, we are interested in incidents because each incident has a single PNC that is subsequently duplicated across incident lines. Thus, retaining all incident lines would misrepresent the actual distribution of PNCs. Therefore, the numbers presented in this section largely do not align with those from the staffing analysis, in which incident lines were important to account for multiple officers arriving on scene in multiple vehicles. The following is a summary of the cleaning tasks performed on the initial 1,794,408 lines of data:

- We removed 915,146 incident lines in which the response was noted to be a secondary vehicle responding (because we are primarily interested in the first arriving patrol unit in our analyses) or for which no vehicle responded to the incident. In other words, we retained only one line per incident, the line including information about the first car to respond to the scene, and we did not retain lines in which no car ever responded.
- We removed an additional 1,733 incident lines that shared the same incident number with another line, retaining whichever line contained the first unit on scene based on the arrival time.
- We removed 18 incident lines that had no incident number identifier.
- We appended vehicle data (which contains on-scene arrival time and call cleared times) to the calls-for-service data; we note that 129,731 calls-for-service incidents do not have associated vehicle data. This lack of vehicle data may reflect data quality issues, including the possibility of misentered incident numbers (because that is the field we used to merge

these datasets). We were still able to analyze these lines in nearly all the below sections because the only major variable we use from the vehicle dataset is the call cleared time.

- We calculated variables to measure the time from initial incident identification (e.g., 9-1-1 call taken) until a unit arrived on scene and the time from a unit arriving on scene until the call was cleared. After performing these calculations, we replaced any negative calculated time with a missing value; there were 946 and 20,461 instances of negative calculated time, respectively. In our experience, these typically represent data entry errors.

Taken together, the rate of missing values and removed data because of inappropriate values (like negative times) is very low compared to the overall number of calls for service documented during the five-year period—less than 5 percent for each type of data irregularity except the vehicle data gaps (which, as noted above, do not affect all analyses). We have no reason to believe that the incidents completely removed from the dataset vary systematically from those included (the probability of a typo while entering an incident time seems unlikely to vary by PNC, for example). We have high confidence that the analysis on the cleaned data is accurate and representative of MECC incident data collection and response.

Basic characteristics and trends

Over the five-year period analyzed, the MECC cataloged information for approximately 1.79 million incidents.[12] Figure 12 shows the distribution of calls for service over time, broken out by those prompted by 9-1-1 calls and those that represent self-deployments. The trend in 9-1-1 calls shows the typical seasonal trend with higher call rates in the summer months, at steady average annual rates over the five-year period. Self-deployments trend downward over the five-year period, particularly from mid-2018 onward, and this trend is also reflected in the total calls-for-service trend. Over the entire period, 60 percent of calls for service were produced by 9-1-1 calls.

---

[12] We provide an approximate figure here because our data cleaning procedures to remove incidents with multiple lines of data (produced, for example, when multiple patrol units are dispatched to an incident) may have introduced minor errors in the complete count of incidents. These are so small in number that they do not affect the overall analysis and findings.

Figure 12. Calls for service over time
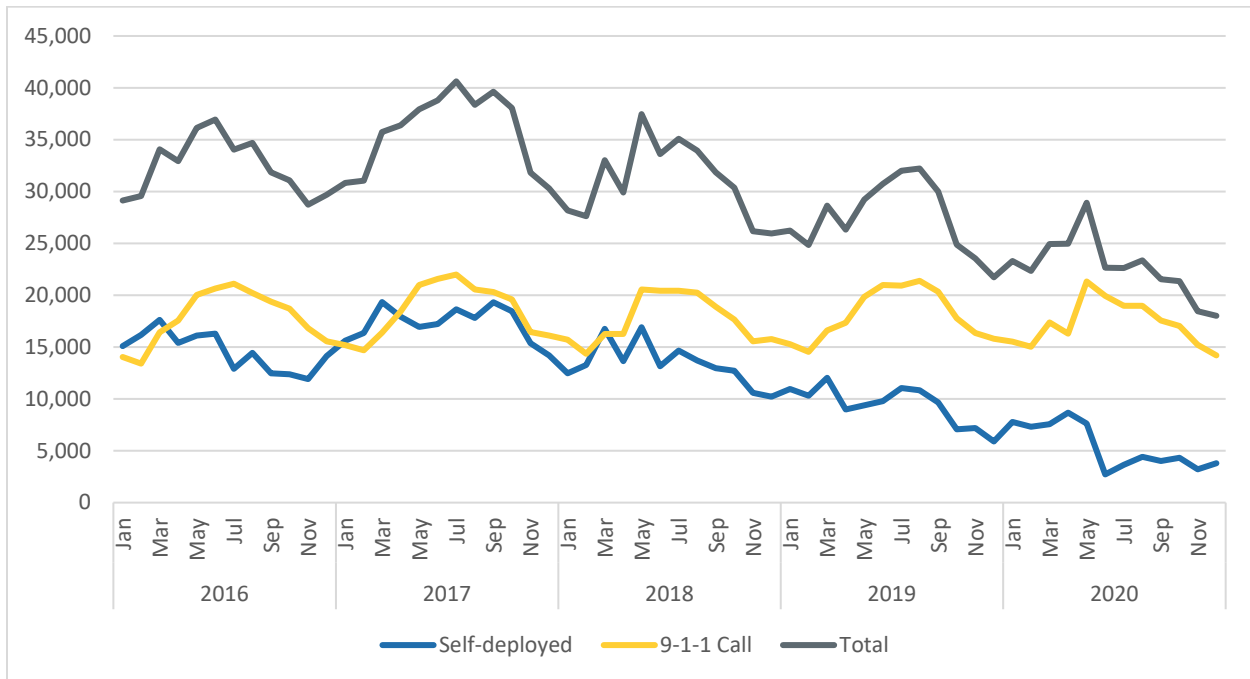
In Figure 13, we present calls for service by time of day, also broken out by call type. As in most agencies, calls for service are lowest in the early morning hours and peak in the late afternoon into the evening. (Note that this figure re-presents information from Figure 2 in a different format, broken out by type of call for service.)

Figure 13. Calls for service by time of day
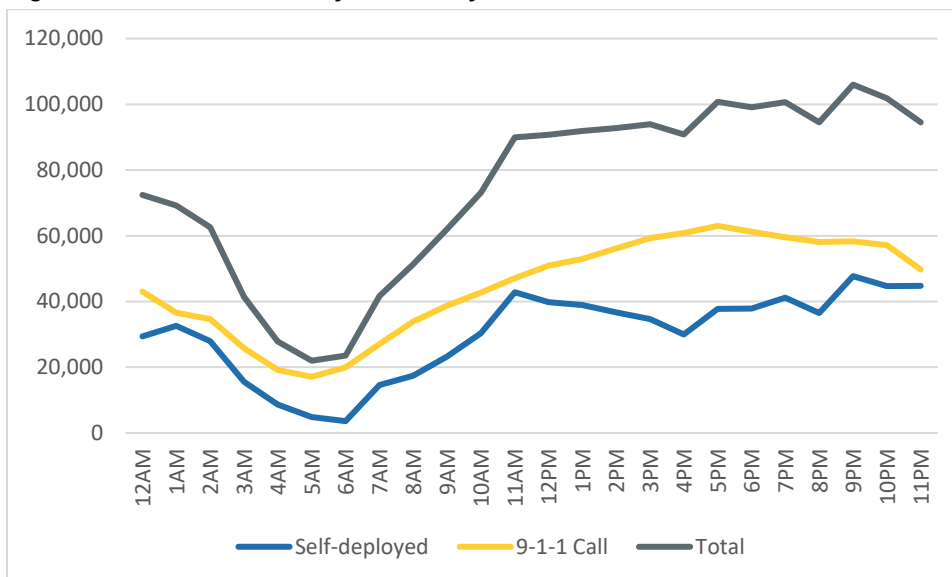
For incidents in which a unit did arrive on scene (87 percent of incidents), the average (mean) time from the initial call intake until a unit arrived on scene is 15 and a half minutes; this time is 27.8 minutes for calls that originate from 9-1-1 calls. Figure 14 presents the breakout of response times for all calls, whereas Figure 15 displays average response times for calls originating from 9-1-1 only.

As expected, when considering all calls, the most common response time is less than 5 minutes, whereas when considering 9-1-1 calls only, the most common response time is between 5 and 10 minutes. The assessment team notes that some incidents have extremely long response times (ranging into months), and these outliers do influence the mean. Unfortunately, it is impossible to discern from the data whether these calls reflect data entry errors or legitimately lengthy response times, and we cannot determine an appropriate cutoff point beyond which to discard these data.

Figure 14. Time from intake to arrival on scene in minutes, all calls
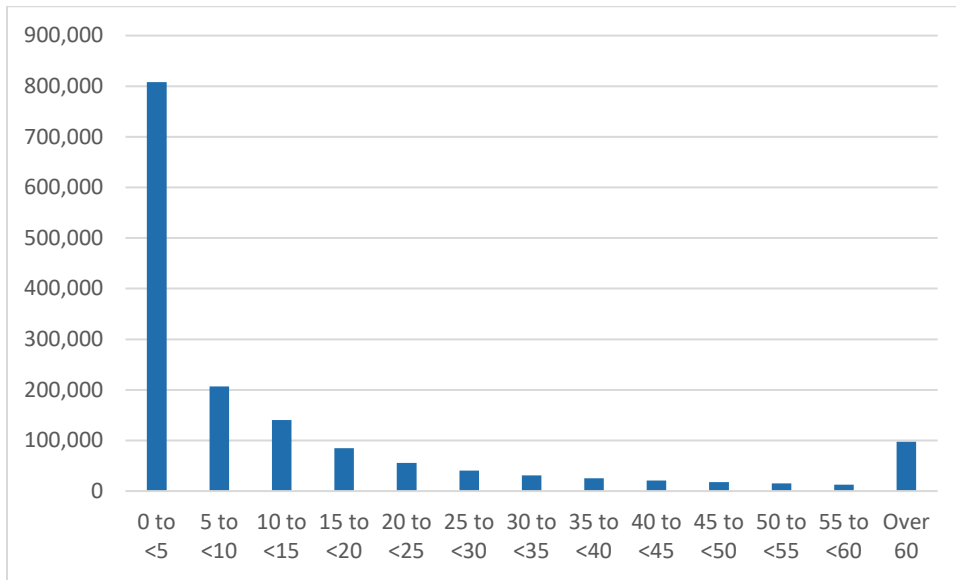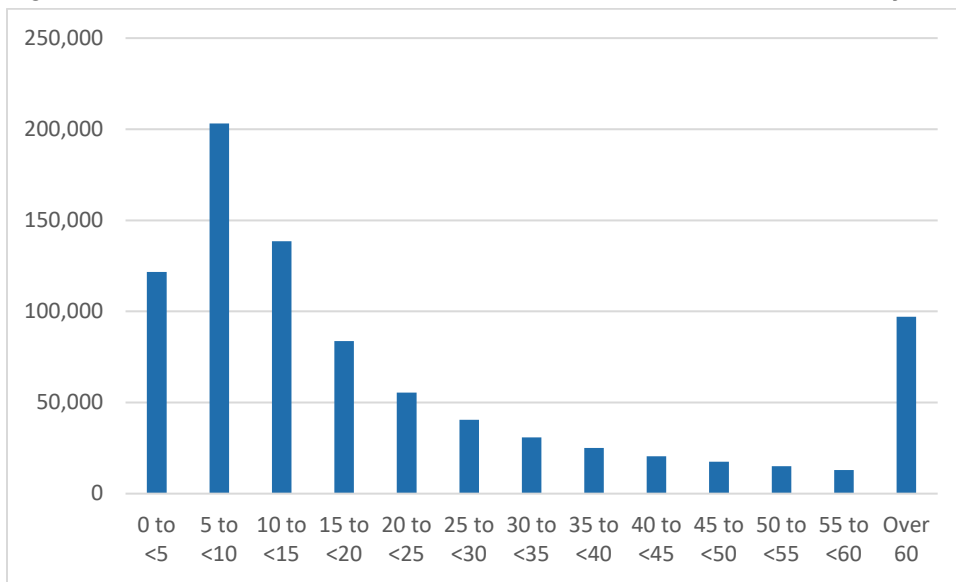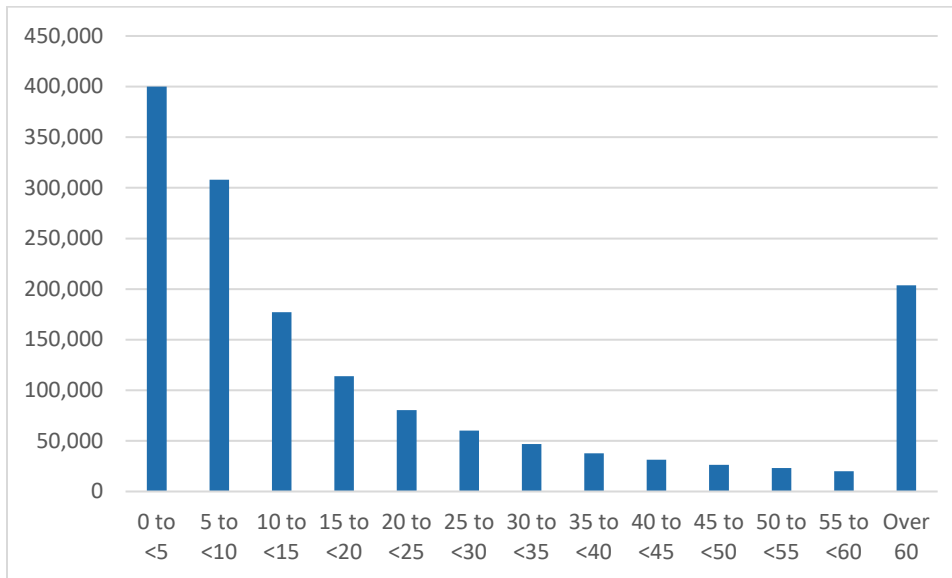

Figure 15. Time from intake to arrival on scene in minutes, 9-1-1 response only

For incidents in which a unit did arrive on scene, the average time from arrival until the call was cleared is 30.9 minutes. Figure 16 presents the breakout of time to clear a call from arrival.

Figure 16. Time from arrival on scene until call cleared in minutes

Taken together, the analyses above present a compelling pattern, in that many calls are both arrived to and cleared relatively quickly but a substantial number require more than an hour for response time or clearing. This pattern suggests the need to disaggregate the data to understand which types of calls are driving the two ends of the data, which we proceed to next.

Problem nature codes

During the analyzed time period, the MECC used 167 PNCs as the final code associated with a call. In this section, we use both the initial codes and the final codes at different points (unlike the staffing analysis, which relies solely on initial codes). We are primarily interested in final codes because these reflect the most accurate assessment of the incident type (e.g., the assessment by officers after arriving at and assessing the scene). However, we also include analysis comparing initial to final codes.

By their nature, PNCs are extremely specific. This specificity is important because these codes help prepare officers for the situation they are responding to and help Minneapolis first responders understand what types of calls for service they encounter. Some codes are used quite rarely (e.g., Aircraft Crash in City) but are still important to classify separately. In addition, certain closely related PNCs, such as Stabbing and Stabbing Report Only, are important to categorize separately because they entail different response deployments—police only versus police and emergency medical services.

Least frequently used codes

Our assessment team reviewed the PNCs currently in use and did not identify any obvious duplication in codes. We did identify some low-use codes (50 or fewer uses in five years) that should be considered for elimination, summarized in Table 7. Not all low-use codes should be considered for

elimination; codes that are used for particularly severe or specific incidents should be retained, as we note in the table. We also acknowledge that we do not have intensive working knowledge of City operations, and there may be reasons to retain these codes despite their low overall use in incidents. The ultimate determination to remove codes should be made by City staff with this working knowledge.

Table 7. Low-use problem nature codes

Problem Nature Code[a]	Times Used	Suggested Action	Reasoning
Barge(s) Loose (PF)	1	Retain	Severity of incident
Shortness of Breath (FE)	1	Remove	Lack of use suggests these incidents are typically coded under another code
Aircraft Alert - Standby (PFE)	2	Retain	Part of a code series
Bicycle Violation (UM)	2	Combine	Several codes for university response are similar in nature and could be combined into fewer categories in MECC's data system
Aircraft Crash in City (PFE)	3	Retain	Severity of incident
Aircraft Alert - Notify (PFE)	4	Retain	Part of a code series
BDS Alert (Main PO) (PFE)	4	Retain	Severity of incident
ESP Activation (P)	4	Retain	Severity of incident
No Tag (UM)	4	Combine	Several codes for university response are similar in nature and could be combined into fewer categories in MECC's data system
Pedestrian Contact	5	Remove	Lack of use suggests these incidents are typically coded under another code
Skateboarder Violation (UM)	6	Combine	Several codes for university response are similar in nature and could be combined into fewer categories in MECC's data system
Explosion - Vehicle (PFE)	7	Retain	Severity of incident
Wires Down (F)	8	Retain	Severity of incident
Rescue - Bldg Collapse (PFE)	9	Retain	Severity of incident
Drowning (PFE)	10	Retain	Severity of incident and custom response requirements
Alcohol Violation (UM)	11	Combine	Several codes for university response are similar in nature

Problem Nature Code[a]	Times Used	Suggested Action	Reasoning
			and could be combined into fewer categories in MECC's data system
Explosion - Structure (PFE)	11	Retain	Severity of incident
Driving While Intoxicated (UM)	27	Combine	Several codes for university response are similar in nature and could be combined into fewer categories in MECC's data system
Overdose - Accidental (PE)	35	Retain	This code differentiates from overdoses requiring police response
Animal Fight (P)	39	Retain	Custom response requirements
Harassment (UM)	46	Combine	Several codes for university response are similar in nature and could be combined into fewer categories in MECC's data system
Robbery of Biz - Report (P)	46	Remove	Lack of use suggests these incidents are typically coded under another code
Non-Vehicular Accident (UM)	50	Combine	Several codes for university response are similar in nature and could be combined into fewer categories in MECC's data system
SAFE (P)	50	N/A	This code has already been removed

[a] The abbreviations following each PNC refer to the default first responders for the PNC: P represents police, F represents fire, E represents emergency medical services, and UM references university response.

Most frequently used codes

Another consideration when implementing coding structures is whether some codes are used too frequently or lack sufficient specificity. Table 8 presents the most frequently used codes, those with more than 25,000 uses in the five-year analysis period. Most of these codes are at an appropriate level of specificity—they represent call types commonly used in many law enforcement agencies. We do suggest revising the Emotionally Disturbed Person code to reflect emerging preferred language. Although this term was once common parlance in law enforcement agencies, an increasing number are adjusting to use terms such as "individual in mental health crisis" instead. A working group

including MPD, Minneapolis Fire Department, EMS, and MECC personnel is currently working to address this issue.

Table 8. Frequently used problem nature codes

Problem Nature Code	Times Used
Directed Patrol (P)	229,511
Business Check (P)	125,032
Traffic Law Enforcement (P)	107,452
Disturbance (P)	77,314
Suspicious Person (P)	69,478
Check the Welfare (P)	69,384
Unwanted Person (P)	60,729
Suspicious Vehicle (P)	55,547
Foot Beat (P)	48,096
Miscellaneous (P)	47,569
Domestic (P)	45,139
Unknown Wireless/Cell Phone(P)	44,827
Property Damage Accident (P)	42,280
Unknown Trouble (P)	39,171
Theft - Report Only (P)	36,037
Audible Business Alarm (P)	29,695
Emotionally Disturb Person (P)	28,443
Down Outside-One (PE)	26,771
Property Damage/Hit & Run (P)	26,765
Assist EMS Personnel (P)	25,985

Use of the "Miscellaneous" code

We also note that the Miscellaneous PNC is used very frequently in the current coding structure. Although this frequent use is typical in many agencies, it hinders complete analysis of calls-for-service data. To better understand the use of this code, we cross-tabulated it against other characteristics of the incidents. Table 9 summarizes these tabulations. Of particular note is that most uses of the Miscellaneous PNC are for non–9-1-1 call incidents and that nearly a quarter of Miscellaneous PNC calls result in a call disposition of "Report," with an additional 17 percent resulting in a call disposition of "Information." We suggest that the City determine a method to capture, at a minimum, these two categories of responses into a separate problem nature code or codes to more accurately reflect the incident characteristics.

Table 9. Characteristics of the Miscellaneous problem nature code's use

Characteristic	Percentage
Related to a 9-1-1 call	19%

Characteristic	Percentage
Unit arrived on scene	80%
Call cancelled	12%
Call disposition: Report	25%
Call disposition: Information	17%
Call disposition: All OK	14%
No call disposition	11%

In reviewing the frequency of code use, our main takeaway is that overall, the PNC list seems to be well crafted to capture incident characteristics, although we also understand that dispatchers find the number of different codes somewhat burdensome (see Section 4 for more information on this issue). For data quality reasons, we always encourage agencies to reduce use of "other" and "miscellaneous" categories, and we do here as well. This analysis informs several of our recommendations below.

Problem nature codes and other characteristics

The MECC codes both an initial PNC and a final PNC for each incident. The initial PNC and final PNC are the same 88 percent of the time. We consider here the 12 percent of incidents in which the PNC does change.

Of those incidents with a change in PNC, 70 percent are 9-1-1 call responses. This is somewhat higher than the overall ratio of 9-1-1 call incidents, which makes sense contextually. Officers are likely able to classify incidents more accurately on first sight than community members.

First, we consider which PNCs, when coded initially, are the most commonly changed.[13] Nine PNCs are changed 50 percent of the time or more frequently, as shown in Table 10. Many of these codes are also infrequently used, with the exception being the code for Possible Personal Injury Accident. This code is deliberately included in the system for accidents in which the call taker cannot discern whether emergency medical response is required and a police unit is dispatched to make that determination. The code is then changed if necessary. The other most frequently used and changed code is Referral; this code is now deprecated (i.e., no longer in active use but retained in the CAD system for historical data). Although these codes are often changed, we do not recommend changes to the codes beyond those already noted above because the more commonly used are being used appropriately as temporary placeholders and the others are infrequently used.

---

[13] There are 263 administrative use PNCs used only for initial coding that are changed 100 percent of the time to the more general form of that code. Here we omit those codes from analysis. We also omit the On Site PNC, which is a placeholder during initial police response for self-deployed calls and is updated once the officer discerns the nature of the situation.

Table 10. Frequently changed initial problem nature codes

Initial Problem Nature Code	Times Used	Percent Changed
Aircraft Crash in City (PFE)	10	80%
Driving While Intoxicated (UM)	10	80%
Alcohol Violation (UM)	20	75%
No Tag (UM)	13	69%
Drowning (PFE)	28	68%
Aircraft Alert - Standby (PFE)	5	60%
Poss Personal Injury Acc (P)	8,695	59%
Referral (P)	995	56%
Pedestrian Contact	10	50%

Next, we consider the most common combinations of initial and final PNCs. (A complete cross-tabulation is available upon request; here we feature just the most common combinations for the sake of space and readability.) In this analysis, we again omit the codes noted in footnote 13 as well as those in Table 10 because we have already explored these.

Table 11 summarizes the most common pairs among changed PNCs. Several notable patterns stand out in this table. First, the Miscellaneous code again appears frequently, with the final code being Directed Patrol. We suggest that the MECC and MPD review communication protocols associated with officers going on directed patrol to reduce or eliminate initial coding of that activity into the Miscellaneous PNC. Similarly, Foot Beat is commonly reclassified to Directed Patrol, suggesting the need for similar clarification.

The Domestic Abuse-In Progress code is often recoded to other PNCs in the final assessment. Most commonly it is recoded to Domestic, which presumably reflects that the incident is no longer in progress, and in other cases it is recoded to Unwanted Person or Disturbance. Similarly, Unknown Trouble is frequently recoded to Domestic, likely because the initial 9-1-1 caller is uncertain of the nature of a disturbance they are reporting and officers are able to clarify upon arrival.

Another frequently recoded code is Emotionally Disturbed Person being revised to Check the Welfare. The assessment team imagines that this change again reflects an initial report from a community member in which the situation is ultimately determined not to involve a mental health crisis by responding officers, who then recode the incident to the broader welfare check category.

Lastly, two incident types are commonly recoded to Disturbance: Assault in Progress and Fight. This finding seems to represent a problem being reclassified to a broader category from a more specific one, which is the reverse of what is typically expected. We encourage the MECC and MPD to ensure that these recodings are not resulting in loss of specificity because Disturbance is defined in the PNC index as for use when another more specific code is not available.

Table 11. Comparison of initial and final problem nature codes for most frequent combinations

Initial Problem Nature Code	Final Problem Nature Code	Count
Domestic Abuse-In Progress (P)	Domestic (P)	9,899
Assault in Progress (P)	Disturbance (P)	2,695
Miscellaneous (P)	Directed Patrol (P)	2,234
Property Damage Accident (P)	Property Damage/Hit & Run (P)	2,193
Domestic Abuse-In Progress (P)	Unwanted Person (P)	1,743
Domestic Abuse-In Progress (P)	Disturbance (P)	1,564
Unknown Trouble (P)	Domestic (P)	1,523
Emotionally Disturb Person (P)	Check the Welfare (P)	1,448
Foot Beat (P)	Directed Patrol (P)	1,284
Fight (P)	Disturbance (P)	1,261

Priority levels analysis

We also consider the priority levels assigned to calls. Each PNC has an associated priority level, documented in MECC policy. Priority 0 calls are the most urgent, and priority 3 calls are the least. A priority designation of 9 is used as a placeholder. We restrict this analysis to calls in which (1) the incident was initiated by a 9-1-1 call (because response times for self-initiated calls are substantively different), (2) a unit arrived on scene in response to the incident, and (3) the initial priority code was between 0 and 3. Here we define response time as the number of minutes from the initial call being received until a unit arrived on scene.

As expected, most responses are for priority levels 1 and 2, and the response time is slower for lower priority calls (Table 12).

Table 12. Priority level frequency and response times

Initial Priority Level	Count[a]	Average Response Time (minutes)
0	1,294	6
1	384,825	12
2	376,432	38
3	88,368	49

[a] Note that counts in this section differ from other analyses because of the data restrictions listed above.

Response time analysis

We next consider whether there are particular PNCs for which response times are considerably greater or less than would be anticipated based on their priority level. For this analysis, we further limit our sample to PNCs that were used at least 1,000 times over the five-year period because it would be difficult to disentangle patterns when reviewing every PNC. We also limit to incidents in

which the PNC was the same in the initial and final designation because these incidents offer the simplest interpretation of any observed differences in response times.

After comparing averages by PNC to the overall average for the designated priority level that the PNC falls within, we found 13 PNCs with unusually shorter or longer response times, defined as response times that are either less than 50 percent or more than 150 percent of the average for their priority level. For example, our analysis captured PNCs designated as priority level 1 that had a unit on scene in less than 6 minutes or more than 18 minutes.

As seen in Table 13, most of the PNCs with substantively different response times have an initial priority level of 1. Most of these reflect shorter response times than the average, which is not concerning, particularly for level 1 calls. However, the Domestic PNC has an average response time that is more than twice the average for a priority level 1 call. We suggest that the MPD review this discrepancy, identify the underlying cause, and address it to ensure that these calls are responded to efficiently.

Among the other calls, the Burglary Business – Report PNC is noted as priority level 2 but typically takes more than an hour to respond to, considerably longer than the average response time of 38 minutes for priority level 2 calls. Based on the PNC description, this code is used to collect information about a burglary at a business that has already taken place. This PNC might be better aligned with priority level 3, given it is not a crime in progress and could be handled on a longer time frame.

Table 13. Problem nature codes with response times notably above or below the average for their assigned priority level

Initial Priority	Problem Nature Code	Average Response Time (minutes)	Count	Average Time for Priority Level	Difference	Direction
1	Assist EMS Personnel (P)	6.7	14,970	12	−5.3	Shorter
1	Assist Fire Personnel (P)	7.1	2,082	12	−4.9	Shorter
1	Domestic (P)	26.8	1,114	12	+14.8	Longer
1	Down Outside-One (PE)	7.5	15,640	12	−4.5	Shorter
1	Down Outside-One w/Fire (PFE)	7.2	4,229	12	−4.8	Shorter
1	Holdup Alarm (P)	5.9	1,906	12	−6.1	Shorter
1	Overdose-Accidental (E)	5.9	3,308	12	−6.1	Shorter
1	ShotSpotter Activation (P)	7.6	4,818	12	−4.4	Shorter
1	Slumper w/Fire (PFE)	7.7	1,174	12	−4.3	Shorter
2	Burglary Business - Report (P)	79.4	1,541	38	+41.4	Longer

Initial Priority	Problem Nature Code	Average Response Time (minutes)	Count	Average Time for Priority Level	Difference	Direction
2	Suspected Prostitute (P)	25.1	1,217	38	−12.9	Shorter
3	Drunk/Intoxicated Person (P)	29.8	2,128	49	−19.2	Shorter
3	Miscellaneous (P)	29.3	2,991	49	−19.7	Shorter

Call length analysis

Another topic of interest when considering PNCs is the time typically associated with clearing a call for different codes. Understanding this time can help agencies understand staffing requirements and identify call types that could most affect staffing needs. For this analysis, we consider the final PNC and restrict the analysis to those incidents in which a unit did arrive on scene and clear the call. We analyzed the time from arrival on scene until the call was cleared in minutes, on average, by PNC.[14] As noted above, the average call clearance time is 30.9 minutes. When considering the time by PNC, the PNC with the longest average time to clear—1,020 minutes—is for structure explosions, of which only five occurred in the five-year period. The shortest average time to clear for a PNC that is not procedural or a university code is for firecrackers, averaging 9 minutes to clear the call across 1,256 incidents.

Table 14 summarizes the PNCs associated with the longest times to clear the call. We include the 17 PNCs that last more than two hours on average.

Calls for mental health response are of particular interest in terms of time spent on the call. Based on these data, the MPD spends, on average, 40 and a half minutes on calls under the Emotionally Disturbed Person PNC, which is longer than the average call length by about 10 minutes. Although this is not a dramatic difference from the average call, the MPD responded to more than 25,000 of these calls in the five-year period, representing more than 3,000 hours of officer time. We encourage the City to continue considering alternate response models, as described in Section 2, that could reduce officer time spent dispatched on these calls.

Table 14. Longest problem nature code times to clear call

Problem Nature Code	Average Time to Clear Call (minutes)	Count
Explosion-Structure (PFE)	1,020	5
Personal Injury w/ Trap (PFE)	308	100
Shooting (PFE)	280	1,196

---

[14] Note that this time is definitionally different from the time spent on a call used in the staffing analysis, which also considered the time the officer spends in transit. Here we are concerned not with officer time spent in total but with the time spent actually responding to the call and not in transit to the call.

Problem Nature Code	Average Time to Clear Call (minutes)	Count
Police Event (P)	230	383
Motor Vehicle Chase (P)	195	670
Driving While Intoxicated (UM)	188	25
Dead Person (P)	169	2,532
Officer Needs Help (P)	146	700
Stabbing (PE)	135	1,019
Chase on Foot (P)	135	623
Crim Sex Conduct/Report (P)	134	2,266
Shooting Report Only (P)	132	483
Crim Sex Conduct (P)	132	859
High Risk Warrant Entry (P)	129	1,401
Robbery Dwell in Progress (P)	123	133
Stabbing Report Only (P)	123	259
Robbery of Biz in Progress (P)	122	549

Recommendations

Recommendation 20: The MECC should revise the Emotionally Disturbed Person PNC title and description to reflect recent changes in preferred language for describing these situations (e.g., "Individual Experiencing Mental Health Crisis"). These changes should be reflected throughout policy and practice in both MECC and MPD documents. A working group including MPD, Minneapolis Fire Department, EMS, and MECC personnel is currently working to address this issue.

Recommendation 21: The City should work to better classify incidents currently captured in the Miscellaneous PNC, particularly those incidents with dispositions of "Report" or "Information." This practice would considerably reduce the use of the Miscellaneous code.

Recommendation 22: The MECC and MPD should review communication protocols associated with officers going on directed patrol to reduce or eliminate initial coding of that activity into the Miscellaneous PNC.

Recommendation 23: The MPD should review its response process for Domestic PNC calls, identify the underlying cause for the lengthy response time for these calls, and address it to ensure that these calls are responded to efficiently.

Recommendation 24: The City should consider recoding the Burglary Business – Report PNC to priority level 3.

Recommendation 25: Community members are generally satisfied, in nonemergencies, with a predictable response rather than a rapid response. Whenever possible, the MECC should

have protocol and a script to provide callers with an estimate of the response time given call prioritization. This practice can also work well in parallel with alternative response models (such as self-reporting of minor vehicle accidents and property crimes).

This page intentionally left blank.

Section 4: Business Process Analysis

Introduction

The success of the MPD Patrol Bureau relies on efficient and effective administrative and operational policies, especially when operating with a persistent reduction in staffing levels. These policies include the processes for responding to calls for service, assigning patrol officers across police precincts, using specialty units, and initiating investigations and gathering evidence at crime scenes. It is important to understand the context and workload of these administrative and operational policies. Understanding these processes, including "pain points" within them that lead to frustration or inefficiencies, is foundational to developing actionable and practical recommendations and improving the MPD's effectiveness.
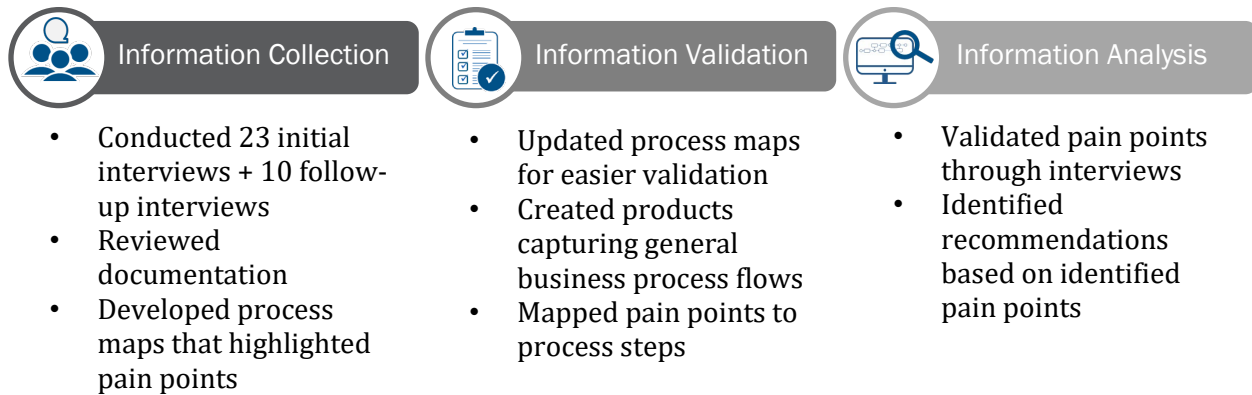
Approach

As described in Section 2, the assessment team conducted 23 semi-structured interviews in August 2021 with representatives from the MPD and MECC to develop an understanding of formal police and dispatch policies and practices. These interviewees included individuals at all levels, from the Deputy Chief to line officers, as well as MECC managers and dispatchers. We also conducted 10 follow-up semi-structured interviews in December 2021 with a similar range of staff. The follow-up interviews were specifically focused on business processes and pain points, supplementing the information procured during the original round of interviews. As noted above, the ongoing COVID-19 pandemic forced the assessment team to conduct all original and follow-up interviews virtually, in accordance with national public safety guidelines. We used both Microsoft Teams and Zoom for the interviews.

CNA used qualitative thematic analysis principles to review the interview notes and identify themes specific to business processes and pain points. These themes coalesced around four primary groups of processes and pain points: MECC/dispatch, patrol, specialty units, and investigative functions. The pain points we identified make delivering services more challenging for MPD and MECC personnel. Some of the identified pain points also highlight the emotionally challenging aspects of their work.

CNA used a repeated approach to collect, validate, and analyze the processes used by MPD staff. We reviewed the documents provided by the MECC and MPD to create an initial business process diagram. We supplemented and augmented this diagram using information on these processes obtained from the interviews with those directly engaged in them. The resulting business process highlights the general flow of activities and information from an initial call through the completion and closeout of investigative functions, with the pain points identified at the applicable steps along the process. Figure 17 provides an overview of the steps involved in our approach.

Figure 17. Business process analysis approach

| Information Collection	Information Validation	Information Analysis
• Conducted 23 initial interviews + 10 follow-up interviews • Reviewed documentation • Developed process maps that highlighted pain points	• Updated process maps for easier validation • Created products capturing general business process flows • Mapped pain points to process steps	• Validated pain points through interviews • Identified recommendations based on identified pain points

Findings

The pain points are aligned to where in the business process analysis they were originally identified. For each section, we present a high-level business process and the pain points identified from the interviews. It is worth emphasizing that staffing shortages were identified as an issue across the board. Every MECC and MPD interviewee noted the low levels of staff they are experiencing and explained that this understaffing is significantly affecting their ability to perform efficiently and effectively. However, CNA also identified other pain points from these interviews, which are described in the following sections.

MECC

Call taker

The role of call taker is relatively new in the MECC; this role used to be part of the general dispatcher duties. Figure 18 provides the high-level business process reviewed for call takers.

Figure 18. Business process flow for call takers
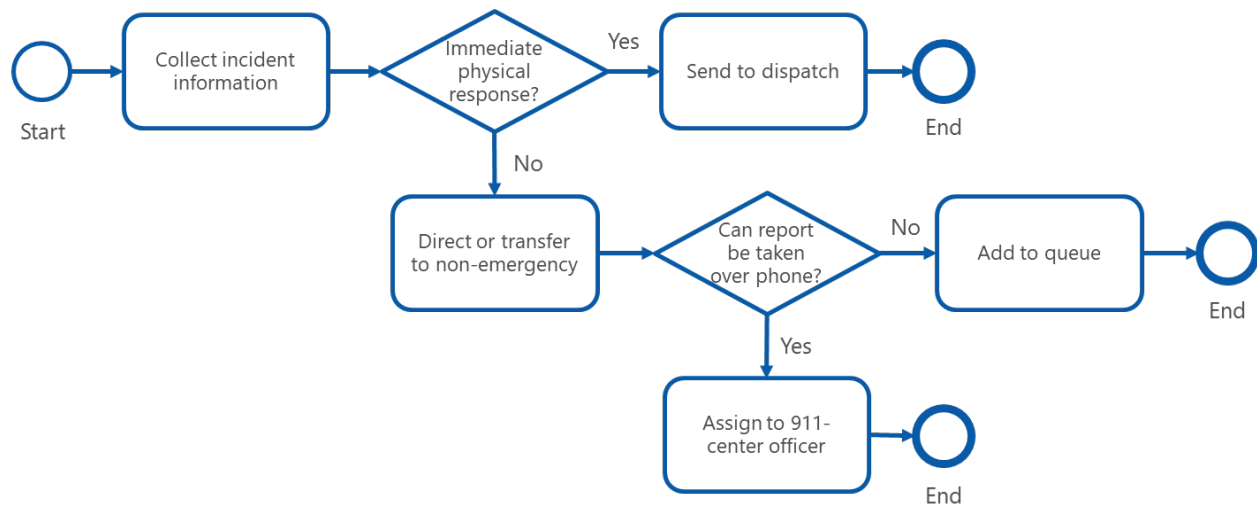
Summary of pain points

Collecting incident information from calls for service. As expected, the process for responding to calls can vary substantially based on the nature of the call and the needs of the caller. There are some specific challenges related to collecting incident information. As a result, individual call takers must make a lot of inferences to get the information necessary for assessing priority levels and transferring calls to dispatch. For example, call takers must determine whether the call requires a uniformed police response, while also addressing the caller's stated preferences for or against such a response. Also, call takers have perceived an increase in instances in which the caller includes nonfactual details to ensure a quicker response time (e.g., exaggerating elements of danger that would ensure a more rapid response). In addition, call takers are responsible for answering both emergency and nonemergency lines and determining what type of service or response is needed.

Number of PNCs during initial assessment. The relatively higher number of PNCs for police-related calls presents challenges to call takers during the initial information collection phase. A MECC dispatcher highlighted the disproportionate number of PNCs for fire (4) versus police (34) as well as the need for dispatchers to update PNCs based on the documented narratives as specific challenges related to the assignment of PNCs during call intake. However, the interviewee also acknowledged that a recent review of these PNCs indicated that these numbers make sense from a categorization perspective based on the types of calls.

Challenging and high-stress work environment. The emotionally challenging work environment presents challenges in retention of skills. Before the call taker role was separated from dispatch, interviewees noted that moving people from phone to dispatch was an additional source of stress. Furthermore, the MECC did not have permanent leadership at the time of CNA's interviews, which could serve as an additional source of strain among department personnel.

Dispatch

The dispatch role is particularly challenging because it requires continuous monitoring and tracking of information (both visual and audio) across multiple systems. Figure 19 provides the high-level business process reviewed for dispatch.

Figure 19. Business process flow for dispatch
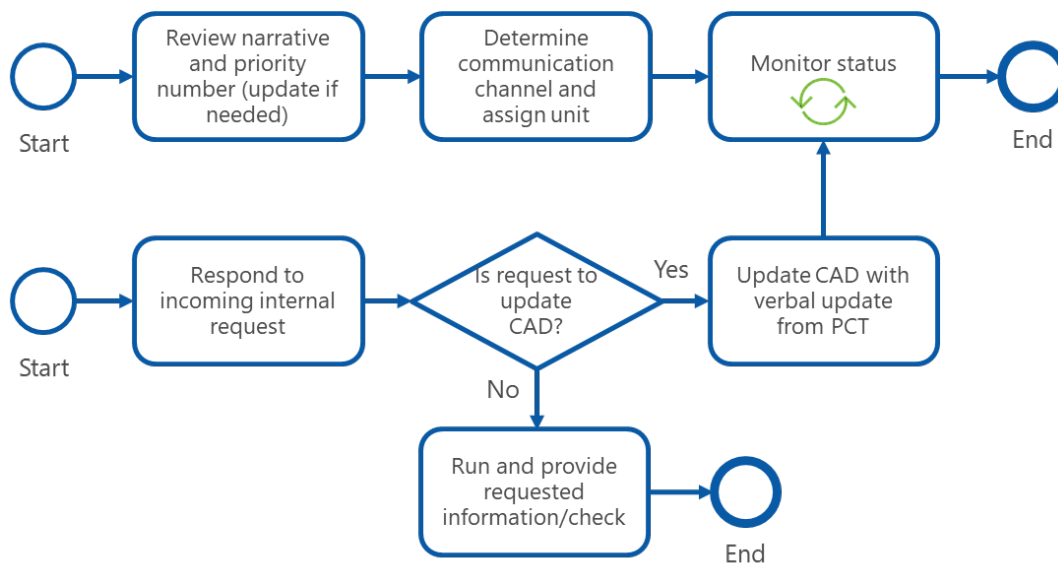
Summary of pain points

Interpreting the narrative. The caller's desire, or lack thereof, to see an officer often affects the accuracy of the narrative. Dispatch relies heavily on the details contained in the narrative when assessing priority and assigning resources.

Continuous monitoring using multiple systems. Dispatchers need to keep track of a wide range of information and activities as part of their continuous monitoring and dissemination activities. This process involves tracking information across multiple systems, leading to challenges and inefficiencies in how information is presented. Having access to consolidated information presented in an easily digestible format would improve the ability to continuously monitor status.

Deactivating calls for service. A call can be deactivated when it is no longer relevant or when too much time has elapsed. However, no formal guidelines for deactivating a call currently exist, except the directive to not deactivate calls without approval from a sergeant in the field, which leads to inconsistencies in the process.

Patrol

Nearly every interviewee highlighted the amount of time spent on mental health–related calls and non-patrol-related activities. In late 2021, the City began a partnership with Canopy Mental Health and Consulting to deploy behavioral health response teams. These teams are dispatched to some of

the behavioral health PNCs in lieu of MPD officers. CNA was able to garner initial impressions about these teams during the follow-up interviews conducted in December 2021. Interviewees across the board had positive thoughts about this pilot program and noted its potential for taking some of the more time-consuming calls (see Section 1, task three) away from patrol officers. Still, this program has not fully alleviated the time commitment from patrol, and several main issues persist. Figure 20 provides the high-level business process reviewed for patrol.

Figure 20. Business process flow for patrol
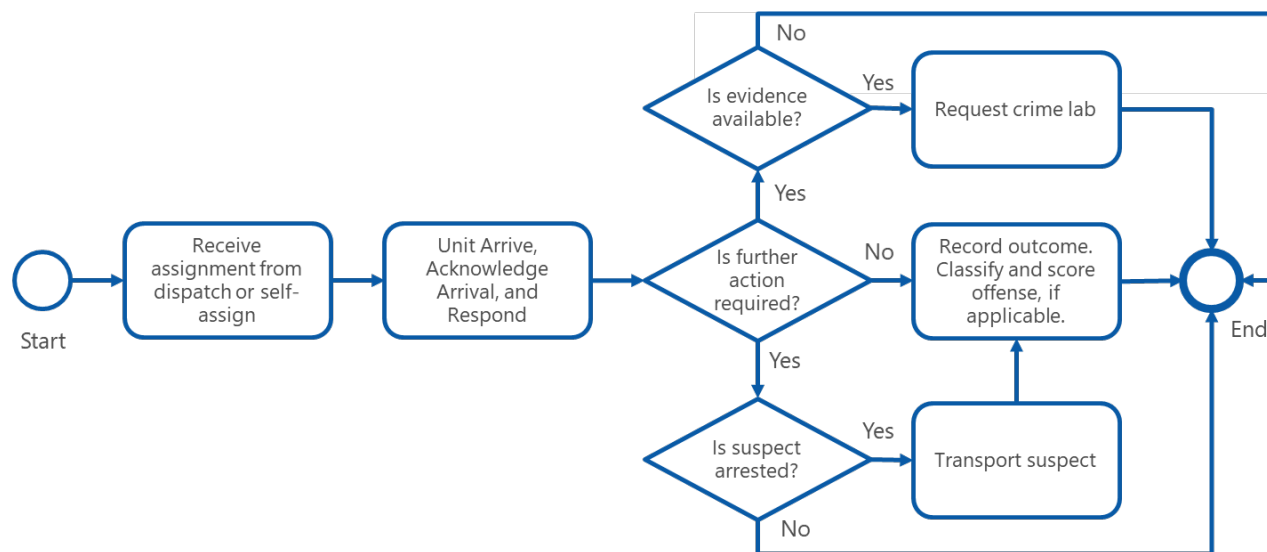
Summary of pain points

Staffing priorities. All positions are understaffed, and there is general misalignment of guidance and the associated priorities. For example, interviewees noted that property crimes require more evidence and resources from the MPD to prosecute than they have in the past, resulting in fewer convictions for a relatively high amount of effort and attention. Another example from the interviews is the level of effort required from patrol officers to detain suspects, particularly juveniles, who are immediately released.

Time-consuming responses. The time spent on mental health–related calls is perceived as being very high compared to other call types. The behavioral health response teams specializing in mental health have been positively viewed after the initial rollout. However, interviewees voiced concerns that the behavioral health response teams cost more than patrols, which may affect their utilization. In addition, officers are still required to respond to EDP and mental health–related calls that are deemed too dangerous for civilians. These calls involve specific processes, such as waiting for an ambulance, that contribute to increased time spent. Similarly, the civilian unit will not transport an individual deemed violent or aggressive, which can tie up sworn personnel.

Non-patrol-related commitments. The time spent on non-patrol-related items, such as training, takes away from time spent in the community. One solution suggested during the interviews was to expand the use of role-playing by actors instead of uniformed officers during training.

Communicating with the public. The MPD has opportunities to develop general guidance and standards for communicating with the public. For example, explaining a situation when arriving on scene is often more effective than telling bystanders to mind their own business. MPD officers have also had to communicate staffing challenges to the public when explaining delays in responding to calls, and would benefit from specific language to use consistently in these circumstances.

Specialty units

The specialty units were not a primary focus of the interviews, but CNA was able to identify some specific pain points associated with a few of these functions, including strategic operations and crime analysis, "gangs and guns" investigations, mental health response teams, and auto theft specialists. Figure 21 provides the high-level business process reviewed for specialty units and functions.

Figure 21. Business process flow for specialty units
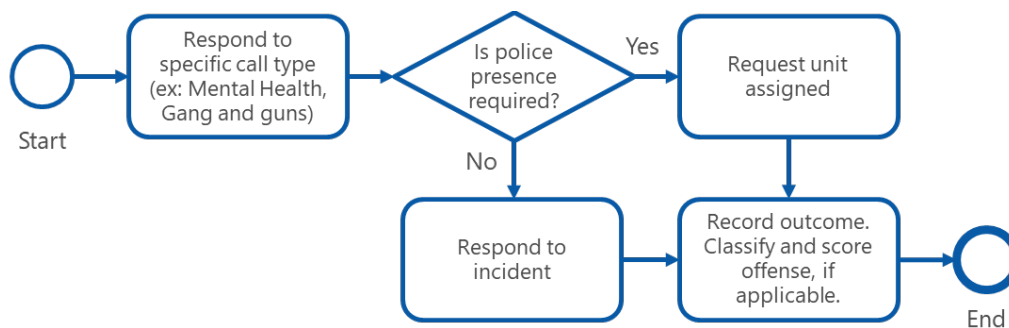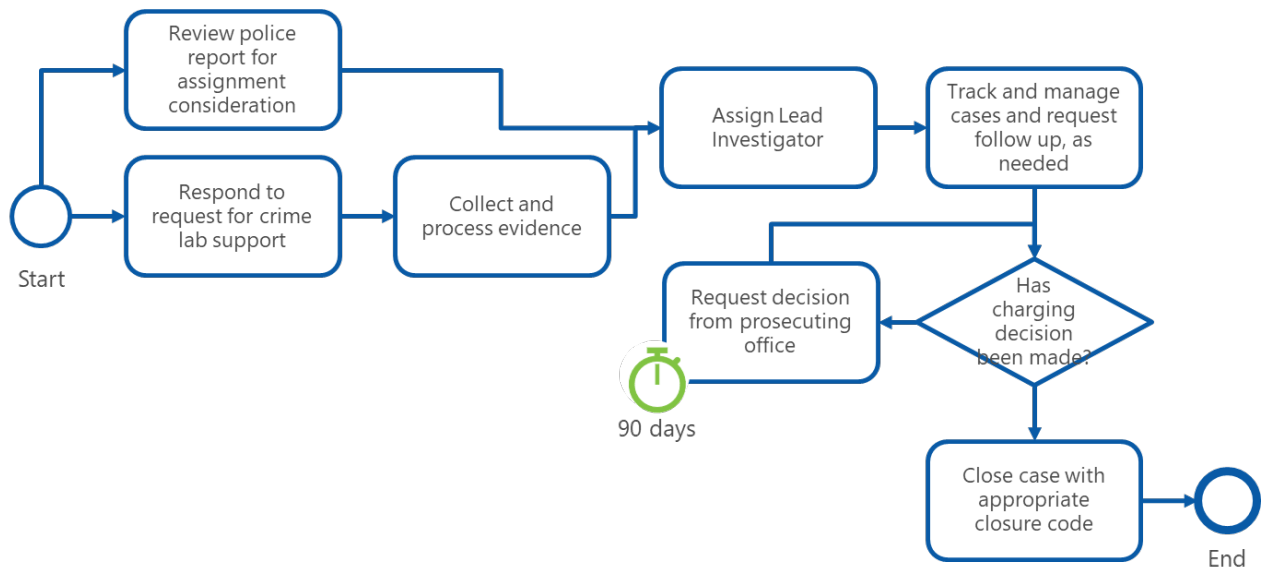

Summary of pain points

Lack of unified command. There is a lot of opportunity for using real-time data and analysis to support patrol and improve collaboration across teams. However, the lack of a unified command makes information sharing and collaboration more difficult. For example, it is unclear how the Strategic Information Center supports intelligence separate from the analysis performed in Operations Analysis.

Inability to leverage some units during high demand. Some units are available to help with patrol presence but not available to help respond to calls, which can add to challenges in keeping up with call volumes.

Investigative functions

The investigative functions are fairly well documented and tracked in MPD systems. Figure 22 provides the high-level business process reviewed for investigative functions.

Figure 22. Business process flow for assigning and managing investigative cases

Summary of pain points

Staffing shortages creating a backlog. Multiple instances of staffing shortages have created issues in the MPD's investigative functions. For example, there are not enough forensic staff to process evidence in a timely manner, with impounded cars often taking two to eight weeks to process and DNA taking as long as six to eight weeks.

Lack of standard process for processing crimes. The standards for prosecuting property crimes have been raised by the district attorney, leading to a general need to standardize the process for investigating these crimes. Additionally, no monetary value is set for burglaries, which has been a challenge for prioritizing investigative work because there is no set standard.

Other pain points

Precinct structure and associated resources. The 3rd precinct does not have a "home" from which it can manage its operations. The precinct is currently renting space in another building. Lack of dedicated space was cited as a general challenge for morale and ability to respond to calls for service. There may be an opportunity to combine precincts to combine resources.

Community relationships are strained. Relationships with the community are strained, leading to a decrease in trust on both sides. For example, callers are increasingly providing incorrect information during a call to accelerate police response, and police are no longer able to proactively engage with communities.

Recommendations

Recommendation 26: The MECC and MPD should review whether some of the automation processes used by Fire can be modified and applied to police calls for service. In the absence of automation, development of a decision tree outlining various scenarios could increase standardization.

Recommendation 27: The MECC should consider streamlining processes for emergency and nonemergency lines because the same people are answering both.

Recommendation 28: The MECC and MPD should define or develop standard processes or criteria for the deactivation of a call to ensure standardization across the unit.

Recommendation 29: The MECC should look for opportunities to simplify and consolidate information presented to dispatchers. This practice will help reduce the number of systems that need to be used and streamline the overall process.

Recommendation 30: Health and wellness are acute concerns in the dispatcher community. Dispatching is a sedentary yet highly stressful occupation, particularly during times of severe staffing shortages. Mental and physical health are key factors in retaining personnel. Accordingly, steps should be taken to address these issues. The MECC should consider offering time for short walks (outside or on a treadmill) and providing snacks with healthy options. The MECC should also make stress-related counseling regularly accessible to personnel. Given the lack of natural light in the current location, thought should be given to investing in lighting more conducive to a healthy environment.

Recommendation 31: The MPD, and particularly precinct leads, should clearly define response priority based on the staffing level available. This priority needs to be clearly defined and communicated both internally to the MPD and externally to callers and City leadership because general frustration is felt across the board.

Recommendation 32: The MECC should identify permanent leadership. At the time of CNA's interviews, the MECC did not have permanent leadership. Identifying permanent leadership positions can help create stability in the agency and serve as a basis for implementing additional improvements.

Recommendation 33: MECC and Command Center personnel have developed effective mechanisms for coordinating during regular operations as well as emergencies and crisis response, despite being located in different physical locations. These practices should be continued and regularly reviewed in case adjustments are necessary to continue to effectively operate collaboratively and under a unified command structure.

Conclusion

Many aspects of the MPD and MECC's policies, processes, and procedures are supportive of a community-oriented response model that produces efficient outcomes for the agency and the community it serves. At the same time, both entities could take steps that would bring them into closer alignment with 21st century policing practices and ideals. Some of these changes are relatively simple to implement, such as revising the use of particular language in datasets and policies. Other changes, such as implementation of alternate response models and restaffing units such as the Community Outreach Bureau to appropriate levels, will require additional investment of resources and personnel.

Although our patrol staffing analysis suggests that the MPD currently enlists sufficient patrol officers to respond to calls for service at a 50 percent performance objective rate (i.e., 50 percent of officer time spent on community-initiated calls for service), our analysis of calls for service suggests that officers are currently responding primarily to 9-1-1 calls and not engaging in self-initiated activity. This trend has developed over time, with steadily decreasing levels of self-initiated activity during the period analyzed and a particularly low level in 2020. If the MPD wishes officers to spend more time on self-initiated activity, it will need to address this through policy and practice, and potentially a higher staffing level than our analysis would initially suggest.

In addition, although our analysis could not provide estimates for other units in the MPD, we know at a minimum the Community Outreach Bureau is unstaffed. Restaffing this unit must be a priority to ensure that the MPD is able to successfully serve the community. We also heard consistently from individuals operating in specialized units that they struggle with the current workload and have reduced staffing numbers that affect efficiency. Some of these units would potentially benefit from increased use of civilian personnel to replace or supplement sworn personnel.

In all these efforts, the City should continue to explore alternate response models as appropriate to reduce the use of police response in scenarios not requiring law enforcement actions. In particular, we commend Minneapolis for enacting mental health crisis response teams in partnership with a community organization. As that effort continues to roll out and is evaluated, the City should prepare to adjust program parameters and implementation as needed for effectiveness. We also encourage the City to continue its exploration of reducing or eliminating patrol response to nonviolent property crimes, instead making these crimes self-reportable. Such changes will, however, also have implications for the patrol division investigative staff, who handle these crimes after the initial response.

PNCs in the MECC and in coordination with the MPD are largely functioning efficiently. The codes themselves are largely appropriate, although there is some room for improvement to reduce the use of the Miscellaneous code and potentially eliminate some underused codes that could be combined with other categories. Our analysis of recoding, response times, and priority levels suggests that calls are being handled appropriately in these regards.

Staffing shortages were identified as the single biggest challenge to business processes at the MPD, impacting both operations and the ability to repair relationships with the community. The staffing resources available are not sufficient to police the way that is as responsive as the interviewees would like. However, of positive note, interviewees were aware of investments in staff well-being as well as implemented organizational changes and were hopeful that these changes would improve day-to-day operations. There are opportunities to reevaluate priorities and overall organization to best support the MECC, MPD, and the community. CNA has provided recommendations to implement as a first step in improving overall business processes and reducing some of the challenges faced by staff.

It is our hope that this analysis will prove helpful to the City of Minneapolis, MPD, and MECC as they continue through the process of organizational change and evolution to embrace 21st century approaches to public safety.

Appendix A: Acronyms

Acronym	Definition
BTU	Business Technology Unit
CAD	computer-aided dispatch
CIT	crisis intervention team
COPE	Community Outreach for Psychiatric Emergencies
COPS Office	Office for Community Oriented Policing Services
CSO	community service officer
EDP	emotionally disturbed persons
ICMA	International City/County Management Association
MCT	mobile crisis team
MECC	Minneapolis Emergency Communications Center
MPD	Minneapolis Police Department
PNC	problem nature code

This page intentionally left blank.

Appendix B: References

References on staffing analysis

Anderson, J., & Dossetor, K. (2012). *First-response police officers working in single person patrols: A literature review*. Australian Institute of Criminology.

McCabe, J. (2013). *An analysis of police department staffing: How many officers do you really need?* ICMA Center for Public Safety Management White Paper.

Weiss, A. (2015). *Albuquerque Police Department comprehensive staffing assessment and resource study*. Alexander Weiss Consulting, LLC.

Wilson, J. M., & Weiss, A. (2012). *Essentials for leaders: A performance-based approach to police staffing and allocation*. Washington, DC: Office of Community Oriented Policing Services. Available online: https://cops.usdoj.gov/RIC/Publications/cops-p247-pub.pdf.

References on civilianization

Alderden, M. & Skogan, W.G. (2014). The place of civilians in policing. *Policing: An International Journal of Police Strategies & Management*, *37*(2), 259–284.

Cordner, G. (1997). Community policing: Elements and effects. In R. G. Dunham and G. P. Alpert (Eds.), *Critical issues in policing* (3rd ed.) (pp. 451–468). Prospect Hills, IL: Waveland.

Cox, R. (2012). *Addressing the shortage of police officers: Civilianizing some traditional duties of the sworn officer. A leadership white paper*. The Bill Blackwood Law Enforcement Management Institute of Texas.

Davis R., Lombardo M., Woods D., Koper C., & Hawkins, C. (2013). *Civilian staff in policing: An assessment of the 2009 Byrne Civilian Hiring Program*. Final Report to the National Institute of Justice.

Forst, B. (2000). *The privatization and civilianization of policing*. Boundary Changes in Criminal Justice: National Institute of Justice.

Hennessy, J. J. (1976). The use of civilians in police work. *The Police Chief*, 43, 36–38.

Kiedrowski, J., Melchers, R. F., Ruddell, R., & Petrunik, M. (2015). *The civilianization of police services in Canada*. Ottawa, ON: Public Safety Canada.

Kiedrowski, J., Ruddell, R., & Petrunik, M. (2019). Police civilianisation in Canada: A mixed methods investigation. *Policing and Society*, *29*(2), 204–222.

Loveday, B. (2006). Workforce modernization: implications for the police service in England and Wales. *The Police Journal*, *79*(2), 105–124.

Maguire, E. R., & King, W. R. (2004). Trends in the police industry. *ANNALS, American Academy of Political Science Society, 593*(5), 15–41.

Major City Chiefs Association (2009). *Civilianization: Risks and rewards*. Washington, DC: Major City Chiefs Association and the National Executive Institute, Federal Bureau of Investigation.

Quattlebaum, M., & Tyler, T. (2020). Beyond the law: An agenda for policing reform. *Boston University Law Review*, *100*, 1017–1046.

Rice, L. (2019). Junior partners or equal partners? Civilian investigators and the blurred boundaries of police detective work. *Policing and Society*, *30*(8), 966–981. 10.1080/10439463.2019.1632310.

San Jose Office of the City Auditor (2010). *Audit of civilianization opportunities in the San Jose Police Department*. City of San Jose, Capital of Silicon Valley.

Skolnick, J. H., & Bayley, D. H. (1986). *The new blue line: Police innovations in six American cities*. New York: The Free Press.

References on alternative response models

Compton, M. T., Broussard, B., Reed, T. A., Crisafio, A., & Watson, A. C. (2015). Surveys of police chiefs and sheriffs and of police officers about CIT programs. *Psychiatric Services*, *66*(7), 760–763.

Compton, M. T., Esterberg, M. L., McGee, R., Kotwicki, R. J., & Oliva, J. R. (2006). Crisis intervention team training: Changes in knowledge, attitudes, and stigma related to schizophrenia. *Psychiatric Services*, *57*, 1199 –120.

Cowell, A. J., Broner, N., & Dupont, R. (2004). The cost-effectiveness of criminal justice diversion programs for people with serious mental illness co-occurring with substance abuse: Four case studies. *Journal of Contemporary Criminal Justice, 20*, 292–325.

Dupont, R., & Cochran, S. (2000). Police response to mental health emergencies: Barriers to change. *Journal of the American Academy of Psychiatry and the Law, 28,* 338–344.

Gordon, S. (2021, March 11). *Fort Worth Police to start dispatching civilians to some low-risk calls*. NBCDFW. https://www.nbcdfw.com/news/local/fort-worth-police-to-start-dispatching-civilians-to-some-low-risk-calls/2577292/.

Jany, L. (2021, July 16). Minneapolis to start sending civil response teams not police to some mental health calls. *Minneapolis Star Tribune*. https://www.startribune.com/minneapolis-to-start-sending-civil-response-teams-not-police-to-some-mental-health-calls/600078792/.

Kuznitz, A., & Zhou, A. (2020, October 7). *Charlotte will divert some 911 calls to non-police responders*. Governing. https://www.governing.com/now/charlotte-will-divert-some-911-calls-to-non-police-responders.html.

Lamb H. R., Shaner, R., Elliott, D. M., De Cuir Jr., W. J., & Foltz, J. T. (1995). Outcome for psychiatric emergency patients seen by an outreach police–mental health team. *Psychiatric Services, 46*, 1267–1271.

National Alliance on Mental Illness. (n.d.). *Crisis intervention team (CIT) programs*. https://www.nami.org/Advocacy/Crisis-Intervention/Crisis-Intervention-Team-(CIT)-Programs.

National Alliance on Mental Illness Santa Clara County. (n.d.). *Community mobile response (CMR) program—Let us know what you think!* https://namisantaclara.org/2021/02/community-mobile-response-cmr-program-let-us-know-what-you-think/.

Nethers, D. (2021, September 20). *Akron discussing proposal to send trained civilian teams to low-priority calls instead of police.* Fox 8 News. https://fox8.com/news/akron-discussing-proposal-to-send-trained-civilian-teams-to-low-priority-calls-instead-of-police/.

Saint Louis, C. (2021, September 16). Rollout of program to send mental health responders to some police calls delayed. *Minneapolis Star Tribune.* https://www.startribune.com/rollout-of-program-to-send-mental-health-responders-to-some-police-calls-delayed/600098011/.

Shapiro, G. K., Cusi, A., Kirst, M., O'Campo, P., Nakhost, A., & Stergiopoulos, V. (2015). Co-responding police-mental health programs: A review. *Administration and Policy in Mental Health and Mental Health Services Research*, *42*(5), 606–620.

Strauss, G., Glenn, M., Reddi, P., Afaq, I., Podolskaya, A., Rybakova, T., … El-Mallakh, R. S. (2005). Psychiatric disposition of patients brought in by crisis intervention team police officers. *Community Mental Health Journal, 41*, 223–228.

White Bird Clinic. (n.d.). *CAHOOTS.* https://whitebirdclinic.org/cahoots/.

White Bird Clinic. (2020, October 29). *What is CAHOOTS?* https://whitebirdclinic.org/what-is-cahoots/.

References on centralization of specific functions

Horvath, F., Meesig, R. T., & Lee, Y. H. (2001). *A national survey of police policies and practices regarding the criminal investigation process: Twenty-five years after RAND.* Washington, DC: The National Institute of Justice.

Kenney, D. J., White, M. D., & Ruffinengo, M. A. (2010). Expanding the role of patrol in criminal investigations: Houston's investigative first responder project. *Police Quarterly, 13*(2), 136–160.

Manning, P. K. (1992). Information technology and the police. In M. Tonry & N. Morris (Eds.), *Modern policing* (pp. 349–398). Chicago, IL: University of Chicago Press.

McCluskey, J. D., Cancino, J. M., Tillyer, M. S., & Tillyer, R. (2014). Does organizational structure matter? Investigation centralization, case clearances, and robberies. *Police Quarterly*, *17*(3), 250–275.

Sanders, W. B. (1977). *Detective work: A study of criminal investigations.* New York: Free Press.

References on one- versus two-person patrol car use

Carmen, A., & Guevara, L. (2003). Police officers on two-officer units: A study of attitudinal responses towards a patrol experiment. *Policing: An International Journal, 26*(1), 144–161. https://doi.org/10.1108/13639510310460332c.

Chelst, K. R. (1981). Deployment of one-vs. two-officer patrol units: A comparison of travel times. *Management Science, 27*(2), 213–230.

Green, L., & Kolesar, P. (1984). The feasibility of one-officer patrol in New York City. *Management Science, 30*(8), 964–981.

Kaplan, E. H. (1979). Evaluating the effectiveness of one-officer versus two-officer patrol units. *Journal of criminal justice*, *7*(4), 325-355.

Long, D. L. (2014). *Selective deployment of two officer patrol units.* The Bill Blackwood Law Enforcement Management Institute of Texas.

McCabe, J. (2013). *An analysis of police department staffing: How many officers do you really need?* ICMA Center for Public Safety Management White Paper.

Wilson, J. M., & Weiss, A. (2014). Police staffing allocation and managing workload demand: A critical assessment of existing practices. *Policing: A Journal of Policy and Practice*, *8*(2), 96–108.

References on proactive time proportion

COPS Office. (2014). *Community Policing Defined*. Washington, DC. Available online: https://cops.usdoj.gov/RIC/Publications/cops-p157-pub.pdf.

Cordner, G. (1981). While on routine patrol: What the police do when they're not doing anything. *American Journal of Police*, *1*, 94.

Famega, C. N., Frank, J., & Mazerolle, L. (2005). Managing police patrol time: The role of supervisor directives. *Justice Quarterly*, *22*(4), 540–559.

Koper, C. S., Lum, C., Wu, X., & Fritz, N. (2020). Proactive policing in the United States: A national survey. *Policing: An International Journal, 43*(5), 861–876.

Lum, C., Koper, C. S., & Wu, X. (2021). Can we really defund the police? A nine-agency study of police response to calls for service. *Police Quarterly*, 10986111211035002.

Lum, C., Koper, C. S., Wu, X., Johnson, W., & Stoltz, M. (2020). Examining the empirical realities of proactive policing through systematic observations and computer-aided dispatch data. *Police Quarterly*, *23*(3), 283–310. https://doi.org/10.1177/1098611119896081.

McCabe, J. (2013). *An analysis of police department staffing: How many officers do you really need?* ICMA Center for Public Safety Management White Paper.

Weisburd, D., Majmundar, M. K., Aden, H., Braga, A., Bueermann, J., Cook, P. J., ... Tyler, T. (2019). Proactive policing: A summary of the report of the National Academies of Sciences, Engineering, and Medicine. *Asian Journal of Criminology*, *14*(2), 145–177.

Wilson, J. M., & Weiss, A. (2012). *Essentials for leaders: A performance-based approach to police staffing and allocation.* Washington, DC: Office of Community Oriented Policing Services. Available online: https://cops.usdoj.gov/RIC/Publications/cops-p247-pub.pdf.

Appendix C: PNC Subgroups Definitions

In this appendix, we list the specific PNCs associated with each of the subgroups analyzed in the staffing analysis.

Police Officer Statute PNCs

- Abandoned Child (P)
- Audible Alarm (P)
- Audible Business Alarm (P)
- Audible Residential Alarm (P)
- Holdup Alarm (P)
- Silent Alarm (P)
- Panic Alarm (P)
- Assist Other Agency (P)
- Assault in Progress (P)
- Assist EMS Personnel (P)
- Assist Fire Personnel (P)
- Assist an Officer (P)
- Attempt Pick-Up (P)
- Attempted Suicide (PE)
- Auto Theft (P)
- Auto Theft in Progress (P)
- Bait Vehicle Auto Theft (P)
- Business Check (P)
- Bomb Threat (P)
- Burglary Biz - In Progress (P)
- Burglary Business - Report (P)
- Burglary Dwlng In Progress (P)
- Chase on Foot (P)

- Curfew Violations (P)
- Customer Trouble (P)
- Domestic Abuse Report Only (P)
- Domestic Abuse-In Progress (P)
- Domestic with Weapons (P)
- Damage Property-In Progress(P)
- Drunk/Intoxicated Person (P)
- Domestic (P)
- Directed Patrol (P)
- DWI Court-Home Visit (P)
- Paramedic Needs Help (PE)
- Police Event (P)
- Explosion (P)
- Explosion-Structure (PFE)
- Explosion-Vehicle (PFE)
- Firecrackers (P)
- Found Child (P)
- Firefighter Needs Help (PF)
- Fight (P)
- Motor Vehicle Chase (P)
- Foot Beat (P)
- Forgery in Progress (P)
- Officer Needs Help (P)

- Hotrodders (P)
- Receive Information (P)
- Person Threat to Jump (PF)
- Kidnapping/Abduction (P)
- Luring (P)
- Miscellaneous (P)
- Narcotics (Drug) Activity (P)
- Notification (P)
- Property Damage/Hit & Run (P)
- Person with a Gun (P)
- Person with a Weapon (P)
- Personal Inj Acc-Report (P)
- Personal Inj/Hit and Run (PFE)
- Personal Injury Accident (PFE)
- Personal Injury w/ Trap (PFE)
- Poss Personal Injury Acc (P)
- Sex Offender Comp Check (P)
- Prowler (P)
- Rescue - Bldg Collapse (PFE)
- Rescue-Technical (PFE)
- High Risk Warrant Entry (P)
- Robbery Dwell in Progress (P)
- Robbery Dwlng/Person Rpt (P)

- Robbery of Biz In Progress (P)
- Robbery of Person (P)
- Shooting (PFE)
- Shooting Report Only (P)
- Sound of Shots Fired (P)
- Slumper (PE)
- Slumper w/Fire (PFE)
- ShotSpotter Activation (P)
- Stabbing (PE)
- Stabbing Report Only (P)
- Suspected Hazard (P)
- Suspected Hazard (PE)
- Suspicious Person (P)
- Suspicious Vehicle (P)
- Theft (P)
- Theft-Hold One Cooperative (P)
- Threats (P)
- Traffic Law Enforcement (P)
- Transportation (P)
- Trespass in Boarded Dwell (P)
- Unknown Trouble (P)
- Unknown Wireless/Cell Phone(P)
- Walk Through a Building (P)

- Crim Sex Conduct (P)
- Homeland-Terrorism Act (P)
- Robbery of Biz - Report (P)
- Water Emergency (PFE)

Behavioral Health PNCs

- Check the Welfare (P)
- Emotionally Disturb Person (P)

Theft Reporting PNCs

- Damage Property-Rpt Only (P)
- Forgery Report (P)
- Burglary Dwlng - Report (P)
- Mysterious Disappearance (P)
- Property Damage Accident (P)
- Theft - Report Only (P)

Other Alternative Response PNCs

- Lock-In-Police (P)
- Parking Problem (P)
- Road Hazard (P)
- Music-Loud (P)
- Disturbance (P)
- Check Hazard (P)
- Animal Bite (P)
- Animal Call (P)
- Animal Check The Welfare
- Animal Fight (P)
- Aggressive Dog (P)

This page intentionally left blank.

CNA

3003 Washington Blvd., Arlington Virginia 22201