

Memorandum



CITY OF DALLAS

DATE August 23, 2019

TO Honorable Mayor and Members of the City Council

SUBJECT **Dallas Police Department Staffing Study**

In November 2018, the City Council approved a contract with KPMG to conduct a staffing analysis of the Dallas Police Department (DPD). For the past seven months, KPMG has conducted a thorough assessment of both the patrol and investigative bureaus. This analysis includes a comprehensive data review for the past five years, analysis of other cities, review of departmental procedures and practices, and completion of office interviews and ride-alongs to better assess the needs of the department.

The study highlights the following conclusions:

- A realignment of strategy, goals, mission and tactics will provide the highest return for the Dallas Police Department.
- Operational changes were identified that could improve the effectiveness of the department. Changes in patrol and investigations call for a redesign of processes, changes in working practices, expansion of performance tracking, and increased utilization of technology to offset the currently constrained DPD resources available to meet workload.
 - a. The study provides multiple staffing scenarios to illustrate the level of resources needed to meet demand for services.
- DPD should reassess deep-seeded organizational practices that have led to a need to improve performance accountability and better use of data to manage unit performance.
- KPMG developed a software-based staffing algorithm for the Department to provide a sustainable tool for on-going analysis of the Department's workload and staffing needs.
 - b. The software contains an algorithm that allows for trained individuals in the Department to set parameters and goals by each patrol division to determine the ideal staffing level.
 - c. If manpower constraints do not allow for optimum staffing levels the software identifies optimal resource allocation with current staffing.

Attached you will find the completed KPMG Staffing Analysis with the PowerPoint that will be presented on Monday.

DATE August 23, 2019
SUBJECT **Dallas Police Department Staffing Study**

Please let me know if you have any questions or concerns.



Jon Fortune
Assistant City Manager

c: T.C. Broadnax, City Manager
Chris Caso, City Attorney (Interim)
Mark Swann, City Auditor
Biliera Johnson, City Secretary
Preston Robinson, Administrative Judge
Kimberly Bizer Tolbert, Chief of Staff to the City Manager
Majed A. Al-Ghafry, Assistant City Manager

Joey Zapata, Assistant City Manager
Nadia Chandler Hardy, Assistant City Manager and Chief Resilience Officer
Michael Mendoza, Chief of Economic Development and Neighborhood Services
M. Elizabeth Reich, Chief Financial Officer
Laila Aleqresh, Chief Innovation Officer
M. Elizabeth (Liz) Cedillo-Pereira, Chief of Equity and Inclusion
Directors and Assistant Directors

Dallas Police Department Staffing Study

KPMG

August 26, 2019



Ian McPherson, Principal
Brendan Davis, Director
Caoimhe Thornton, Manager



Presentation Overview

- Background
- DPD Patrol Bureau
- DPD Investigations Bureau
- The Broader Horizon
- Importance/Significance
- Risks and Challenges
- Proposed Action



Background

- In 2018, the City released a Request for Proposals seeking an analysis of the Patrol and Investigations Bureaus to allow the DPD to most efficiently and effectively utilize its staffing resources.
- KPMG was awarded the contract in December 2018 and carried out a six month study from January 2019 to July 2019. As detailed in the RFP, this study delivers:
 - An evaluation of the effectiveness of DPD's current staffing, shift, and deployment patterns
 - A temporal analysis of trends in demand and calls for service
 - The development of strategies to improve efficiency and effectiveness of police resources
 - The development of cost estimates associated with the implementation of the above strategies



DPD Patrol Bureau

- The Dallas Police Department's (DPD) staffing declined by ten percent from 2015 to 2018. From 2016 to 2017, DPD staffing declined by 266 employees. From 2017 to 2018, DPD staffing fell by an additional 111 employees. KPMG's report identifies operational changes designed to enable DPD to better meet its organizational goals with its current constrained resources.
- Key recommendations include:
 - Implementation of data-driven deployment strategies (including the use of a resource optimization model)
 - Implementation of demand management strategies for lower-priority calls
 - Review demand drivers of self-initiated and department-directed workload



DPD Patrol Bureau

- KPMG built a scheduling tool for DPD to allow for scenario modelling and guide decision making for staffing and scheduling.
 1. **Scenario One:** Realign current staffing to best meet projected demand
 2. **Scenario Two:** Hire and redistribute full-time employees to meet workload volume 100 percent of the time
 3. **Scenario Three:** Use a combination of overtime hours and full-time employees to meet workload volume while minimizing costs

	Current Officer Supply	Potential Officer Supply	Potential Supply Changes	Weekly Overtime Hours	% of demand met
Scenario One	1,406	1,406	0	806	98%
Scenario Two	1,406	2,109	703	0	100%
Scenario Three	1,406	1,754	348	881	100%



DPD Investigations Bureau

- DPD's current clearance rates stand below the benchmark statistics provided by the FBI's Uniform Crime Reporting program.
- KPMG developed a series of recommendations designed to improve the efficiency and effectiveness of operations at the Investigations Bureau:
 - Standardizing processes for case assignment within units, allowing for effective case prioritization in line with DPD's strategy and goals
 - Expanding crime analyst time dedicated to tracking trends in crime, suspects, and geography, thereby allowing the agency to shift to a more proactive, intelligence-led model
 - Developing and implementing performance metrics and key performance indicators at the bureau, unit, and individual levels



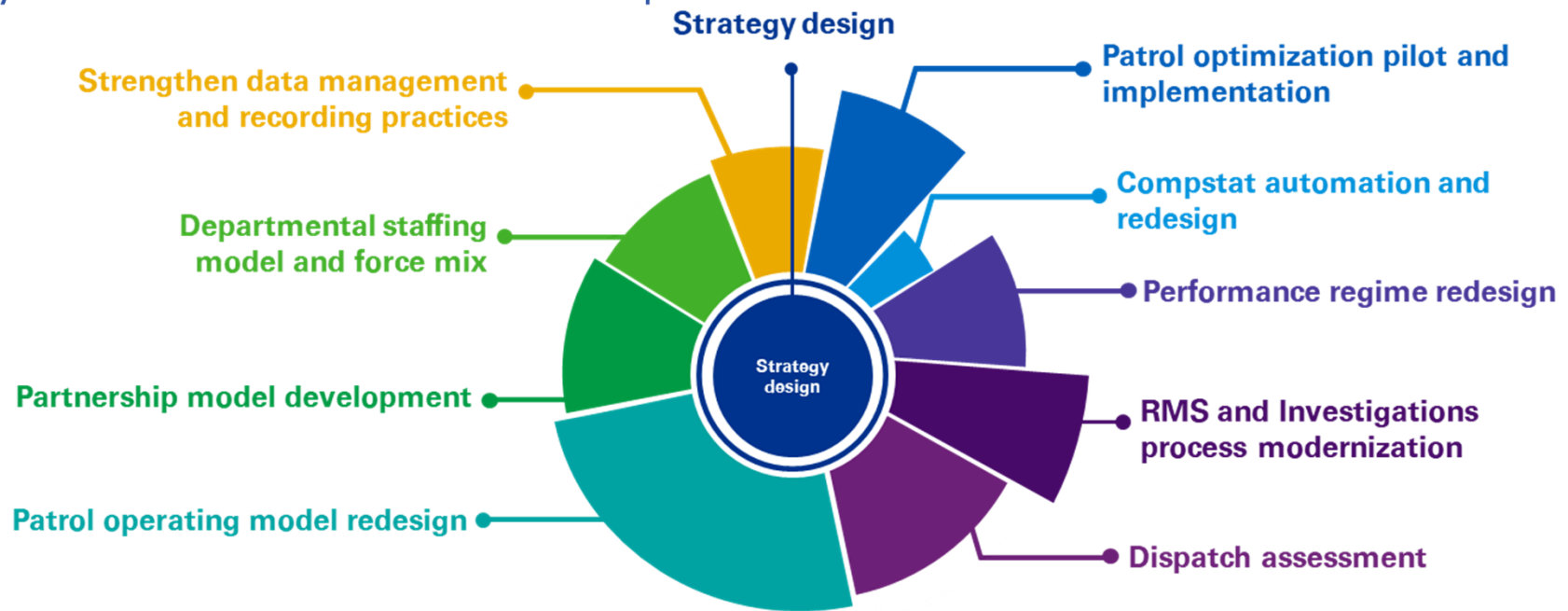
DPD Investigations Bureau

- It was not possible to definitively identify an optimal staffing level for the Investigations Bureau due to data quality issues, gaps in data recording practices, and a lack of historical information on staffing and workload.
- KPMG’s report outlines process improvements intended to resolve these issues, thereby allowing DPD to collect the workload and performance data necessary to define an optimal staffing level in the future.
- Key process improvements include:
 - Creating and deploying a standardized “how to” guide for user interaction with the RMS system and the case management module
 - Standardizing data recording processes for case screening, activity tracking, case status, and caseload tracking



The Broader Horizon

- Across both bureaus, KPMG’s report outlines overarching strategic recommendations to enable data-driven decision-making, streamline existing processes, enhance the efficiency and effectiveness of operations, and establish systems for the measurement of performance and outcomes.



Importance/Significance

- For the past decade, DPD has been an organization in contemporaneous change -- in the form of declines in staffing numbers, as well as changes in crime levels, strategy, and leadership.
- A realignment of strategy, goals, mission, and tactics can yield the significant benefits to DPD and to the City.
- The recommendations stemming from the KPMG study have the potential to positively impact:
 - The City's budget
 - Public safety: both crime levels and public confidence
 - Officer safety and wellness
 - The reputation of DPD and the City



Risks and Challenges

- Increased staffing alone cannot achieve complete success toward organizational goals such as reduced response times, city-wide crime reduction, and increased service levels for citizens. Rather, a realignment of strategy, goals, mission, and tactics would yield the highest return to the DPD.
- The recommendations detailed in this report are designed to deliver this realignment. Their implementation would require support from DPD and City leadership.
- The timeframe for transformation will require organizational and leadership stamina to follow through on the considerable effort to change entrenched practices.



Proposed Action

The implementation plan below highlights the initial activities that should be prioritized across the five most critical work streams within the first 12 months of the three year implementation.

		2019 - 2020												
Work stream	Activity	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	
Strategy design	Develop core principles and pillars of strategy	█												
RMS and Investigations process modernization	RMS refresher training rollou	█										◆		
Patrol optimization pilot and implementation	Resource optimization pilot and refinement		█				◆							
Strategy design	Establish strategic objectives and goals			█		◆								
Dispatch assessment	Conduct operational and performance assessment		█			◆								
Strategy design	Define division objectives, goals and KPIs					█		◆						
Compstat automation and redesign	Define data requirements and gap analysis							█						
Patrol optimization pilot and implementation	Resource optimization rollout					█							◆	

Milestone outcomes:

- Reduced case processing times
- Increased case filings
- Reduced administrative burden
- Standardized system usage

Milestone outcomes:

- Reduced response times
- Reduced overtime levels
- Increased officer visibility
- Increased neighborhood focus





Improving the efficiency of public safety services

Dallas Police Department Staffing Analyses



July 2019

kpmg.com

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Executive summary

KPMG reviewed the Dallas Police Department (DPD) patrol and investigations functions from January 2019 to July 2019. The intent of this review was to identify optimal staffing levels, discover opportunities for efficiencies, and develop an algorithm to schedule officers based on workload and demand. This executive report is the third report in this series and includes the previously delivered patrol and investigations reports in Appendix A and B, respectively. The purpose of this component of KPMG's work is to summarize recommendations and findings, and to lay the foundational roadmap for DPD's implementation of recommendations that Dallas and DPD leadership believe to be viable and necessary.

KPMG highly recommends that you review the reports that underpin this executive report. The details provided within the patrol and investigations reports catalog the specific findings and observations that underwrite the recommendations delivered here. KPMG's study involved an exhaustive review of quantitative and qualitative data provided by the DPD. This study, one of the most comprehensive in DPD's history, involved hundreds of hours of interviews at every level of the organization, and the analysis of thousands of lines of data. KPMG benchmarked its findings and recommendations against leading practices for the industry in addition to direct comparisons with peer agencies.

The study revealed that the DPD for the past decade has been an organization in contemporaneous change. Those changes have come in the form of declines in staffing numbers, as well as changes in crime levels, strategy, and leadership. The organization shifts and adapts quickly to new mandates but does so within the same organizational design. This has led to a misalignment of goals, mission, and tactics. The main conclusion of this KPMG study is that a realignment of strategy, goals, mission, and tactics would yield the highest return to the DPD, even above and beyond an increase in staffing.

Police organizations find themselves in a difficult market for hiring personnel. With local and national unemployment rates near historic lows, the impact on DPD, and its staffing strength, is no exception. This means filling operational gaps with additional personnel is a difficult practical solution. KPMG kept this context in mind while delivering recommendations that are actionable and outcome focused. When asked at various levels about the goals of the organization, DPD staff identified the following outcomes and organizational goals:

- Reduced response times
- Citywide crime reduction
- Enhanced organizational efficiency
- Increased service levels for residents.

When analyzing these goals, it was apparent that increased staffing alone could not achieve complete success toward the above outcomes. Professional policing requires a range of solutions that is not one size fits all. However, in patrol for example, DPD has long utilized the same approach for all calls for service, regardless of severity: a sworn officer responding by car. The department does not employ alternate means of resolution for lower-priority calls, even as some residents report dissatisfaction with response times. This practice of dedicating sworn officers to minor or low-priority calls can cause a potential strain on resources, which more modern thinking might be able to alleviate. A targeted surge in officers responding to priority calls would certainly help, but there are also equally viable alternatives to increase resident satisfaction. This report provides several recommendations that have shown proven globally to be highly effective in achieving higher satisfaction among callers for police service.

KPMG also identified a range of solutions to increase the efficiency and effectiveness of the department. Those solutions start with the development and communication of focused goals and

outcomes for the DPD. This report could not emphasize more the need for clear organizational strategy that informs tactical behavior by officers and that is clearly communicated to the public. The DPD today spreads its limited resources across a broad spectrum of siloed functions, all necessary but struggling to complement each other in the most effective manner as they compete for resources. We found an organization that continuously flexes to the “crisis of the day,” yet has maintained the same legacy strategy for more than a decade. We recommend a reset in strategy and organizational design to meet the challenges of today and tomorrow.

In reviewing DPD’s core business functions, KPMG also identified operational changes that could significantly impact the effectiveness of the DPD. Those changes in patrol and investigations call for a redesign of processes, changes in working practices, expansion of performance tracking, and increased utilization of technology to offset the currently constrained DPD resources available to meet the increased workload across resident calls for service and caseloads for investigators. KPMG’s findings support the need to reassess deep-seated organizational practices that have led to a broad lack of accountability in some areas and limited use of data to govern unit performance.

It is noteworthy that this commentary is a reflection of operational management and not the DPD’s focus on crime fighting, which is considerable and includes layers of checkpoints that drive a focus on crime reduction. The biggest part of that program is the DPD’s use of Compstat to track and adjust its tactical strategies to the perceived ever-changing crime situation in the City of Dallas. KPMG found that staff were fully committed to this core mission. The biggest concern across both functions reviewed was their inability to be more proactive in reducing crime facing Dallas residents. Staff attributed their lack of capacity to be proactive with the recent reductions in staffing. We do agree that staffing levels could be increased in some areas with the right type of staff. KPMG also believes that capacity could be found through streamlined processes and staffing mix, the increased use of technology, and the prioritization of mission-critical and strategically aligned tasks.

The changes proposed here are significant. If the recommendations are to be effectively adopted, it will require a significant change management and implementation program. Nevertheless, the results and outcomes would yield significant return on investment for the DPD and residents of Dallas. The DPD will need a dedicated team to lead the proposed transformation outlined here. In addition to the resources needed, the timeframe for transformation will require organizational and leadership stamina to follow through on the considerable effort to change entrenched practices. Some of the technical skill sets required to deliver the proposed change initiative are:

- Process and Lean Six Sigma specialists
- Data scientists and optimization experts
- Technologists
- Change management specialists
- Project managers.

These resources could enable the DPD to begin quickly developing and piloting changes across the enterprise. One of those first changes could be the implementation of the KPMG optimized deployment scenarios for patrol. The piloting of various options could be deployed across the enterprise; an agile approach to testing would allow for quick changes and ultimately a department-wide optimized redesigned patrol model. This could be tested and delivered within a few months and yield the biggest impact to the organization. The 12-month implementation plan in this report outlines a number of quick wins, such as the optimization of patrol deployment, which are achievable for the DPD. Additionally, the activities in this 12-month plan allow DPD to begin addressing the department’s data quality issues. Improving data collection practices to allow for reliable internal data is a critical step

that will inform leadership decision-making around key issues, including staffing levels and performance targets. The keys to successful implementation will be:

- Leadership
- Programmatic design
- Organizational and external communication
- Program management and tracking.

KPMG believes that the strength of the organization, its ability to adapt, and the quality of the DPD’s personnel are all reasons to believe that a change program of the scale proposed here can be implemented successfully. KPMG was continually impressed by the DPD’s staff and the difficult environment in which they operate. KPMG found that the organization was transparent, open to new ideas, and willing to change. Many of the key ideas presented here were raised by DPD personnel in interviews (and later validated as leading practices). The organization should be commended for its participation in this study, which is not intended to criticize but to open the door to new possibilities as to how DPD can operate.

Purpose and scope

Project background

In 2018, the City of Dallas released a Request for Proposals to conduct a comprehensive analysis and provide feedback on how the Dallas Police Department (DPD) might most efficiently and effectively utilize its resources to better staff the department so that it may continue its efforts to reduce crime, respond to calls for service, and engage the community. KPMG was awarded the contract by the City of Dallas in December 2018 and commenced work on the six-month study with the DPD formally in January 2019. This report outlines recommendations based on KPMG’s analysis and evaluation of the Patrol and Investigations Bureau and strategic insights to address the core requirement to “develop comprehensive strategies to improve efficiency and effectiveness.”

KPMG and DPD have worked collaboratively to review department operations—undertaking interviews, focus groups, ride-alongs, and observations—and KPMG has invested significant time validating data and results with DPD leadership. It should be noted that while KPMG and DPD use the same calculation methods for the data analysis within this report, the approach to data cleaning (i.e., the removal of outlier and erroneous data) is different and, therefore, may result in differing results. This report provides context to the methodologies used and outcomes of the analysis conducted.

This is a consolidated report that provides the overarching recommendations for the Patrol and Investigations Bureaus and identifies strategic and operational recommendations for the DPD as a whole. This report should be viewed as part of a decision-making tool only when combined with the patrol assessment and the investigations assessment, which are included as Appendix A and B, respectively; together the reports provide analysis and recommendations to inform DPD’s strategy, operating model, staffing levels, force mix, and scheduling approach.

DPD organizational analysis

Overview of DPD responsibilities

The City of Dallas is the ninth largest city in the United States, growing in population at an average of 1.7 percent per year since 2010. DPD is responsible for reducing crime and providing public safety for the City of Dallas. As per the DPD’s mission statement, DPD strives to achieve its objectives by:

- Recognizing that its goal is to help people and provide assistance at every opportunity
- Providing preventive, investigative, and enforcement services
- Increasing resident satisfaction with public safety and obtaining community cooperation through the Department’s training, skills, and efforts
- Realizing that the Police Department alone cannot control crime, but must act in concert with the community and the rest of the Criminal Justice System.

The table below illustrates DPD’s staffing as of February 2019, broken down by employee classification (i.e., civilian and sworn) and organizational bureau. The Patrol Bureau is the largest bureau and employs 56 percent of DPD employees and 65 percent of sworn officers. The second largest bureau is the Administrative Support Bureau, which employs 68 percent of civilian staff while employing nearly the same number of civilian staff as sworn officers.

As of February 2019, approximately 84 percent of DPD employees were sworn officers. Civilians made up 16 percent of the DPD workforce. As discussed in detail in the patrol report, comparison agencies employed workforces with approximately 24 percent civilian staff—a higher proportion of civilians currently used by DPD.

DPD staffing by employee classification and organizational division

Group	Civilian	Sworn	Grand total	Distribution of staff by bureau
Administrative Support Bureau	382	357	739	21%
Investigations and Tactical Support Bureau	89	615	704	20%
Office of the Chief of Police	47	86	133	4%
Patrol Bureau	42	1,946	1,988	56%
Total	560	3,004	3,564	
Distribution of civilian and sworn staff	16%	84%		

Source: IWM data 2019

Note. Totals may be greater than 100 percent due to rounding.

Strategic recommendations

Strategic recommendations

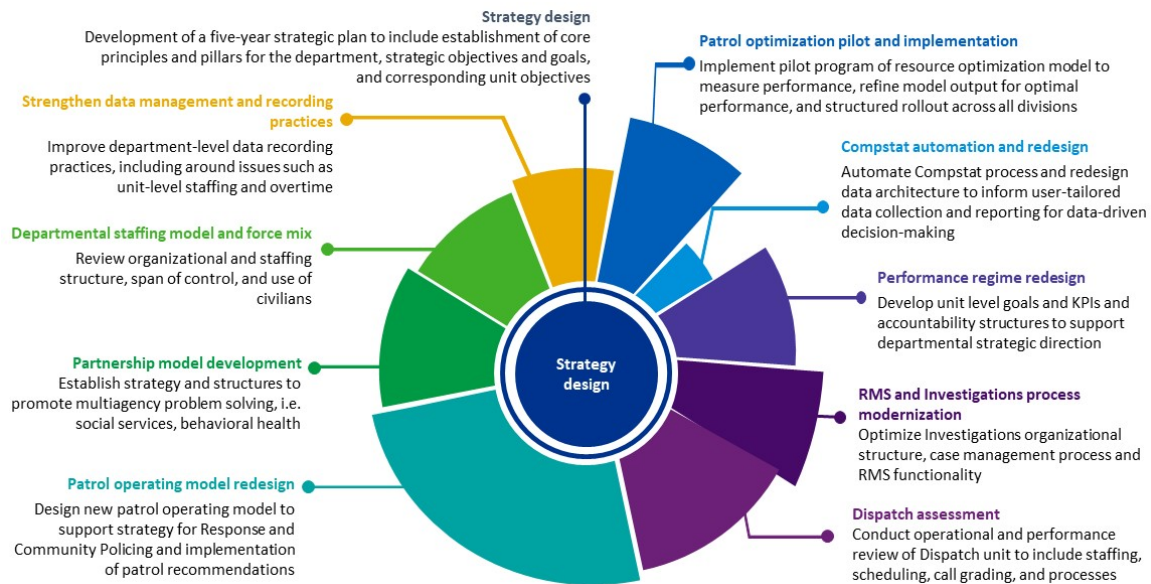
Strategic recommendations

While there are operational and process improvements to be made within the Patrol and Investigations Bureau (see the following chapters in this report), KPMG also identified a series of strategic recommendations that would impact the efficiency and effectiveness of the department as a whole. Many of these recommendations should be addressed immediately; however, some may take a number of years to implement and embed within the organization.

The Strategic recommendations outlined in this report suggest the creation of a departmental strategy and a framework to align department operations to the mission, vision, and goals of the strategy. Taken as a whole, these recommendations will enable data-driven decision-making, streamline and automate existing processes to enhance efficiency and effectiveness of operations, and establish systems for the measurement of performance and outcomes.

Strategic recommendations	
1	Develop a five-year strategic plan, including core principles and strategic objectives
2	Design and implement patrol pilot of resource optimization model
3	Redesign patrol operating model to support strategy for Response and Community Policing and implementation of patrol recommendations
4	Optimize investigations case management workflow, including the bureau's organizational structure, case management process, and record management system (RMS) functionality
5	Establish strategy and structures to promote partnerships and multiagency problem solving (i.e., social services, behavioral health)
6	Redesign and automate Compstat process to inform user-tailored data collection and reporting
7	Conduct an operational and performance review of Dispatch unit to include staffing, scheduling, call grading, and processes
8	Review organizational and staffing structure, span of control, and use of civilians
9	Strengthen data management and recording practices
10	Redesign performance regime to include unit-level goals and KPIs to support the department's strategic objectives

These recommendations are detailed in the graphic on the following page.



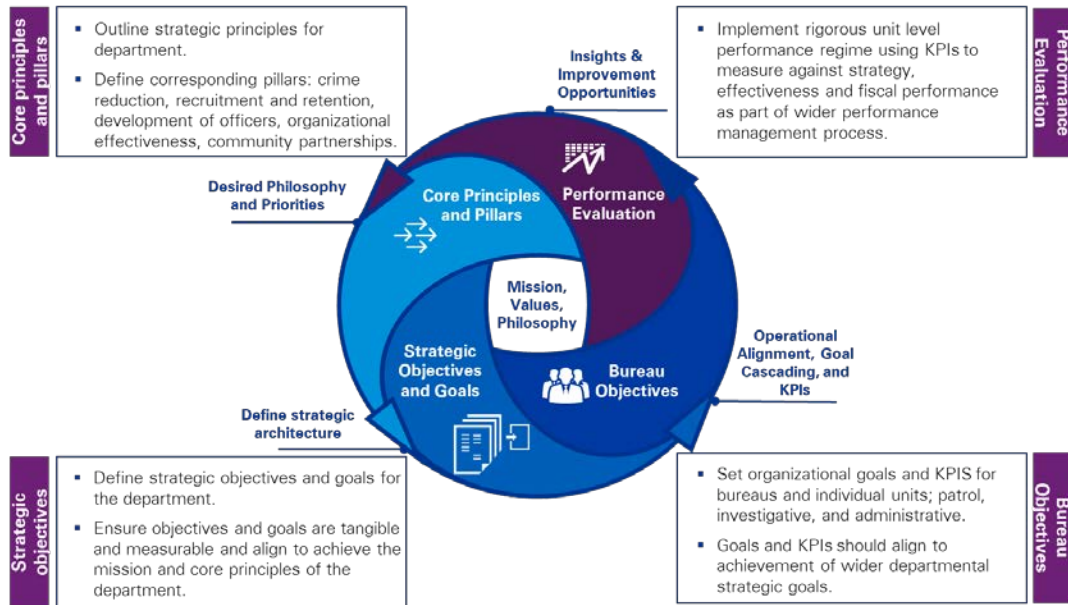
Strategy design and development

Strategic planning is an organizational management activity that is used to set priorities, focus energy and resources, strengthen operations, ensure that employees and other stakeholders are working toward common goals, establish agreement around intended outcomes/results, and assess and adjust the organization’s direction in response to a changing environment.

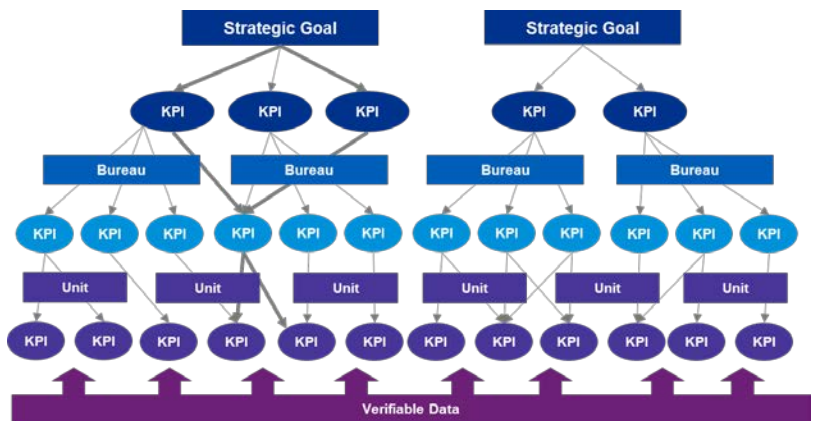
Based on our observations and interviews conducted over six months, it is evident that the DPD lacks a clear strategy and is more reactive to the issues of the day, rather than working toward a common long-term goal. While DPD has strategic priorities, these have not been translated into a strategic plan that can drive action. This is particularly evident at the Patrol officer level, where staff appear unclear of the overall strategic direction and mission for the department as they receive conflicting direction from the department as to what the priority is, either response times or crime fighting.

This is also apparent with respect to the Investigations Bureau, which lacks a clear crime strategy, which should be linked to the overall Department strategy that would allow for a flow-down staffing model from priorities to execution. Staffing decisions are therefore made periodically and reactively. The DPD responds to both attrition of staff and the daily operational disruptions. The ideal allocation model would be based on a strategic crime reduction model, whereby staff is aligned by priority and actual workload and utilizes data and intelligence to inform decision-making. The DPD has considerable work to do in order to achieve this ideal state in the Investigations Bureau.

The next immediate step for the DPD would be to develop a department-wide strategy followed by a Bureau plan to execute that strategy, with careful monitoring through performance management to ensure the achievement of the strategic goals. The diagram below outlines the key steps required to develop a strategy and to cascade the implementation of the strategy throughout the department.



A key element of strategy development is ensuring the cascading of strategic goals and objectives to the Bureau and unit level. Objectives that are aligned to the wider Department objectives should be set at the Bureau and unit level and monitored through the establishment of KPIs. These performance indicators should be closely monitored through a rigorous performance management process and leadership held accountable for performance. The performance management process will allow DPD to measure operational performance against strategy, determine the effectiveness of operations, and aid strategic decision-making with regard to staffing and budget.



Patrol operating model redesign

As outlined in the Patrol Bureau recommendations, there are a number of ways in which DPD could enhance its current patrol operating model. The patrol operating model should be developed in line with the new strategy objectives and goals to ensure that patrol operations are driving toward the achievement of the overall strategy. Other options to enhance the patrol operating model and increase the efficiency and effectiveness of resources and deployment are outlined on pages 17 to 29 of this report and include:

- Review of “one size fits all” response times

- Implementation of demand management/customer service strategies for lower-priority calls
- Outcome tracking for all patrol units
- Implementation of data-driven deployment strategies
- Enhanced use of technology
- Implementation of a performance management strategy.

Patrol optimization pilot and implementation

As outlined within the Patrol Bureau assessment chapter, a key component of the DPD staffing analyses was the analysis of historical patrol demands as an input to the development of a patrol scheduling optimization model. The outputs of the patrol scheduling optimization model are outlined within the Patrol Bureau assessment chapter; however, the model does not provide only one singular staffing recommendation. Rather, the model is designed as a sustainable tool for the DPD to model scenarios and use to aid future patrol staffing and scheduling decision-making. KPMG presented three representative scenarios based on historical demand and supply data and assumes that the DPD will continue to operate under its current operating model, meaning that its current practices of deployment, scheduling, staffing, resource utilization, and call management will remain the same. The DPD has the ability to model a multitude of scenarios through the patrol scheduling optimization model as it is designed to provide DPD with the ability to model scenarios and provide sufficient information to make decisions based on the ever-changing environment in which the department operates.

The DPD should consider the broader options available to them through the optimization model and then begin a program of piloting the optimized staffing recommendations. This may include changes to the number of watches, watch start and end times, the number of staff across watches, and the volume of overtime used. The purpose of a pilot program is to trial the changes and identify any issues and document the impact of the changes prior to full implementation. A pilot program should be carefully designed and implemented to ensure that the changes are communicated appropriately and robust performance indicators are established, recorded, and analyzed prior to and during the pilot to identify issues and successes and document the impact of the changes. It is also important to manage the day-to-day operations of the pilot program to ensure that the changes implemented are not negated by behavioral changes and appropriate supervision is in place.

It is important for DPD to conduct a number of pilot programs prior to full implementation, taking care to learn from the pilot schemes, as the optimization model suggests differing schedules and profiles for each division, which is a significant change from the current “one size fits all” way of operating. The optimization model is also based on five years of data, from 2014 through 2018, and, therefore, some operational decisions may need to be implemented to ensure the schedule fits the most recent demand profile and staffing levels.

Investigations and RMS process redesign

As outlined within the Investigations recommendations, a redesign of the operations of the Investigations Bureau is required to provide standardized case screening, assessment, and assignment as well as case management practices. A core focus of the redesign should be to establish consistent policies and procedures regarding the use of the case management module within the RMS. The next steps for the Investigations Bureau are outlined in further detail on pages 30 to 35 of this report and below:

- Create a standardized process for system use
- Establish general orders for case management
- Establish case screening/solvability methodology and process for recording “leads” or “no leads” cases
- Establish standardized case assignment process and eliminate manual tracking system
- Formalize a caseload prioritization system

- Establish a formalized training process and refresher training cycle for the RMS system
- Implement a performance management strategy.

Partnership model development

DPD does not operate in isolation, and there is an increasing need for complex citywide problems to be addressed in partnership with other Dallas criminal justice and health and human services agencies.

DPD is making efforts in this area, for example, the establishment of the Rapid Integrated Group Healthcare Team (RIGHT) Care pilot program, which is a multidisciplinary team composed of a law enforcement officer with mental health training, a paramedic, and a behavioral health clinician, to answer mental health–related calls for service. This team is able to quickly mobilize and respond to people experiencing a behavioral health crisis in the community to divert people with complex health needs related to serious mental illness (SMI), when appropriate, from jail and emergency departments in order to decrease recidivism rates, better facilitate recovery, and more appropriately allocate community resources. Within the first year of the pilot, the team affected 638 hospital diversions and 316 jail diversions.

As demonstrated through the pilot program example through the amalgamation of information shared between agencies and the pooling of resources to tackle certain issues, underlying social problems or causes of offending can be more effectively tackled and problem-solving efforts instituted. Due to the increasingly complex needs of many residents seeking help by calling 911, the work of other agencies such as youth and children’s services in partnership with law enforcement can be more effective in understanding the complexities of issues such as family situations and child delinquency.¹

Partnerships have been promoted as a promising vehicle for planning, coordinating, and executing complex, innovative social interventions, and they offer significant potential for positive impact upon the most needy in society. However, despite the opportunity to create truly comprehensive partnerships, to date, law enforcement agencies in the U.S. have not done so.² There is an opportunity for the City of Dallas to promote and institute a partnership model for public safety to help tackle the more complex and wider social issues and implement sustainable solutions to provide better outcomes for its residents.

Compstat process redesign and automation

Compstat is a widely used performance management system that is used to reduce crime and achieve other police department goals. Compstat emphasizes information sharing, responsibility and accountability, and improving effectiveness. It includes four generally recognized core components: (1) timely and accurate information or intelligence, (2) rapid deployment of resources, (3) effective tactics, and (4) relentless follow-up. The most widely recognized element of Compstat is its regularly occurring meetings where department executives and officers discuss and analyze crime problems and the strategies used to address those problems.³ DPD utilized Compstat for this purpose and conducts weekly leadership meetings to review crime statistics and discuss actions. It was noted during interviews that Compstat meetings within DPD can be a regurgitation of data and statistics rather than understanding the causal effects and addressing actions needed to combat the issue. In addition, as

¹ “The Police and Partnership Working: Reflections on Recent Research,” Daniel McCarthy and Megan O’Neill, *Policing: A Journal of Policy and Practice*, August 12, 2014.

² “Evaluating multi-agency anti-crime partnerships: Theory, design, and measurement issues,” Dennis P. Rosenbaum, University of Illinois at Chicago, January 2002.

³ <https://www.bja.gov/publications/perf-compstat.pdf>

mentioned above, with a strategic plan and strategy for the department to work toward, Compstat can become a reactive tool rather than a method for proactive decision-making.

While KPMG did not observe a Compstat meeting, the team did review the data and information that Bureau leadership was provided with in advance of their attendance. The volume of data that Bureau leadership is provided is significant—they are asked to conduct their own analysis and identify causes and solutions based on the data provided in advance of the Compstat meeting. This process requires a significant level of effort and is the primary use of the crime analysts in many units if they are available. If crime analysts are not available, then unit commanders incur a higher level of effort to conduct the analysis themselves. It was noted during interviews that preparation for a Compstat meeting, to review data provided, conduct analysis, understand analysis, and develop solutions, can take anywhere between four and eight hours. There appears to be an opportunity to streamline and consolidate and potentially automate the data that is provided centrally to reduce the burden on the unit crime analysts and leadership in preparation for the Compstat meeting. The data provided centrally should help to identify patterns, temporal trends, offenders, and even predictive analytics rather than producing pure statistics that then require further investigation.

Compstat should not just be a reactive tool focusing on trend statistics but a tool for enhanced problem-solving and proactive measures. Recent research evidence suggests that Compstat is more likely to generate reactive crime control responses rather than more creative problem-solving responses designed to address the conditions that cause crime problems to recur.⁴ In order to be effective, the Police Foundation identified six key elements of Compstat that form a comprehensive approach for mobilizing police agencies to identify, analyze, and solve public safety problems: mission clarification, internal accountability, geographic organization of command, organizational flexibility, data-driven problem identification and assessment, and innovative problem-solving. When compared to non-Compstat police departments, police departments that use Compstat have been found to be more likely to implement traditional crime control strategies rather than community problem-solving strategies to address crime problems.⁵ Willis, Mastrofski, and Kochel suggested a new form of Compstat that supports collective problem-solving, maintains accountability, and more fully embraces community policing. They observed that this may require diminishing the formality of the chain of command in crime control meetings to support more collaborative problem-solving by a wider range of meeting participants.⁶

With this in mind and considering the recent increase in crime within Dallas, DPD may consider reviewing its current Compstat process to help ensure that the focus is not on reporting of statistics and reactive measures but considers proactive problem-solving initiatives so that the Compstat meetings add value toward the department's crime strategy and are a productive use of time for all parties involved.

Dispatch assessment

A similar assessment of the Dispatch function should be conducted as it plays a pivotal coordination role for the Patrol Bureau. While Dispatch was not within the scope of the DPD staffing analyses, the team did conduct a tour of the Dispatch facility and spoke with several of the staff. Opportunities for Dispatch were also identified when conducting the patrol division interviews and Computer Aided

⁴ "Observations Regarding Key Operational Realities in a Compstat Model of Policing," Dean Dabney, *Justice Quarterly*, April 2009.

⁵ "Reforming to Preserve: Compstat and Strategic Problem Solving in American Policing," David Weisburd et al., *Criminology and Public Policy*, 2002

⁶ "The co-implementation of Compstat and community policing," James J. Willis and Stephen D. Mastrofski and Tammy Rinehart Kochel, *Journal of Criminal Justice*, September 2010

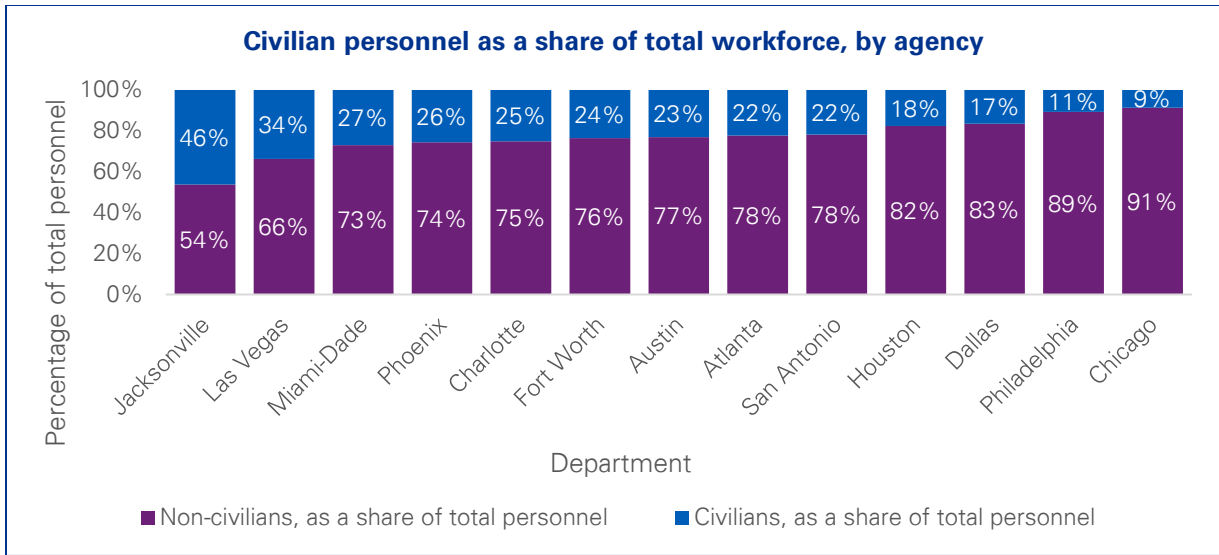
Dispatch (CAD) analysis. The Dispatch function would benefit from a full review similar to that conducted within Patrol and Investigations to identify further opportunities for efficiency and integration with Patrol to enhance the overall effectiveness of the service provided by DPD.

- **Review dispatching protocol of first available resource and sector/beat integrity:** Due to the focus on meeting response time goals for all priorities, the current practice within Dispatch is to assign a call based on the first available resource. While it may make sense to dispatch the call that came in first to the first resource that is available in order to meet response time goals, in some instances, it does lead to officers travelling further distances to attend a call, which may in fact lead to longer response times. Based on feedback received during interviews, the lack of sector/beat integrity means that officers are crossing paths with each other in order to attend calls and may have to pass a closer call for service because they have been dispatched as the first available resource. The reestablishment of sector/beat integrity should be reviewed for dispatch to assign the closest available resource rather than the first, potentially for those Priority 2s, 3s, and 4s initially, to increase the overall efficiency of officers.
- **Review of call codes and call assessment:** When conducting the CAD analysis, the team found that an extensive list of call codes exists, and many appear to be duplicative in nature. Despite the significant number of call codes, two of the top call types are “Other” and “Other 01,” accounting for over 100,000 calls within the five-year period. This suggests that despite the extensive list of call codes, they may not be closely aligned to the demand received. A review and recategorization of call codes would help DPD better understand their demand and also provide officers with more complete information when answering calls for service.

Department force-mix review

While the scope of the DPD staffing analyses was limited to the Patrol and Investigations Bureaus, there were a number of opportunities identified to increase the use of civilian or non-sworn staffing within the Department. The DPD could benefit from the force-mix review of all functions within the department to help ensure that the right positions, with the right skills, are performing the right roles. It was noted by DPD staff and leadership that during budget cuts, the first positions to be unfunded are the civilian and non-sworn positions; however, this can only serve to increase the burden on sworn staff and shift their focus from their core tasks. Civilian staffing accounts for just 16 percent of total DPD staffing as of March 2019.

When compared to the comparison cohort, the size of Dallas’s civilian workforce is the third smallest, with Dallas ranking eleventh out of thirteen agencies as civilians composed only 17 percent of the workforce in 2017. As discussed in detail in the patrol report and illustrated in the graphic on the following page, the project team’s review of comparison agencies found that, on average, 24 percent of their workforces were civilian staff.



Source: 2017 FBI Uniformed Crime Reporting data

The opportunities within the Patrol and Investigations Bureaus are outlined below:

- **Use of investigations technicians:** Investigations technicians or civilian investigators are often utilized to support the investigations process, defined as such in terms of their (1) non-sworn status and (2) limited enforcement powers. Civilian investigators do not have the power to arrest but are generally given the power to issue citations. Civilian investigators commonly interview victims and witnesses in misdemeanor crimes, process reports and evidence, and prepare cases for prosecution. The goal of the movement is increased efficiency—to relieve sworn investigators of the low-priority or less complex cases so that they can devote more time to solving felony crimes. For example, the Corpus Christi, TX police department relies on civilian investigators to interview victims and witnesses for misdemeanor cases.⁷ Likewise, civilian investigators employed by the Arlington, TX police department perform investigatory tasks such as record checks and interviews.⁸

- **Enhanced utilization of crime analysts:** As mentioned within the Patrol and Investigations chapters, the use of crime analysts within the department appears to be inconsistent and their utilization is not as effective as it could be. This is a highly technical and specialized function. The crime analysts’ primary focus should be to provide officers and investigators with the data-driven resources and information they need to meet the department’s crime strategy and provide real-time information to aid decision-making. Their current usage is primarily to aid leadership in reporting. There should be either a central pool of crime analysts or a dedicated crime analyst for each unit who can conduct analysis to track call and crime trends, across victims, suspects, and geography to inform deployment patterns, staffing, and aid problem-solving rather than reactionary decisions. The current use of sworn officers in some crime analyst positions is not an effective use of a sworn resource; it is recommended that crime analysts are civilian or non-sworn resources who have the necessary skill sets to perform the advanced data and analytics required.

⁷ “Detective workload and opportunities for increased productivity in criminal investigations,” John Liederbach, Eric J. Fritsch, and Charissa L. Womack, *Police Practice and Research*, September 8, 2010.

⁸ Ibid,

- **Explore the use of Community Support Officers:** Community Support Officers (CSOs) are used to provide alternative call resolution options and engage in community policing activities. CSOs are non-sworn officers that do not have powers of arrest and cannot interview prisoners or carry out the high-risk tasks of police officers. They can, however, answer lower-priority, quality-of-life calls for service; provide reassurance and advice to the public; and deter crime through visibility. Most importantly, CSOs can be a significant resource to assist in community problem-solving. The use of CSOs as an additional resource within Patrol to release capacity among sworn officers to focus on high-priority calls and crime and provide additional resiliency is common across many U.S. jurisdictions and within international policing models⁹ and may provide a useful resource to the DPD as it could allow the department to have sworn Patrol officers focus on Priority 1 and 2 calls and crime fighting while still providing a high level of service to the residents of Dallas.
- **Provision of administrative support:** There appears to be a general lack of administrative support within the department to conduct administrative and clerical activities. The reduction in civilian staffing over the years has resulted in a shift of administrative burden to sworn staff. While there is an expectation that sworn staff should conduct some administrative activities, the lack of administrative support does lessen the focus on core patrol or investigative duties. A review of where administrative support would be beneficial to increase the efficiency and effectiveness of officers and investigators should be conducted at a more thorough level.

Data management and recording practices

Throughout the DPD staffing analyses process, the consistent challenge faced was data quality. This was primarily driven by either data recording practices or the lack of system integration to provide a common viewpoint within the data. Bureau-specific recommendations for data management have been outlined within the Patrol and Investigation chapters; however, there are improvements that need to be made at the Department level.

Staffing

- **Record staffing at the unit level:** Staffing for some units is currently consolidated into offense groups when recorded within the Lawson system (e.g., Violent Crimes contains six investigations units including Homicide, Assaults, Robbery, Youth Operations, Crimes against Children, and Family Violence). The recording of staffing data at an aggregated level prevents leadership from conducting analysis at the unit level and hinders unit-level decision-making.
- **Maintain records of historical staffing levels:** The recording of information at the offense level was not the only challenge faced when analyzing staffing. There is no common picture that provides staffing within each unit for previous years. KPMG was provided with multiple data sources to piece this information together; each source provided different information and provided various levels of information. DPD should establish a common view of staffing, to include position, employee, unit assignment, and subunit assignment, from a single source to be able to track staffing trends over time. Due to the lack of a structured process for recording staffing at the unit level in a consistent manner and without the maintenance of accurate records for historic staffing, there is no way of assessing historical staffing trends, and it causes difficulty when assessing future staffing requirements.

Overtime

Overtime can be an efficient means to manage short or unpredictable peaks in demand. However, when used inefficiently, overtime can result in unnecessary departmental expenses. The project team

⁹ "Police Community Support Officer," Cate Newnessmith, Social Innovation Exchange, <https://socialinnovationexchange.org/insights/police-community-support-officer>

identified a number of recommendations to improve DPD's overtime recording practices to help ensure the department effectively uses this critical tool:

- **Eliminate manual tracking of overtime:** Overtime should not be recorded using the "pink slip" process as functionality exists within the Lawson system for users to enter the information directly. A department-wide process should be established for officers and investigators to enter their overtime information directly into the system, and all approvals by supervisors should be conducted through the system. The establishment of this process would remove the duplication of effort and streamline overtime approvals through a reduction in the time taken to record and process approvals. It would also improve the audit trail for overtime requests and approval as currently each pink slip is recorded manually and stored within each unit.
- **Improve level of data recording for overtime:**
 - **Record temporal trends:** The level of information recorded within Lawson for overtime should be enhanced to include the time period for which overtime was used. The recording of this information would assist the department in assessing if overtime is being utilized to meet peaks in demand and provide data to develop schedules that are more closely aligned to demand.
 - **Revise overtime activity codes:** A review of the current 168 overtime activity codes should be conducted to revise or create new activity codes that more accurately reflect the purpose for which the overtime was used. The creation of generic activity codes limits the ability to assess the effectiveness of overtime.
 - **Record case or call assignment:** If possible, the particular case or call that the overtime was utilized for should also be recorded. Understandably, this would be easier for investigations as overtime within patrol may be used for multiple calls. The recording of the case or call, however, would provide the department with the ability to monitor the effectiveness of overtime usage, or the level of overtime and effort being utilized on any given case or call.
- **Record overtime at the unit level within Lawson:** Similar to the staffing recommendation above, overtime should be recorded at the unit level and not based on offense groups. Overtime should be recorded at the unit level and, if possible, the subunit level to allow for analysis to be conducted and aid data-driven decision-making.

Performance management structure

There is a lack of formal performance management within DPD across both the Patrol and Investigations Bureaus. The current system does not foster a culture of high performance, accountability, or action.

- **Establish performance measures or KPIs at the Bureau, unit, and individual level:** Performance measures should be established at the Bureau, unit, and individual level, all of which should be aligned to the achievement of the Department strategy and goals. These measures may center on resource utilization and productivity, clearance rates, customer satisfaction, etc. The establishment of performance measures will allow DPD leadership to monitor behaviors, activities, outcomes, and performance and drive decisions and actions based on this information. Overall, it will allow DPD a system to measure how the department is functioning to meet its strategic plan and goals.
- **Establish performance reporting and management process:** The establishment of performance measures needs a structured performance reporting and management system to routinely measure performance and take action where necessary. Leadership should be engaged in performance management and conduct Bureau, unit, and individual evaluations on a rolling schedule based on performance against the measures or KPIs. Those units that are consistently

not trending against their performance measures will be subject to closer monitoring and a systematic review cycle until performance issues are identified, addressed, and resolved.

- ***Improve data to provide insight into performance:*** As described under the “data management” section, the establishment of performance metrics would require quality data to provide valuable insights into performance. The current quality of the data within the department would not present an accurate representation to be able to measure performance.

Patrol Bureau recommendations

Patrol Bureau recommendations

The patrol section of this report outlines two potential optimized staffing recommendations for DPD; these staffing recommendations were created based on the department’s current patrol operating model. The report begins with a recommendation that DPD select and pilot one of these optimized staffing scenarios. However, the report includes five additional recommendations designed to enhance the department’s patrol operating model and offers potential options for demand management to increase customer choice and the use of alternative resources, to reduce the burden on sworn officers and offer increased efficiency and effectiveness for the residents of Dallas.

Patrol recommendations

- 1 Design and implement patrol pilot of resource optimization model
- 2 Implement demand management strategies for lower-priority calls
- 3 Review demand drivers of self-initiated and department-directed workload
- 4 Develop a structured mechanism for tracking patrol activity and outcomes
- 5 Implement data-driven deployment strategies
- 6 Develop and implement geospatial deployment

Patrol operating model

A significant level of effort during the DPD staffing analyses was dedicated to the Patrol Bureau and assessing staffing requirements. KPMG’s study utilized data and analytics to analyze historical patrol demands, which acted as an input into a patrol scheduling optimization model. The outputs of the patrol scheduling optimization model are outlined within the Patrol Bureau Assessment chapter; however, the model does not provide only one singular staffing recommendation. Rather, the model is designed as a sustainable tool for the DPD to model scenarios and use to aid future patrol staffing and scheduling decision-making. The staffing options outlined are based on DPD’s current operating model; however, there are several recommendations to enhance the patrol operating model outlined within this report that could make DPD more efficient and effective, and improve the level of service provided. The information regarding staffing requirements should be considered with this in mind, and staffing requirements, including the volume of staff, and the type and skill set of staff, will change should the recommendations for the DPD patrol operating model be implemented.

Shift pattern requirement: The first evaluation KPMG conducted was of the current shift pattern. Through examination of research and leading practices, DPD and KPMG focused on analyzing the effectiveness of 4–10 and 5–8 shift patterns in aligning supply to demand. As confirmed by DPD leadership, a 12-hour shift pattern was not modeled due to research on this shift pattern suggesting it negatively impacts officer alertness, increases fatigue, and puts both officers and residents at a

heightened risk of accident.¹⁰ Through experimentation of the optimization model, which modeled thousands of scenarios at the division level and hundreds at the global department level with different staffing parameters and response time constraints between the two shift patterns, we observed that a 5–8 shift pattern is the optimal choice for DPD to maximize alignment of supply and demand and enhance staffing utilization. Based on the demand profile of two divisions, Northeast and Southwest, a 4–10 shift pattern was observed to be optimal; however, due to the operational complexity of managing two different shift patterns across divisions, that was not deemed to be a feasible recommendation. The 5–8 shift pattern overall allowed for improved alignment of officer supply to peaks in demand, and therefore allows a higher percentage of demand to be met across all divisions.

Staffing level requirement: There are many approaches to determining staffing allocation, including the per capita, minimum staffing, authorized level, and workload-based methods.¹¹ KPMG used an optimized workload-based approach to evaluate the effectiveness of patrol staffing. The workload approach estimates future staffing needs of police departments by modeling the level of current and historical activity, which can assist in determining the need for additional resources or relocating existing resources (by time and location), assessing individual and group performance and productivity, and detecting trends in workload that may illustrate changing activity levels and conditions. There has been extensive research articulating the advantages and disadvantages of each method.¹² The per capita-based approach, while favored by many police departments nationally, has been critiqued by the International Association of Chiefs of Police (IACP). Their conclusion, “Ratios, such as officers-per-thousand population, are totally inappropriate as a basis for staffing decisions. Defining patrol staffing allocation and deployment requirements is a complex endeavor which requires consideration of an extensive series of factors and a sizable body of reliable, current data,”¹³ has led many departments to utilize alternative approaches to determine staffing allocation. Extensive research has concluded that a workload-based approach to staffing is the most effective method due to the consideration of environmental and department-specific variables that it considers. IACP is a strong advocate of this approach, as it relies on actual levels of demand for police services and matches that demand with the supply of police resources. Typically, this approach relies on an examination of calls for service received by a department, and these calls are modeled to understand demand and supply. Workload demands should be modeled and then placed in context with other operational demands facing the department. The result is a comprehensive assessment of workload through both calls for service and other sustained operational commitments placed on the department.¹⁴

¹⁰ “The Impact of Shift Length in Policing on Performance, Health, Quality of Life, Sleep, Fatigue, and Extra-Duty Employment,” Karen Amendola et al., National Institute of Justice.

¹¹ “Police Staffing Allocation and Managing Workload Demand: A Critical Assessment of Existing Practices,” Jeremy M. Wilson and Alexander Weiss, *Policing: A Journal of Policy and Practice*, June 2014.

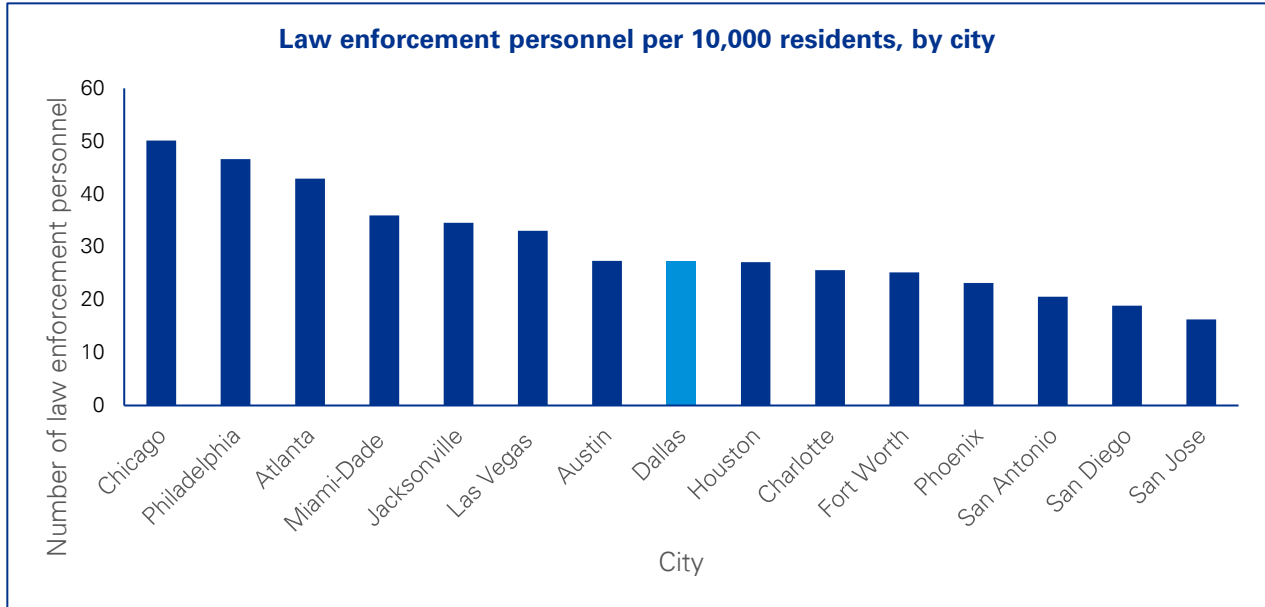
¹² Ibid.

¹³ IACP (2014) pg.2

¹⁴ An analysis of police department staffing: How many officers do you really need? A Review of 62 Police Agencies Analyzed by the ICMA/CPSM, Professor James McCabe, PhD, Senior Associate, ICMA Center for Public Safety Management.

Peer agency staffing comparisons

When compared to a cohort of comparable cities, in terms of population size and crime density, Dallas ranked just below average in terms of law enforcement personnel per 10,000 residents. Dallas has 27 law enforcement officers per 10,000 residents, as compared to an average of 30 officers per 10,000 residents for the comparison cohort. However, as discussed earlier within this report, per capita staffing has been proven to lack accuracy and is not deemed an appropriate measure upon which to base staffing decisions.



Source: 2017 FBI Uniformed Crime Reporting data

When analyzing DPD’s staffing requirements, a number of scenarios were developed based on choices DPD could make (e.g., maximizing response times met, minimizing overtime, maximizing overtime, etc.). Within each scenario, two options were given: to provide staffing to meet 100 percent of demand within response times or to meet 80 percent of demand within response times. These options were provided because a significant percentage of DPD’s calls for service are nonemergency: Priority 1 calls compose just 3 percent of total demand volume annually while Priority 3 and 4 calls account for 24–30 percent of calls by year from 2014 to 2018.

KPMG modeled the option in which staff supply exceeds workload demand for 80 percent of the time. Under this option, during the 80 percent of the time in which staff supply meets or exceeds workload demand, DPD should typically be able to respond to calls for service within the department’s target response times. (Based on historical data, there are occasional instances in which DPD was not able to adhere to response time targets even when staff supply exceeded workload demand—this likely stems from factors such as an extended travel time due to officer geographical location.) KPMG recommends in this report a range of solutions to reduce the types of demand that make up the 20 percent of calls that would be impacted by a slower response time. These types of calls usually have few police outcomes, such as generation of reports or arrests made. It is important to note that slower response time does not mean that calls will not be responded to; as with current operational practices, 100 percent of calls will be responded to whether or not the response time target is violated.

The staffing scenario that provided the most feasible option was through the utilization of both officers and an efficient use of overtime while minimizing the demand and supply gap. Through the use of both officers and scheduled overtime, the model created a schedule that meets the demand-supply gap targets outlined above at an optimal cost. Per current DPD policy, up to 140 hours per week of

scheduled overtime per division was permitted. It should be noted that under both options, Priority 1 response times are not exceeded and remain within the eight-minute goal. The staffing scenario outline below recommends staffing levels within patrol of 1,426, an increase of 20 officers, to meet the 80 percent demand requirement or staffing levels of 1,754, an increase of 348 officers, to meet the 100 percent demand requirement.

As noted previously, these requirements are options under DPD’s current operating model. Recommendations for demand management, use of data-driven deployment, and use of technology could all serve to enhance the patrol operating model and more effectively utilize current staffing available.

Option One: Staff supply meets or exceeds projected demand 80 percent of the time at an optimal cost.

As noted above, a target supply-demand gap of 80 percent enables cost savings by allowing DPD to more slowly respond to lower-priority calls for service during periods of peak demand. To achieve this supply-demand gap target at minimal cost, the model recommend 5–8 shift patterns across all divisions. The model’s division-level outcomes—including key metrics, shift start times, and schedules—are included in Appendix A, while summary tables are included below. Sergeant staffing levels assume DPD maintains its current ratio of one sergeant per seven officers.

Model output summary, by division (Option One)

Division	Officer supply	Weekly overtime hours	Days per shift	Shift length	% of demand met
Central	194	139	5	8	80.1%
North Central	173	16	5	8	88.1%
Northeast	236	123	5	8	80.1%
Northwest	177	108	5	8	80.1%
South Central	209	132	5	8	80.1%
Southeast	234	138	5	8	80.4%
Southwest	203	140	5	8	82.4%
Total officer supply	1,426	796			
Total sergeants	204				

Potential changes in officer supply, by division (Option One)

Compared to DPD’s current staffing of 1,406 officers across the seven patrol divisions listed below, the model recommends a total staffing increase of 20 officers to 1,426 total, along with 796 hours of scheduled overtime per week. While the staffing requirement is similar to current staffing, the distribution of staff among divisions has altered to reflect the division-level variations in demand profiles and workload.

Division	Current Officer Supply	Potential Officer Supply	Potential Supply Changes
Central	219	194	-25
North Central	126	173	47

Northeast	241	236	-5
Northwest	174	177	3
South Central	217	209	-8
Southeast	221	234	13
Southwest	208	203	-5
Total Officer Staffing	1,406	1,426	20

Associated watch start times (Option One)

The model recommends the below watch start times, by division. Under current schedules, watch 1 begins at 11:00 PM or 12:00 AM, depending on the division; watch 2 begins at 7:00 AM or 8:00 AM; watch 3 begins at 3:00 PM or 4:00 PM; and the newly implemented watch 4 begins at 4:00 PM. As shown in the table below, the proposed schedules would make slight changes to start times for watches 1 and 2 and more significant changes to the start times for watches 3 and 4.

Watch #	Central	North Central	Northeast	Northwest	South Central	Southeast	Southwest
1	11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM
2	6:00 AM	6:00 AM	6:00 AM	6:00 AM	6:00 AM	6:00 AM	6:00 AM
3	1:00 PM	1:00 PM	1:00 PM	1:00 PM	1:00 PM	1:00 PM	1:00 PM
4	8:00 PM	8:00 PM	8:00 PM	8:00 PM	8:00 PM	8:00 PM	8:00 PM

Option Two: Staff supply meets or exceeds projected demand 100 percent of the time at lowest cost.

To most efficiently meet 100 percent of project demand for officer workload at an optimal distribution of regular and overtime hours, the model recommends a 5–8 shift pattern across all divisions. The model’s division level outcomes—including key metrics, shift start times, and schedules—are included in Appendix A, while summary tables are included below. Sergeant staffing levels assume DPD maintains its current ratio of one sergeant per seven officers.

Model output summary, by division (Option Two)

Division	Officer supply	Weekly overtime hours	Days per shift	Shift length	% of demand met
Central	243	137	5	8	100%
North Central	179	81	5	8	100%
Northeast	297	112	5	8	100%
Northwest	230	134	5	8	100%
South Central	257	140	5	8	100%
Southeast	305	140	5	8	100%
Southwest	243	137	5	8	100%
Total officer supply	1,754	881			
Total sergeants	251				

Potential changes in officer supply, by division (Option Two)

Compared to DPD’s current staffing of 1,406 officers across the seven patrol divisions listed below, the model recommends a total staffing increase of 348 officers to 1,754 total, along with 881 hours of scheduled overtime per week.

Division	Current Officer Supply	Potential Officer Supply	Potential Supply Changes
Central	219	243	24
North Central	126	179	53
Northeast	241	297	56
Northwest	174	230	56
South Central	217	257	40
Southeast	221	305	84
Southwest	208	243	35
Total Officer Staffing	1,406	1,754	348

Associated watch start times (Option Two)

The model recommends the below watch start times, by division. Under current schedules, watch 1 begins at 11:00 PM or 12:00 AM, depending on the division; watch 2 begins at 7:00 AM or 8:00 AM; watch 3 begins at 3:00 PM or 4:00 PM; and the newly implemented watch 4 begins at 4:00 PM. As shown in the table below, the proposed schedules would make slight changes to start times for watches 1 and 2 and more significant changes to the start times for watches 3 and 4.

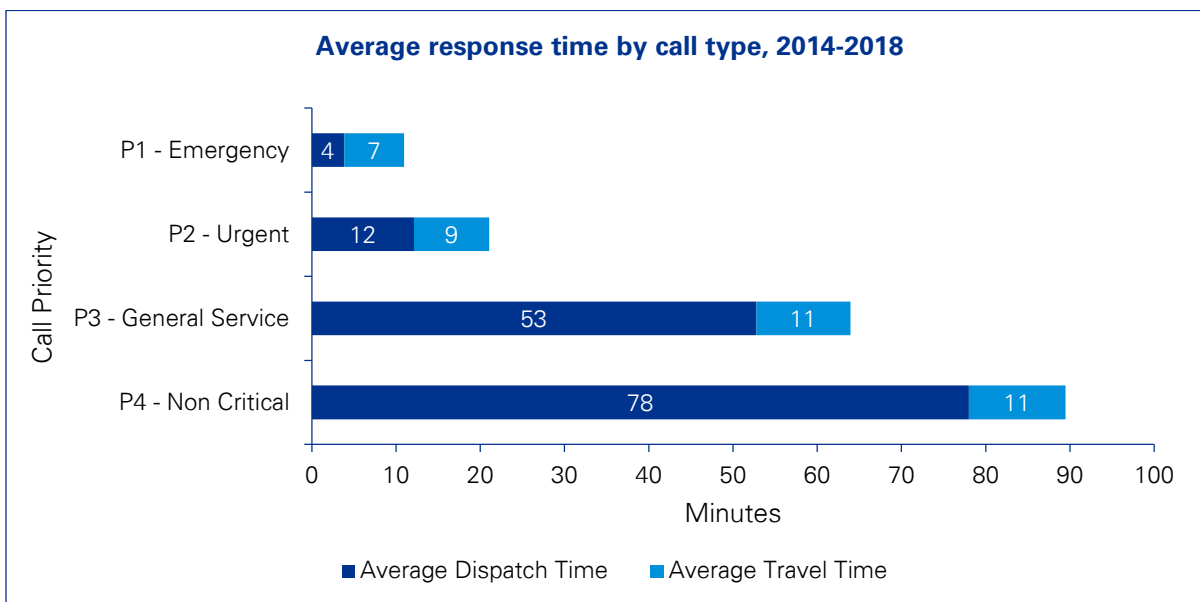
Watch #	Central	North Central	Northeast	Northwest	South Central	Southeast	Southwest
1	11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM
2	6:00 AM	6:00 AM	6:00 AM	6:00 AM	6:00 AM	6:00 AM	6:00 AM
3	1:00 PM	1:00 PM	1:00 PM	1:00 PM	1:00 PM	1:00 PM	1:00 PM
4	8:00 PM	8:00 PM	8:00 PM	8:00 PM	8:00 PM	8:00 PM	8:00 PM

Review response time requirement: The DPD’s current operating model has the primary objective of responding to calls for service efficiently and effectively within their target response times. Based on this objective, KPMG developed optimized staffing scenarios for front-line patrol officers (i.e., senior corporals and police officers), for which the primary objective was to minimize the gap between officer supply and demand within response time constraints. It should be noted that within the model, Priority 1 response times cannot be exceeded and must be met within the current eight-minute target. However, response times are only one metric that should be considered when measuring performance and do not necessarily reflect the department’s ability to fight crime and engage the community.

It should be noted that while KPMG and DPD use the same calculation method for response times, the approach to data cleaning (i.e., the removal of outlier and erroneous data) is different and, therefore, may result in differing response time results. The graph below illustrates the average dispatch and travel time by call type from 2014 to 2018. The response time is calculated by taking the sum of the dispatch and travel time for a call. Priority 1 calls have the shortest response time, at approximately 11 minutes. The average response time is 21 minutes for Priority 2 calls, 64 minutes for Priority 3 calls,

and 89 minutes for Priority 4 calls. This variation in response time stems largely from significantly longer dispatch times for low-priority calls. For example, Priority 1 calls have a dispatch time of 7.1 minutes while Priority 4 calls have a dispatch time of 78 minutes. Travel times remain fairly consistent across call types, ranging from 7.1 minutes for Priority 1 calls to 11.5 minutes for Priority 4 calls.

Call priority	Average response time	Target response time
1	11 minutes	8 minutes
2	21 minutes	12 minutes
3	64 minutes	30 minutes
4	89 minutes	60 minutes

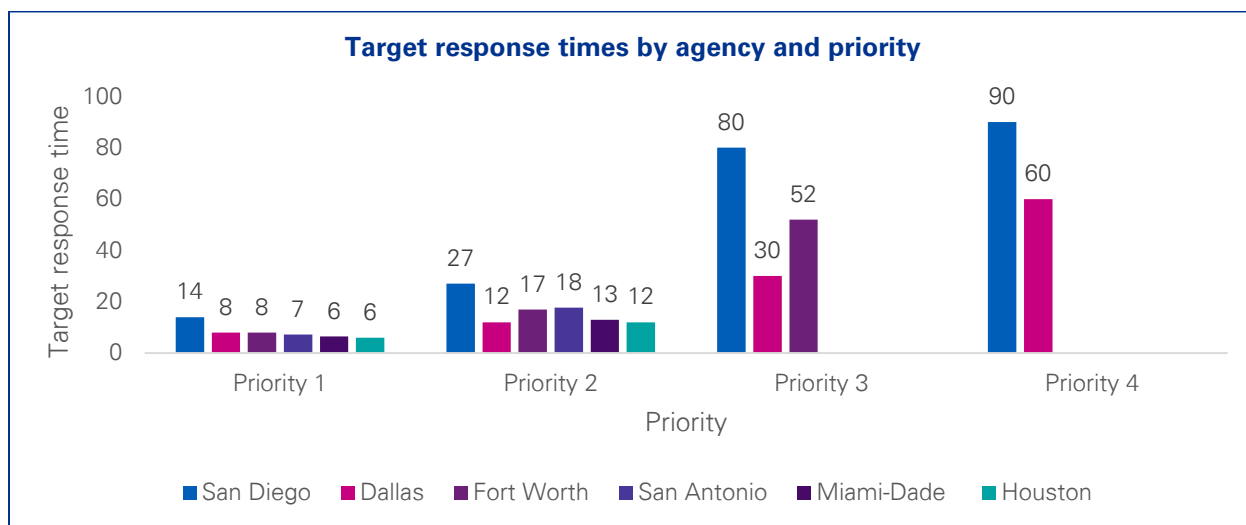


It is worth noting that the above figures are averages between 2014 and 2018. DPD may benefit from further refining these target response times to create data-informed targets that reflect variations in geography across divisions and variations in urgency within call priorities. For example, at present, all divisions have the same response time targets, despite variations in the geography and density of their service areas and their staffing levels. Similarly, P1 calls share the same target response time, despite differences in geography between divisions; due to traffic congestion, weather, or environmental factors, officers may be unable to go code three to P1 calls, which may also impact response times. Interviews with staff also revealed that the target response times were not developed from a data-driven process. Ultimately, the targets may be unrealistic or outdated based on optimal staffing levels for demand or when applying other strategies such as geospatial mapping for demand management. If resources are deployed in a way that concentrates officers where they are most likely to be needed, response times may be lower and could then be an indicator of effective deployment.

Additionally, it is worth noting that research suggests that public satisfaction with police agencies is driven by more than just response times. For example, studies show the public typically accepts a delayed response or alternatives to a patrol officer response such as telephone reporting and online reporting when it is properly presented and explained when they place their call to the police for crimes that are not in progress at the time of the call.

Drawing on publicly available documents, the project team compared Dallas's response time targets with those from other major cities. As shown in the graph below, Dallas's Priority 1 and 2 response

time targets appear in line with those chosen by the comparison cohort. However, Dallas’s Priority 3 target is considerably faster than that chosen by the comparison agencies. There was insufficient publicly available data to do a robust comparison of Priority 4 response time targets.



Source: FY 2019 budget reports for each locality

Demand management

Implement demand management strategies for lower-priority calls: From 2014 to 2018, DPD averaged approximately 596,000 calls for service per year, as well as an additional 436,000 self-initiated or department-directed activities each year. Only a small percentage of this activity, however, stemmed from urgent, emergency situations: Priority 1 calls constituted just 3 percent of total demand volume annually, and Priority 2 calls amounted to 25 to 32 percent of demand volume, depending on the year. Looking at officer workload, Priority 1 calls accounted for 18 percent of total officer workload from 2014 to 2018 while Priority 2 calls accounted for 18 percent of officer workload. As a result, high-priority calls accounted for just 36 percent of officer workload from 2014 to 2018. Managing the bulk of calls in a more modern customer-centric approach may well offer groundbreaking opportunity for performance improvement. This will, however, require considerable consultation and preparation prior to implementation.

While high-priority calls require an immediate response from sworn officers, DPD can more efficiently manage lower-priority demand drivers by diverting them to alternative demand management mechanisms, including telephone reporting, online reporting, use of neighborhood police officers (NPOs), and scheduled appointments. These alternative mechanisms may be particularly well-suited for Priority 3 and 4 calls, which accounted for 22 to 30 percent of call volume, by year. Lower-priority calls (Priority 3 and 4) consumed 27 percent of officer workload from 2014 to 2018. Due to the ever-changing demographics of large cities, it may be beneficial for DPD to offer more than one response mechanism to a call for service, especially considering the evolution of technology. Many residents who place a call for service may not be able to wait for an officer to arrive due to work or childcare commitments, and many may not wish to see an officer at all and require a police report for insurance purposes; however, there will still be residents who wish to see an officer in person. DPD should explore options to cater to all residents of Dallas rather than provide a “one size fits all” service. The Metropolitan Police Service in the United Kingdom has developed a Public Access strategy to

determine the mechanisms for how they engage with the public and how the public can access police services.¹⁵

Much of the lower-priority workload may be eligible to be diverted to the response mechanisms outlined below:¹⁶

Telephone reporting: The DPD currently operates a telephone reporting unit, referred to as the “Expediter” unit, and certain calls for service are eligible for diversion. However, this unit is currently only staffed with one resource and, therefore, the capacity for call diversion is limited. Due to the limited resourcing, it is unclear when calls can or cannot be diverted because the hours of operation are not always consistent. DPD should review the current 10 call types that are available for telephone reporting and assess if these categories can be expanded upon. Based on the eligible call categories, DPD should analyze historical CAD data to determine the anticipated call volume that could be diverted and the temporal trends to inform staffing and scheduling requirements not just for the Expediter unit but also for the potential impact on patrol officer workload. Once determined, the Expediter unit schedule should be formally communicated and call takers should be made aware to help ensure appropriate diversion.

Online reporting: At the time of writing this report, DPD was in the process of implementing an online reporting system. The DPD has determined certain calls that are eligible for online reporting; however, when provided to KPMG, the call types eligible for diversion did not directly align to the current call categories and, therefore, KPMG could not conduct an analysis on potential demand. As with the telephone reporting unit, DPD should analyze historical CAD data to determine the anticipated call volume that could be diverted and the temporal trends to inform staffing and scheduling requirements for the potential impact on patrol officer workload.

NPOs responding to lower-priority calls: Within many community policing models, for example, within the New York Police Department¹⁷ and the Metropolitan Police Service in the United Kingdom, NPOs are responsible for not only community engagement activities such as community meetings and school visits but are also responsible for providing a response to lower-priority calls for service. Those calls for service may be deemed “quality of life” calls where a response is also providing a mechanism for community engagement and problem-solving. Under DPD’s current operating model, NPOs do not respond to calls for service unless there are no other patrol officers available. DPD should consider the opportunity and impact of reassigning lower-priority calls to NPOs and providing capacity for patrol officers to attend the higher-priority calls.

Appointments: In an effort to provide an enhanced level of service to residents, there is the option to provide appointments. Appointments are typically conducted by NPOs and scheduled around other community engagement activities. The use of appointments allows residents the flexibility of receiving a response from an officer but at a time convenient to them that does not impact their work, childcare, or other commitments they may have. Appointments are typically scheduled within a 72-hour period to help ensure an appropriate response is provided. Again, this could offer an opportunity to redirect lower-priority calls to NPOs and allow patrol officers to focus on the higher-priority calls. The DPD should explore the use of appointments; consideration would need to be given to eligible call types, call demand, and appropriate staffing in addition to the impact on patrol officers, to help ensure they

¹⁵ https://www.london.gov.uk/sites/default/files/31_aug_2017_public_access_strategy_draft.pdf

¹⁶ “Making Policing More Affordable,” George Gascón and Todd Foglesong, Harvard Kennedy School and National Institute of Justice, <https://www.ncjrs.gov/pdffiles1/nij/231096.pdf>.

¹⁷ <https://www1.nyc.gov/site/nypd/bureaus/patrol/neighborhood-coordination-officers.page>

continue to provide a high level of service to their residents while utilizing their resources in the most effective manner possible.

By shifting workload to the alternative response mechanisms outlined above, DPD can reduce sworn officer capacity to respond to the highest-priority calls for service.

Review demand drivers of self-initiated workload: Self-initiated calls account for 15 to 30 percent of demand volume, depending on the year. From 2014 to 2018, the number of self-initiated activities grew by 93 percent, with most of that increase occurring between 2014 and 2015. Self-initiated activities accounted for approximately 7 percent of officer workload from 2014 to 2018. DPD should consider reviewing the calls that officers choose to initiate, and develop clear guidelines outlining situations in which officers should initiate patrol activity, to assess whether some of this officer workload could be redirected. There are further recommendations regarding how to maximize the effectiveness of officer self-initiated activity through the use of data, crime density mapping, and officer staging (see “data-driven deployment” and “use of technology” recommendations).

Review department-directed workload: Officer department-directed activities account for 14 to 19 percent of demand volume, varying by year. On average, department-directed activities accounted for 17 percent of officer workload from 2014 to 2018. The call types that compose department-directed activities are:

- 60-Special Assignment
- 61-Foot Patrol
- 63-Cover Element
- 75-Special Tracking
- 76-Arrest or Search Warrant
- 68-Verified Response Alarm.

The majority of the calls are related to special assignments which, based on interviews, consists of reactionary tasks that divert officers from patrol duties. For example, it was noted during interviews that two officers spent two weeks patrolling outside the City library to move along homeless due to a complaint. The tasks are tracked within the CAD data; however, there is no mechanism for recording what the particular task was or the outcome of that task. DPD should consider enhanced recording of information regarding the department-directed activities to be able to monitor the effectiveness of the officer’s time since 17 percent of officer workload is a significant level of effort to invest without being able to determine its usage.

Outcome tracking for patrol activities

As outlined within the Patrol Bureau Assessment chapter, there is limited monitoring of the outcomes from patrol activities other than the reporting of crime statistics within weekly Compstat meetings. The analysis of the top 10 highest-volume calls between 2014 and 2018 revealed that despite these call types having the highest volume and consuming a large portion of patrol workload, they do not result in any significant outcomes for the DPD. Of the top 10 call types over the five-year period, on average, only 2.25 percent resulted in an arrest and only 33 percent required a report. This suggests that there may be alternative ways for DPD to manage call demand for some call types, as outlined within the “demand management” recommendation. The top 10 call analysis only relates to the activities of patrol officers; there is currently no formal mechanism in place for monitoring the outcomes and activities of the other units within patrol (i.e., NPOs, Crime Response Team [CRT], and Deployment units). A structured mechanism for monitoring activity, outcomes, and performance should be

developed to help track activities and help assess the effective utilization of these resources in meeting DPD's overall strategy.

Data-driven deployment

While the data was of a higher quality than that of the Investigations Bureau, the team found that the data was not necessarily being used to inform operations as well as it could be. Patrol officers have limited access to real-time information, partially due to technology limitations as they cannot view reports on their Mobile Device Terminals (MDTs), and rely on the personal relationships they have with the CRT to receive information. While crime analysts do develop some information on crime hot spots, this is not fed into the deployment patterns, and the focus of patrol operations is reactionary.

Implement data-driven deployment strategies: When it comes to data-driven law enforcement, there are two approaches: intelligence-led policing and predictive policing. While these approaches are not mutually exclusive, there is a difference. Predictive policing uses computers to analyze the big data regarding crimes in a geographical area in an attempt to anticipate where and when a crime will occur in the near future.¹⁸ While it does not go so far as to identify who will commit the crime, it does pinpoint hot spots to help law enforcement anticipate the approximate time of day and area of town where another crime might occur. Armed with this information, police can be placed more strategically to either thwart a crime in progress, or even better, prevent a crime from taking place.

Intelligence-led policing, on the other hand, attempts to identify potential victims and potential repeat offenders, then works in partnership with the community to provide offenders with an opportunity to change their behavior before being arrested for a more severe crime.¹⁹ According to the U.S. Department of Justice, intelligence-led policing is "a collaborative law enforcement approach combining problem-solving policing, information sharing, and police accountability, with enhanced intelligence operations."²⁰ It is designed to guide policing activities toward high-frequency offenders, locations, or crimes to impact resource allocation decisions. An important component of intelligence-led policing is that it encourages—and, arguably, depends on—collaboration among various agencies and the community, including not only local police, but also other local law enforcement, the FBI, homeland security agencies, and even probation and parole officers. In short, predictive policing is concerned with where and when crime may happen, while intelligence-led policing, which often includes predictive policing, focuses on preventing victimization.²¹

It is recommended that DPD incorporate both these approaches into their patrol operations. Crime analysts should be used to support predictive policing by using historical CAD data to identify crime or call density areas, which should be used to inform the self-initiated and proactive deployment of officers.

A wider strategy would need to be incorporated to inform intelligence-led policing (see the strategic recommendations regarding the development of a partnership model); however, immediate changes could be made to facilitate more formal channels of communication and information sharing between

¹⁸ "Predictive Policing," National Institute of Justice, June 9, 2014.

¹⁹ Intelligence-Led Policing: The New Intelligence Architecture, U.S. Department of Justice, Office of Justice Programs, September 2005.

²⁰ Navigating Your Agency's Path to Intelligence-Led Policing, U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Assistance, Washington, DC, Global Justice Information Sharing Initiative, 2009.

²¹ "Intelligence-led Policing: Changing the Face of Crime Prevention," Police Chief Magazine, IACP.

Patrol, CRT, Deployment, and Investigators to help ensure that deployment and activities are targeted toward the high-priority crime in the most effective way possible.

Use of technology

Develop and implement geospatial deployment: As discussed in the Patrol Bureau Assessment chapters, the target response times for DPD are not based on a data-driven process, and they do not consider variations in geography across divisions and variations in urgency within call priorities.

DPD should consider developing target response times that are appropriate for the geographic size and staffing levels of each division. Additionally, DPD may be able to minimize response times through the use of geospatial deployment.

As discussed in the above recommendation, crime analysts should be used to develop call and crime density maps, which are an effective tool in identifying areas with higher levels of criminal activity. These maps are an industry-leading analytical tool to assist officers in optimizing their deployment. Research shows that approximately 3–5 percent of addresses in cities are responsible for about 50 percent of calls, and that crime clusters tend to form at “micro-locations,” such as car parks, bars, street segments, and shopfronts.²²

By tracking and analyzing where crimes occur and where calls for service most frequently are generated, DPD can focus officer-proactive and self-initiated time by staging officers in areas where calls are most likely to occur, and where proactive officer activities may be most beneficial. In doing so, geospatial deployment can reduce response times and deter criminal activity.

²² “Hot Spot Policing Can Reduce Crime,” National Institute of Justice, <https://www.nij.gov/topics/law-enforcement/strategies/hot-spot-policing/pages/welcome.aspx>.

Investigations Bureau recommendations

Investigations Bureau recommendations

Investigations recommendations

As detailed in the Investigations Report, it was not possible to definitively identify an optimal staffing level for DPD’s Investigations Bureau due to data quality issues, gaps in current data recording practices, and a lack of historical information regarding staffing, caseload, and workload. This report outlines recommended process improvements intended to resolve these issues, thereby allowing DPD to record and monitor workload and performance to define an optimal investigations staffing level in the future. Additionally, the recommendations below provide a means for the Investigations Bureau to improve performance in the near term by adopting leading practices and implementing a standardized case management process and use of technology.

Investigations recommendations

- 1** Create a standardized “how to” guide for user interaction with the RMS system and the case management module
- 2** Assess and revise existing general orders on case assignment across units to ensure clarity and consistency
- 3** Create a standardized process for internal case assignment to be implemented in each investigations unit
- 4** Develop clear guidelines for case prioritization, based on DPD’s strategy and goals
- 5** Increase utilization of civilian investigations staff, such as crime analysts
- 6** Dedicate investigative support staff to tracking trends in crime, suspects, and geography
- 7** Standardize data recording practices across units, including around issues such as case screening, activity tracking, case status, and caseload tracking
- 8** Develop performance metrics and KPIs at the bureau, unit, and individual levels

Case management and RMS usage

Create a standardized process for system use: The RMS team, in conjunction with DPD leadership, should conduct a case management process review and create a standardized “how to” guide for user interaction with the RMS system and the case management module. This should outline the functionality of the system, as well as instructions guiding how the system should be utilized throughout the case management process. The new guidelines should reduce the manual workarounds, duplicative practices, and process inefficiencies currently in use by specifying how the system functionality integrates into the case management process and by reviewing the system’s integration with other technology. For example, many supervisors require a case report to be printed for manual review and signature, and then scanned back into the system. This occurs because not all units have access to PDF Editor Software, which DPD requires individual units to request. DPD’s case management process review can streamline the case report approval process by providing all units access to the same technology, thereby reducing unnecessary administrative burdens and technical obstacles. The RMS team should also create a formal process to schedule and provide training to all new staff, as well as “refresher” training to current staff, to facilitate the universal adoption of the redesigned case management process.

Case assignment across units

Assess and revise existing general orders on case assignment across units to ensure clarity and consistency: DPD has general orders established by the department that provide direction on which case types and offenses should be assigned to each investigations unit. However, during interviews, it became evident that these general orders are not always enforced or implemented. These inconsistencies not only lead to confusion and frustration within DPD’s investigations units, but they may also result in delays in initiating contact with the public, thereby negatively impacting DPD’s service levels. DPD investigations leadership should develop oversight processes to monitor system workflow, allowing for an assessment of whether cases are assigned to the correct investigations unit. This oversight process will facilitate voluntary adherence to the general orders, while also enabling leadership to take corrective action when necessary.

Case assignment within units

Create a standardized process for internal case assignment across all units: Currently, each unit utilizes different policies to guide case assignment to investigators within a unit: some units may make decisions based on case volume, while others utilize case type, geography, and/or investigator specialization. DPD investigations leadership should develop consistent policies to guide case assignment within investigations units. These policies should be data-driven—informed by internal DPD data on each investigator’s caseload, estimates of the effort required by a particular case type, and DPD’s average investigator productivity. The recommendations listed in the “Data management and recording” section below provide guidance as to how DPD can update its data recording practices so these metrics are available to unit leadership. Additionally, DPD’s updated processes for case assignment should maximize use of DPD’s RMS and case management systems, as the current manual tracking of case assignments adds significant administrative effort and increases the risk of human error.

Case prioritization

Create clear guidelines for case prioritization, based on DPD’s strategy and goals: Currently, investigators typically use their own discretion to determine which cases within their caseload should be prioritized. Individual units may have an internal prioritization structure; however, prioritization procedures are not consistent across units. A lack of standardization or direction regarding case prioritization and case management can result in varying levels of service provided to the public and prioritization that does not align to the department’s goals. As a result, DPD investigations leadership

should develop case prioritization policies that align with DPD's goals and strategy regarding effective investigative service provision to the public. This may include prioritization based on factors such as case type, case severity, or dollar amount (for property crimes). The goal of the prioritization policies should be to direct investigators to the cases deemed most important to the department.

Use of crime analysts

Increase utilization of civilian investigations staff, such as crime analysts: The use of civilians within investigations units has been a growing trend nationally. Civilian staff can be used for specialized tasks previously conducted by investigators, and to reduce the administrative tasks conducted by investigators. Incorporating lower-cost civilian staff where possible allows investigators to concentrate their time on complicated tasks most suited to their skill set. For example, civilian investigators may be given the power to issue citations, or be assigned to interview victims and witnesses in misdemeanor crimes, process reports and evidence, and prepare cases for prosecution. At present, there appears to be limited investment in civilian support within DPD's investigations units, as the department staffs only five crime analysts, two senior criminal intelligence analysts, and one investigations support specialist as of March 2019. As DPD leadership reviews the agency's investigations staffing levels, leadership should work with investigations unit leadership to identify duties that can be assigned to civilian staff.

Use of data and intelligence

Dedicate investigative support staff to tracking trends in crime, suspects, and geography: There is currently no structure in place to track and analyze trends in case type, repeat suspects, repeat victims, or geography—either at the case screening and assignment stage or during the case investigation and management process. Research shows that crime analysis and targeted investigations of repeat offenders can improve case outcomes productivity, and improve clearance rates, enable a more proactive approach, and identify opportunities for problem-solving to reduce criminal activity in the long term.²³ These duties can also be carried out in a cost-effective manner by civilian staff. However, DPD's current processes do not dedicate staff to crime analysis; rather, the identification of trends within units is reliant on investigators verbally sharing information or recognizing case similarities. As DPD assesses and adjusts its investigations staffing, the agency should ensure sufficient staff are dedicated to crime analysis, thereby allowing the agency to shift to a more proactive, intelligence-led model.

Data management and recording

Standardize data recording practices across units: At present, processes for recording and inputting data into the RMS system differ across investigations units. This lack of standardized guidelines for data recording and management results in poor data quality, including missing or incomplete fields and incorrect and erroneous data. This poor data quality has widespread implications for DPD management and leadership: without reliable internal data, department leadership cannot assess workload, caseload, performance, and resource requirements for the investigations units to inform operational decision-making or develop KPIs. The RMS team should work with DPD leadership to create a policy and

²³ "Detective workload and opportunities for increased productivity in criminal investigations," John Liederbach, Eric J. Fritsch, and Charissa L. Womack, *Police Practice and Research*, September 8, 2010.

procedure manual to enable consistent and accurate data recording practices, including around issues such as the following:

- **Case screening:** Revised recording practices should allow DPD to identify the volume of cases that have “leads” or “no leads,” and enable the department to sort cases into three groups:²⁴
 1. Cases that cannot be solved with a reasonable amount of investigations effort
 2. Cases solved by circumstances, which only requires that the suspects be arrested, booked, and interrogated, and a prosecutable case prepared
 3. Cases that may be solved if a reasonable level of investigations effort is applied to them, but will not be solved otherwise.

Data recording practices that allow for an estimate of investigator effort per case can inform unit leadership decision-making—particularly around case assignments—thereby allowing workload to spread more evenly across investigators. Additionally, improved internal data may allow DPD to concentrate resources on cases with a higher probability of being solved.

- **Activity tracking:** Currently, case investigation activities are recorded only qualitatively, and this qualitative information cannot be easily extracted from the system and analyzed. Shifting to a quantifiable recording method for investigator activity tracking will allow DPD leadership to monitor investigator workload and develop data-driven staffing requirements.
- **Case status guidelines:** Based on information gathered within focus groups, there appear to be varying rules or processes for recording case status across units and limited guidelines or checks for data quality when entering information into the system. For example, within the case management module data, there are two disposition statuses, Active or Closed, yet 7 percent of all cases do not contain a case status. Even for those that do have a case status, data quality is poor. The information recorded within the case status field is used to calculate clearance rates for units and the department. Developing consistent and accurate recording practices will help ensure the reporting of reliable performance data.
- **Caseload tracking:** Current data recording practices do not allow for the reliable calculation of each investigator’s caseload by year. For example, badge numbers recorded against cases appear across multiple units within the same year, even though investigators are typically assigned to only one unit. Caseload per investigator is one method that can be used to assess the productivity and utilization of an investigator, and thereby inform a staffing analysis. Developing reliable data tracking to record caseload per investigator will provide a key metric to inform DPD staffing decisions going forward.

Performance management

Develop performance metrics and KPIs: There do not appear to be any formal KPIs defined for investigators working within the investigations units. While clearance rates are reported externally, unit or bureau leadership does not use clearance rates as a performance measure internally. There is no structure in place to measure productivity, utilization, case quality, caseload, or workload across all units. As described in the “data management” section above, the establishment of performance metrics may require modifications to DPD’s current data management and recording practices. However, improving these data management policies can enable DPD’s transition to a data-driven performance management approach, enabling increased productivity and continuous improvement. As

²⁴ “Detective workload and opportunities for increased productivity in criminal investigations,” John Liederbach, Eric J. Fritsch, and Charissa L. Womack, *Police Practice and Research*, September 8, 2010.

discussed in the “Strategic Recommendations” chapter that follows, KPIs should be developed at bureau, unit, and individual levels.

Recommended implementation roadmap

Recommended implementation roadmap

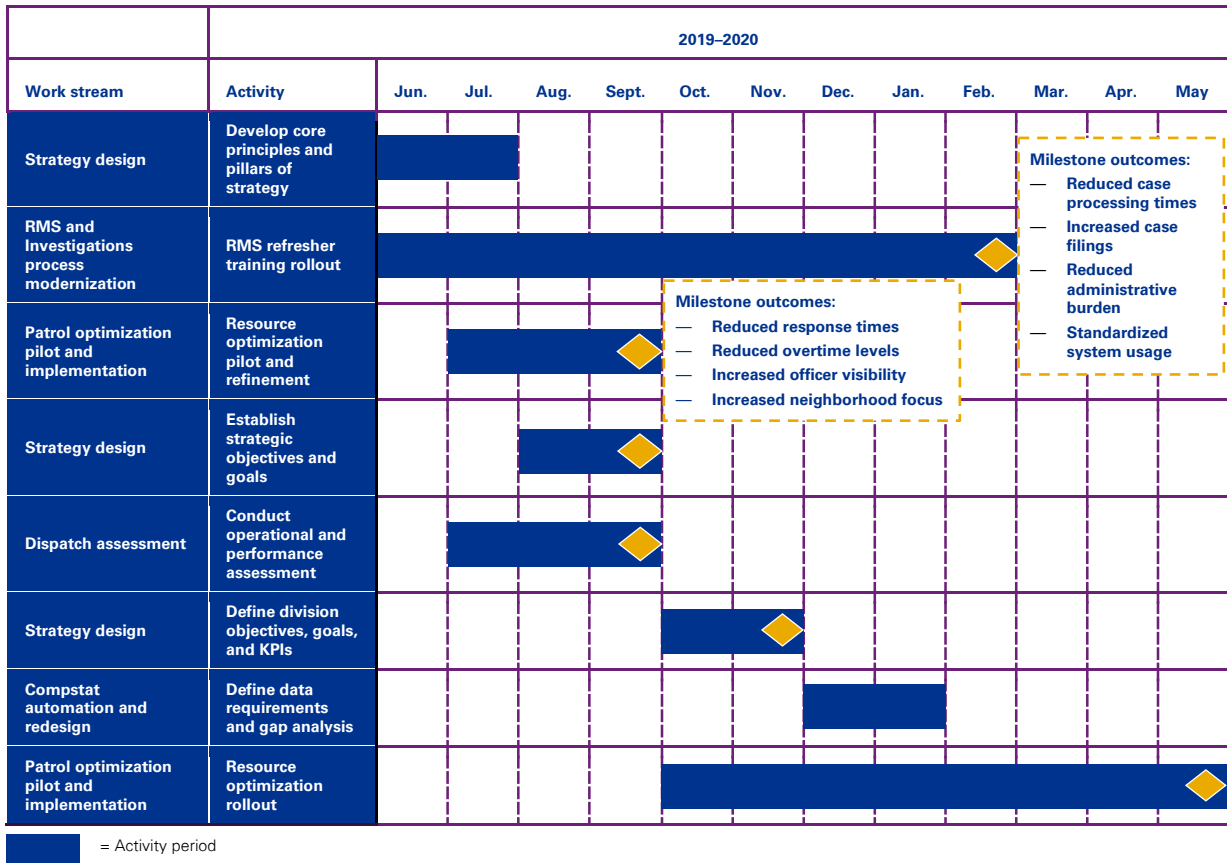
Initial steps

The implementation plan on the following page highlights initial activities that should be prioritized over the next 12 months to commence progress on the five highest-priority recommendations. The project team recommends this near-term implementation timeline, as these recommendations present the greatest opportunities to optimize the use of DPD's current resources, and to define a strategy that will inform DPD's decision-making across numerous recommendations going forward. The rationale for the selection of these five high-priority recommendations is outlined below:

- **Strategy design:** By identifying key departmental priorities, the strategic planning process will assist DPD leadership in focusing energy and resources on the organization's highest-priority goals.
- **RMS and Investigations process modernization:** The redesign of the RMS process will enable the near-term implementation of standardized case screening, assessment, and assignment practices, thereby enabling more efficient and effective operations in DPD's Investigations Bureau.
- **Patrol optimization:** The implementation of an optimized patrol schedule will allow for the most efficient use of DPD's current staff, thereby allowing the department to offer the highest possible service levels at the lowest possible cost.
- **Dispatch assessment:** Dispatch plays a pivotal coordination role for the Patrol Bureau. An operational review of DPD's Dispatch function may yield operational benefits for both DPD's Dispatch and Patrol functions.
- **Compstat automation and redesign:** The redesign of DPD's Compstat processes has the potential to reduce the administrative and analytical tasks carried by sworn officers while providing higher-quality insights and problem-solving to inform the department's efforts to address recent increases in crime.

While complete implementation of these recommendations will not be feasible within 12 months, the graphic on the following page identifies key activities toward realizing the gains associated with each of these recommendations.

The recommended implementation plan below highlights the initial activities that should be prioritized across five work streams within the first 12 months.

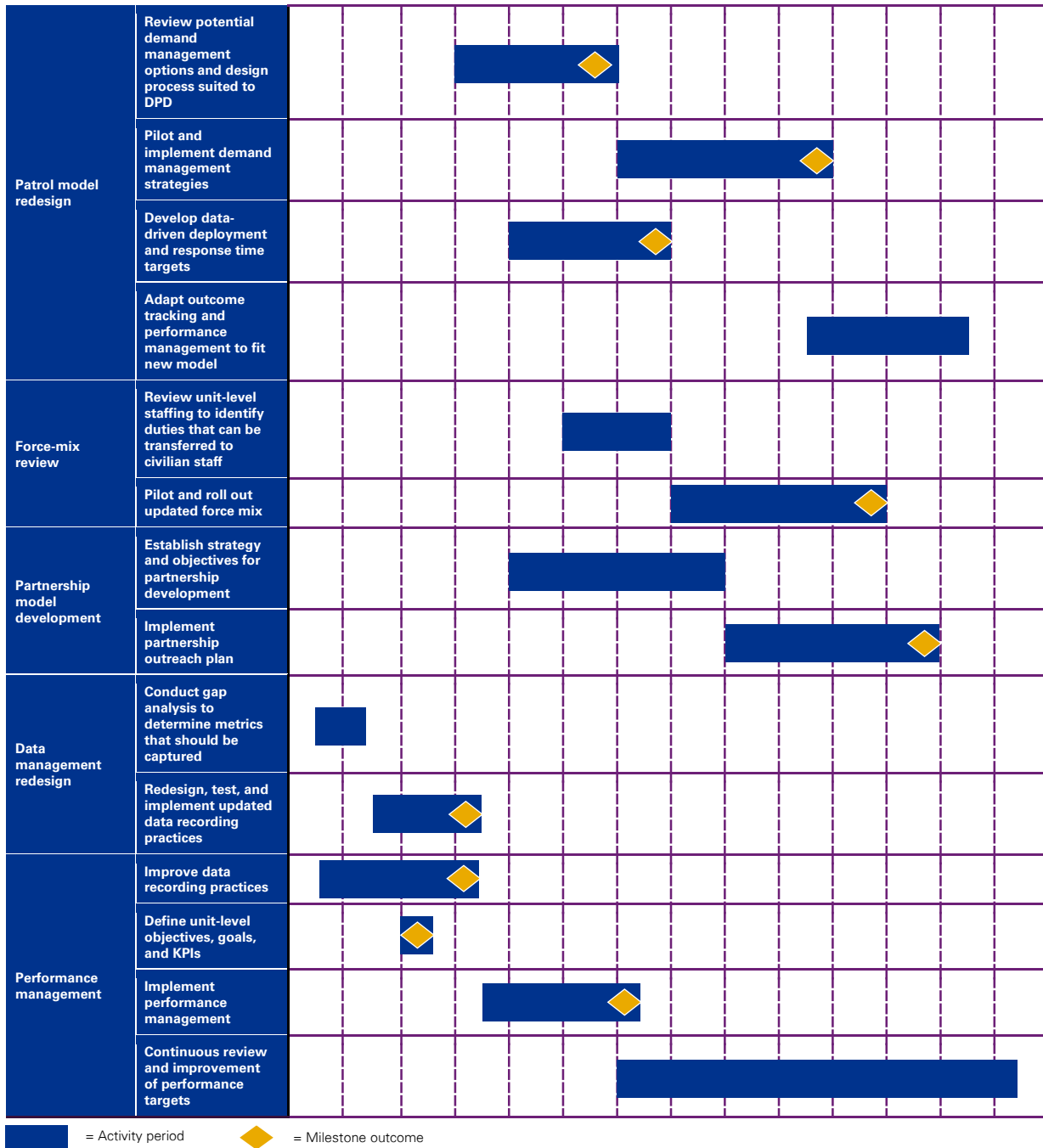


Recommended three-year implementation plan

In addition to the initial steps outlined above, the project team developed a high-level roadmap to guide the implementation of all 10 strategic recommendations over the next three years. The graphic below maintains the timelines outlined for the initial implementation activities of the five high-priority recommendations, while also outlining timelines to implement the remaining five strategic recommendations by the end of 2022.

The long-term implementation plan below outlines a high-level three-year timeline for the adoption of all 10 strategic recommendations outlined in the report.

Work stream	Activity	2019		2020				2021				2022			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Strategy design	Develop core principles and pillars of strategy	■													
	Establish strategic objectives and goals		◆												
	Define division objectives, goals, and KPIs			◆											
	Rollout performance measurement across all units				■	■	■	◆							
RMS and Investigations process modernization	RMS refresher training rollout	■	■	■	■	■	◆								
	Develop standardized case screening, case assignment, and case prioritization processes			■	■	■	◆								
	Rollout updated training on the above processes, as well as performance measurement procedures							■	■	■	◆				
Patrol staffing optimization (current operating model)		■	■	■	■	◆									
Dispatch assessment	Conduct operational and performance assessment	◆													
	Implement recommendations from assessment			■	■	◆									
Compstat automation and redesign	Redefine Compstat mission and meeting structure and test effectiveness			■	■										
	Define data requirements and gap analysis					■									
	Design and pilot automated processes to analyze data centrally and disseminate findings to units							■	■	■	◆				



Appendix A: An
assessment of the
Patrol function of
the Dallas Police
Department



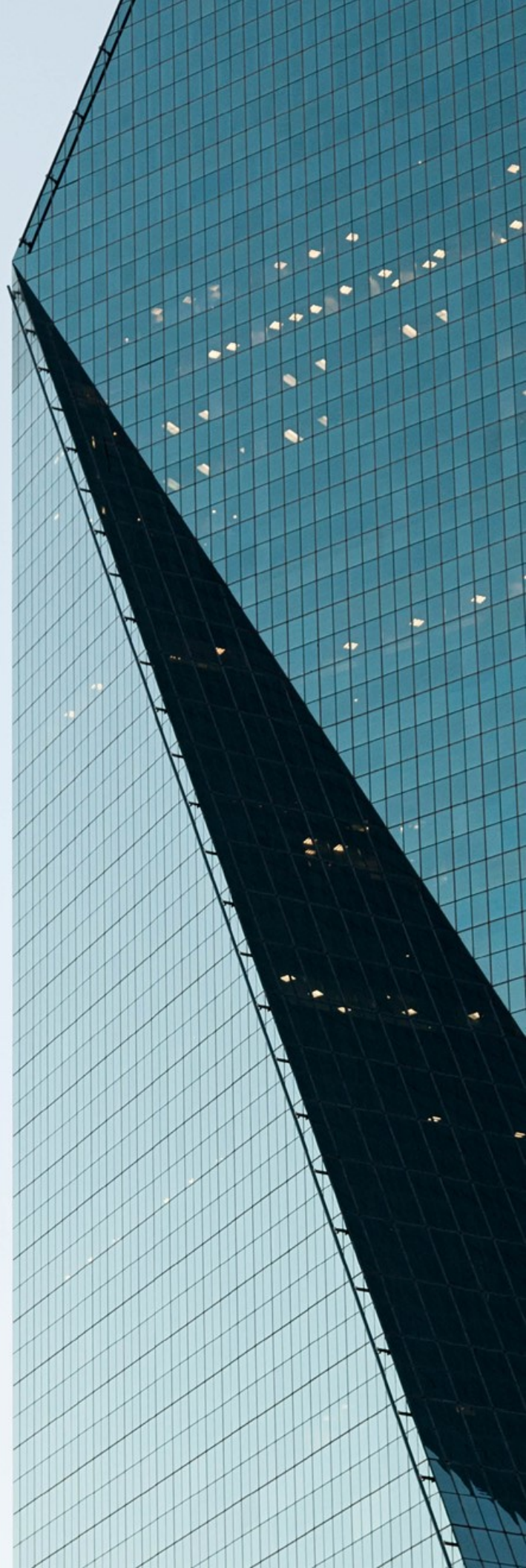
Improving the efficiency of public safety services

An assessment of the Patrol function of the Dallas Police Department



June 2019

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Executive summary

Purpose and scope

Project background

In 2018, the City of Dallas released a Request for Proposals to conduct a comprehensive analysis and provide feedback on how the Dallas Police Department (DPD) might most efficiently and effectively utilize its resources to better staff the department so that it may continue its efforts to reduce crime, respond to calls for service, and engage the community. KPMG was awarded the contract by the City of Dallas in December 2018 and commenced work on the six-month study with the DPD formally in January 2019. This report outlines the analysis and evaluation of the current staffing in the Patrol Bureau and addresses the core requirement to “develop comprehensive strategies to improve efficiency and effectiveness based on actual staffing levels and demand for police services and provide recommendations of staff utilization to meet response time goals based on work load and shift length.” KPMG’s study utilized data and analytics to analyze historical patrol demands, which acted as an input into a patrol scheduling optimization model. The outputs of the patrol scheduling optimization model are outlined within this report; however, the model does not provide only one singular staffing recommendation. Rather, the model is designed as a sustainable tool for the DPD to model scenarios and use to aid future patrol staffing and scheduling decision-making.

KPMG and DPD have worked collaboratively to review factors relating to patrol staffing: officer productive hours, call for service demand, department-directed demand, overtime trends, and other factors that impact the demands upon, and scheduling of, officers for deployment across all seven patrol divisions. In addition to gathering and analyzing data, the project team has taken a hands-on approach to understanding patrol supply factors. The team has visited every division to conduct interviews and focus groups with leadership and officers, conducted officer ride-alongs at the busiest divisions during peak times, visited DPD’s dispatch facility, and conducted numerous meetings with department leadership to understand and validate both data and the current patrol scheduling model. It should be noted that while KPMG and DPD use the same calculation methods for the data analysis within this report, the approach to data cleaning, i.e., the removal of outlier and erroneous data, is different and, therefore, may result in differing results. This report provides context to the methodologies used and outcomes of the analysis conducted.

This report is part one of the report on the DPD Staffing Analyses, and the analysis contained within should not be considered in isolation. A consolidated report provides the overarching recommendations for the Patrol and Investigations Bureaus and identifies strategic and operational recommendations for the DPD as a whole. This report should be viewed as part of a decision-making tool only when combined with the investigations assessment and the consolidated report; together the reports will provide analysis and recommendations to inform DPD’s strategy, operating model, staffing levels, force mix, and scheduling approach.

Results

The first evaluation was of the current shift pattern. Through examination of research and leading practices, DPD and KPMG focused on analyzing the effectiveness of 4–10 and 5–8 shift patterns in aligning supply to demand. As confirmed by DPD leadership, a 12-hour shift pattern was not modeled due to research on this shift pattern suggesting it negatively impacts officer alertness, increases fatigue, and puts both officers and residents at a heightened risk of accident.²⁵ Through experimentation of the optimization model, which modeled thousands of scenarios at the division level and hundreds at the global department level with different staffing parameters and response time constraints between the two shift patterns, we observed that a 5–8 shift pattern is the optimal choice for DPD to maximize alignment of supply and demand and enhance staffing utilization. This shift pattern allows for improved alignment of officer supply to peaks in demand, and therefore allows a higher percentage of demand to be met across all divisions.

The DPD's current operating model has the primary objective of responding to calls for service efficiently and effectively within their target response times. Based on this objective, KPMG developed an optimization staffing scenario for front-line patrol officers (i.e., senior corporals and police officers), for which the primary objective was to minimize the gap between officer supply and demand within response time constraints. It should be noted that within the model, Priority 1 response times cannot be exceeded and must be met within the current eight-minute target.

KPMG began with Scenario One, which programmed the model to maximize the percentage of demand met within current response time constraints while maintaining DPD's current staffing levels and allocation by division. To achieve this, the model developed the most efficient blend of regular hours and overtime hours to meet demand, while maintaining DPD's limit of 140 scheduled overtime hours per division per week. While the staffing levels by division were held constant in this scenario, the model was permitted to reallocate officers across watches to most efficiently meet call for service and internal demand for officer time.

Optimize current staffing levels, Scenario One

Scenario One tasked the model with designing a schedule to maximize the percentage of demand met relying on DPD's current staffing by division. To most efficiently meet demand across DPD's seven patrol divisions, the schedule assigned:

1,406 officers

and 806 weekly overtime hours.

In Scenario Two, KPMG maintained the primary objective of aligning staff supply to demand, but it allowed the model to adjust the total number of DPD staff. Within this scenario, two secondary objectives were modeled: meeting 80 percent of demand (i.e., officer supply is equal to or above demand and would satisfy current response time constraints 80 percent of the time), and meeting 100 percent of demand (i.e., officer supply is equal to or above demand at all times satisfying all response

²⁵ "The Impact of Shift Length in Policing on Performance, Health, Quality of Life, Sleep, Fatigue, and Extra-Duty Employment," Karen Amendola et al., National Institute of Justice.

time constraints). The focus of this scenario was on the use of regular hours and, therefore, overtime hours would be utilized in addition to the potential staffing levels.

Potential staffing levels, Scenario Two

The results of this scenario provided two potential staffing levels for patrol officers:

1,635 officers and 234 sergeants under 80 percent of demand met, and

2,109 officers and 302 sergeants under 100 percent of demand met.

This would represent potential staffing increases of 229 and 703 officers, respectively, over the current front-line patrol officer working headcount of 1,406 officers.

The project team then developed a third optimization scenario for which the primary objective was to minimize total cost through the use of regular officer hours and overtime hours. The use of overtime hours was constrained to DPD's current budgetary constraints of 140 overtime hours per division per week. The same two secondary objectives were modeled, meeting 80 percent of demand and meeting 100 percent of demand within response time constraints.

Potential staffing levels, Scenario Three

The results of this scenario provided two potential staffing levels for patrol officers:

1,426 officers, 204 sergeants, and 796 weekly overtime hours under 80 percent of demand met, and

1,754 officers, 251 sergeants, and 881 weekly overtime hours under 100 percent of demand met.

This would represent potential staffing increases of 20 and 348 officers, respectively, over the current front-line patrol officer working headcount of 1,406 officers.

As outlined above, these are just three representative scenarios that the DPD has the ability to model through the patrol scheduling optimization model. These scenarios are based on historical demand and supply data and assume that the DPD will continue to operate under its current operating model, meaning that its current practices of deployment, scheduling, staffing, resource utilization, and call management will remain the same. The optimization model is designed to provide DPD with the ability to model scenarios and provide sufficient information to make decisions based on the ever-changing environment in which the department operates.

The consolidated report outlines further analysis and final recommendations to inform DPD's strategy, operating model, staffing levels, force mix, and scheduling approach and, therefore, the analysis and results of the three scenarios described above should not be considered as final recommended staffing levels for the DPD Patrol Bureau.

Methodology and analysis

Scope of analysis

The project team addressed staffing and scheduling for front-line patrol officers (i.e., senior corporals and police officers) deployed across all seven patrol divisions. Specialist teams that function in a problem-solving or community-oriented policing role, for example Neighborhood Police Officers (NPOs), Crime Reduction Teams (CRTs), and Deployment teams, are excluded. These groups are excluded because they do not operate on a requirement to respond to a call for service from the public and require a level of flexibility within their operations. In addition, scheduling of lieutenants and majors was excluded and should be considered based on span of control desired once decisions regarding the staffing levels for senior corporals and police officers have been made.

The analysis and evaluation of the effectiveness of current staffing in the Patrol Bureau focused on meeting the key criteria outlined in the request for proposal:

- Evaluate effectiveness of current staffing, including gaps in service and utilization.
- Evaluate calls for service supply and demand for police services by season, day of week, and hour of day.
- Evaluate deployment patterns by season, day of week, and hour of day.
- Evaluate current shift length and how it impacts utilization and deployment.
- Provide recommendations for change with regard to staffing, including utilization patterns by season, day of week, and hour of day along with a specific staffing schedule that will address issues of efficiency.
- Provide recommendations for change with respect to shift schedule/length and how it impacts utilization and deployment.

Approach

There are many approaches to determining staffing allocation including the per capita, minimum staffing, authorized level, and workload-based methods.²⁶ KPMG used a workload-based approach to evaluate the effectiveness of patrol staffing. The workload approach estimates future staffing needs of police departments by modeling the level of current and historical activity, which can assist in determining the need for additional resources or relocating existing resources (by time and location), assessing individual and group performance and productivity, and detecting trends in workload that may illustrate changing activity levels and conditions.²⁷ There has been extensive research articulating the advantages and disadvantages of each method. The per capita-based approach, while favored by many police departments nationally, has been critiqued by the International Association of Chiefs of Police (IACP). Their conclusion, “Ratios, such as officers-per-thousand population, are totally inappropriate as a basis for staffing decisions. Defining patrol staffing allocation and deployment requirements is a complex endeavor which requires consideration of an extensive series of factors and a sizable body of reliable, current data,”²⁸ has led many departments to utilize alternative approaches to determine staffing allocation. Extensive research has concluded that a workload-based approach to staffing is the most effective method due to the consideration of environmental and department-specific variables that it considers. IACP is a strong advocate of this approach, as it relies on actual levels of demand for police services and matches that demand with the supply of police resources. Typically, this approach relies on an

²⁶ “Police Staffing Allocation and Managing Workload Demand: A Critical Assessment of Existing Practices,” Jeremy M. Wilson and Alexander Weiss, *Policing: A Journal of Policy and Practice*, June 2014.

²⁷ Ibid.

²⁸ IACP (2014) pg.2

examination of calls for service received by a department, and these calls are modeled to understand demand and supply. Workload demands should be modeled and then placed in context with other operational demands facing the department. The result is a comprehensive assessment of workload through both calls for service and other sustained operational commitments placed on the department.²⁹

In order to conduct a workload-based analysis and model optimized patrol schedules, the project team identified relevant and recorded information pertaining to patrol workload, officer supply and scheduling patterns, as well as constraints and assumptions that may impact officers' ability to meet demand. Following data collection, aggregation, and cleaning, the project team developed the criteria for outcomes needing optimization.

An optimization problem is composed of three key components: decision variables, mathematical constraints, and objective function. Decision variables are the set of values a mathematical model is allowed to permute, in order to satisfy the given constraints. The algorithm behind an optimization model objectively iterates on the pool of available resources in order to maximize or minimize the imposed objective, for example aligning demand and supply or minimizing cost. With current state input and optimization criteria in place, the project team moved into schedule considerations to determine the patterns that drive the greatest benefits. The project team reviewed benchmarking data, relevant studies, and industry standards for scheduling of police patrol units. The project team considered the current 5–8 patrol schedules and 4–10 schedules for the analysis.

The project team incorporated these considerations (both qualitative and quantitative) and developed a mathematical model to evaluate optimal outcomes for DPD with these considerations. For each of the considered schedule types, the project team has now evaluated millions of iterations and in this report will outline the results of the optimal schedule for each shift pattern, as determined by a combination of efficiency and alignment of scheduled deployment to patrol demand. KPMG's solution is designed with high flexibility in mind. The user can specify how restricted the constraints should be and is given an option to relax the constraints. All the constraints are customized by the user through a user settings option. In addition to being able to customize the constraints, the user is also given flexibility to choose between various objectives as follows:

Minimize Demand-Supply Gap

Maximize Percentage of Demand Met

Minimize Response Time Limits Exceeded (Priority 1)

Minimize Response Time Limits Exceeded (All Priorities).

DPD will have the ability to choose among these "potential schedules" and the model can produce optimized schedules for different objective functions to aid decision-making.

²⁹ An analysis of police department staffing: How many officers do you really need? A Review of 62 Police Agencies Analyzed by the ICMA/CPSM, Professor James McCabe, PhD, Senior Associate, ICMA Center for Public Safety Management.

DPD organizational analysis

DPD organizational analysis

DPD organizational structure and responsibilities

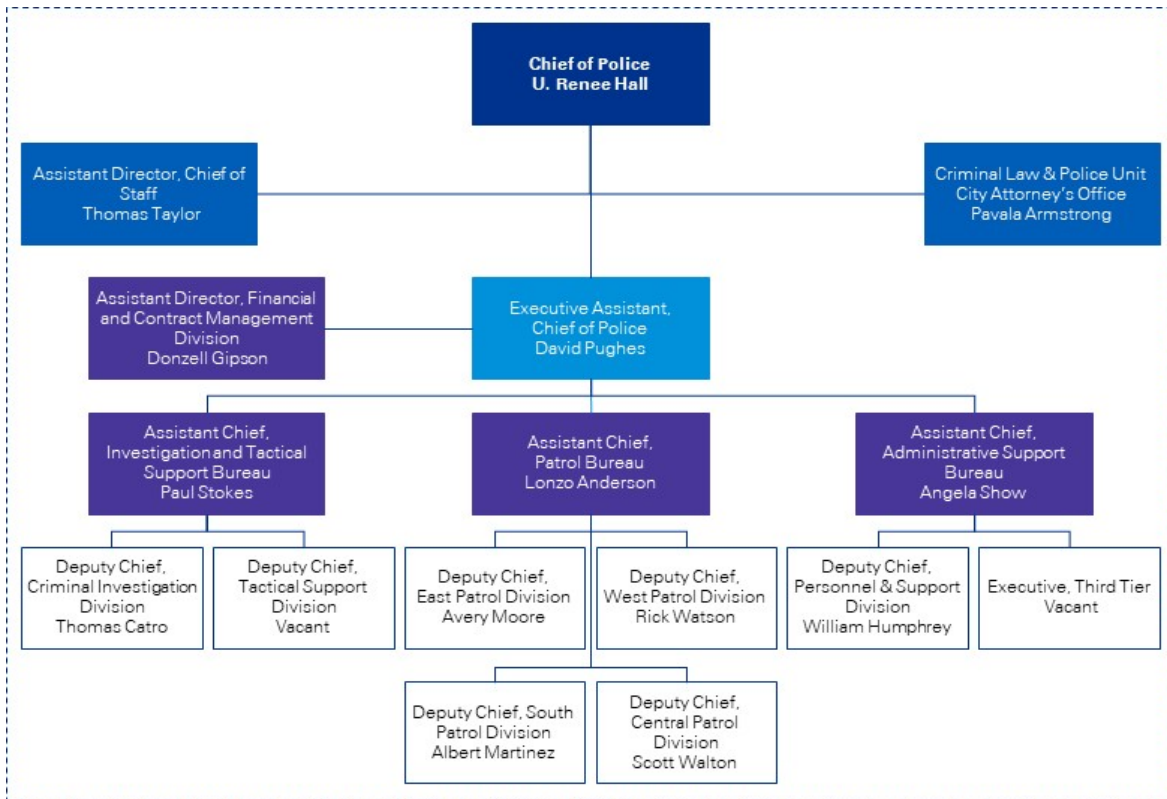
Overview of DPD responsibilities

The City of Dallas is the ninth largest city in the United States, growing in population at an average of 1.7 percent per year since 2010. DPD is responsible for reducing crime and providing public safety for the City of Dallas. As per the DPD’s mission statement, DPD strives to achieve its objectives by:

- Recognizing that its goal is to help people and provide assistance at every opportunity
- Providing preventive, investigative, and enforcement services
- Increasing resident satisfaction with public safety and obtaining community cooperation through the Department’s training, skills, and efforts
- Realizing that the Police Department alone cannot control crime, but must act in concert with the community and the rest of the Criminal Justice System.

DPD organizational structure (2018)

Headed by Chief Renee Hall, DPD is composed of three bureaus: Administration Support Bureau, Patrol Bureau, and Investigations and Tactical Support Bureau. Certain functions—such as internal affairs and public relations—are located within the Office of the Chief of Police.



The table below illustrates DPD’s staffing as of February 2019, broken down by employee classification (i.e., civilian and sworn) and organizational bureau. The Patrol Bureau is the largest bureau and employs 56 percent of DPD employees and 65 percent of sworn officers. The second largest bureau is the Administrative Support Bureau and employs 68 percent of civilian staff while employing nearly the same number of civilian staff as sworn officers.

As of February 2019, approximately 84 percent of DPD employees were sworn officers. Civilians made up 16 percent of the DPD workforce.

DPD staffing by employee classification and organizational division

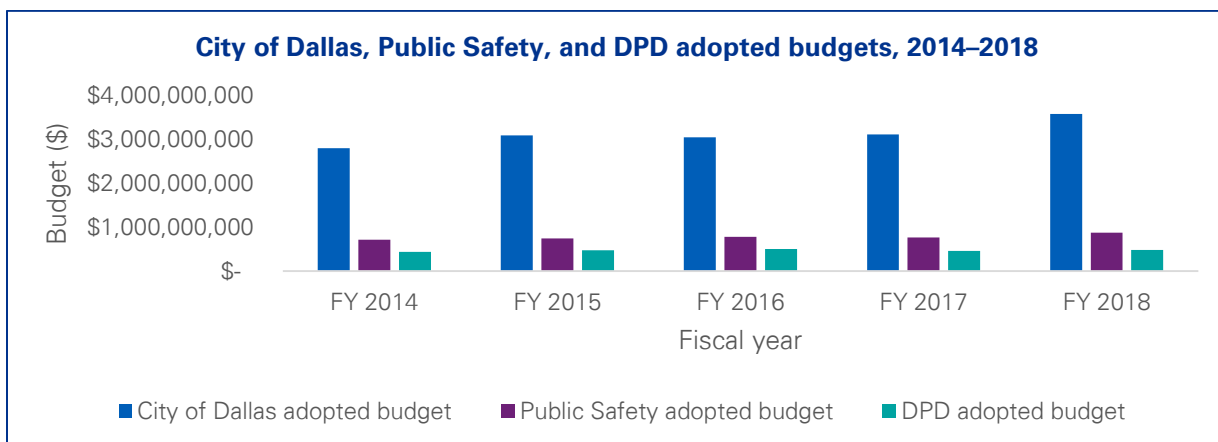
Group	Civilian	Sworn	Grand total	Distribution of staff by bureau
Administrative Support Bureau	382	357	739	21%
Investigations and Tactical Support Bureau	89	615	704	20%
Office of the Chief of Police	47	86	133	4%
Patrol Bureau	42	1,946	1,988	56%
Total	560	3,004	3,564	
Distribution of civilian and sworn staff	16%	84%		

Source: IWM data 2019

DPD budget trends

DPD adopted budget compared to the overall City budget and Public Safety budget

From 2014 to 2018, the City of Dallas’s adopted budget grew by approximately \$480 million in nominal terms, or 28 percent. The City’s public safety spending grew by \$162 million during this period, or approximately 23 percent. While DPD’s budget also grew from 2014 to 2018, this growth did not match overall increases in public safety spending or the City’s overall budget. DPD’s budget grew by approximately \$49 million, or 11 percent, from 2014 to 2018 in nominal terms.

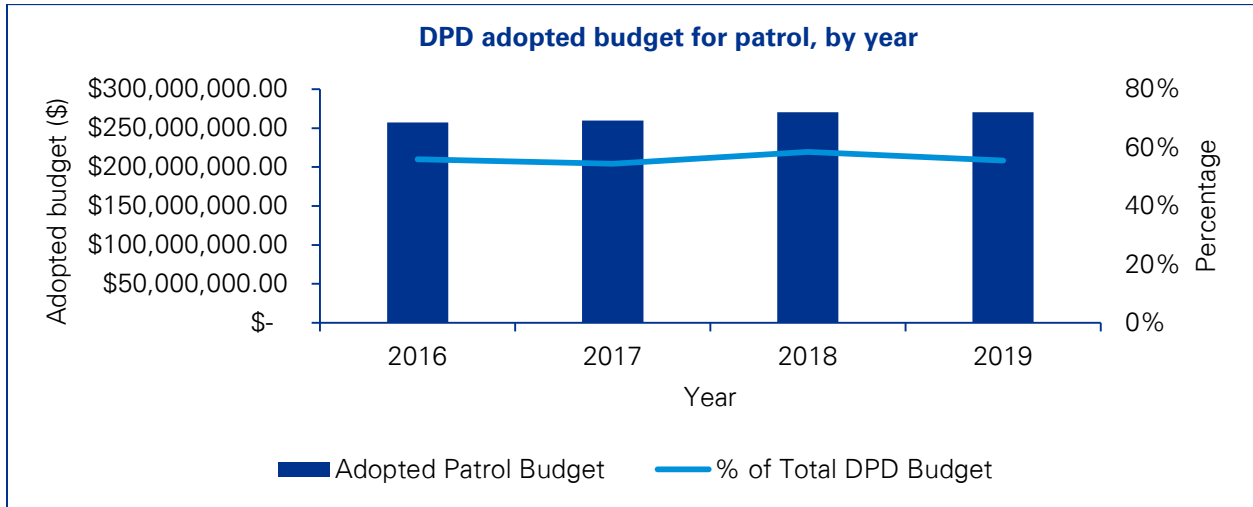


Source: City of Dallas Annual Budget Documents, 2014–2018

As a result, DPD’s budget fell from 16 percent of the City of Dallas’s annual adopted budget in 2014 to 14 percent in 2018. Similarly, DPD’s budget fell from 61 percent of the City’s total public safety spending in 2014 to 55 percent in 2018.

DPD adopted budget for the Patrol Bureau

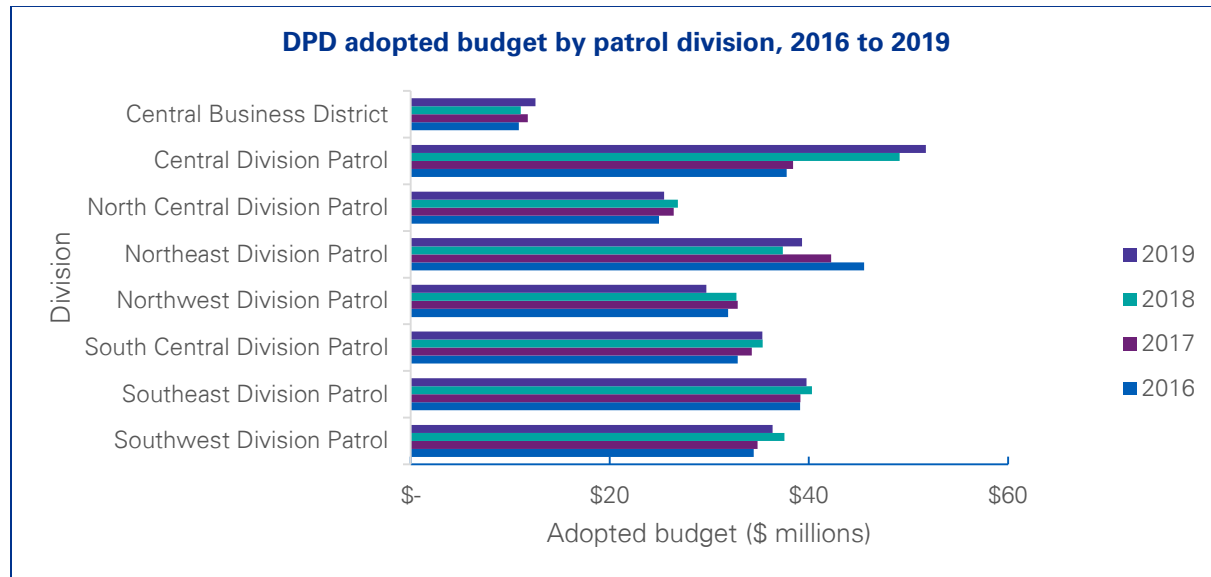
From 2016 to 2019, the Patrol Bureau consumed in excess of 50 percent of DPD’s adopted budget, with an average adopted budget of \$264 million per year. For the average and year-by-year budget for each division by each patrol division, please refer to the charts below.



Source: City of Dallas budget data

DPD adopted budget by patrol division

There are seven patrol divisions underneath the Patrol Bureau. The Central Business District sits within the Central Division; however, for the purpose of the following analysis, it is considered as a separate division. The Central Division is the largest division with a nearly \$51 million budget, representing 20 percent of the total share of allocated patrol division budgets. The Central Division budget grew by over 37 percent from 2016 to 2019, the largest increase in budget compared to the other patrol divisions.



Source: DPD budget data

Division	Year-over-year adopted budget change		
	2016 to 2017	2017 to 2018	2018 to 2019
Central Business District Patrol	8%	-6%	14%
Central Division Patrol	2%	28%	5%
North Central Division Patrol	6%	2%	-5%
Northeast Division Patrol	-7%	-11%	5%
Northwest Division Patrol	3%	0%	-9%
South Central Division Patrol	4%	3%	0%
Southeast Division Patrol	0%	3%	-1%
Southwest Division Patrol	1%	8%	-3%

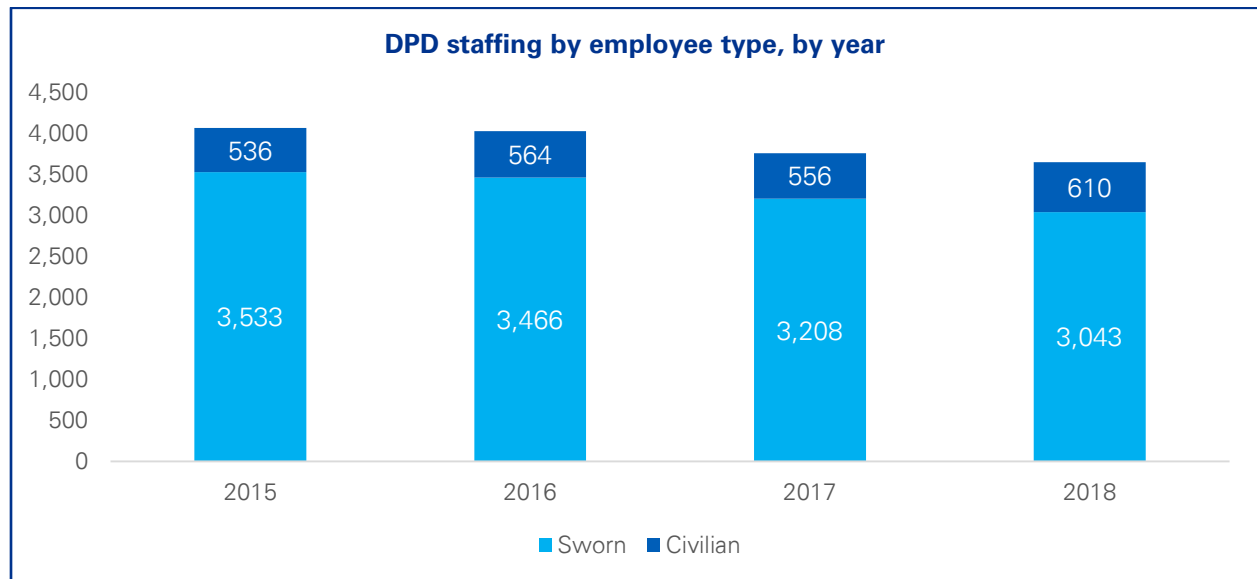
Source: DPD budget data

Staffing trends

DPD staffing from 2015 to 2018

DPD staffing strength has reduced in actual personnel from 4,069 in 2015 to 3,653 in 2018, a reduction of approximately 10 percent. From 2016 to 2017, DPD staffing declined by 266 employees. From 2017 to 2018, DPD staffing fell by an additional 111 employees.

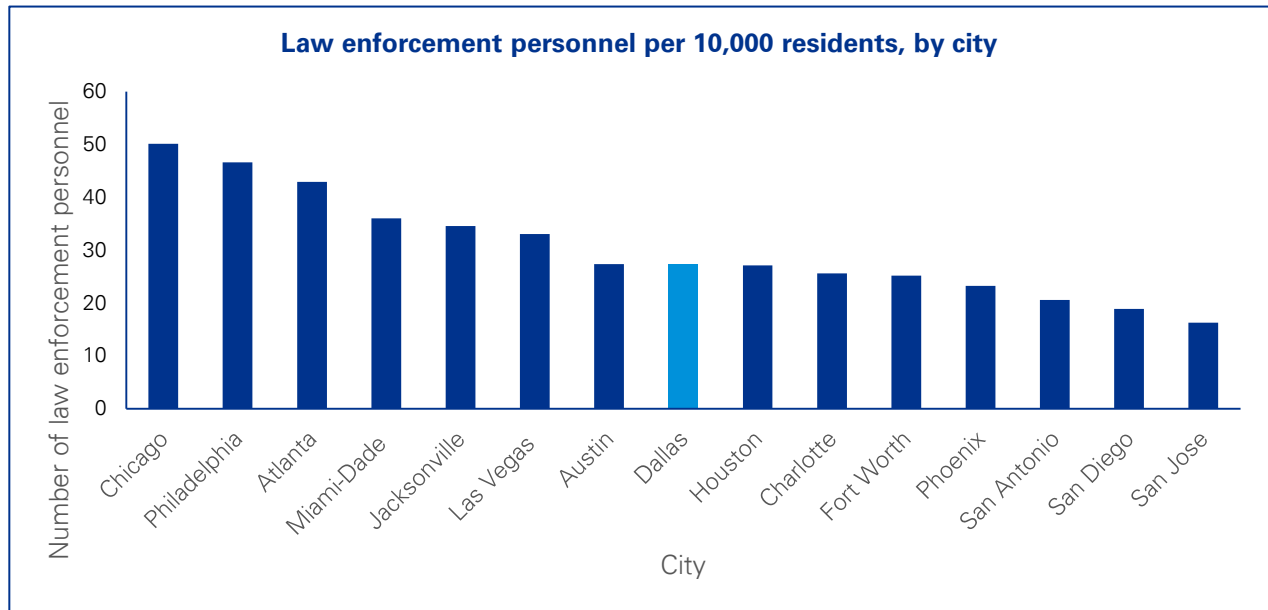
Staffing trends between civilian and sworn employees exhibit an opposite trend. The decline in staffing has occurred entirely among DPD's sworn force. Sworn staffing fell by 490 full-time employees, or 14 percent, from 3,533 officers in 2015 to 3,043 in 2018. Concurrently, the department's civilian staffing grew by 74 employees, from 536 civilian staff in 2015 to 610 civilian staff in 2018.



Source: The above analysis utilizes the DPD's Organizational Strength Reports. Due to data availability, the figures above reflect a "point in time" analysis of staffing levels, comparing DPD's staffing in March of each year.

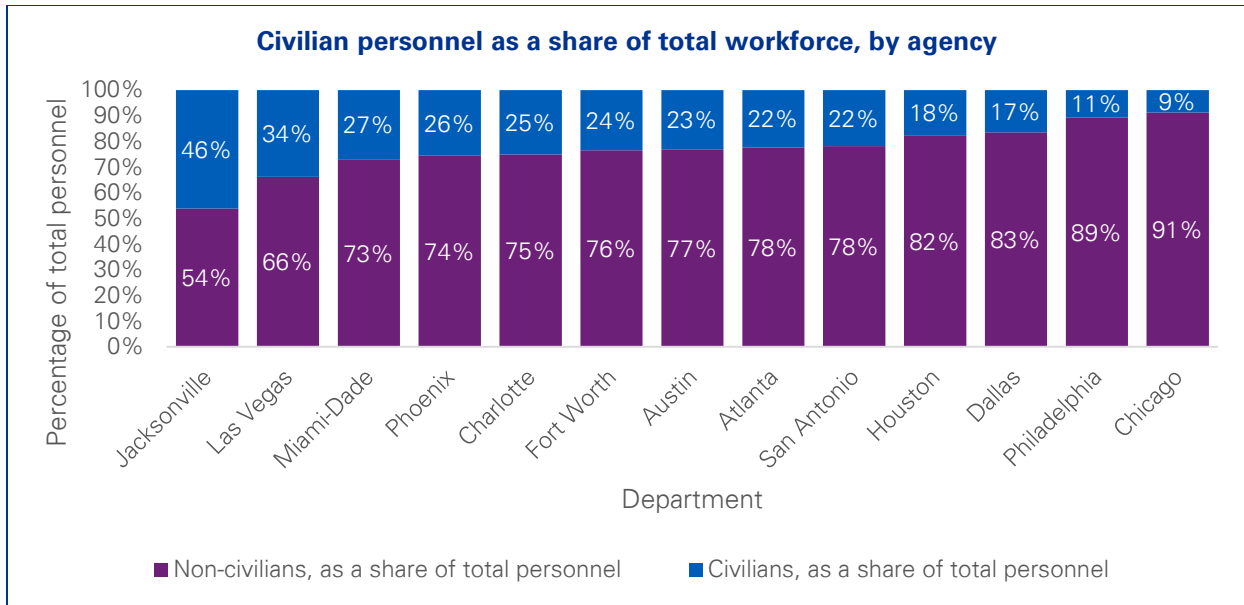
Peer agency staffing comparisons

When compared to a cohort of comparable cities, in terms of population size and crime density, Dallas ranked just below average in terms of law enforcement personnel per 10,000 residents. Dallas has 27 law enforcement officers per 10,000 residents, as compared to an average of 30 officers per 10,000 residents for the comparison cohort. However, as discussed earlier within this report, per capita staffing has been proven to lack accuracy and is not deemed an appropriate measure upon which to base staffing decisions.



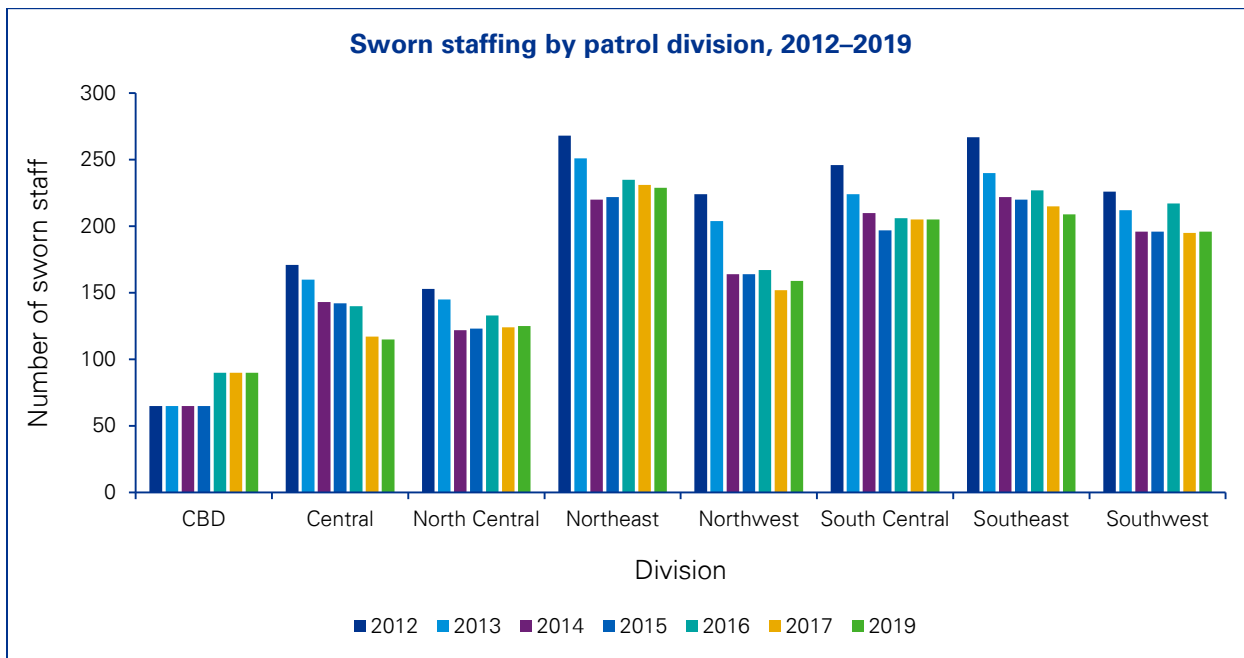
Source: 2017 FBI Uniformed Crime Reporting data

When compared to the comparison cohort, the size of Dallas's civilian workforce is the third smallest, with Dallas ranking eleventh out of thirteenth agencies as civilians compose only 17 percent of the workforce.



Source: 2017 FBI Uniformed Crime Reporting data

Patrol division staffing trends



Source: DPD staffing data

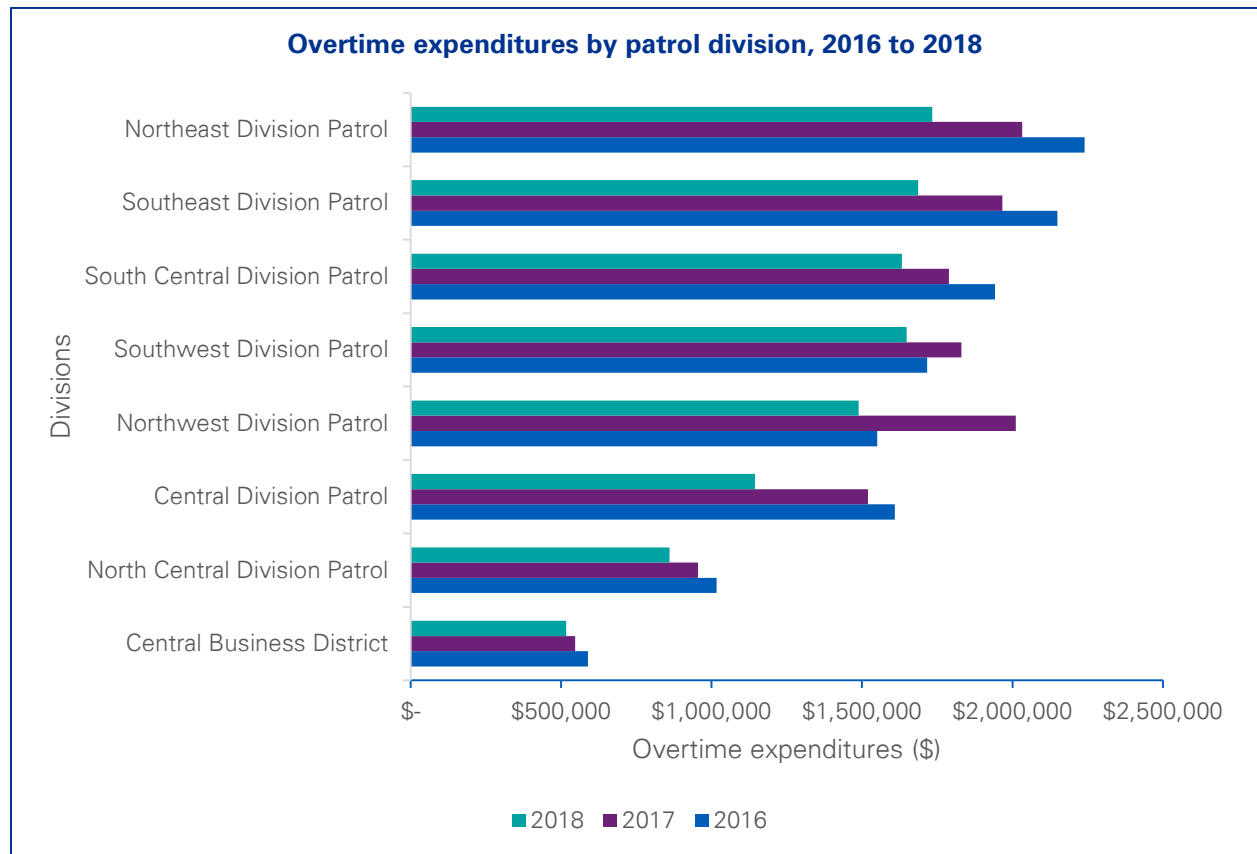
From 2012 to 2019, excluding 2018, total patrol staffing fell by 18 percent, or 292 officers, across all patrol divisions. During this period, staffing fell in every division except within the Central Business District, which added 25 officers. Excluding the Central Business District, DPD’s seven other patrol divisions shed an average of 45 officers, or 21 percent of their staff, during the eight-year period through 2018.

Staffing data was not available for 2018 as DPD did not conduct a bid during that year, which is the current method for determining staffing and resourcing by division, and as a result is excluded from this chart.

Overtime trends

Overtime by patrol division

Overtime usage within patrol divisions has declined since 2016 overall. On average across 2016 to 2018, Northeast Division Patrol utilized the highest amount of overtime to conduct its operations. At the time of writing, overtime was limited to 140 hours per week per division. Further analysis on the effectiveness of overtime usage was unable to be conducted due to the current process of tracking overtime data, which does not record the time periods in which overtime was utilized.



Source: DPD budget data

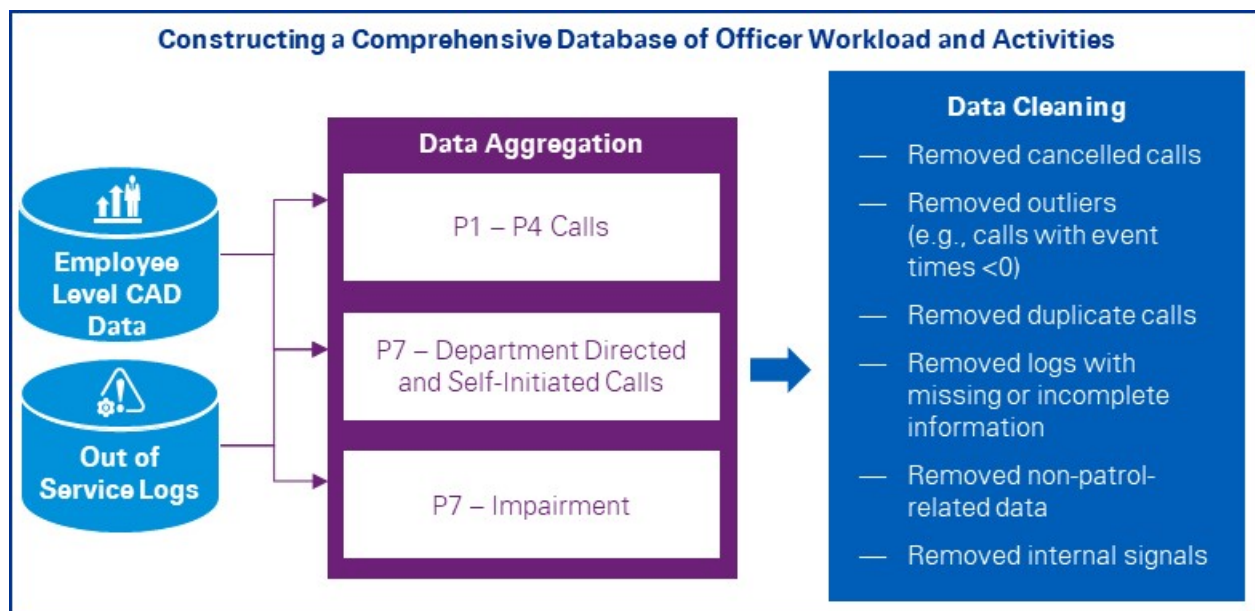
Patrol Bureau demand analysis

Data and methodology

Data sources and cleaning

Data sources

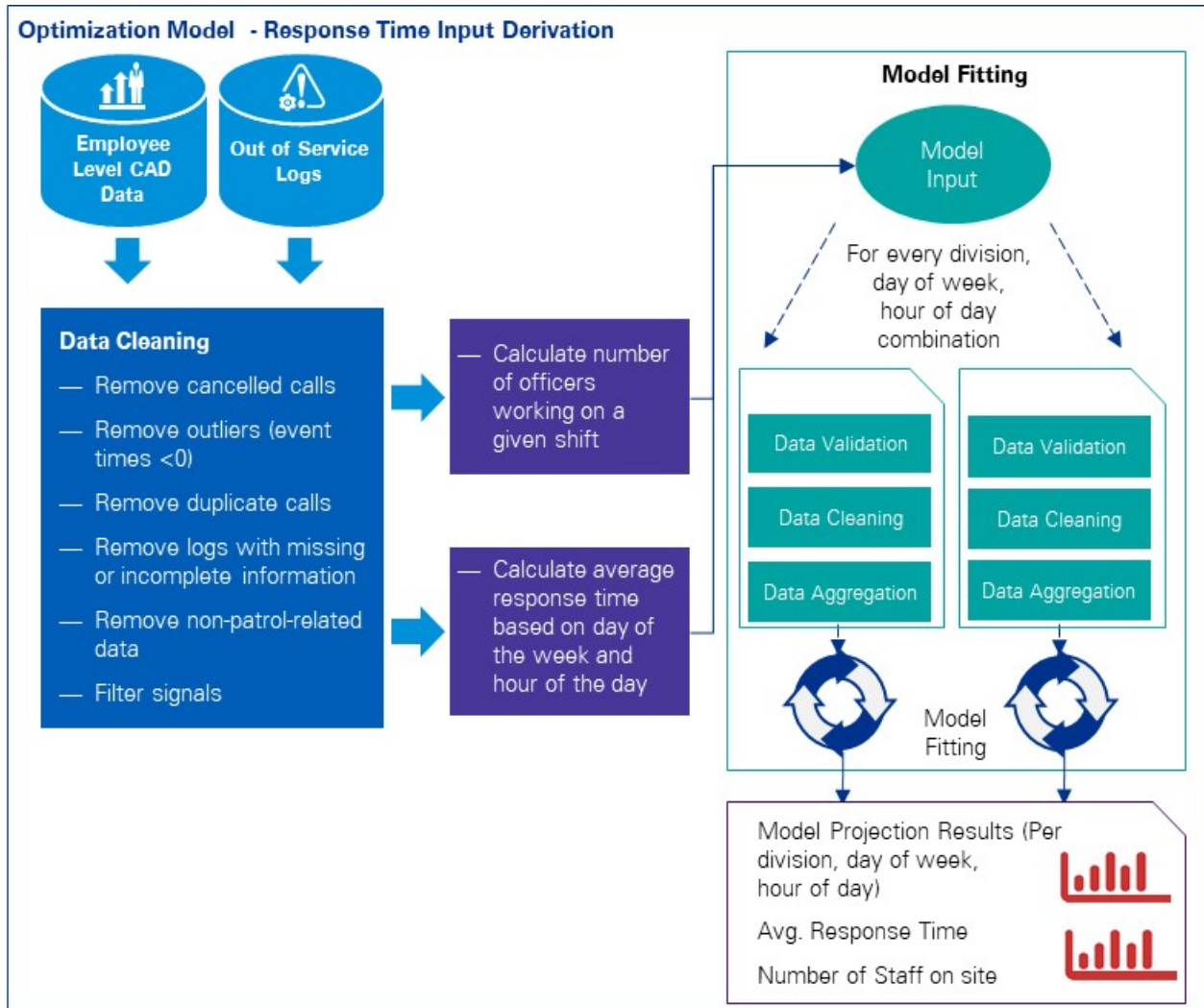
The data sources used in the Patrol Bureau analysis contain all calls for service logged between January 1, 2014 and December 31, 2018. As detailed in the graphic below, KPMG utilized DPD's Computer Aided Dispatch database (CAD) as well as Out of Service Data Logs, which record officer activity when not responding to calls for service, to create a comprehensive data set for this analysis, and allow for an accurate assessment of total officer workload.



From this compiled data set, KPMG removed certain call types to create an accurate picture of true demand for DPD patrol officers. The following call types were excluded from the data set:

- Cancelled calls: Calls that were cancelled by the Dallas resident who originated the call.
- DSO transfer calls: Calls made by the public that were originally assigned to a DPD officer but given the location or nature of the call were transferred to the Dallas Sheriff's Office.
- Outlier calls: Calls with a negative dispatch time, travel time, or out of service time were excluded as erroneous data. Calls with incomplete division or unit data were excluded as well, as were calls with years that fell outside of the 2014–2018 period that is the focus of this analysis.
- Priority 5–6 calls were excluded from the analysis as they are used to allocate calls to nonpatrol staff, e.g., the Telephone Reporting unit. Priority 1–4 calls that were marked as "ODJ – Off Duty Job" were removed from the data set, as were Priority 7 signals that were not marked as "self-initiated," "department directed," or "impairment."

The data sources described above are cleaned, aggregated, and analyzed to act as inputs into the patrol scheduling optimization model through the process described below. The output of the patrol schedule model will provide the optimal shift pattern, staffing requirements by shift and division, and overtime usage.

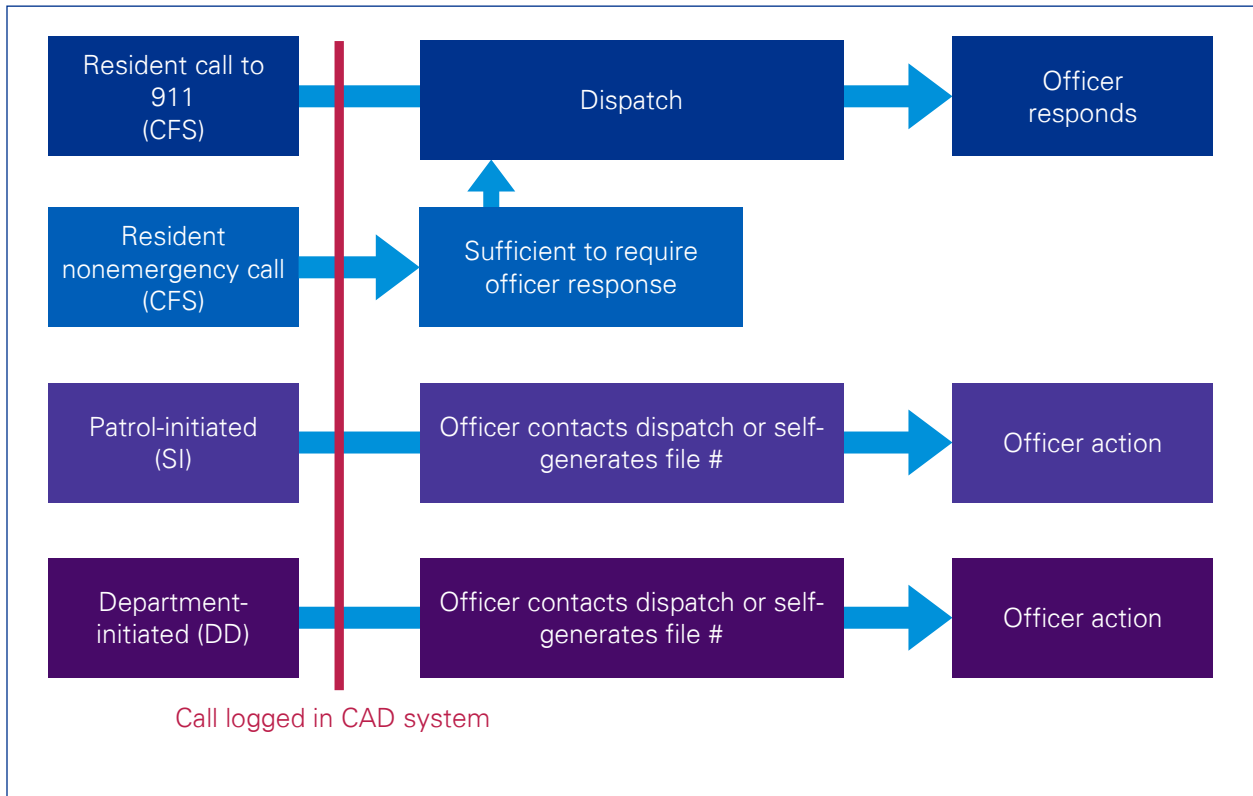


Call type definitions

DPD breaks its call data into Priority levels, with Priority 1 calls being the most severe and Priority 4 calls being information calls. Below is a table of the Priority call levels along with a description of the call type.

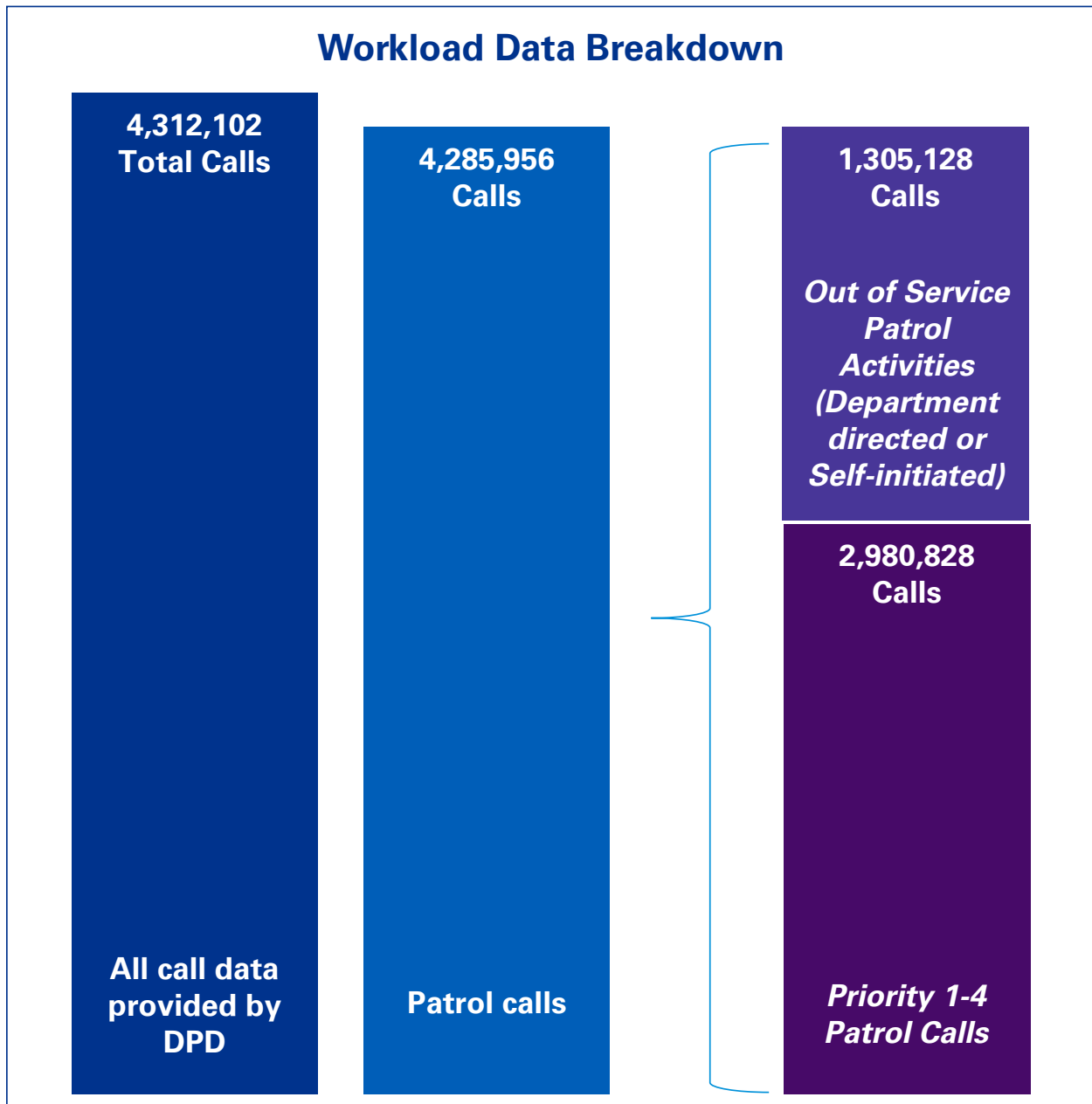
Priority level	Call source	Description
1 – Emergency	General public	Involve circumstances that pose a high threat to human life or property such as a shooting, cutting, disturbance such as an active shooter afoot, kidnapping in progress, etc.
2 – Urgent	General public	Involve circumstances of an urgent, but non-life-threatening, nature. These calls are generally disturbances, robberies, fires, or criminal assault.
3 – General service	General public	Involve circumstances of a nonemergency or past nature and shall be assigned to an available unit as soon as possible. These calls may include a missing person, intoxicated person, drug house, or burglary (recent).
4 – Noncritical	General public	Involve circumstances of nonemergency or past nature and shall be assigned to an available unit as soon as possible. These calls typically include disturbance (loud music), theft, burglary (unknown when occurred), animal complaints, criminal mischief, or panhandling.
Self-initiated activity (SI)	Patrol officer	Involve circumstances where an officer conducts proactive duties, for example conducting a random traffic stop or community patrol, etc.
Department-directed activity (DD)	DPD personnel	An officer is assigned to perform a special assignment at the direction of a Department-set directive or policy; these typically are focused on quality of life issues such as homeless encampments, facility/event security, etc.
Impairment	N/A	Officer workload associated with non-patrol-related activities while on duty such as attending court, eating lunch, and watch detail.

The following figure outlines the sources of call demand from initial report to response.



CAD data breakdown

As shown in the graphic below, KPMG received DPD call data detailing 4,312,102 calls between January 1, 2014 and December 31, 2018. The team then removed nonpatrol calls from the analysis, leaving 4,285,956 patrol-related calls. These 4.2 million calls included both Priority 1–4 calls for service, as well as Out of Service (OOS) activities. OOS activities include self-initiated (SI), department-directed (DD), and officer impairment activities.



Patrol Bureau demand breakdown

Patrol Bureau demand breakdown

Officer activity breakdown

Activity volume by year: calls for service, self-initiated calls, and department-directed activities breakdown

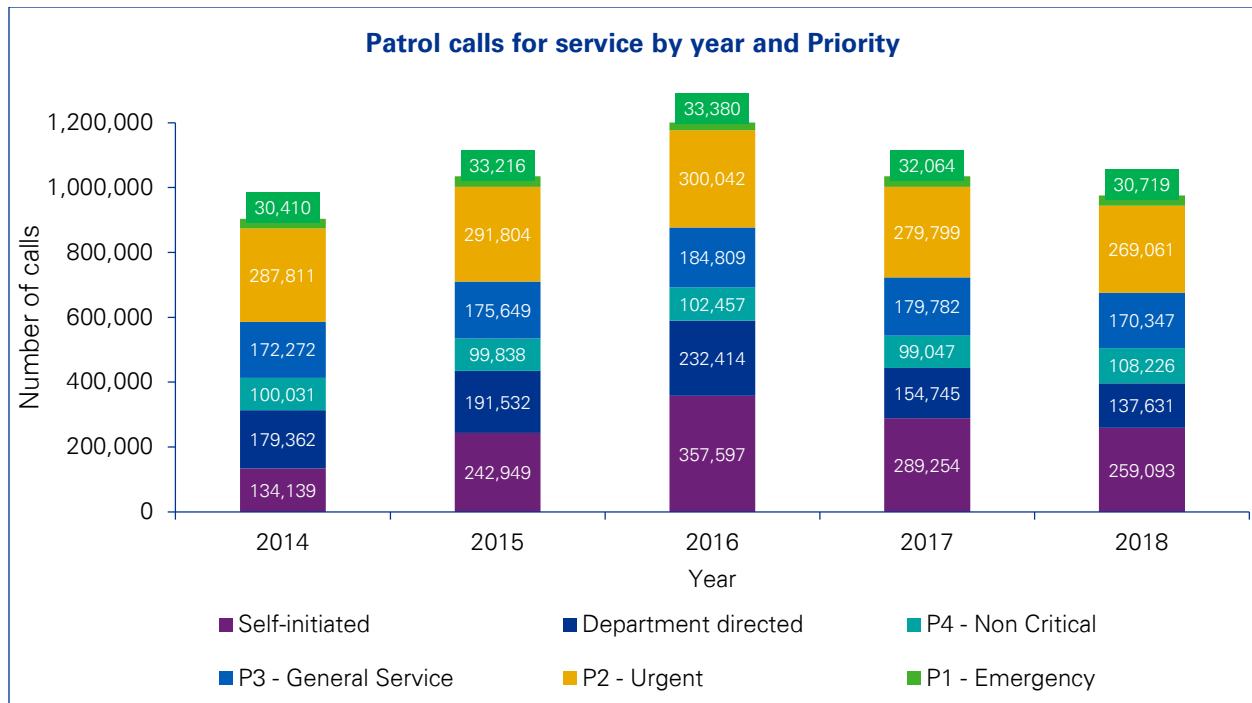
For the purposes of this report, calls for service (CFS), self-initiated calls (SI), department-directed (DD), and impairment activities are considered in combination as representative of demand on officers.

DPD logged approximately 3 million calls for service from January 1, 2014 to December 31, 2018. In addition, officers conducted approximately 2.2 million self-initiated, department-directed, or impairment activities. Combined, this demand amounted to 5.2 million “calls” over the five-year period. The department averaged approximately 596,000 calls for service per year, as well as an additional 436,000 self-initiated calls or department-directed activities per year.

Total call volume peaked in 2016 at 1.2 million CFS, SI, or DD activities—2016 also had the greatest number of CFS at 621,000 and self-initiated and department-directed activities at 590,000. Of the five years for which data was available, 2015 had the lowest total number of CFS, SI, or DD activities at 904,000.

Priority 1 calls constituted 3 percent of total demand volume annually. Priority 2 calls were among the largest drivers of demand at 25–32 percent, Priority 3 calls constituted 15–19 percent of demand, and Priority 4 calls composed 8–11 percent of total demand. Department-directed activities accounted for 14–19 percent of demand while self-initiated calls accounted for 15–30 percent. The number of self-initiated activities grew by 93 percent from 2014 to 2018, with most of that increase occurring between 2014 and 2015. The number of department-directed activities fell by 25 percent during the same period.

Each year, call volume was approximately evenly split between higher-priority calls (Priorities 1 and 2) and lower-priority calls (Priorities 3 and 4). Higher-priority calls composed 28–35 percent of call volume by year while lower-priority calls made up 24–30 percent of call volume by year.



Source: DPD CAD data and OOS logs, 2014–2018

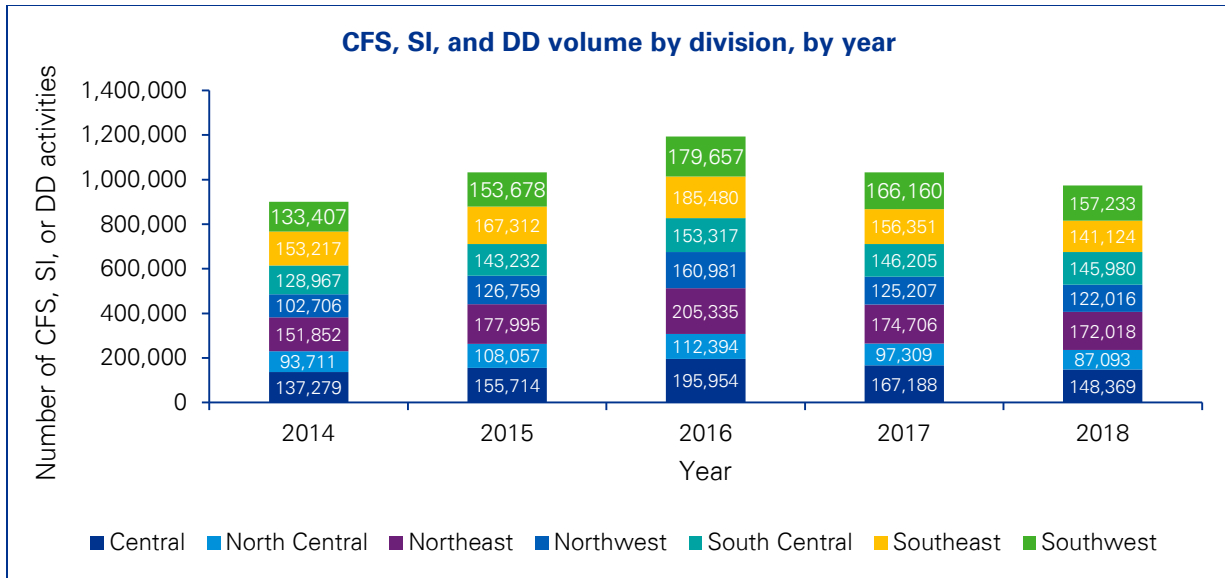
Call volume by year: Division breakdown

The distribution of total calls—including only CFS and SI—received by each division remained largely constant from year to year. Department-directed activities are not included in this analysis, as they are not logged within the CAD data. The Northeast Division received the largest share of DPD’s annual patrol calls for service each year, receiving 17–18 percent of total calls. The North Central Division consistently received the lowest share of demand, at 9–11 percent of total calls.

Share of total calls for service, by division, by year*

Division	2014	2015	2016	2017	2018
Central	14%	14%	16%	16%	15%
North Central	11%	10%	10%	10%	9%
Northeast	17%	17%	18%	17%	17%
Northwest	13%	13%	13%	12%	13%
South Central	15%	14%	13%	14%	15%
Southeast	16%	15%	15%	15%	15%
Southwest	15%	15%	15%	16%	16%

* Department-directed activities are not included in this table, as they are not logged in CAD data.



Source: DPD CAD and OOS data

The table below details the distribution of all calls and activities between January 1, 2014 and December 31, 2018.

Division	Calls for service	Self-initiated calls	Department-directed calls
Central	382,446	260,285	161,773
North Central	315,461	106,143	76,960
Northeast	533,202	204,640	144,064
Northwest	387,989	151,522	98,158
South Central	440,205	170,688	106,808
Southeast	464,907	182,025	156,552
Southwest	456,554	207,729	125,852

Source: DPD CAD data

Response times

Using DPD data, KPMG identified the dispatch time, travel time, occurrence time, and the number of officers that responded to each call. Definitions for these metrics, as well as other key terms related to response times, are outlined below:

Dispatch time: The time that elapses between the receipt of an emergency call until the moment officers are dispatched.

Travel time: The time that elapses between dispatch and the arrival of officers at the scene.

Response time: The time that elapses between the receipt of a call until the arrival of officers at the scene (that is, the sum of the dispatch time and travel time).

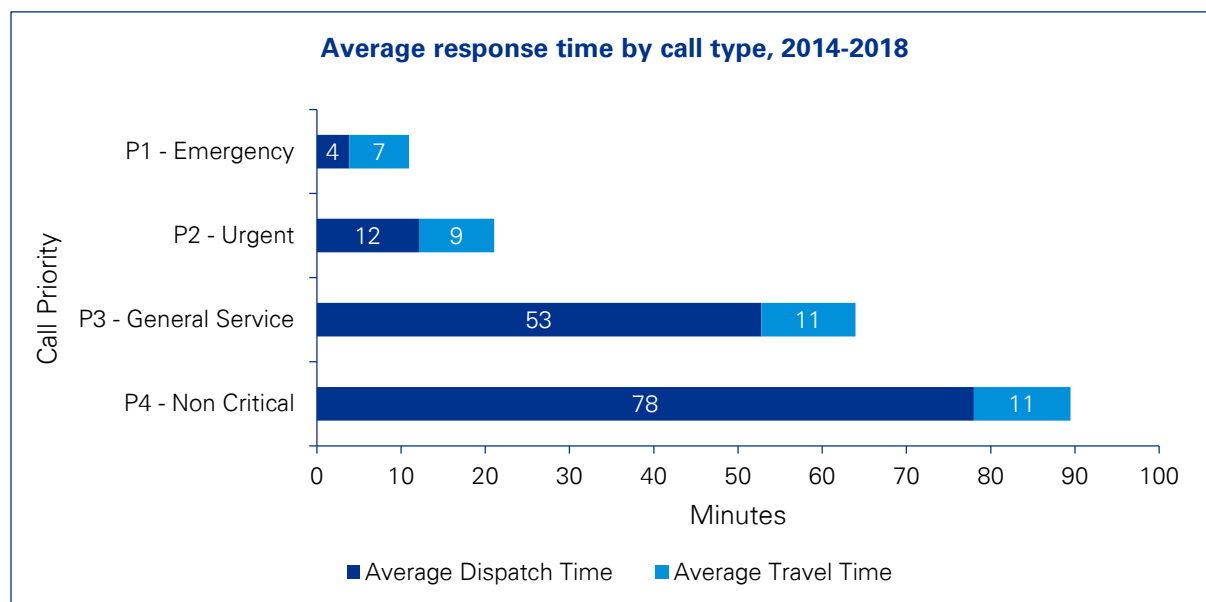
Occurrence time: The time between when an officer arrives at the scene and when the call is closed.

Call length: The time that elapses from the moment a call is dispatched until the call is closed (that is, the sum of the travel time and occurrence time).

Number of officers: The number of officers who respond to a particular call.

It should be noted that while KPMG and DPD use the same calculation method for response times, the approach to data cleaning, i.e., the removal of outlier and erroneous data, is different and, therefore, may result in differing response time results. The graph below illustrates the average dispatch and travel time by call type from 2014 to 2018. The response time is calculated by taking the sum of the dispatch and travel time for a call. Priority 1 calls have the shortest response time, at approximately 11 minutes. The average response time is 21 minutes for Priority 2 calls, 64 minutes for Priority 3 calls, and 89 minutes for Priority 4 calls. This variation in response time stems largely from significantly longer dispatch times for low-priority calls. For example, Priority 1 calls have a dispatch time of 7.1 minutes while Priority 4 calls have a dispatch time of 78 minutes. Travel times remain fairly consistent across call types, ranging from 7.1 minutes for Priority 1 calls to 11.5 minutes for Priority 4 calls.

Call Priority	Average response time	Target response time
1	11 minutes	8 minutes
2	21 minutes	12 minutes
3	64 minutes	30 minutes
4	89 minutes	60 minutes

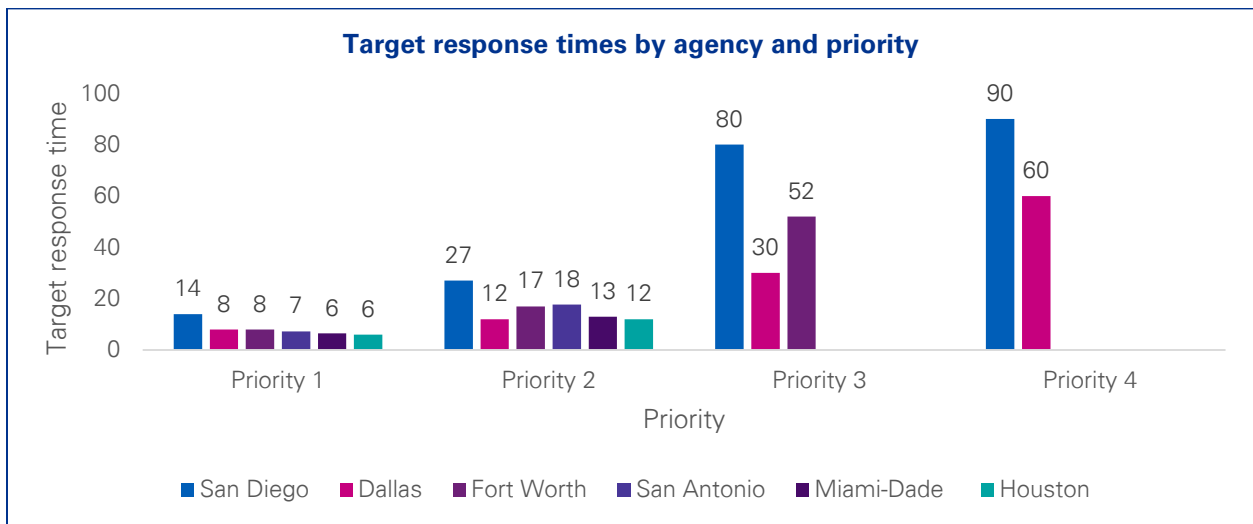


It is worth noting that the above figures are averages between 2014 and 2018. During this time, DPD has not met its target response times for Priority 1 through 4 calls, as shown in the table above and chart below. However, DPD may benefit from further refining these target response times to create data-informed targets that reflect variations in geography across divisions and variations in urgency within call priorities. For example, at present, all divisions have the same response time targets, despite variations in the geography and density of their service areas and their staffing levels. Similarly, P1 calls share the same target response time, despite differences in geography between divisions, and due to traffic congestion, weather, or environmental factors, officers may be unable to go code three to P1 calls, which may also impact response times. Interviews with staff also revealed that the target response

times were not developed from a data-driven process. Ultimately, the targets may be unrealistic or outdated based on optimal staffing levels for demand or when applying other strategies such as geospatial mapping for demand management. If resources are deployed in a way that concentrates officers where they are most likely to be needed, response times may be lower and could then be an indicator of effective deployment.

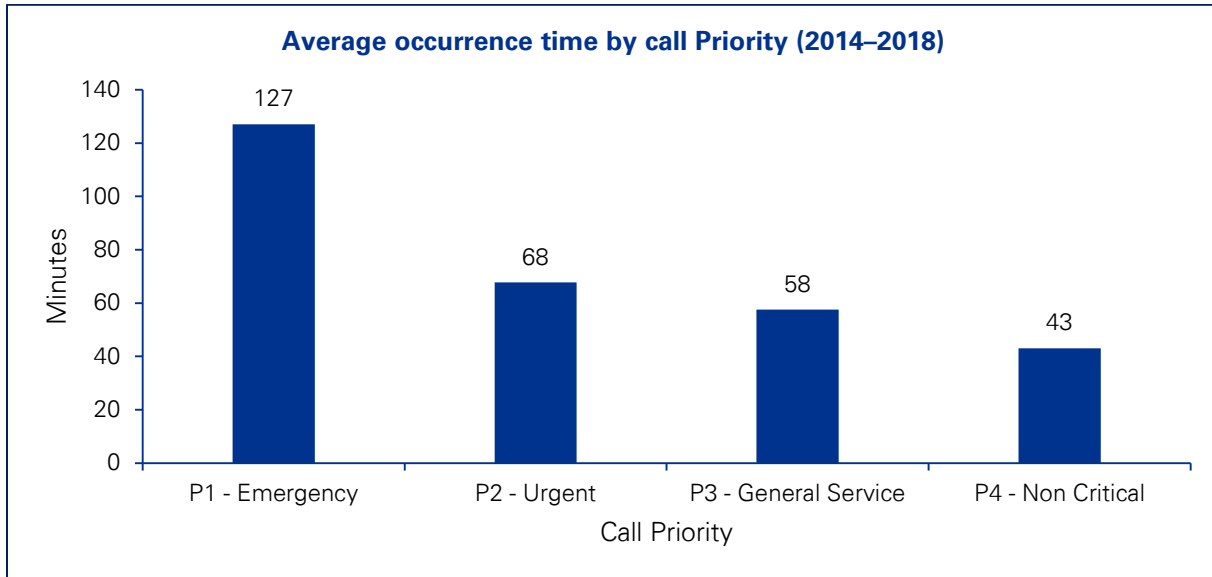
Additionally, it is worth noting that research suggests that public satisfaction with police agencies is driven by more than just response times. For example, studies show the public typically accepts a delayed response or alternatives to a patrol officer response such as telephone reporting and online reporting when it is properly presented and explained when they place their call to the police for crimes that are not in progress at the time of the call.

Drawing on publicly available documents, the project team compared Dallas’s response time targets with those from other major cities. As shown in the graph below, Dallas’s Priority 1 and 2 response time targets appear in line with those chosen by the comparison cohort. However, Dallas’s Priority 3 target is considerably faster than that chosen by the comparison agencies. There was insufficient publicly available data to do a robust comparison of Priority 4 response time targets.



Source: FY 2019 budget reports for each locality

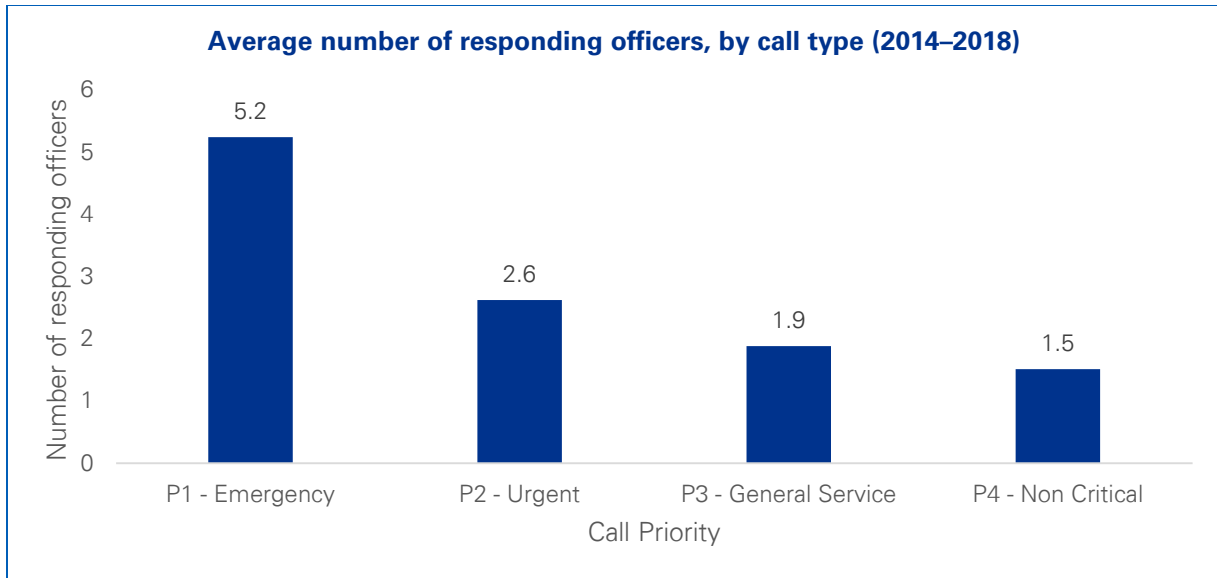
As shown in the graph below, higher-priority calls take longer to resolve than lower-priority calls, leading to longer occurrence times for high-priority calls. For example, officers are typically on the scene for 127 minutes before a Priority 1 call is closed. Priority 4 calls have a much shorter occurrence time, with officers remaining on the scene for an average of 43 minutes before a call is closed. Note: Due to current data recording practices, occurrence times may or may not include time taken for report writing.



Source: DPD CAD data

Overall, Priority 1 calls experienced the longest call times and the shortest response times, reflecting the serious nature of emergency situations. In contrast, Priority 4 calls had the shortest call times and longest response times, reflecting their noncritical nature. A more in-depth analysis of response times by division can be found within the division profiles on pages 101 through 164.

Priority 1 calls average 5.2 responding officers; this figure includes supervisory staff as DPD policy requires a supervisor to attend all Priority 1 calls. This is twice the average number of responding officers for Priority 2 calls, which average 2.6 officers per call. Priority 3 calls average 1.9 officers while Priority 4 calls average 1.5 officers. As shown in the table below, the average number of responding officers remained largely constant across divisions.



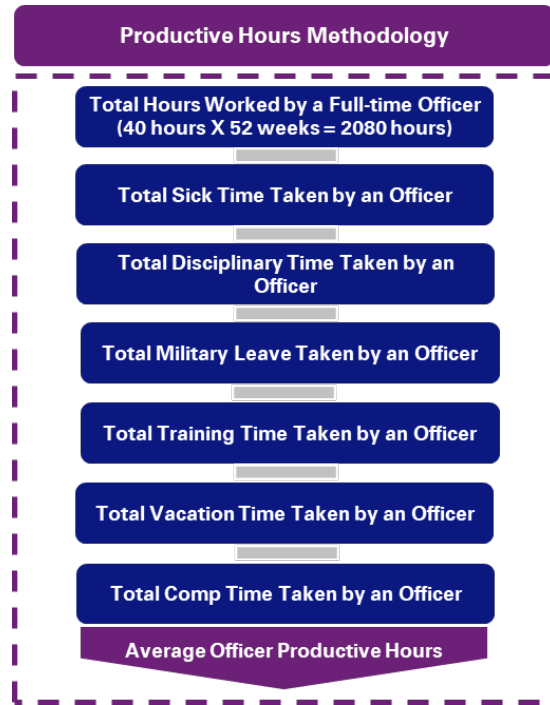
Source: DPD CAD data

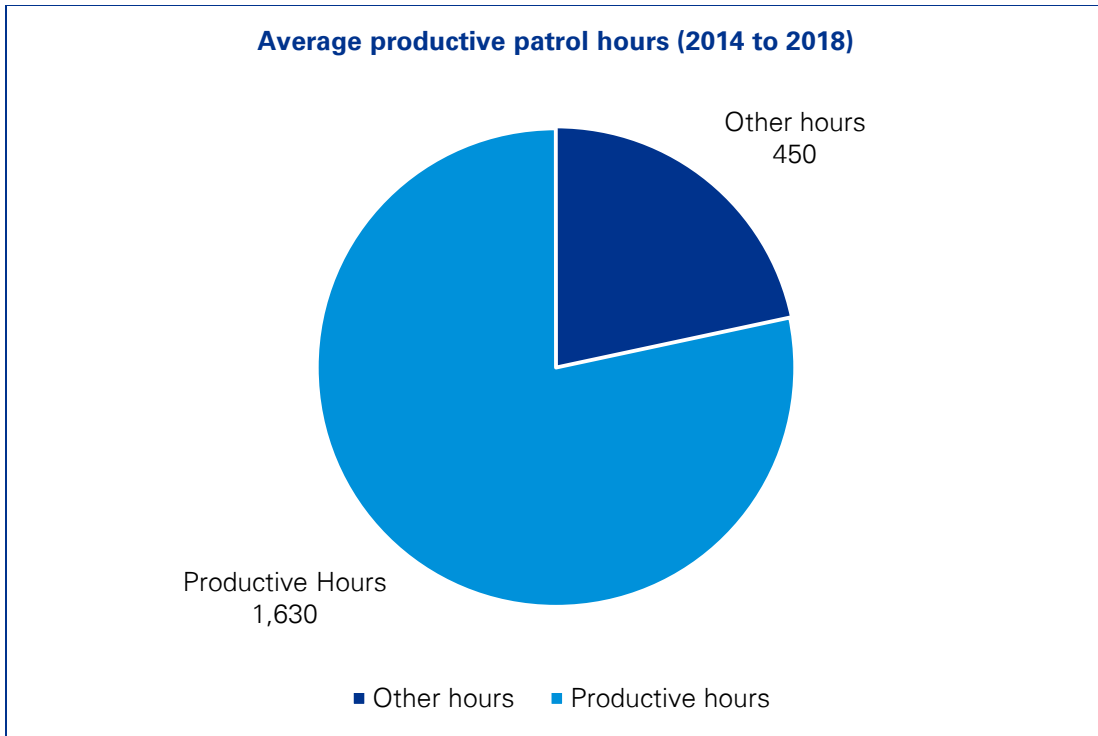
Average number of responding officers, by division and call Priority				
	P1 – Emergency	P2 – Urgent	P3 – General service	P4 – Noncritical
Central	5.4	2.7	1.9	1.5
North Central	4.5	2.5	1.9	1.4
Northeast	5.2	2.6	1.8	1.5
Northwest	4.8	2.5	1.8	1.5
South Central	5.6	2.7	1.9	1.6
Southeast	5.9	2.8	2.0	1.6
Southwest	5.3	2.6	1.9	1.5

Officer productive hours

Officer productive hours are a measure of the total time an employee, in this case an officer, is available for work in a year with the exception of overtime. The productive hour metric is expressed as an absolute figure that aggregates the total time spent at work relative to the total time an employee is paid for. For example, a full-time salaried employee is paid for an entire year, which totals 2,080 hours in a year assuming 52 weeks in a year and 40 hours per week. However, after taking into consideration vacation, sick leave, and other leave factors, DPD can expect an officer to be present for patrol between 1,612 and 1,655 hours out of the 2,080 hours in a year. For the purposes of this report, KPMG focused on determining the aggregate productive hours of patrol officers across the seven patrol divisions. KPMG used employee-level payroll data from 2014 to 2018 to calculate the figures set forth below. The pay codes used to inform the productive hour calculation are listed on page 267 of this report.

KPMG determined that average productive hours for a patrol officer are approximately 1,630 hours. In other words, DPD can expect that a patrol officer will be available to work, i.e., performing patrol-related duties, approximately 78 percent of the time in a year after taking into consideration sick leave, vacation, military leave, disciplinary action, comp time, and training.



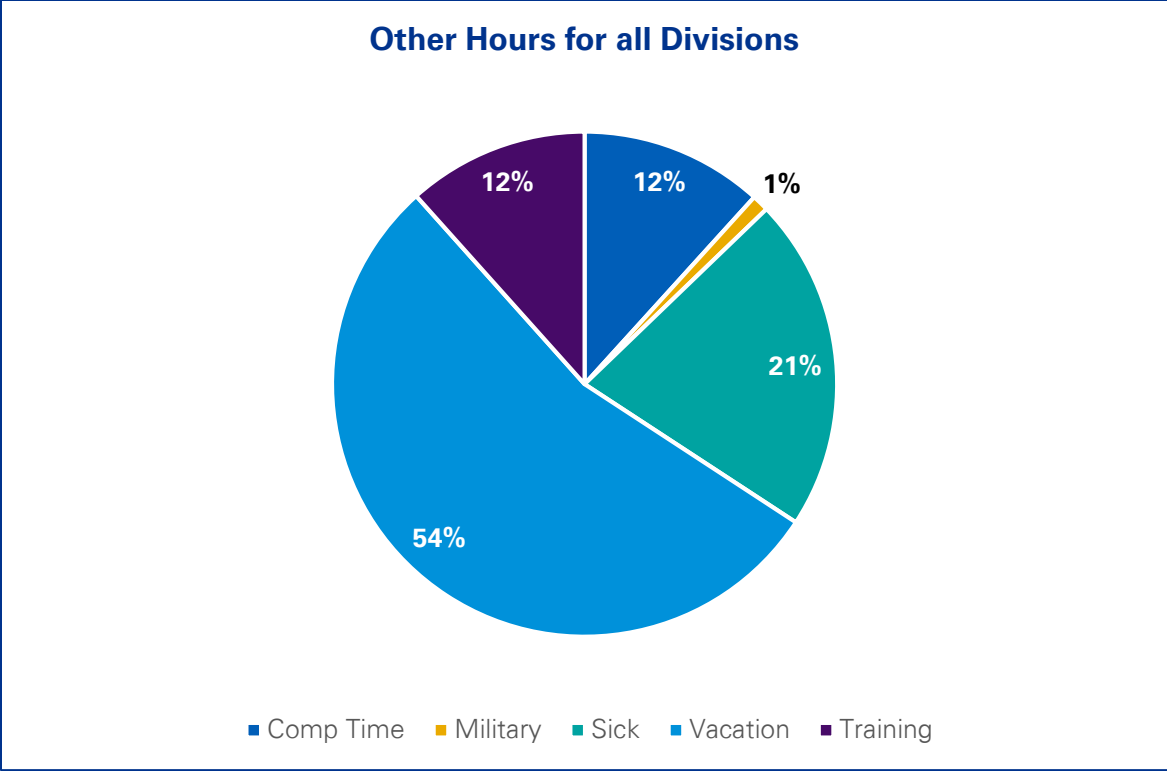


Source: DPDU data

Data from DPD shows that actual productive hours vary between divisions ranging from 1,612 hours to 1,655 hours with an average of all data points resulting in 1,630 hours. Statistical analysis indicates that despite variance, 1,630 is representative of expected productivity on a division level.

Other hours

Of the 2,080 regular hours assigned per year, nonpatrol hours are excluded from the productive hour counts. Other hours include training, vacation, comp time, sick leave, military leave, and disciplinary leave. These other hours vary in terms of utilization across divisions based on personnel and their respective needs.



Source: DPDU data

At the department level (all divisions), the majority of unproductive hours, 54 percent are used for vacation. Approximately 21 percent are used for sick leave, 12 percent are used for comp time (i.e., overtime that is taken as accrued vacation days), 12 percent are used for training, approximately 1 percent are used for military leave, and disciplinary leave accounted for a negligible number of hours each year. In comparison to national averages, DPD officers have higher levels of vacation at 236 hours when compared to the industry average, which is 116 hours nationally. However, Dallas’ sickness rates are below the industry average, with Dallas officers averaging 93 hours per year as compared to an industry average of 107 hours.³⁰

Productive hours vary across law enforcement organizations due to variations in internal department and/or city policies that dictate allocation of sick leave, vacation, and military leave, and can also vary by an employee’s tenure and position. Based on KPMG’s review of other law enforcement agencies and industry benchmarks, officer productive hours typically range from 1,690 to 1,780 hours³¹ setting DPD below industry standards. Productive hours can have a significant operational and financial impact on an organization’s ability to meet service levels effectively and efficiently.

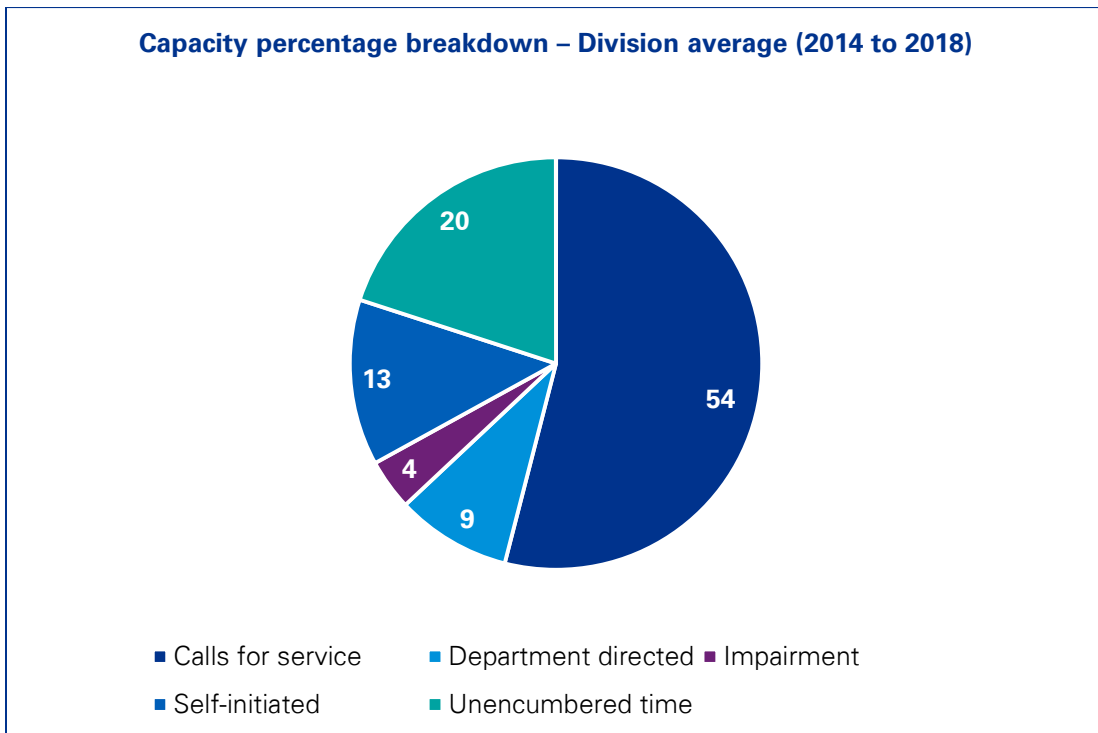
Patrol unit capacity breakdown

Officers have a range of activities that occupy their time, much of which is recorded as CFS, SI, or DD in DPD’s CAD system. The capacity analysis aims to understand the total demand on an officer’s time. In

³⁰ “A Performance-Based Approach to Police Staffing and Allocation,” <https://ric-zai-inc.com/Publications/cops-p247-pub.pdf>.

³¹ Ibid.

making decisions around staffing, law enforcement agencies typically assess what total capacity exists beyond the data that is quantifiable. Unquantified time includes activity types that are of a sporadic nature or police discretionary activities that do not result in recorded incidents. The charts in this section provide insight into quantified CFS, SI, and DD, and current patrol unit capacity to undertake additional policing activity, which is typically represented through unencumbered time. Unencumbered time and SI capacity should be considered together to represent the capacity an officer has to undertake proactive or community policing. The chart below represents the capacity breakdown of an officer across all divisions taken over a five-year period. On average, officers will spend 54 percent of their time answering calls for service, 13 percent on self-initiated activities (i.e., proactive or community policing activities), 9 percent on department-directed activities (i.e., special assignments, serving warrants, or foot patrol), and approximately 4 percent of their time on impairment activities (i.e., lunch breaks, attending court, and other administrative activities). Based on the analysis, KPMG estimates that patrol officers across all divisions currently have approximately 33 percent capacity for proactive policing activity.



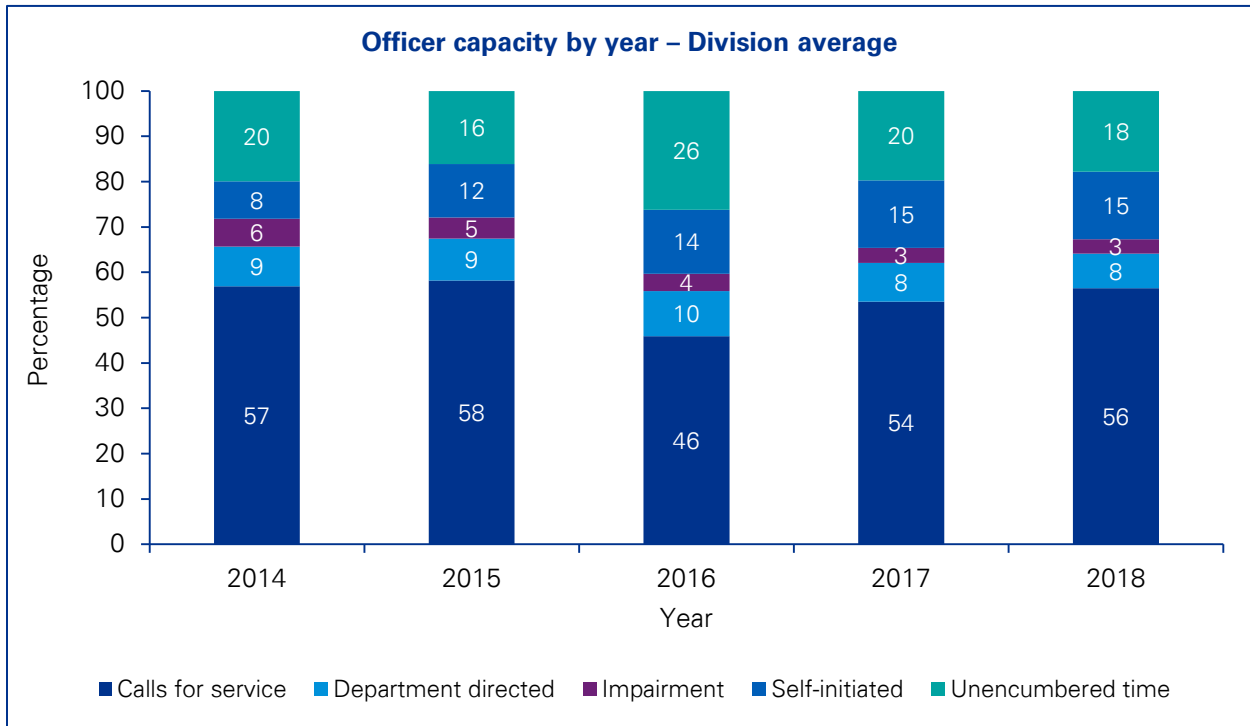
Capacity call signs

Outlined below are the call signs, also referred to as call types, associated with each capacity category.

Priority level	Call signs
Priority 1 to 4	All call signs coded as Priority 1 to 4
Self-initiated calls (SI)	55-Stopping Traffic Violator 58-Routine Investigation 59-Follow-up Investigation PK-Park Check
Department-directed calls (DD)	60-Special Assignment 61-Foot Patrol 63-Cover Element 75-Special Tracking 76-Arrest or Search Warrant 68-Verified Response Alarm
Impairment	50-Eat 51-Coffee 52-City Court 53-County Court 56-Out to the Division 57-Out to the Garage 64-Out to Radio Shop 65-Use Telephone

Yearly patrol officer capacity

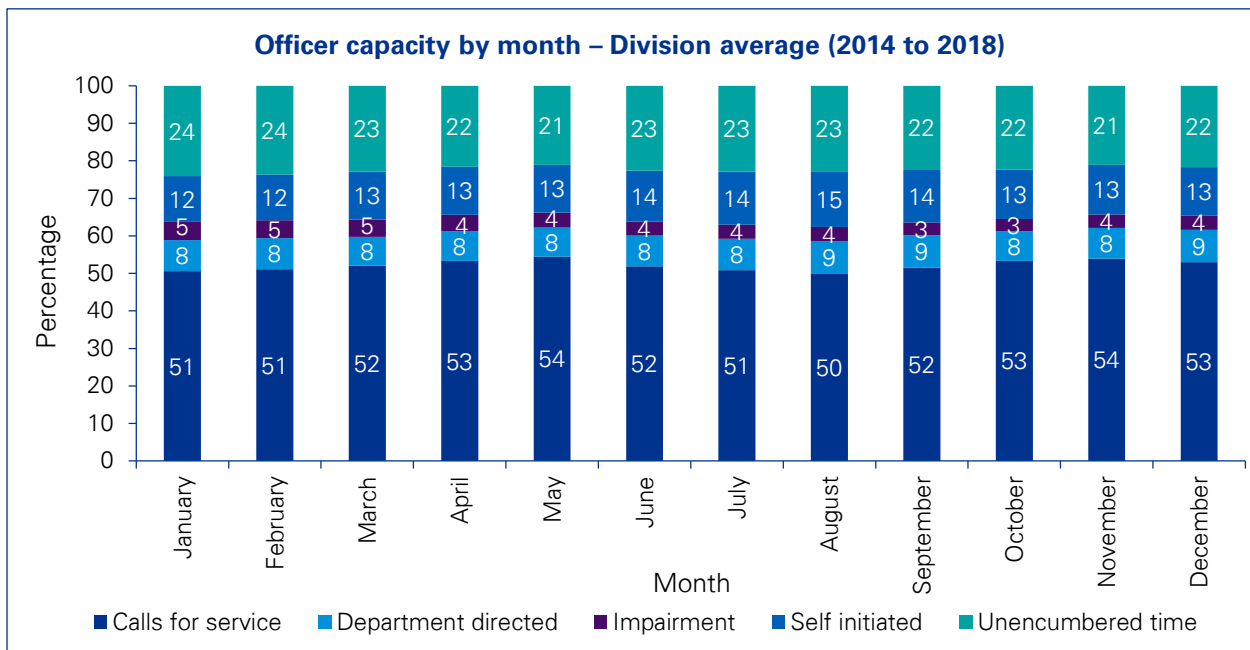
KPMG analyzed average yearly patrol officer capacity to assess the impact of the recent decline in staffing on capacity. As such, patrol officer capacity profiles have experienced a notable shift toward spending a larger portion of time responding to calls in recent years, growing from 46 percent in 2016 to 56 percent in 2018. Department-directed activity has remained relatively constant at approximately 9 percent of capacity. From 2016 to 2018, officer capacity for proactive activity, i.e., self-initiated and unencumbered time, has reduced from 40 percent in 2016 to 33 percent in 2018.



Source: DPDU data

Monthly patrol officer capacity

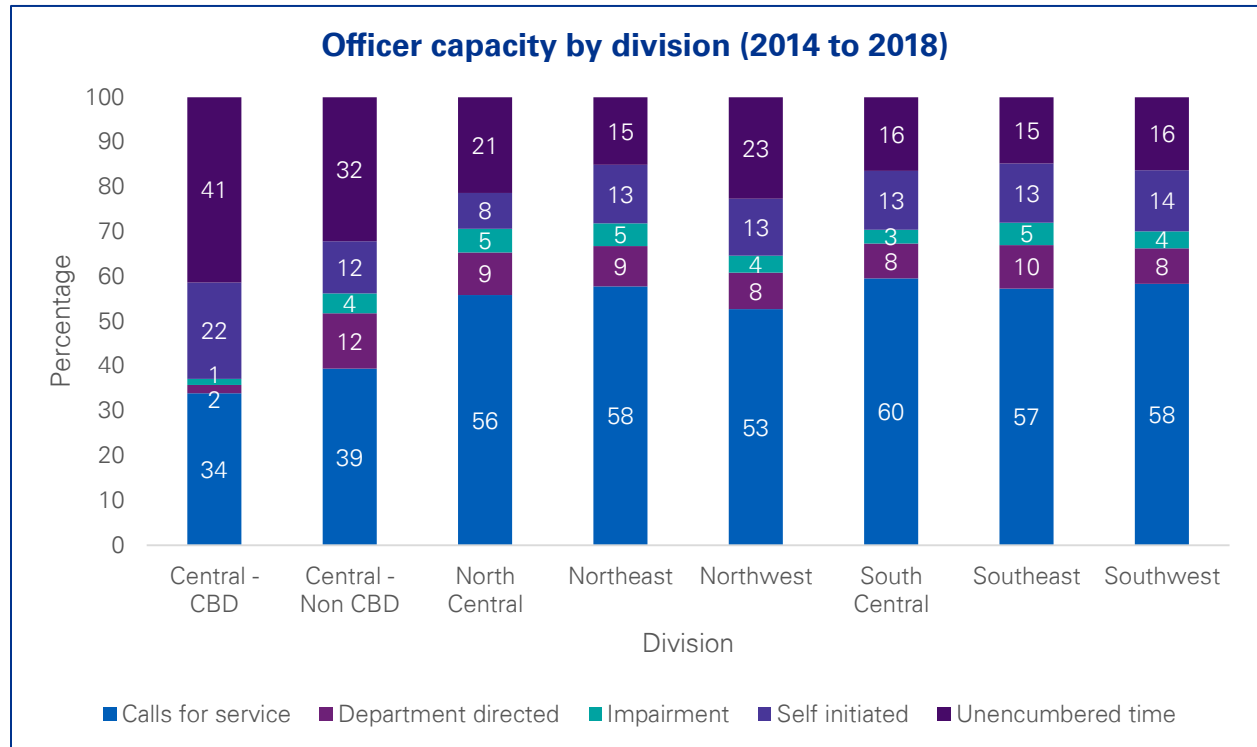
The chart below depicts officer capacity on a monthly basis to highlight seasonal changes in demand. Call for service capacity increases between April and June, which aligns with the corresponding decrease in unencumbered capacity. The monthly average capacity for proactive policing activities is approximately 34 percent to 38 percent.



*Figures may not total 100 percent due to rounding

Patrol officer capacity by division

Officer capacity varies greatly by division as each division has a unique geography and demand profile. Central Division and the Central Business Division (CBD) officers spend less of their capacity on calls for service. Within CBD, this may be due to their focus on community engagement activities, which may not be accurately recorded within the CAD data. Officers within the other divisions spend approximately 57 percent of their capacity on calls for service, ranging from 53 percent at Northwest to 60 percent at South Central. With the exception of Northwest, which has approximately 36 percent capacity for proactive policing, and the Central Division and CBD mentioned previously, the remaining divisions all have a relatively consistent capacity for proactive policing of approximately 29 percent.



Measured workload

Measuring workload is the process of measuring the gross service hour demand for police services, which includes calls for service, self-initiated, department-directed, and impairment activities. The calculation to produce workload for each call in the population data is as follows:

- 1) Understand the amount of calls for service, self-initiated, department-directed, and impairment activities and how they are dispersed temporally (year, seasonal, months, days, and hours) and within divisions.
- 2) Understand the type of CFS, SI, DD, and Impairment activities that occur. DPD's call volume is composed of 20 percent of calls, which may only require one officer to respond. However, 3 percent of calls require a multiofficer response. Understanding the types of activities is essential to understanding the demand on officers.
- 3) Understand the amount of time spent on activities. Each call and activity was given a response time, occurrence time, and number of officers.

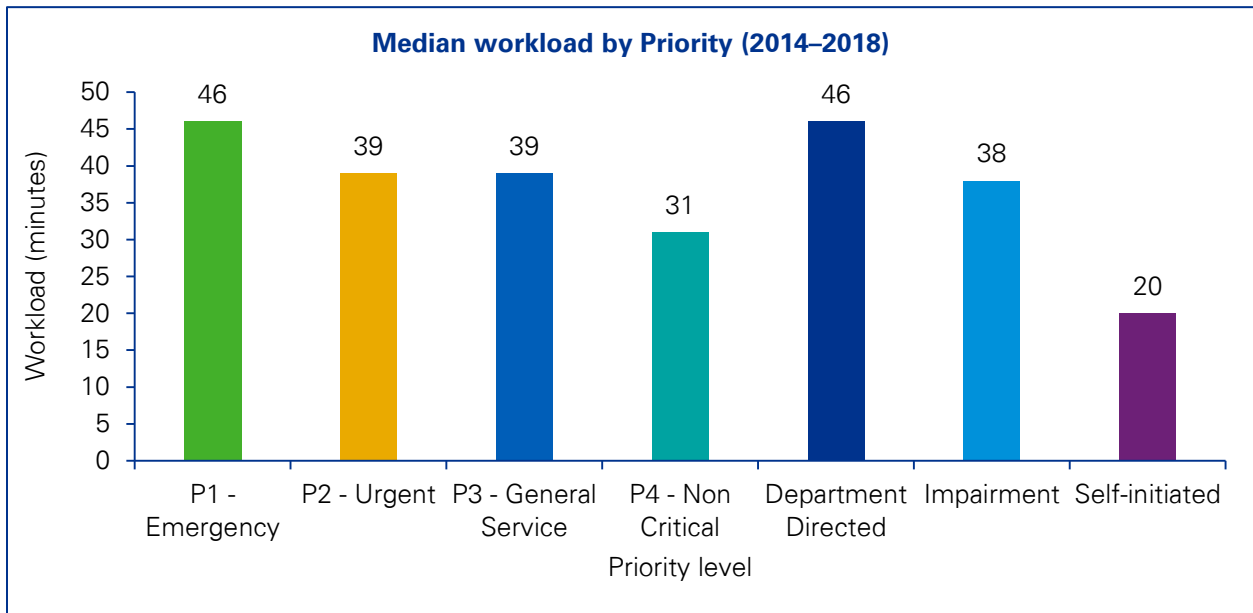
To understand the service hour requirements and the full-time equivalent (FTE) staffing levels to meet the patrol workload, KPMG aggregated total service hour workload and applied the officer productive hour factor, of 1,630 hours per year. Total patrol workload is provided in FTE service hours, which includes regular hours and overtime hours.



Median workload by call type

KPMG calculated the median workload for each call type, which effectively illustrates the amount of time the department spent on responding to each call, by call type. The median was calculated to remove outliers and account for erroneous data within the CAD data set. Through the data cleaning process, and with validation from DPD leadership, issues were identified with the data recording practices, which led to erroneous data and values being recorded. The median is the value lying at the midpoint of a frequency distribution of observed values and, therefore, was used instead of an average to remove outliers that may skew the data outputs. Workload is calculated by multiplying the median amount of officer time dedicated to each call (that is, the response time and occurrence time) by the number of officers who responded to the call.

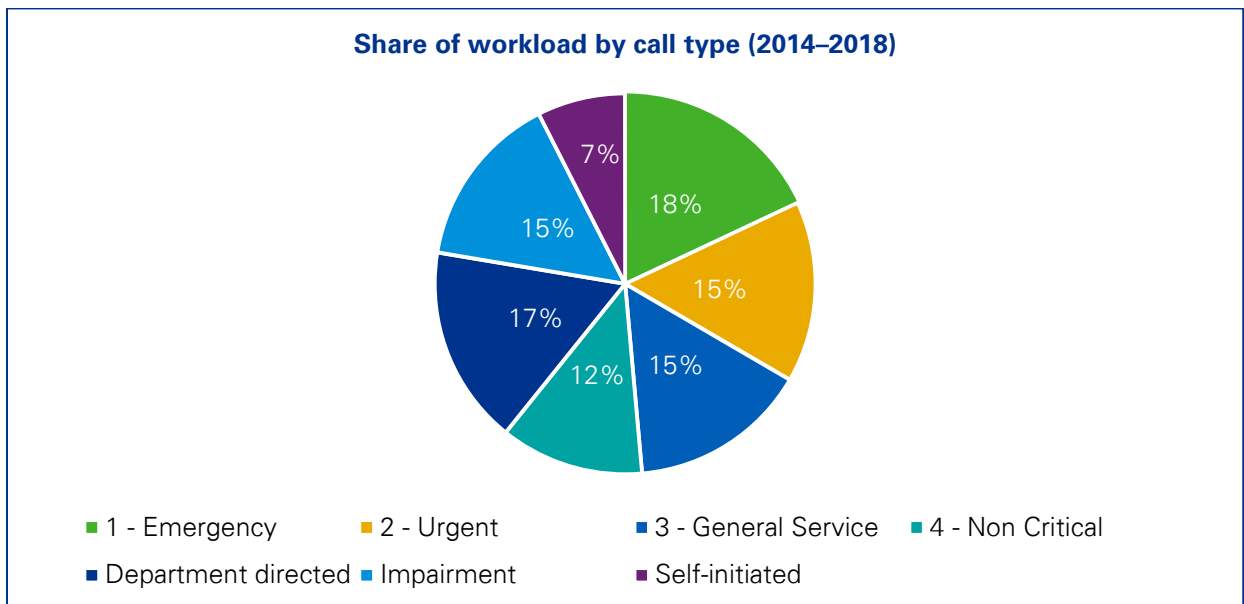
A DPD-wide analysis of median workload by priorities over the five-year span from 2014 to 2018 revealed that Priority 1 calls and department-directed activities consume the greatest workload, at 46 minutes each.



Source: DPDU data

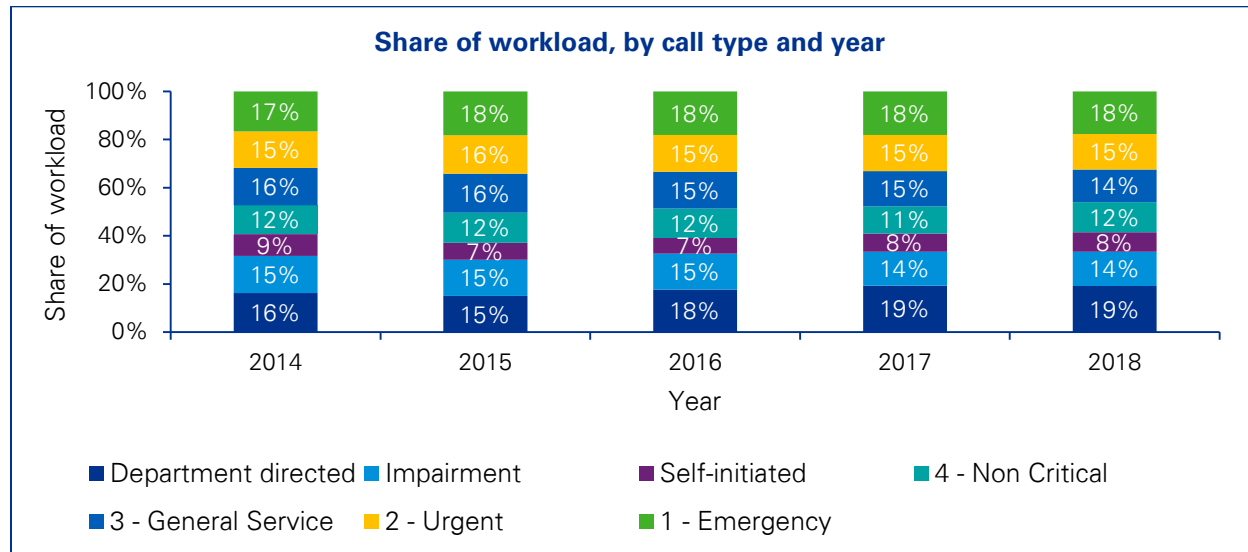
When considering the volume of calls, the time spent on each call, and the number of officers responding to each call, Priority 1 calls are the largest consumer of patrol workload, with 18 percent of total workload from 2014 to 2018. During this same period, Priority 2 calls consumed 15 percent of total workload; Priority 3 and 4 calls consumed 15 percent and 12 percent, respectively.

A significant amount of patrol workload is consumed by lower-priority calls. Priority 3 and 4 calls together consumed 27 percent of total patrol workload. By comparison, higher-priority calls—that is, Priority 1 and 2 calls—consumed 33 percent of patrol workload during the same period.



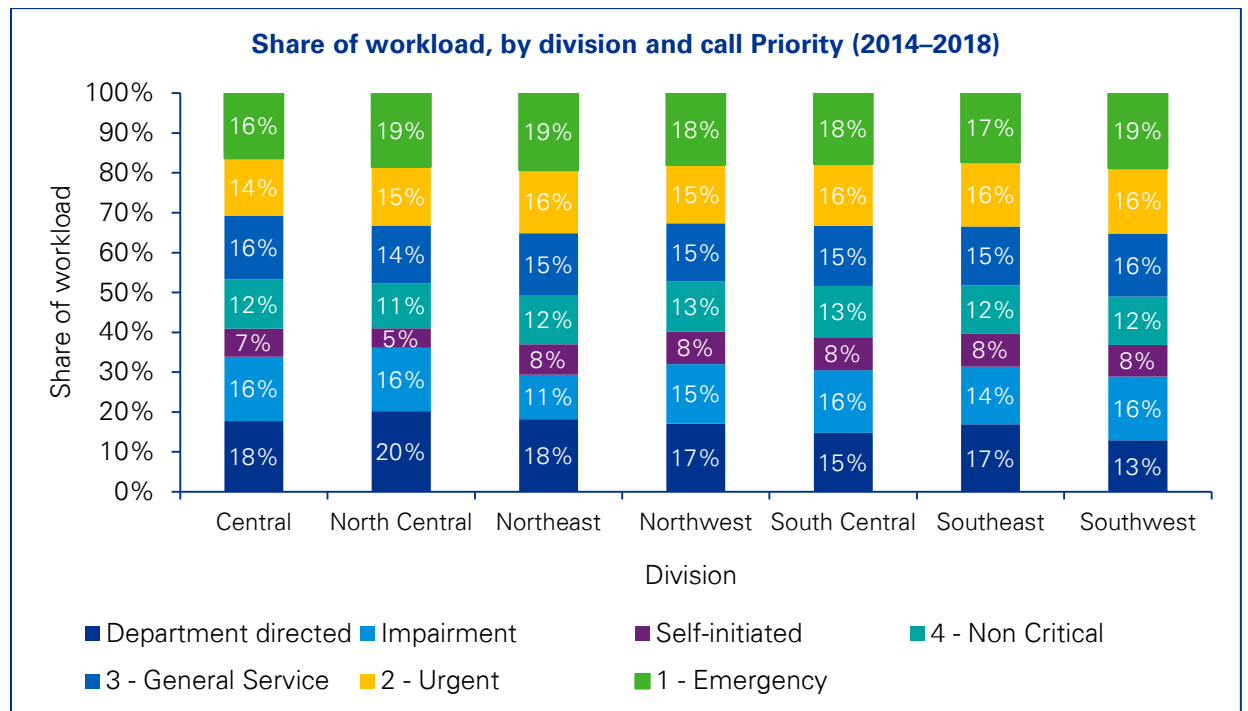
Source: DPDU data. Figures may not add to 100% due to rounding

The share of patrol workload consumed by each call type held constant across years, as shown in the graph below.



Source: DPDU data. Figures may not add to 100% due to rounding

Similarly, the share of workload consumed by each call type held largely constant across divisions, as shown in the graph below. For example, Priority 1 calls consumed between 16 percent and 19 percent of workload at each division, while Priority 2 calls consumed between 14 percent and 16 percent of workload at each division.

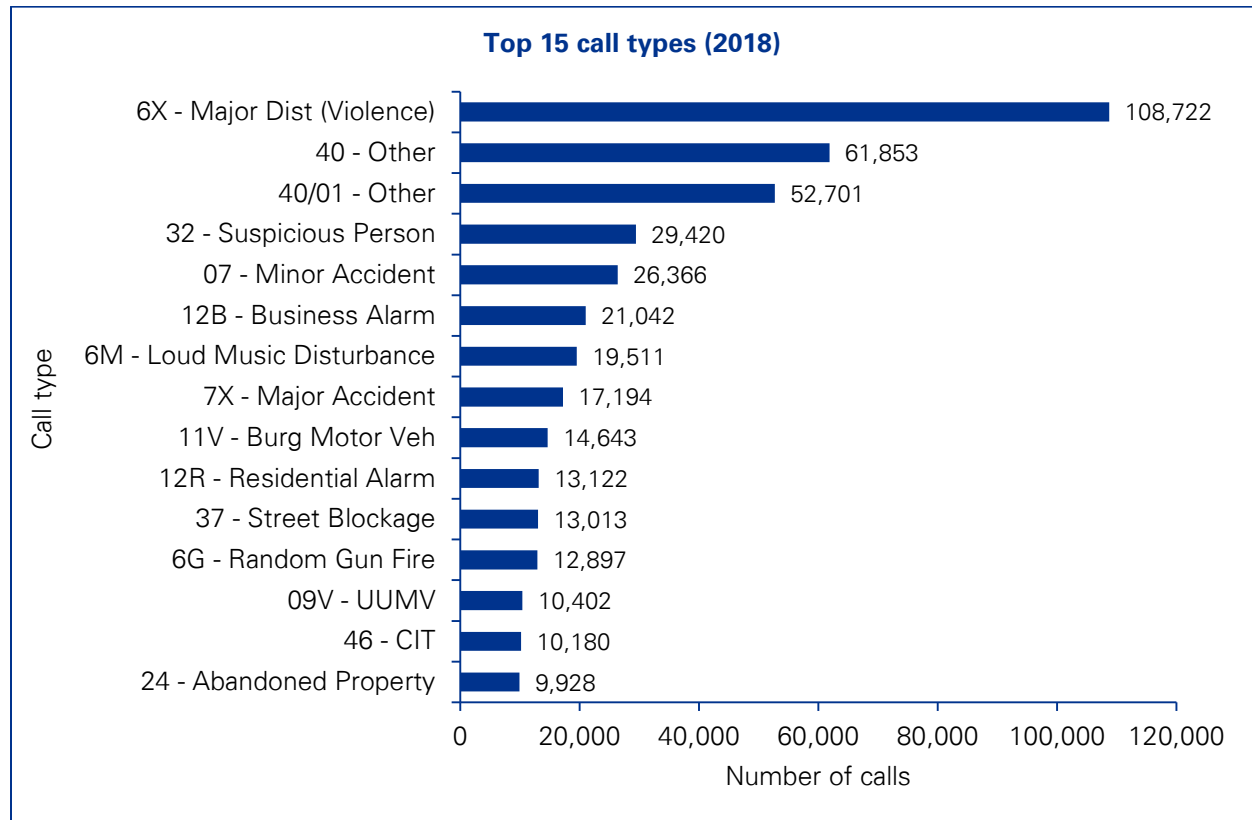


Source: DPDU data. Figures may not add to 100% due to rounding

Call type analysis

Call demand by call type

Dissecting call volume by call type can further help DPD understand patrol demand. Below is an analysis of the call types with the highest volume of calls in 2018. A more division-focused analysis and deeper dive into the most common call types are provided later in this report. The highest call volume is categorized as “Other” with 114,554 calls. The “Other” category is not an emergency call and is categorized as such when a call cannot be defined yet a dispatcher believes it warrants an officer response. The second highest call volume is a Major Disturbance with over 100,000 calls per year.

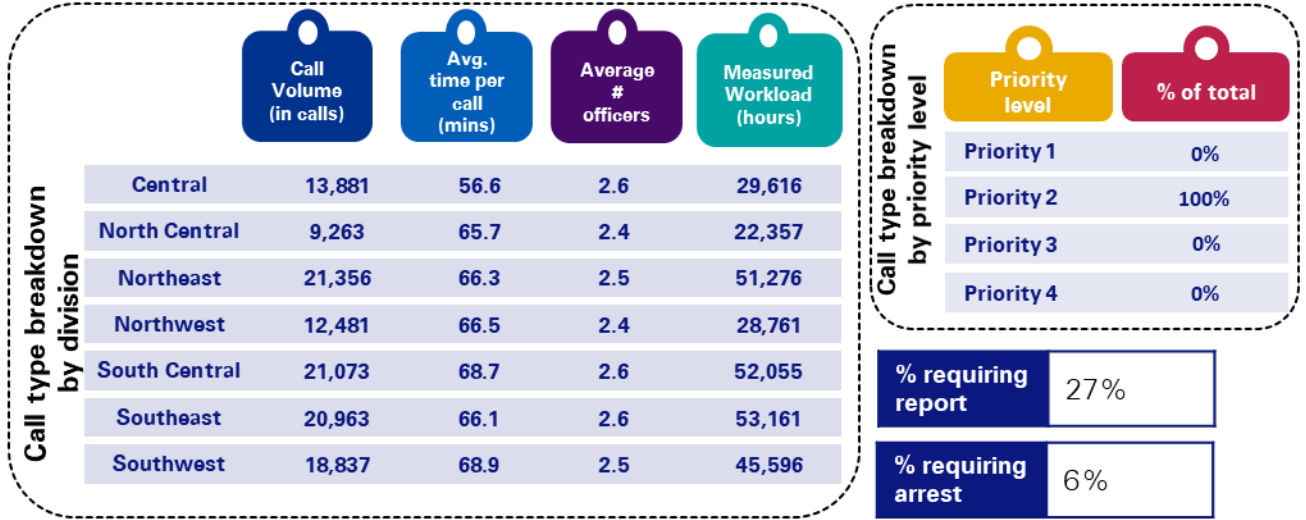


Source: CAD data

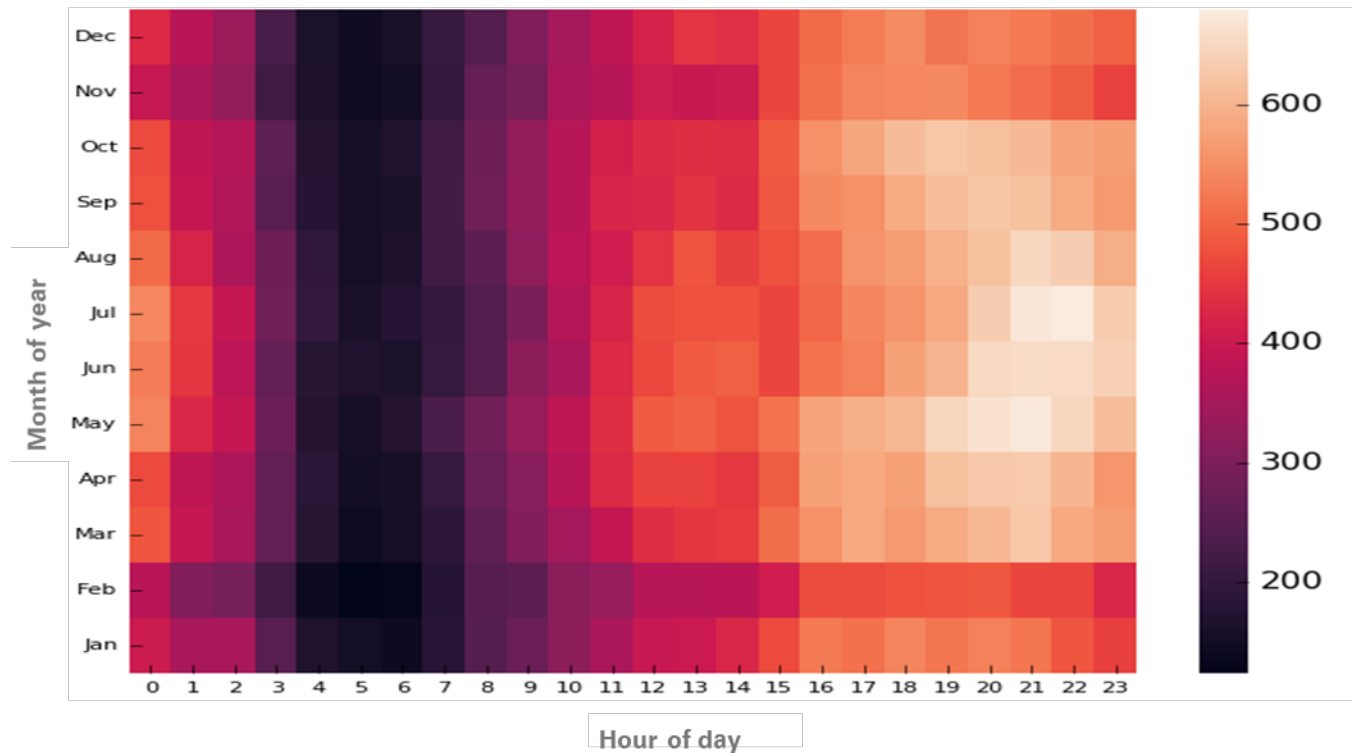
A deeper analysis of the top ten highest-volume calls between 2014 and 2018 is highlighted below. The analysis shows that despite these call types having the highest volume and consuming a large portion of patrol workload, they do not result in any significant outcomes for the DPD. Of the top ten call types over the five-year period, on average, only 2.25 percent result in an arrest and only 33 percent require a report. This suggests that there may be alternative ways for DPD to manage call demand for some call types and especially lower-priority calls, for example through higher utilization of their telephone reporting “expediter” function. While DPD is in the process of implementing an online reporting functionality, it may also consider the use of alternative resources to respond to certain call types to alleviate demand on patrol officers.

Call type profile – Major Disturbance (6x)

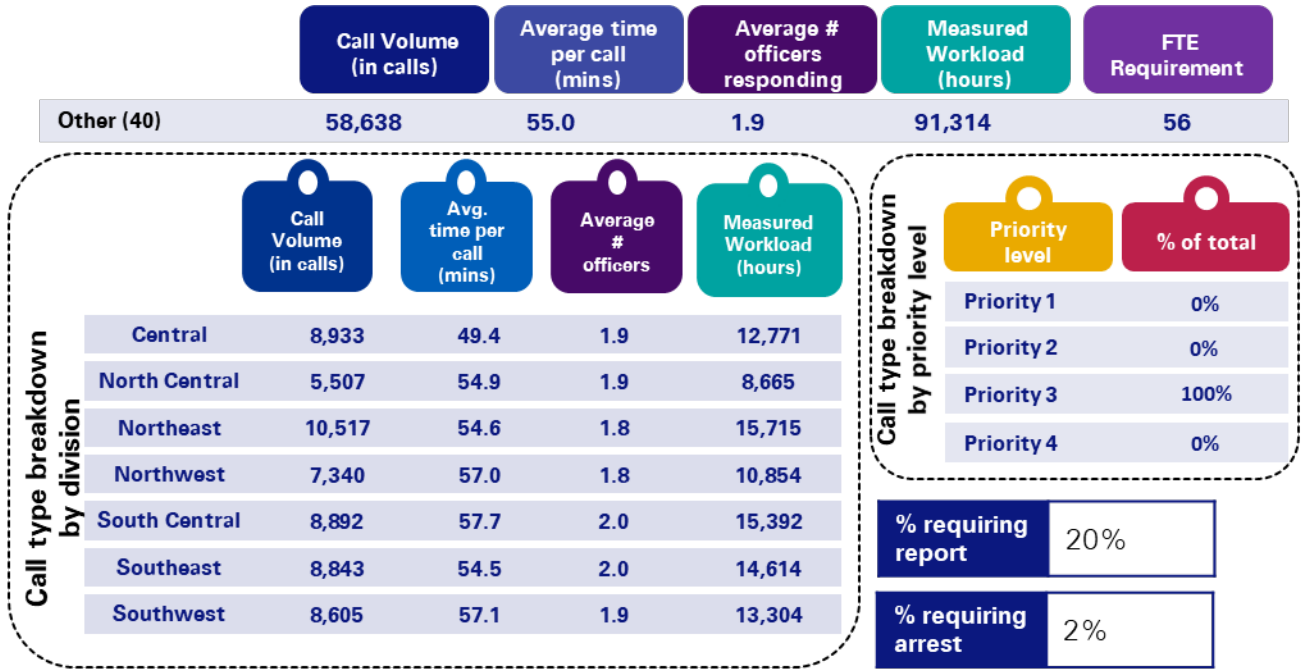
	Call Volume (in calls)	Average time per call (mins)	Average # officers responding	Measured Workload (hours)	FTE Requirement
Major Disturbance	117,854	65.5	2.5	282,821	174



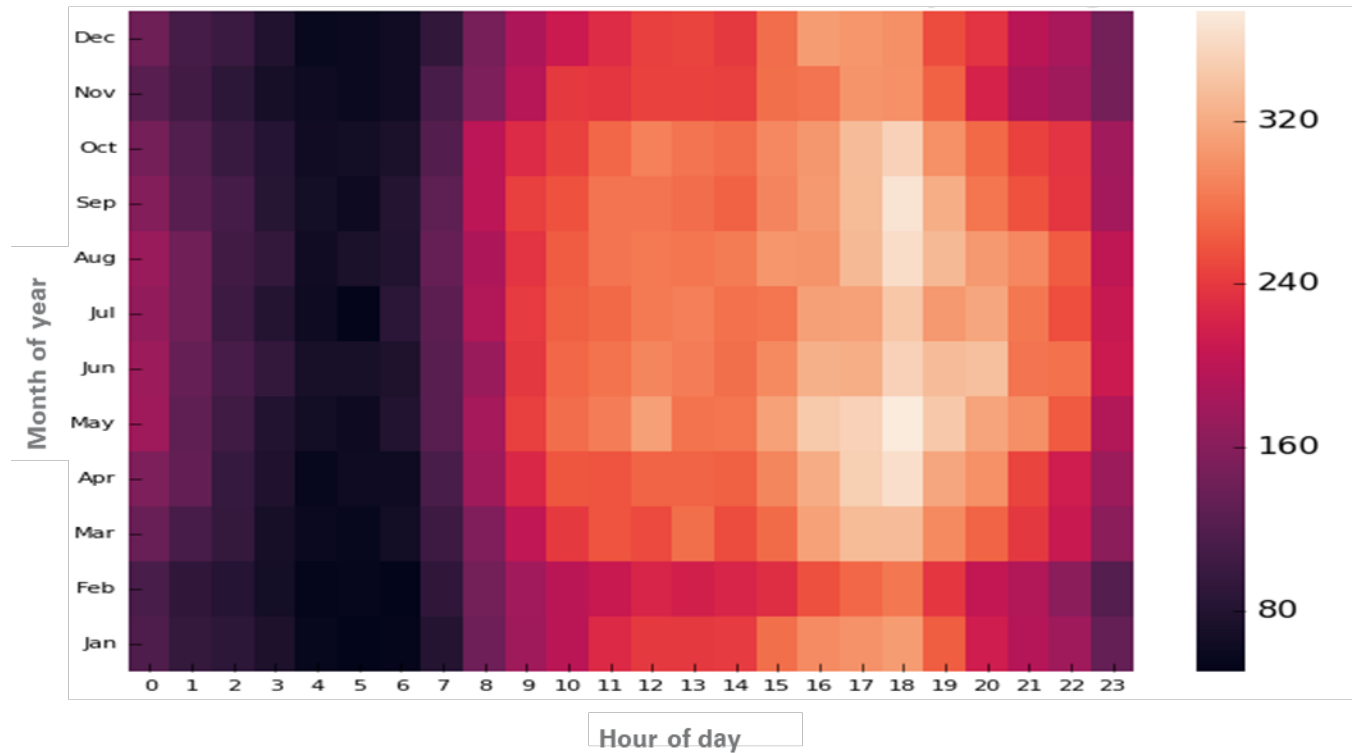
Call volume temporal analysis



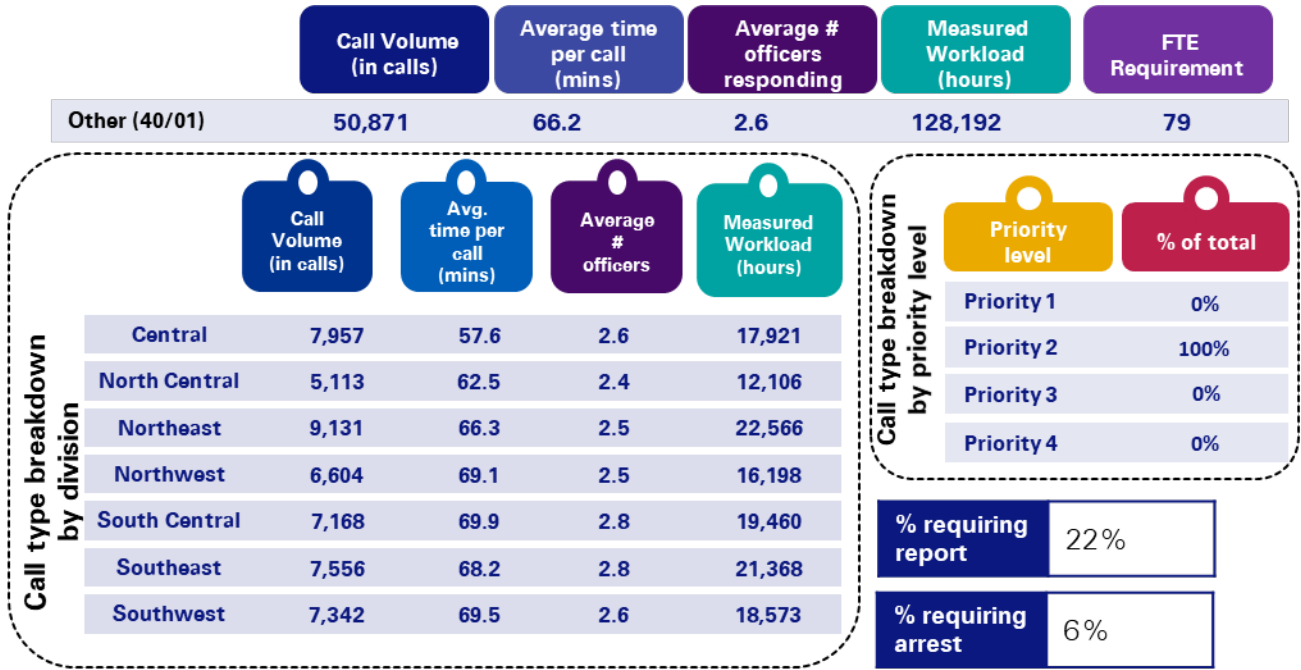
Call type profile – Other (40)



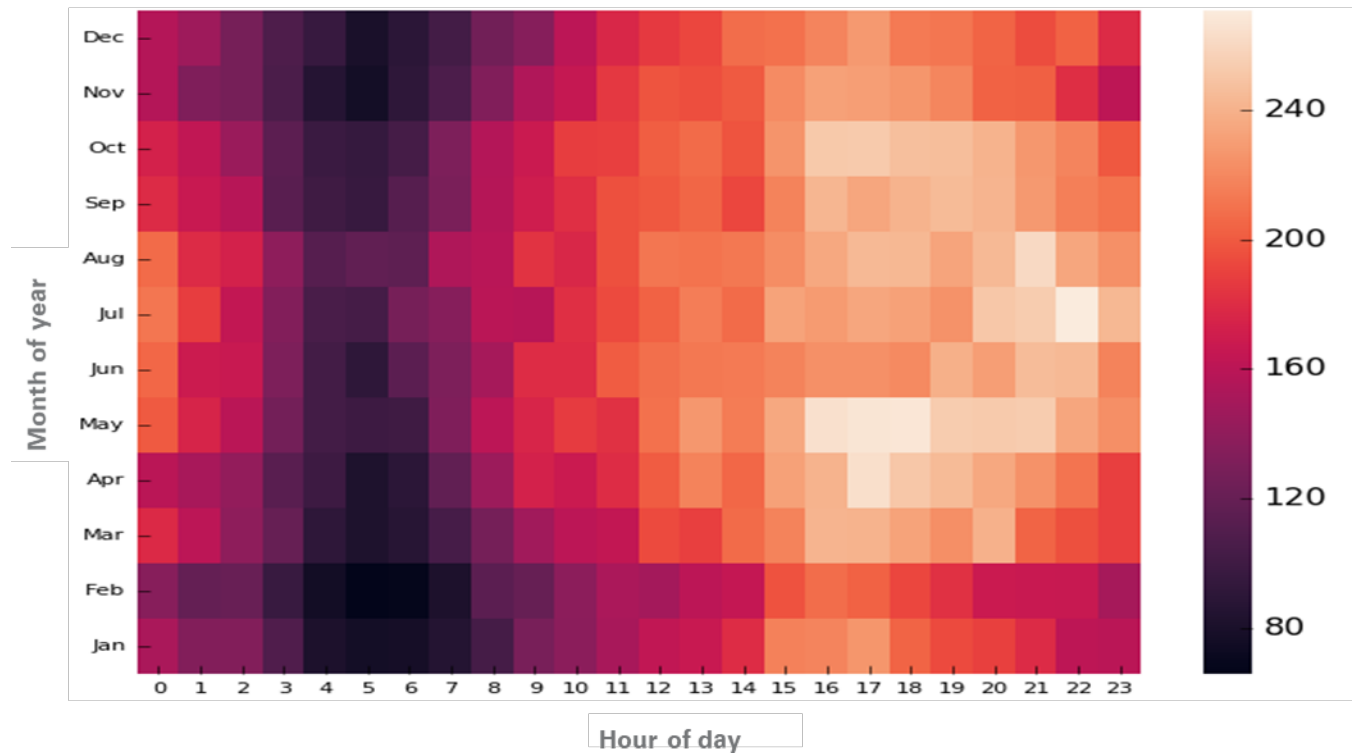
Call volume temporal analysis



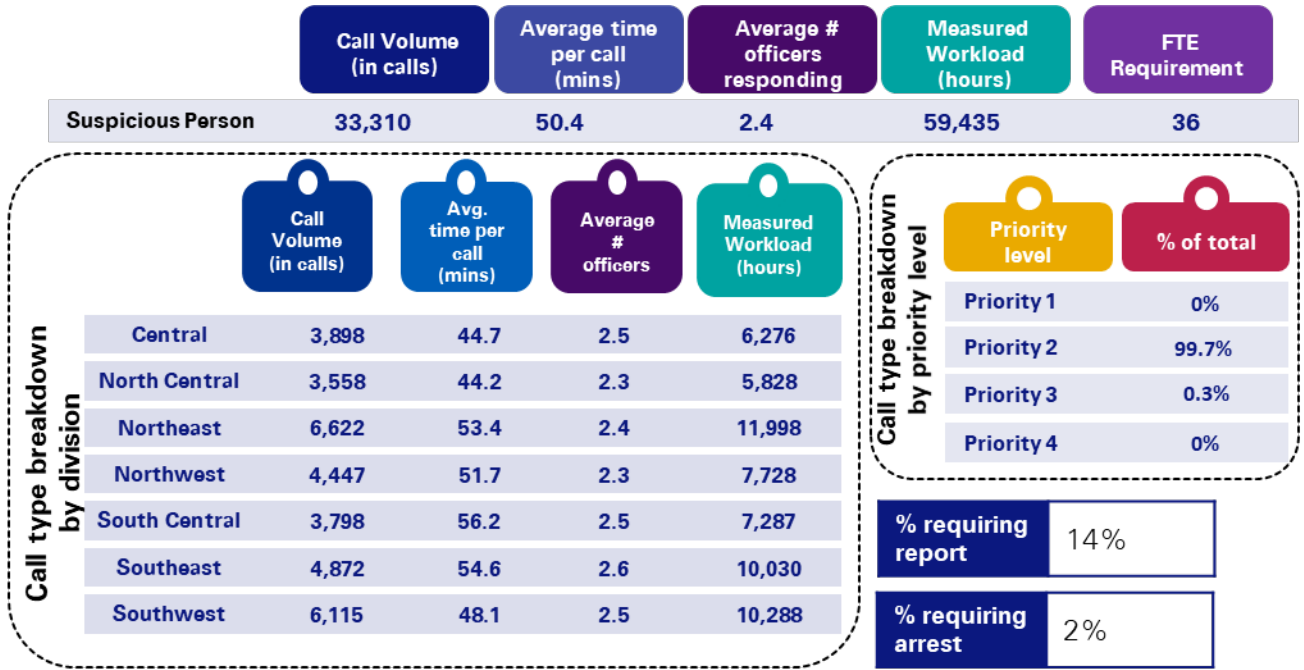
Call type profile – Other (40/01)



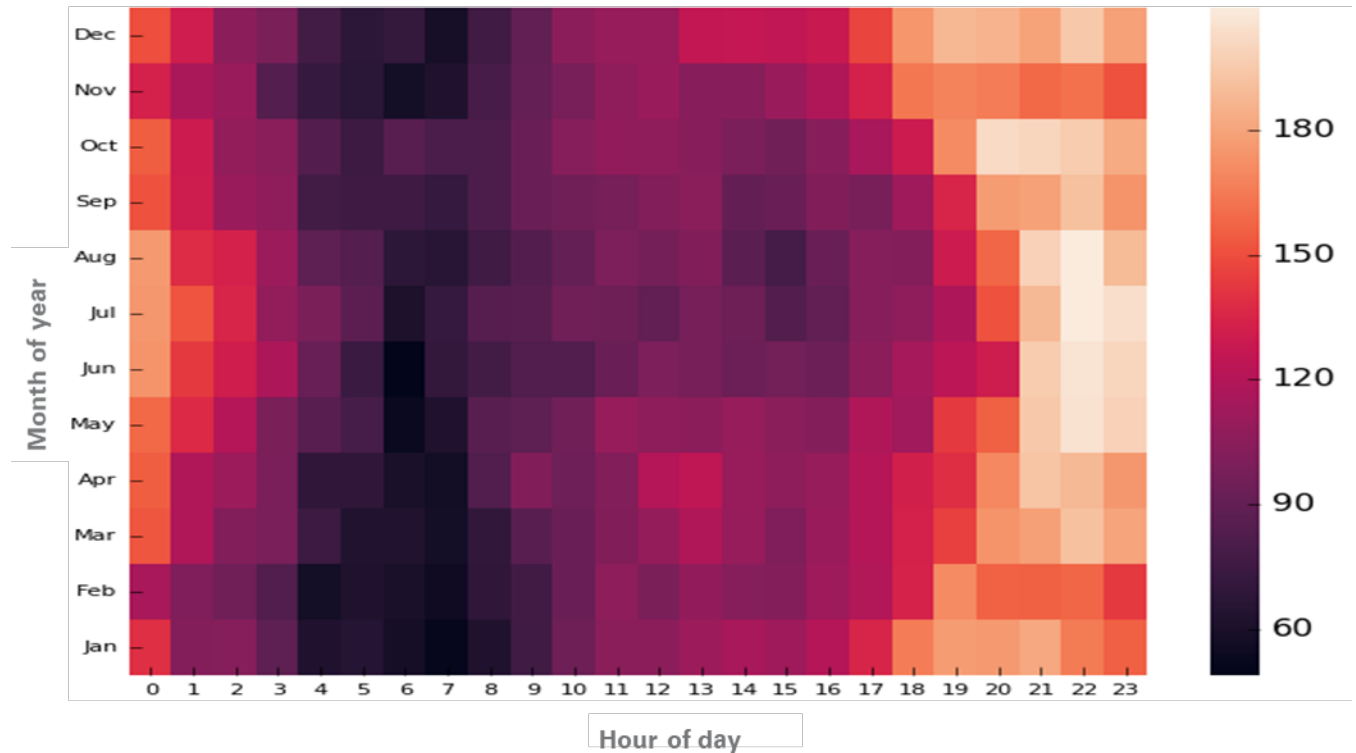
Call volume temporal analysis



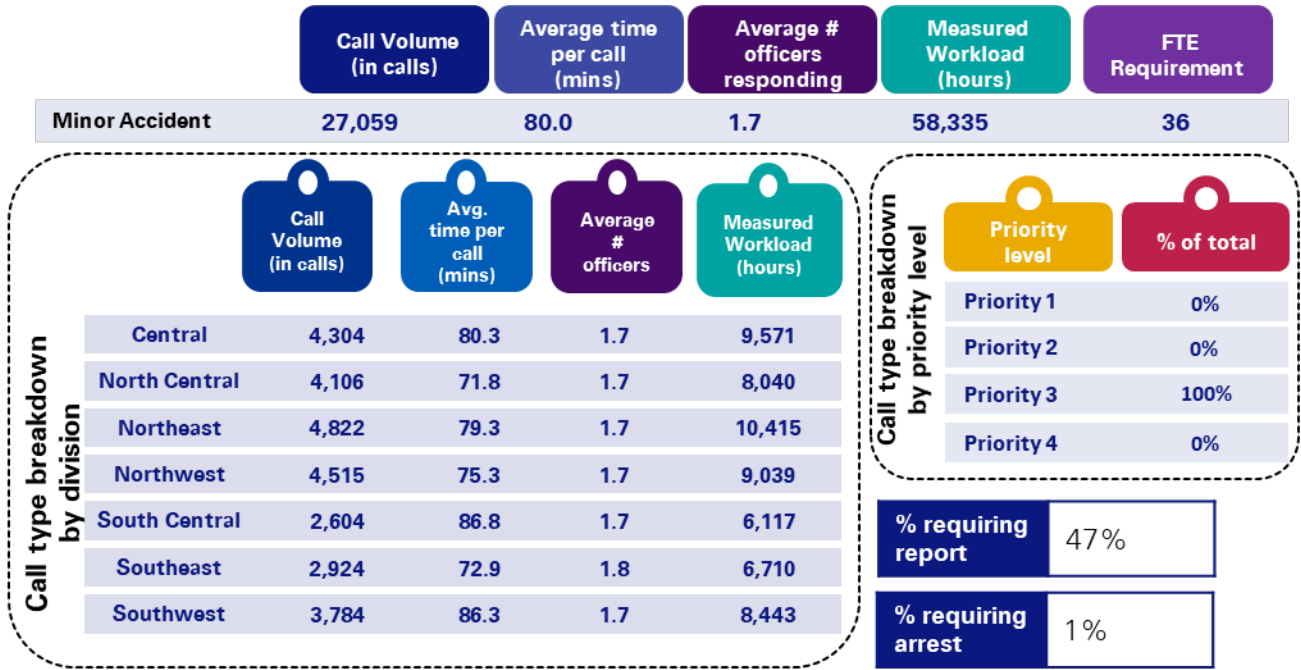
Call type profile – Suspicious Person (32)



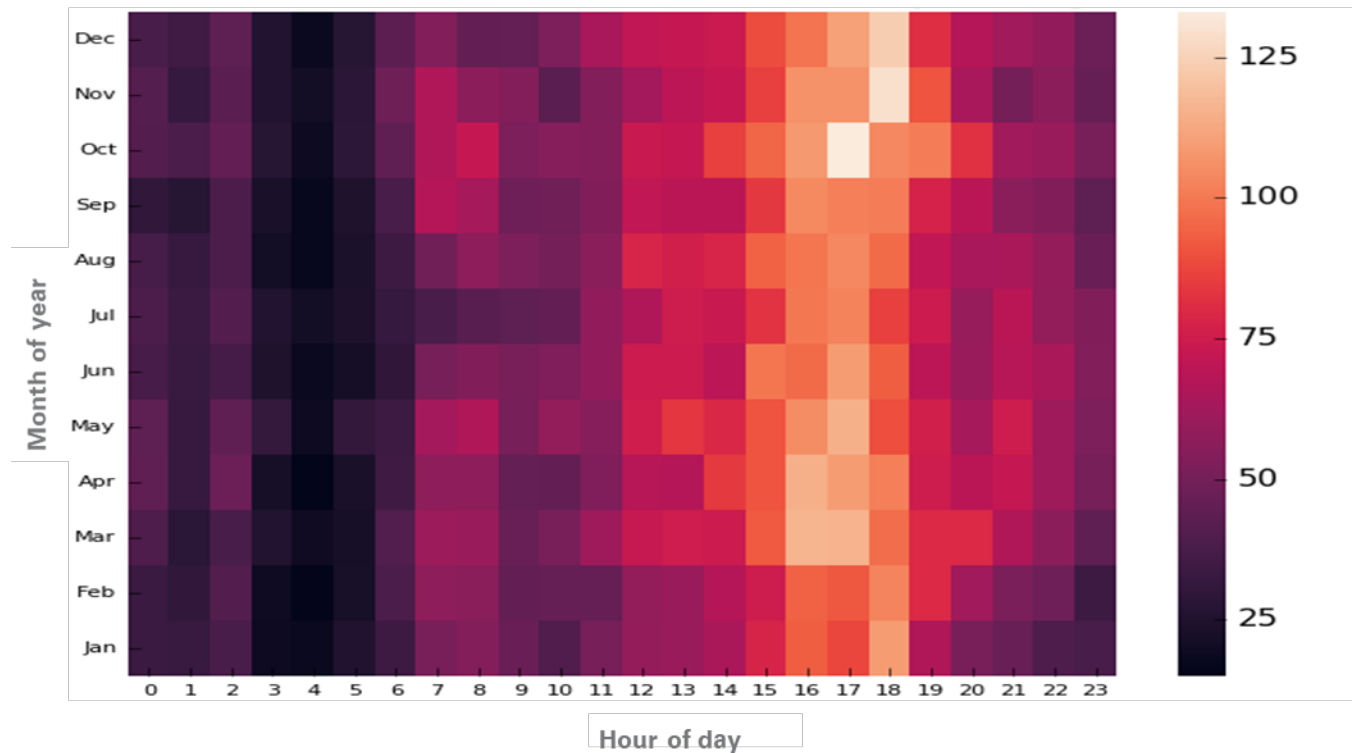
Call volume temporal analysis



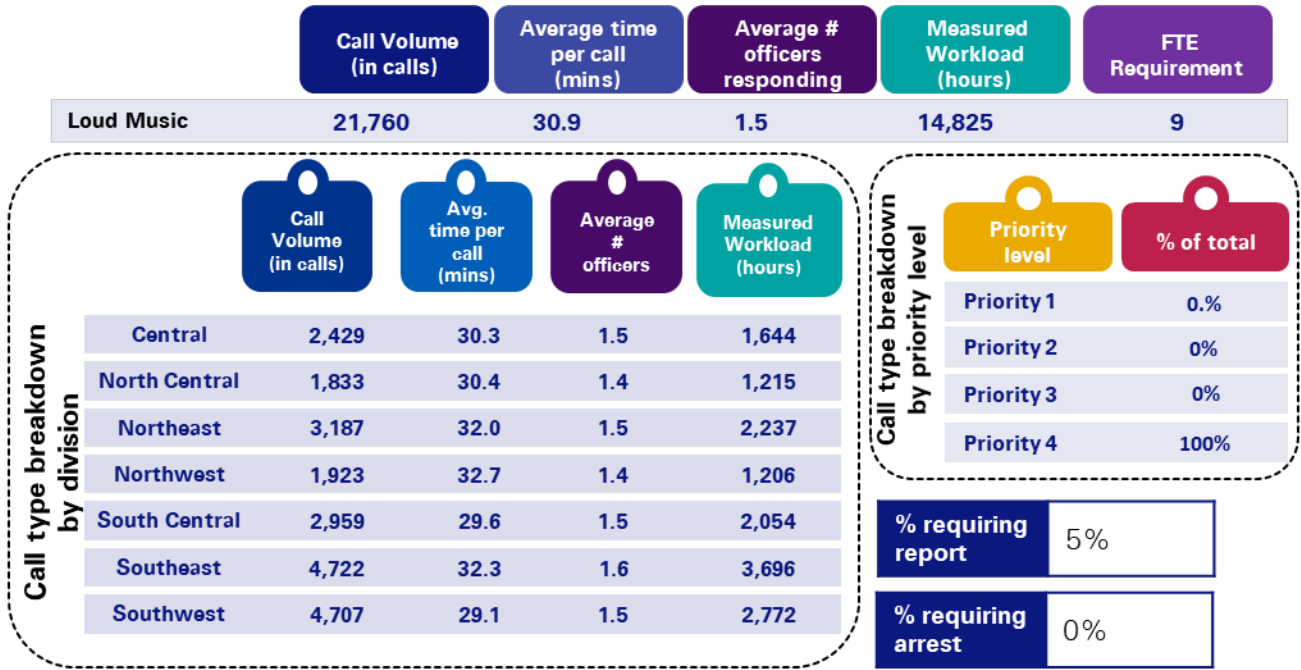
Call type profile – Minor Accident (07)



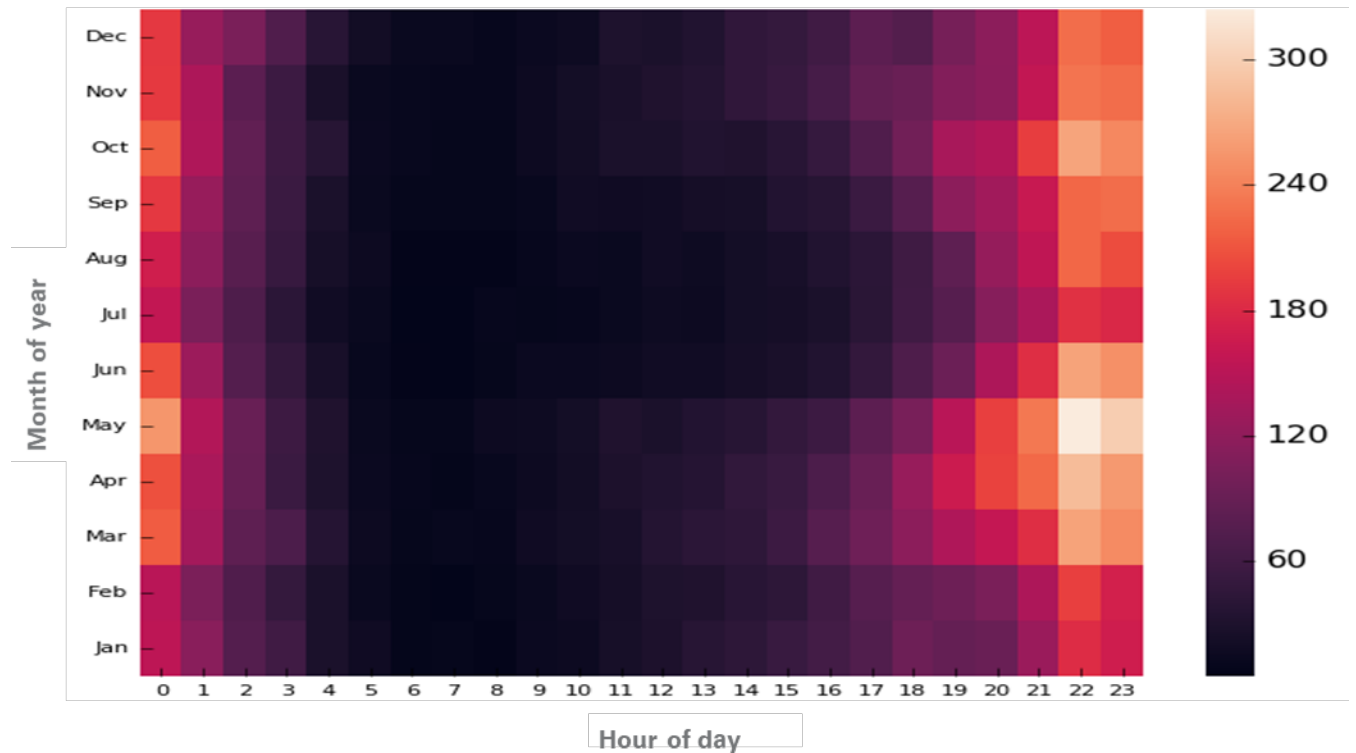
Call volume temporal analysis



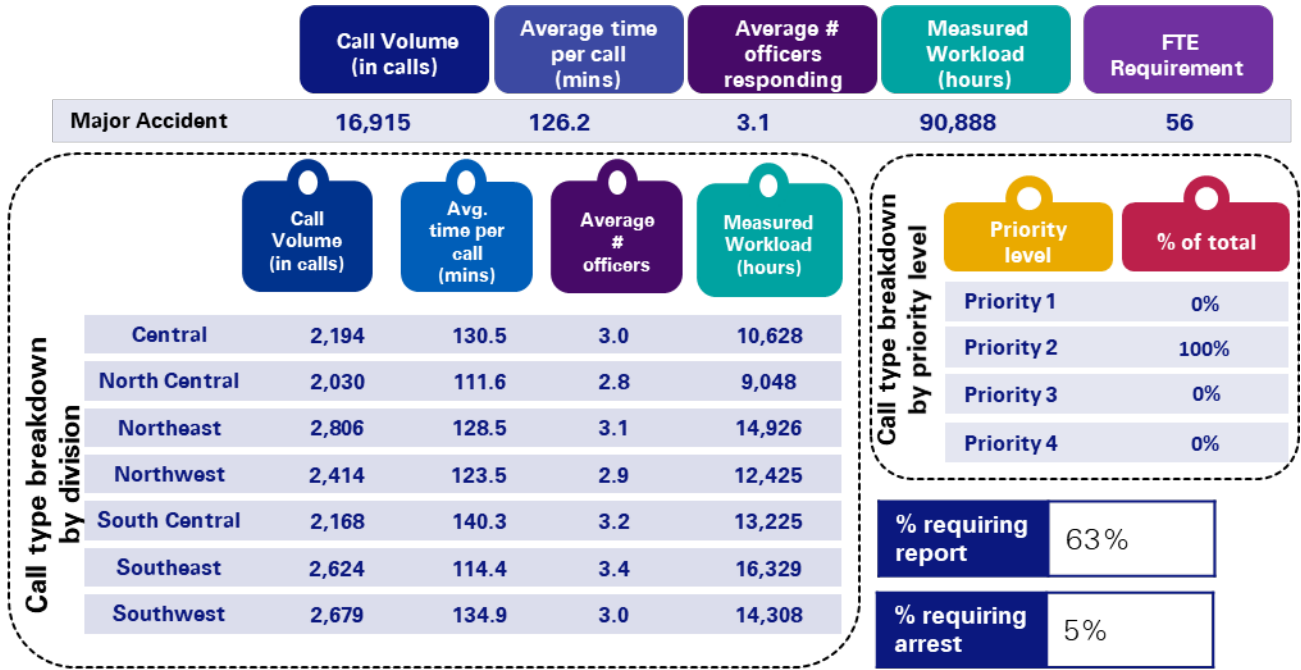
Call type profile – Loud Music Disturbance (6M)



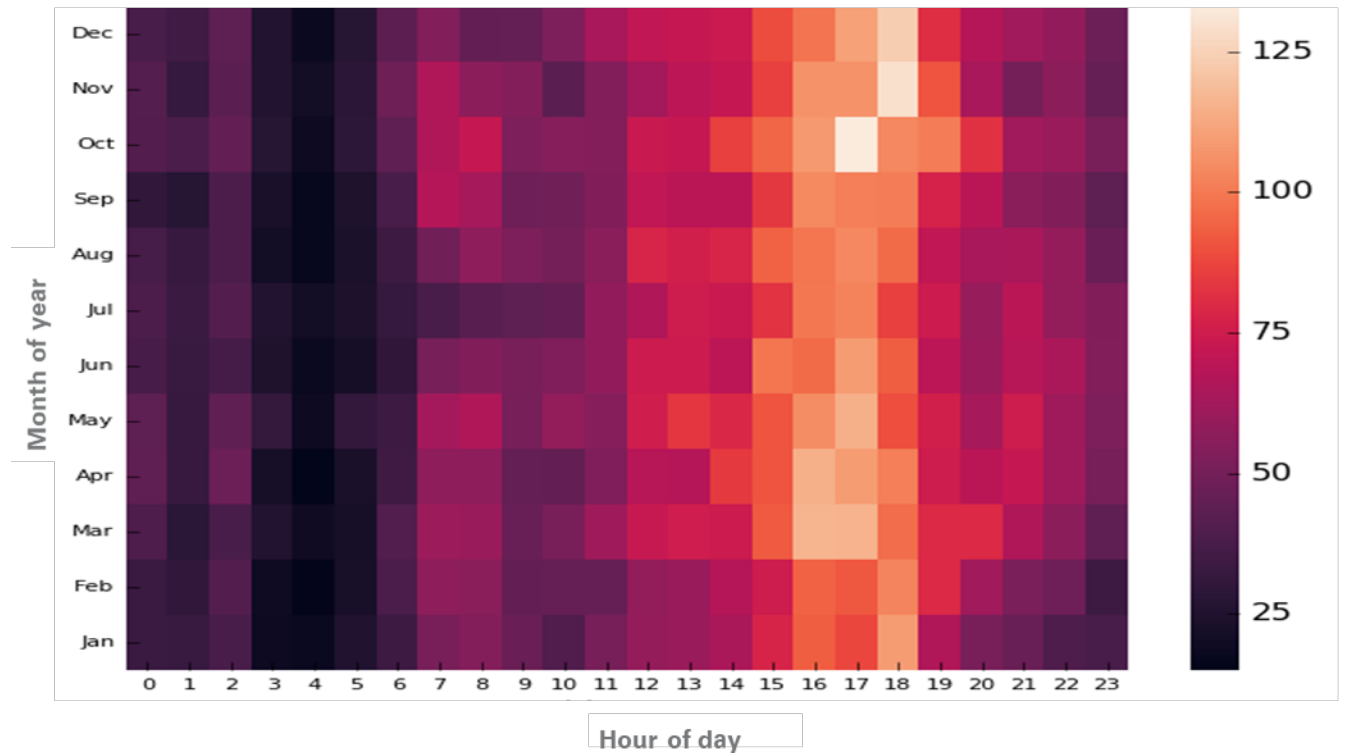
Call volume temporal analysis



Call type profile – Major Accident (7x)



Call volume temporal analysis



Call type profile – Business Alarm (12B)

	Call Volume (in calls)	Average time per call (mins)	Average # officers responding	Measured Workload (hours)	FTE Requirement
Business Alarm	16,720	52.9	2.3	28,675	18

Call type breakdown by division

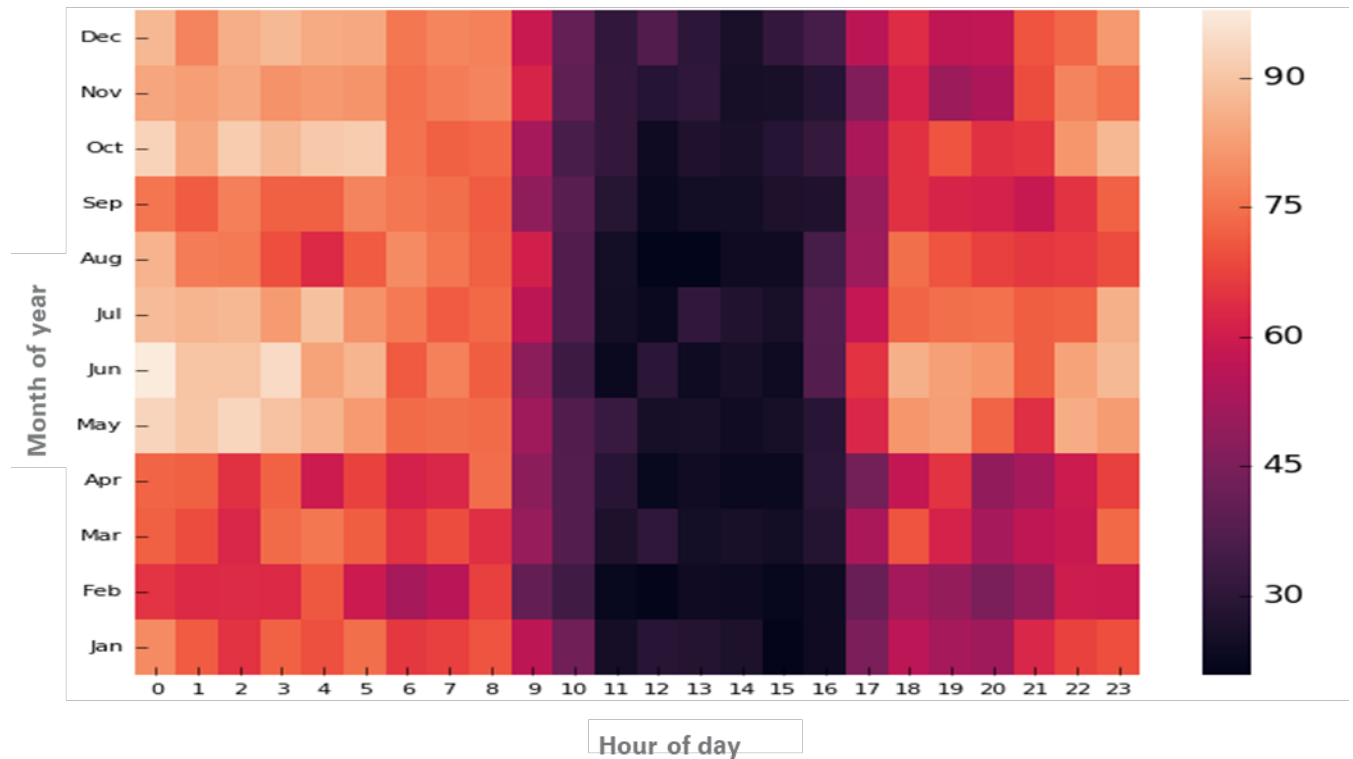
	Call Volume (in calls)	Avg. time per call (mins)	Average # officers	Measured Workload (hours)
Central	2,405	49.4	2.2	3,911
North Central	2,092	44.5	2.2	3,193
Northeast	2,591	51.0	2.2	4,617
Northwest	4,474	51.2	2.1	7,010
South Central	1,295	60.5	2.4	2,674
Southeast	1,527	58.9	2.5	3,304
Southwest	2,335	54.6	2.3	3,965

Call type breakdown by priority level

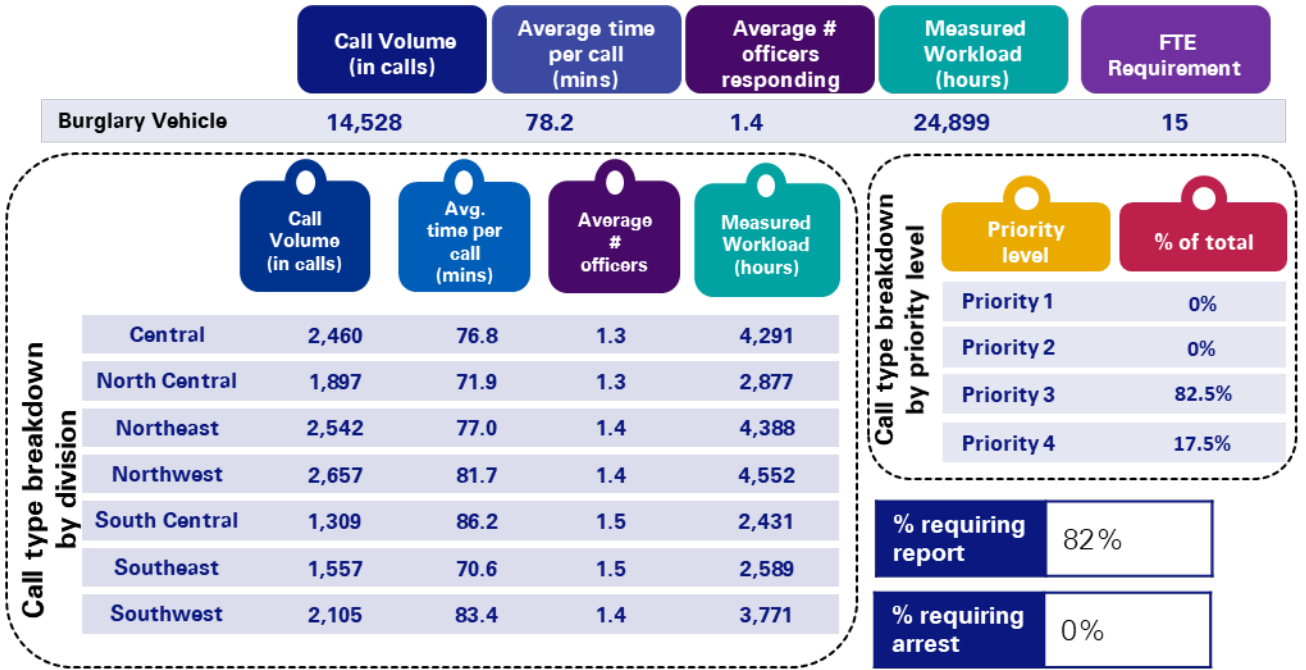
Priority level	% of total
Priority 1	0.5%
Priority 2	1%
Priority 3	98.6%
Priority 4	0%

% requiring report	24%
% requiring arrest	0%

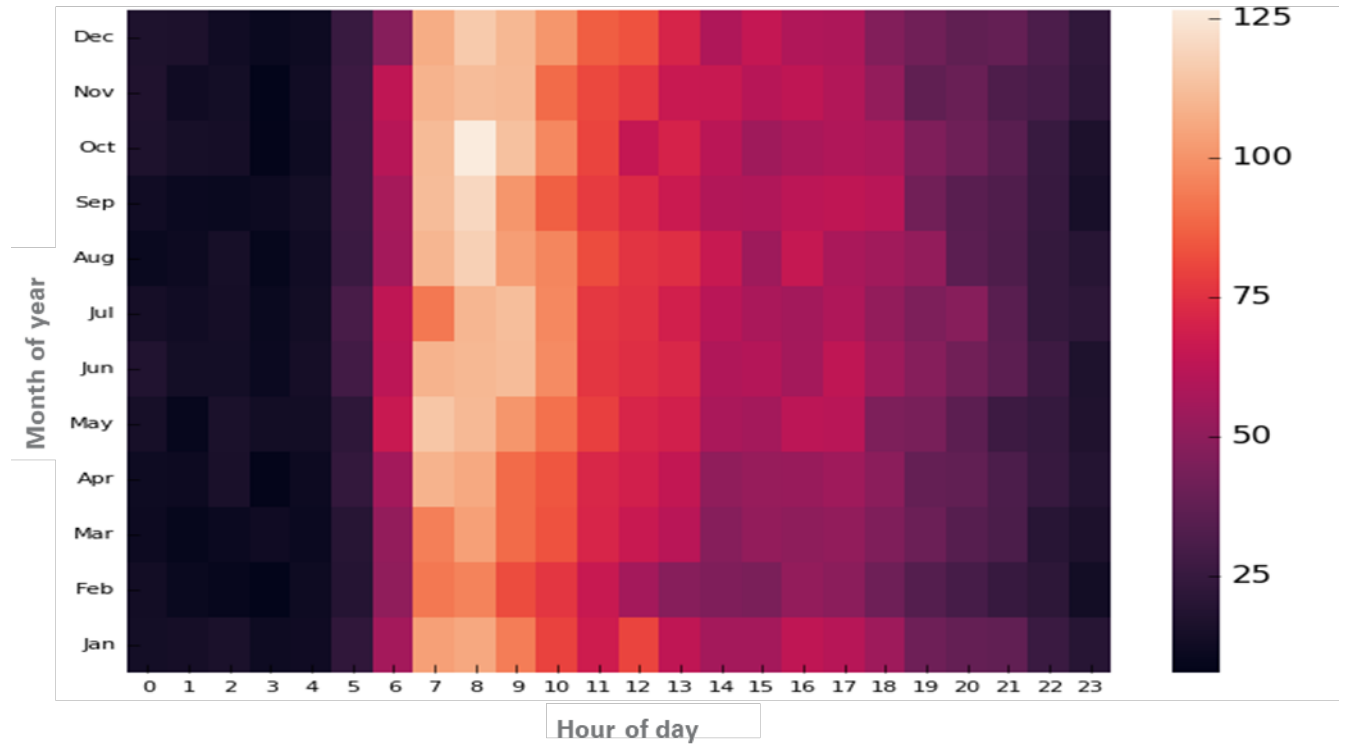
Call volume temporal analysis



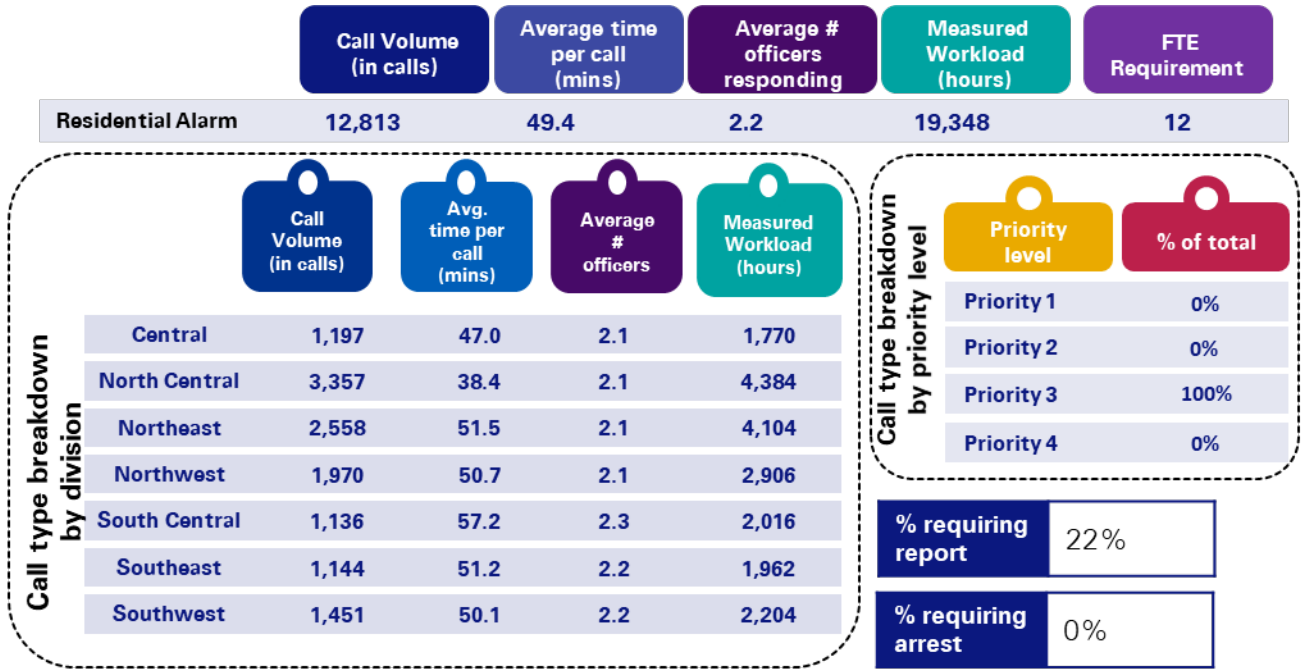
Call type profile – Burglary Motor Vehicle (11V)



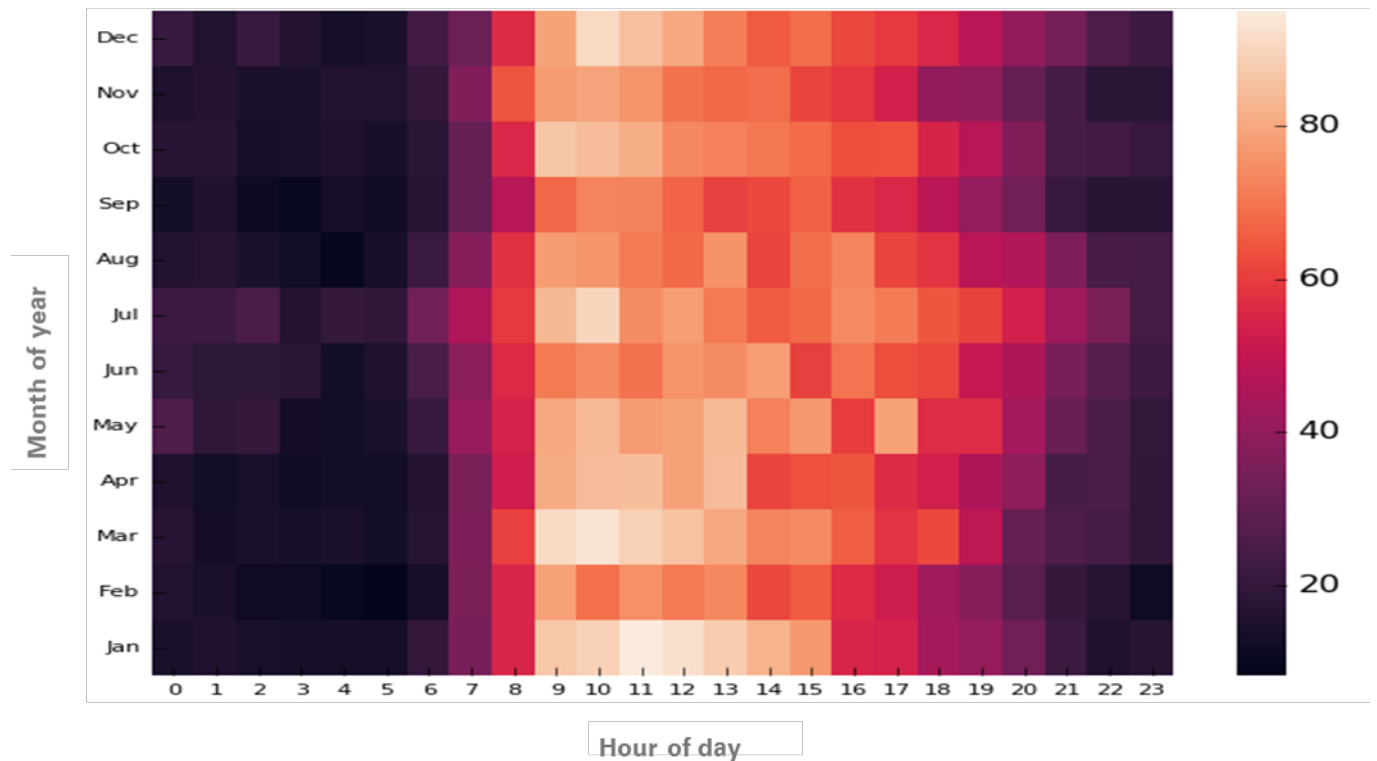
Call volume temporal analysis



Call type profile – Residential Alarm (12R)



Call volume temporal analysis



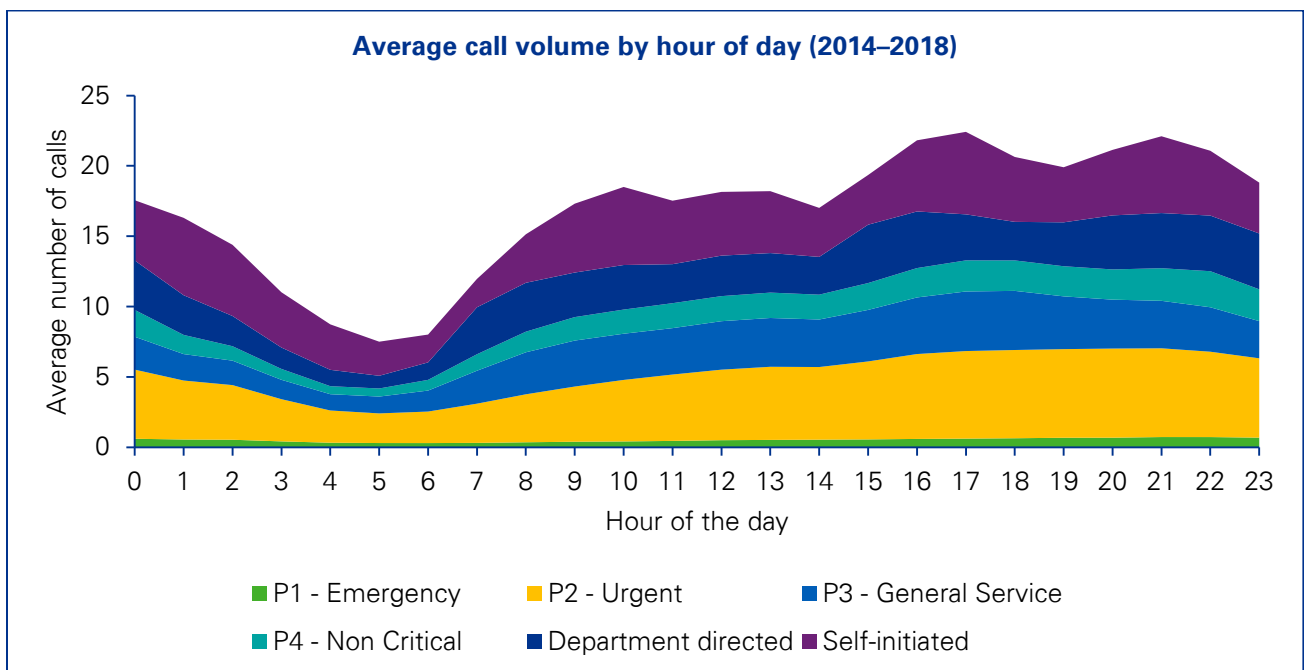
Call volume temporal trends

KPMG analyzed call demand using four primary timeframes in order to understand trends and patterns across all divisions on a temporal and seasonal basis. These timeframes include:

Timeframe	Description
Month of year	Temporal analysis conducted on a monthly level to determine trends in demand by month
Week of year	Temporal analysis conducted on a weekly basis to identify trends in demand by week of the year
Day of week	Temporal analysis conducted by day of the week to show daily trends in demand throughout the week
Hour of day	Temporal analysis conducted on an hourly basis to depict trends in call demand over the course of the day. This analysis is supplemented by two hour of day analyses at the all division data—hour of day by season and hour of day by day of week.

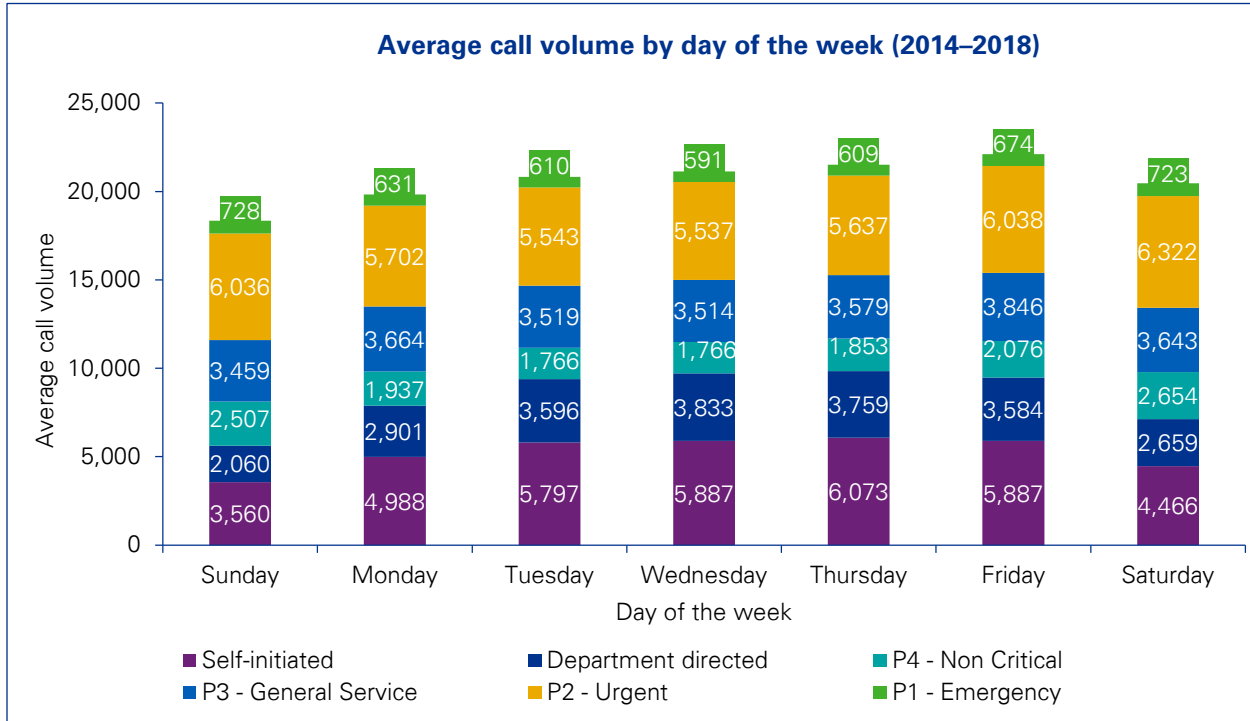
Temporal analysis – Call volume by hour of day

An hour-of-day analysis was conducted in order to assess trends in the average volume of calls received by DPD throughout the day. Such an analysis is important as call distribution has an impact on officer scheduling. On an overall basis, the busiest call times are during the evening from 3:00 PM to 10:00 PM. The least busy call periods are during the early morning hours between 3:00 AM and 7:00 AM.



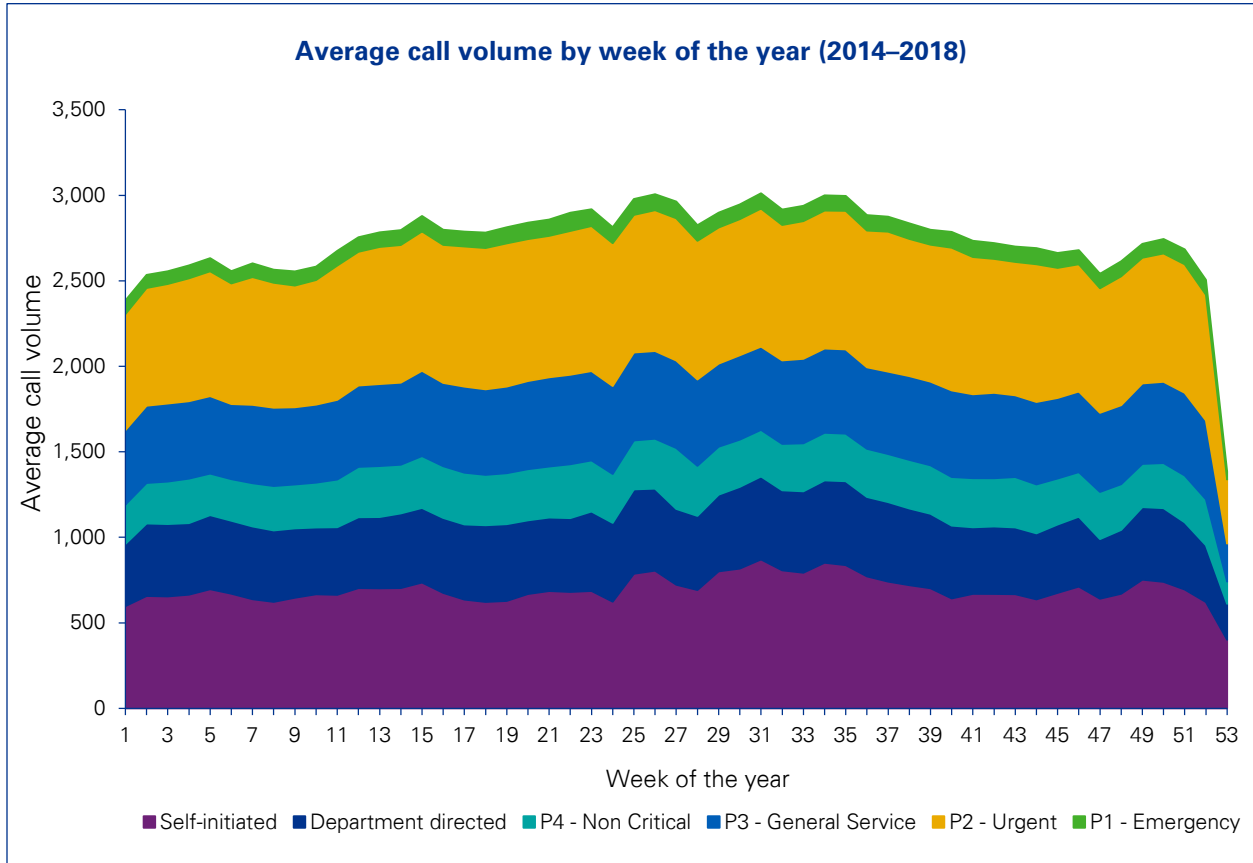
Temporal analysis – Call volume by day of week

Call data was also analyzed by day of the week in order to gauge the effect of traditional workweek and weekend schedules on call demand. On a total call basis, calls peaked on Wednesday, Thursday, and Friday, with the lowest demand on Sunday and Monday.



Temporal analysis – Call volume by week of year

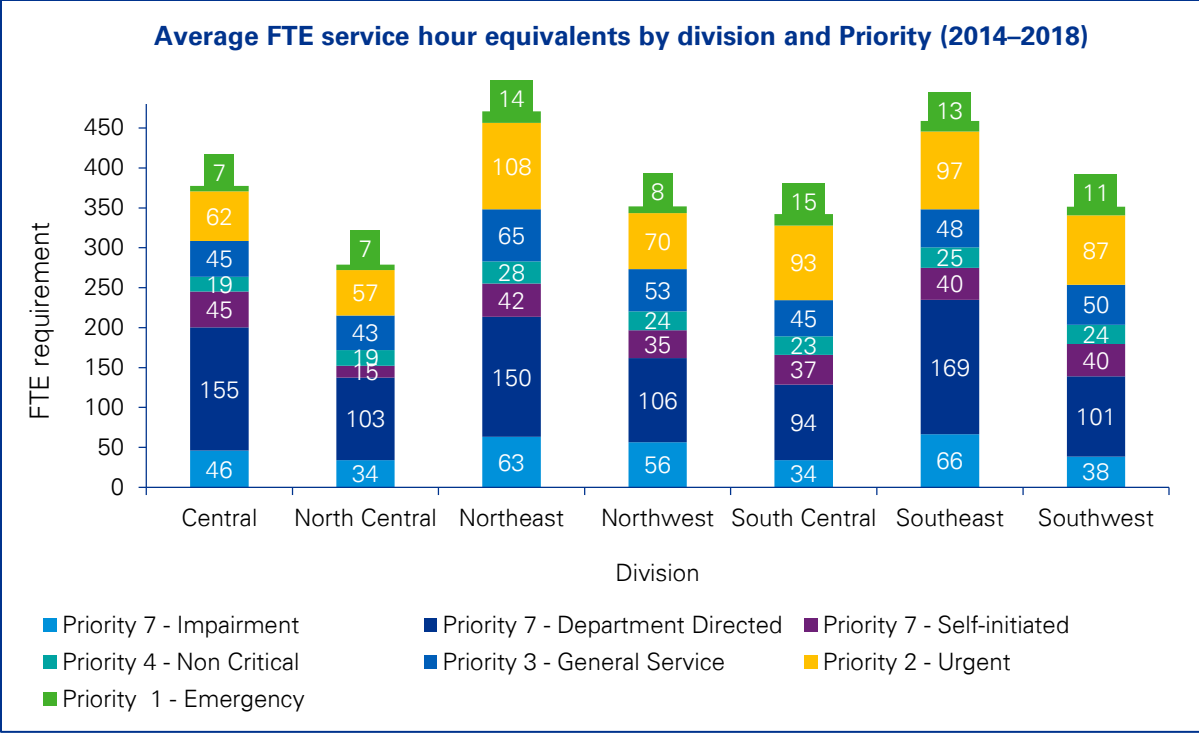
Historic call data was plotted on a weekly basis over the course of a year in order to assess the seasonality of call demand. The analysis suggests that calls for service are lowest in December and January (the first and last weeks of the year) and that call volume peaks in May and June (specifically weeks 25–37).



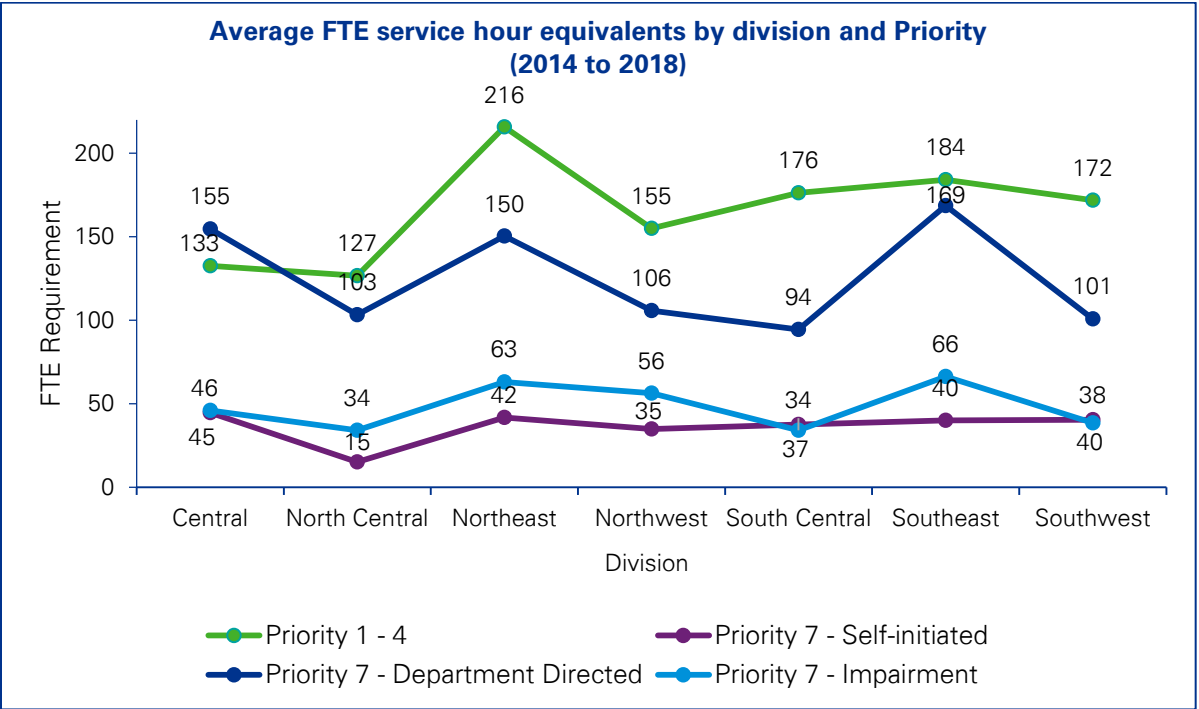
FTE service hour equivalents, based on aggregated workload under current operating model

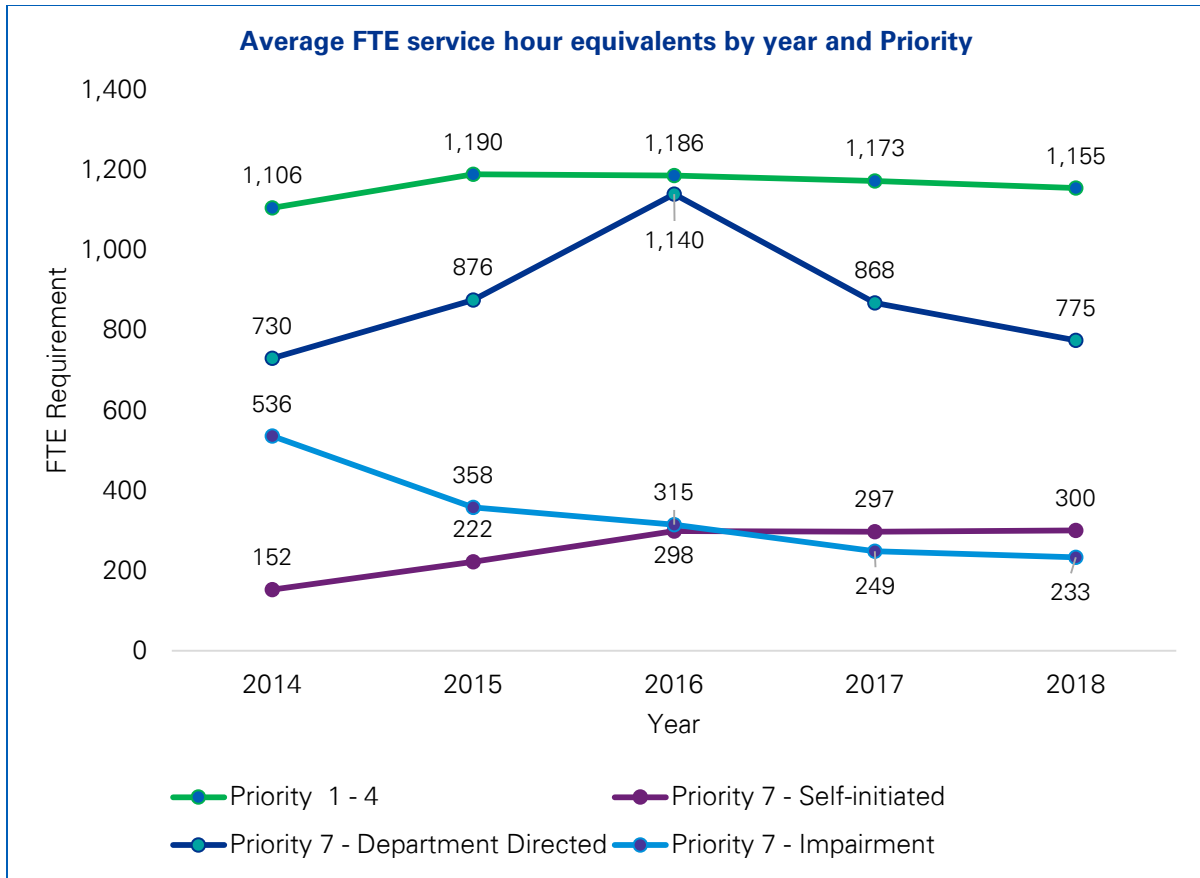
KPMG estimated the number of FTE service hour equivalents required to manage DPD’s current workload under its current operating model. These estimates reflect DPD’s average call volume—monthly, annually, or at the division level—multiplied by the median workload per call. These estimates are represented in FTEs as it considers both regular staff and overtime hours: the figures below show the number of FTEs, required to meet demand assuming 1,630 productive hours per year (the DPD average). The optimization section of this report identifies an optimal mix of regular hours and overtime hours. This section is intended to depict workload as a measure of FTEs; however, it does not represent recommended staffing levels. The charts below represent gross workload that has not been optimized for temporal or geographic distribution or for resource type, i.e., regular officer hours or overtime hours.

These estimates assume there are no changes to DPD’s current operating model. DPD may be able to reduce the number of FTE service hour equivalents required to meet demand through strategies such as demand management and data-driven deployment. This analysis also assumes all recorded activity is valid, impactful, and of a strategic nature aligned with the department’s goals; see the final report for KPMG’s final recommendations on department strategy and operating model.



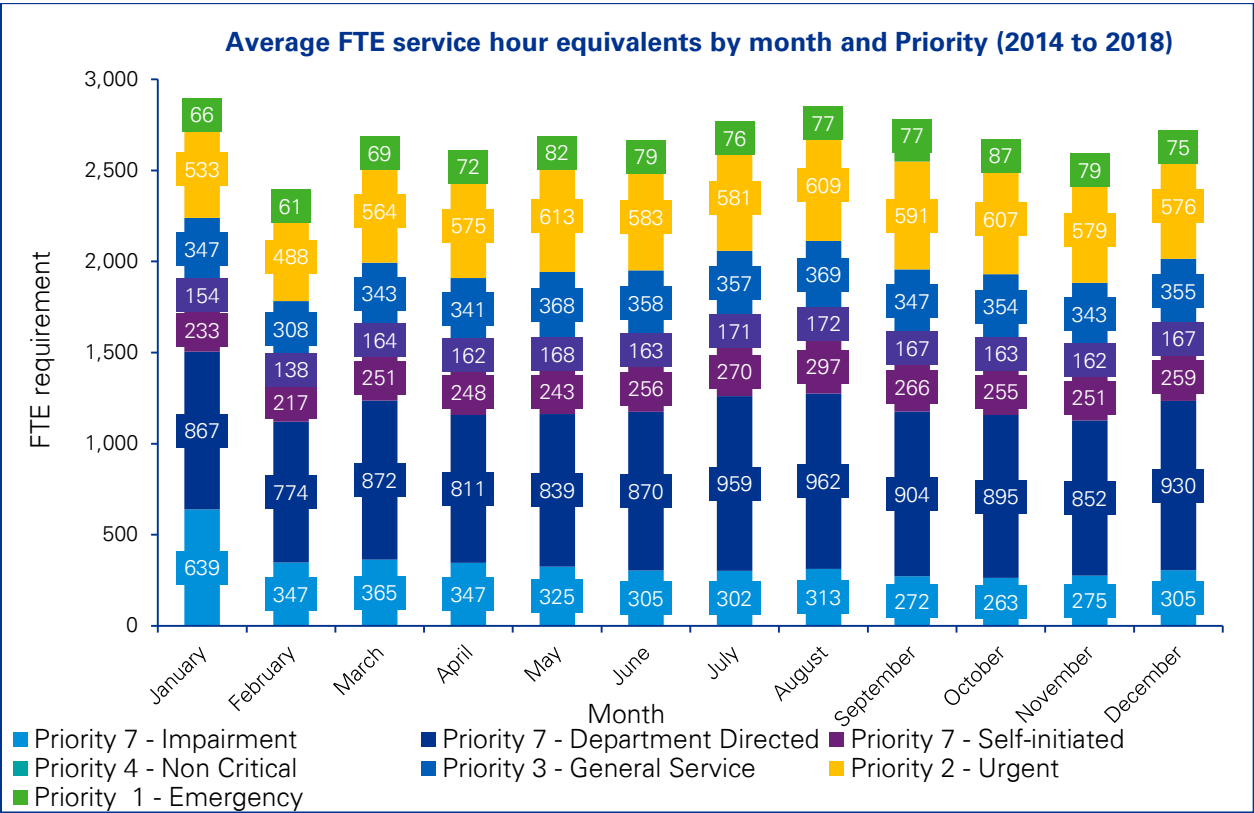
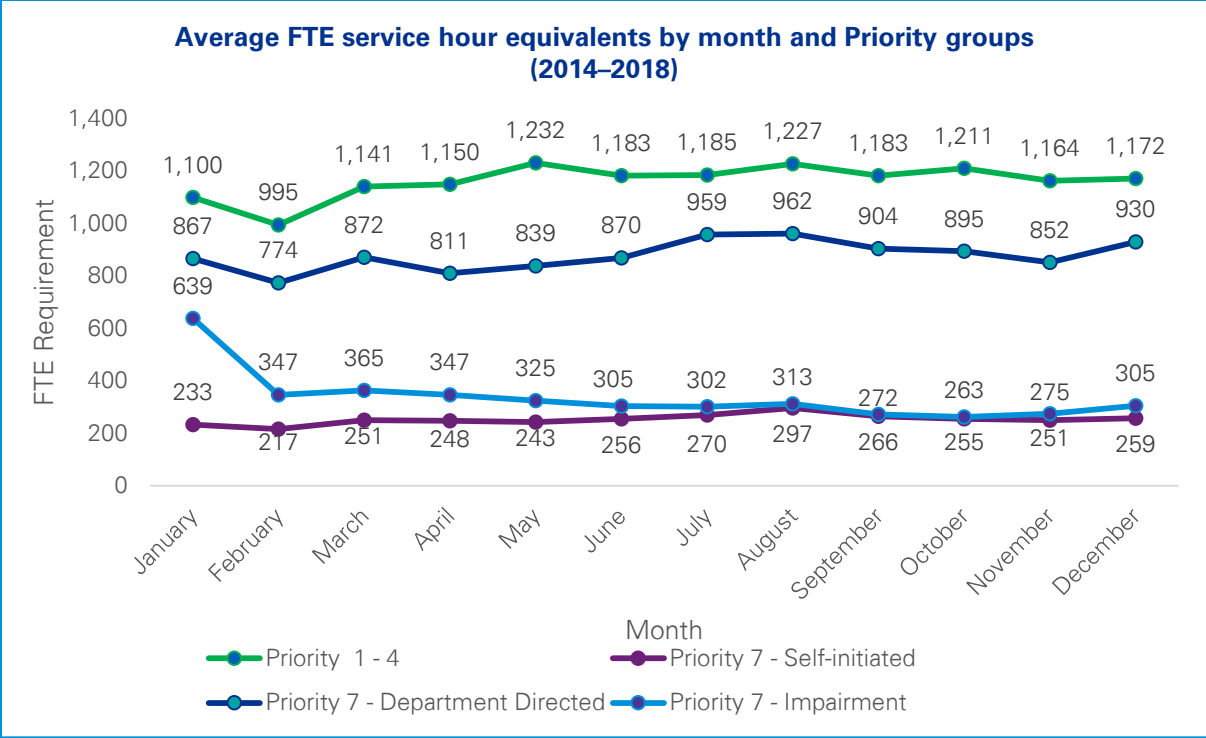
As discussed above, call volume is not distributed evenly across divisions. Divisions that accounted for a disproportionate share of calls for service require the greatest number of FTE service hour equivalents in KPMG’s analysis. Specifically, the Northeast and Southeast Divisions require the greatest number of FTE service hour equivalents to meet demand while North Central requires the least.





Department-wide, from 2014 to 2018, the number of FTE service hour equivalents required for Priority 1 to 4 calls remained relatively constant, with a low of 1,106 FTEs in 2014 and a high of 1,190 in 2015. The number of FTE service hour equivalents required for department-directed activities grew by approximately 56 percent from 730 FTEs in 2014 to 1,140 FTEs in 2016 before returning to near its 2014 level by 2018. The number of FTEs required for impairment activities fell by approximately 56 percent from 537 FTEs in 2014 to 233 FTEs in 2018. Simultaneously, the number of FTE service hour equivalents consumed by self-initiated activities doubled from 152 in 2014 to 300 in 2018. The analysis above is based on historical data and can be impacted by data recording practices.

As shown in the charts below, the number of FTE service hour equivalents consumed by most call priorities remains relatively constant throughout the years. The exception to this trend is impairment time, which peaks in January, as officers may have more capacity due to lower call volumes.



Patrol environment context

Patrol environment context

Overview of patrol divisions

DPD's patrol bureaus are divided across seven geographic areas. Each geographic region varies in population and geographic size, demographic and socioeconomic distribution, distribution of crime type, and call for service demand. As such, given the unique needs of each division, DPD should take a tailored approach in allocating staff to meet the changing crime and demand profiles of each division. Historically, each division's patrol staffing has been delineated across three groups aligned to DPD's patrol goals. The three overarching goals that shape the allocation of sworn staff in any division are as follows:

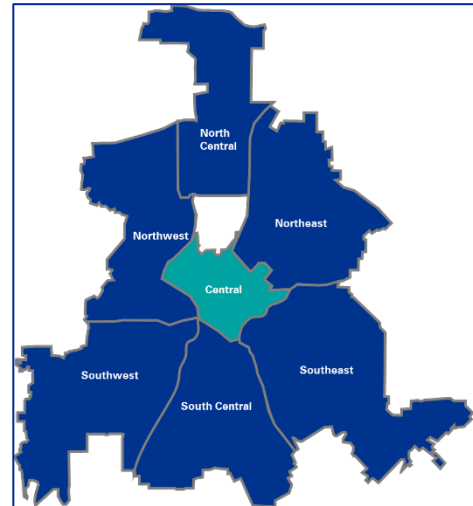
1. Patrol: Responding to calls for service such that response times are in accordance with DPD's established standards
2. Crime Response Team: Reducing the crime within each division and across the City through proactive policing
3. Neighborhood Police Officers: Building community partnerships through community engagement.

While the focus of this report is on workload and demand for patrol, recommendations will be made with regard to the overall patrol operating model in the final report. This section of the report outlines the division-level metrics for call volume, response times, officer capacity, workload, and service hour equivalents. Due to the varying demand profiles of each division, a "one size fits all" approach may not be the recommended approach for DPD when considering how to effectively meet demand and the scheduling of officers.

Division profiles

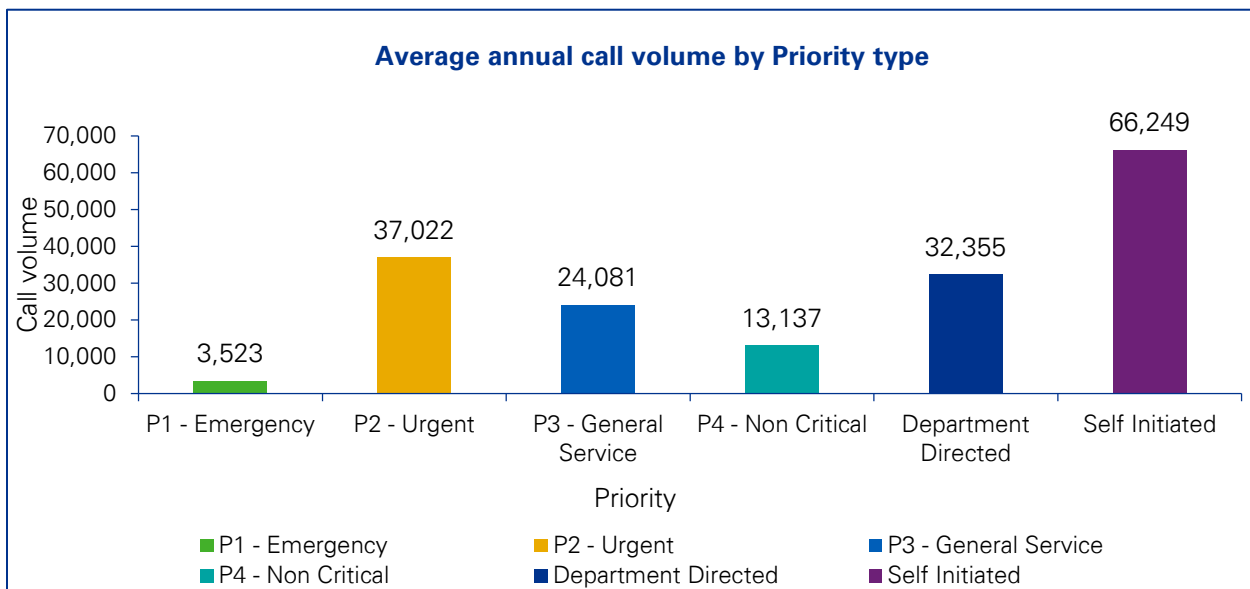
Central Division

Attributes	Values
Square miles	17.54
Population	104,000
Top three calls	Self-initiated, Priority 2, department-directed
Peak times	17:00–18:00
Peak time call volumes	4,212



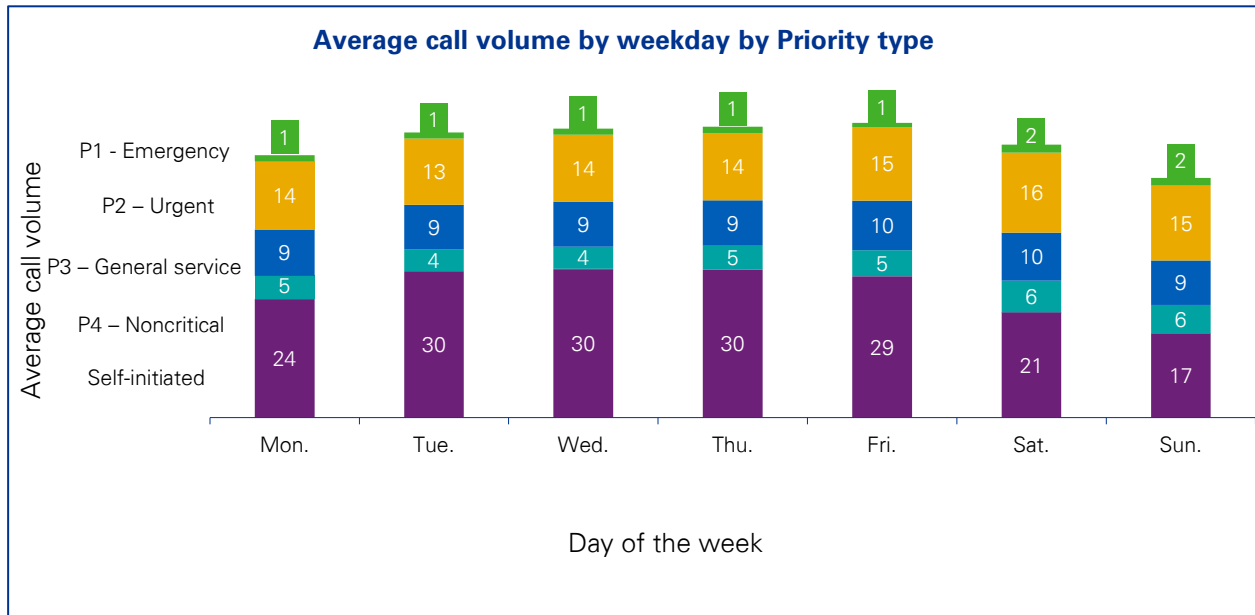
Average annual call volumes

The Central Division fields over 176,000 calls annually, approximately 2 percent of which are for Priority 1 incidents and 21 percent of which are for Priority 2 incidents. Priority 3 and 4 calls represent a combined 21 percent of average annual call volume, while department-directed calls make up 18 percent. The most frequent calls are self-initiated, accounting for 38 percent of call volume.



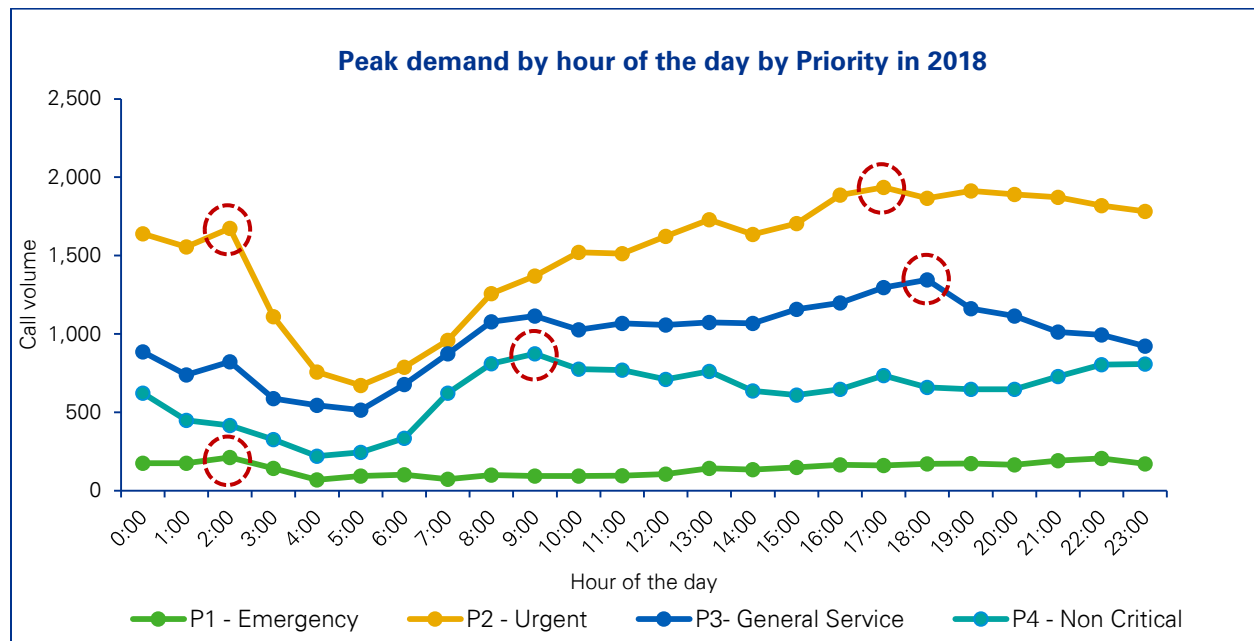
Average daily call volumes

An average of 391 calls are received each week, with call volume decreasing slightly during the weekend. An average of 58 calls are received per day Monday through Friday, while only 52 calls on average are received per day during Saturday and Sunday. Priority 1 calls occur about once a day, while Priority 2 calls are received an average of 14 times a day. Priority 3 and 4 calls combined are also received an average of 14 times a day. Self-initiated calls have the highest daily volume, with an average of 26 a day.



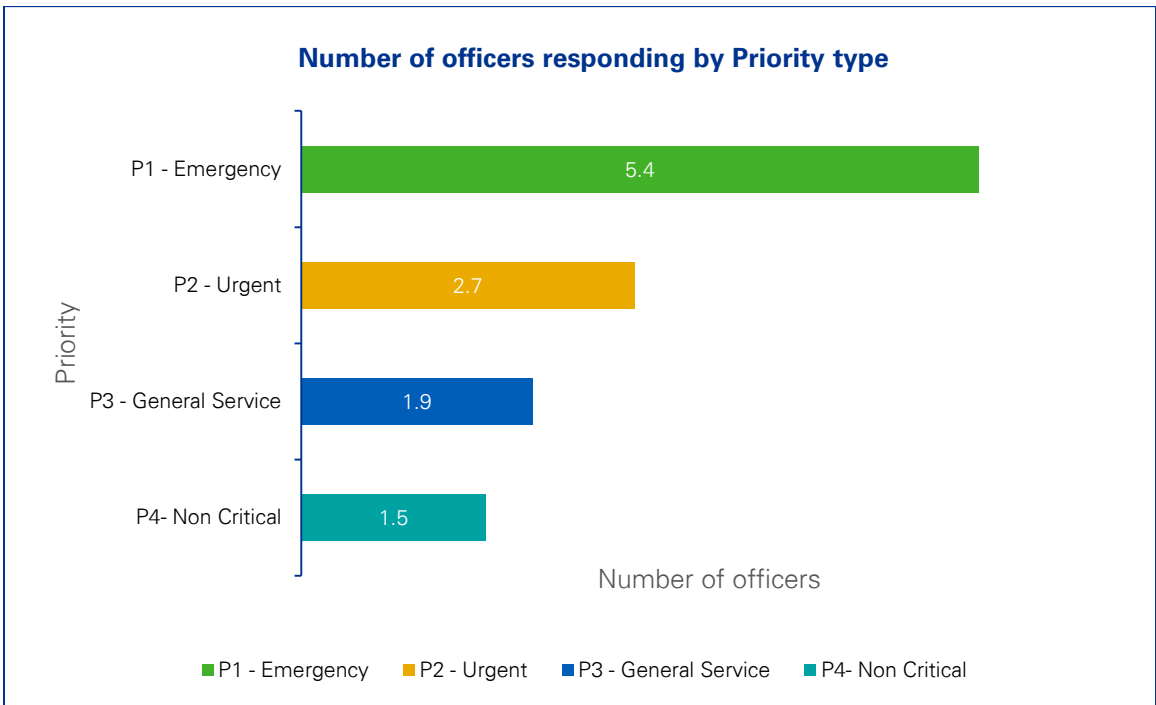
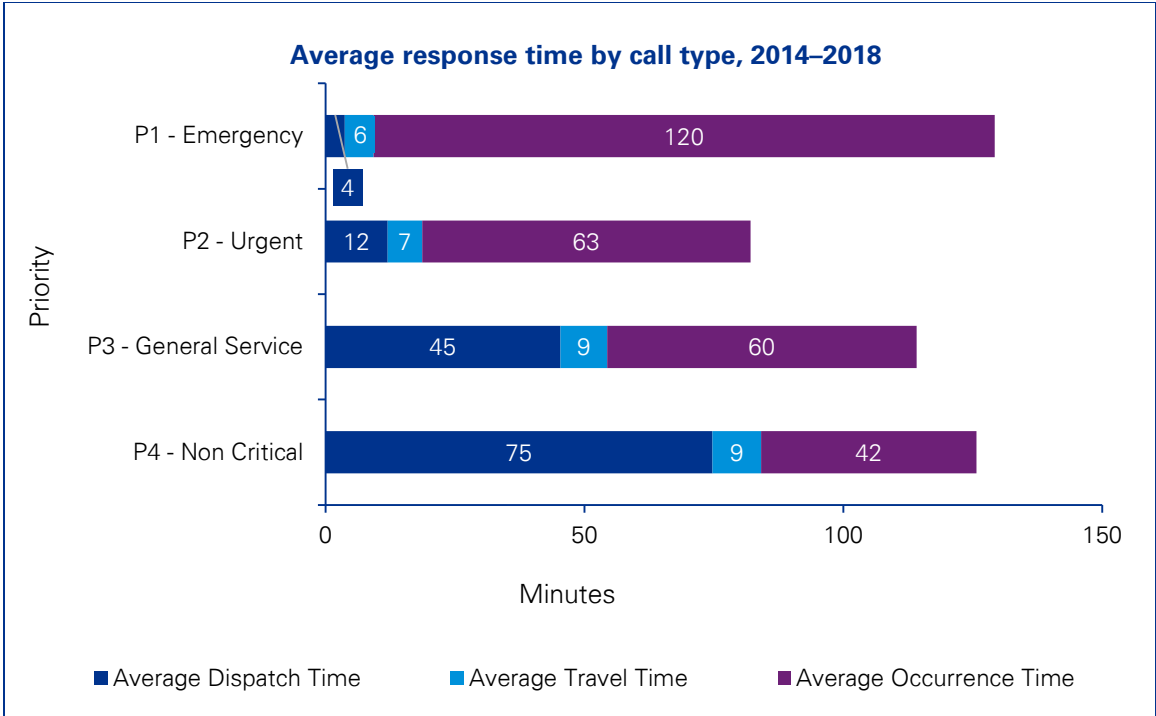
Call volume demand

Hourly call volume demand varies by Priority, as demonstrated by the different hourly peaks in the graph below. In 2018, Priority 1 call volumes peaked at 2:00 AM, with a total of 213 calls being received at that time throughout the year as a whole. Unlike other Priority calls, Priority 1 calls did not exhibit significant fluctuations in volume demand, ranging between 69 calls and 213 calls throughout the year depending on the hour of the day. In contrast, Priority 2–4 calls peaked at 5:00 PM, 6:00 PM, and 9:00 AM, respectively, and exhibited much larger fluctuations in hourly volume demand. Priority 2 ranged from 672 to 1,935 calls, Priority 3 ranged from 515 to 1,346 calls, and Priority 4 ranged from 221 to 873 calls. Of the four Priority types, Priority 2 calls were the most frequent during every hour of the day and experienced the largest fluctuation in volume between its trough and peak. Priority 2–4 calls all followed a similar trend by which call volume demand declined in the early hours of the morning between 2:00 AM and 5:00 AM, before gradually increasing as the day began.



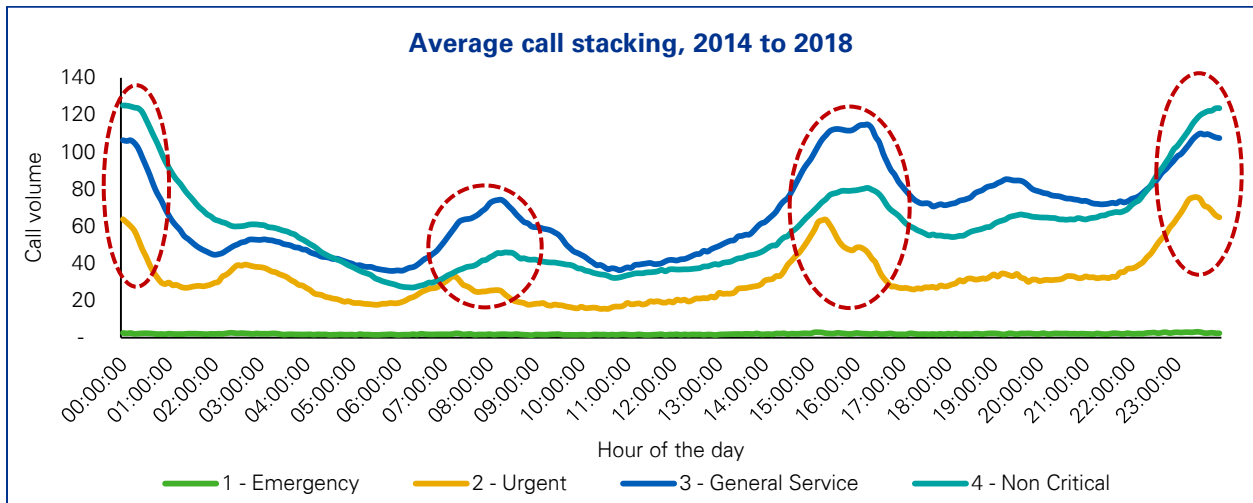
Response times

Response times, calculated as the sum of dispatch and travel time, and how many officers respond, are dependent upon the type of call received. Priority 1 calls average a response time of only 10 minutes with an average of five to six officers responding, while Priority 2 calls average a response time of 19 minutes with an average of two to three officers responding. In contrast, Priority 3 and Priority 4 calls have average response times of 54 minutes and 84 minutes, respectively, with one to two officers responding to each. Time spent on location is also dependent on the Priority of the call, with an average of 120 minutes, 63 minutes, 60 minutes, and 42 minutes spent responding to Priority 1, 2, 3, and 4 calls, respectively.



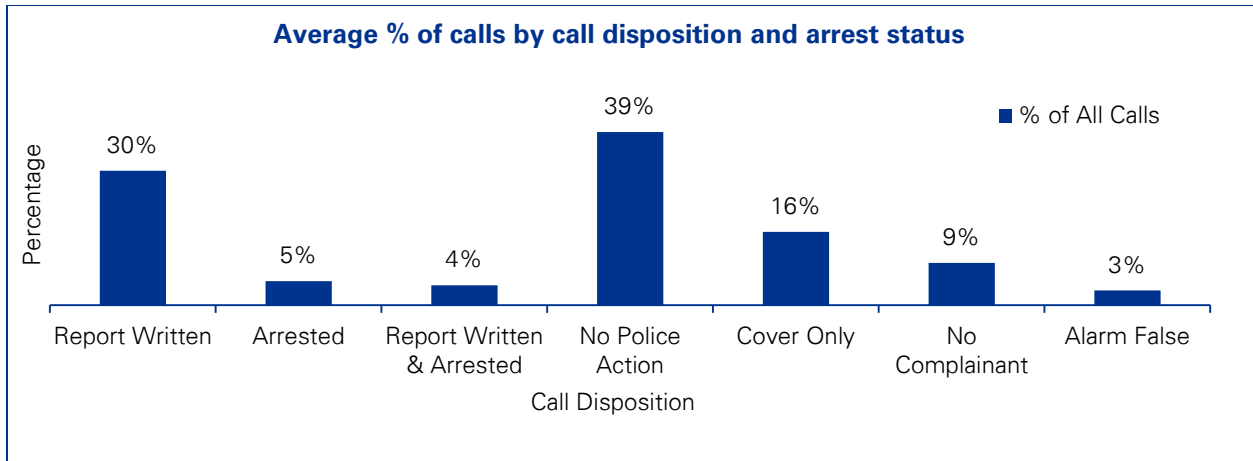
Call stacking

Call stacking, or the number of calls awaiting a response, varied by Priority type from 2014 to 2018 but followed a similar temporal trend based on the time of day. Priority 1 calls ranged from 1 to 3 calls waiting at any point during the day, while Priority 2 calls ranged from 15 to 76 calls. At lower Priority levels, the range in waiting calls increased, with Priority 3 calls ranging from 36 to 115 and Priority 4 calls ranging from 27 to 125. There were noticeable spikes in call stacking around 7:00–9:00 AM, 3:00–5:00 PM, and 10:00 PM–12:00 AM for Priority 2, 3, and 4 calls, coinciding with changes in watch. Watch 1 begins rolling off in favor of Watch 2 between 7:00 and 8:00 AM, Watch 2 begins rolling off in favor of Watch 3 between 3:00 and 4:00 PM, and Watch 3 begins rolling off in favor of Watch 1 again between 11:00 PM and 12:00 AM. Given this staggering in watches, there should always be officers available to respond to calls regardless of watch change. The buildup in calls waiting around these times, however, could be an indication of officers ending their watch early or starting late. One notable exception was Priority 1 calls, which did not stack despite these watch changes due to their critical nature.



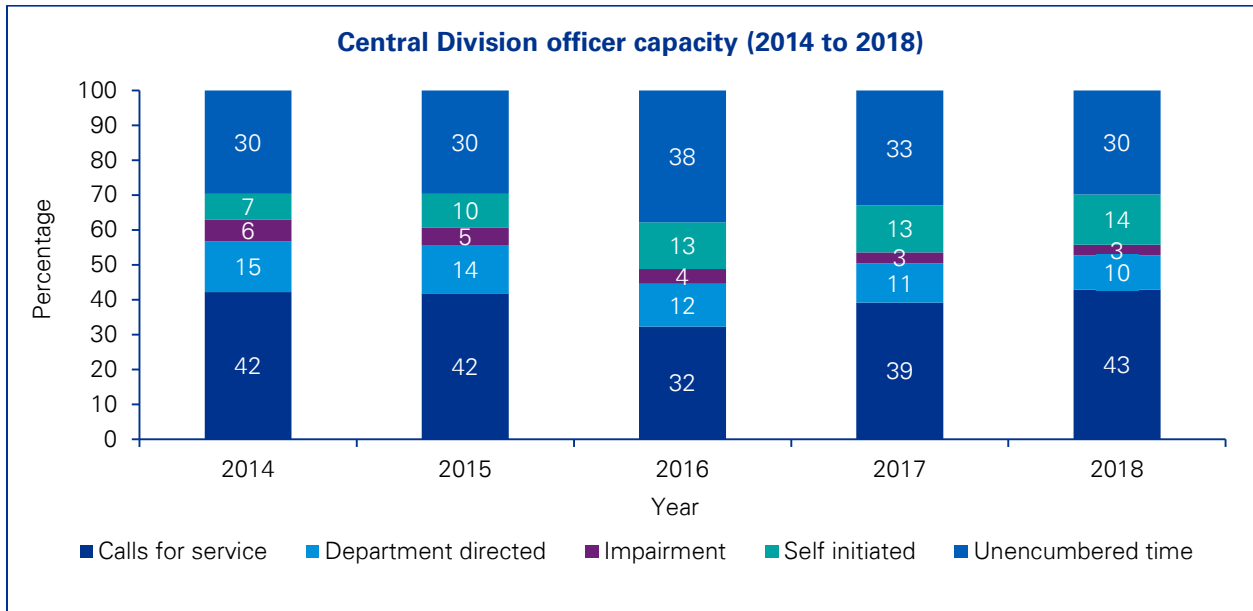
Call disposition and arrest status

The below analysis relates to all call types during the period 2014 to 2018. Of the top seven call dispositions, the majority of calls received, 39 percent, result in no police action being taken, with just a report being written for 30 percent of incidents. There is no complainant upon arrival for 9 percent of calls, with a further 3 percent of calls being a false alarm. For 5 percent of incidents, a suspect is arrested, with an arrest and a report being written for an additional 4 percent of incidents. This indicates that the majority of the police work undertaken tends to be focused on situations other than major crimes.



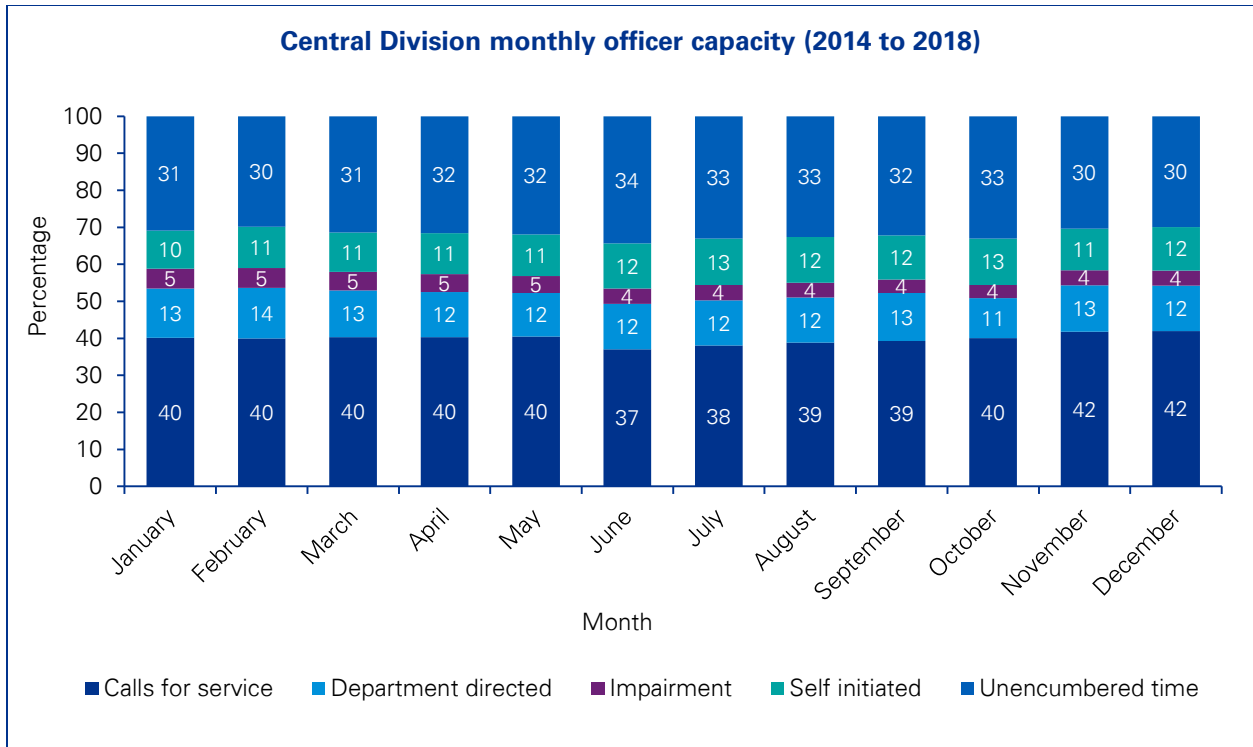
Officer yearly capacity

The percentage of time officers spend responding to calls for service has increased over the past three years, from 32 percent in 2016 to 43 percent in 2018. A corresponding decline in unencumbered time has been seen during the same timeframe, from 38 percent in 2016 to 30 percent in 2018. Department-directed, impairment (time spent going for lunch, defending a ticket in court, setting up the patrol car, etc.), and self-initiated time have remained largely flat over the course of the past five years.



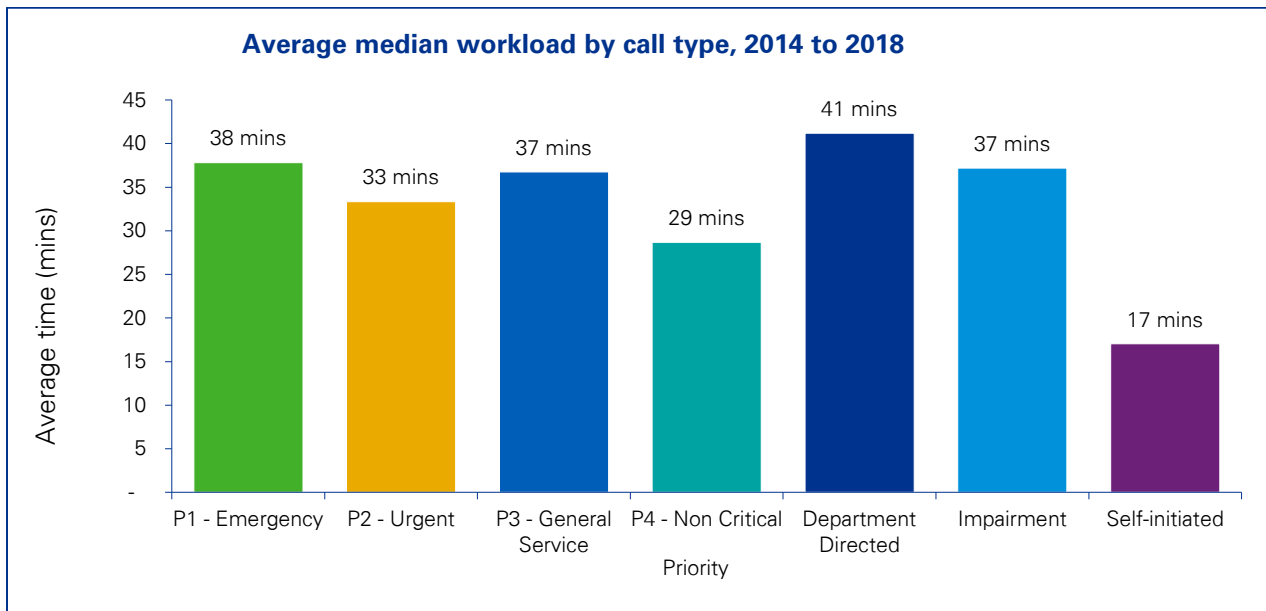
Officer monthly capacity

The percentage of time officers spend responding to calls for service exhibited modest variability on a monthly basis from 2014 to 2018, ranging from 37 percent to 42 percent, roughly in line with the 2018 average seen above. Unencumbered time, the second largest share, ranged from 30 percent to 34 percent of time, averaging 32 percent. Time spent responding to department-directed and self-initiated calls showed little variability, with department-directed ranging from 11 percent to 14 percent and self-initiated ranging from 10 percent to 13 percent of time. Impairment time remained largely unchanged month to month, averaging 4 percent of total time.

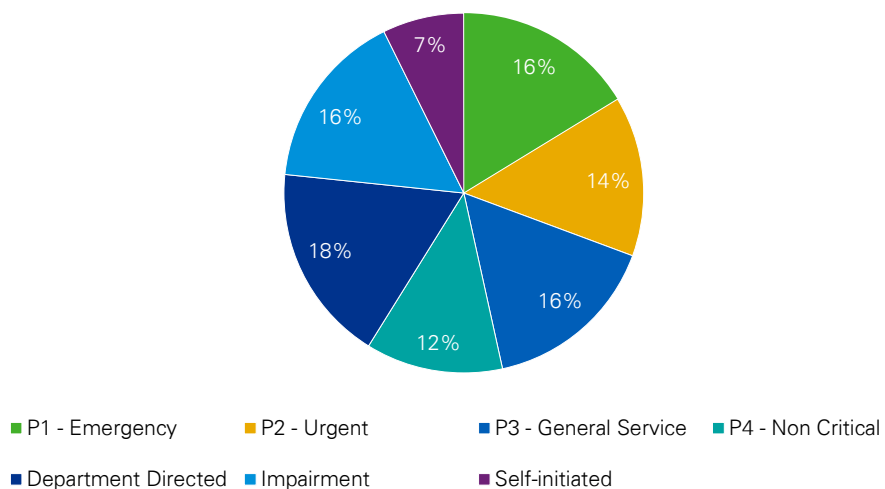


Median workload

From 2014 to 2018, department-directed calls had the greatest average median workload at 41 minutes, or 18 percent of total workload. Priority 1 calls were a close second at 38 minutes, or 16 percent of total workload, while Priority 3 and impairment also took up 16 percent of total workload at 37 minutes each. Self-initiated calls, despite having the highest annual call volume, took up the least amount of time at just 17 minutes, or 7 percent of total workload.



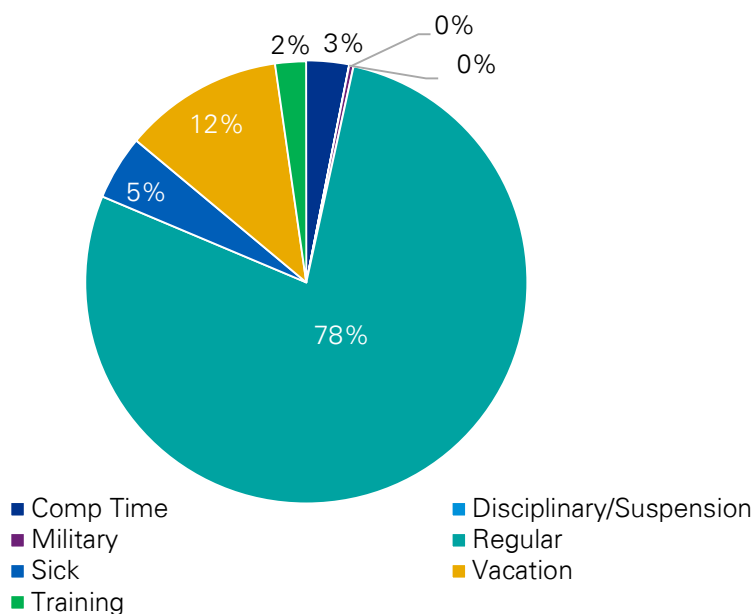
Average % call workload, 2014 to 2018



Officer productive hours

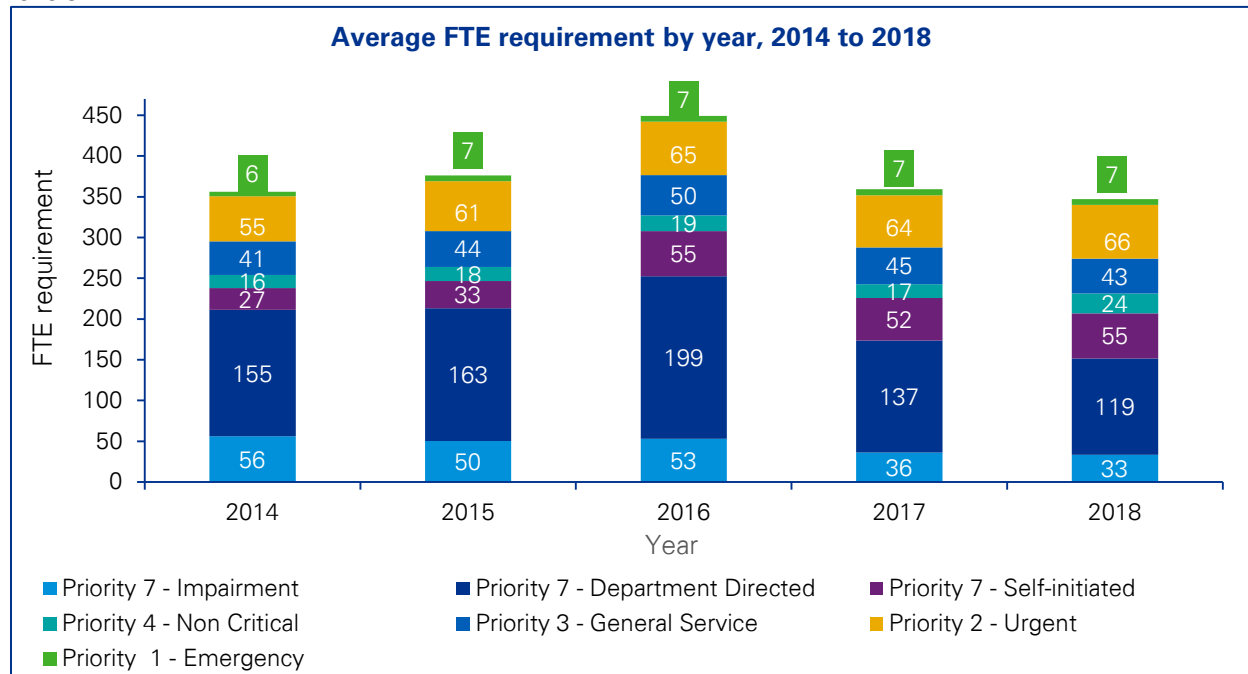
The Central Division averages 1,623 productive hours a year out of 2,080 total hours, or 78 percent. Of the remaining 457 hours not considered productive, 53 percent (242 hours) are used for vacation, 21 percent (98 hours) are used for sick time, 14 percent (64 hours) are taken as comp time, and 10 percent (47 hours) are used for training. A de minimis percentage is used for military commitments and disciplinary/suspension reasons.

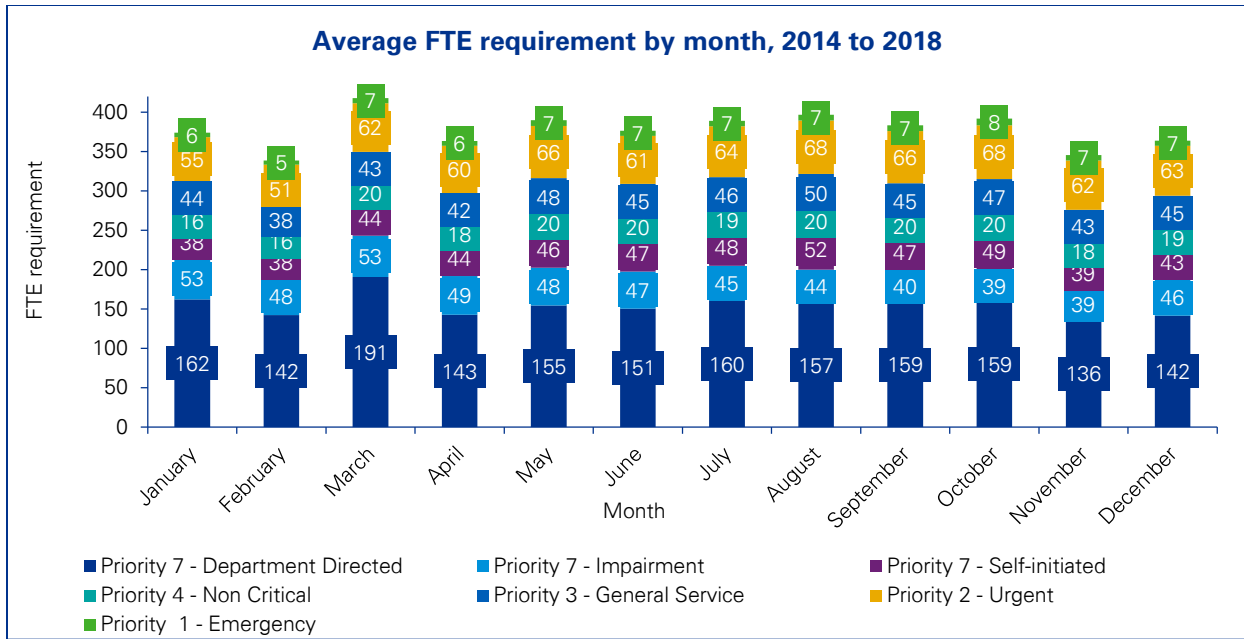
Central Patrol Division



FTE analysis

From 2014 to 2018, the FTE service hour equivalents for Priority 1 and Priority 4 calls have remained relatively consistent, averaging 7 and 19, respectively. Priority 2 calls averaged the second highest FTE service hour equivalents at 62, with Priority 3 and self-initiated calls the third highest at an average of 45 each. Self-initiated calls specifically have experienced a sharp increase over the past five years, from 27 to 55, indicating the officers have more capacity for proactive activities, while impairment has decreased from 56 to 33. Department-directed calls required the highest average FTE service hour equivalents at 154. Overall, the average FTE service hour equivalents over the past five years for the division were 377 of which 133 (35 percent) were related to core Priorities 1–4, with months such as March having a higher equivalent (420) and February and November having a lower equivalent (338 and 344). Of note, the FTE service hour equivalents shown below are not optimized for temporal trends or specific supply and demand criteria, but rather reflect the gross requirement derived from the median workload per call type multiplied by the volume for each call type and should not be considered as recommended staffing levels.

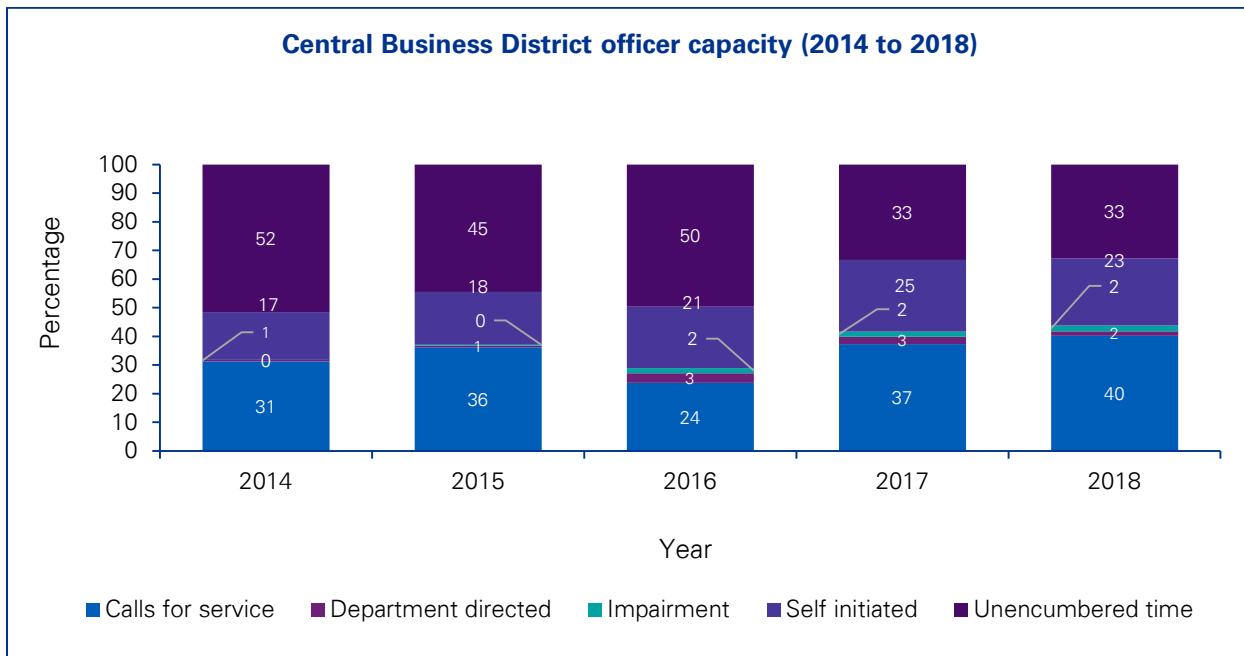




Central Business District

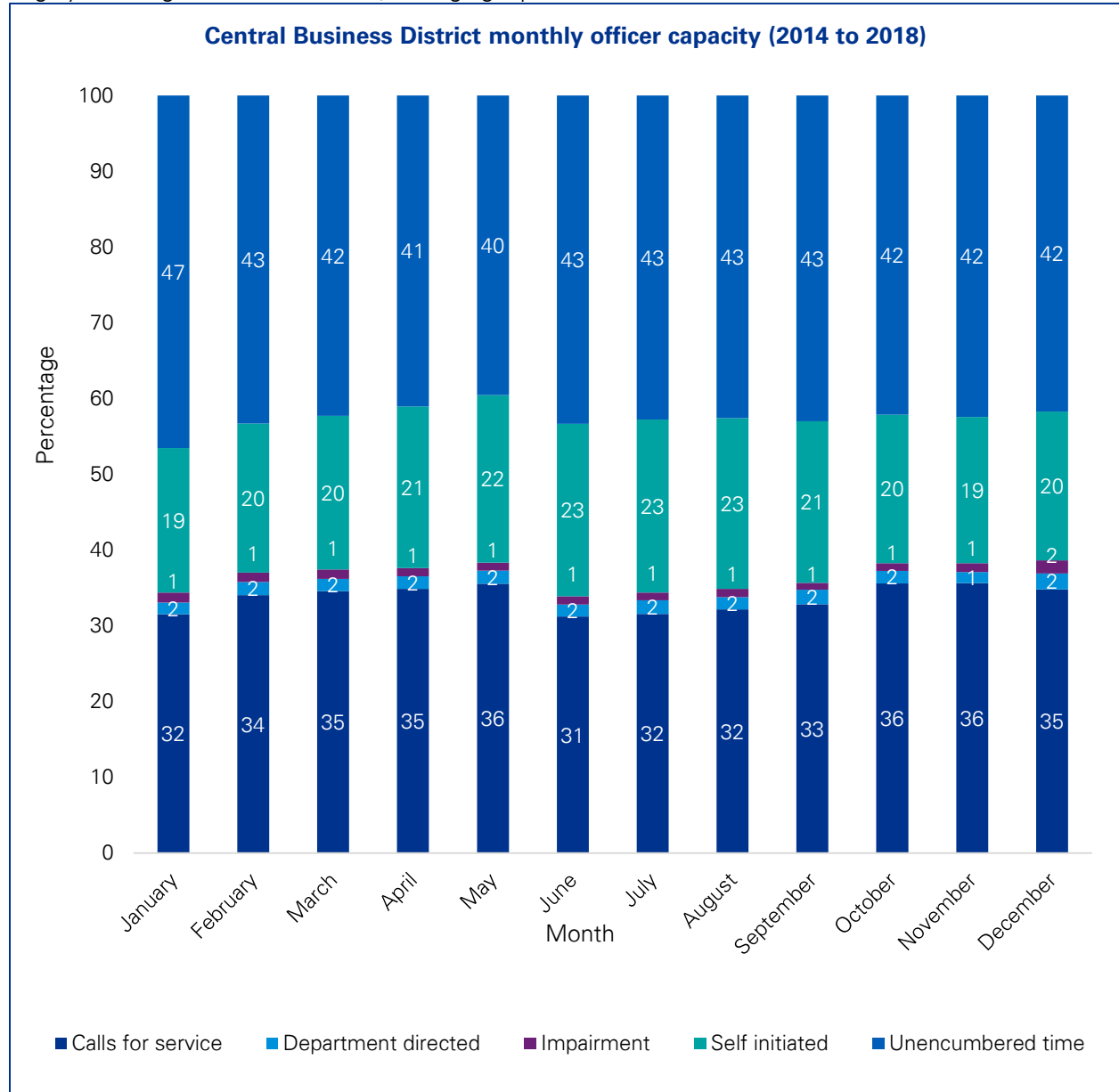
Officer yearly capacity

The percentage of time officers spend responding to calls for service has increased over the past three years, from 24 percent in 2016 to 40 percent in 2018. A corresponding decline in unencumbered time has been seen during the same timeframe, from 50 percent in 2016 to 33 percent in 2018. Self-initiated time has increased since 2016, from 21 percent to 23 percent, while department-directed and impairment (time spent going for lunch, defending a ticket in court, setting up the patrol car, etc.) time have remained largely flat over the course of the past three years.



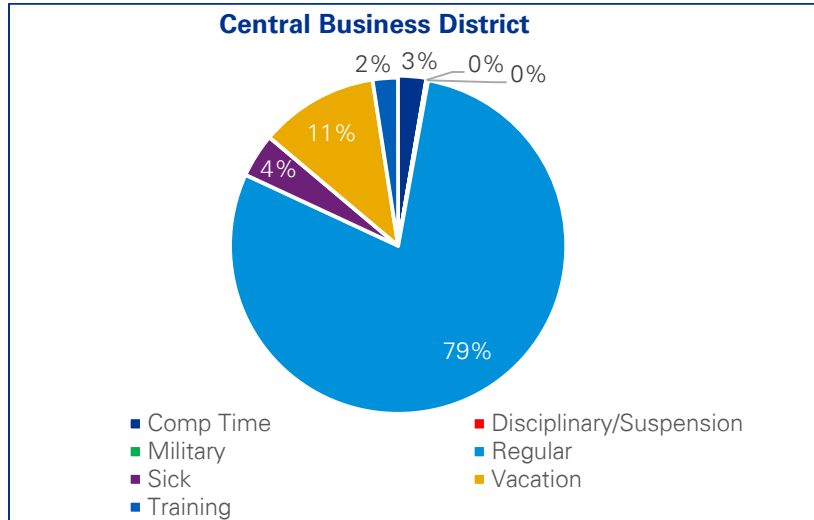
Officer monthly capacity

The percentage of time officers spend responding to calls for service exhibited modest variability on a monthly basis from 2014 to 2018, ranging from 31 percent to 36 percent, slightly below the 2018 average seen above. Unencumbered time, the largest share, ranged from 40 percent to 47 percent of time, averaging 43 percent, above the average seen for 2018. Time spent responding to department-directed and self-initiated calls showed little variability, with department-directed ranging from 1 percent to 2 percent and self-initiated ranging from 19 percent to 23 percent of time. Impairment time remained largely unchanged month to month, averaging 1 percent of total time.



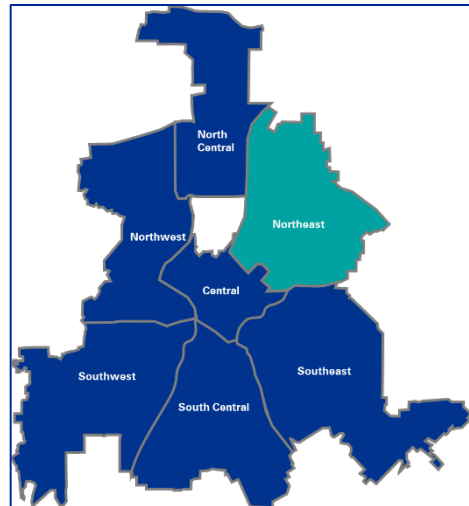
Officer productive hours

The Central Business District averages 1,621 productive hours a year out of 2,080 total hours, or 78 percent. Of the remaining 459 hours not considered productive, 52 percent (238 hours) are used for vacation, 19 percent (87 hours) are used for sick time, 12 percent (55 hours) are taken as comp time, and 11 percent (51 hours) are used for training. A de minimis percentage is used for military commitments and disciplinary/suspension reasons. Note: Percentages within chart may not equal 100 percent due to rounding.



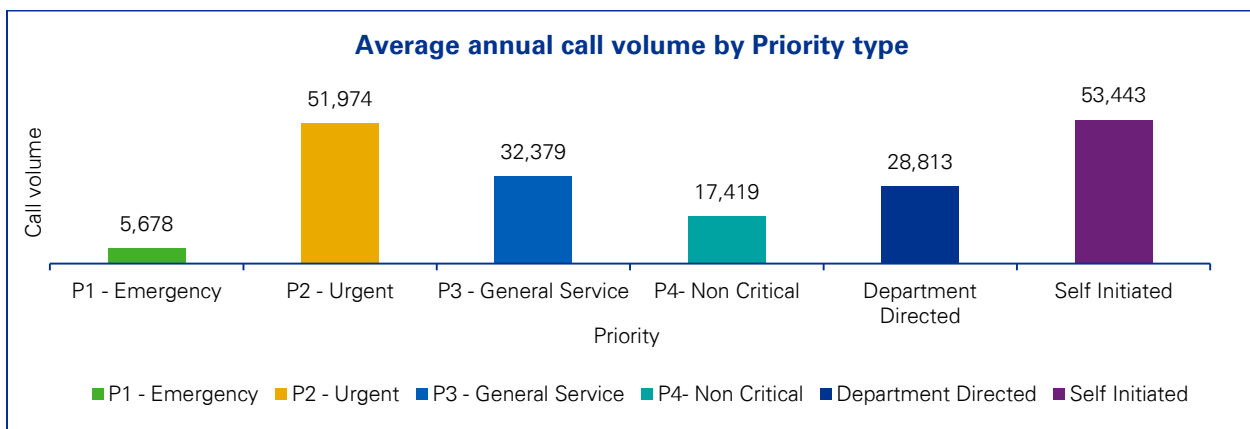
Northeast Division

Attributes	Values
Square miles	86.70
Population	241,000
Top three calls	Self-initiated, Priority 2, Priority 3
Peak times	17:00–18:00
Peak time call volumes	6,354



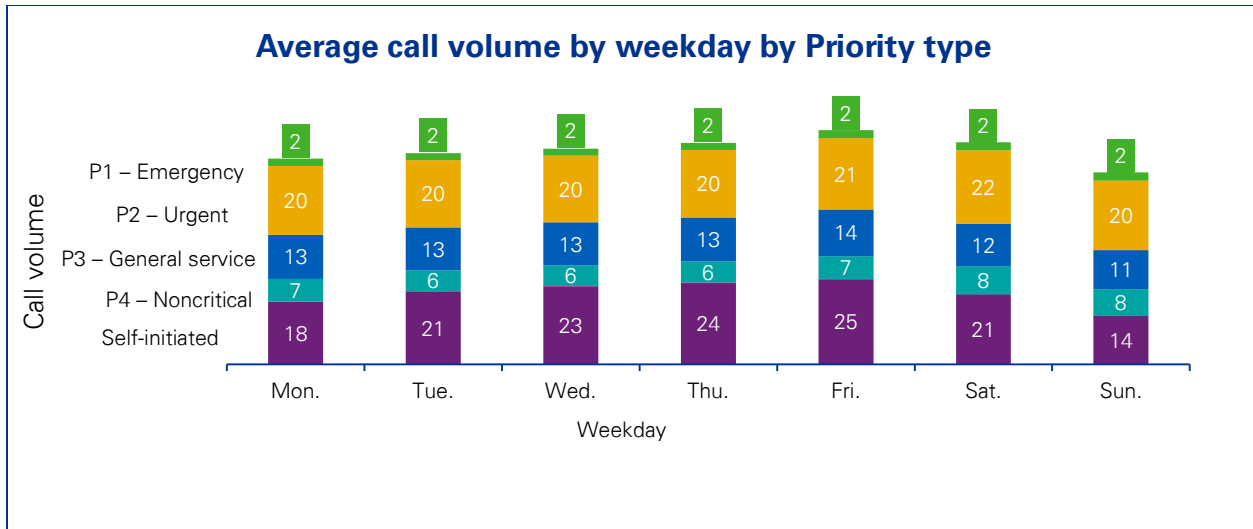
Average annual call volumes

The Northeast Division fields over 189,000 calls annually, approximately 3 percent of which are for Priority 1 incidents and 27 percent of which are for Priority 2 incidents. Priority 3 and 4 calls represent a combined 26 percent of average annual call volume, while department-directed calls make up 15 percent. The most frequent calls are self-initiated, accounting for 28 percent of call volume.



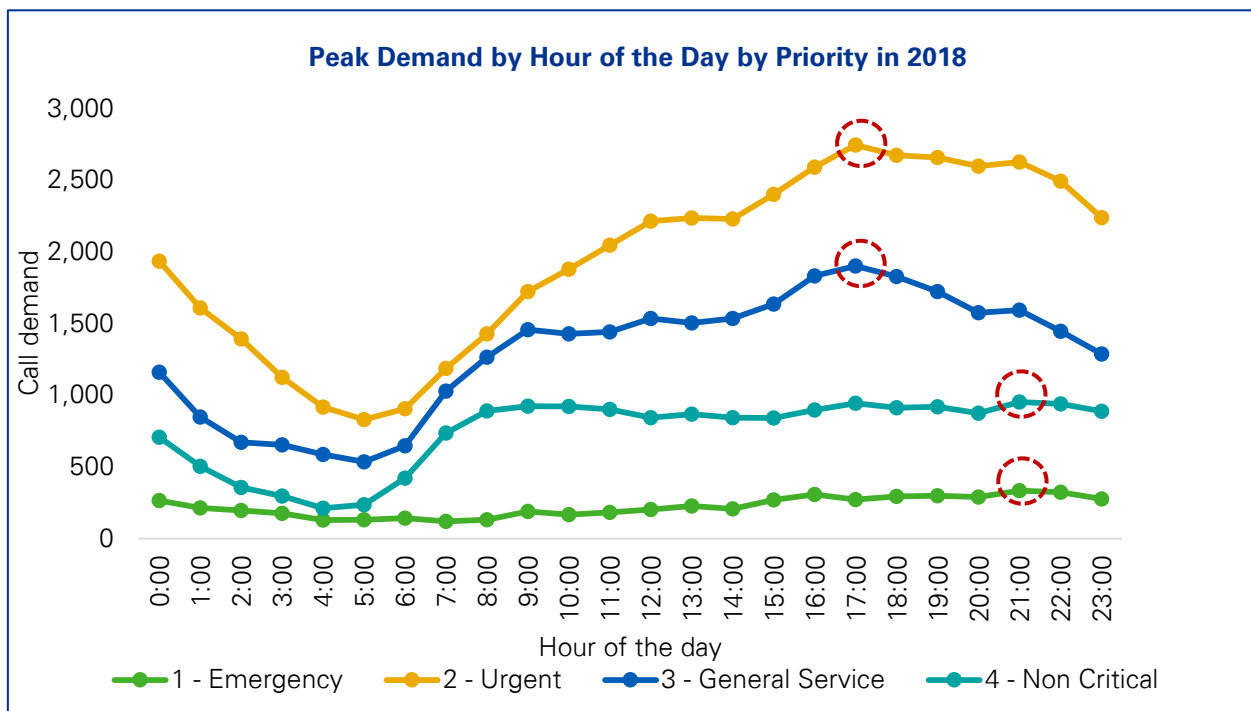
Average daily call volumes

An average of 440 calls are received each week, with call volume decreasing slightly during the weekend. An average of 64 calls are received per day Monday through Friday, while only 60 calls on average are received per day during Saturday and Sunday. Priority 1 calls occur twice a day, while Priority 2 calls are received an average of 20 times a day. Priority 3 and 4 calls combined are also received an average of 20 times a day. Self-initiated calls have the highest daily volume, with an average of 21 a day.



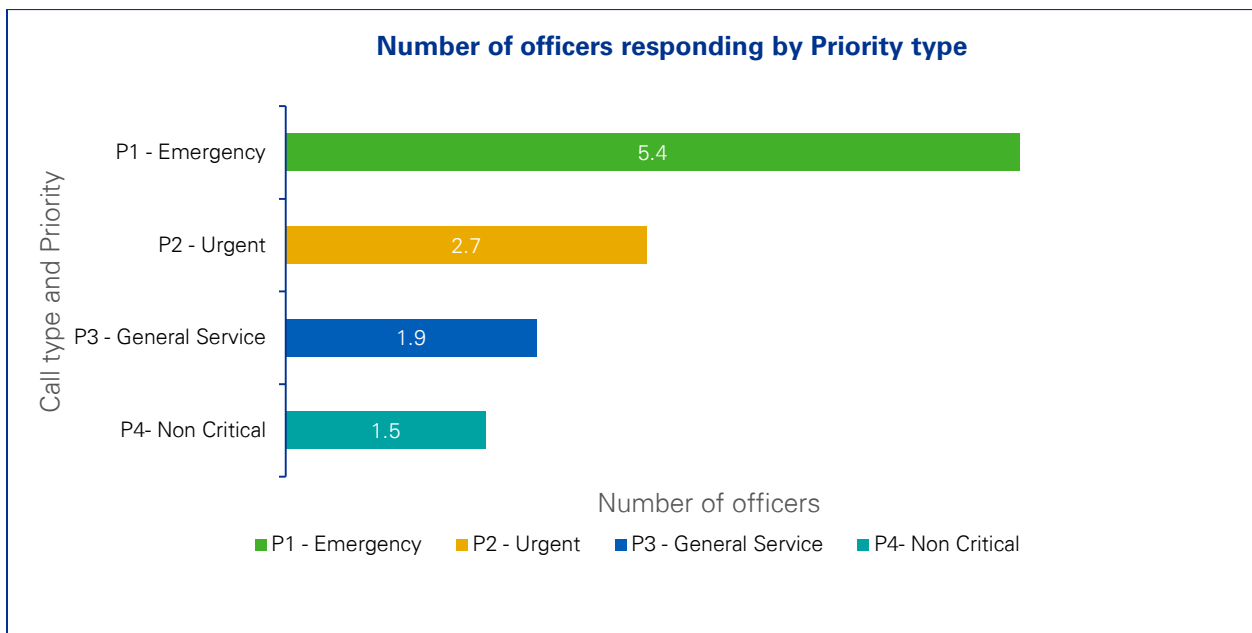
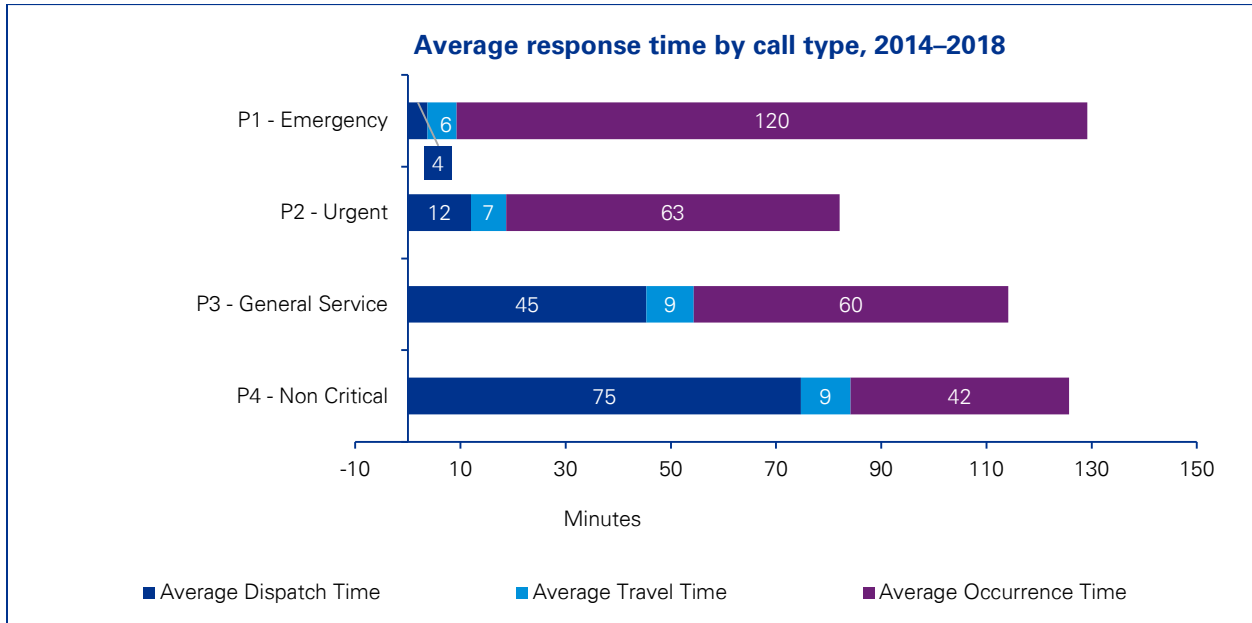
Call volume demand

Hourly call volume demand varies by Priority, as demonstrated by the different hourly peaks in the graph below. In 2018, Priority 1 call volumes peaked at 9:00 PM, with a total of 334 calls being received at that time throughout the year as a whole. Unlike other Priority calls, Priority 1 calls did not exhibit significant fluctuations in volume demand, ranging between 120 calls and 334 calls throughout the year depending on the hour of the day. In contrast, Priority 2–4 calls peaked at 5:00 PM, 5:00 PM, and 9:00 PM, respectively, and exhibited much larger fluctuations in hourly volume demand. Priority 2 ranged from 829 to 2,744 calls, Priority 3 ranged from 534 to 1,900 calls, and Priority 4 ranged from 212 to 953 calls. Of the four Priority types, Priority 2 calls were the most frequent during every hour of the day and experienced the largest fluctuation in volume between its trough and peak. Priority 2–4 calls all followed a similar trend by which call volume demand declined in the early hours of the morning between 12:00 AM and 5:00 AM, before gradually increasing as the day began.



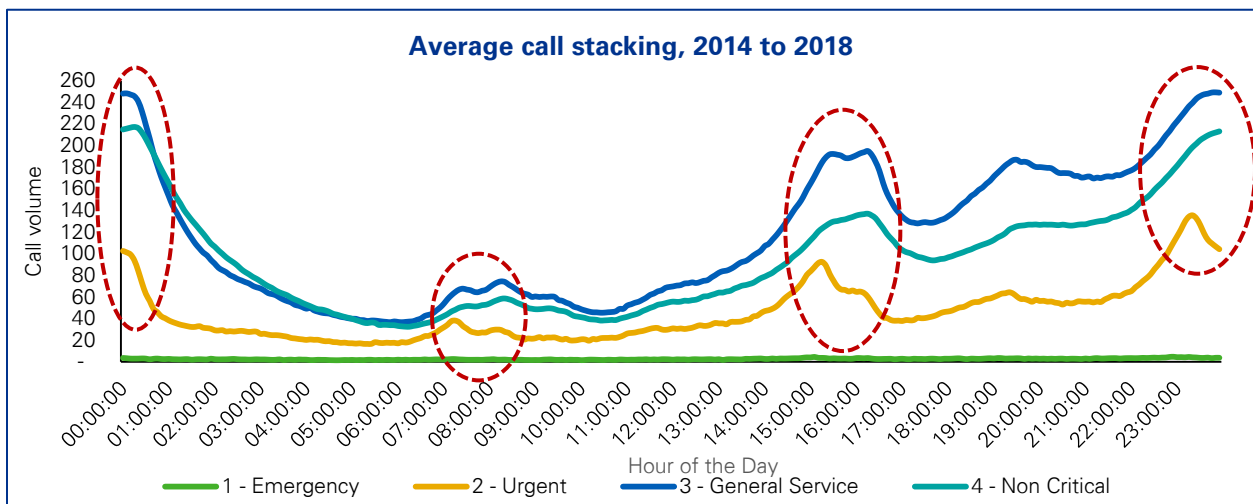
Response times

Response times, calculated as the sum of dispatch and travel time, and how many officers respond, are dependent upon the type of call received. Priority 1 calls average a response time of only 10 minutes with an average of five to six officers responding, while Priority 2 calls average a response time of 19 minutes with an average of two to three officers responding. In contrast, Priority 3 and Priority 4 calls have average response times of 54 minutes and 84 minutes, respectively, with one to two officers responding to each. Time spent on location is also dependent on the Priority of the call, with an average of 120 minutes, 63 minutes, 60 minutes, and 42 minutes spent responding to Priority 1, 2, 3, and 4 calls, respectively.



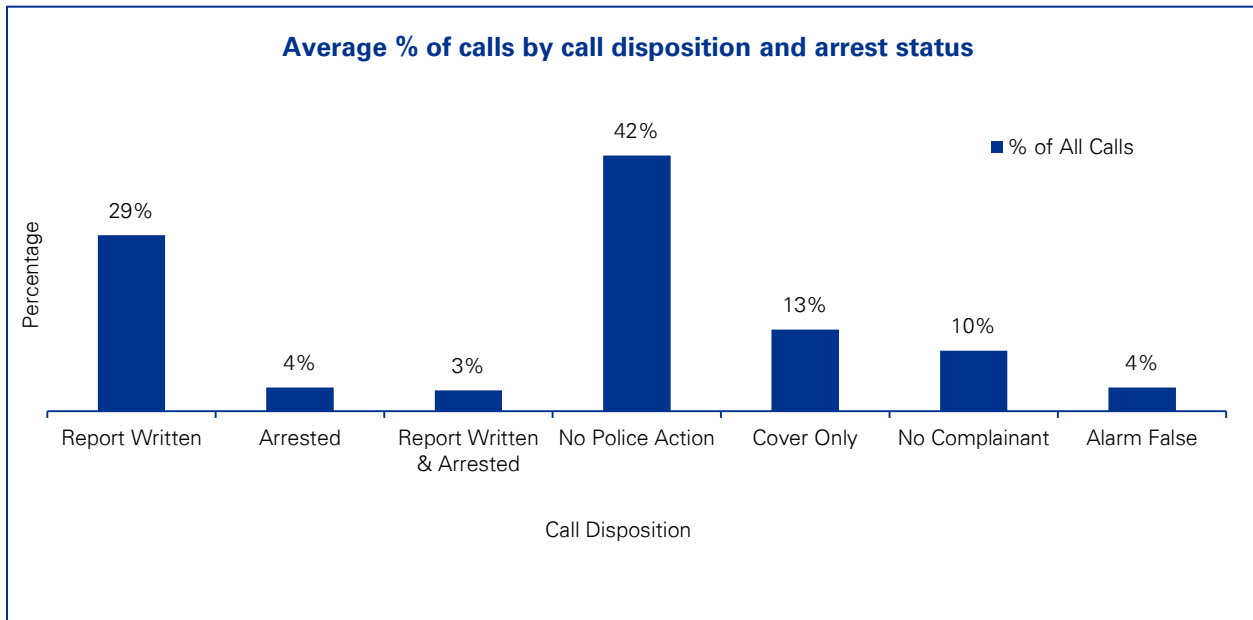
Call stacking

Call stacking, or the number of calls awaiting a response, varied by Priority type from 2014 to 2018 but followed a similar temporal trend based on the time of day. Priority 1 calls ranged from 2 to 5 calls waiting at any point during the day, while Priority 2 calls ranged from 17 to 136 calls. At lower Priority levels, the range in waiting calls increased, with Priority 3 calls ranging from 37 to 249 and Priority 4 calls ranging from 33 to 217. There were noticeable spikes in call stacking around 7:00–9:00 AM, 3:00–5:00 PM, and 10:00 PM–12:00 AM for Priority 2, 3, and 4 calls, coinciding with changes in watch. Watch 1 begins rolling off in favor of Watch 2 between 7:00 and 8:00 AM, Watch 2 begins rolling off in favor of Watch 3 between 3:00 and 4:00 PM, and Watch 3 begins rolling off in favor of Watch 1 again between 11:00 PM and 12:00 AM. Given this staggering in shifts, there should always be officers available to respond to calls regardless of shift change. The buildup in calls waiting around these times, however, could be an indication of officers ending their watch early or starting late. One notable exception was Priority 1 calls, which did not stack despite these shift changes due to their critical nature.



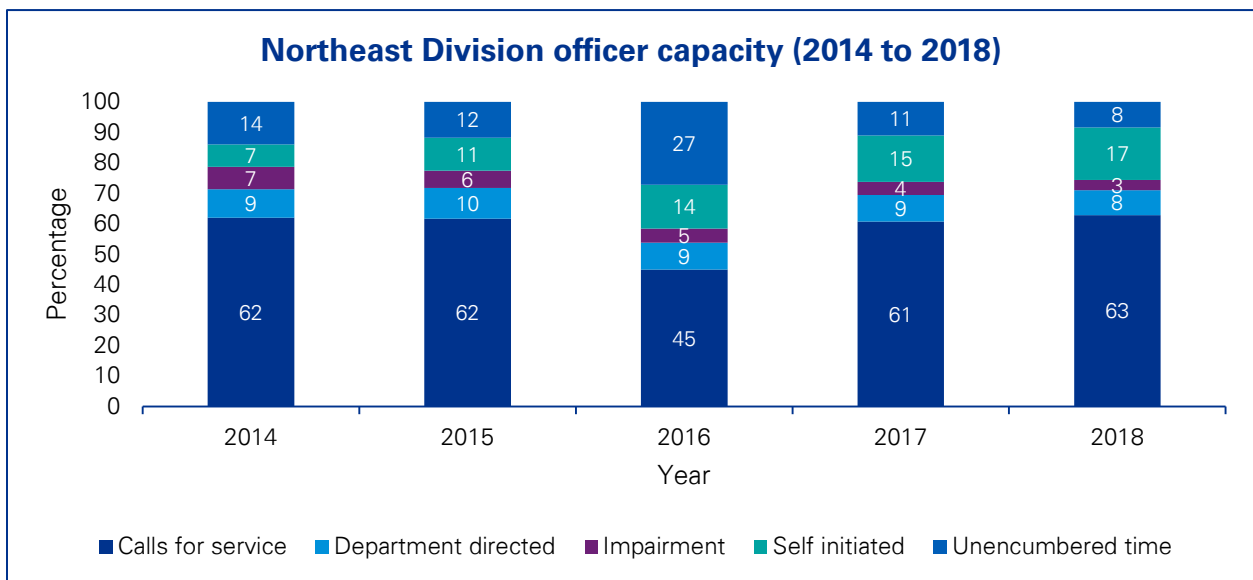
Call disposition and arrest status

The below analysis relates to all call types during the period 2014 to 2018. Of the top seven call dispositions, the majority of calls received, 42 percent, result in no police action being taken, with just a report being written for 29 percent of incidents. There is no complainant upon arrival for 10 percent of calls, with a further 4 percent of calls being a false alarm. For 4 percent of incidents, a suspect is arrested, with an arrest and a report being written for an additional 3 percent of incidents. This indicates that the majority of the police work undertaken tends to be focused on situations other than major crimes.



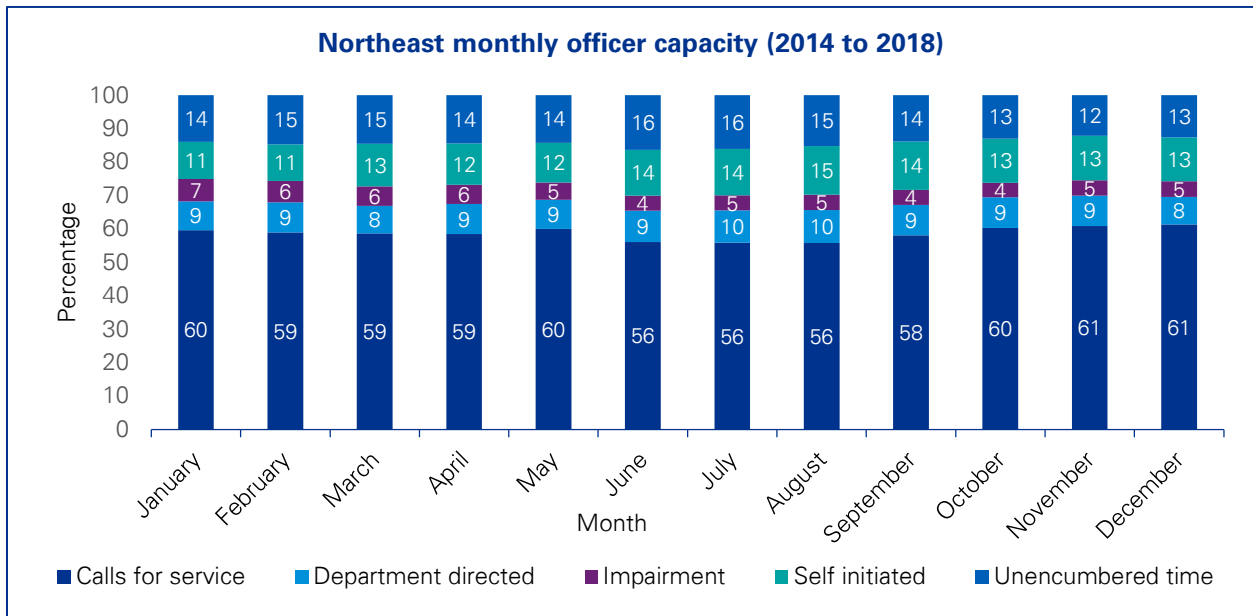
Officer yearly capacity

The percentage of time officers spend responding to calls for service has increased over the past three years, from 45 percent in 2016 to 63 percent in 2018. A corresponding decline in unencumbered time has been seen during the same timeframe, from 27 percent in 2016 to 8 percent in 2018. Self-initiated time has increased since 2014, from 7 percent to 17 percent. Department-directed time has remained relatively constant at 8 percent to 10 percent, while impairment time (time spent going for lunch, defending a ticket in court, setting up the patrol car, etc.) has decreased from 7 percent to 3 percent over the course of the past five years.



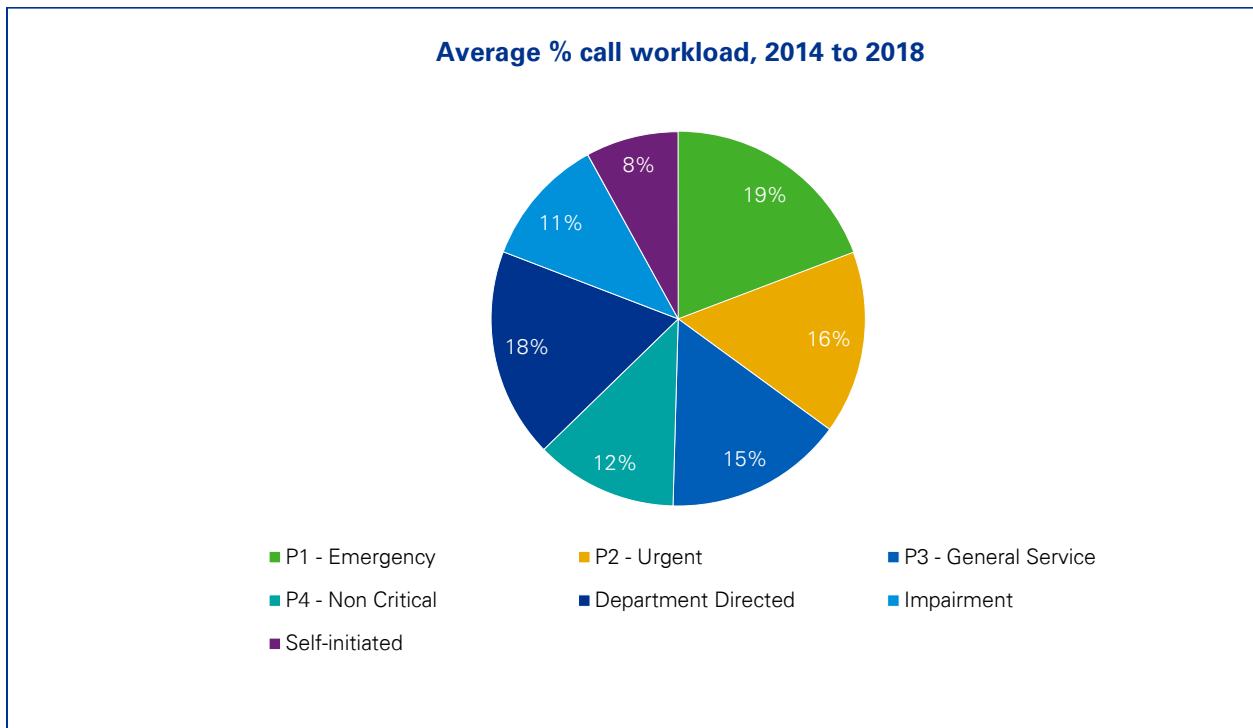
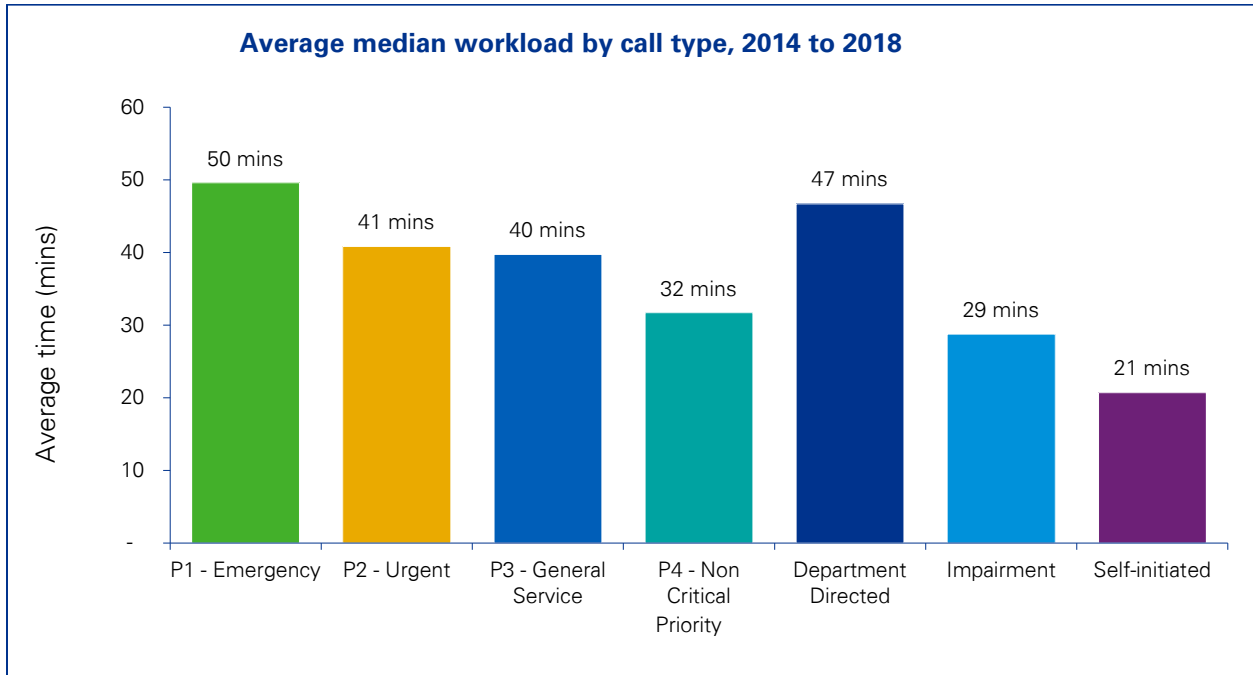
Officer monthly capacity

The percentage of time officers spend responding to calls for service exhibited modest variability on a monthly basis from 2014 to 2018, ranging from 56 percent to 61 percent, roughly in line with the 2018 average seen above. Unencumbered time, the second largest share, ranged from 12 percent to 16 percent of time, averaging 14 percent. Time spent responding to department-directed and self-initiated calls showed little variability, with department-directed ranging from 8 percent to 10 percent and self-initiated ranging from 11 percent to 15 percent of time. Impairment time remained largely unchanged month to month, averaging 5 percent of total time.



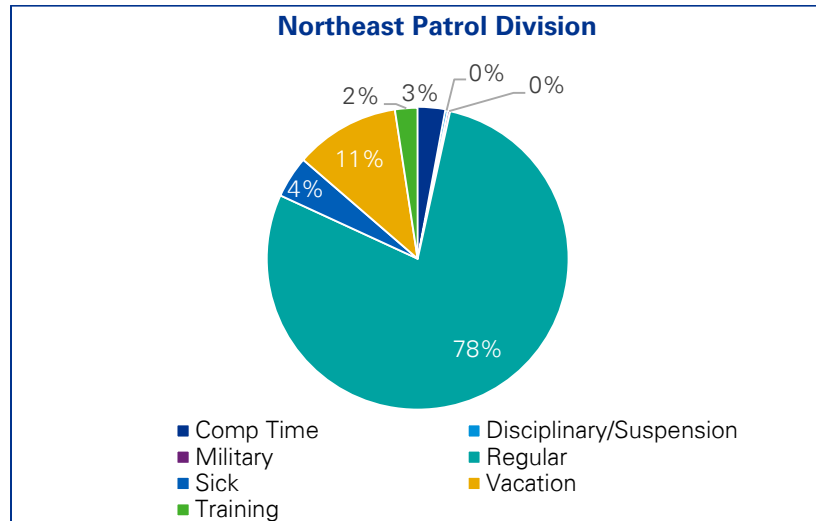
Median workload

From 2014 to 2018, Priority 1 calls had the greatest average median workload at 50 minutes, or 19 percent of total workload. Department-directed calls were a close second at 47 minutes, or 18 percent of total workload, while Priority 2 and Priority 3 calls took up 16 percent and 15 percent, respectively, of total workload at 41 and 40 minutes. Self-initiated calls, despite having the highest annual call volume, took up the least amount of time at just 21 minutes, or 8 percent of total workload.



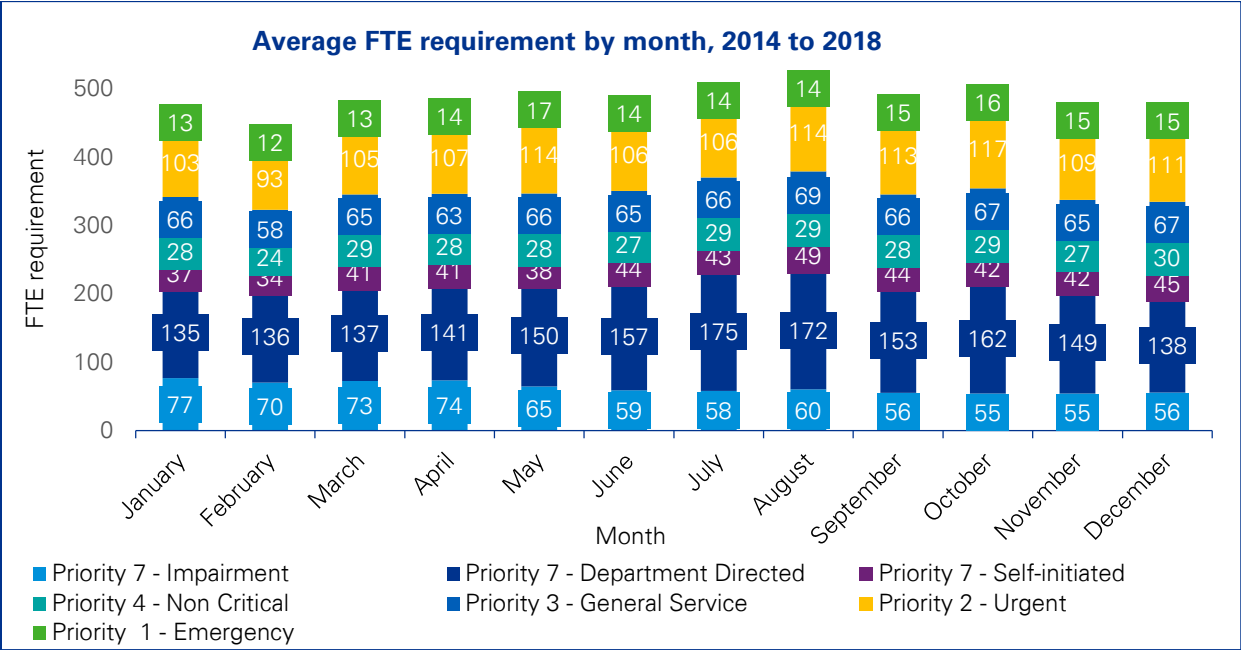
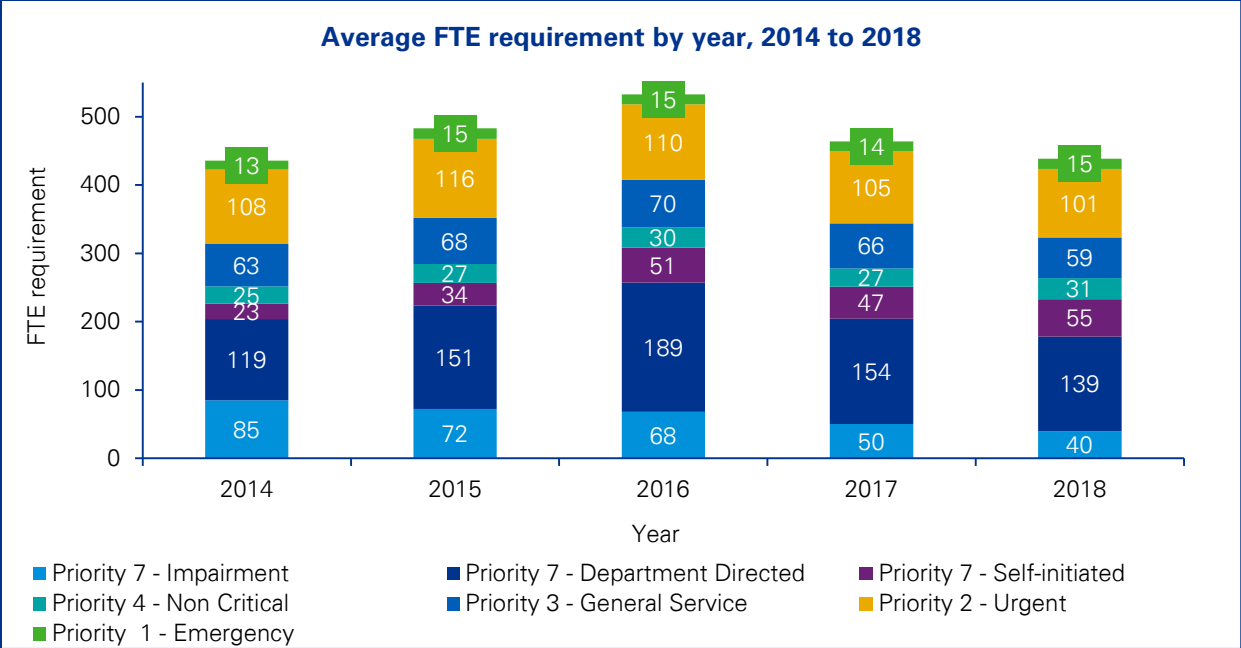
Officer productive hours

The Northeast Division averages 1,631 productive hours a year out of 2,080 total hours, or 78 percent. Of the remaining 449 hours not considered productive, 52 percent (234 hours) are used for vacation, 21 percent (93 hours) are used for sick time, 14 percent (61 hours) are taken as comp time, and 11 percent (50 hours) are used for training. A de minimis percentage is used for military commitments and disciplinary/suspension reasons. Note: Percentages below may not equal 100 percent due to rounding.



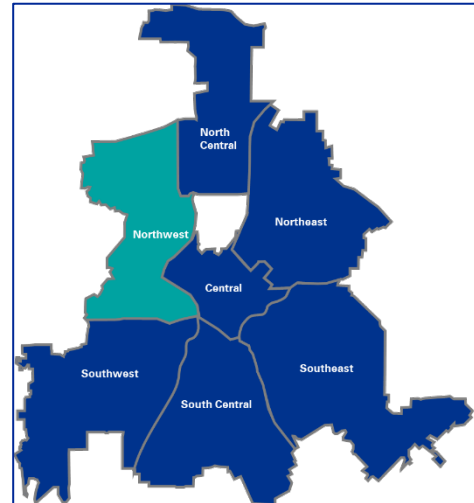
FTE analysis

From 2014 to 2018, the FTE service hour equivalents for Priority 1 and Priority 4 calls have remained relatively consistent, averaging 14 and 28, respectively. Priority 2 calls averaged the second highest FTE service hour equivalents at 108, with Priority 3 the third highest at an average of 65. Self-initiated calls have experienced a sharp increase over the past five years, from 23 to 55, while impairment has decreased from 85 to 40. Department-directed calls required the highest average FTE service hour equivalents at 150. Overall, the average FTE service hour equivalents over the past five years for the division were 471, of which 216 (46 percent) were related to core Priorities 1–4. Of note, the FTE service hour equivalents shown below are not optimized for temporal trends or specific supply and demand criteria, but rather reflect the gross requirement derived from the median workload per call type multiplied by the volume for each call type and should not be considered as recommended staffing levels.



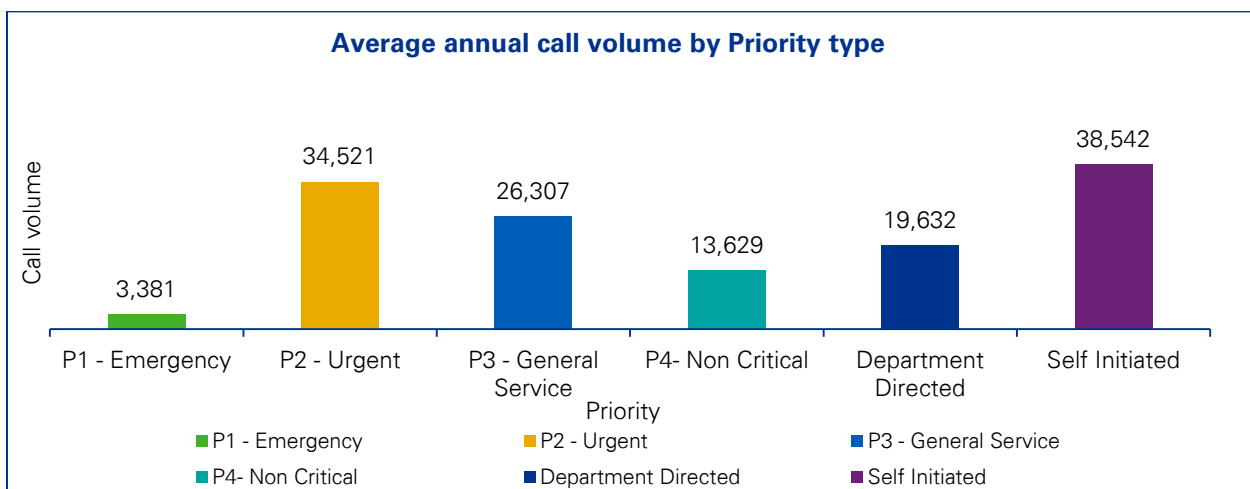
Northwest Division

Attributes	Values
Square miles	48.43
Population	140,000
Top three calls	Self-initiated, Priority 2, Priority 3
Peak times	17:00–18:00
Peak time call volumes	4,237



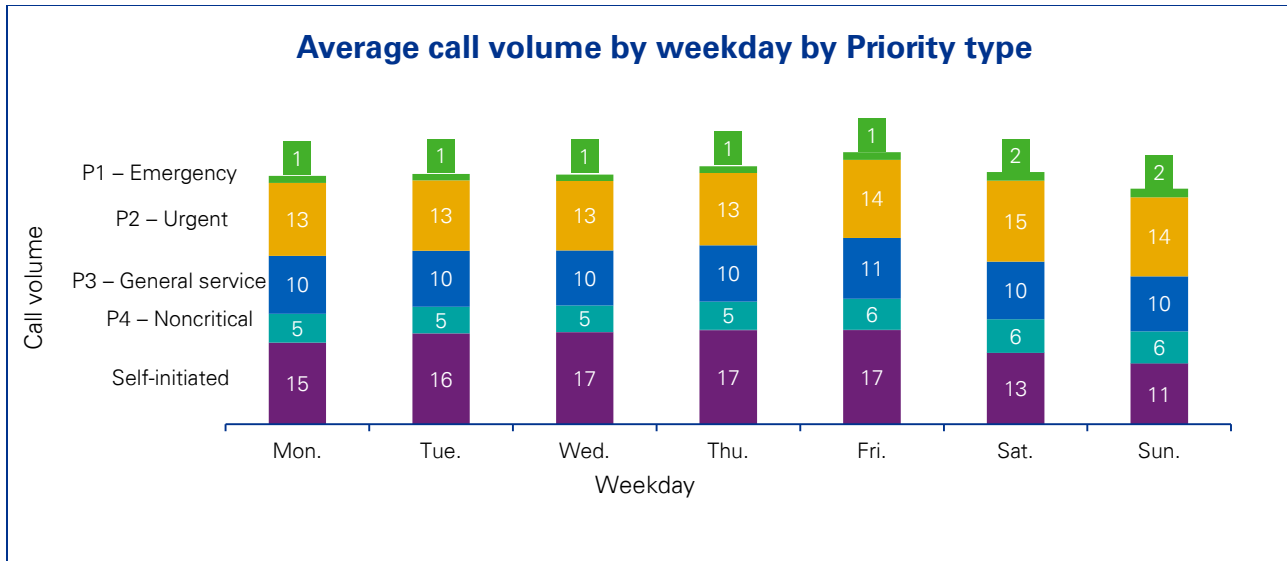
Average annual call volumes

The Northwest Division fields over 136,000 calls annually, approximately 2.5 percent of which are for Priority 1 incidents and 25 percent of which are for Priority 2 incidents. Priority 3 and 4 calls represent a combined 29 percent of average annual call volume, while department-directed calls make up 14 percent. The most frequent calls are self-initiated, accounting for 28 percent of call volume.

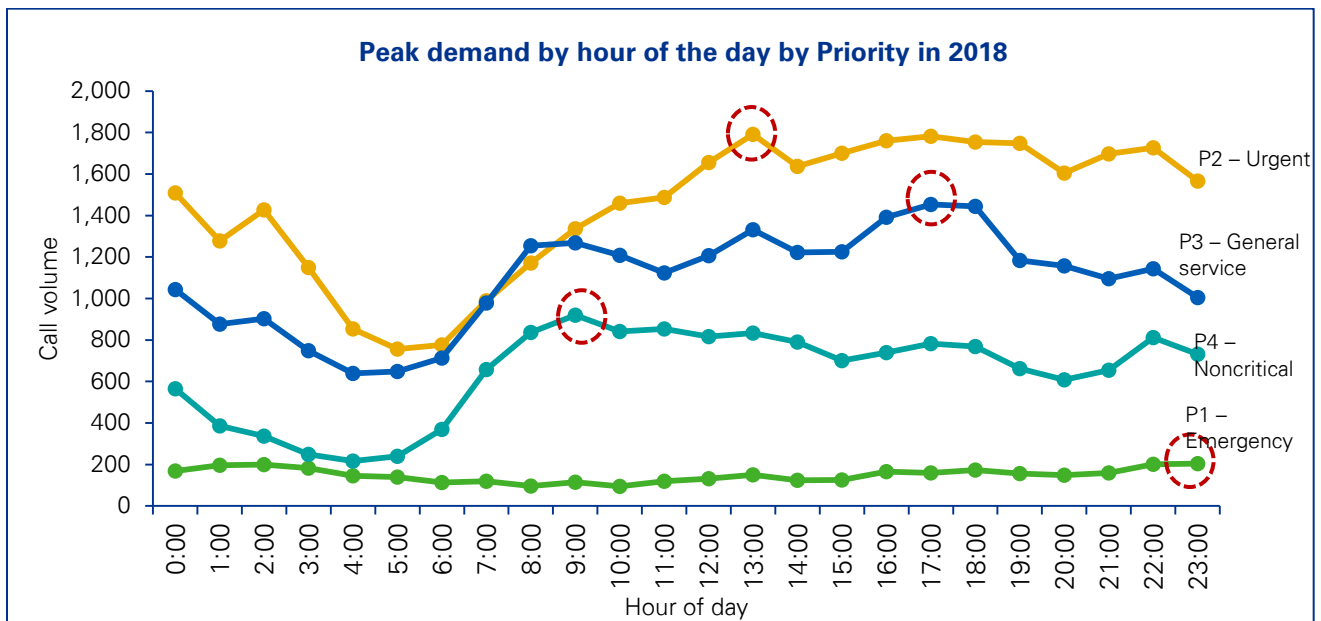


Average daily call volumes

An average of 320 calls are received each week, with call volume decreasing slightly during the weekend. An average of 46 calls are received per day Monday through Friday, while only 44 calls on average are received per day during Saturday and Sunday. Priority 1 calls occur about once a day, while Priority 2 calls are received an average of 14 times a day. Priority 3 and 4 calls combined, as well as self-initiated calls, are received an average of 15 times a day.



Call volume demand

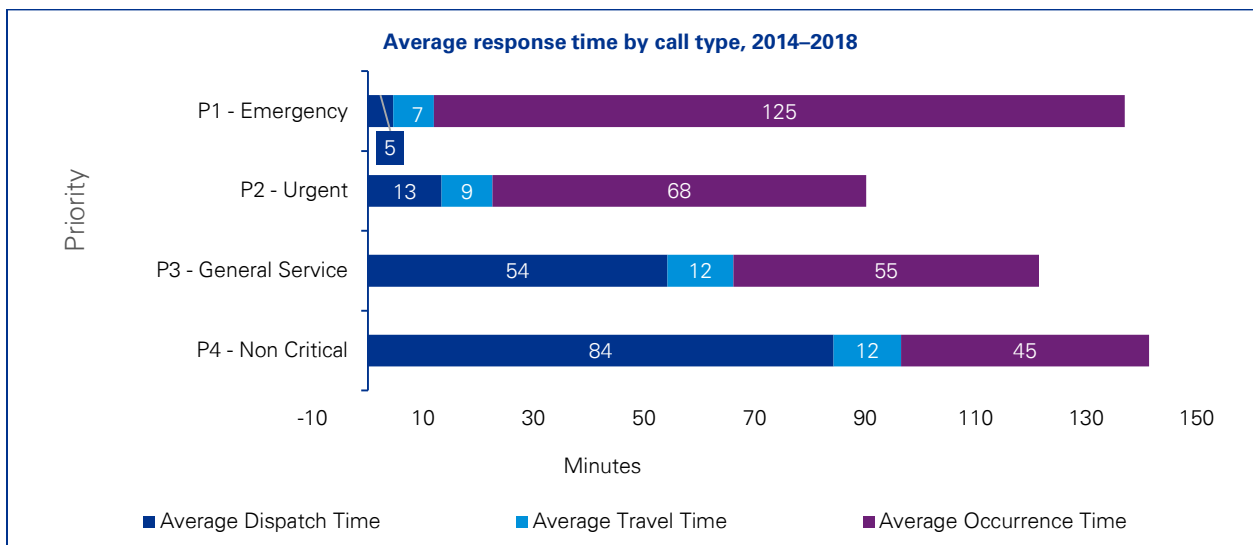
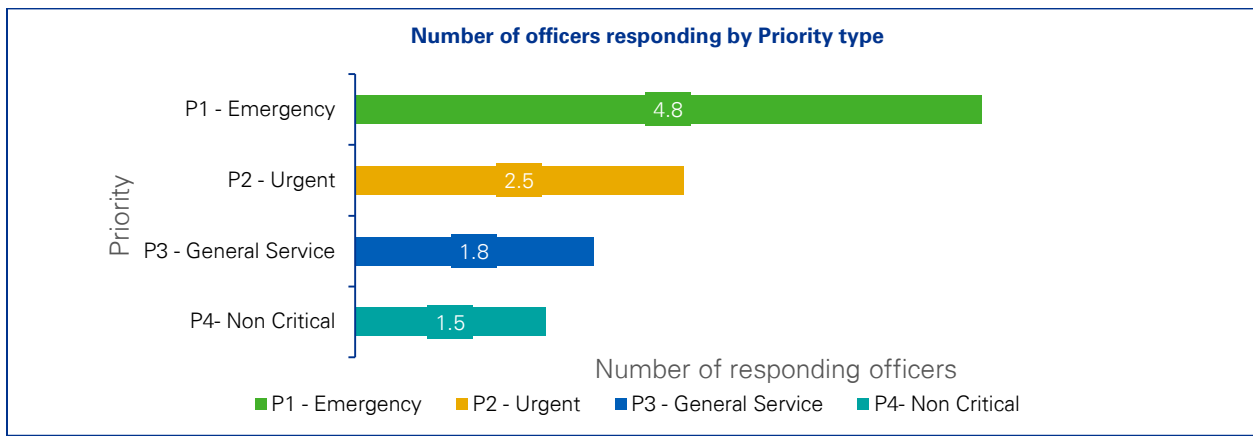


Hourly call volume demand varies by Priority, as demonstrated by the different hourly peaks in the graph below. In 2018, Priority 1 call volumes peaked at 11:00 PM, with a total of 204 calls being received at that time throughout the year as a whole. Unlike other Priority calls, Priority 1 calls did not exhibit significant fluctuations in volume demand, ranging between 95 calls and 204 calls throughout the year depending on the hour of the day. In contrast, Priority 2–4 calls peaked at 1:00 PM, 5:00 PM, and 9:00 AM, respectively, and exhibited much larger fluctuations in hourly volume demand. Priority 2 ranged from 756 to 1,791 calls, Priority 3 ranged from 639 to 1,454 calls, and Priority 4 ranged from 217 to 920 calls. Of the four Priority types, Priority 2 calls were the most frequent during every hour of the day, except 8:00 AM when Priority 3 calls were slightly higher, and experienced the largest fluctuation in volume between its trough and peak. Priority 2–4 calls all followed a similar trend by which call volume demand

declined in the early hours of the morning between 2:00 AM and 4:00 AM, before gradually increasing as the day began.

Response times

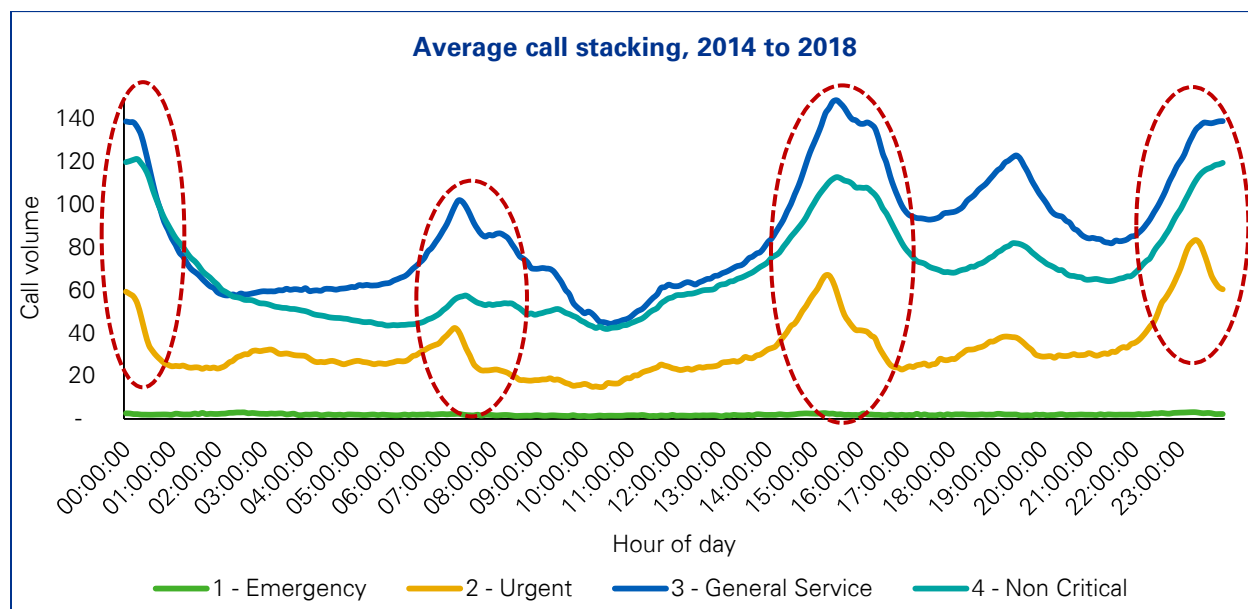
Response times, calculated as the sum of dispatch and travel time, and how many officers respond, are dependent upon the type of call received. Priority 1 calls average a response time of only 12 minutes with an average of four to five officers responding, while Priority 2 calls average a response time of 22 minutes with an average of two to three officers responding. In contrast, Priority 3 and Priority 4 calls have average response times of 66 minutes and 96 minutes, respectively, with one to two officers responding to each. Time spent on location is also dependent on the Priority of the call, with an average of 125 minutes, 68 minutes, 55 minutes, and 45 minutes spent responding to Priority 1, 2, 3, and 4 calls, respectively.



Call stacking

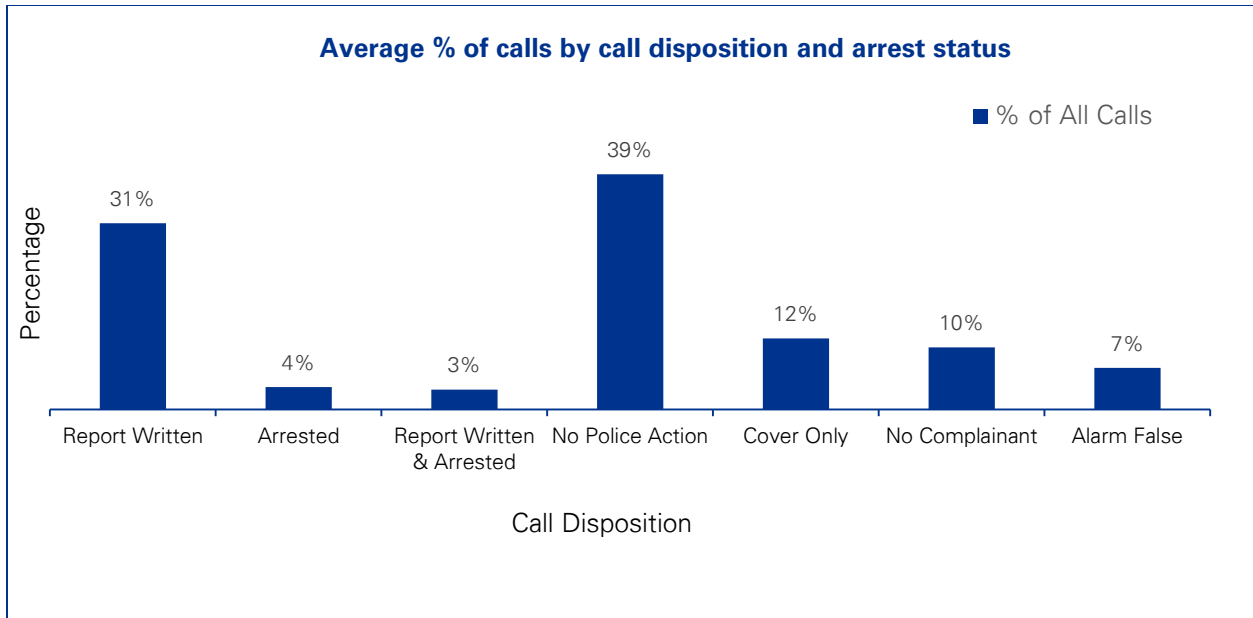
Call stacking, or the number of calls awaiting a response, varied by Priority type from 2014 to 2018 but followed a similar temporal trend based on the time of day. Priority 1 calls ranged from 1 to 3 calls waiting at any point during the day, while Priority 2 calls ranged from 15 to 83 calls. At lower Priority levels, the range in waiting calls increased, with Priority 3 calls ranging from 44 to 149 and Priority 4 calls ranging from 42 to 121. There were noticeable spikes in call stacking around 7:00–9:00 AM, 3:00–5:00

PM, and 10:00 PM–12:00 AM for Priority 2, 3, and 4 calls, coinciding with changes in watch. Watch 1 begins rolling off in favor of Watch 2 between 7:00 and 8:00 AM, Watch 2 begins rolling off in favor of Watch 3 between 3:00 and 4:00 PM, and Watch 3 begins rolling off in favor of Watch 1 again between 11:00 PM and 12:00 AM. Given this staggering in shifts, there should always be officers available to respond to calls regardless of shift change. The buildup in calls waiting around these times, however, could be an indication of officers ending their watch early or starting late. One notable exception was Priority 1 calls, which did not stack despite these shift changes due to their critical nature.



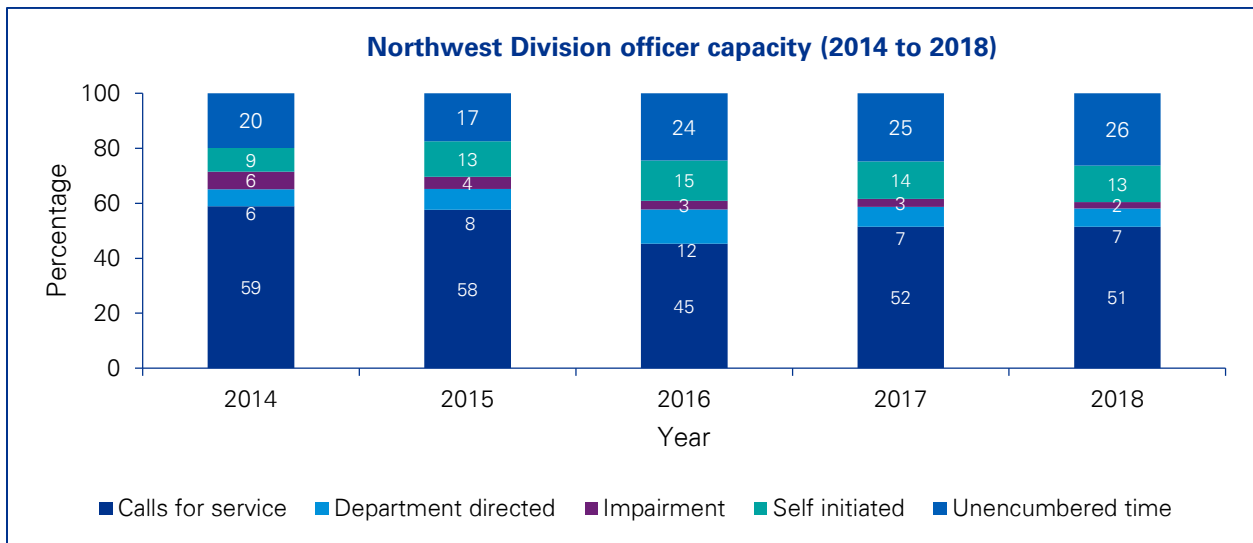
Call disposition and arrest status

The below analysis relates to all call types during the period 2014 to 2018. Of the top seven call dispositions, the majority of calls received, 39 percent, result in no police action being taken, with just a report being written for 31 percent of incidents. There is no complainant upon arrival for 10 percent of calls, with a further 7 percent of calls being a false alarm. For 4 percent of incidents, a suspect is arrested, with an arrest and a report being written for an additional 3 percent of incidents. This indicates that the majority of the police work undertaken tends to be focused on situations other than major crimes.



Officer yearly capacity

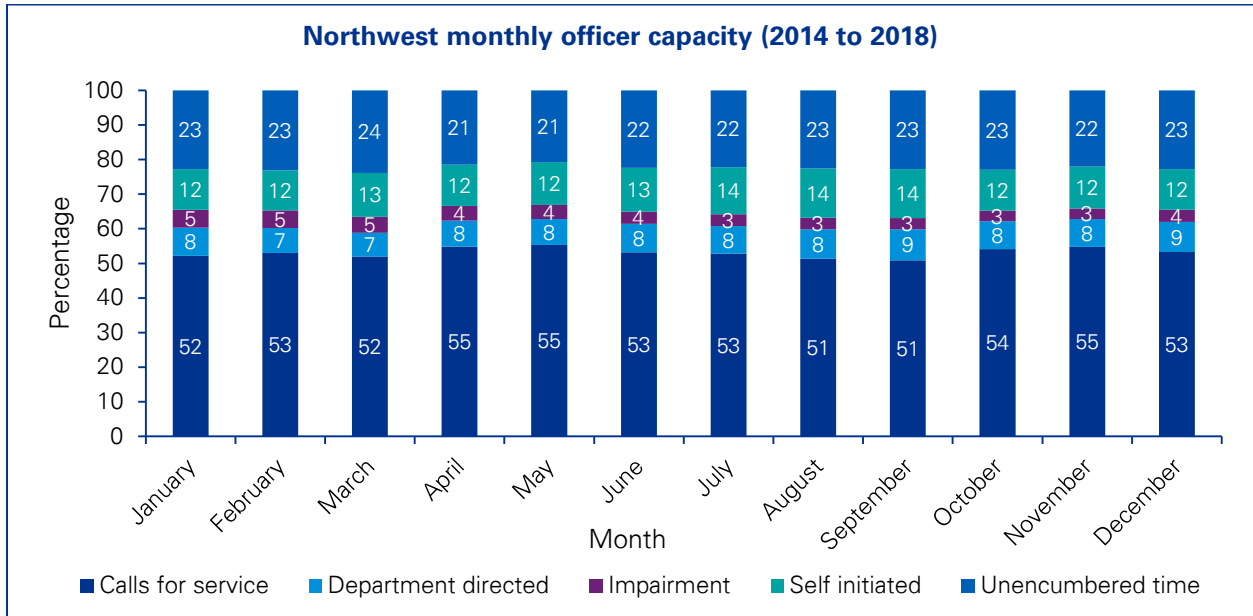
The percentage of time officers spend responding to calls for service has decreased over the past five years, from 59 percent in 2014 to 51 percent in 2018. A corresponding increase in unencumbered time has been seen during the same timeframe, from 20 percent in 2014 to 26 percent in 2018. Self-initiated time has increased since 2014, from 9 percent to 13 percent. Department-directed time has remained relatively constant at 6 percent to 8 percent with the exception of 2016, while impairment time (time spent going for lunch, defending a ticket in court, setting up the patrol car, etc.) has decreased from 6 percent to 2 percent over the course of the past five years.



Officer monthly capacity

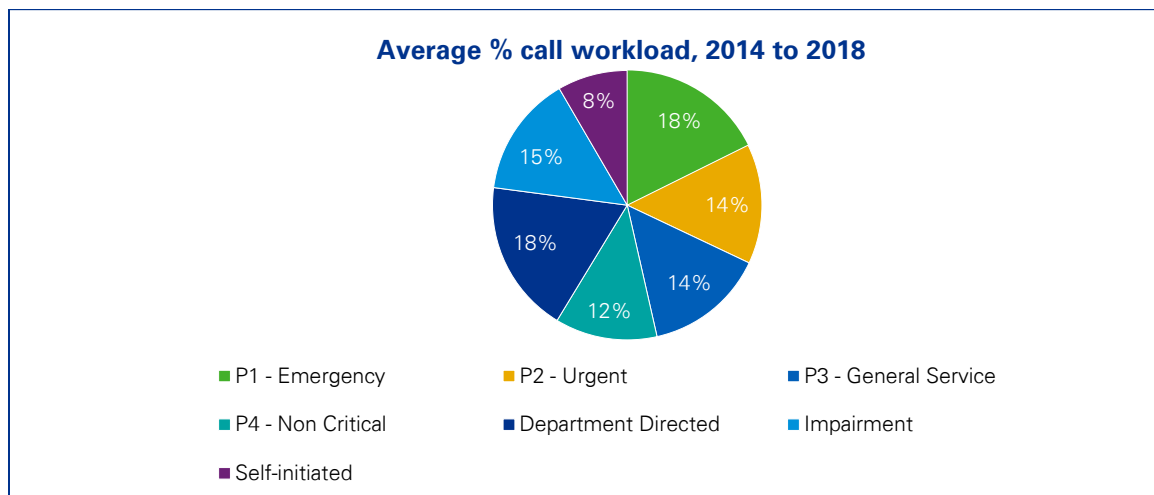
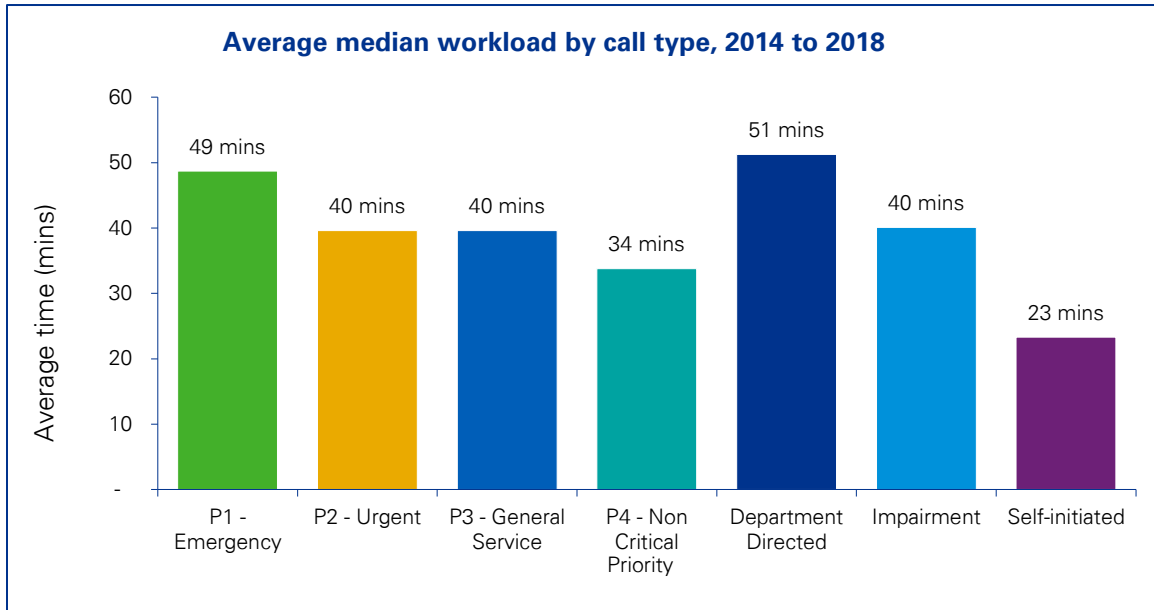
The percentage of time officers spend responding to calls for service exhibited modest variability on a monthly basis from 2014 to 2018, ranging from 51 percent to 55 percent, roughly in line with the 2018 average seen above. Unencumbered time, the second largest share, ranged from 21 percent to 24 percent of time, averaging 22 percent. Time spent responding to department-directed and self-initiated

calls showed little variability, with department-directed ranging from 7 percent to 9 percent and self-initiated ranging from 12 percent to 14 percent of time. Impairment time remained largely unchanged month to month, averaging 4 percent of total time.



Median workload

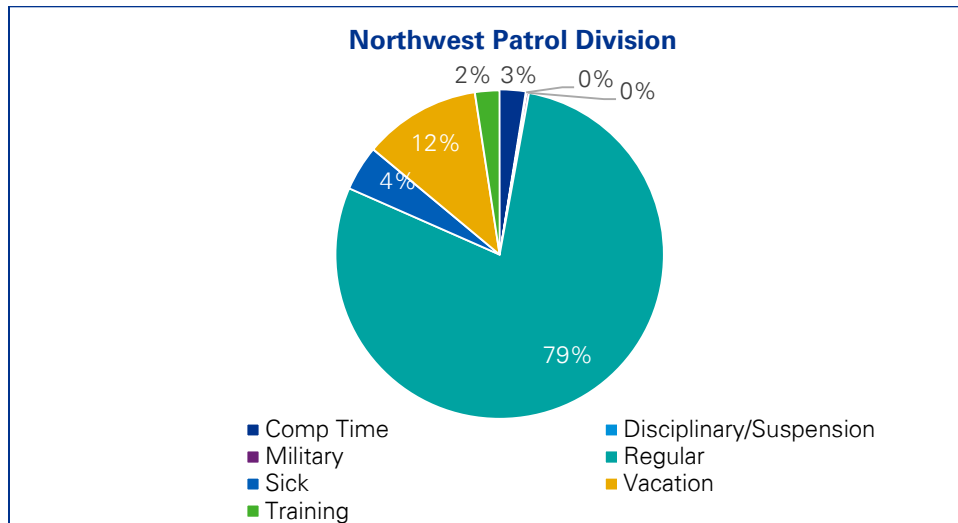
From 2014 to 2018, department-directed calls had the greatest average median workload at 51 minutes, or 18 percent of total workload. Priority 1 calls were a close second at 49 minutes, or 18 percent of total workload, while Priority 2, Priority 3, and impairment calls each took 14-15 percent of total workload at 40 minutes. Self-initiated calls, despite having the highest annual call volume, took up the least amount of time at just 23 minutes, or 8 percent of total workload.



Officer productive hours

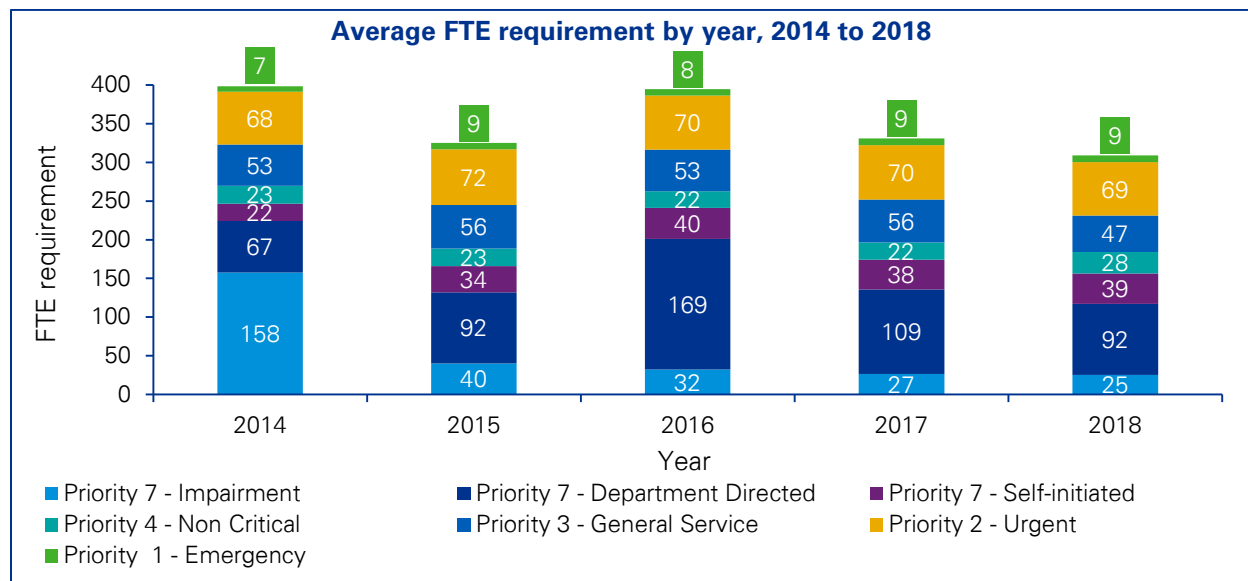
The Northwest Division averages 1,637 productive hours a year out of 2,080 total hours, or 79 percent. Of the remaining 443 hours not considered productive, 54 percent (240 hours) are used for vacation, 21 percent (93 hours) are used for sick time, 12 percent (53 hours) are taken as comp time, and 12 percent

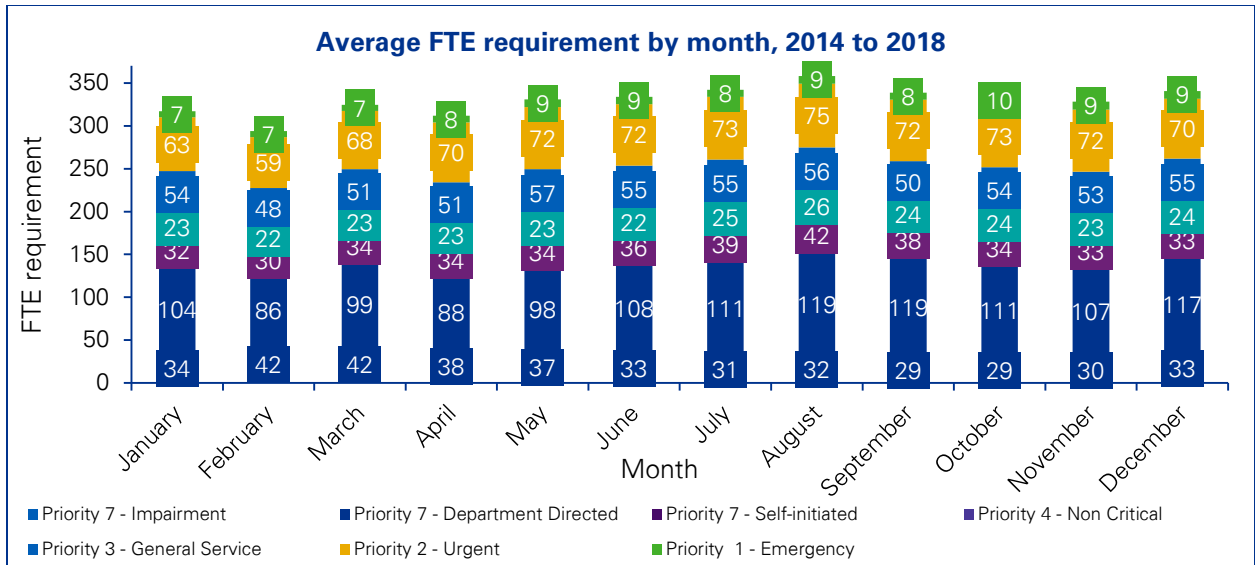
(51 hours) are used for training. A de minimis percentage is used for military commitments and disciplinary/suspension reasons.



FTE analysis

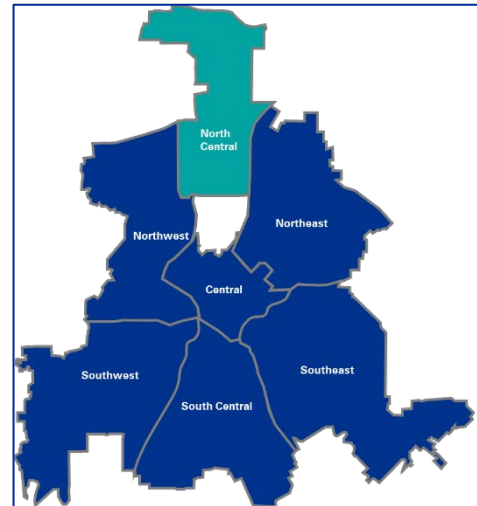
From 2014 to 2018, the FTE service hour equivalents for Priority 1 and Priority 4 calls have remained relatively consistent, averaging 8 and 24, respectively. Priority 2 calls averaged the second highest FTE service hour equivalents at 70 and Priority 3 calls had an average of 53. Self-initiated calls have experienced a sharp increase over the past five years, from 22 to 39, while impairment has decreased from 158 to 25. Department-directed calls required the highest average FTE service hour equivalents at 105. Overall, the average FTE service hour equivalents over the past five years for the division were 352, of which 155 (44 percent) were related to core Priorities 1–4, with months such as August having a higher equivalent (359) and February having a lower equivalent (294). Of note, the FTE service hour equivalents shown below are not optimized for temporal trends or specific supply and demand criteria, but rather reflect the gross requirement derived from the median workload per call type multiplied by the volume for each call type and should not be considered as recommended staffing levels.





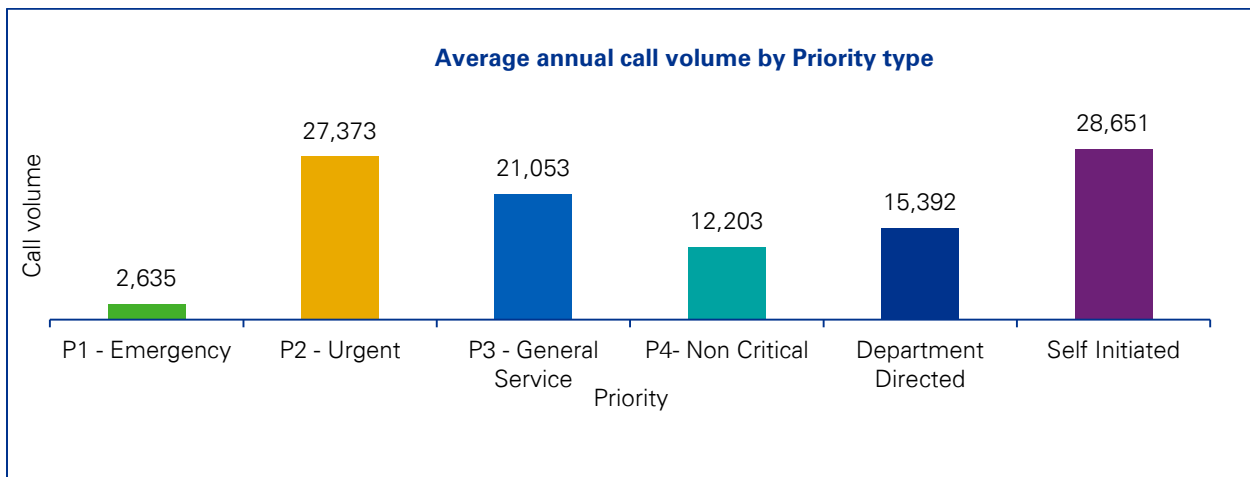
North Central Division

Attributes	Values
Square miles	36.92
Population	196,000
Top three calls	Self-initiated, Priority 2, Priority 3
Peak times	17:00–18:00
Peak time call volumes	3,778



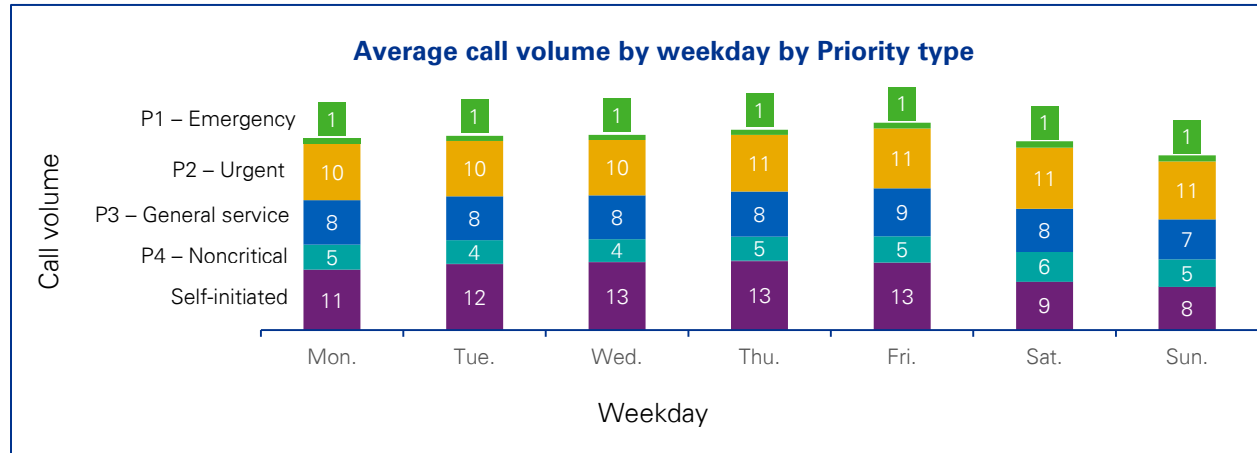
Average annual call volumes

The North Central Division fields over 107,000 calls annually, approximately 2.5 percent of which are for Priority 1 incidents and 26 percent of which are for Priority 2 incidents. Priority 3 and 4 calls represent a combined 31 percent of average annual call volume, while department-directed calls make up 14 percent. The most frequent calls are self-initiated, accounting for 27 percent of call volume.



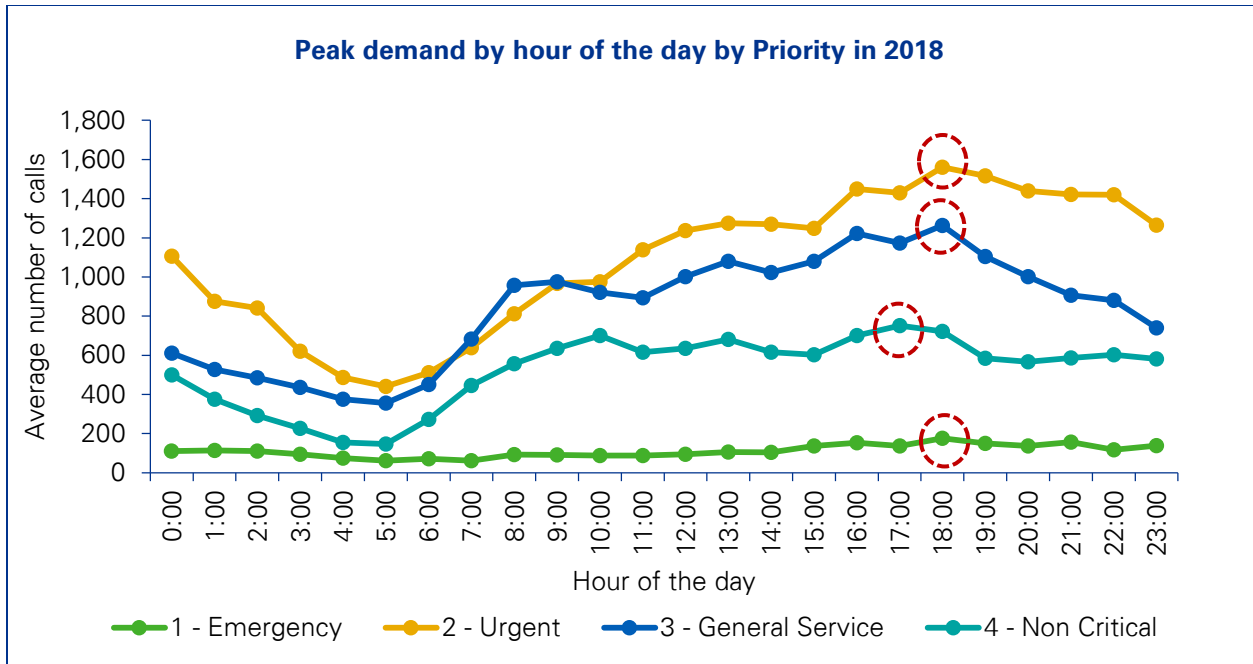
Average daily call volumes

An average of 250 calls are received each week, with call volume decreasing slightly during the weekend. An average of 37 calls are received per day Monday through Friday, while only 34 calls on average are received per day during Saturday and Sunday. Priority 1 calls occur about once a day, while Priority 2 calls are received an average of 11 times a day. Priority 3 and 4 calls combined average 13 a day, and self-initiated calls are received an average of 11 times a day.



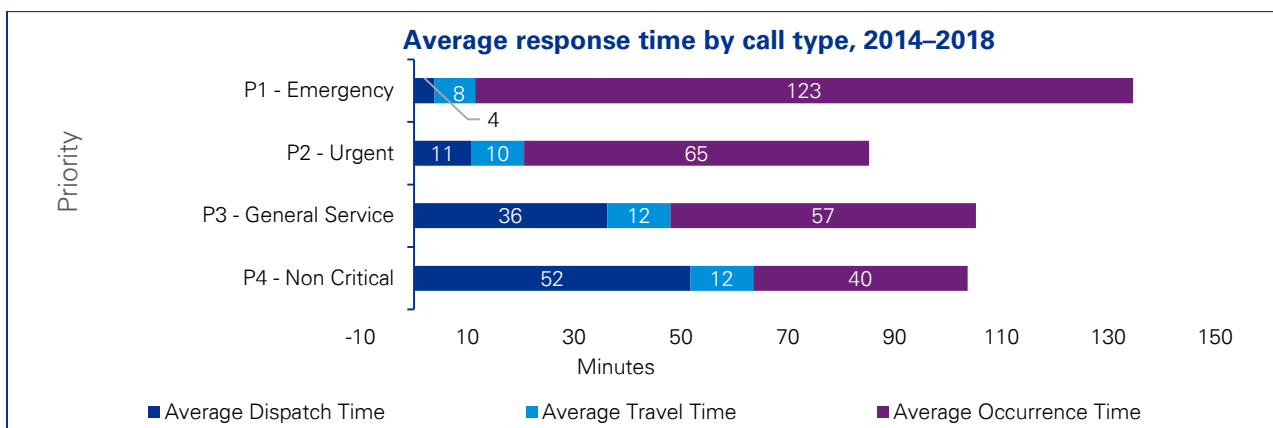
Call volume demand

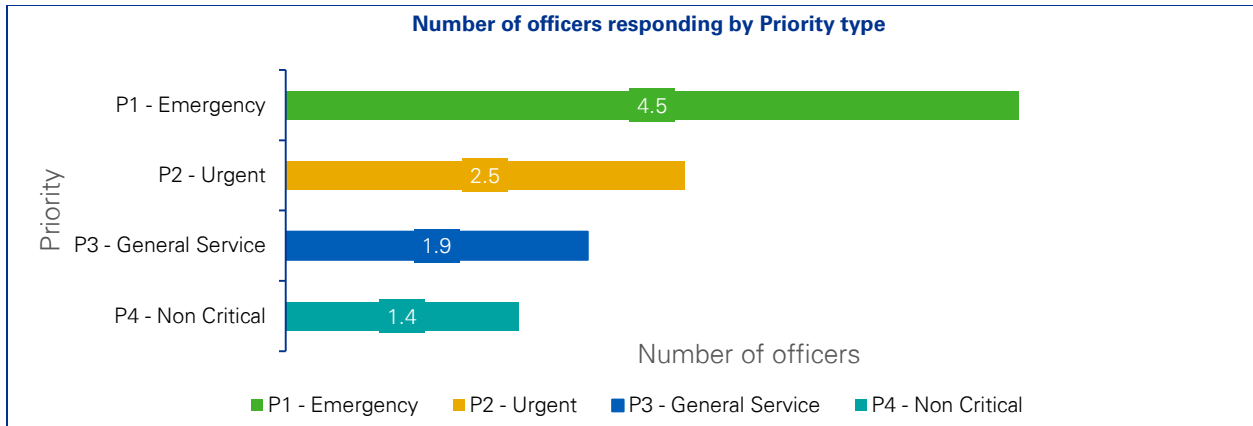
Hourly call volume demand varies by Priority, as demonstrated by the different hourly peaks in the graph below. In 2018, Priority 1 call volumes peaked at 6:00 PM, with a total of 176 calls being received at that time throughout the year as a whole. Unlike other Priority calls, Priority 1 calls did not exhibit significant fluctuations in volume demand, ranging between 62 calls and 176 calls throughout the year depending on the hour of the day. In contrast, Priority 2–4 calls peaked at 6:00 PM, 6:00 PM, and 5:00 PM, respectively, and exhibited much larger fluctuations in hourly volume demand. Priority 2 ranged from 440 to 1,560 calls, Priority 3 ranged from 355 to 1,263 calls, and Priority 4 ranged from 147 to 752 calls. Of the four Priority types, Priority 2 calls were the most frequent during every hour of the day, except 7:00 AM and 8:00 AM when Priority 3 calls were slightly higher, and experienced the largest fluctuation in volume between its trough and peak. Priority 2–4 calls all followed a similar trend by which call volume demand declined in the early hours of the morning between 12:00 AM and 5:00 AM, before gradually increasing as the day began.



Response times

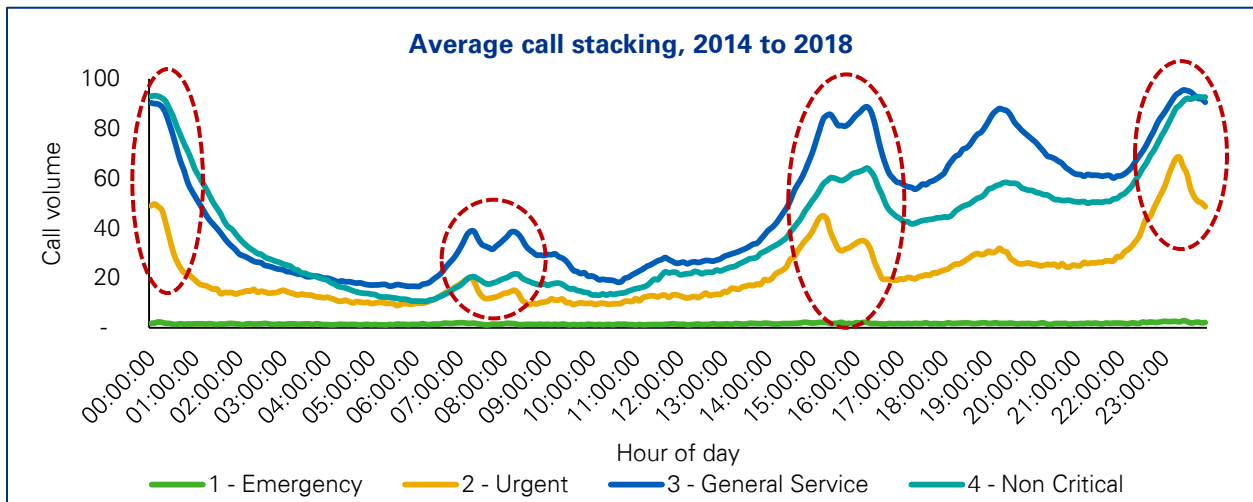
Response times, calculated as the sum of dispatch and travel time, and how many officers respond, are dependent upon the type of call received. Priority 1 calls average a response time of only 12 minutes with an average of four to five officers responding, while Priority 2 calls average a response time of 21 minutes with an average of two to three officers responding. In contrast, Priority 3 and Priority 4 calls have average response times of 48 minutes and 64 minutes, respectively, with one to two officers responding to each. Time spent on location is also dependent on the Priority of the call, with an average of 123 minutes, 65 minutes, 57 minutes, and 40 minutes spent responding to Priority 1, 2, 3, and 4 calls, respectively.





Call stacking

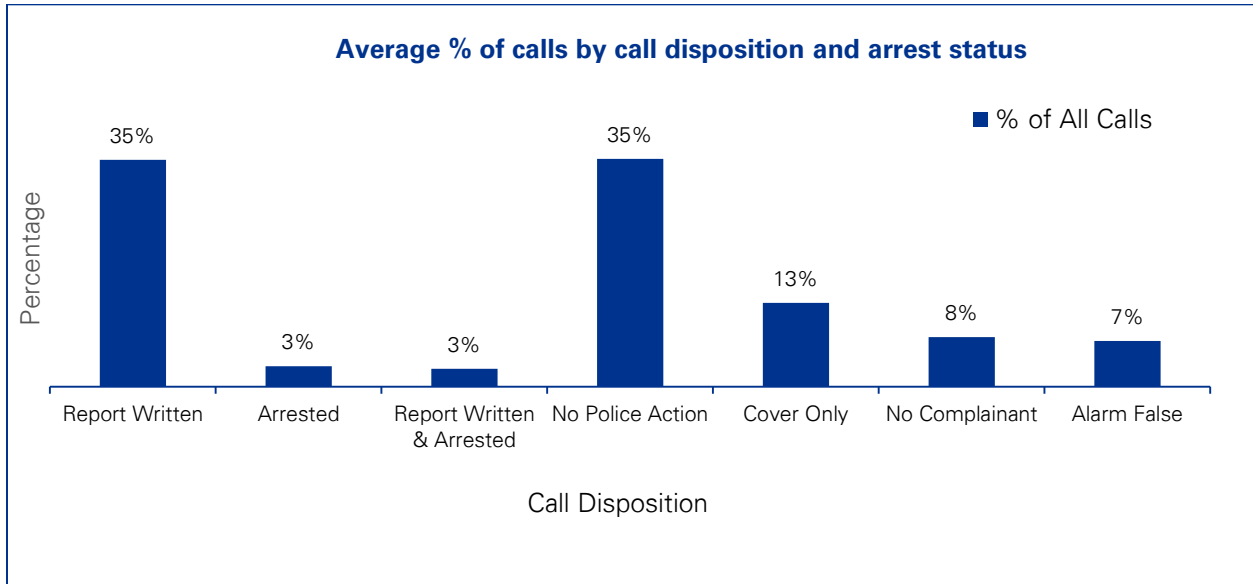
Call stacking, or the number of calls awaiting a response, varied by Priority type from 2014 to 2018 but followed a similar temporal trend based on the time of day. Priority 1 calls ranged from 1 to 3 calls waiting at any point during the day, while Priority 2 calls ranged from 9 to 69 calls. At lower Priority levels, the range in waiting calls increased, with Priority 3 calls ranging from 17 to 96 and Priority 4 calls ranging from 11 to 93. There were noticeable spikes in call stacking around 7:00–9:00 AM, 3:00–5:00 PM, and 10:00 PM–12:00 AM for Priority 2, 3, and 4 calls, coinciding with changes in watch. Watch 1 begins rolling off in favor of Watch 2 between 7:00 and 8:00 AM, Watch 2 begins rolling off in favor of Watch 3 between 3:00 and 4:00 PM, and Watch 3 begins rolling off in favor of Watch 1 again between 11:00 PM and 12:00 AM. Given this staggering in shifts, there should always be officers available to respond to calls regardless of shift change. The buildup in calls waiting around these times, however, could be an indication of officers ending their watch early or starting late. One notable exception was Priority 1 calls, which did not stack despite these shift changes due to their critical nature.



Call disposition and arrest status

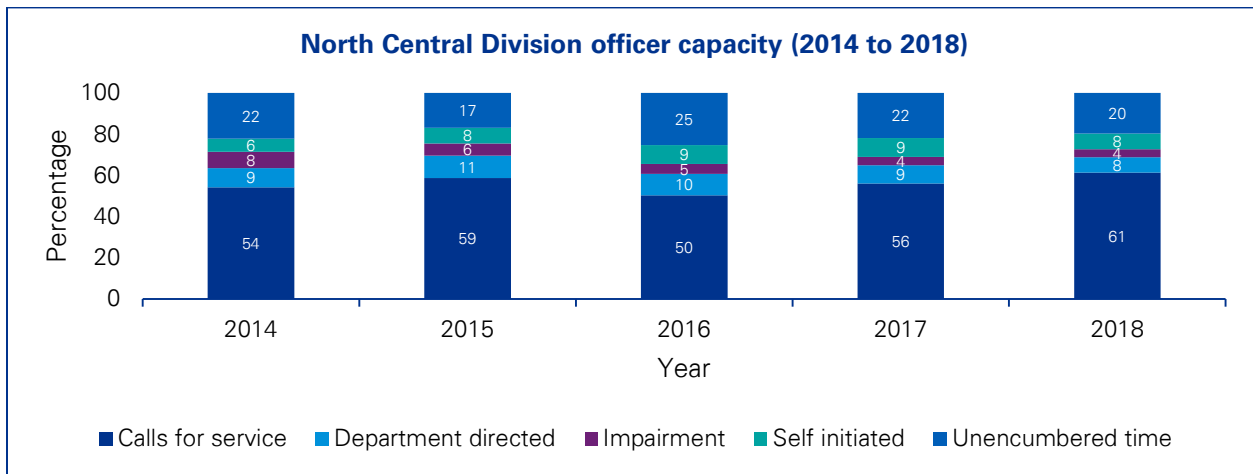
The below analysis relates to all call types during the period 2014 to 2018. Of the top seven call dispositions, the majority of calls received result in either no police action being taken or just a report being written, both occurring for 35 percent of incidents. There is no complainant upon arrival for 8 percent of calls, with a further 7 percent of calls being a false alarm. For 3 percent of incidents, a suspect is arrested, with an arrest and a report being written for an additional 3 percent of incidents. This

indicates that the majority of the police work undertaken tends to be focused on situations other than major crimes.



Officer yearly capacity

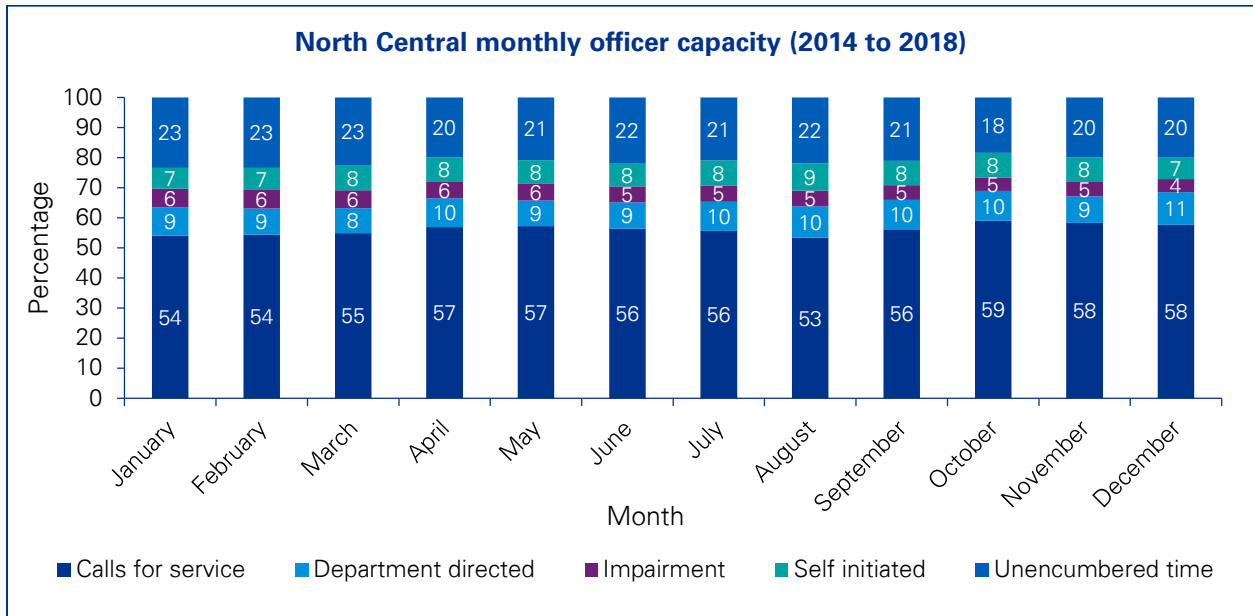
The percentage of time officers spend responding to calls for service has increased over the past five years, from 54 percent in 2014 to 61 percent in 2018. A corresponding decrease in unencumbered time has been seen during the same timeframe, from 22 percent in 2014 to 20 percent in 2018. Self-initiated time has remained relatively constant at 6 percent to 9 percent. Department-directed time has decreased from 9 percent to 8 percent, while impairment time (time spent going for lunch, defending a ticket in court, setting up the patrol car, etc.) has decreased from 8 percent to 4 percent over the course of the past five years.



Officer monthly capacity

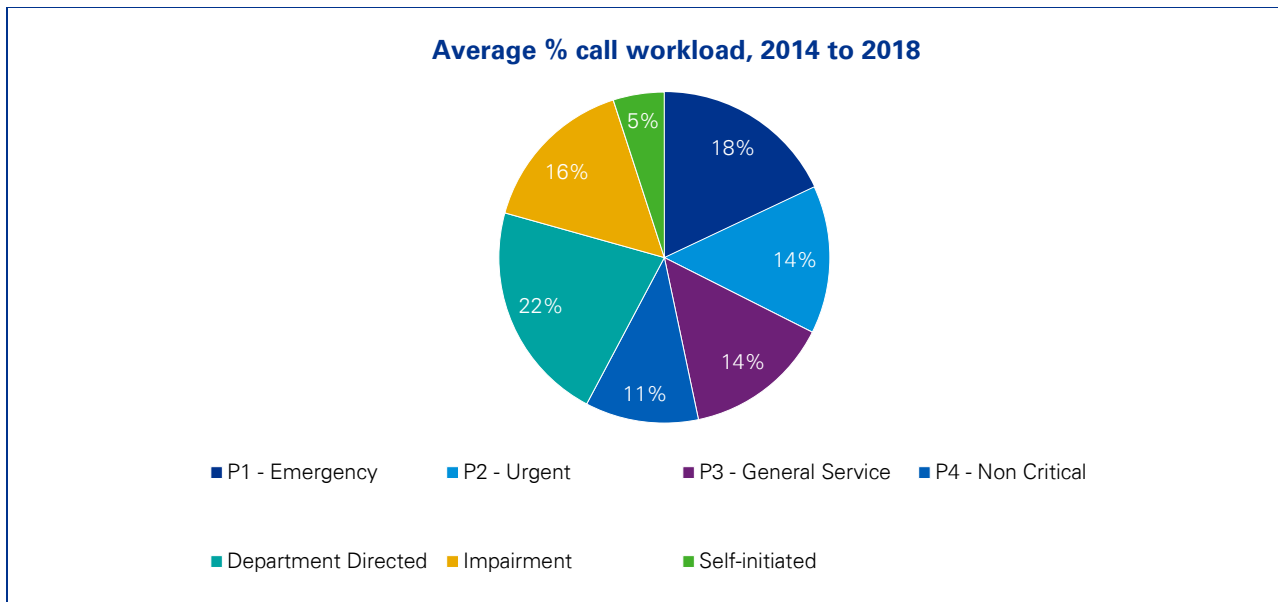
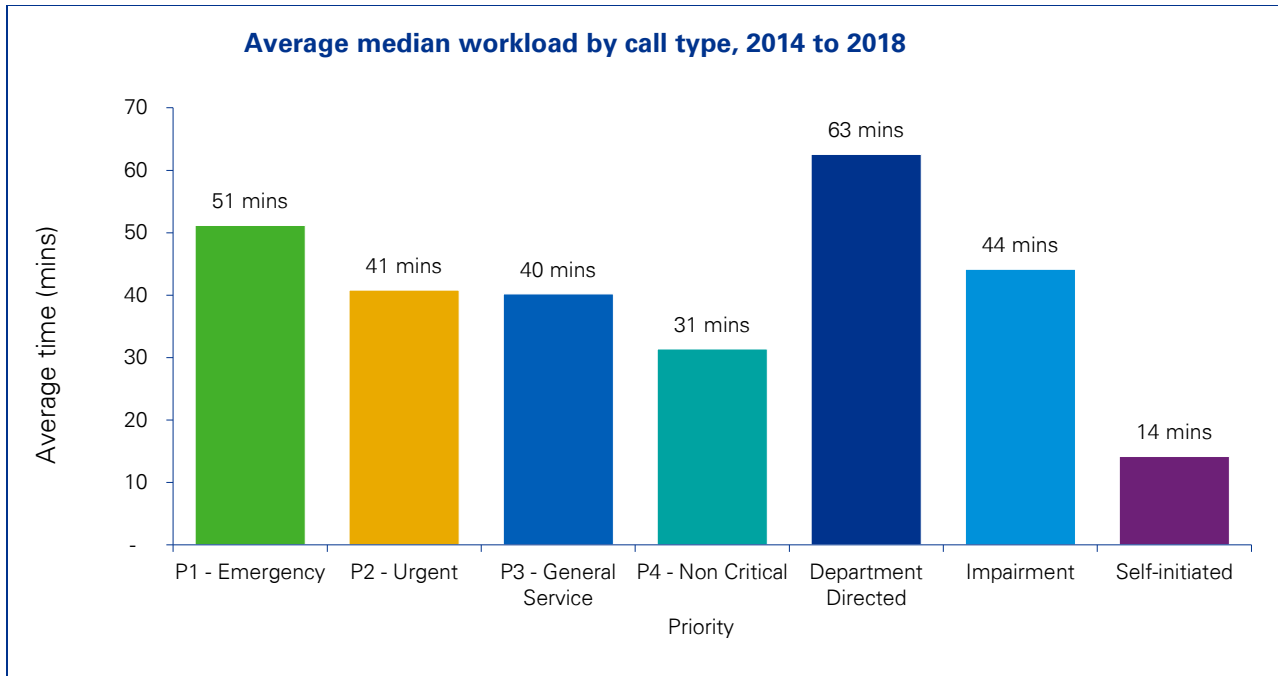
The percentage of time officers spend responding to calls for service exhibited modest variability on a monthly basis from 2014 to 2018, ranging from 53 percent to 59 percent, roughly in line with the 2018 average seen above. Unencumbered time, the second largest share, ranged from 18 percent to 23

percent of time, averaging 21 percent. Time spent responding to department-directed and self-initiated calls showed little variability, with department-directed ranging from 8 percent to 11 percent and self-initiated ranging from 7 percent to 9 percent of time. Impairment time remained largely unchanged month to month, averaging 5 percent of total time.



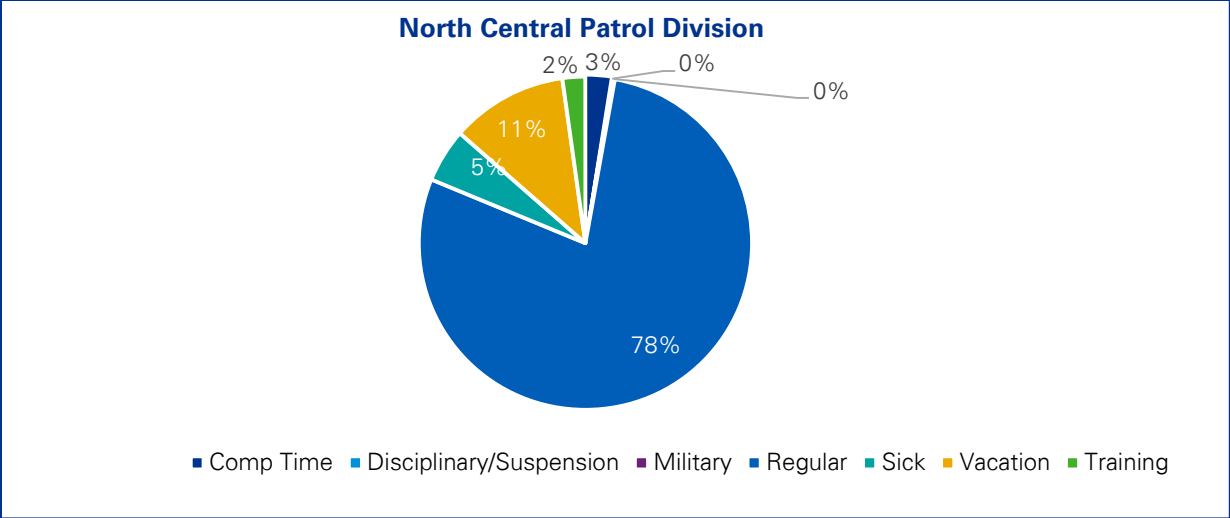
Median workload

From 2014 to 2018, department-directed calls had the greatest average median workload at 63 minutes, or 22 percent of total workload. Priority 1 calls were second at 51 minutes, or 18 percent of total workload, while impairment calls took 16 percent of total workload at 44 minutes. Priority 2 and 3 calls were also high at 41 minutes and 40 minutes, respectively, or 14 percent of total workload. Self-initiated calls, despite having the highest annual call volume, took up the least amount of time at just 14 minutes, or 5 percent of total workload.



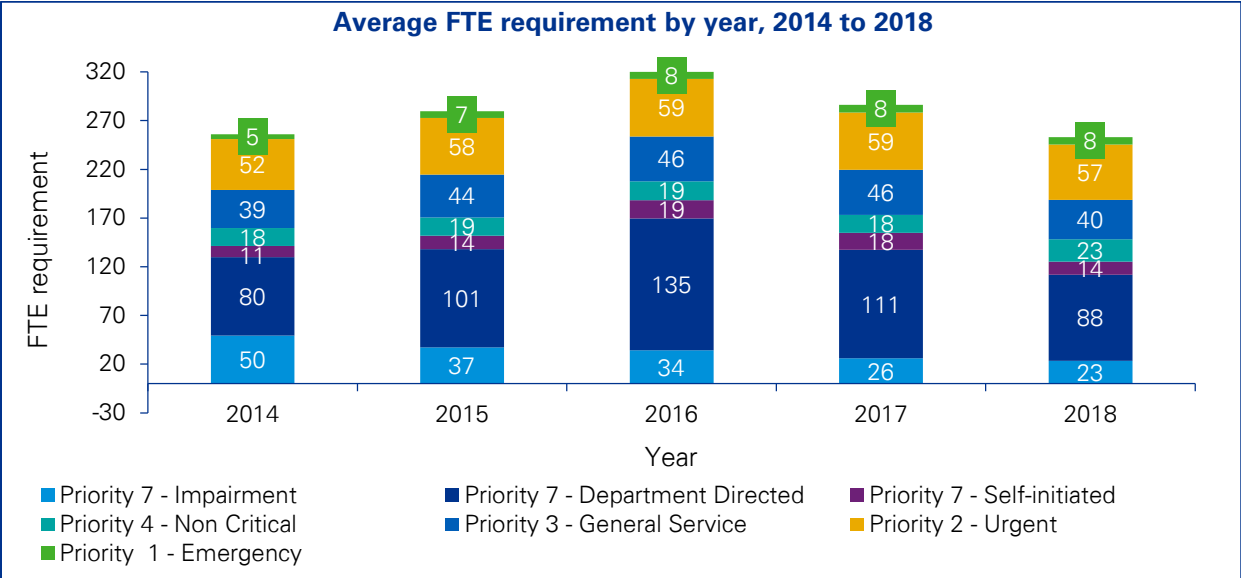
Officer productive hours

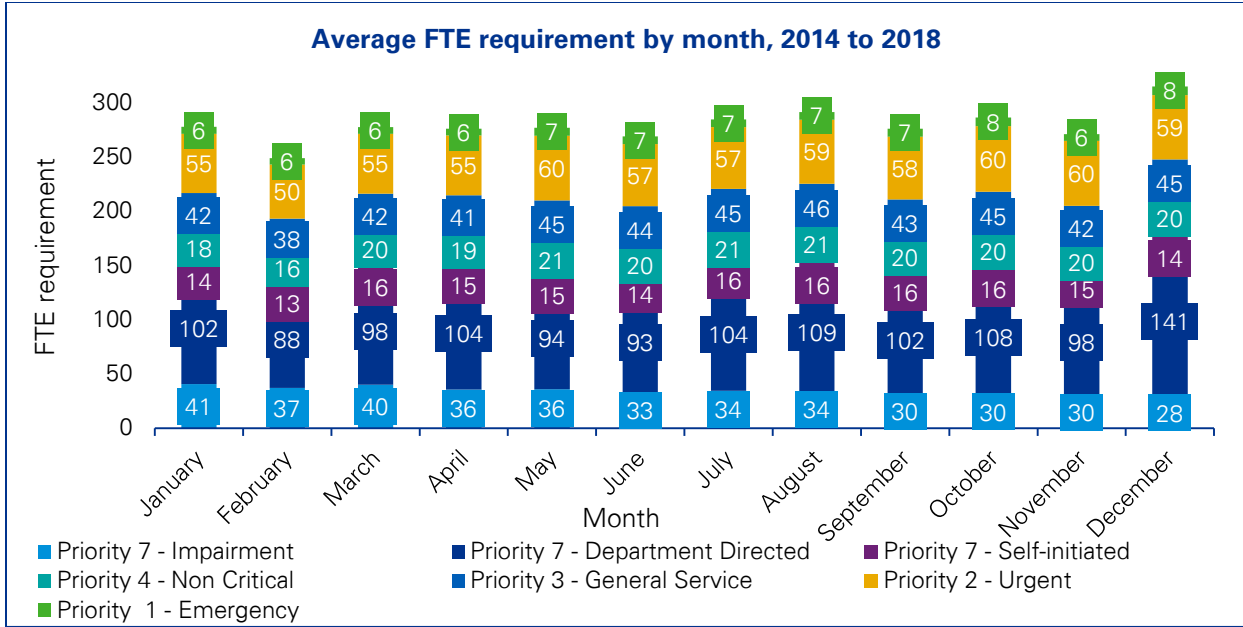
The North Central Division averages 1,618 productive hours a year out of 2,080 total hours, or 78 percent. Of the remaining 462 hours not considered productive, 51 percent (236 hours) are used for vacation, 23 percent (108 hours) are used for sick time, 13 percent (61 hours) are taken as comp time, and 10 percent (46 hours) are used for training. A de minimis percentage is used for military commitments and disciplinary/suspension reasons.



FTE analysis

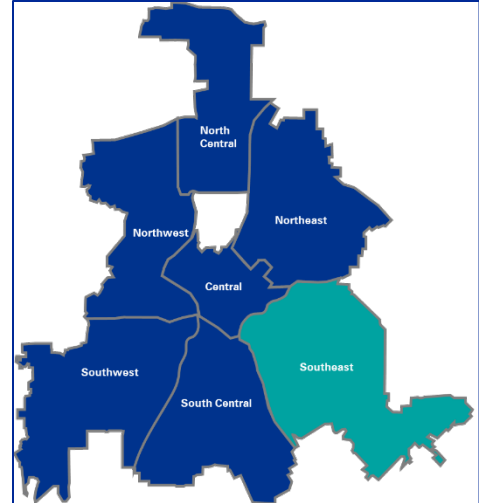
From 2014 to 2018, the FTE service hour equivalents for Priority 1 and Priority 4 calls have remained relatively consistent, averaging 7 and 19, respectively. Priority 2 calls averaged the second highest FTE service hour equivalents at 57 and Priority 3 calls had the third highest with an average of 43. Self-initiated calls have also remained largely flat over the past five years, averaging 15, while impairment has decreased from 50 to 23. Department-directed calls required the highest average FTE service hour equivalents at 103. Overall, the average FTE service hour equivalents over the past five years for the division were 279, of which 127 (46 percent) were related to core Priorities 1–4, with months such as December having a higher equivalent (315) and February having a lower equivalent (248). Of note, the FTE service hour equivalents shown below are not optimized for temporal trends or specific supply and demand criteria, but rather reflect the gross requirement derived from the median workload per call type multiplied by the volume for each call type and should not be considered as recommended staffing levels.





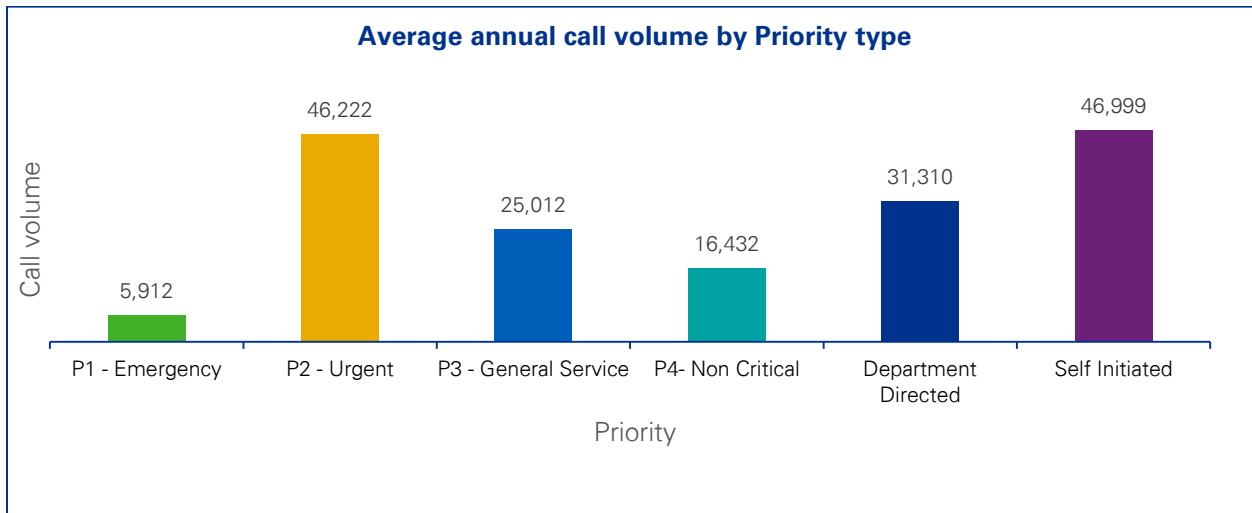
Southeast Division

Attributes	Values
Square miles	64.11
Population	176,000
Top three calls	Self-initiated, Priority 2, department-directed
Peak times	21:00–22:00
Peak time call volumes	5,627



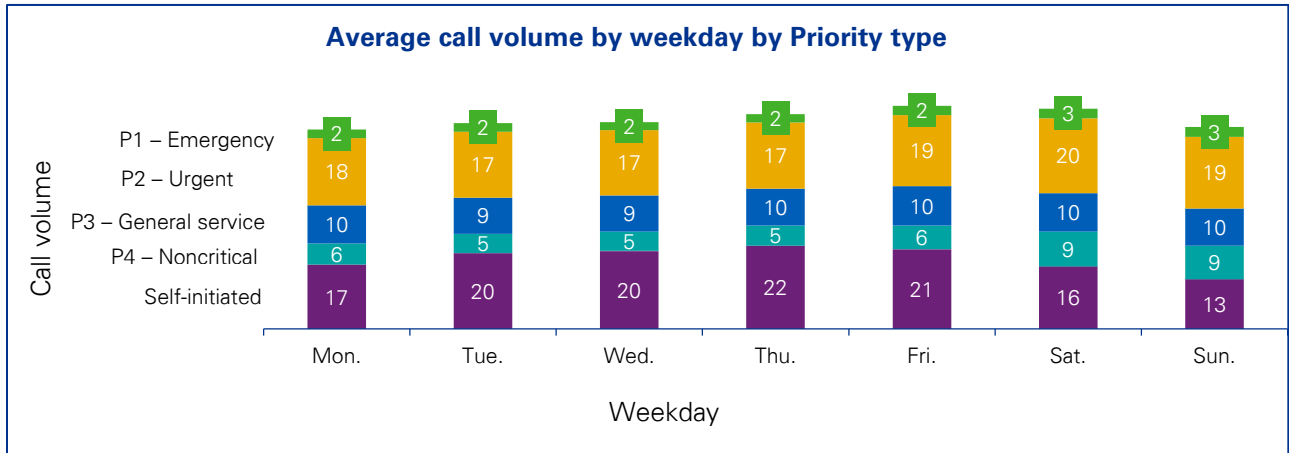
Average annual call volumes

The Southeast Division fields over 171,000 calls annually, approximately 3 percent of which are for Priority 1 incidents and 27 percent of which are for Priority 2 incidents. Priority 3 and 4 calls represent a combined 24 percent of average annual call volume, while department-directed calls make up 18 percent. The most frequent calls are self-initiated, accounting for 27 percent of call volume.

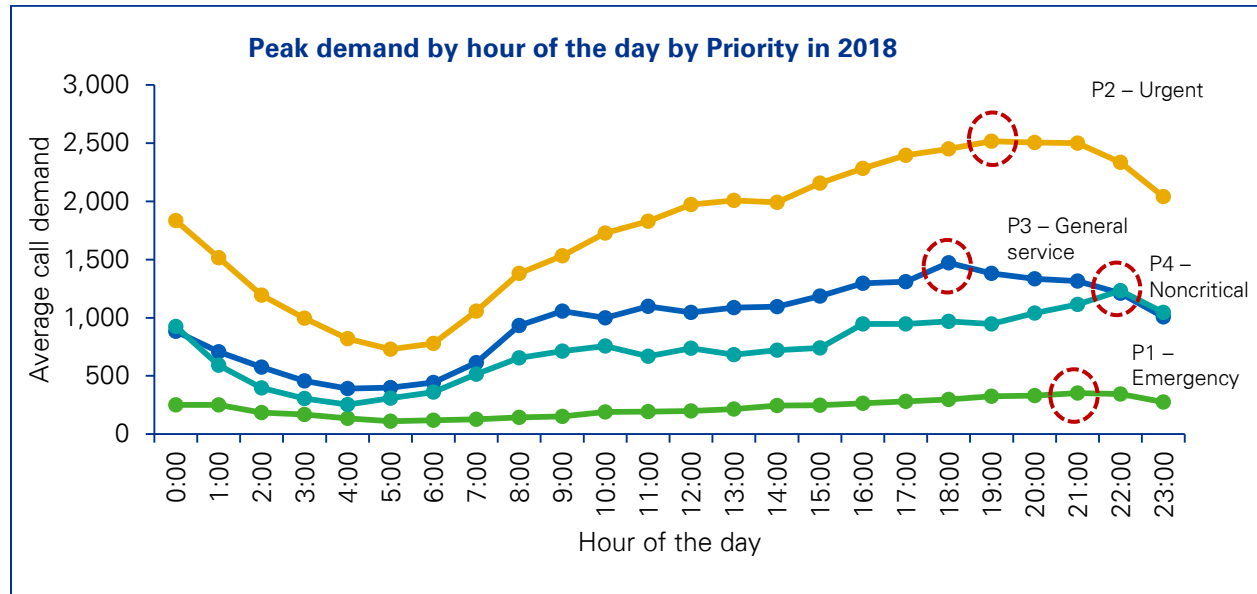


Average daily call volumes

An average of 385 calls are received each week, with an average of 55 calls being received per day. Priority 1 calls occur about twice a day, while Priority 2 calls are received an average of 18 times a day. Priority 3 and 4 calls combined average 16 a day, and self-initiated calls are received an average of 18 times a day.



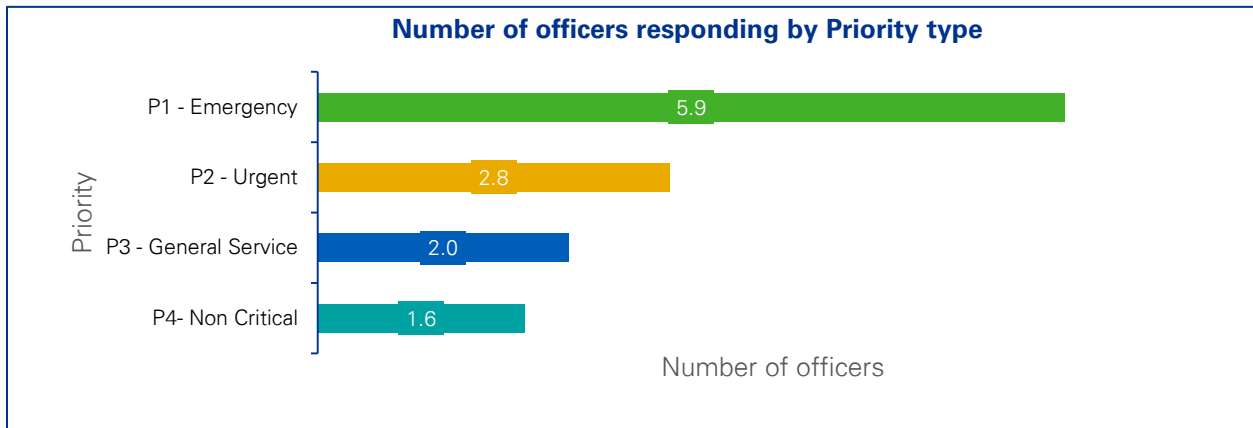
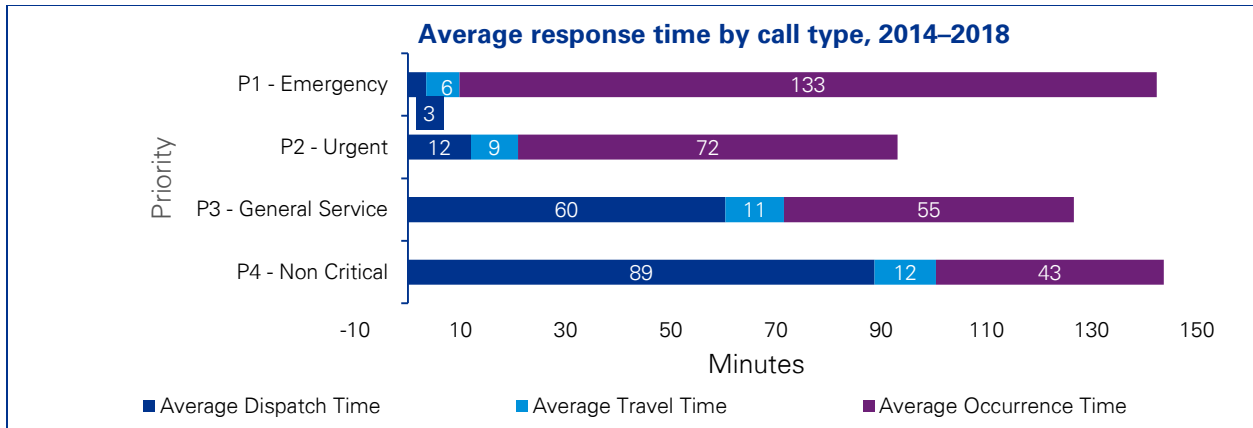
Call volume demand



Hourly call volume demand varies by Priority, as demonstrated by the different hourly peaks in the graph below. In 2018, Priority 1 call volumes peaked at 9:00 PM, with a total of 354 calls being received at that time throughout the year as a whole. Unlike other Priority calls, Priority 1 calls did not exhibit significant fluctuations in volume demand, ranging between 111 calls and 354 calls throughout the year depending on the hour of the day. In contrast, Priority 2–4 calls peaked at 7:00 PM, 6:00 PM, and 10:00 PM, respectively, and exhibited much larger fluctuations in hourly volume demand. Priority 2 ranged from 729 to 2,518 calls, Priority 3 ranged from 390 to 1,472 calls, and Priority 4 ranged from 253 to 1,233 calls. Of the four Priority types, Priority 2 calls were the most frequent during every hour of the day and experienced the largest fluctuation in volume between its trough and peak. Priority 2–4 calls all followed a similar trend by which call volume demand declined in the early hours of the morning between 12:00 AM and 4:00 AM, before gradually increasing as the day began.

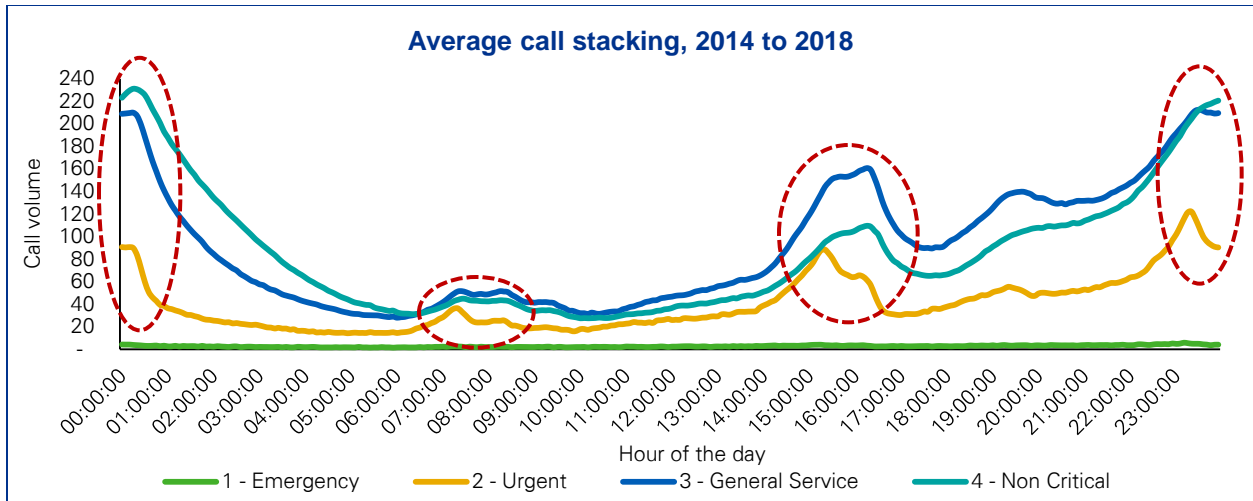
Response times

Response times, calculated as the sum of dispatch and travel time, and how many officers respond, are dependent upon the type of call received. Priority 1 calls average a response time of only 9 minutes with an average of five to six officers responding, while Priority 2 calls average a response time of 21 minutes with an average of two to three officers responding. In contrast, Priority 3 and Priority 4 calls have average response times of 71 minutes and 101 minutes, respectively, with one to two officers responding to each. Time spent on location is also dependent on the Priority of the call, with an average of 133 minutes, 72 minutes, 55 minutes, and 43 minutes spent responding to Priority 1, 2, 3, and 4 calls, respectively.



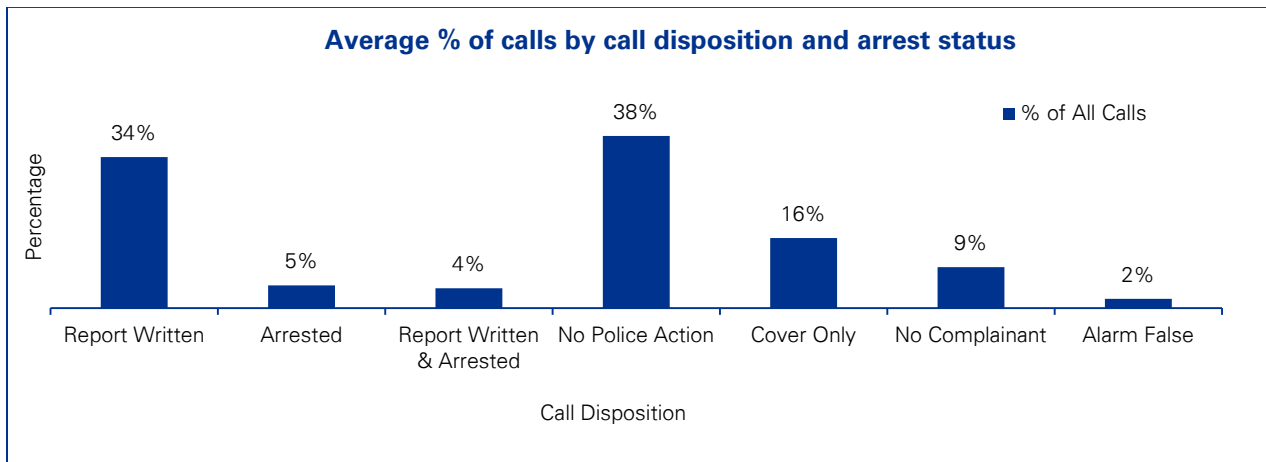
Call stacking

Call stacking, or the number of calls awaiting a response, varied by Priority type from 2014 to 2018 but followed a similar temporal trend based on the time of day. Priority 1 calls ranged from 1 to 6 calls waiting at any point during the day, while Priority 2 calls ranged from 14 to 122 calls. At lower Priority levels, the range in waiting calls increased, with Priority 3 calls ranging from 28 to 213 and Priority 4 calls ranging from 27 to 231. There were noticeable spikes in call stacking around 7:00–9:00 AM, 3:00–5:00 PM, and 10:00 PM–12:00 AM for Priority 2, 3, and 4 calls, coinciding with changes in watch. Watch 1 begins rolling off in favor of Watch 2 between 7:00 and 8:00 AM, Watch 2 begins rolling off in favor of Watch 3 between 3:00 and 4:00 PM, and Watch 3 begins rolling off in favor of Watch 1 again between 11:00 PM and 12:00 AM. Given this staggering in shifts, there should always be officers available to respond to calls regardless of shift change. The buildup in calls waiting around these times, however, could be an indication of officers ending their watch early or starting late. One notable exception was Priority 1 calls, which did not stack despite these shift changes due to their critical nature.



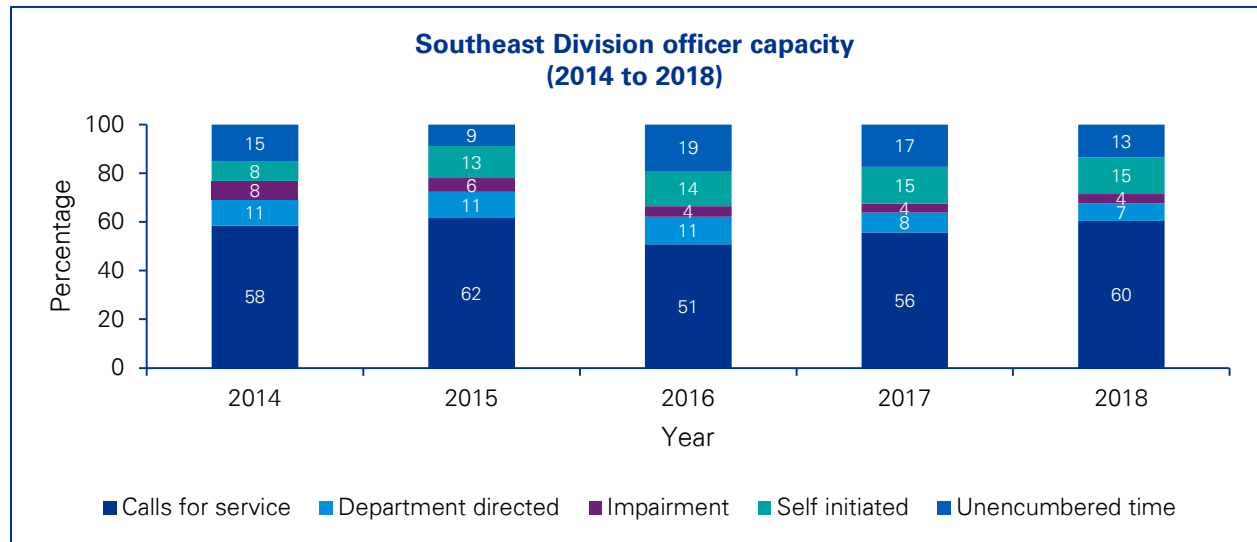
Call disposition and arrest status

The below analysis relates to all call types during the period 2014 to 2018. Of the top seven call dispositions, the majority of calls received, 38 percent, result in no police action being taken, with just a report being written for 34 percent of incidents. There is no complainant upon arrival for 9 percent of calls, with a further 2 percent of calls being a false alarm. For 5 percent of incidents, a suspect is arrested, with an arrest and a report being written for an additional 4 percent of incidents. This indicates that the majority of the police work undertaken tends to be focused on situations other than major crimes.



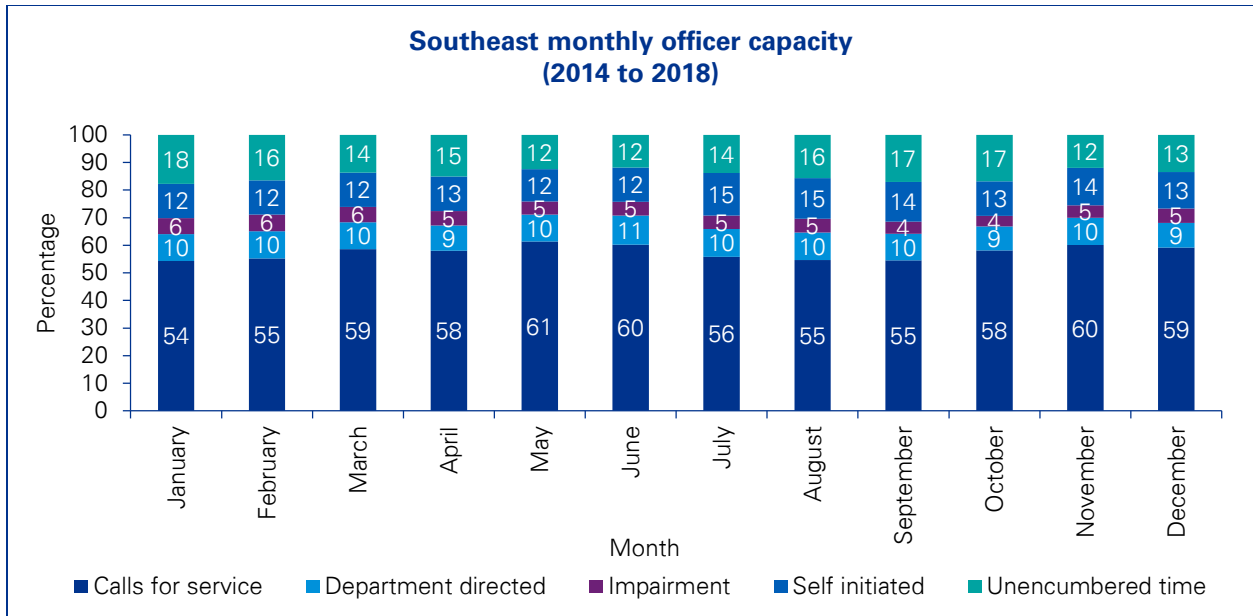
Officer yearly capacity

The percentage of time officers spend responding to calls for service has increased over the past three years, from 51 percent in 2016 to 60 percent in 2018. A corresponding decrease in unencumbered time has been seen during the same timeframe, from 19 percent in 2016 to 13 percent in 2018. Self-initiated time has increased since 2014, from 8 percent to 15 percent. Department-directed time has decreased from 11 percent to 7 percent, while impairment time (time spent going for lunch, defending a ticket in court, setting up the patrol car, etc.) has decreased from 8 percent to 4 percent over the course of the past five years.



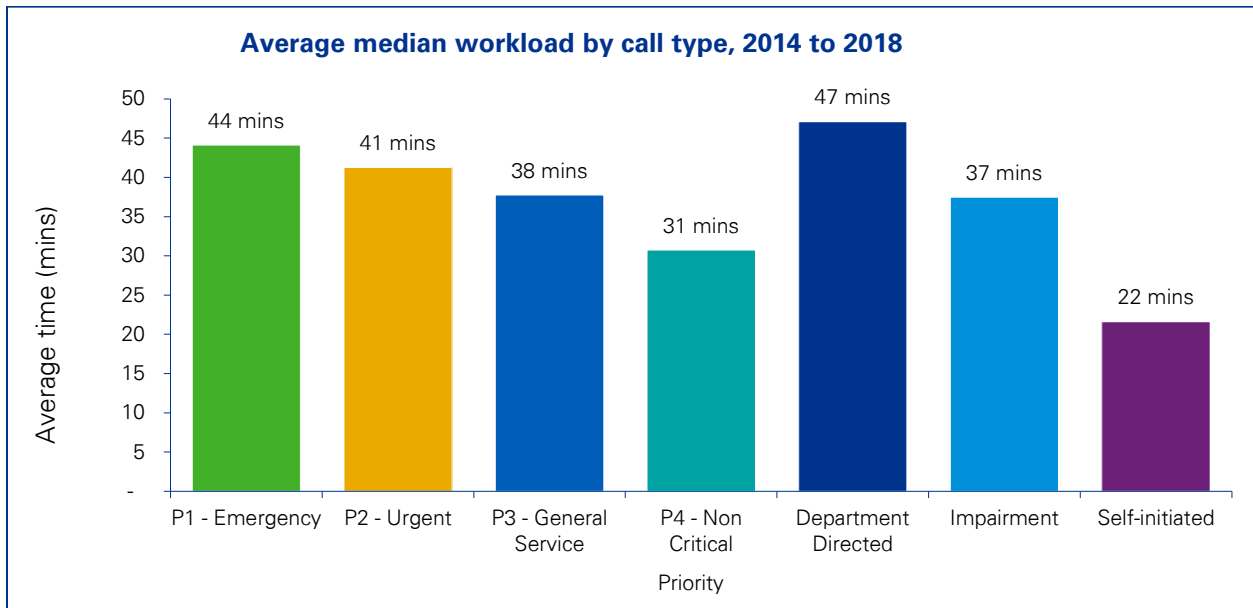
Officer monthly capacity

The percentage of time officers spend responding to calls for service exhibited modest variability on a monthly basis from 2014 to 2018, ranging from 54 percent to 61 percent, roughly in line with the 2018 average seen above. Unencumbered time, the second largest share, ranged from 12 percent to 18 percent of time, averaging 15 percent. Time spent responding to department-directed and self-initiated calls showed little variability, with department-directed ranging from 9 percent to 11 percent and self-initiated ranging from 12 percent to 15 percent of time. Impairment time remained largely unchanged month to month, averaging 5 percent of total time.

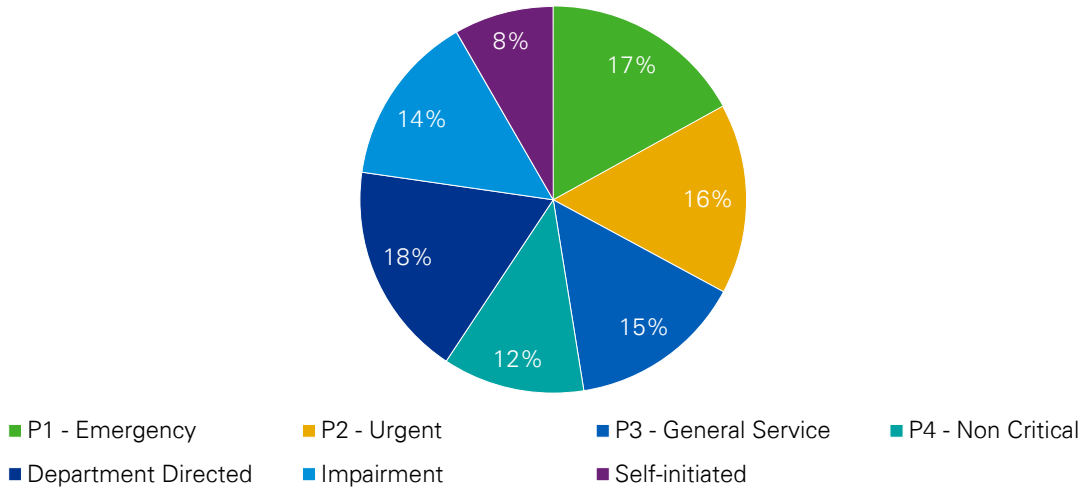


Median workload

From 2014 to 2018, department-directed calls had the greatest average median workload at 47 minutes, or 18 percent of total workload. Priority 1 calls were a close second at 44 minutes, or 17 percent of total workload, while Priority 2 and Priority 3 calls took 16 percent and 15 percent of total workload, respectively, at 41 minutes and 38 minutes. Self-initiated calls, despite having the highest annual call volume, took the least amount of time at just 22 minutes, or 8 percent of total workload.



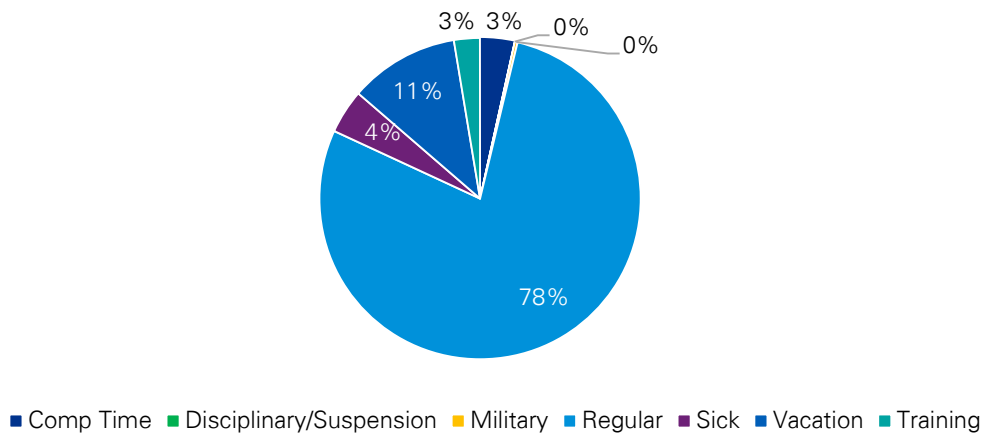
Average % call workload, 2014 to 2018



Officer productive hours

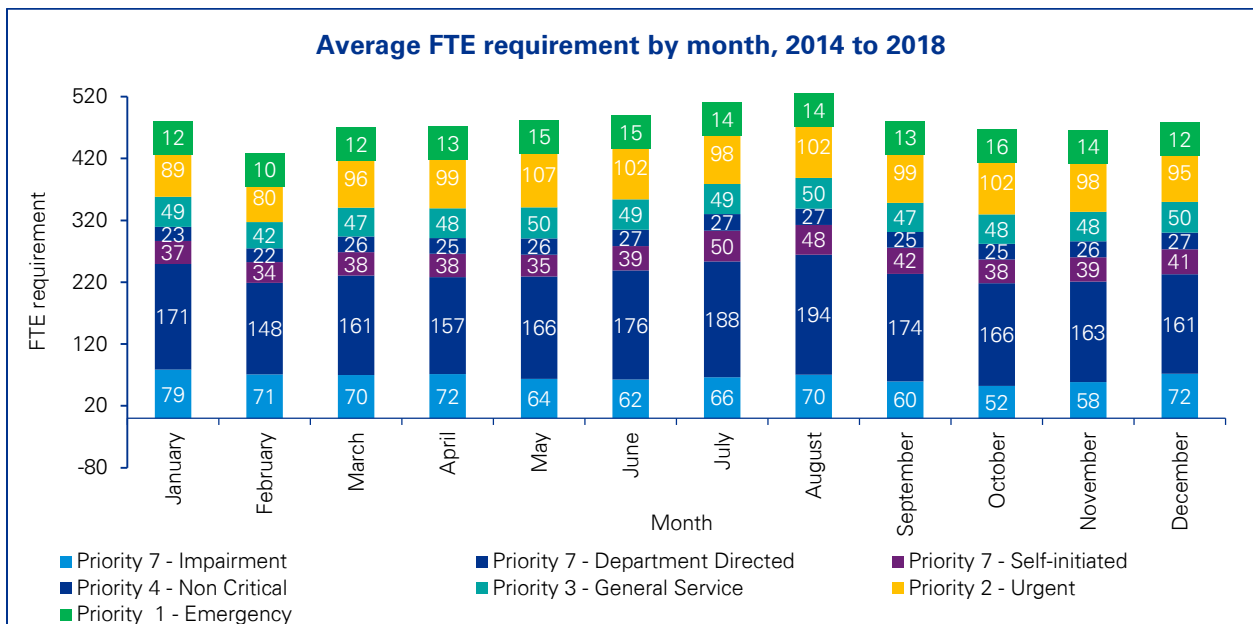
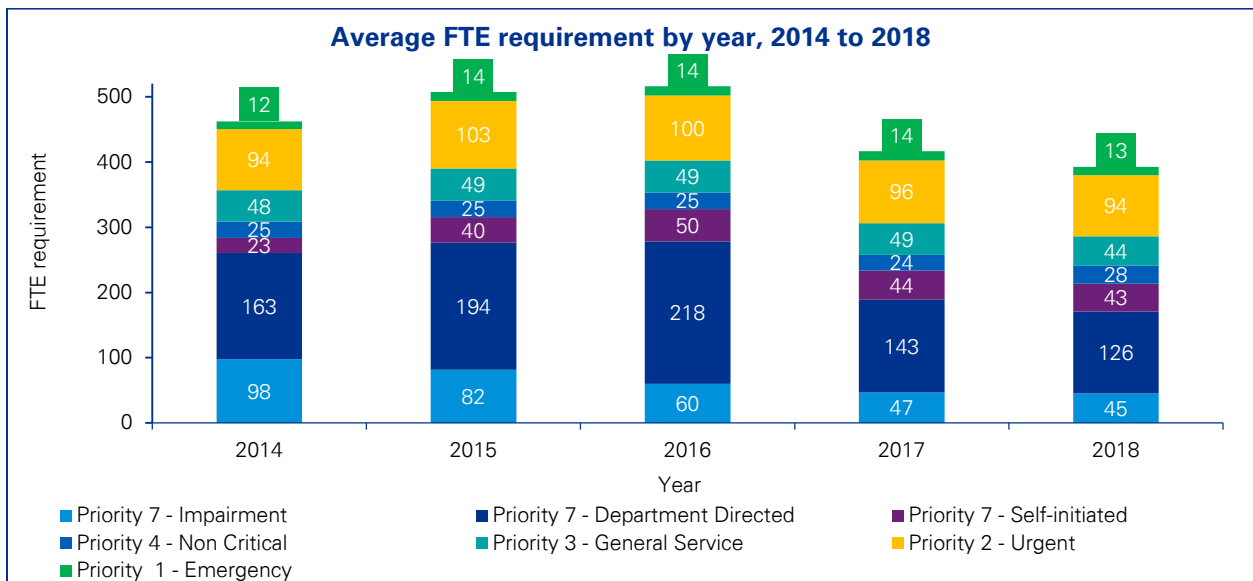
The Southeast Division averages 1,612 productive hours a year out of 2,080 total hours, or 78 percent. Of the remaining 468 hours considered nonproductive, 49 percent (230 hours) are used for vacation, 20 percent (92 hours) are used for sick time, 15 percent (72 hours) are taken as comp time, and 12 percent (54 hours) are used for training. A de minimis percentage is used for military commitments and disciplinary/suspension reasons. Note: Percentages below may not equal 100 percent due to rounding.

Southeast Patrol Division



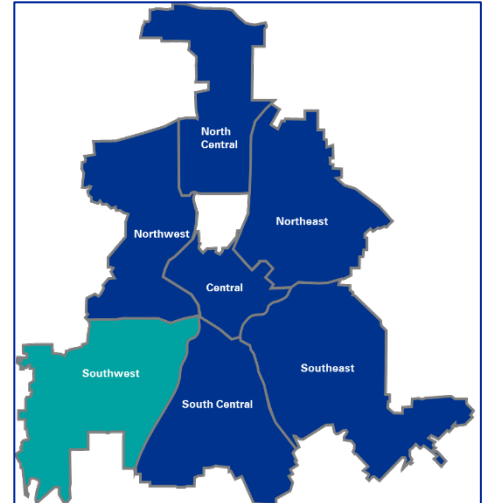
FTE analysis

From 2014 to 2018, the FTE service hour equivalents for Priority 1 and Priority 4 calls have remained relatively consistent, averaging 13 and 25, respectively. Priority 2 calls averaged the second highest FTE service hour equivalents at 97 and Priority 3 calls averaged 48. Self-initiated calls have experienced a sharp increase over the past five years from 23 to 43, while impairment has decreased from 98 to 45. Department-directed calls required the highest average FTE service hour equivalents at 168. Overall, the average FTE service hour equivalents over the past five years for the division were 459, of which 184 (40 percent) were related to core Priorities 1–4, with months such as August having a higher equivalent (505) and February having a lower equivalent (407). Of note, the FTE service hour equivalents shown below are not optimized for temporal trends or specific supply and demand criteria, but rather reflect the gross requirement derived from the median workload per call type multiplied by the volume for each call type and should not be considered as recommended staffing levels.



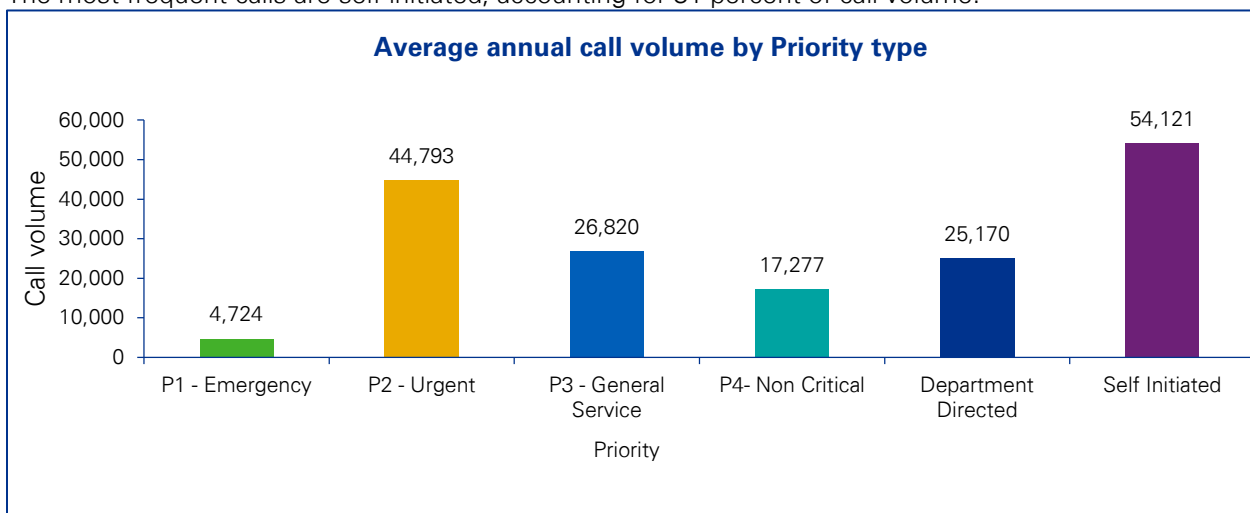
Southwest Division

Attributes	Values
Square miles	76.72
Population	212,000
Top three calls	Self-initiated, Priority 2, Priority 3
Peak times	21:00–22:00
Peak time call volumes	5,379



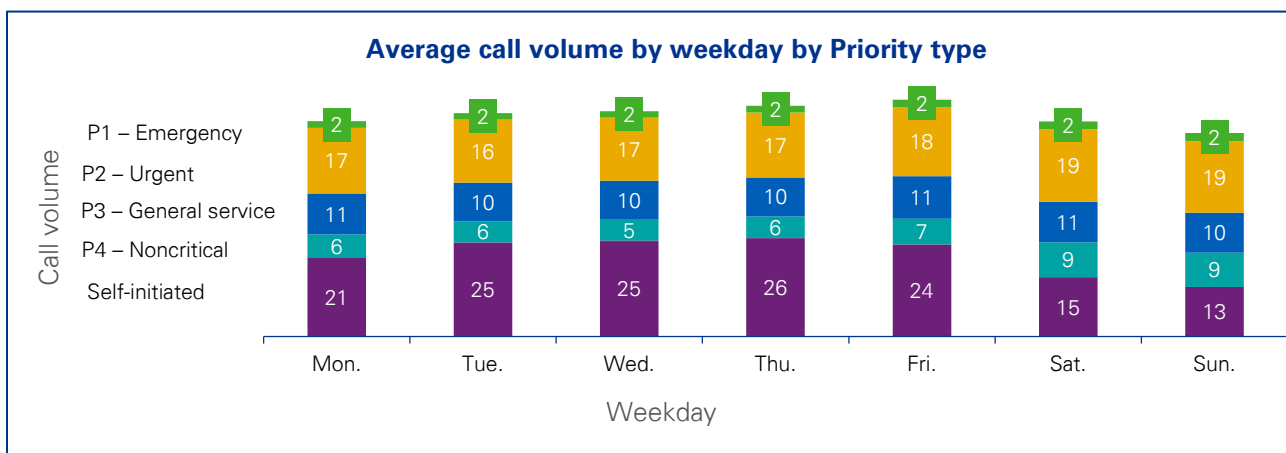
Average annual call volumes

The Southwest Division fields over 172,000 calls annually, approximately 3 percent of which are for Priority 1 incidents and 26 percent of which are for Priority 2 incidents. Priority 3 and 4 calls represent a combined 26 percent of average annual call volume, while department-directed calls make up 15 percent. The most frequent calls are self-initiated, accounting for 31 percent of call volume.



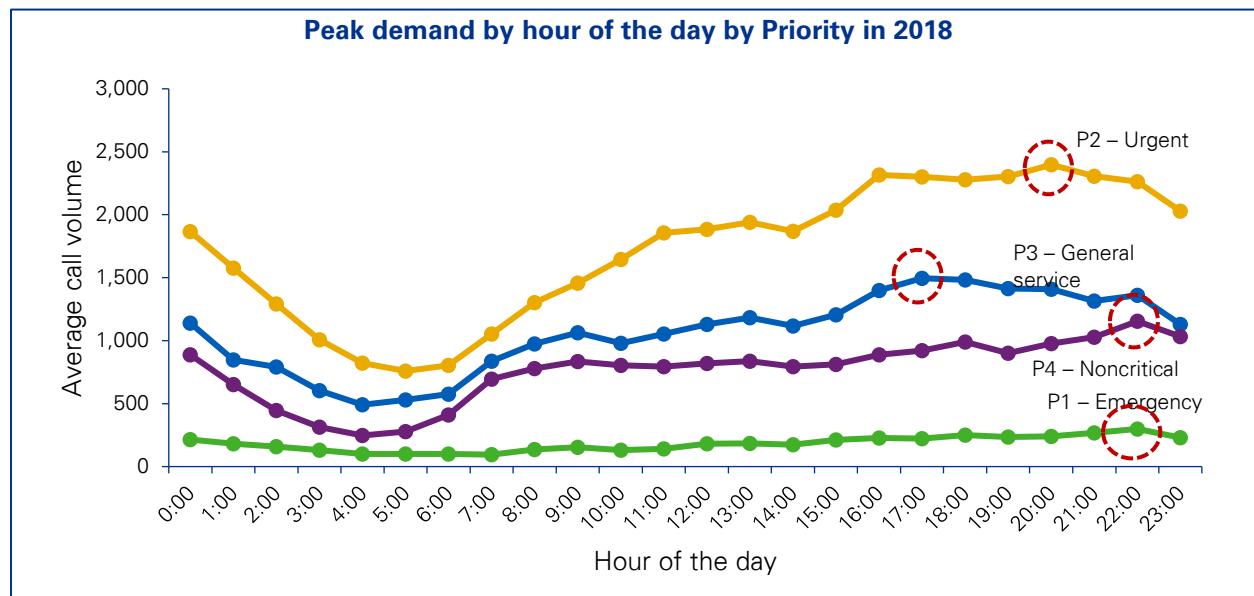
Average daily call volumes

An average of 407 calls are received each week, with call volume decreasing slightly during the weekend. An average of 59 calls are received per day Monday through Friday, while only 55 calls on average are received per day during Saturday and Sunday. Priority 1 calls occur about twice a day, while Priority 2 calls are received an average of 18 times a day. Priority 3 and 4 calls combined average 17 a day, and self-initiated calls have the highest daily volume, with an average of 21 a day.



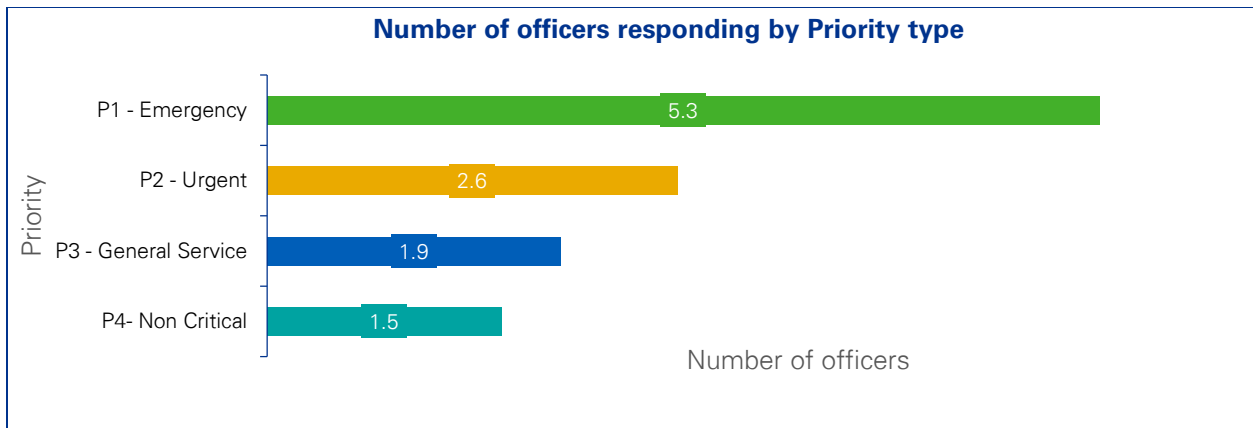
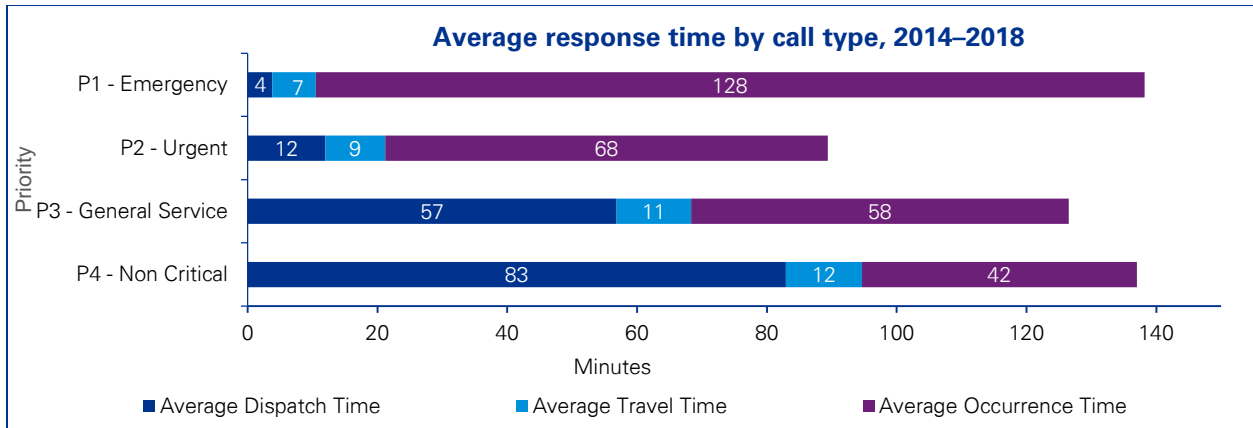
Call volume demand

Hourly call volume demand varies by Priority, as demonstrated by the different hourly peaks in the graph below. In 2018, Priority 1 call volumes peaked at 10:00 PM, with a total of 299 calls being received at that time throughout the year as a whole. Unlike other Priority calls, Priority 1 calls did not exhibit significant fluctuations in volume demand, ranging between 95 calls and 299 calls throughout the year depending on the hour of the day. In contrast, Priority 2–4 calls peaked at 8:00 PM, 5:00 PM, and 10:00 PM, respectively, and exhibited much larger fluctuations in hourly volume demand. Priority 2 ranged from 759 to 2,397 calls, Priority 3 ranged from 491 to 1,496 calls, and Priority 4 ranged from 247 to 1,154 calls. Of the four Priority types, Priority 2 calls were the most frequent during every hour of the day and experienced the largest fluctuation in volume between its trough and peak. Priority 2–4 calls all followed a similar trend by which call volume demand declined in the early hours of the morning between 12:00 AM and 4:00 AM, before gradually increasing as the day began.



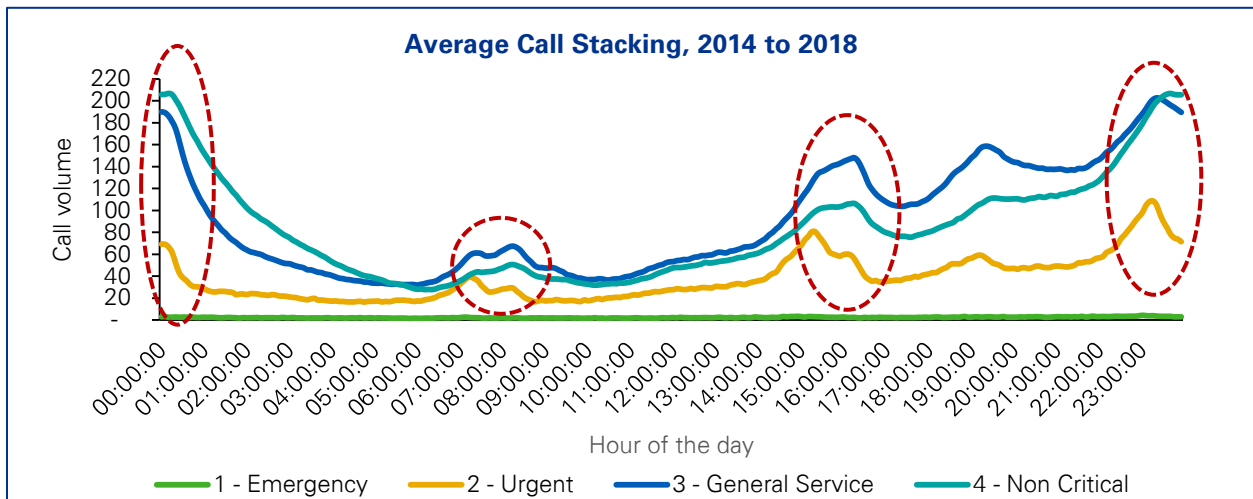
Response times

Response times, calculated as the sum of dispatch and travel time, and how many officers respond, are dependent upon the type of call received. Priority 1 calls average a response time of only 11 minutes with an average of five to six officers responding, while Priority 2 calls average a response time of 21 minutes with an average of two to three officers responding. In contrast, Priority 3 and Priority 4 calls have average response times of 68 minutes and 95 minutes, respectively, with one to two officers responding to each. Time spent on location is also dependent on the Priority of the call, with an average of 128 minutes, 68 minutes, 58 minutes, and 42 minutes spent responding to Priority 1, 2, 3, and 4 calls, respectively.



Call stacking

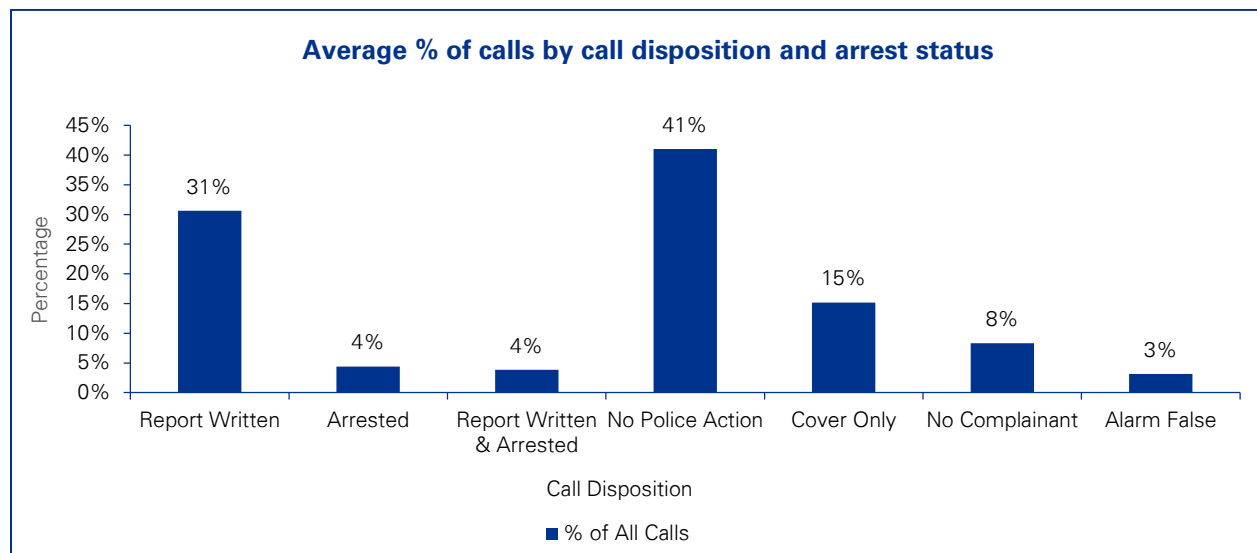
Call stacking, or the number of calls awaiting a response, varied by Priority type from 2014 to 2018 but followed a similar temporal trend based on the time of day. Priority 1 calls ranged from 1 to 4 calls waiting at any point during the day, while Priority 2 calls ranged from 16 to 109 calls. At lower Priority levels, the range in waiting calls increased, with Priority 3 calls ranging from 32 to 203 and Priority 4 calls ranging from 28 to 207. There were noticeable spikes in call stacking around 7:00–9:00 AM, 3:00–5:00 PM, and 10:00 PM–12:00 AM for Priority 2, 3, and 4 calls, coinciding with changes in watch. Watch 1



begins rolling off in favor of Watch 2 between 7:00 and 8:00 AM, Watch 2 begins rolling off in favor of Watch 3 between 3:00 and 4:00 PM, and Watch 3 begins rolling off in favor of Watch 1 again between 11:00 PM and 12:00 AM. Given this staggering in shifts, there should always be officers available to respond to calls regardless of shift change. The buildup in calls waiting around these times, however, could be an indication of officers ending their watch early or starting late. One notable exception was Priority 1 calls, which did not stack despite these shift changes due to their critical nature.

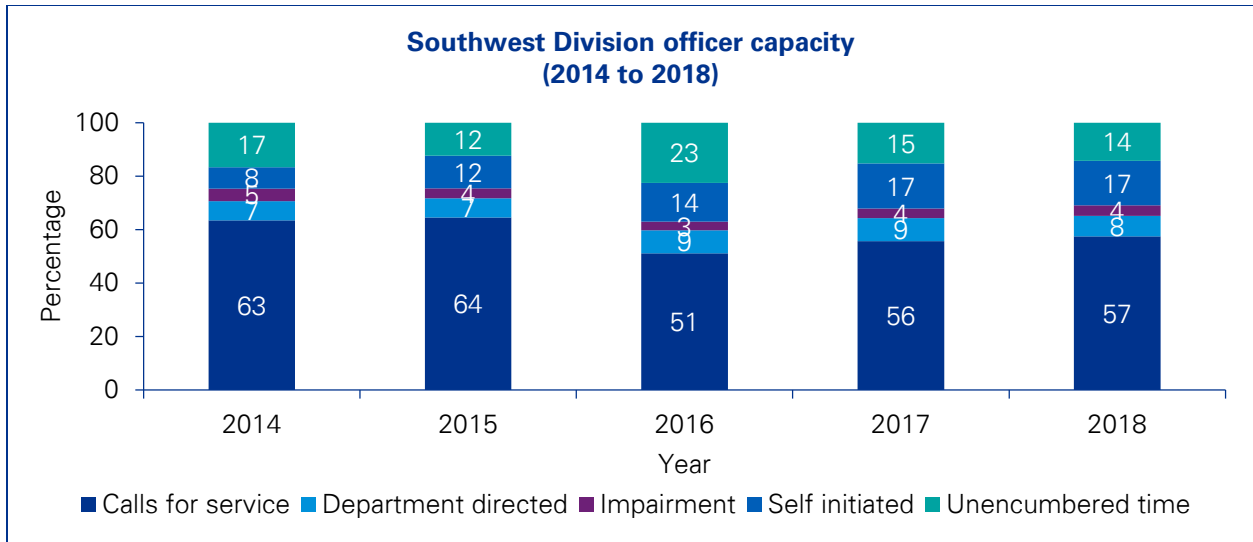
Call disposition and arrest status

The below analysis relates to all call types during the period 2014 to 2018. Of the top seven call dispositions, the majority of calls received, 41 percent, result in no police action being taken, with just a report being written for 31 percent of incidents. There is no complainant upon arrival for 8 percent of calls, with a further 3 percent of calls being a false alarm. For 4 percent of incidents, a suspect is arrested, with an arrest and a report being written for an additional 4 percent of incidents. This indicates that the majority of the police work undertaken tends to be focused on situations other than major crimes.



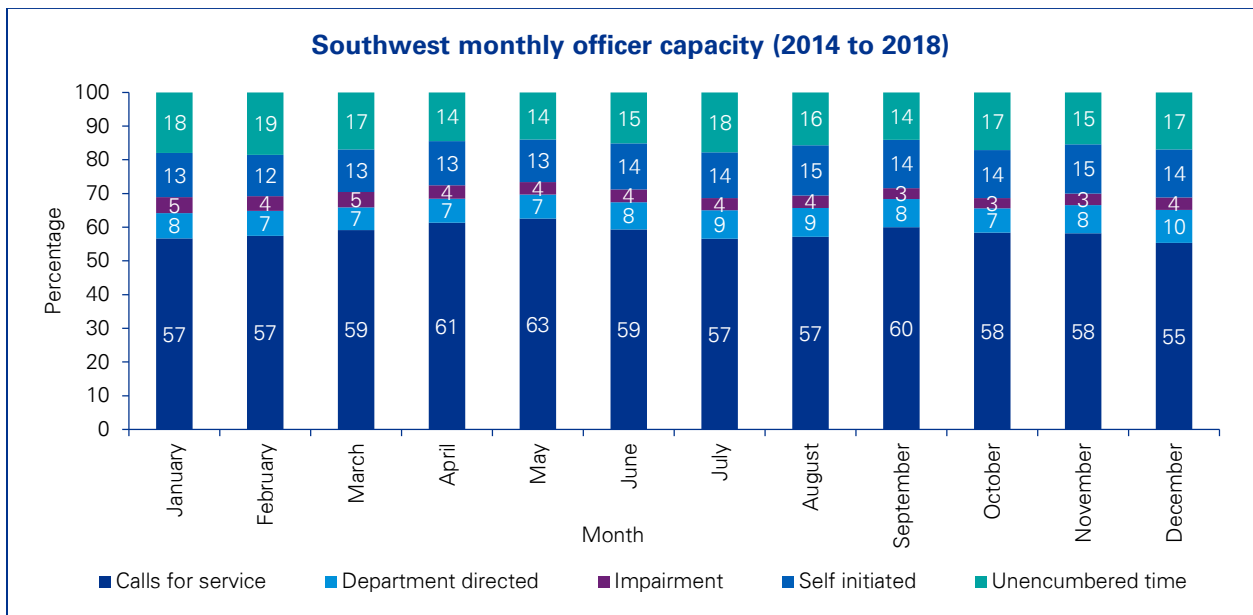
Officer yearly capacity

The percentage of time officers spend responding to calls for service has increased over the past three years, from 51 percent in 2016 to 57 percent in 2018. A corresponding decrease in unencumbered time has been seen during the same timeframe, from 23 percent in 2016 to 14 percent in 2018. Self-initiated time has increased since 2014, from 8 percent to 17 percent. Department-directed time has remained relatively constant at 7 percent to 9 percent, while impairment time (time spent going for lunch, defending a ticket in court, setting up the patrol car, etc.) has remained relatively constant at 4 percent over the course of the past five years.



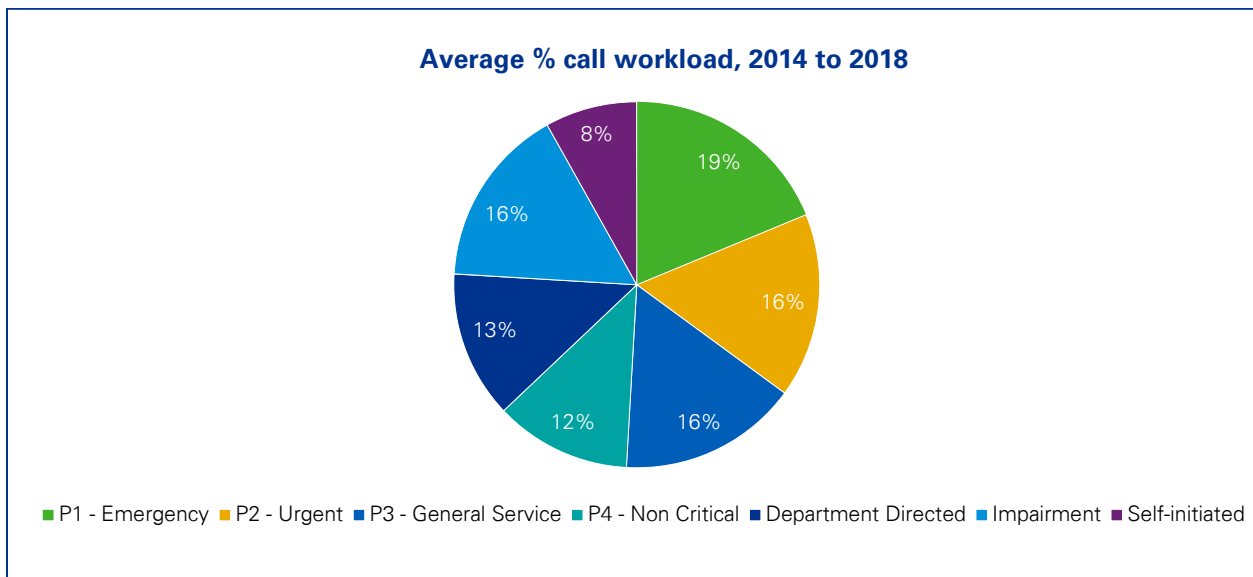
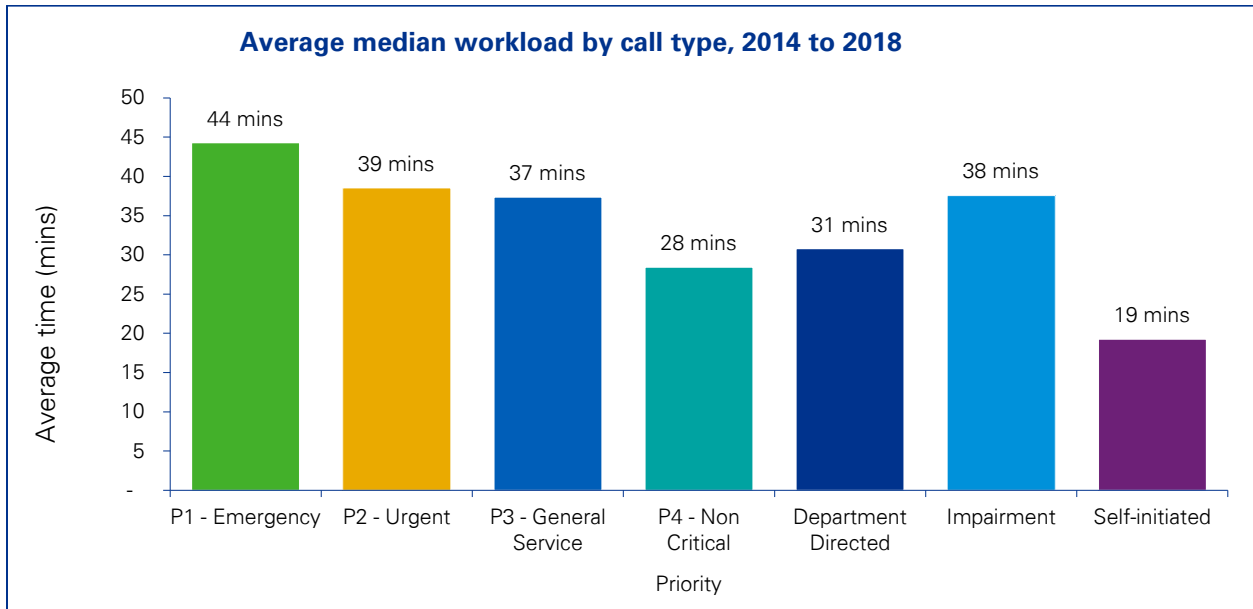
Officer monthly capacity

The percentage of time officers spend responding to calls for service exhibited modest variability on a monthly basis from 2014 to 2018, ranging from 55 percent to 63 percent, roughly in line with the 2018 average seen above. Unencumbered time, the second largest share, ranged from 14 percent to 19 percent of time, averaging 16 percent. Time spent responding to department-directed and self-initiated calls showed little variability, with department-directed ranging from 7 percent to 10 percent and self-initiated ranging from 12 percent to 15 percent of time. Impairment time remained largely unchanged month to month, averaging 4 percent of total time.



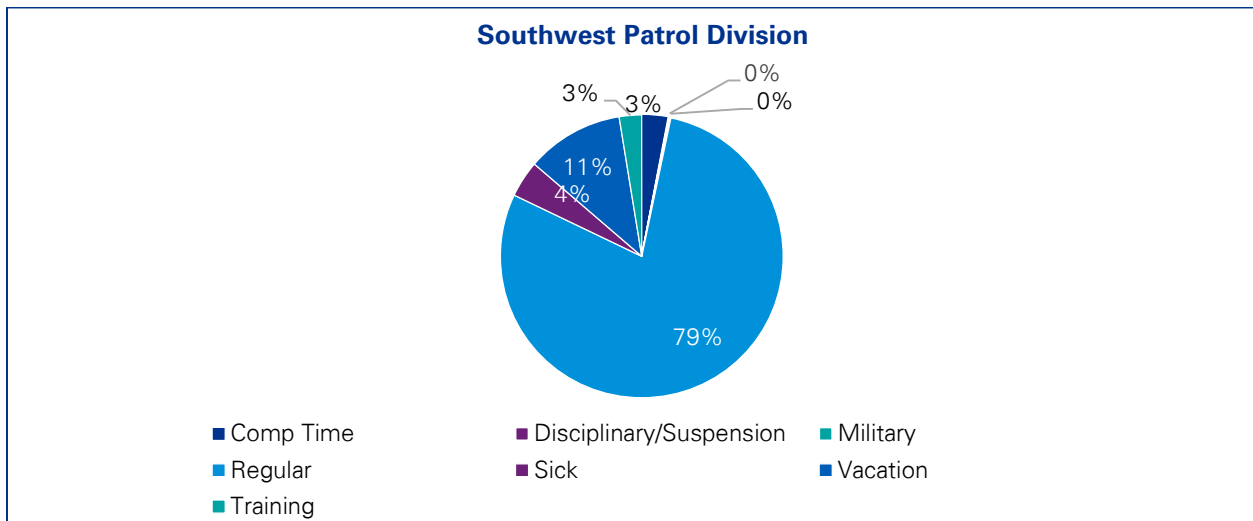
Median workload

From 2014 to 2018, Priority 1 calls had the greatest average median workload at 44 minutes, or 19 percent of total workload. Priority 2 calls were second at 39 minutes, or 16 percent of total workload, while impairment and Priority 3 calls each took 16 percent of total workload at 38 minutes and 37 minutes, respectively. Self-initiated calls, despite having the highest annual call volume, took up the least amount of time at just 19 minutes, or 8 percent of total workload.



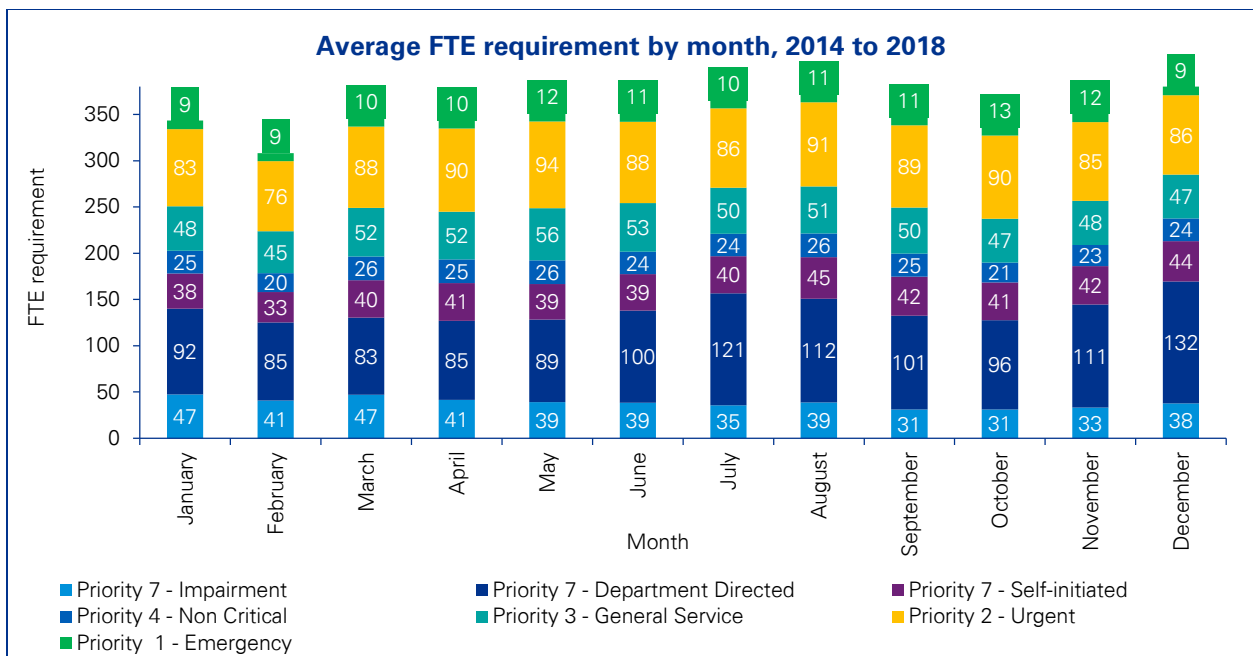
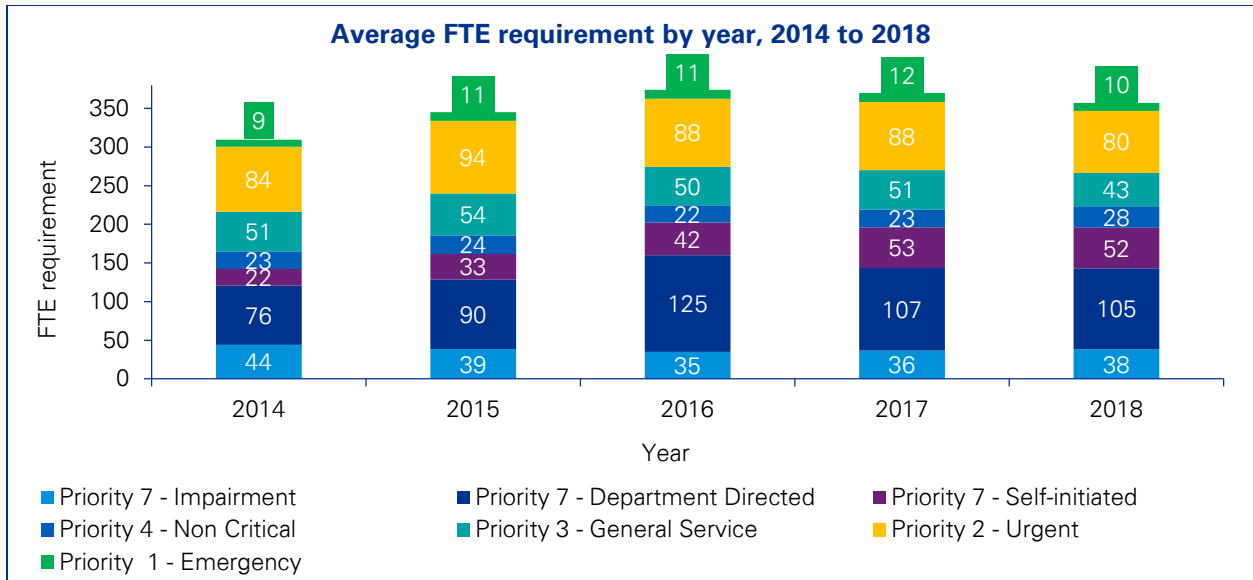
Officer productive hours

The Southwest Division averages 1,640 productive hours a year out of 2,080 total hours, or 79 percent. Additionally, 11 percent of total hours are used for vacation; 4 percent are used for sick time, 3 percent are taken as comp time, and 3 percent are used for training. A de minimis percentage is used for military commitments and disciplinary/suspension reasons.



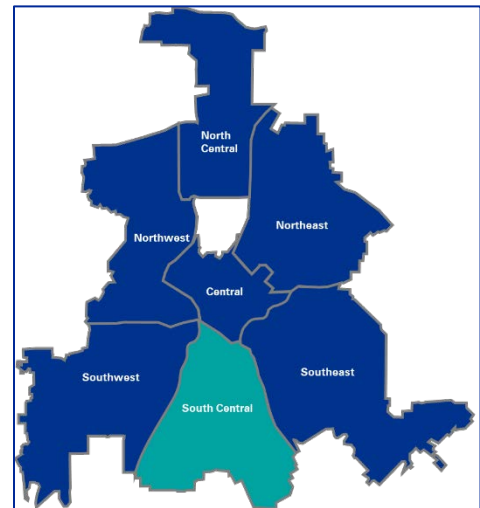
FTE analysis

From 2014 to 2018, the FTE service hour equivalents for Priority 1 and Priority 4 calls have remained relatively consistent, averaging 11 and 24, respectively. Priority 2 calls averaged the second highest FTE service hour equivalents at 87 and Priority 3 calls averaged the third highest at 50. Self-initiated calls have experienced a sharp increase over the past five years from 22 to 52, while impairment has decreased from 44 to 38. Department-directed calls required the highest average FTE service hour equivalents at 100. Overall, the average FTE service hour equivalents over the past five years for the division were 351, of which 172 (49 percent) were related to core Priorities 1–4, with months such as December having a higher equivalent (380) and February having a lower equivalent (309). Of note, the FTE service hour equivalents shown below are not optimized for temporal trends or specific supply and demand criteria, but rather reflect the gross requirement derived from the median workload per call type multiplied by the volume for each call type and should not be considered as recommended staffing levels.



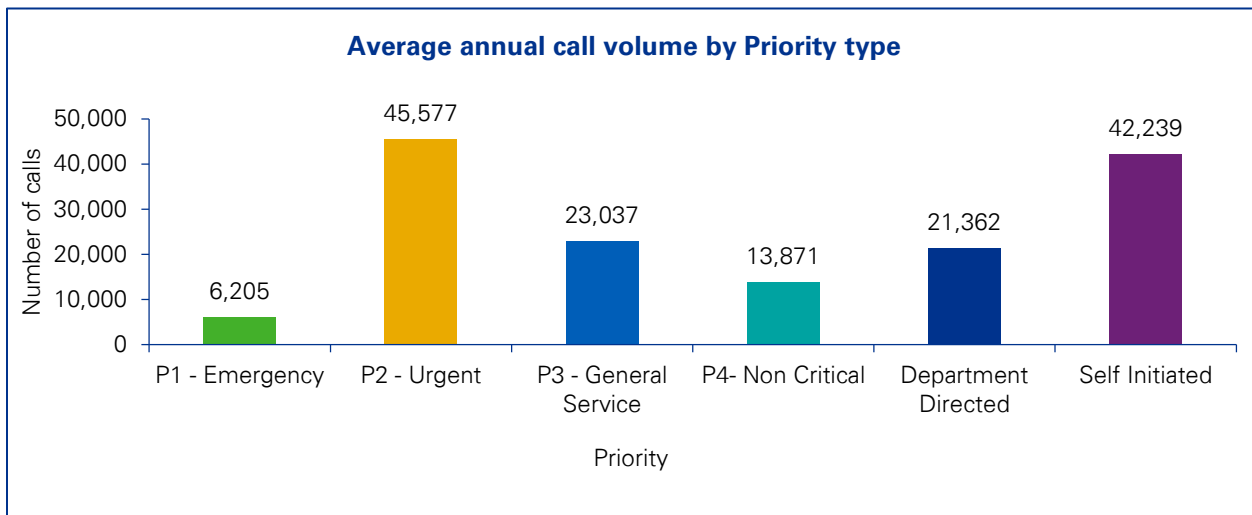
South Central Division

Attributes	Values
Square miles	54.50
Population	128,000
Top three calls	Priority 2, self-initiated, Priority 3
Peak times	18:00–19:00
Peak time call volumes	5,165



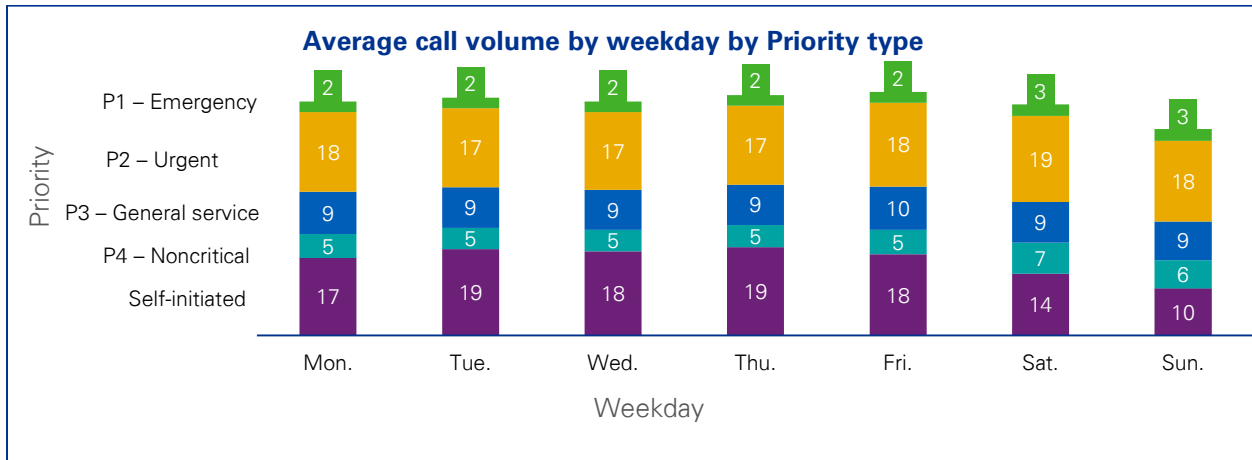
Average annual call volumes

The South Central Division fields over 152,000 calls annually, approximately 4 percent of which are for Priority 1 incidents and 30 percent of which are for Priority 2 incidents, the most frequent call type. Priority 3 and 4 calls represent a combined 24 percent of average annual call volume, while department-directed calls make up 14 percent. Self-initiated calls account for 28 percent of call volume.



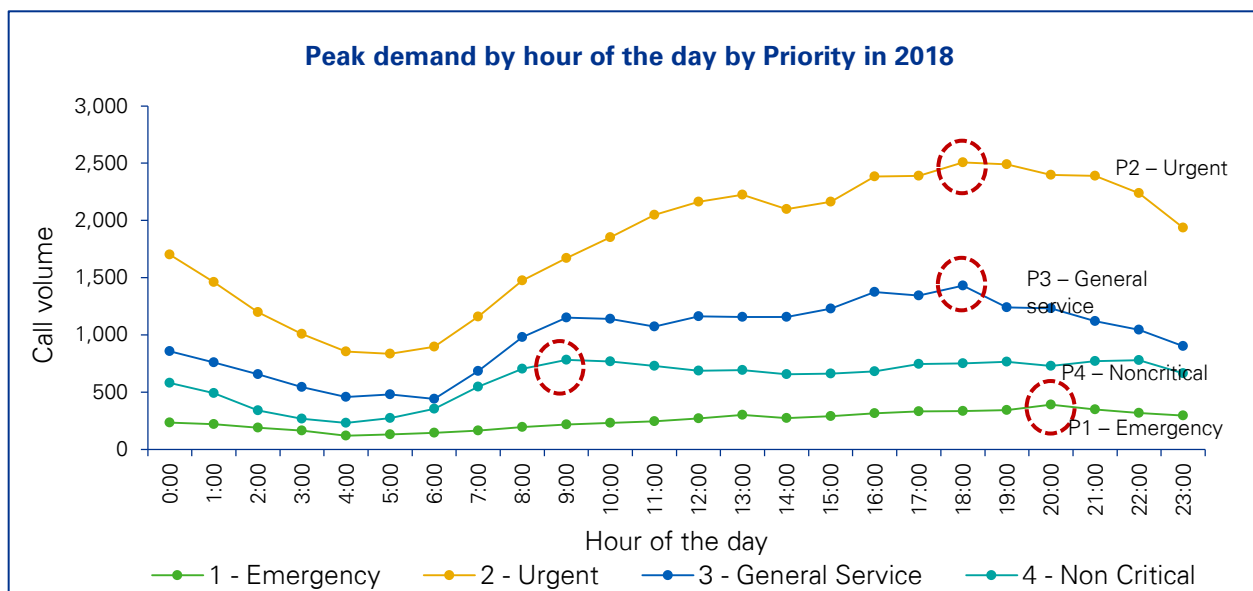
Average daily call volumes

An average of 357 calls are received each week, with call volume decreasing slightly during the weekend. An average of 52 calls are received per day Monday through Friday, while only 49 calls on average are received per day during Saturday and Sunday. Priority 1 calls occur about twice a day, while Priority 2 calls are received an average of 18 times a day. Priority 3 and 4 calls combined average 14 a day, and self-initiated calls are received an average of 17 times a day.



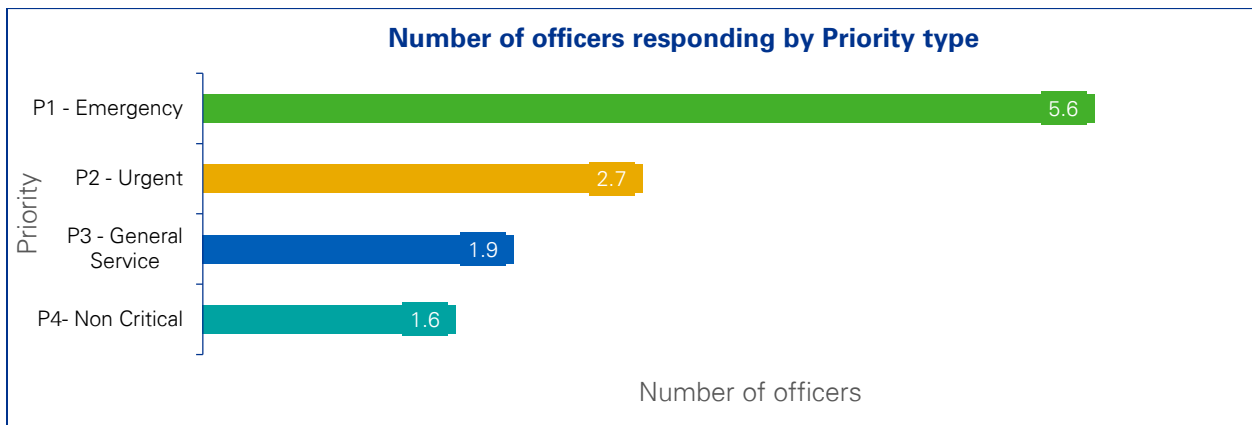
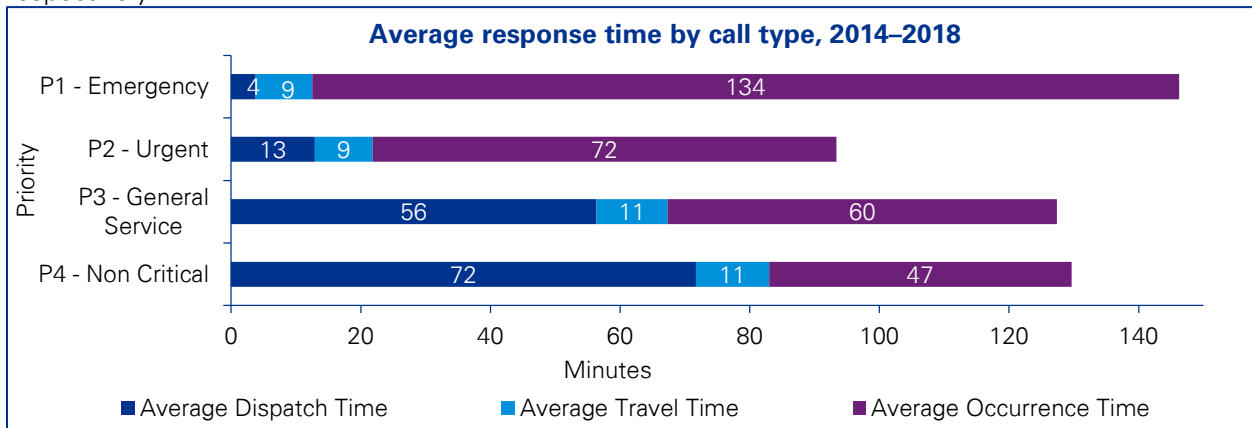
Call volume demand

Hourly call volume demand varies by Priority, as demonstrated by the different hourly peaks in the graph below. In 2018, Priority 1 call volumes peaked at 8:00 PM, with a total of 391 calls being received at that time throughout the year as a whole. Unlike other Priority calls, Priority 1 calls did not exhibit significant fluctuations in volume demand, ranging between 119 calls and 391 calls throughout the year depending on the hour of the day. In contrast, Priority 2–4 calls peaked at 6:00 PM, 6:00 PM, and 9:00 AM, respectively, and exhibited much larger fluctuations in hourly volume demand. Priority 2 ranged from 836 to 2,507 calls, Priority 3 ranged from 441 to 1,431 calls, and Priority 4 ranged from 231 to 783 calls. Of the four Priority types, Priority 2 calls were the most frequent during every hour of the day and experienced the largest fluctuation in volume between its trough and peak. Priority 2–4 calls all followed a similar trend by which call volume demand declined in the early hours of the morning between 12:00 AM and 4:00 AM, before gradually increasing as the day began.



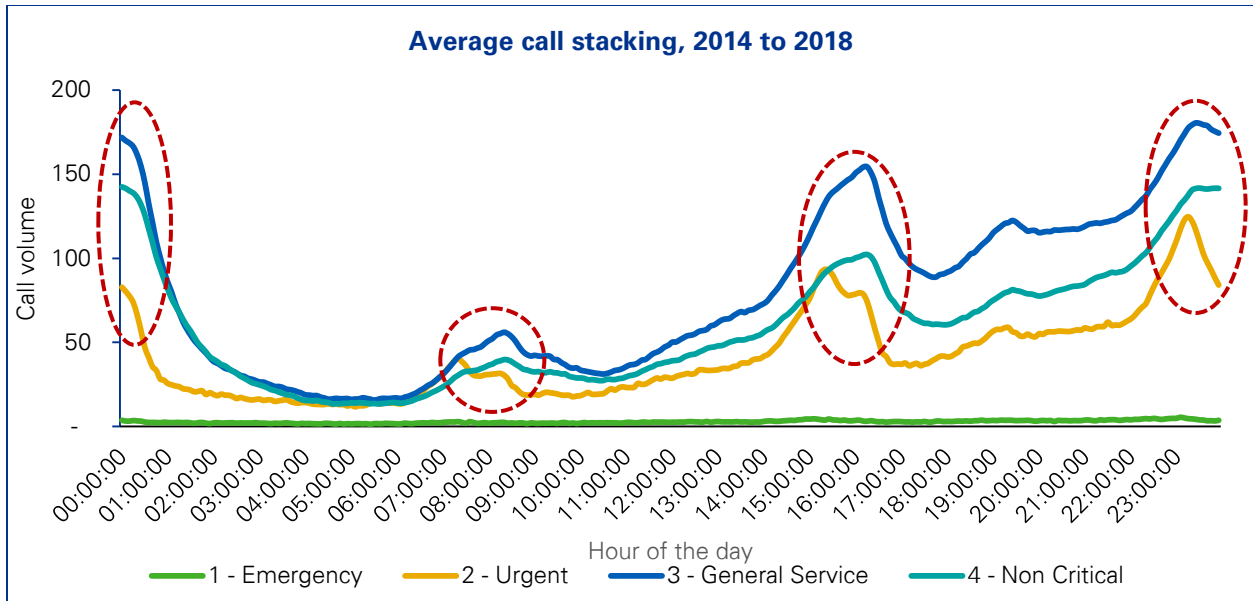
Response times

Response times, calculated as the sum of dispatch and travel time, and how many officers respond, are dependent upon the type of call received. Priority 1 calls average a response time of only 13 minutes with an average of five to six officers responding, while Priority 2 calls average a response time of 22 minutes with an average of two to three officers responding. In contrast, Priority 3 and Priority 4 calls have average response times of 67 minutes and 83 minutes, respectively, with one to two officers responding to each. Time spent on location is also dependent on the Priority of the call, with an average of 134 minutes, 72 minutes, 60 minutes, and 47 minutes spent responding to Priority 1, 2, 3, and 4 calls, respectively.



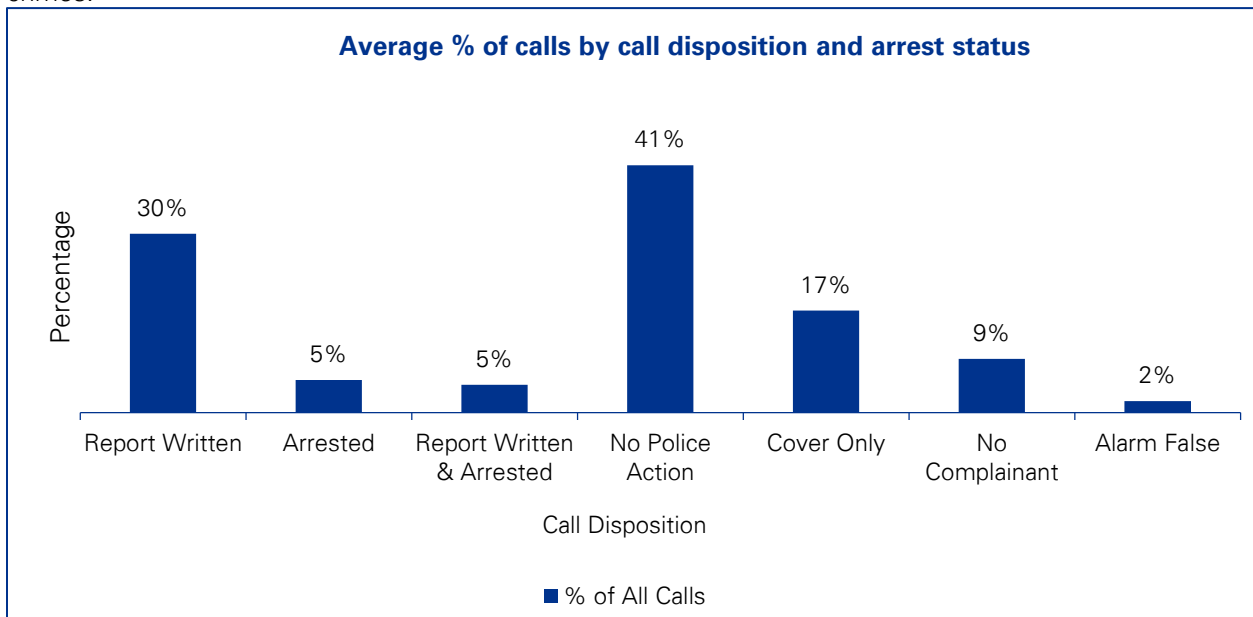
Call stacking

Call stacking, or the number of calls awaiting a response, varied by Priority type from 2014 to 2018 but followed a similar temporal trend based on the time of day. Priority 1 calls ranged from 1 to 6 calls waiting at any point during the day, while Priority 2 calls ranged from 12 to 125 calls. At lower Priority levels, the range in waiting calls increased, with Priority 3 calls ranging from 16 to 180 and Priority 4 calls ranging from 13 to 142. There were noticeable spikes in call stacking around 7:00–9:00 AM, 3:00–5:00 PM, and 10:00 PM–12:00 AM for Priority 2, 3, and 4 calls, coinciding with changes in watch. Watch 1 begins rolling off in favor of Watch 2 between 7:00 and 8:00 AM, Watch 2 begins rolling off in favor of Watch 3 between 3:00 and 4:00 PM, and Watch 3 begins rolling off in favor of Watch 1 again between 11:00 PM and 12:00 AM. Given this staggering in shifts, there should always be officers available to respond to calls regardless of shift change. The buildup in calls waiting around these times, however, could be an indication of officers ending their watch early or starting late. One notable exception was Priority 1 calls, which did not stack despite these shift changes due to their critical nature.



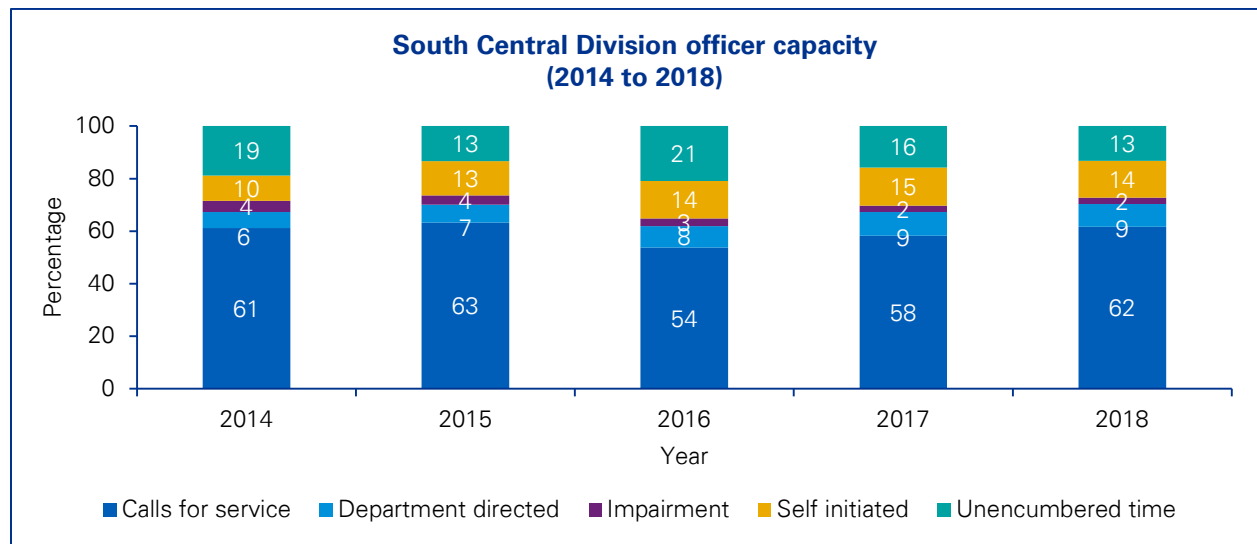
Call disposition and arrest status

The below analysis relates to all call types during the period 2014 to 2018. Of the top seven call dispositions, the majority of calls received, 41 percent, result in no police action being taken, with just a report being written for 30 percent of incidents. There is no complainant upon arrival for 9 percent of calls, with a further 2 percent of calls being a false alarm. For 5 percent of incidents, a suspect is arrested, with an arrest and a report being written for an additional 5 percent of incidents. This indicates that the majority of the police work undertaken tends to be focused on situations other than major crimes.



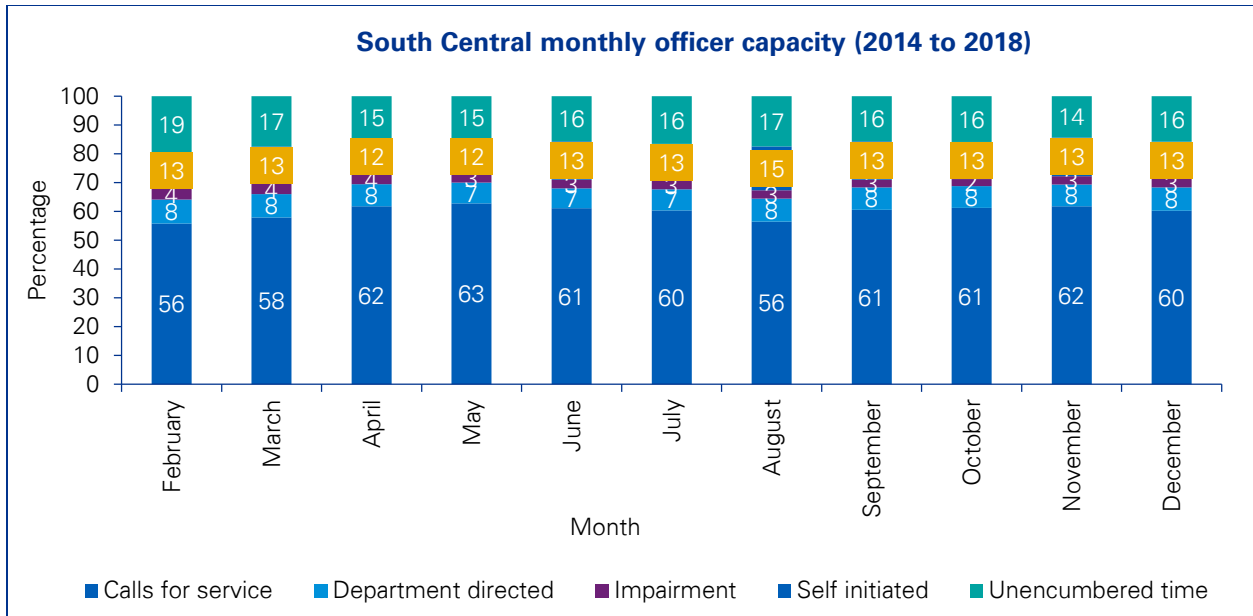
Officer yearly capacity

The percentage of time officers spend responding to calls for service has increased over the past three years, from 54 percent in 2016 to 62 percent in 2018. A corresponding decrease in unencumbered time has been seen during the same timeframe, from 21 percent in 2016 to 13 percent in 2018. Self-initiated time has increased since 2014, from 10 percent to 14 percent. Department-directed time has remained relatively constant at 6 percent to 9 percent, while impairment time (time spent going for lunch, defending a ticket in court, setting up the patrol car, etc.) has decreased from 4 percent to 2 percent over the course of the past five years.



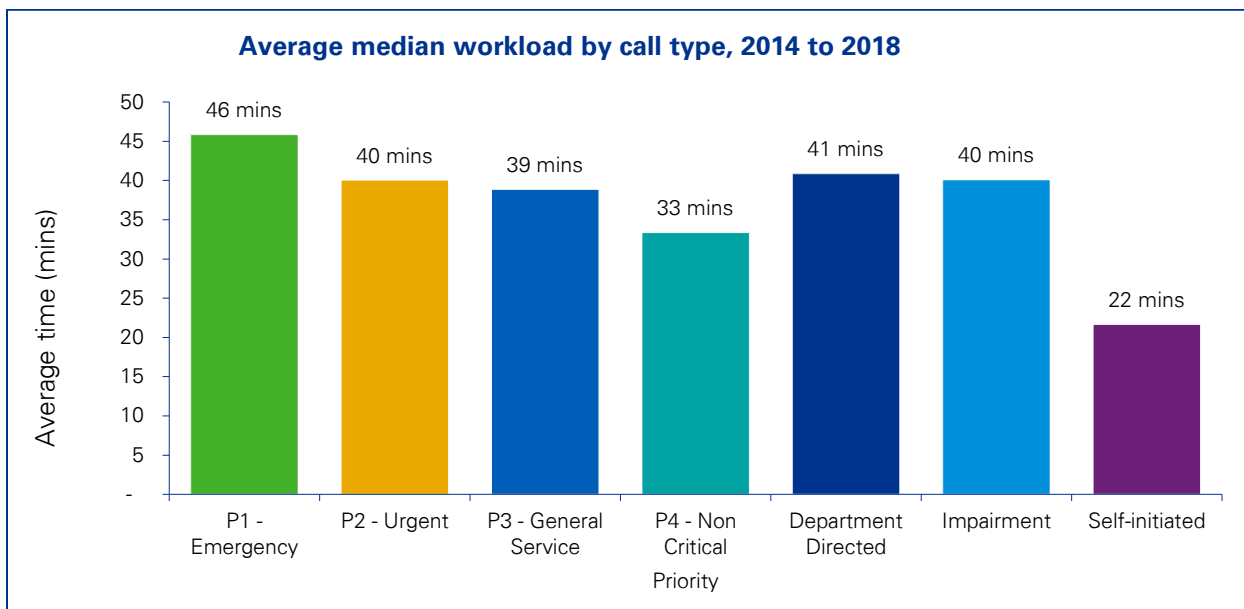
Officer monthly capacity

The percentage of time officers spend responding to calls for service exhibited modest variability on a monthly basis from 2014 to 2018, ranging from 56 percent to 63 percent, roughly in line with the 2018 average seen above. Unencumbered time, the second largest share, ranged from 14 percent to 19 percent of time, averaging 16 percent. Time spent responding to department-directed and self-initiated calls showed little variability, with department-directed ranging from 7 percent to 8 percent and self-initiated ranging from 12 percent to 15 percent of time. Impairment time remained largely unchanged month to month, averaging 3 percent of total time.

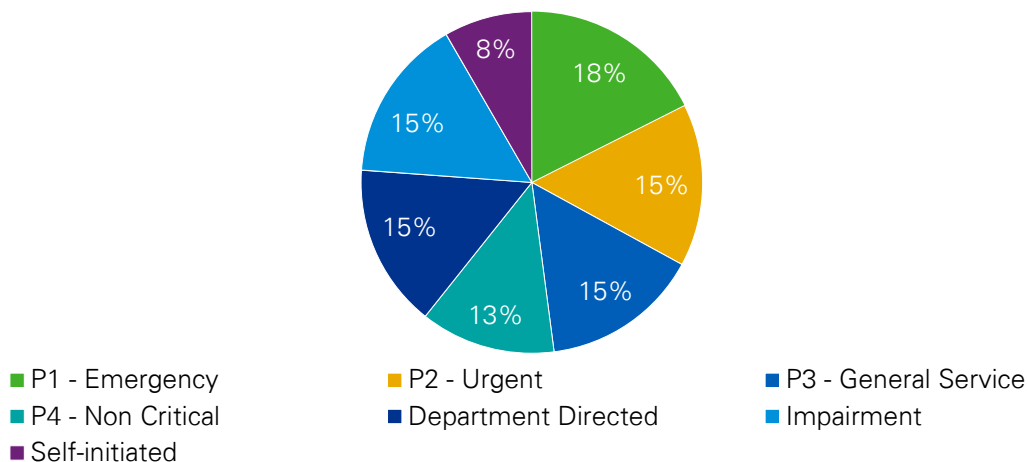


Median workload

From 2014 to 2018, Priority 1 calls had the greatest average median workload at 46 minutes, or 18 percent of total workload. Department-directed calls were second at 41 minutes, or 15 percent of total workload, while Priority 2, impairment, and Priority 3 calls each took 15 percent of total workload as well at 40 minutes, 40 minutes, and 39 minutes, respectively. Self-initiated calls, despite having the second highest annual call volume, took up the least amount of time at just 22 minutes, or 8 percent of total workload. Note: Percentages below may not equal 100 percent due to rounding.



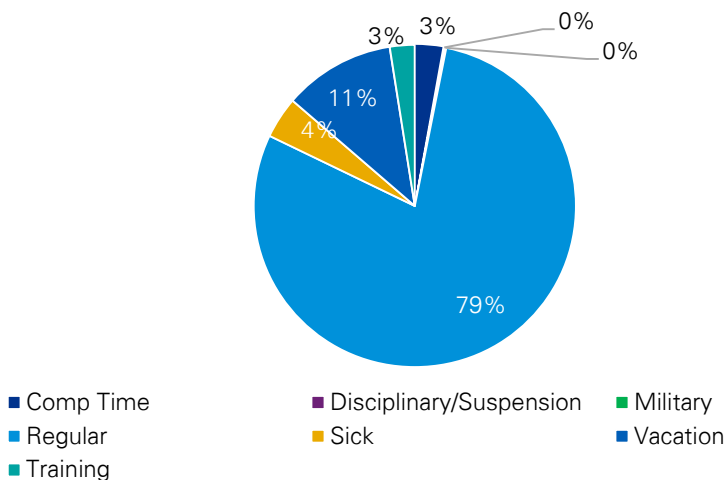
Average % call workload, 2014 to 2018



Officer productive hours

The South Central Division averages 1,655 productive hours a year out of 2,080 total hours, or 79 percent. Additionally, 11 percent are used for vacation, 4 percent are used for sick time, 3 percent are taken as comp time, and 3 percent are used for training. A de minimis percentage is used for military commitments and disciplinary/suspension reasons.

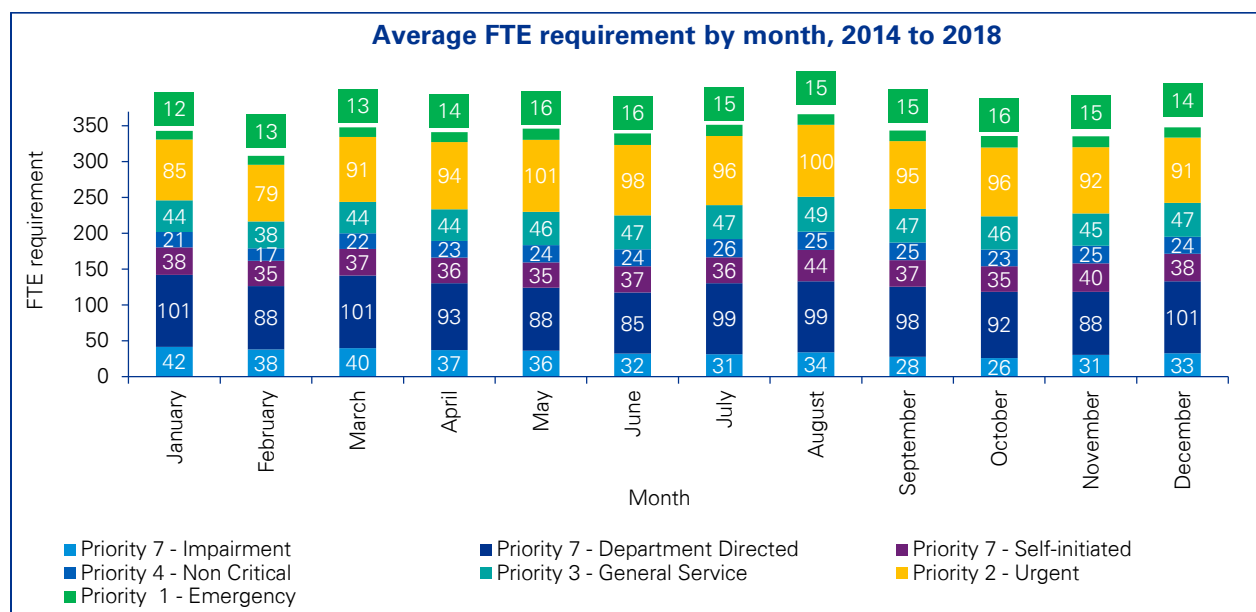
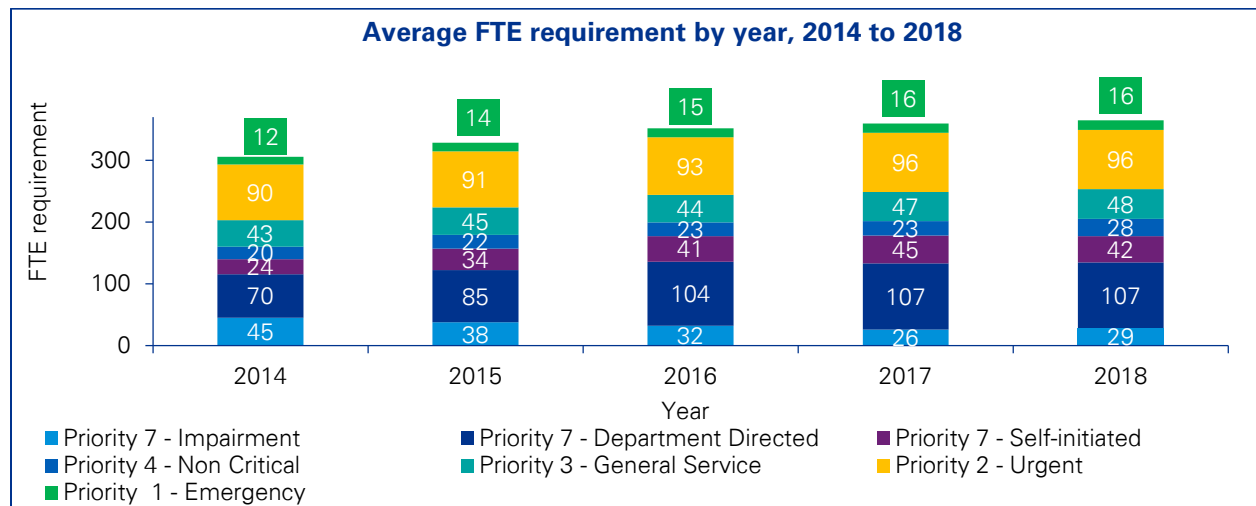
South Central Patrol Division



FTE analysis

From 2014 to 2018, the FTE service hour equivalents for Priority 1 and Priority 4 calls have remained relatively consistent, averaging 15 and 23, respectively. Priority 2 calls averaged the second highest FTE service hour equivalents at 93 and Priority 3 calls averaged the third highest at 45. Self-initiated calls have experienced a sharp increase over the past five years from 24 to 42, while impairment has decreased from 45 to 29. Department-directed calls required the highest average FTE service hour equivalents at 94. Overall, the average FTE service hour equivalents over the past five years for the division were 342, of which 176 (51 percent) were related to core Priorities 1–4, with months such as August having a

higher equivalent (366) and February having a lower equivalent (308). Of note, the FTE service hour equivalents shown below are not optimized for temporal trends or specific supply and demand criteria, but rather reflect the gross requirement derived from the median workload per call type multiplied by the volume for each call type and should not be considered as recommended staffing levels.



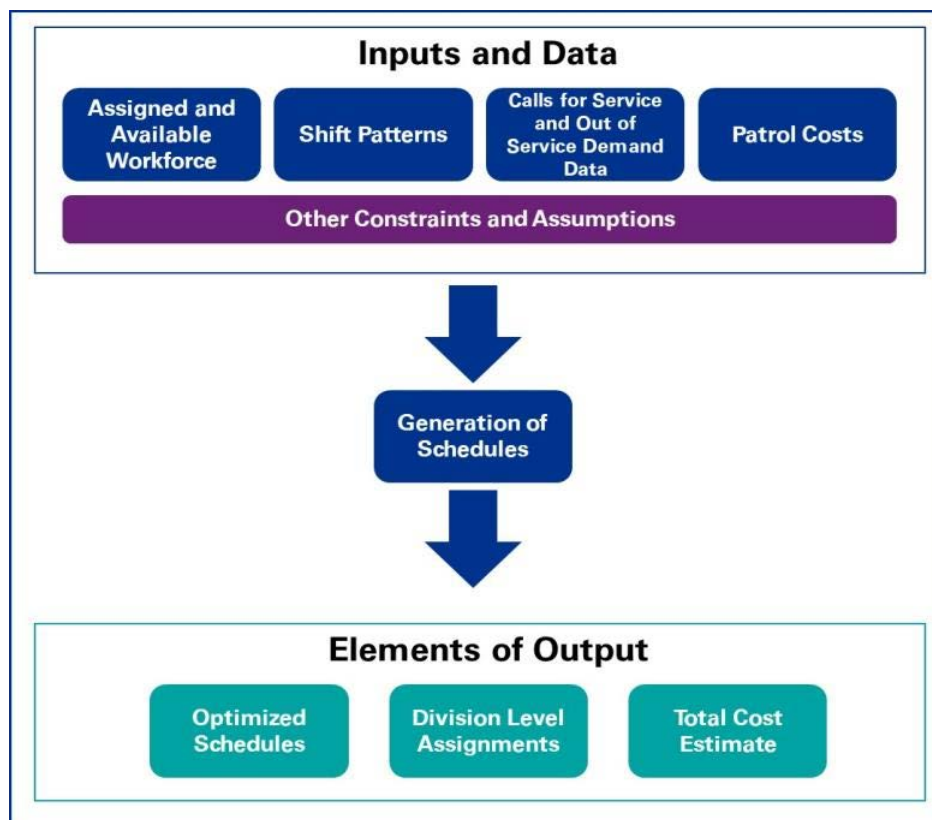
Patrol optimization model

Patrol optimization model overview

KPMG’s patrol optimization model is designed to develop optimal staffing and schedules for law enforcement, using an agency’s unique inputs and constraints—including factors such as officer productive hours, trends in demand, supply constraints, budgetary constraints, and FTE service hour requirements. The model analyzes millions of possible schedule permutations based on the defined parameters to determine the most effective shift pattern and required staffing levels. The optimization model can be evaluated on factors such as minimizing response time limits exceeded, maximizing the alignment of demand and supply, minimizing cost, as well as other custom objectives.

Taking into account DPD’s scheduling goals (e.g., maximizing the percent of demand met without exceeding response times, and effective utilization of current staffing), the model produces the most efficient combination of the following outputs:

- Staff assignments, by division: the number of officers assigned to each division, the number of weekly overtime hours assigned to each division, and the number of watches in the schedule
- Scheduling details, by division: shift pattern, watch start and end times, and officer allocation by watch.



Schedule optimization approach

Utilizing all the data inputs outlined in the previous sections, KPMG developed a scheduling optimization model for the Patrol Bureau. The schedule optimization methodology involves three key components: mathematical constraints, modifiable decision variables, and a desired objective.

The model is provided constraints that limit the complete universe of options available. These constraints are specific to each law enforcement client. In the case of DPD, key constraints included aligning supply to demand trends to help ensure optimal service levels, a minimum threshold of demand that must be met within target response time parameters, as well as overtime constraints (e.g., no division can use more than 140 hours of scheduled overtime per week). A full description of the constraints provided within the model is available on pages 172–173 of this report.

Decision variables are the set of values that a mathematical model is allowed to permute. In the case of the DPD schedule optimization model, the model may be permitted to modify the following factors:

- Staff assignments, by division: the number of officers assigned to each division, the number of weekly overtime hours assigned to each division, and the number of watches in the schedule
- Scheduling details, by division: shift pattern, watch start and end times, and officer allocation by watch.

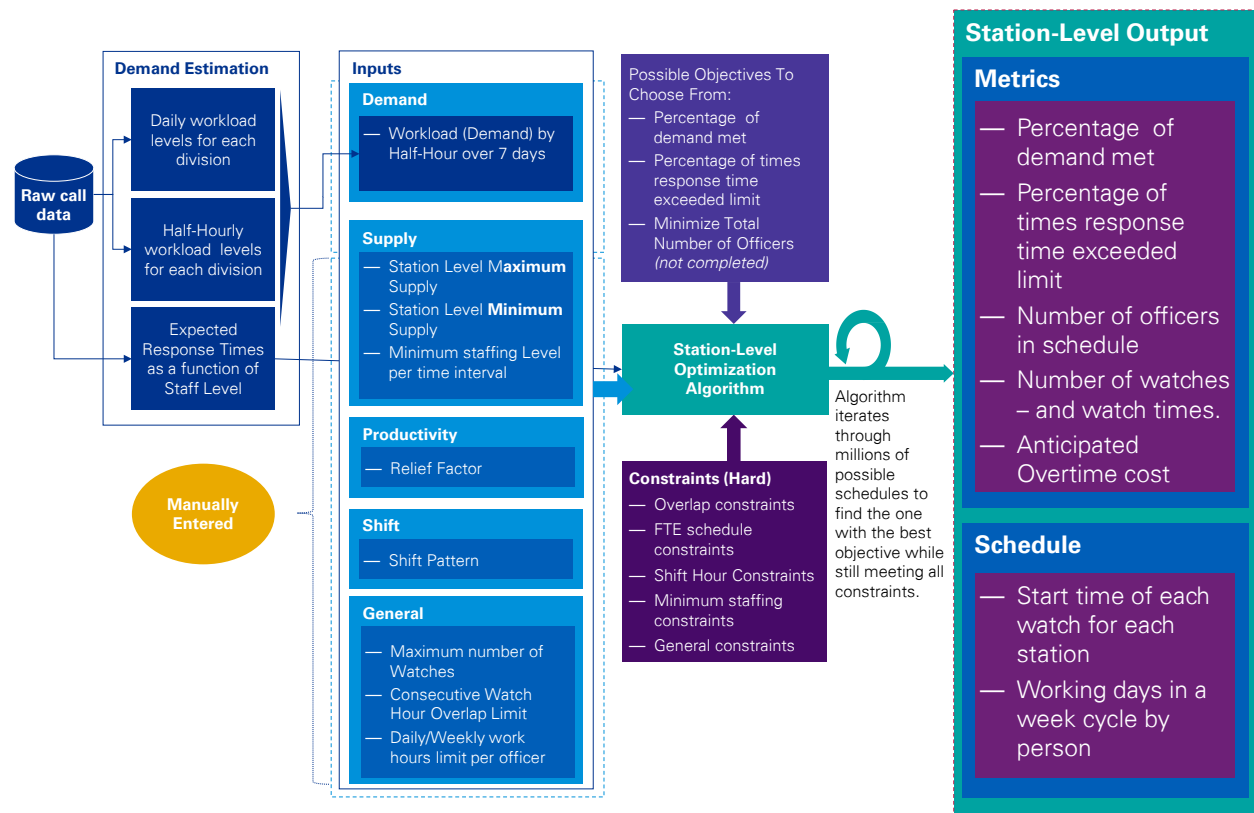
The algorithm behind the optimization model iterates on the user inputted pool of available resources. The pool of resources may be DPD's current staffing levels or desired staffing levels, in order to achieve the desired objective. In this optimization, KPMG ran scenarios for three target objectives:

- **Scenario One: Optimize current staff supply and division allocation:** Under this scenario, the model designs schedules that align DPD's current staffing levels to best meet projected levels of demand within the current response time constraints. The model uses DPD's current officer supply per division as a constraint. Based on these constraints, the model has identified the optimal assignment of officers to each watch, across up to six watches. It uses a blend of regular hours and overtime hours in order to maximize the percentage of demand met under DPD's current staffing. By analyzing historical demand data from 2014 to 2018, the model schedules additional officers during periods that tend to be busy, while drawing down staffing levels during lulls in demand—thereby enabling the most efficient patrol scheduling based on current DPD data and policy. Per DPD policy, divisions cannot use more than 140 hours of scheduled overtime per week.
- **Scenario Two: Minimize the demand-supply gap:** Under this scenario, based on historical trends in demand, the model constructs schedules designed to staff sufficient officers to meet projected workload within a target percentage of response time. This scenario was modeled under two options, detailed below—one of which aims to ensure staff supply meets or exceeds workload volume within response time constraints 80 percent of the time, and the other aims to ensure staff supply meets or exceeds workload volume 100 percent of the time. It should be noted that under both options, Priority 1 response times are not exceeded and remain within the eight-minute goal.

When staff supply meets or exceeds workload demand, DPD should typically be able to respond to calls for service within the department's target response times. Based on historical data, there are occasional instances in which DPD was not able to adhere to response time targets even when staff supply exceeded workload demand—this likely stems from factors such as an extended travel time due to the geographic location of officers. The model has assumed that these trends will continue going forward, which results in a small number of response time limits exceeded even in the 100 percent target scenarios.

- *Option One:* Staff supply meets or exceeds projected demand for staff time 80 percent of the time. As a result, under this option, DPD should be able to meet a minimum of 80 percent of demand with optimal response time outcomes. In the remaining 20 percent of the time, DPD may exceed its response time targets, for Priority 2–4 calls.
- *Option Two:* Staff supply meets or exceeds projected demand for staff time 100 percent of the time. DPD should be able to respond to all calls within target response times, with the exception of calls in which delays stem from factors such as travel time.
- **Scenario Three: Minimize total cost while meeting specific demand-supply gap targets:**
Scenario Three takes the demand-supply gap targets of Scenario Two as the secondary model objective; however, the primary objective is to minimize the cost profile of the schedule by optimizing regular officer hours and overtime hours. Through the use of both officers and scheduled overtime, the model creates schedules that meet the demand-supply gap targets outlined above at an optimal cost. Per current DPD policy, Scenario Two permits up to 140 hours per week of scheduled overtime per division. It should be noted that under both options, Priority 1 response times are not exceeded and remain within the eight-minute goal.
- *Option One:* Staff supply meets or exceeds projected demand for staff time 80 percent of the time within response time constraints. As a result, under this option, DPD should be able to meet a minimum of 80 percent of demand with optimal response time outcomes. In the remaining 20 percent of the time, DPD may exceed its response time targets, for Priority 2–4 calls.
- *Option Two:* Staff supply meets or exceeds projected demand for staff time 100 percent of the time. DPD should be able to respond to all calls within target response times, with the exception of calls in which delays stem from factors such as travel time.

The graphic below outlines the process that is utilized within the schedule optimization process to generate the required outputs.



Model inputs

Demand profiles

As discussed in the Methodology section, the model draws on a data set compiled by KPMG that includes a comprehensive assessment of officer workload. Drawing on DPD, CAD, and OOS data, this data set includes five years of historical demand data. This data set includes calls for which patrol is dispatched via resident, officer self-initiated, and department-directed activities. This data is analyzed at a division level to understand demand for patrol services by hour of the day, day of the week, and month of the year based on call Priority and type, and the associated workload generated from these calls.

Cost profile

The model uses regular hour and overtime hour rates associated with staffing to calculate the financial impact of various staffing options. These mixed rates incorporate DPD’s salary, benefits, and overtime payment policies.

DPD staffing

DPD’s staffing levels for the past five years have been incorporated into the model. The model is capable of producing the most efficient schedules for DPD’s current staffing levels (based on data from February

2019). Alternatively, the model is also capable of producing schedules for alternative staffing scenarios, as determined by the user.

Current assignments

The table below details current staffing assignments by role level at each division for 2019. This data has been collected from DPD to understand current scheduling and to reallocate staff schedules as part of the optimization process. The two tables depict the assigned staffing, how many officers are assigned to each division, and working staffing, how many officers are actually working within each division. The difference between the assigned and working staffing is due to officers being placed on special assignment to other functions within the department, for example, training academy, administration, task forces, etc. There is a current difference of 42 patrol officers between the assigned and working staffing levels.

Assigned staffing levels

District	Patrol officers	NPOs	CRT	Deployment	Abatement	Admin	Patrol division unassigned and special units
Central District	225	5	4	2	1	2	7
North Central	129	7	3	4	0	1	6
Northwest District	179	5	8	5	0	1	2
Northeast District	246	7	6	5	0	4	8
South Central District	224	13	10	5	1	0	1
Southwest District	218	9	11	2	1	1	6
Southeast District	227	6	6	2	0	0	18
Total staffing levels	1,448	52	48	25	3	9	48

Working staffing levels

District	Patrol officers	NPOs	CRT	Deployment	Abatement	Admin	Patrol division unassigned and special units
Central District	219	5	4	2	1	2	7
North Central	126	7	2	4	0	1	6
Northwest District	174	4	8	5	0	1	2
Northeast District	241	7	6	5	0	4	8
South Central District	217	13	10	5	1	0	1
Southwest District	208	8	11	1	1	1	6
Southeast District	221	5	6	2	0	0	17
Total staffing levels	1,406	49	47	24	3	9	47

DPD’s February 2019 patrol staffing levels, as incorporated into the model, are outlined in the table below. Note the table below is taken from DPD Bid data and does not include recruits or assigned officers.

Division	Watch				Total
	1	2	3	4	
CBD	25	30	35	-	90
Central	29	38	23	16	106
North Central	29	39	32	8	108
Northeast	55	77	65	16	213
Northwest	40	50	38	16	144
South Central	48	71	59	16	194
Southeast	55	68	60	16	199
Southwest	47	64	53	16	180
Total	328	437	365	104	1,234

Shift patterns

The model is capable of considering both a 4–10 and a 5–8 shift pattern, the two predominant shift patterns in use by law enforcement. Some law enforcement agencies also utilize 12-hour-per-day shifts. However, research on this shift pattern suggests that it negatively impacts officer alertness, increases fatigue, and puts both officers and residents at a heightened risk of accident.³² Based on this data, KPMG chose to focus on the 4–10 and 5–8 shift patterns.

5–8 schedule model

The 5–8 shift pattern, which DPD currently operates, proscribes eight-hour shifts, five days per week. Officers work eight hours per day on ten days per pay period.

³² “The Impact of Shift Length in Policing on Performance, Health, Quality of Life, Sleep, Fatigue, and Extra-Duty Employment,” Karen Amendola et al. National Institute of Justice, <https://www.ncjrs.gov/pdffiles1/nij/grants/237330.pdf>.

Week 1						Week 2																					
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 1	Day 2	Day 3	Day 4	Day 5																	
5-8 shifts	8 hours	8 hours	8 hours	8 hours	8 hours	8 hours	8 hours	8 hours	8 hours	8 hours																	
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
Watch 1	5-8 shift; 8 hours																										
Watch 2									5-8 shift; 8 hours																		
Watch 3																	5-8 shift; 8 hours										

4-10 schedule model

Within a 4-10 model, officers work 10 hours per day for 8 days each pay period. As this results in 30 scheduled hours per day across the three watches, there are typically two to four hours per day in which the watches overlap. These overlap hours are determined by the watch start times.

Week 1					Week 2																						
	Day 1	Day 2	Day 3	Day 4	Day 1	Day 2	Day 3	Day 4																			
4-10 shifts	10 hours	10 hours	10 hours	10 hours	10 hours	10 hours	10 hours	10 hours																			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
Watch 1	4-10 shift; 10 hours																										
Watch 2										4-10 shift; 10 hours																	
Watch 3																4-10 shift; 10 hours											

4-10 schedule with power shift

With a 4-10 power shift, there will be four shifts per day, with 8 days worked per pay period by all patrol units. Ten hours of overlap between shifts stemming from a power shift can support improved patrol unit availability during high-volume hours.

Shift hours																													
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23					
Watch 1	4-10 shift; 10 hours																												
Watch 2										4-10 shift; 10 hours																			
Watch 3																4-10 shift; 10 hours													
Power shift										4-10 shift; 10 hours																			

Assumptions and constraints

The mathematical techniques used to construct the analysis and its resulting schedules involve an exercise in constrained optimization. This means that the model starts at a point of constraints, which serves to limit the universe of options available to the target points of optimization. Thus, the modeling exercise of developing optimized schedules through mathematical techniques involves understanding the basic constraints and assumptions used to construct the model.

In the case of DPD patrol schedules, the impact of constraints is significant. As such, the KPMG team has worked closely with DPD to set constraints and has validated assumptions with DPD leadership, DPD patrol data, and generally accepted practices within the industry. As one of the primary outputs of KPMG's study is a patrol optimization model that generates staffing and scheduling outputs for DPD, many of these constraints have been designed to be customizable by the user and can be modified to allow the model to run varying alternative scenarios to aid DPD decision-making in the future.

Productive hours

Productive hours of each officer is defined as the number of "regular" hours each officer will provide to the department each year. "Regular" hours are hours in which patrol officers are available for work excluding time taken for vacation, comp, military, sick, and disciplinary/suspension time. KPMG found that the actual number of available productive hours was on average 1,630 hours per available officer.

Overtime constraints

In accordance with current DPD practices, the model does not provide divisions with schedules that include more than 140 hours of overtime per week. This constraint can be modified to increase or decrease the desired level of overtime.

Supply constraints

The model allows the user to set staff supply constraints. For example, the model can be programmed to produce the most efficient schedules given DPD's current staffing. Alternatively, the user can input desired staffing levels for the patrol divisions overall or at the individual division level to generate what-if scenarios. Example: Maximum supply for a given division is 500 officers or minimum supply for a given division is 100 officers.

Response time constraints

The model allows the user to set constraints regarding response time, based on call Priority level. For example, the model can produce schedules intended to help ensure Priority 1 response time does not exceed 8 minutes more than 10 percent of the time.

Overlap constraints

The model requires an overlap of at least 30 minutes between consecutive watches. This can be increased or decreased as desired.

FTE schedule constraints

The model does not schedule officers to work more than 40 regular hours per week.

Shift hour constraints

The model is designed to consider either a 4–10 or 5–8 shift pattern at present. The user can model scenarios for both shift patterns to compare schedule outputs.

Minimum staffing constraints

The model allows the user to set minimum staffing constraints at the division level.

Shift start time constraints

The model allows the user to set watch start time constraints, if desired. Example: One watch should start at 8:00 AM or no watch can start at 4:00 AM.

Optimized patrol schedules

Optimized patrol schedules

This report contains the model's outputs for the three scenarios, as detailed below. Scenarios Two and Three detail two staffing options each.

- **Scenario One: Optimize current staff supply:** Under this scenario, the model designs schedules that align DPD's current staffing levels to best meet projected levels of demand. The model maintains DPD's current six watch times and uses DPD's current officer supply per division as a constraint. Based on these constraints, the model has identified the optimal assignment of officers to each watch. It also uses a blend of regular hours and overtime in order to maximize the percentage of demand met under DPD's current staffing. By analyzing historical demand data from 2014 to 2018, the model schedules additional officers during periods that tend to be busy, while drawing down staffing levels during lulls in demand—thereby enabling the most efficient patrol scheduling based on current DPD data and policy. Per DPD policy, divisions cannot use more than 140 hours of scheduled overtime per week.
- **Scenario Two: Minimize the demand-supply gap:** Under this scenario, based on historical trends in demand, the model constructs schedules designed to staff sufficient officers to meet projected workload within a target percentage of response time. This scenario was modeled under two options, detailed below—one of which aims to ensure staff supply meets or exceeds workload volume within response time constraints 80 percent of the time, and the other aims to ensure staff supply meets or exceeds workload volume 100 percent of the time. It should be noted that under both options, Priority 1 response times are not exceeded and remain within the eight-minute goal.

When staff supply meets or exceeds workload demand, DPD should typically be able to respond to calls for service within the department's target response times. Based on historical data, there are occasional instances in which DPD was not able to adhere to response time targets even when staff supply exceeded workload demand—this likely stems from factors such as an extended travel time due to the geographic location of officers. The model has assumed that these trends will continue going forward, which results in a small number of response time limits exceeded even in the 100 percent target scenarios.

- *Option One:* Staff supply meets or exceeds projected demand for staff time 80 percent of the time. As a result, under this option, DPD should be able to meet a minimum of 80 percent of demand with optimal response time outcomes. In the remaining 20 percent of the time, DPD may exceed its response time targets, for Priority 2–4 calls.
- *Option Two:* Staff supply meets or exceeds projected demand for staff time 100 percent of the time. Based on these staffing levels, DPD should be able to respond to all calls within target response times, with the exception of calls in which delays stem from factors such as travel time.
- **Scenario Three: Minimize total cost while meeting specific demand-supply gap targets:** Scenario Three takes the demand-supply gap targets of Scenario Two as the secondary model objective; however, the primary objective is to minimize the cost profile of the schedule by optimizing regular officer hours and overtime hours. Through the use of both officers and scheduled overtime, the model creates schedules that meet the demand-supply gap targets outlined above at an optimal

cost. Per current DPD policy, Scenario Three permits up to 140 hours per week of scheduled overtime per division. It should be noted that under both options, Priority 1 response times are not exceeded and remain within the eight-minute goal.

- *Option One:* Staff supply meets or exceeds projected demand for staff time 80 percent of the time within response time constraints. As a result, under this option, DPD should be able to meet a minimum of 80 percent of demand with optimal response time outcomes. In the remaining 20 percent of the time, DPD may exceed its response time targets, for Priority 2–4 calls.
- *Option Two:* Staff supply meets or exceeds projected demand for staff time 100 percent of the time. Based on these staffing levels, DPD should be able to respond to all calls within target response times, with the exception of calls in which delays stem from factors such as travel time.

The rationale for an 80 percent objective:

A significant percentage of DPD's calls for service are nonemergency: Priority 1 calls compose just 3 percent of total demand volume annually while Priority 3 and 4 calls account for 24–30 percent of calls by year from 2014 to 2018.

Given that these low-priority calls are nonurgent, KPMG has modeled an option in which staff supply exceeds workload demand for 80 percent of the time. Under this option, during the 80 percent of the time in which staff supply meets or exceeds workload demand, DPD should typically be able to respond to calls for service within the department's target response times. (Based on historical data, there are occasional instances in which DPD was not able to adhere to response time targets even when staff supply exceeded workload demand—this likely stems from factors such as an extended travel time due to officer geographical location.) During the 20 percent of the time in which staff supply does not meet workload demand, DPD may elect to more slowly respond to lower-priority calls. This staffing scenario allows DPD to respond in a timely manner to urgent calls while optimizing fiscal constraints.

Constraints and parameters selected

In addition to the specific demand-supply gap targets specified in each scenario, KPMG utilized the following parameters, assumptions, and constraints to create these model outputs:

- Productive hours: Annual productive hours per officer were set as 1,630 hours per available officer, based on KPMG's assessments of current officer activity.
- Overtime constraints: In accordance with DPD's current practices, the model did not provide divisions with schedules that include more than 140 hours of overtime per week.
- Supply constraints: The model required each division to have a minimum officer supply of 100 officers and a maximum supply of 500 officers. The maximum supply is significantly greater than DPD's current supply of officers.
- FTE schedule constraints: The model did not schedule officers to work more than 40 regular hours per week.
- Shift hour constraints: The model considered a 4–10 shift pattern or a 5–8 shift pattern for each division.
- Watch start time constraints: The model did not specify watch start times; however, due to the operational impact, no watches were scheduled to begin between 12:30 AM and 5:30 AM. The

maximum allowed number of watches was set at six per day. A minimum overlap time of 60 minutes between watches was determined; however, this constraint can be amended by the user.

- Response time constraints: Priority 1 calls were designated a maximum response time of 8 minutes. The model allowed Priority 1 calls to exceed this target response time no more than 10 percent of the time. Other call priorities were designated a maximum response time of 60 minutes. The model allowed response times to exceed these priorities up to 20 percent of the time.

Exemplar optimization model iterations

To identify the optimal schedules, which are outlined later within the report, KPMG’s optimization model evaluated thousands of schedule iterations for each of DPD’s divisions based on parameters listed above. Summary snapshots of a selection of these permutations are included below. The model generated scenarios for each shift pattern at varying levels of demand to identify potential staffing levels. The optimization model is designed to provide DPD with the ability to model scenarios and provide sufficient information to make staffing and scheduling decisions based on the ever-changing environment in which the department operates.

Central

Index	Division	Days per Shift	Shift Length	Max Supply	% of demand met	Status
1	Central	4	10	308	100.0%	Solution found
2	Central	4	10	308	100.0%	Solution found
3	Central	4	10	288	100.0%	Solution found
4	Central	4	10	288	99.7%	Solution found
5	Central	5	8	308	99.7%	Solution found
6	Central	5	8	288	99.7%	Solution found
7	Central	5	8	308	99.7%	Solution found
8	Central	5	8	288	99.7%	Solution found
9	Central	5	8	278	99.7%	Solution found
10	Central	5	8	268	99.4%	Solution found
11	Central	5	8	288	98.8%	Solution found
12	Central	4	10	278	98.2%	Solution found
13	Central	5	8	278	97.3%	Solution found
14	Central	4	10	268	97.0%	Solution found
16	Central	4	10	268	97.0%	Solution found
16	Central	5	8	268	97.0%	Solution found
17	Central	5	8	268	91.7%	Solution found
18	Central	4	10	229	91.1%	Solution found
19	Central	5	8	248	91.1%	Solution found
20	Central	5	8	238	89.0%	Solution found
21	Central	5	8	228	85.1%	Solution found
22	Central	4	10	189	0.0%	No solution found
23	Central	4	10	180	0.0%	No solution found
24	Central	5	8	218	0.0%	No solution found
26	Central	5	8	218	0.0%	No solution found
26	Central	5	8	208	0.0%	No solution found
27	Central	5	8	198	0.0%	No solution found
28	Central	5	8	188	0.0%	No solution found
29	Central	5	8	178	0.0%	No solution found
30	Central	5	8	288	0.0%	No solution found

North Central

Index	Division	Days per Shift	Shift Length	Max Supply	% of demand met	Status
31	North Central	5	8	202	100.0%	Solution found
32	North Central	4	10	202	100.0%	Solution found
33	North Central	4	10	192	100.0%	Solution found
34	North Central	4	10	182	100.0%	Solution found
35	North Central	5	8	202	100.0%	Solution found
36	North Central	5	8	200	100.0%	Solution found
37	North Central	5	8	198	100.0%	Solution found
38	North Central	5	8	162	99.9%	Solution found
39	North Central	5	8	196	99.7%	Solution found
40	North Central	5	8	197	98.8%	Solution found
41	North Central	4	10	172	98.8%	Solution found
42	North Central	4	10	172	96.1%	Solution found
43	North Central	5	8	192	96.1%	Solution found
44	North Central	5	8	187	95.5%	Solution found
45	North Central	5	8	182	90.8%	Solution found
46	North Central	4	10	162	90.8%	Solution found
46	North Central	4	10	174	90.2%	Solution found
47	North Central	4	10	168	86.9%	Solution found
48	North Central	5	8	172	81.3%	Solution found
49	North Central	4	10	162	0.0%	No solution found
50	North Central	4	10	156	0.0%	No solution found
51	North Central	4	10	150	0.0%	No solution found
52	North Central	4	10	174	0.0%	No solution found
53	North Central	4	10	170	0.0%	No solution found
54	North Central	4	10	168	0.0%	No solution found
55	North Central	4	10	166	0.0%	No solution found
56	North Central	5	8	157	0.0%	No solution found
57	North Central	5	8	157	0.0%	No solution found
58	North Central	5	8	155	0.0%	No solution found
59	North Central	5	8	153	0.0%	No solution found

Scenario One: Optimize current staff supply

The model uses DPD’s current six watch times and current officer supply per division as constraints. Based on these constraints, the model has identified the optimal assignment of officers to each watch, which may vary from DPD’s current watch assignments. The model uses a blend of regular hours and overtime in order to maximize the percentage of demand met under DPD’s current staffing, while adhering to DPD’s current policy of limiting scheduled overtime to 140 hours per division per week. The model’s division-level outcomes—including key metrics, shift start times, and schedules—are included in Appendix A, while summary tables are included below. Sergeant staffing levels assume DPD maintains its current ratio of one sergeant per seven officers.

Model output summary, by division (Scenario One)

Division	Officer supply	Days per shift	Shift length	% of demand met
Central	219	5	8	100%
North Central	126	5	8	100%
Northeast	241	5	8	97%
Northwest	174	5	8	100%
South Central	217	5	8	100%
Southeast	221	5	8	86.3%
Southwest	208	5	8	100%
Total officers	1,406			
Total sergeants	201			

Associated watch start times (Scenario One, Option One, 5–8 shift pattern)

The model maintains DPD’s existing watch start times by division, as detailed in the table below. The model may have shifted officer assignments across watches in order to achieve the most efficient staffing levels. The number of officers assigned to each watch, by division, is detailed on pages 189 through 203.

Watch #	Central	North Central	Northeast	Northwest	South Central	Southeast	Southwest
1	11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM
2	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM
3	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM
4	8:00 AM	8:00 AM	8:00 AM	8:00 AM	8:00 AM	8:00 AM	8:00 AM
5	3:00 PM	3:00 PM	3:00 PM	3:00 PM	3:00 PM	3:00 PM	3:00 PM
6	4:00 PM	4:00 PM	4:00 PM	4:00 PM	4:00 PM	4:00 PM	4:00 PM

Scenario Two: Minimize the demand-supply gap

Option One: Staff supply meets or exceeds projected demand 80 percent of the time.

As noted above, a target supply-demand gap of 80 percent enables flexibility of resources by allowing DPD to more slowly respond to lower-priority calls for service during periods of peak demand. Division-level outcomes for Scenario Two, Option One—including key metrics, watch start times, and schedules—are included in Appendix A, while summary tables are included below. Sergeant staffing levels assume DPD maintains its current ratio of one sergeant per seven officers.

Model output summary, by division (Scenario Two, Option One, mixed shift patterns)

To achieve this supply-demand target, the model's optimal solution has mixed shift patterns across divisions, a blend of 4–10s and 5–8s, as detailed in the table below.

Division	Officer supply	Days per shift	Shift length	% of demand met
Central	228	5	8	85.1%
North Central	162	5	8	99.9%
Northeast	272	4	10	80.4%
Northwest	220	5	8	86.0%
South Central	237	5	8	90.5%
Southeast	283	5	8	91.7%
Southwest	229	4	10	83.6%
Total officers	1,631			
Total sergeants	233			

Potential changes in officer supply, by division (Scenario Two, Option One, mixed shift patterns)

Compared to DPD’s current “working” patrol staffing of 1,406 officers across the seven patrol divisions listed below, the model recommends a total staffing increase of 225 officers to 1,631 total.

Division	Current officer supply	Potential officer supply	Potential supply changes
Central	219	228	9
North Central	126	162	36
Northeast	241	272	31
Northwest	174	220	46
South Central	217	237	20
Southeast	221	283	62
Southwest	208	229	21
Total officer staffing	1,406	1,631	225

Model output summary, by division (Scenario Two, Option One, 5–8 shift pattern)

For operational and resource management reasons, DPD may choose for all officers be on the same shift pattern. Based on the outputs of the model, the 5–8 shift pattern is the most efficient for the Patrol Bureau as a whole. This shift pattern allows for improved alignment of officer supply to peaks in demand, and therefore allows a higher percentage of demand to be met across all divisions. A consistent shift pattern across all divisions may allow for improved resource management and flexibility in facilitating the transfer and flexing of officers across divisions.

Division	Officer supply	Days per shift	Shift length	% of demand met
Central	228	5	8	85.1%
North Central	162	5	8	99.9%
Northeast	273	5	8	91.7%
Northwest	220	5	8	86.0%
South Central	237	5	8	90.5%
Southeast	283	5	8	91.7%
Southwest	232	5	8	90.8%
Total officers	1,635			
Total sergeants	234			

Potential changes in officer supply, by division (Scenario Two, Option One, 5–8 shift pattern)

Compared to DPD’s current staffing of 1,406 officers across the seven patrol divisions listed below, the model recommends a total staffing increase of 229 officers to 1,635 total.

Division	Current officer supply	Potential officer supply	Potential supply changes
Central	219	228	9
North Central	126	162	36
Northeast	241	273	32
Northwest	174	220	46
South Central	217	237	20
Southeast	221	283	62
Southwest	208	232	24
Total officer staffing	1,406	1,635	229

Associated watch start times (Scenario Two, Option One, 5–8 shift pattern)

The model recommends the below watch start times, by division. Under current schedules, watch 1 begins at 11:00 PM or 12:00 AM, depending on the division; watch 2 begins at 7:00 AM or 8:00 AM; watch 3 begins at 3:00 PM or 4:00 PM; and the newly implemented watch 4 begins at 4:00 PM. As shown in the table below, the proposed schedules would make slight changes to start times for watches 1 and 2 and more significant changes to the start times for watches 3 and 4.

Watch #	Central	North Central	Northeast	Northwest	South Central	Southeast	Southwest
1	11:00 PM	11:00 PM	12:00 AM	11:30 PM	11:00 PM	12:00 AM	12:00 AM
2	6:00 AM	6:00 AM	7:00 AM	6:00 AM	6:00 AM	7:00 AM	7:00 AM
3	12:00 PM	1:00 PM	11:00 AM	11:00 AM	1:00 PM	2:00 PM	2:00 PM
4	4:00 PM	4:00 PM	5:00 PM	4:30 PM	8:00 PM	9:00 PM	9:00 PM

Option Two: Staff supply meets or exceeds projected demand 100 percent of the time.

To most efficiently meet 100 percent of project demand for officer workload, the model recommends 5–8 shift patterns across all divisions. The model’s division-level outcomes—including key metrics, shift

start times, and schedules—are included in Appendix A, while summary tables are included below. Sergeant staffing levels assume DPD maintains its current ratio of one sergeant per seven officers.

Model output summary, by division (Scenario Two, Option Two)

Division	Officer supply	Days per shift	Shift length	% of demand met
Central	320	5	8	100%
North Central	202	5	8	100%
Northeast	375	5	8	100%
Northwest	295	5	8	100%
South Central	295	5	8	100%
Southeast	350	5	8	100%
Southwest	272	5	8	100%
Total officers	2,109			
Total sergeants	302			

Potential changes in officer supply, by division (Scenario Two, Option Two)

Compared to DPD’s current staffing of 1,406 officers across the seven patrol divisions listed below, the model recommends a total staffing increase of 703 officers to 2,109 total. This represents an addition of 474 officers on top of the required officer supply to meet 80 percent of projected demand using a 5–8 shift pattern across all divisions.

Division	Current officer supply	Potential officer supply	Potential supply changes
Central	219	320	101
North Central	126	202	76
Northeast	241	375	134
Northwest	174	295	121
South Central	217	295	78
Southeast	221	350	129
Southwest	208	272	64
Total officer staffing	1,406	2,109	703

Associated watch start times (Scenario Two, Option Two)

The model recommends the below watch start times, by division. Under current schedules, watch 1 begins at 11:00 PM or 12:00 AM, depending on the division; watch 2 begins at 7:00 AM or 8:00 AM; watch 3 begins at 3:00 PM or 4:00 PM; and the newly implemented watch 4 begins at 4:00 PM. As

shown in the table below, the proposed schedules would make slight changes to start times for watches 1 and 2 and more significant changes to the start times for watches 3 and 4.

Watch #	Central	North Central	Northeast	Northwest	South Central	Southeast	Southwest
1	11:00 PM	11:00 PM	11:00 PM	11:30 PM	11:00 PM	12:00 AM	12:00 AM
2	6:00 AM	6:00 AM	6:00 AM	6:00 AM	6:00 AM	7:00 AM	7:00 AM
3	12:00 PM	1:00 PM	1:00 PM	11:00 AM	1:00 PM	2:00 PM	2:00 PM
4	4:00 PM	4:00 PM	4:00 PM	4:30 PM	8:00 PM	9:00 PM	9:00 PM

Scenario Three: Minimize total cost while meeting specific demand-supply gap targets

Scenario Three maintains the supply-demand gap targets from Scenario Two; however, the primary objective of the model is to optimize the use of regular hours and overtime hours.

Option One: Staff supply meets or exceeds projected demand 80 percent of the time at an optimal cost.

As noted above, a target supply-demand gap of 80 percent enables cost savings by allowing DPD to more slowly respond to lower-priority calls for service during periods of peak demand. To achieve this supply-demand gap target at minimal cost, the model recommend 5–8 shift patterns across all divisions. The model’s division-level outcomes—including key metrics, shift start times, and schedules—are included in Appendix A, while summary tables are included below. Sergeant staffing levels assume DPD maintains its current ratio of one sergeant per seven officers.

Model output summary, by division (Scenario Three, Option One)

Division	Officer supply	Weekly overtime hours	Days per shift	Shift length	% of demand met
Central	194	139	5	8	80.1%
North Central	173	16	5	8	88.1%
Northeast	236	123	5	8	80.1%
Northwest	177	108	5	8	80.1%
South Central	209	132	5	8	80.1%
Southeast	234	138	5	8	80.4%
Southwest	203	140	5	8	82.4%
Total officer supply	1,426	796			
Total sergeants	204				

Potential changes in officer supply, by division (Scenario Three, Option One)

Compared to DPD's current staffing of 1,406 officers across the seven patrol divisions listed below, the model recommends a total staffing increase of 20 officers to 1,426 total, along with 796 hours of scheduled overtime per week. While the staffing requirement is similar to current staffing, the distribution of staff among divisions has altered to reflect the division-level variations in demand profiles and workload. This represents 209 officers fewer than the number required to meet 80 percent of projected demand using a 5–8 shift pattern without scheduled overtime (in Scenario Two, Option 1, 5–8 shift pattern).

Division	Current officer supply	Potential officer supply	Potential supply changes
Central	219	194	-25
North Central	126	173	47
Northeast	241	236	-5
Northwest	174	177	3
South Central	217	209	-8
Southeast	221	234	13
Southwest	208	203	-5
Total officer staffing	1,406	1,426	20

Associated watch start times (Scenario Three, Option One)

The model recommends the below watch start times, by division. Under current schedules, watch 1 begins at 11:00 PM or 12:00 AM, depending on the division; watch 2 begins at 7:00 AM or 8:00 AM; watch 3 begins at 3:00 PM or 4:00 PM; and the newly implemented watch 4 begins at 4:00 PM. As shown in the table below, the proposed schedules would make slight changes to start times for watches 1 and 2 and more significant changes to the start times for watches 3 and 4.

Watch #	Central	North Central	Northeast	Northwest	South Central	Southeast	Southwest
1	11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM
2	6:00 AM	6:00 AM	6:00 AM	6:00 AM	6:00 AM	6:00 AM	6:00 AM
3	1:00 PM	1:00 PM	1:00 PM	1:00 PM	1:00 PM	1:00 PM	1:00 PM
4	8:00 PM	8:00 PM	8:00 PM	8:00 PM	8:00 PM	8:00 PM	8:00 PM

Option Two: Staff supply meets or exceeds projected demand for staff time 100 percent of the time at lowest cost.

To most efficiently meet 100 percent of project demand for officer workload at an optimal distribution of regular and overtime hours, the model recommends a 5–8 shift patterns across all divisions. The model’s division-level outcomes—including key metrics, shift start times, and schedules—are included in Appendix A, while summary tables are included below. Sergeant staffing levels assume DPD maintains its current ratio of one sergeant per seven officers.

Model output summary, by division (Scenario Three, Option Two)

Division	Officer supply	Weekly overtime hours	Days per shift	Shift length	% of demand met
Central	243	137	5	8	100%
North Central	179	81	5	8	100%
Northeast	297	112	5	8	100%
Northwest	230	134	5	8	100%
South Central	257	140	5	8	100%
Southeast	305	140	5	8	100%
Southwest	243	137	5	8	100%
Total officer supply	1,754	881			
Total sergeants	251				

Potential changes in officer supply, by division (Scenario Three, Option Two)

Compared to DPD’s current staffing of 1,406 officers across the seven patrol divisions listed below, the model recommends a total staffing increase of 348 officers to 1,754 total, along with 881 hours of scheduled overtime per week. This represents 355 officers fewer than the number required to meet 100 percent of projected demand using a 5–8 shift pattern without scheduled overtime (in Scenario Two, Option Two).

Division	Current officer supply	Potential officer supply	Potential supply changes
Central	219	243	24
North Central	126	179	53
Northeast	241	297	56
Northwest	174	230	56
South Central	217	257	40
Southeast	221	305	84
Southwest	208	243	35
Total officer staffing	1,406	1,754	348

Associated watch start times (Scenario Three, Option Two)

The model recommends the below watch start times, by division. Under current schedules, watch 1 begins at 11:00 PM or 12:00 AM, depending on the division; watch 2 begins at 7:00 AM or 8:00 AM; watch 3 begins at 3:00 PM or 4:00 PM; and the newly implemented watch 4 begins at 4:00 PM. As shown in the table below, the proposed schedules would make slight changes to start times for watches 1 and 2 and more significant changes to the start times for watches 3 and 4.

Watch #	Central	North Central	Northeast	Northwest	South Central	Southeast	Southwest
1	11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM	11:00 PM
2	6:00 AM	6:00 AM	6:00 AM	6:00 AM	6:00 AM	6:00 AM	6:00 AM
3	1:00 PM	1:00 PM	1:00 PM	1:00 PM	1:00 PM	1:00 PM	1:00 PM
4	8:00 PM	8:00 PM	8:00 PM	8:00 PM	8:00 PM	8:00 PM	8:00 PM

Conclusion

The purpose of this report is not to provide final recommendations on staffing requirements for DPD's Patrol Bureau, but to analyze and evaluate patterns relating to call volume, call demand, officer utilization, and scheduling. In addition, the requirement was to develop an algorithm for projecting workforce allocation to allow the department to schedule officers for optimal performance and service and aid decision-making. It is evident from the analysis outlined that the DPD faces significant demands upon its officers' time and each division operates within a unique demand profile. The outputs within this report are designed to provide DPD with the information required to inform its decision-making under a variety of operational scenarios as the department evolves.

The findings and recommendations from both the Patrol Bureau and the Investigations and Tactical Support Bureau assessments will be aggregated and presented as final recommendations within the final report. The final report will outline the final staffing recommendations for the DPD alongside recommendations for strategy, operating models, demand management, and scheduling.



Scenario One: Optimize current staff supply

In Scenario One, the model was programmed to maximize the percentage of demand met within current response time constraints while maintaining DPD's current staffing levels by division and six watch start times. To achieve this, the model scheduled both regular hours and overtime hours, while maintaining DPD's limit of 140 scheduled overtime hours per division per week. While the current staffing level allocations by division were held constant in this scenario, the model may have reallocated officers across watches to most efficiently meet demand for officer time.

Based on the DPD's current staffing, the model was able to design a schedule that meets 100 percent of demand in five of seven divisions, while meeting 97 percent and 86 percent of demand in the remaining two divisions.

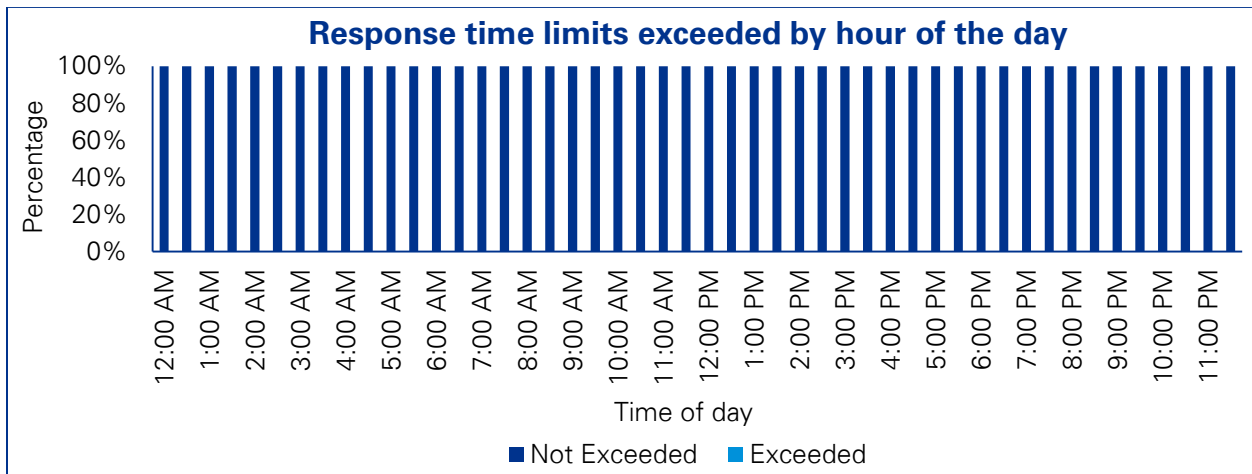
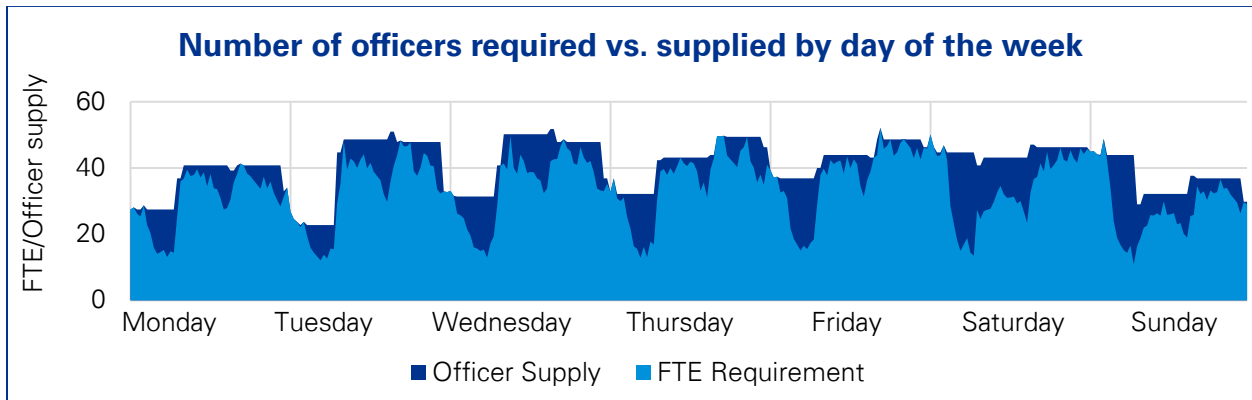
Division	Officer supply	Weekly overtime hours	Days per shift	Shift length	% of demand met
Central	219	23	5	8	100%
North Central	126	137	5	8	100%
Northeast	241	140	5	8	97%
Northwest	174	140	5	8	100%
South Central	217	108	5	8	100%
Southeast	221	140	5	8	86.3%
Southwest	208	118	5	8	100%
Total officer supply	1,406	806			

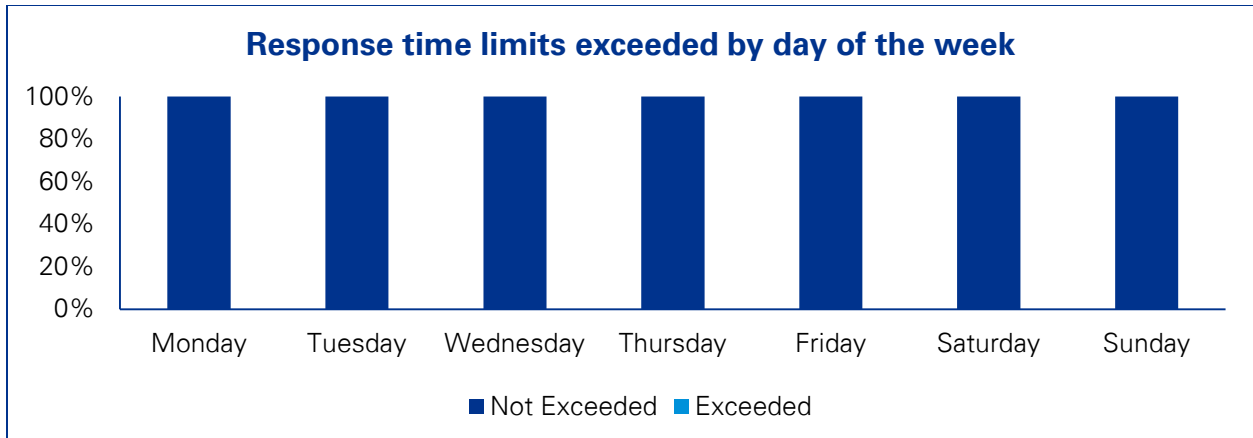
The model's outputs—including key metrics, shift start times, and schedules—are included in the following pages for each division.

Central Division 5–8 output, 80 percent demand met

Central Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	0.0%	10% (Max)	2	12:00 AM	
% of response time limit exceeded – All					
Priorities	0.0%	20% (Max)	3	7:00 AM	
# of officer supply per week	219	219 (Max)	4	8:00 AM	
# of watches	6	6 (Max)	5	3:00 PM	
Total overtime hours	23	140 (Max)	6	4:00 PM	
Estimated total FTE cost (regular + OT)	\$15,090,243	-	-		

Number of officers planned to be on duty at a given day and time





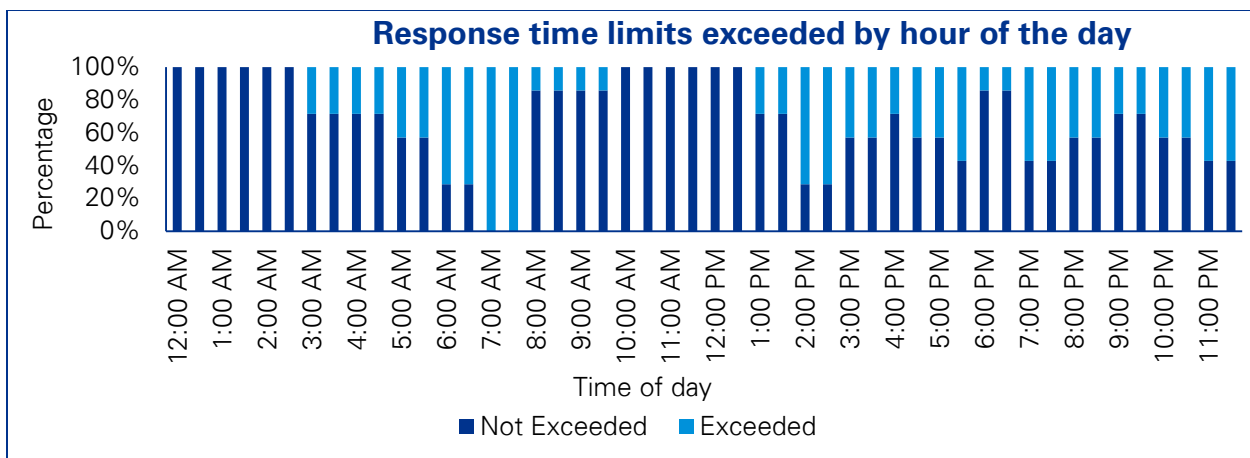
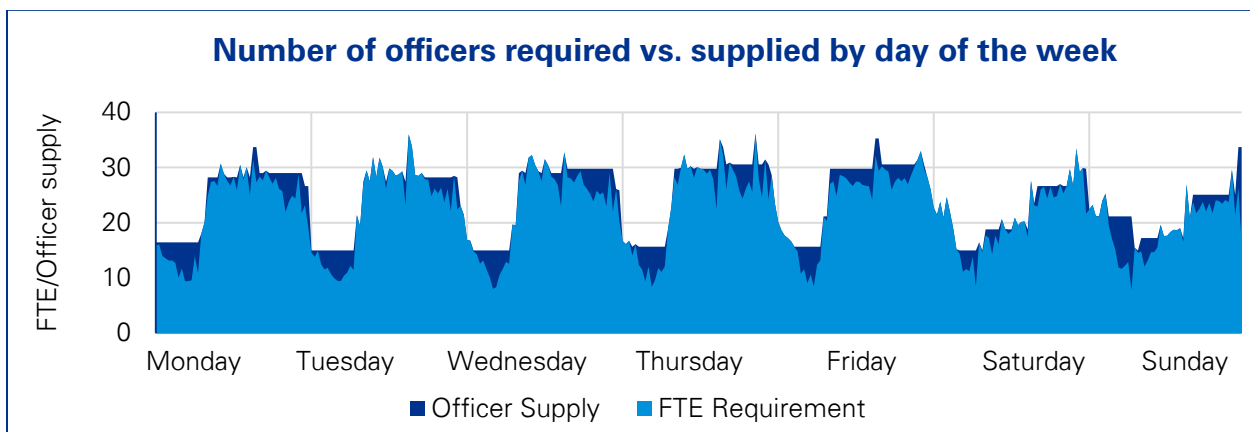
Number of officers planned to be on duty at a given day and time

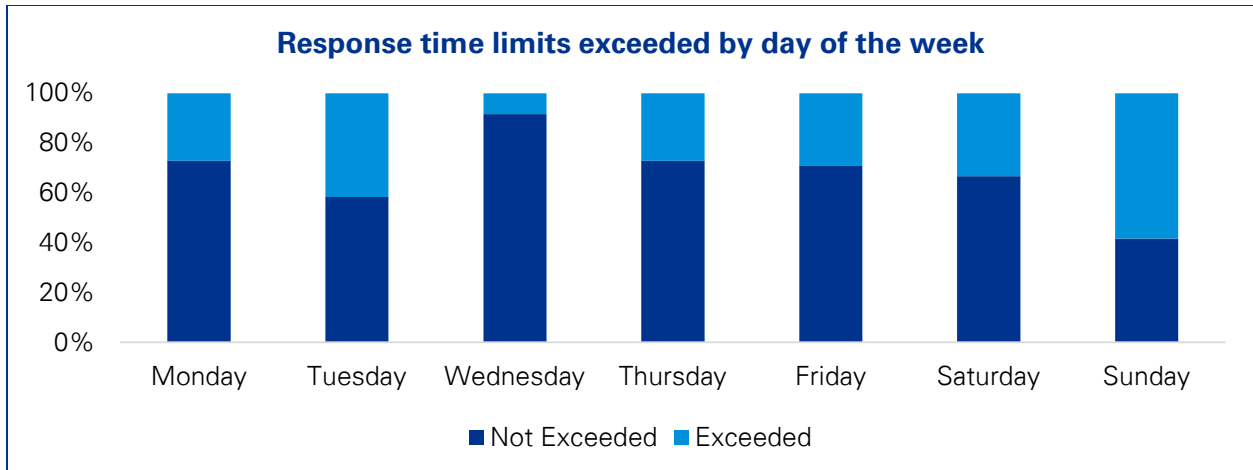
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1:30 AM	35	29	40	41	47	57	56
2:00 AM	35	29	40	41	47	57	56
2:30 AM	35	29	40	41	47	57	56
3:00 AM	35	29	40	41	47	57	56
3:30 AM	35	29	40	41	47	57	56
4:00 AM	35	29	40	41	47	57	56
4:30 AM	35	29	40	41	47	57	56
5:00 AM	35	29	40	41	47	57	56
5:30 AM	35	29	40	41	47	57	56
6:00 AM	35	29	40	41	47	57	56
6:30 AM	35	29	40	41	47	57	56
7:00 AM	47	57	52	54	51	52	37
7:30 AM	47	57	52	54	51	52	37
8:00 AM	52	62	64	55	56	55	41
8:30 AM	52	62	64	55	56	55	41
9:00 AM	52	62	64	55	56	55	41
9:30 AM	52	62	64	55	56	55	41
10:00 AM	52	62	64	55	56	55	41
10:30 AM	52	62	64	55	56	55	41
11:00 AM	52	62	64	55	56	55	41
11:30 AM	52	62	64	55	56	55	41

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	52	62	64	55	56	55	41
12:30 PM	52	62	64	55	56	55	41
1:00 PM	52	62	64	55	56	55	41
1:30 PM	52	62	64	55	56	55	41
2:00 PM	52	62	64	55	56	55	41
2:30 PM	52	62	64	55	56	55	41
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3:30 PM	50	65	66	56	55	60	48
4:00 PM	52	61	61	63	62	59	47
4:30 PM	52	61	61	63	62	59	47
5:00 PM	52	61	61	63	62	59	47
5:30 PM	52	61	61	63	62	59	47
6:00 PM	52	61	61	63	62	59	47
6:30 PM	52	61	61	63	62	59	47
7:00 PM	52	61	61	63	62	59	47
7:30 PM	52	61	61	63	62	59	47
8:00 PM	52	61	61	63	62	59	47
8:30 PM	52	61	61	63	62	59	47
9:00 PM	52	61	61	63	62	59	47
9:30 PM	52	61	61	63	62	59	47
10:00 PM	52	61	61	63	62	59	47
10:30 PM	52	61	61	63	62	59	47
11:00 PM	42	41	47	59	59	59	38
11:30 PM	42	41	47	59	59	59	38

North Central Division, optimization at current staffing levels

North Central Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	32.1%	35% (Max)	2	12:00 AM	
% of response time limit exceeded – All					
Priorities	44.6%	45% (Max)	3	7:00 AM	
# of officer supply per week	126	126 (Max)	4	8:00 AM	
# of watches	6	6 (Max)	5	3:00 PM	
Total overtime hours	137	140 (Max)	6	4:00 PM	
Estimated total FTE cost (regular + OT)	\$9,000,947	-	-		





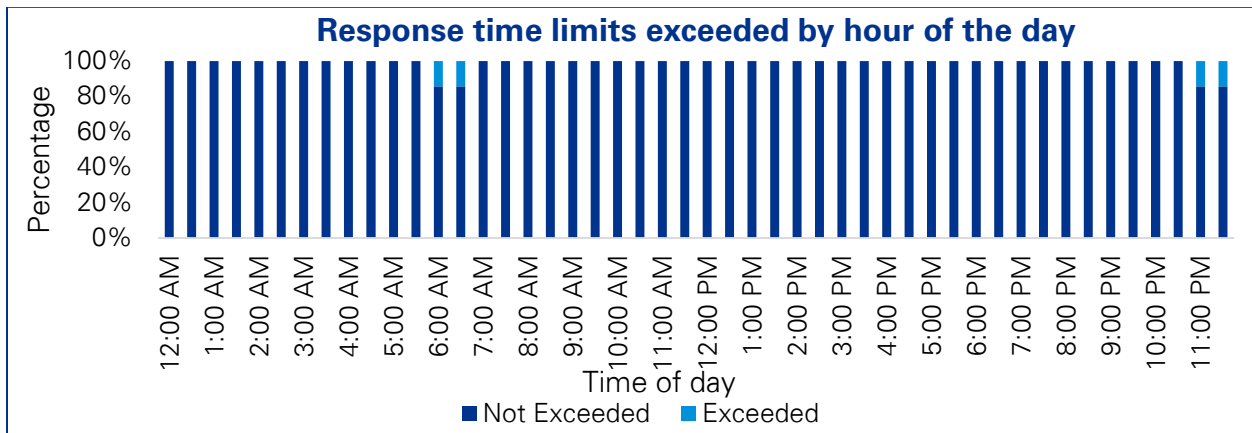
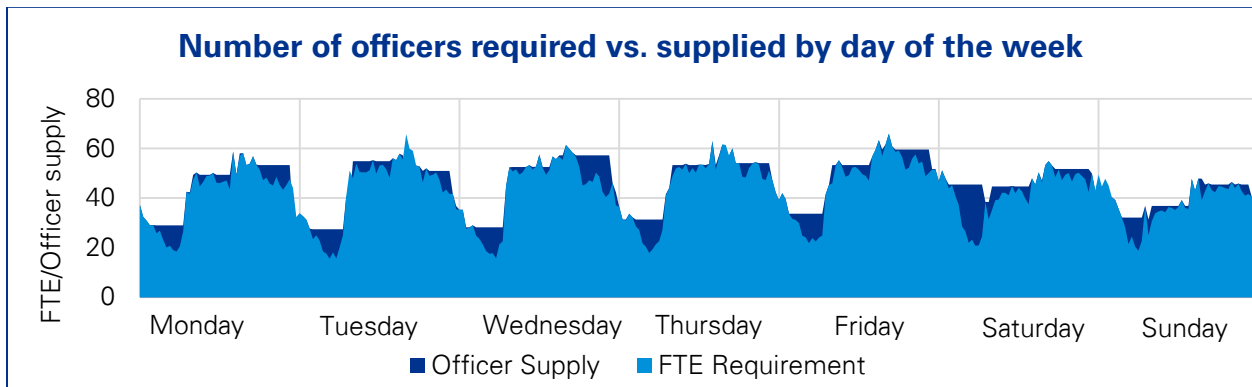
Number of officers planned to be on duty at a given day and time

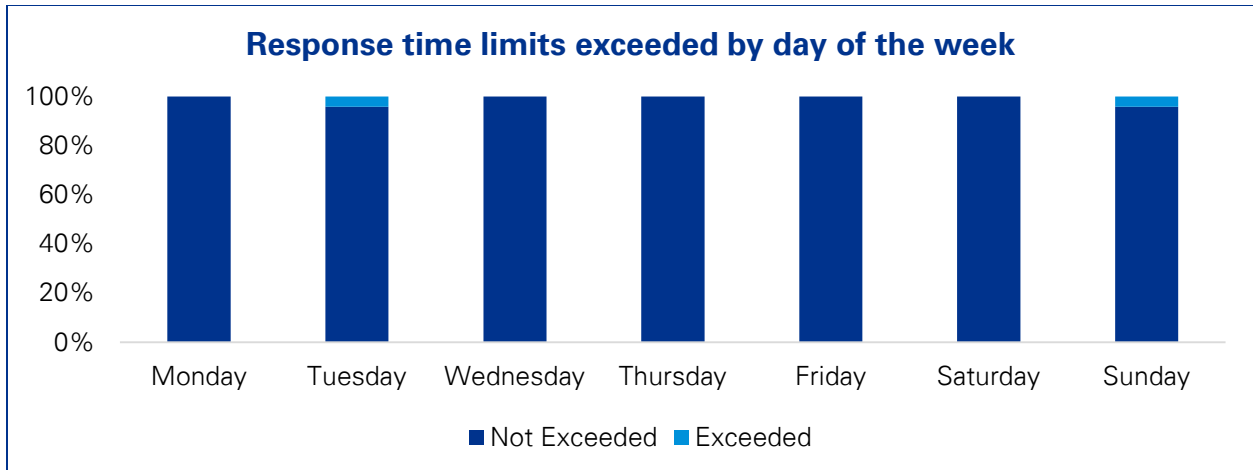
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1:30 AM	21	19	19	20	20	19	27
2:00 AM	21	19	19	20	20	19	27
2:30 AM	21	19	19	20	20	19	27
3:00 AM	21	19	19	20	20	19	27
3:30 AM	21	19	19	20	20	19	27
4:00 AM	21	19	19	20	20	19	27
4:30 AM	21	19	19	20	20	19	27
5:00 AM	21	19	19	20	20	19	27
5:30 AM	21	19	19	20	20	19	27
6:00 AM	21	19	19	20	20	19	27
6:30 AM	21	19	19	20	20	19	27
7:00 AM	15	15	25	24	27	17	17
7:30 AM	15	15	25	24	27	17	17
8:00 AM	36	35	37	38	38	24	22
8:30 AM	36	35	37	38	38	24	22
9:00 AM	36	35	37	38	38	24	22
9:30 AM	36	35	37	38	38	24	22
10:00 AM	36	35	37	38	38	24	22
10:30 AM	36	35	37	38	38	24	22
11:00 AM	36	35	37	38	38	24	22
11:30 AM	36	35	37	38	38	24	22

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	36	35	37	38	38	24	22
12:30 PM	36	35	37	38	38	24	22
1:00 PM	36	35	37	38	38	24	22
1:30 PM	36	35	37	38	38	24	22
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2:30 PM	36	35	37	38	38	24	22
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5:30 PM	37	36	38	39	39	34	32
6:00 PM	37	36	38	39	39	34	32
6:30 PM	37	36	38	39	39	34	32
7:00 PM	37	36	38	39	39	34	32
7:30 PM	37	36	38	39	39	34	32
8:00 PM	37	36	38	39	39	34	32
8:30 PM	37	36	38	39	39	34	32
9:00 PM	37	36	38	39	39	34	32
9:30 PM	37	36	38	39	39	34	32
10:00 PM	37	36	38	39	39	34	32
10:30 PM	37	36	38	39	39	34	32
11:00 PM	34	24	33	30	23	38	43
11:30 PM	34	24	33	30	23	38	43

Northeast Division, optimization at current staffing levels

Northeast Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	97.0%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	1.2%	10% (Max)	2	12:00 AM	
% of response time limit exceeded – All					
Priorities	0.0%	20% (Max)	3	7:00 AM	
# of officer supply per week	241	241 (Max)	4	8:00 AM	
# of watches	6	6 (Max)	5	3:00 PM	
Total overtime hours	140	140 (Max)	6	4:00 PM	
Estimated total FTE cost (regular + OT)	\$16,902,419	-	-		





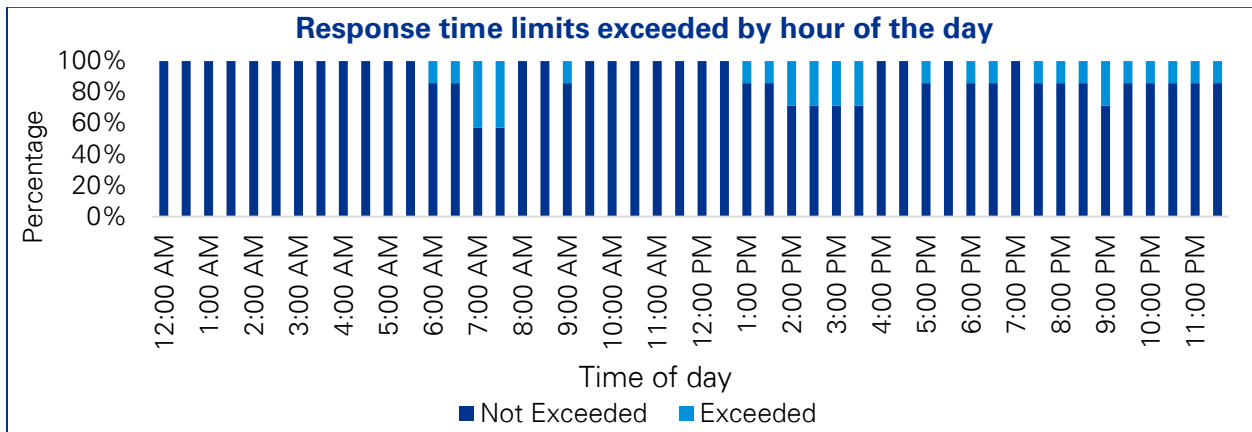
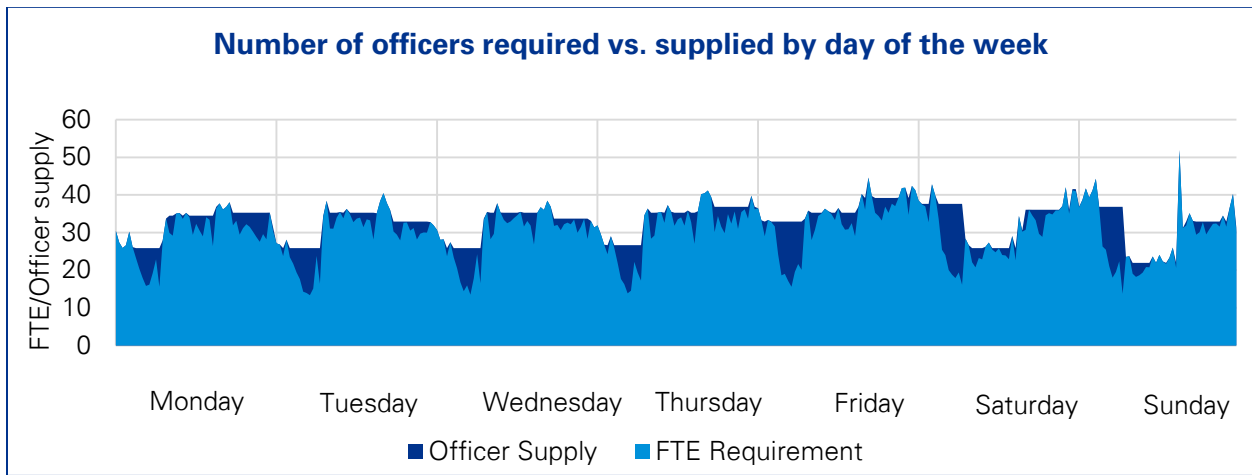
Number of officers planned to be on duty at a given day and time

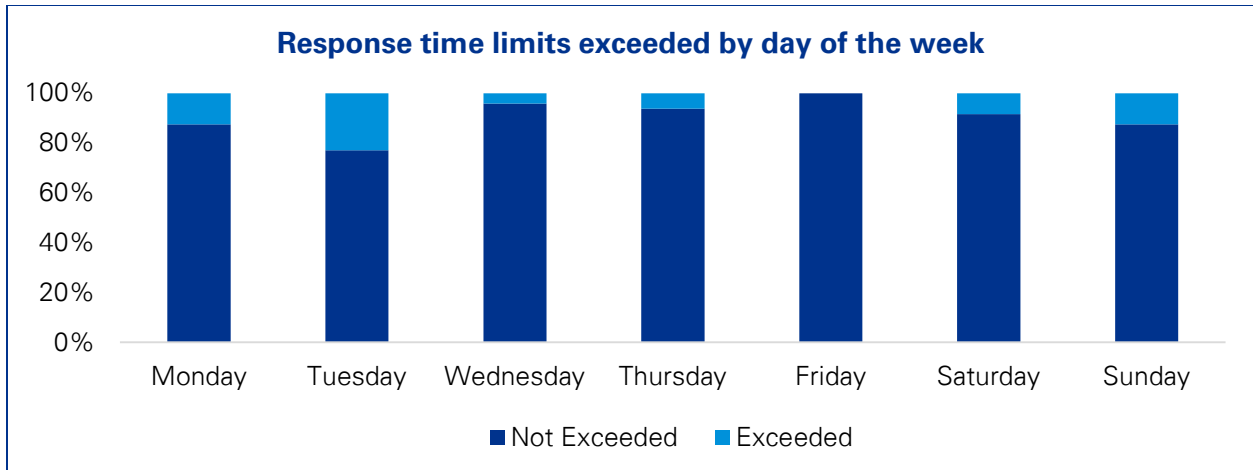
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12:30 AM	37	35	36	40	43	58	41
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1:30 AM	37	35	36	40	43	58	41
2:00 AM	37	35	36	40	43	58	41
2:30 AM	37	35	36	40	43	58	41
3:00 AM	37	35	36	40	43	58	41
3:30 AM	37	35	36	40	43	58	41
4:00 AM	37	35	36	40	43	58	41
4:30 AM	37	35	36	40	43	58	41
5:00 AM	37	35	36	40	43	58	41
5:30 AM	37	35	36	40	43	58	41
6:00 AM	37	35	36	40	43	58	41
6:30 AM	37	35	36	40	43	58	41
7:00 AM	54	49	57	53	53	49	40
7:30 AM	54	49	57	53	53	49	40
8:00 AM	63	70	67	68	68	57	47
8:30 AM	63	70	67	68	68	57	47
9:00 AM	63	70	67	68	68	57	47
9:30 AM	63	70	67	68	68	57	47
10:00 AM	63	70	67	68	68	57	47
10:30 AM	63	70	67	68	68	57	47
11:00 AM	63	70	67	68	68	57	47
11:30 AM	63	70	67	68	68	57	47
12:00 PM	63	70	67	68	68	57	47

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:30 PM	63	70	67	68	68	57	47
1:00 PM	63	70	67	68	68	57	47
1:30 PM	63	70	67	68	68	57	47
2:00 PM	63	70	67	68	68	57	47
2:30 PM	63	70	67	68	68	57	47
3:00 PM	74	73	73	73	76	60	61
3:30 PM	74	73	73	73	76	60	61
4:00 PM	68	65	73	69	76	66	58
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9:30 PM	68	65	73	69	76	66	58
10:00 PM	68	65	73	69	76	66	58
10:30 PM	68	65	73	69	76	66	58
11:00 PM	41	47	54	54	66	55	43
11:30 PM	41	47	54	54	66	55	43

Northwest Division, optimization at current staffing levels

Northwest Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	- (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	9.5%	10% (Max)	2	12:00 AM	
% of response time limit exceeded – All					
Priorities	19.0%	20% (Max)	3	7:00 AM	
# of officer supply per week	174	174 (Max)	4	8:00 AM	
# of watches	6	6 (Max)	5	3:00 PM	
Total overtime hours	140	140 (Max)	6	4:00 PM	
Estimated total FTE cost (regular + OT)	\$12,303,616	-	-		





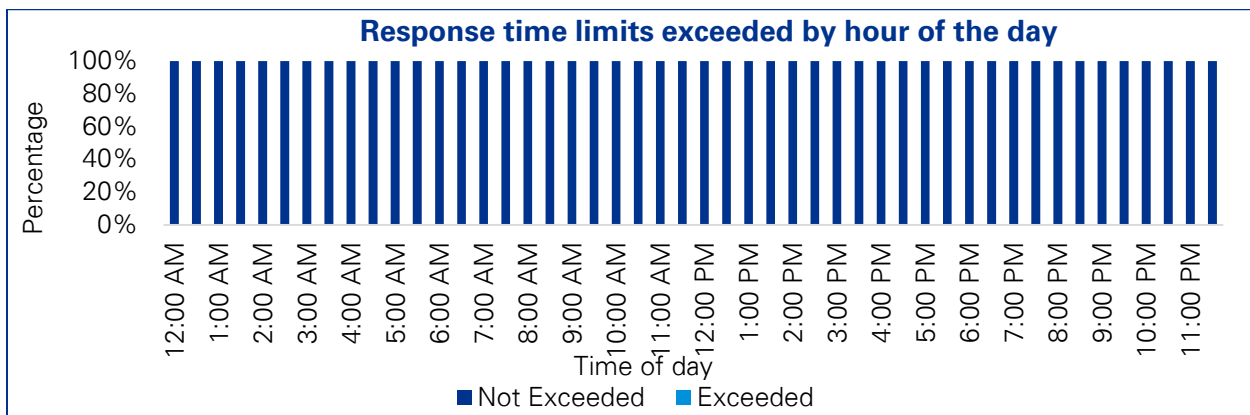
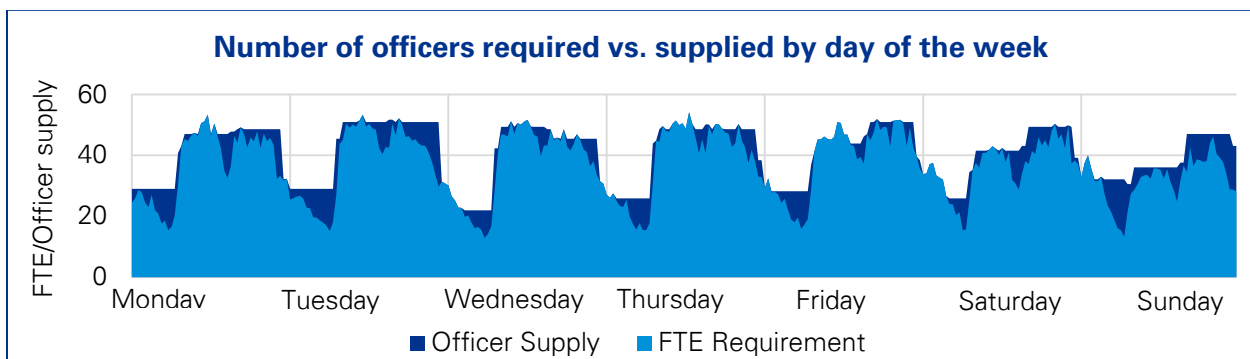
Number of officers planned to be on duty at a given day and time

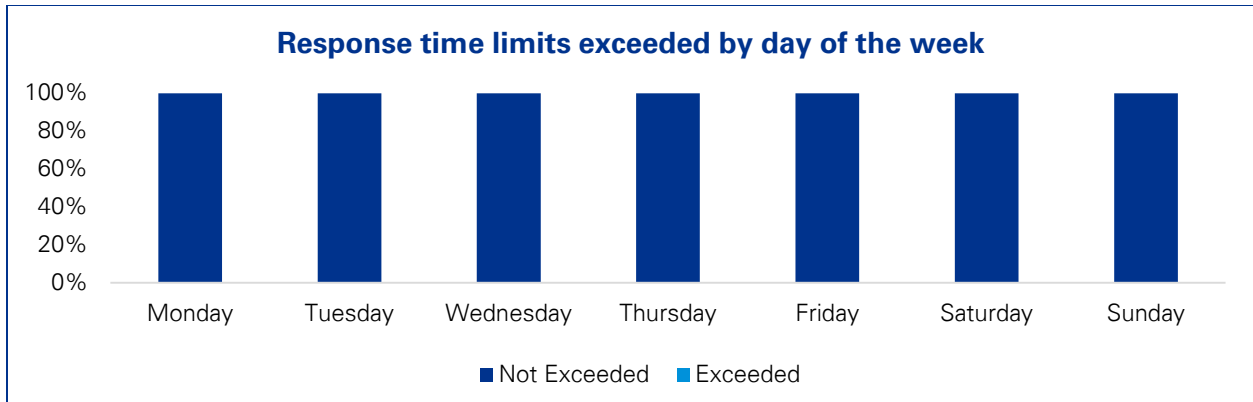
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12:30 AM	33	33	33	34	42	48	47
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1:30 AM	33	33	33	34	42	48	47
2:00 AM	33	33	33	34	42	48	47
2:30 AM	33	33	33	34	42	48	47
3:00 AM	33	33	33	34	42	48	47
3:30 AM	33	33	33	34	42	48	47
4:00 AM	33	33	33	34	42	48	47
4:30 AM	33	33	33	34	42	48	47
5:00 AM	33	33	33	34	42	48	47
5:30 AM	33	33	33	34	42	48	47
6:00 AM	33	33	33	34	42	48	47
6:30 AM	33	33	33	34	42	48	47
7:00 AM	35	44	43	37	43	34	29
7:30 AM	35	44	43	37	43	34	29
8:00 AM	44	45	45	45	45	33	28
8:30 AM	44	45	45	45	45	33	28
9:00 AM	44	45	45	45	45	33	28
9:30 AM	44	45	45	45	45	33	28
10:00 AM	44	45	45	45	45	33	28
10:30 AM	44	45	45	45	45	33	28
11:00 AM	44	45	45	45	45	33	28
11:30 AM	44	45	45	45	45	33	28
12:00 PM	44	45	45	45	45	33	28

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:30 PM	44	45	45	45	45	33	28
1:00 PM	44	45	45	45	45	33	28
1:30 PM	44	45	45	45	45	33	28
2:00 PM	44	45	45	45	45	33	28
2:30 PM	44	45	45	45	45	33	28
3:00 PM	47	44	45	44	47	39	39
3:30 PM	47	44	45	44	47	39	39
4:00 PM	45	42	43	47	50	46	42
4:30 PM	45	42	43	47	50	46	42
5:00 PM	45	42	43	47	50	46	42
5:30 PM	45	42	43	47	50	46	42
6:00 PM	45	42	43	47	50	46	42
6:30 PM	45	42	43	47	50	46	42
7:00 PM	45	42	43	47	50	46	42
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8:00 PM	45	42	43	47	50	46	42
8:30 PM	45	42	43	47	50	46	42
9:00 PM	45	42	43	47	50	46	42
9:30 PM	45	42	43	47	50	46	42
10:00 PM	45	42	43	47	50	46	42
10:30 PM	45	42	43	47	50	46	42
11:00 PM	40	33	40	47	47	53	40
11:30 PM	40	33	40	47	47	53	40

South Central Division, optimization at current staffing levels

South Central Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	0.0%	10% (Max)	2	12:00 AM	
% of response time limit exceeded – All					
Priorities	0.0%	20% (Max)	3	7:00 AM	
# of officer supply per week	217	217 (Max)	4	8:00 AM	
# of watches	6	6 (Max)	5	3:00 PM	
Total overtime hours	108	140 (Max)	6	4:00 PM	
Estimated total FTE cost (regular + OT)	\$15,172,288	-	-		





Number of officers planned to be on duty at a given day and time

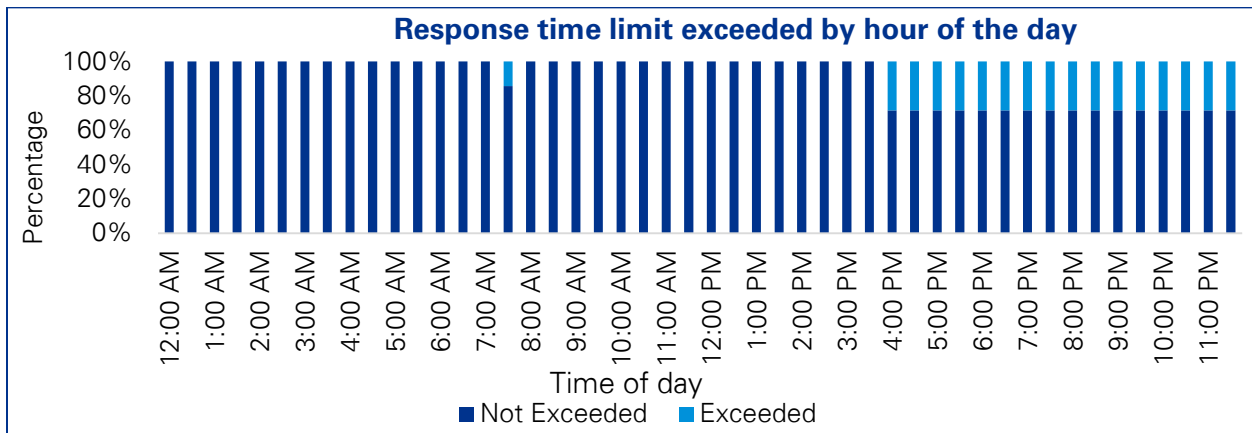
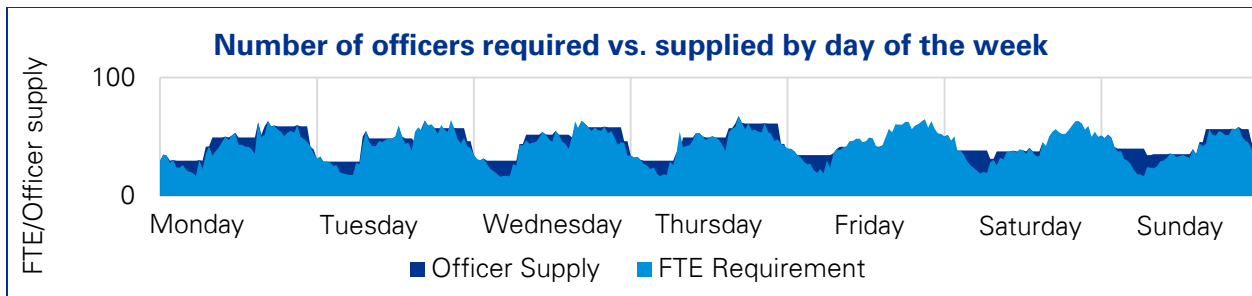
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	37	37	28	33	36	33	41
12:30 AM	37	37	28	33	36	33	41
1:00 AM	37	37	28	33	36	33	41
1:30 AM	37	37	28	33	36	33	41
2:00 AM	37	37	28	33	36	33	41
2:30 AM	37	37	28	33	36	33	41
3:00 AM	37	37	28	33	36	33	41
3:30 AM	37	37	28	33	36	33	41
4:00 AM	37	37	28	33	36	33	41
4:30 AM	37	37	28	33	36	33	41
5:00 AM	37	37	28	33	36	33	41
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6:00 AM	37	37	28	33	36	33	41
6:30 AM	37	37	28	33	36	33	41
7:00 AM	52	58	54	56	47	44	39
7:30 AM	52	58	54	56	47	44	39
8:00 AM	60	65	63	62	56	53	46
8:30 AM	60	65	63	62	56	53	46
9:00 AM	60	65	63	62	56	53	46
9:30 AM	60	65	63	62	56	53	46
10:00 AM	60	65	63	62	56	53	46
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11:30 AM	60	65	63	62	56	53	46

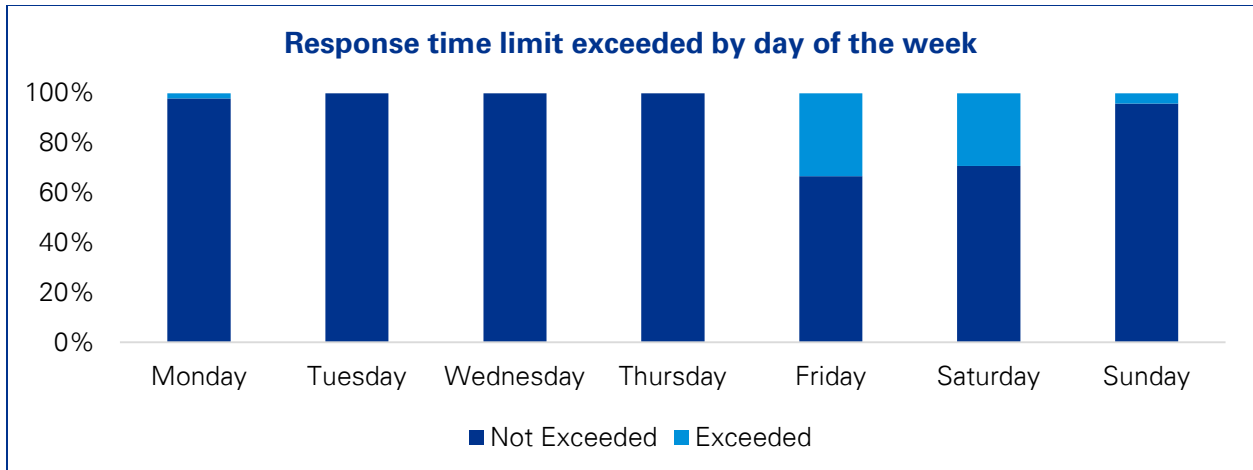
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	60	65	63	62	56	53	46
12:30 PM	60	65	63	62	56	53	46
1:00 PM	60	65	63	62	56	53	46
1:30 PM	60	65	63	62	56	53	46
2:00 PM	60	65	63	62	56	53	46
2:30 PM	60	65	63	62	56	53	46
3:00 PM	61	66	62	64	59	55	48
3:30 PM	61	66	62	64	59	55	48
4:00 PM	62	65	58	62	65	63	60
4:30 PM	62	65	58	62	65	63	60
5:00 PM	62	65	58	62	65	63	60
5:30 PM	62	65	58	62	65	63	60
6:00 PM	62	65	58	62	65	63	60
6:30 PM	62	65	58	62	65	63	60
7:00 PM	62	65	58	62	65	63	60
7:30 PM	62	65	58	62	65	63	60
8:00 PM	62	65	58	62	65	63	60
8:30 PM	62	65	58	62	65	63	60
9:00 PM	62	65	58	62	65	63	60
9:30 PM	62	65	58	62	65	63	60
10:00 PM	62	65	58	62	65	63	60
10:30 PM	62	65	58	62	65	63	60
11:00 PM	41	38	38	49	49	50	55
11:30 PM	41	38	38	49	49	50	55



Southeast Division, optimization at current staffing levels

Southeast Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	86.3%	70% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	9.8%	10% (Max)	2	12:00 AM	
% of response time limit exceeded – All					
Priorities	18.5%	20% (Max)	3	7:00 AM	
# of officer supply per week	221	221 (Max)	4	8:00 AM	
# of watches	6	6 (Max)	5	3:00 PM	
Total overtime hours	140	140 (Max)	6	4:00 PM	
Estimated total FTE cost (regular + OT)	\$15,529,487	-	-		





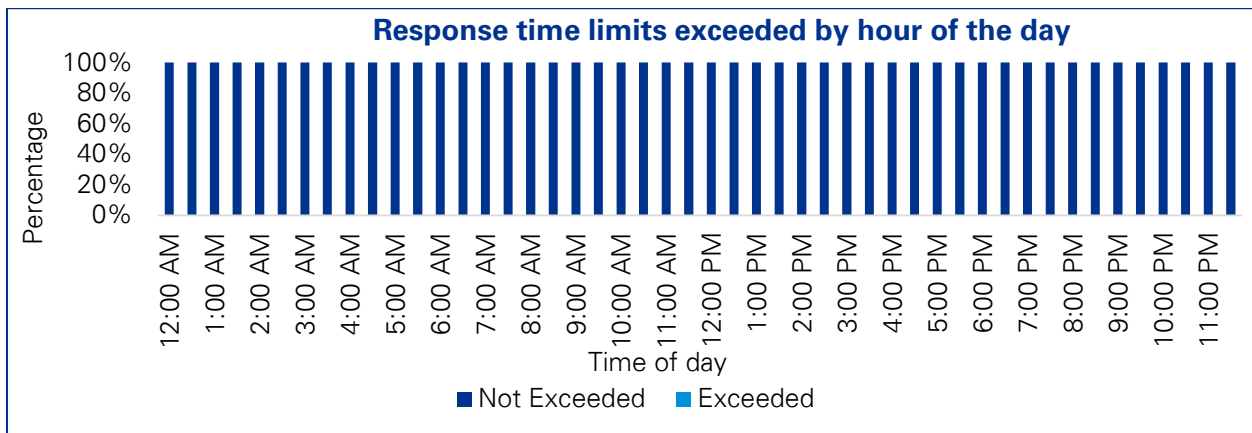
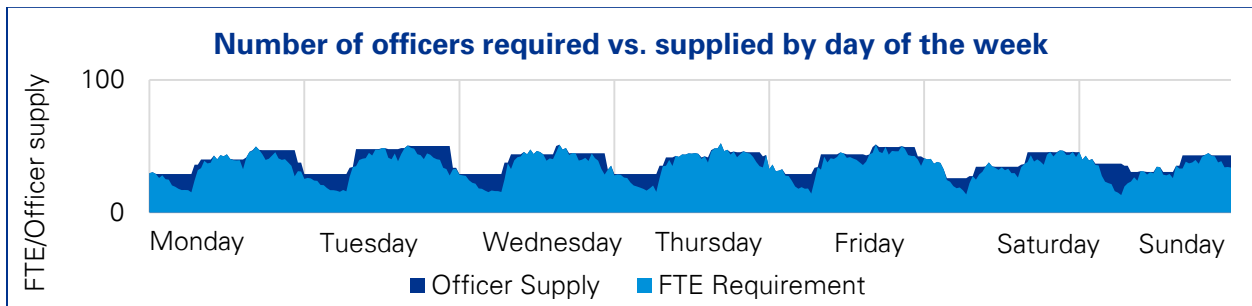
Number of officers planned to be on duty at a given day and time

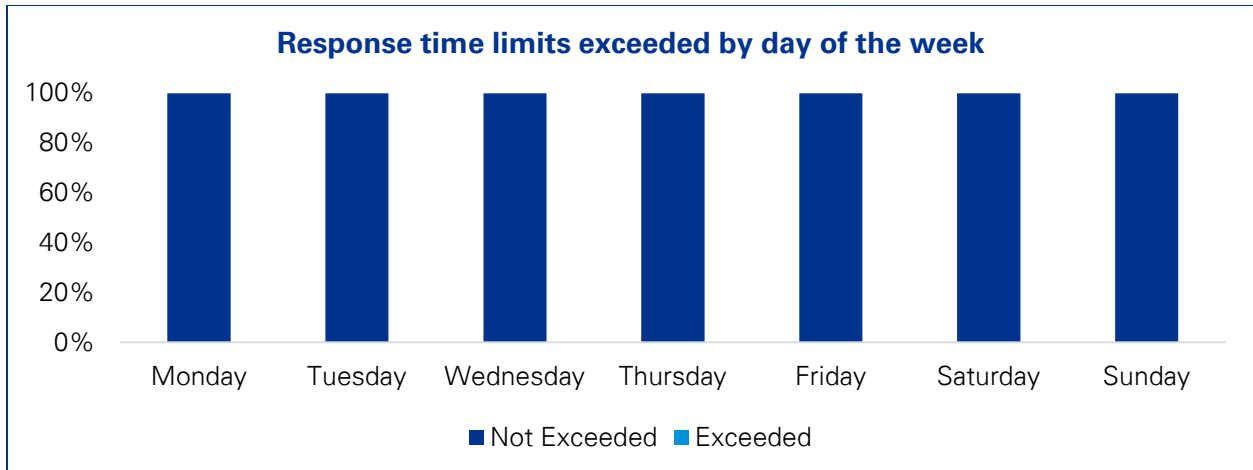
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
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12:30 AM	38	37	38	38	44	49	51
1:00 AM	38	37	38	38	44	49	51
1:30 AM	38	37	38	38	44	49	51
2:00 AM	38	37	38	38	44	49	51
2:30 AM	38	37	38	38	44	49	51
3:00 AM	38	37	38	38	44	49	51
3:30 AM	38	37	38	38	44	49	51
4:00 AM	38	37	38	38	44	49	51
4:30 AM	38	37	38	38	44	49	51
5:00 AM	38	37	38	38	44	49	51
5:30 AM	38	37	38	38	44	49	51
6:00 AM	38	37	38	38	44	49	51
6:30 AM	38	37	38	38	44	49	51
7:00 AM	53	64	56	47	46	40	44
7:30 AM	53	64	56	47	46	40	44
8:00 AM	63	62	66	63	53	48	45
8:30 AM	63	62	66	63	53	48	45
9:00 AM	63	62	66	63	53	48	45
9:30 AM	63	62	66	63	53	48	45
10:00 AM	63	62	66	63	53	48	45
10:30 AM	63	62	66	63	53	48	45
11:00 AM	63	62	66	63	53	48	45
11:30 AM	63	62	66	63	53	48	45

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	63	62	66	63	53	48	45
12:30 PM	63	62	66	63	53	48	45
1:00 PM	63	62	66	63	53	48	45
1:30 PM	63	62	66	63	53	48	45
2:00 PM	63	62	66	63	53	48	45
2:30 PM	63	62	66	63	53	48	45
3:00 PM	66	58	63	73	54	53	58
3:30 PM	66	58	63	73	54	53	58
4:00 PM	75	73	74	78	19	19	72
4:30 PM	75	73	74	78	19	19	72
5:00 PM	75	73	74	78	19	19	72
5:30 PM	75	73	74	78	19	19	72
6:00 PM	75	73	74	78	19	19	72
6:30 PM	75	73	74	78	19	19	72
7:00 PM	75	73	74	78	19	19	72
7:30 PM	75	73	74	78	19	19	72
8:00 PM	75	73	74	78	19	19	72
8:30 PM	75	73	74	78	19	19	72
9:00 PM	75	73	74	78	19	19	72
9:30 PM	75	73	74	78	19	19	72
10:00 PM	75	73	74	78	19	19	72
10:30 PM	75	73	74	78	19	19	72
11:00 PM	50	59	59	56	23	26	57
11:30 PM	50	59	59	56	23	26	57

Southwest Division, optimization at current staffing levels

Southwest Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	0.0%	10% (Max)	2	12:00 AM	
% of response time limit exceeded – All					
Priorities	0.0%	20% (Max)	3	7:00 AM	
# of officer supply per week	208	208 (Max)	4	8:00 AM	
# of watches	6	6 (Max)	5	3:00 PM	
Total overtime hours	118	140 (Max)	6	4:00 PM	
Estimated total FTE cost (regular + OT)	\$14,581,622	-	-		





Number of officers planned to be on duty at a given day and time

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	37	37	37	37	37	33	47
12:30 AM	37	37	37	37	37	33	47
1:00 AM	37	37	37	37	37	33	47
1:30 AM	37	37	37	37	37	33	47
2:00 AM	37	37	37	37	37	33	47
2:30 AM	37	37	37	37	37	33	47
3:00 AM	37	37	37	37	37	33	47
3:30 AM	37	37	37	37	37	33	47
4:00 AM	37	37	37	37	37	33	47
4:30 AM	37	37	37	37	37	33	47
5:00 AM	37	37	37	37	37	33	47
5:30 AM	37	37	37	37	37	33	47
6:00 AM	37	37	37	37	37	33	47
6:30 AM	37	37	37	37	37	33	47
7:00 AM	46	43	48	45	43	35	45
7:30 AM	46	43	48	45	43	35	45
8:00 AM	51	61	56	53	56	44	39
8:30 AM	51	61	56	53	56	44	39
9:00 AM	51	61	56	53	56	44	39
9:30 AM	51	61	56	53	56	44	39
10:00 AM	51	61	56	53	56	44	39
10:30 AM	51	61	56	53	56	44	39
11:00 AM	51	61	56	53	56	44	39
11:30 AM	51	61	56	53	56	44	39

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	51	61	56	53	56	44	39
12:30 PM	51	61	56	53	56	44	39
1:00 PM	51	61	56	53	56	44	39
1:30 PM	51	61	56	53	56	44	39
2:00 PM	51	61	56	53	56	44	39
2:30 PM	51	61	56	53	56	44	39
3:00 PM	53	62	64	60	55	46	45
3:30 PM	53	62	64	60	55	46	45
4:00 PM	60	64	57	58	63	58	55
4:30 PM	60	64	57	58	63	58	55
5:00 PM	60	64	57	58	63	58	55
5:30 PM	60	64	57	58	63	58	55
6:00 PM	60	64	57	58	63	58	55
6:30 PM	60	64	57	58	63	58	55
7:00 PM	60	64	57	58	63	58	55
7:30 PM	60	64	57	58	63	58	55
8:00 PM	60	64	57	58	63	58	55
8:30 PM	60	64	57	58	63	58	55
9:00 PM	60	64	57	58	63	58	55
9:30 PM	60	64	57	58	63	58	55
10:00 PM	60	64	57	58	63	58	55
10:30 PM	60	64	57	58	63	58	55
11:00 PM	48	43	38	54	54	58	55
11:30 PM	48	43	38	54	54	58	55



Scenario Two, Option One: Division-level model outputs meet 80 percent of demand

The most efficient solution found by the model involved mixed shift patterns across divisions: a blend of 4–10 and 5–8 shifts as outlined in the table below.

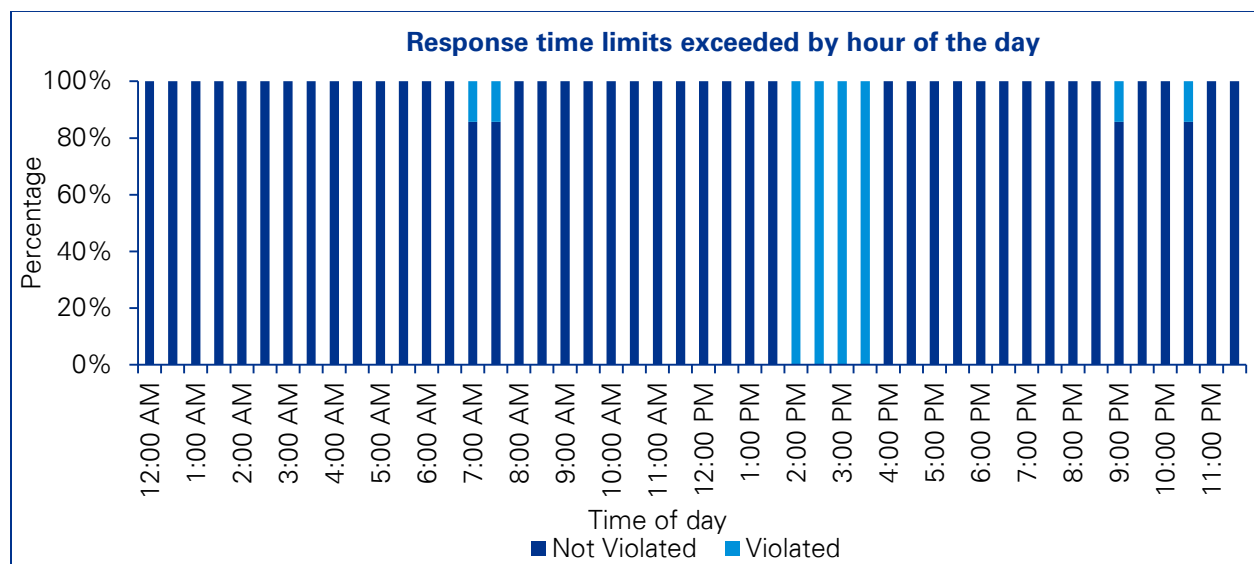
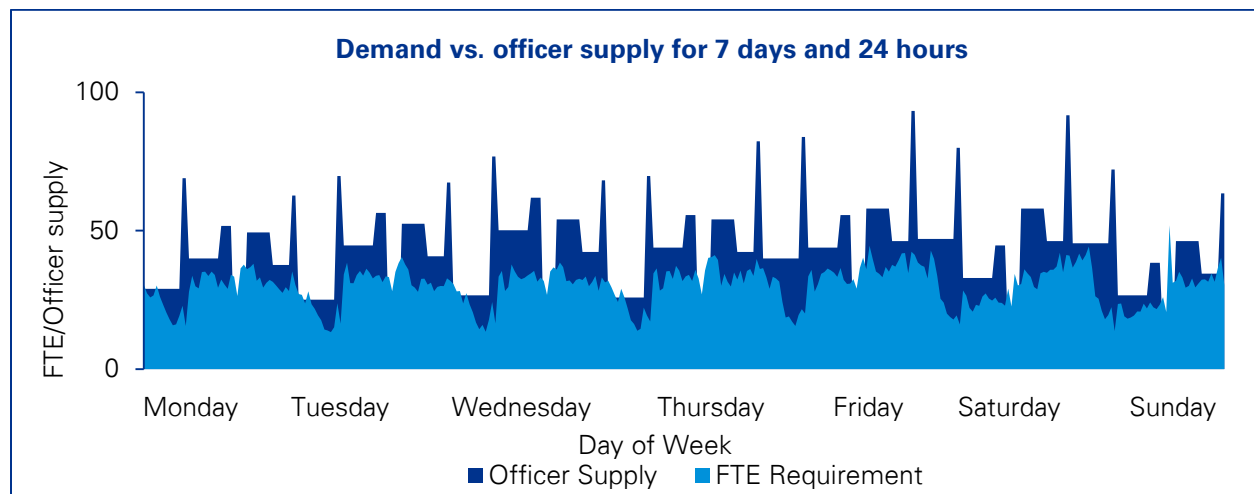
Division	Officer supply	Days per shift	Shift length	% of demand met
Central	228	5	8	85.1%
North Central	162	5	8	99.9%
Northeast	272	4	10	80.4%
Northwest	220	5	8	86.0%
South Central	237	5	8	90.5%
Southeast	283	5	8	91.7%
Southwest	229	4	10	83.6%

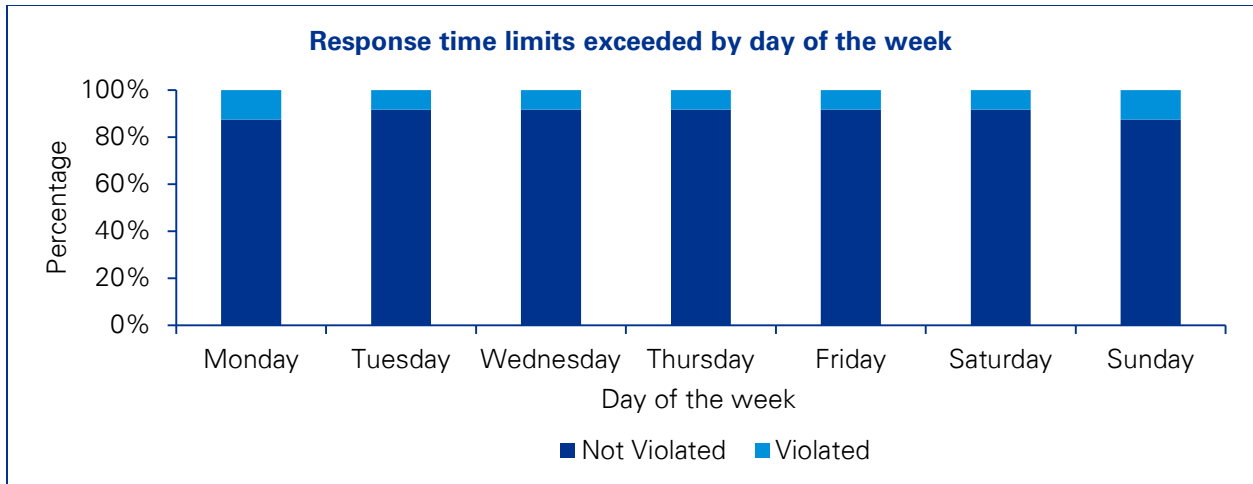
The model’s outputs—including key metrics, shift start times, and schedules—are included in the following pages for each division for the above shift patterns.

Given that DPD may prefer to run one common shift pattern across all patrol divisions for operational reasons, KPMG also has included the model’s outputs for a 5–8 shift pattern at the Northeast and Southwest Divisions. While the model found a 4–10 shift pattern to be more optimal at the division level, if DPD is to stick to one shift pattern across all divisions, a 5–8 was the most efficient pattern for most divisions.

Central Division 5–8 output, 80 percent demand met

Central Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	85.1%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	9.5%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All			3		
Priorities	4.2%	20% (Max)		12:00 PM	
# of officer supply per week	228	228 (Max)	4	4:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	45	140 (Max)			
Estimated total FTE cost (regular + OT)	\$15,649,920	-	-		





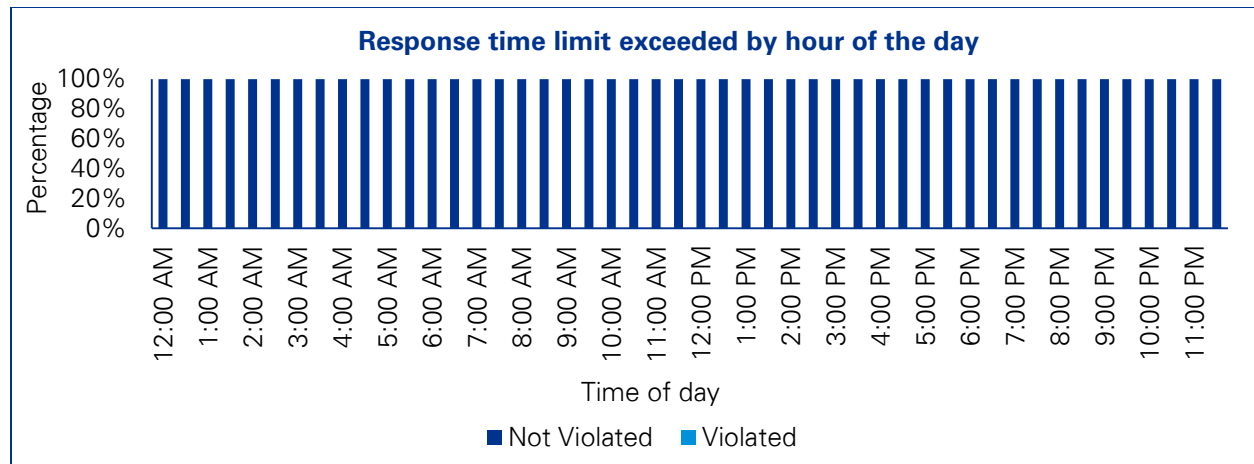
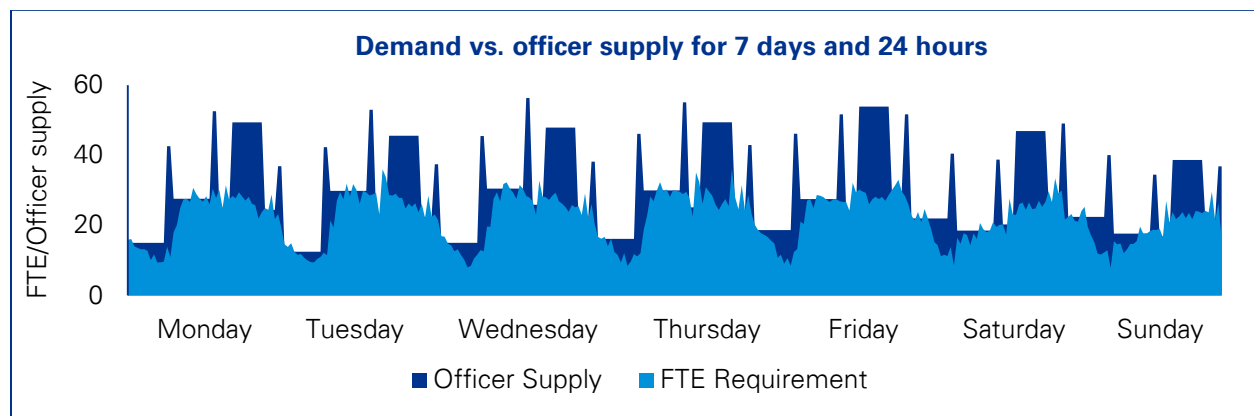
Number of officers planned to be on duty at a given day and time

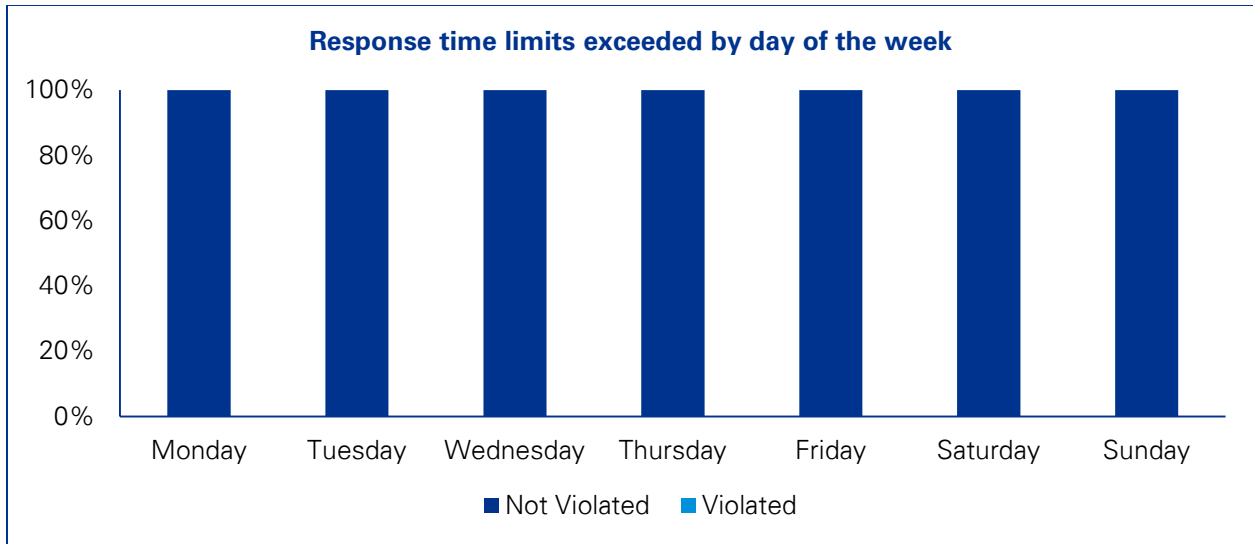
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	37	32	34	33	51	60	58
12:30 AM	37	32	34	33	51	60	58
1:00 AM	37	32	34	33	51	60	58
1:30 AM	37	32	34	33	51	60	58
2:00 AM	37	32	34	33	51	60	58
2:30 AM	37	32	34	33	51	60	58
3:00 AM	37	32	34	33	51	60	58
3:30 AM	37	32	34	33	51	60	58
4:00 AM	37	32	34	33	51	60	58
4:30 AM	37	32	34	33	51	60	58
5:00 AM	37	32	34	33	51	60	58
5:30 AM	37	32	34	33	51	60	58
6:00 AM	88	89	98	89	107	102	92
6:30 AM	88	89	98	89	107	102	92
7:00 AM	51	57	64	56	56	42	34
7:30 AM	51	57	64	56	56	42	34
8:00 AM	51	57	64	56	56	42	34
8:30 AM	51	57	64	56	56	42	34
9:00 AM	51	57	64	56	56	42	34
9:30 AM	51	57	64	56	56	42	34
10:00 AM	51	57	64	56	56	42	34
10:30 AM	51	57	64	56	56	42	34
11:00 AM	51	57	64	56	56	42	34
11:30 AM	51	57	64	56	56	42	34

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	66	72	79	71	71	57	49
12:30 PM	66	72	79	71	71	57	49
1:00 PM	66	72	79	71	71	57	49
1:30 PM	66	72	79	71	71	57	49
2:00 PM	15	15	15	15	15	15	15
2:30 PM	15	15	15	15	15	15	15
3:00 PM	15	15	15	15	15	15	15
3:30 PM	15	15	15	15	15	15	15
4:00 PM	63	67	69	69	74	74	59
4:30 PM	63	67	69	69	74	74	59
5:00 PM	63	67	69	69	74	74	59
5:30 PM	63	67	69	69	74	74	59
6:00 PM	63	67	69	69	74	74	59
6:30 PM	63	67	69	69	74	74	59
7:00 PM	63	67	69	69	74	74	59
7:30 PM	63	67	69	69	74	74	59
8:00 PM	48	52	54	54	59	59	44
8:30 PM	48	52	54	54	59	59	44
9:00 PM	48	52	54	54	59	59	44
9:30 PM	48	52	54	54	59	59	44
10:00 PM	48	52	54	54	59	59	44
10:30 PM	48	52	54	54	59	59	44
11:00 PM	80	86	87	105	119	117	81
11:30 PM	80	86	87	105	119	117	81

North Central Division 5–8 output, 80 percent demand met

North Central Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	99.9%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	4.6%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All			3		
Priorities	0.0%	20% (Max)		1:00 PM	
# of officer supply per week	162	162 (Max)	4	4:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	140	140 (Max)			
Estimated total FTE cost (regular + OT)	\$11,119,680	-	-		





Number of officers planned to be on duty at a given day and time

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	19	16	19	21	24	28	29
12:30 AM	19	16	19	21	24	28	29
1:00 AM	19	16	19	21	24	28	29
1:30 AM	19	16	19	21	24	28	29
2:00 AM	19	16	19	21	24	28	29
2:30 AM	19	16	19	21	24	28	29
3:00 AM	19	16	19	21	24	28	29
3:30 AM	19	16	19	21	24	28	29
4:00 AM	19	16	19	21	24	28	29
4:30 AM	19	16	19	21	24	28	29
5:00 AM	19	16	19	21	24	28	29
5:30 AM	19	16	19	21	24	28	29
6:00 AM	54	54	58	59	59	52	51
6:30 AM	54	54	58	59	59	52	51
7:00 AM	35	38	39	38	35	24	23
7:30 AM	35	38	39	38	35	24	23
8:00 AM	35	38	39	38	35	24	23
8:30 AM	35	38	39	38	35	24	23
9:00 AM	35	38	39	38	35	24	23
9:30 AM	35	38	39	38	35	24	23
10:00 AM	35	38	39	38	35	24	23
10:30 AM	35	38	39	38	35	24	23
11:00 AM	35	38	39	38	35	24	23
11:30 AM	35	38	39	38	35	24	23

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	35	38	39	38	35	24	23
12:30 PM	35	38	39	38	35	24	23
1:00 PM	67	68	72	70	66	49	44
1:30 PM	67	68	72	70	66	49	44
2:00 PM	32	30	33	32	31	26	21
2:30 PM	32	30	33	32	31	26	21
3:00 PM	32	30	33	32	31	26	21
3:30 PM	32	30	33	32	31	26	21
4:00 PM	63	58	61	63	69	60	49
4:30 PM	63	58	61	63	69	60	49
5:00 PM	63	58	61	63	69	60	49
5:30 PM	63	58	61	63	69	60	49
6:00 PM	63	58	61	63	69	60	49
6:30 PM	63	58	61	63	69	60	49
7:00 PM	63	58	61	63	69	60	49
7:30 PM	63	58	61	63	69	60	49
8:00 PM	63	58	61	63	69	60	49
8:30 PM	63	58	61	63	69	60	49
9:00 PM	31	29	28	31	38	34	28
9:30 PM	31	29	28	31	38	34	28
10:00 PM	31	29	28	31	38	34	28
10:30 PM	31	29	28	31	38	34	28
11:00 PM	47	48	49	55	66	63	47
11:30 PM	47	48	49	55	66	63	47

Northeast Division 4–10 output, 80 percent demand met

Northeast Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	80.4%	80% (Min)	1	12:00 AM	
% of response time limit exceeded – Priority 1	3.9%	10% (Max)	2	7:00 AM	
% of response time limit exceeded – All			3		
Priorities	3.6%	20% (Max)		11:00 AM	
# of officer supply per week	272	272 (Max)	4	5:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	0	140 (Max)			
Estimated total FTE cost (regular + OT)	\$18,670,080	-	-		

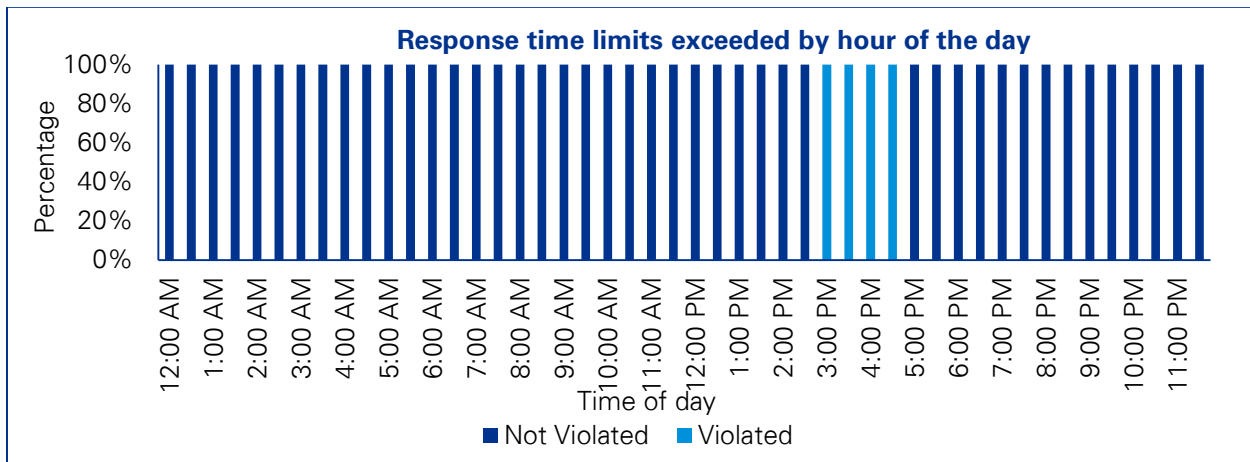
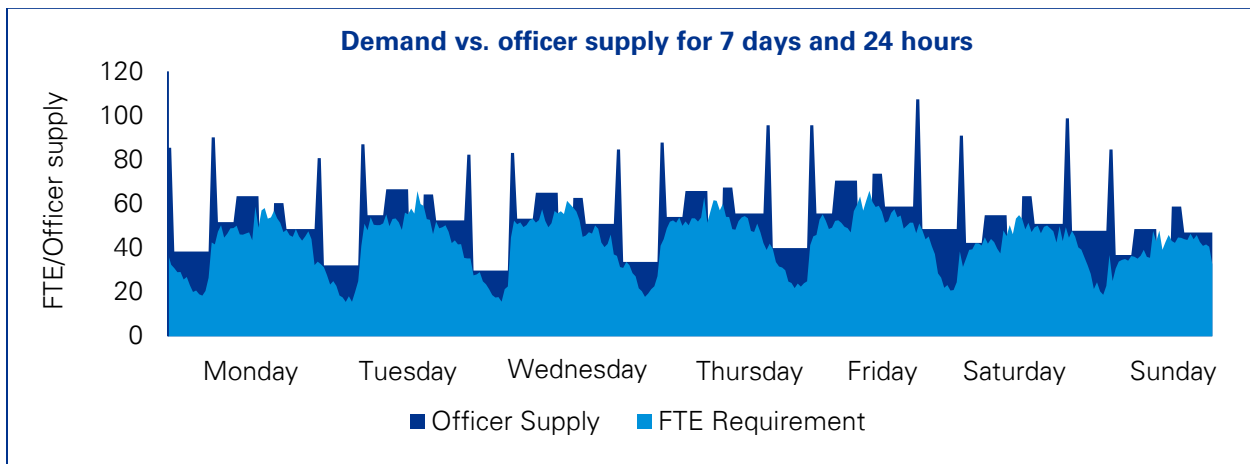
Number of officers planned to be on duty at a given day and time

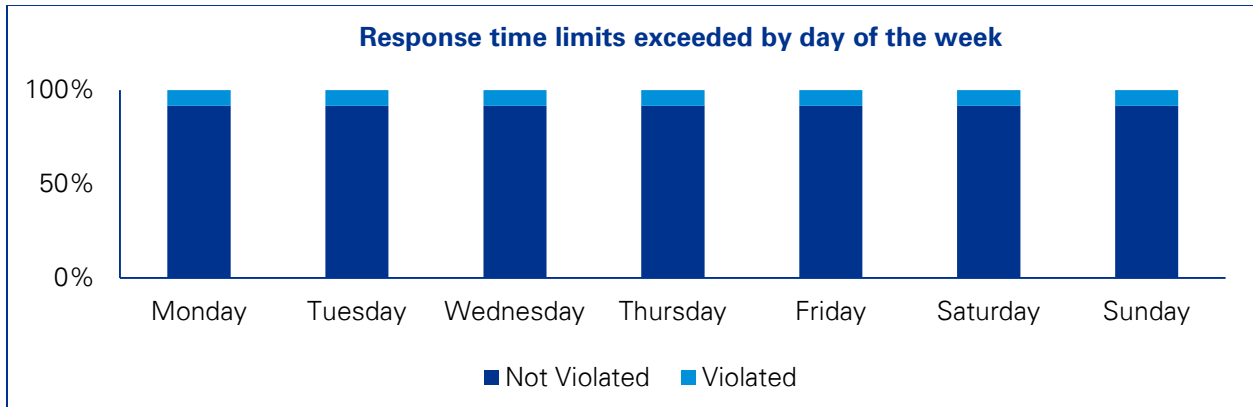
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	94	90	77	52	79	81	111
12:30 AM	94	90	77	52	79	81	111
1:00 AM	94	90	77	52	79	81	111
1:30 AM	94	90	77	52	79	81	111
2:00 AM	94	90	77	52	79	81	111
2:30 AM	94	90	77	52	79	81	111
3:00 AM	35	32	29	27	41	37	47
3:30 AM	35	32	29	27	41	37	47
4:00 AM	35	32	29	27	41	37	47
4:30 AM	35	32	29	27	41	37	47
5:00 AM	35	32	29	27	41	37	47
5:30 AM	35	32	29	27	41	37	47
6:00 AM	35	32	29	27	41	37	47
6:30 AM	35	32	29	27	41	37	47
7:00 AM	99	86	67	63	92	92	101
7:30 AM	99	86	67	63	92	92	101
8:00 AM	99	86	67	63	92	92	101
8:30 AM	99	86	67	63	92	92	101
9:00 AM	99	86	67	63	92	92	101
9:30 AM	99	86	67	63	92	92	101
10:00 AM	64	54	38	36	51	55	54
10:30 AM	64	54	38	36	51	55	54
11:00 AM	69	76	74	70	85	71	59
11:30 AM	69	76	74	70	85	71	59

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	69	76	74	70	85	71	59
12:30 PM	69	76	74	70	85	71	59
1:00 PM	69	76	74	70	85	71	59
1:30 PM	69	76	74	70	85	71	59
2:00 PM	69	76	74	70	85	71	59
2:30 PM	69	76	74	70	85	71	59
3:00 PM	69	76	74	70	85	71	59
3:30 PM	69	76	74	70	85	71	59
4:00 PM	69	76	74	70	85	71	59
4:30 PM	69	76	74	70	85	71	59
5:00 PM	63	70	61	72	78	80	64
5:30 PM	63	70	61	72	78	80	64
6:00 PM	63	70	61	72	78	80	64
6:30 PM	63	70	61	72	78	80	64
7:00 PM	63	70	61	72	78	80	64
7:30 PM	63	70	61	72	78	80	64
8:00 PM	63	70	61	72	78	80	64
8:30 PM	63	70	61	72	78	80	64
9:00 PM	58	48	25	38	44	64	59
9:30 PM	58	48	25	38	44	64	59
10:00 PM	58	48	25	38	44	64	59
10:30 PM	58	48	25	38	44	64	59
11:00 PM	58	48	25	38	44	64	59
11:30 PM	58	48	25	38	44	64	59

Northeast Division 5–8 output, 80 percent demand met

Northeast Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	91.7%	80% (Min)	1	12:00 AM	
% of response time limit exceeded – Priority 1	8.3%	10% (Max)	2	7:00 AM	
% of response time limit exceeded – All			3		
Priorities	0.0%	20% (Max)		11:00 AM	
# of officer supply per week	273	273 (Max)	4	5:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	38	140 (Max)			
Estimated total FTE cost (regular + OT)	\$18,738,720	-	-		





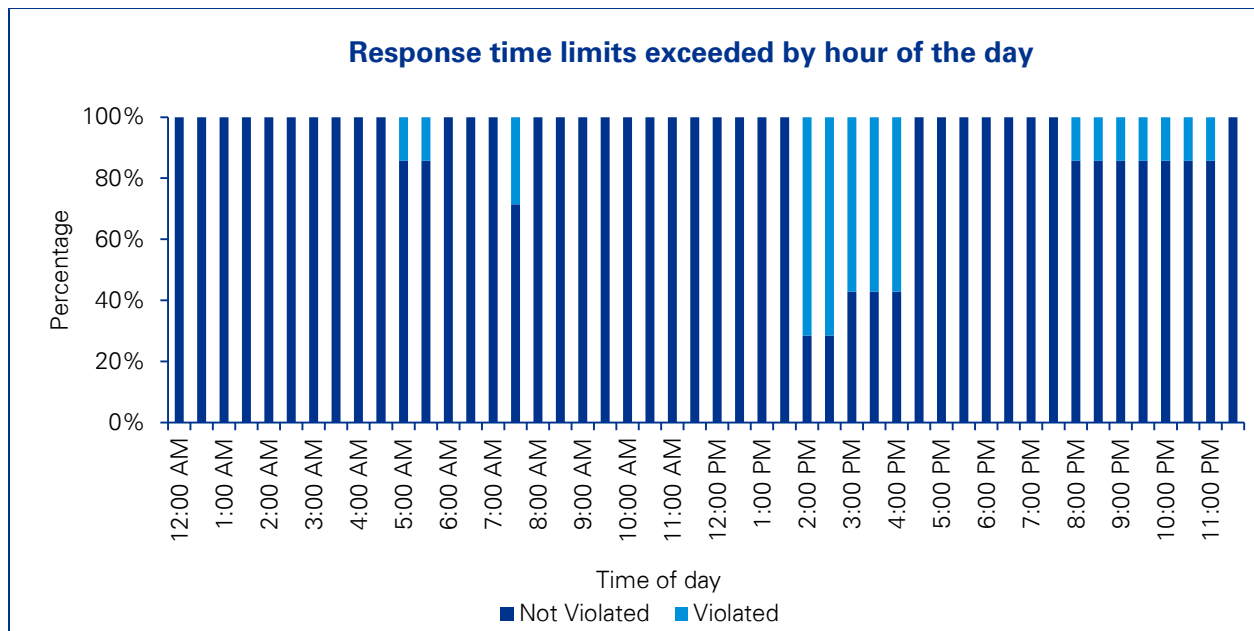
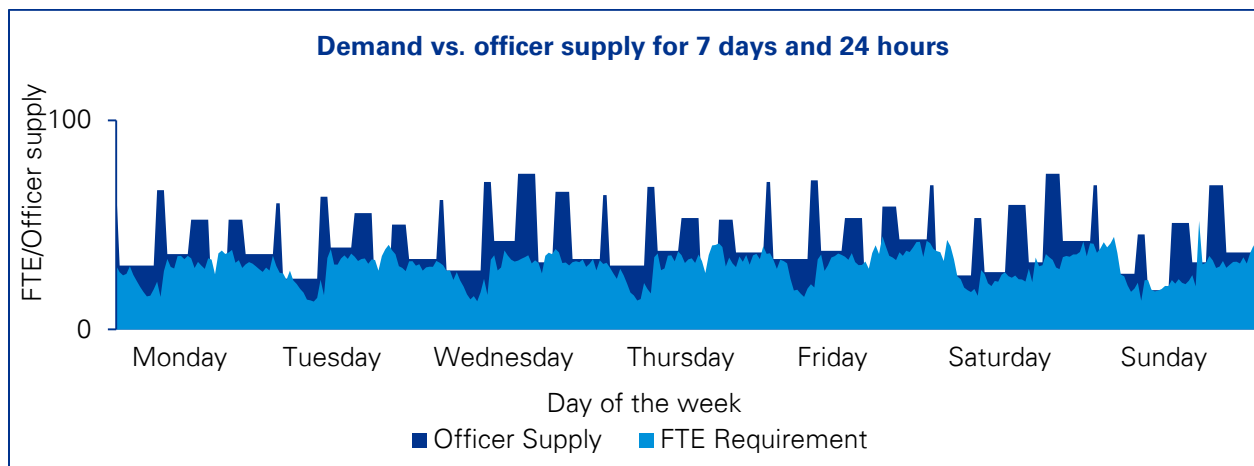
Number of officers planned to be on duty at a given day and time

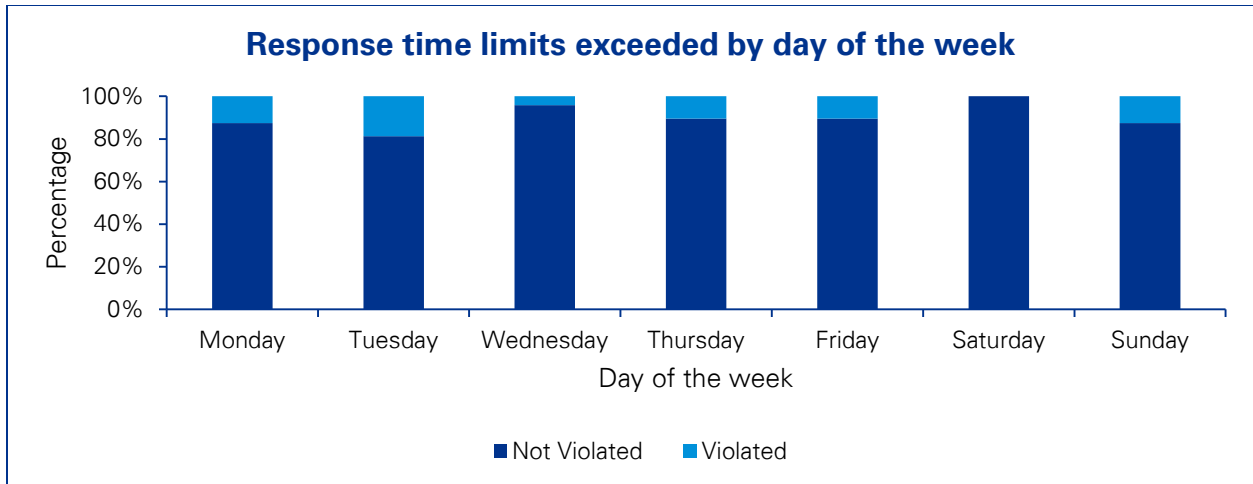
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	109	103	105	108	122	137	126
12:30 AM	109	103	105	108	122	137	126
1:00 AM	49	41	38	43	51	62	61
1:30 AM	49	41	38	43	51	62	61
2:00 AM	49	41	38	43	51	62	61
2:30 AM	49	41	38	43	51	62	61
3:00 AM	49	41	38	43	51	62	61
3:30 AM	49	41	38	43	51	62	61
4:00 AM	49	41	38	43	51	62	61
4:30 AM	49	41	38	43	51	62	61
5:00 AM	49	41	38	43	51	62	61
5:30 AM	49	41	38	43	51	62	61
6:00 AM	49	41	38	43	51	62	61
6:30 AM	49	41	38	43	51	62	61
7:00 AM	115	111	106	112	122	116	108
7:30 AM	115	111	106	112	122	116	108
8:00 AM	66	70	68	69	71	54	47
8:30 AM	66	70	68	69	71	54	47
9:00 AM	66	70	68	69	71	54	47
9:30 AM	66	70	68	69	71	54	47
10:00 AM	66	70	68	69	71	54	47
10:30 AM	66	70	68	69	71	54	47
11:00 AM	81	85	83	84	90	70	62
11:30 AM	81	85	83	84	90	70	62

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	81	85	83	84	90	70	62
12:30 PM	81	85	83	84	90	70	62
1:00 PM	81	85	83	84	90	70	62
1:30 PM	81	85	83	84	90	70	62
2:00 PM	81	85	83	84	90	70	62
2:30 PM	81	85	83	84	90	70	62
3:00 PM	15	15	15	15	19	16	15
3:30 PM	15	15	15	15	19	16	15
4:00 PM	15	15	15	15	19	16	15
4:30 PM	15	15	15	15	19	16	15
5:00 PM	77	82	80	86	94	81	75
5:30 PM	77	82	80	86	94	81	75
6:00 PM	77	82	80	86	94	81	75
6:30 PM	77	82	80	86	94	81	75
7:00 PM	62	67	65	71	75	65	60
7:30 PM	62	67	65	71	75	65	60
8:00 PM	62	67	65	71	75	65	60
8:30 PM	62	67	65	71	75	65	60
9:00 PM	62	67	65	71	75	65	60
9:30 PM	62	67	65	71	75	65	60
10:00 PM	62	67	65	71	75	65	60
10:30 PM	62	67	65	71	75	65	60
11:00 PM	62	67	65	71	75	65	60
11:30 PM	62	67	65	71	75	65	60

Northwest Division 5-8 output, 80 percent demand met

Northwest Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	86.0%	80% (Min)	1	11:30 PM	
% of response time limit exceeded – Priority 1	9.8%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All			3		
Priorities	0.0%	20% (Max)		11:00 AM	
# of officer supply per week	220	220 (Max)	4	4:30 PM	
# of watches	4	4 (Max)			
Total overtime hours	0	140 (Max)			
Estimated total FTE cost (regular + OT)	\$15,100,800	-	-		





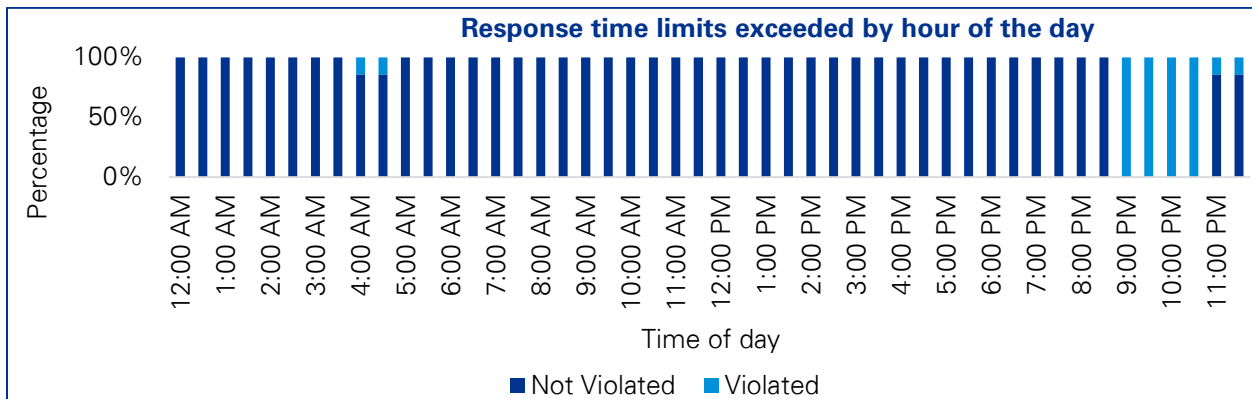
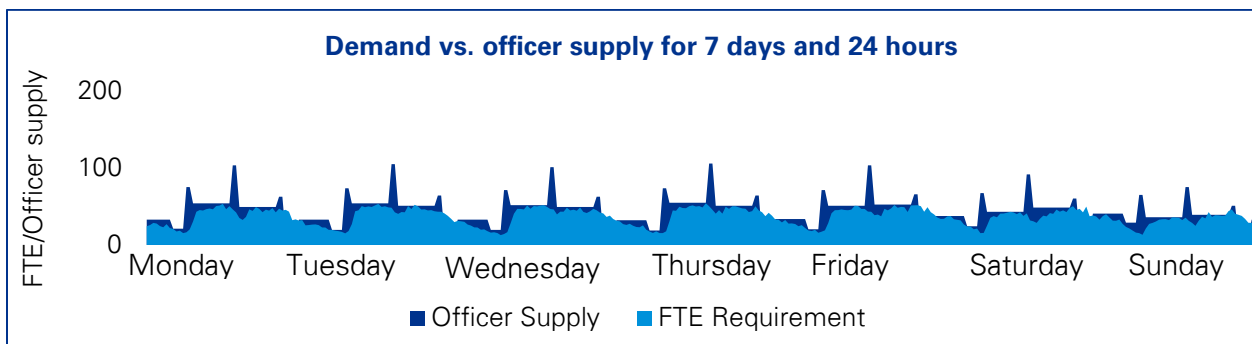
Number of officers planned to be on duty at a given day and time

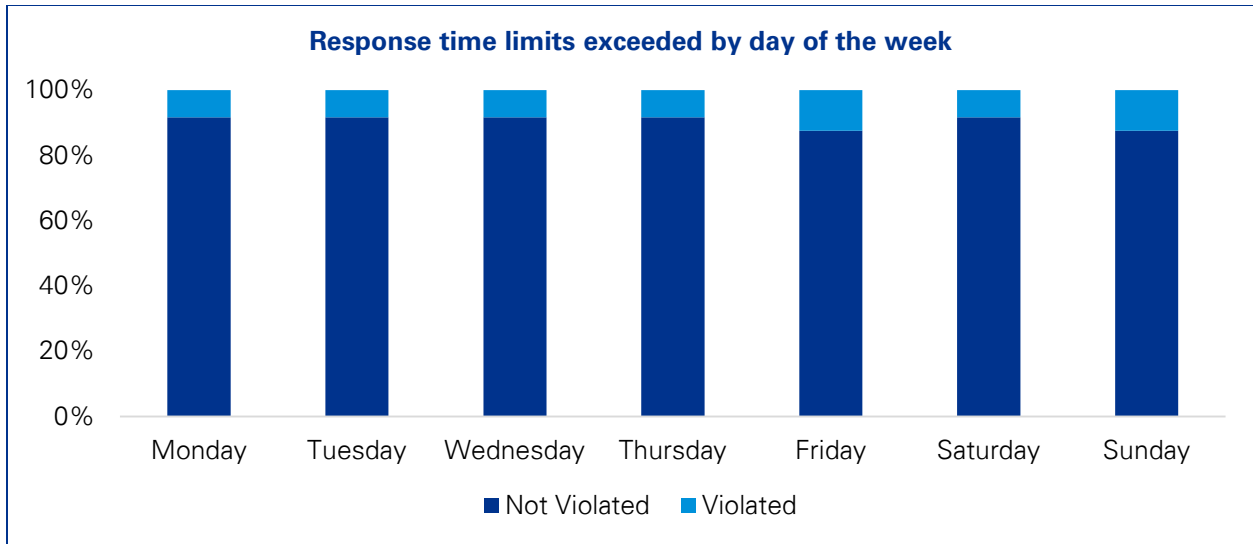
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	86	77	79	82	90	88	88
12:30 AM	39	31	36	39	43	33	34
1:00 AM	39	31	36	39	43	33	34
1:30 AM	39	31	36	39	43	33	34
2:00 AM	39	31	36	39	43	33	34
2:30 AM	39	31	36	39	43	33	34
3:00 AM	39	31	36	39	43	33	34
3:30 AM	39	31	36	39	43	33	34
4:00 AM	39	31	36	39	43	33	34
4:30 AM	39	31	36	39	43	33	34
5:00 AM	39	31	36	39	43	33	34
5:30 AM	39	31	36	39	43	33	34
6:00 AM	85	81	90	87	91	68	58
6:30 AM	85	81	90	87	91	68	58
7:00 AM	85	81	90	87	91	68	58
7:30 AM	46	50	54	48	48	35	24
8:00 AM	46	50	54	48	48	35	24
8:30 AM	46	50	54	48	48	35	24
9:00 AM	46	50	54	48	48	35	24
9:30 AM	46	50	54	48	48	35	24
10:00 AM	46	50	54	48	48	35	24
10:30 AM	46	50	54	48	48	35	24
11:00 AM	67	71	95	68	68	76	65
11:30 AM	67	71	95	68	68	76	65

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	67	71	95	68	68	76	65
12:30 PM	67	71	95	68	68	76	65
1:00 PM	67	71	95	68	68	76	65
1:30 PM	67	71	95	68	68	76	65
2:00 PM	21	21	41	20	20	41	41
2:30 PM	21	21	41	20	20	41	41
3:00 PM	21	21	41	20	20	41	41
3:30 PM	21	21	41	20	20	41	41
4:00 PM	21	21	41	20	20	41	41
4:30 PM	67	64	84	67	75	95	88
5:00 PM	67	64	84	67	75	95	88
5:30 PM	67	64	84	67	75	95	88
6:00 PM	67	64	84	67	75	95	88
6:30 PM	67	64	84	67	75	95	88
7:00 PM	46	43	43	47	55	54	47
7:30 PM	46	43	43	47	55	54	47
8:00 PM	46	43	43	47	55	54	47
8:30 PM	46	43	43	47	55	54	47
9:00 PM	46	43	43	47	55	54	47
9:30 PM	46	43	43	47	55	54	47
10:00 PM	46	43	43	47	55	54	47
10:30 PM	46	43	43	47	55	54	47
11:00 PM	46	43	43	47	55	54	47
11:30 PM	77	79	82	90	88	88	86

South Central Division 5–8 output, 80 percent demand met

South Central Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	90.5%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	9.5%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All			3		
Priorities	10.7%	20% (Max)		1:00 PM	
# of officer supply per week	237	237 (Max)	4	8:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	30	140 (Max)			
Estimated total FTE cost (regular + OT)	\$16,267,680	-	-		





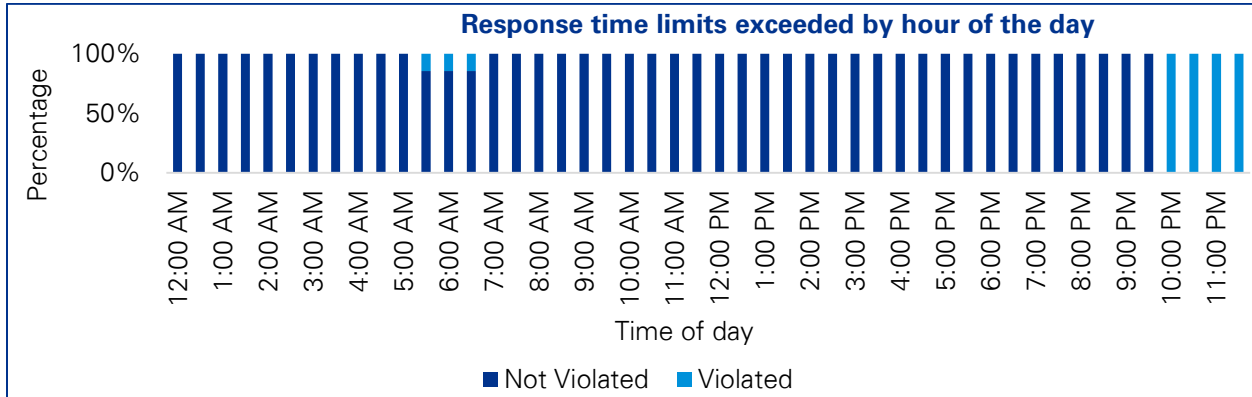
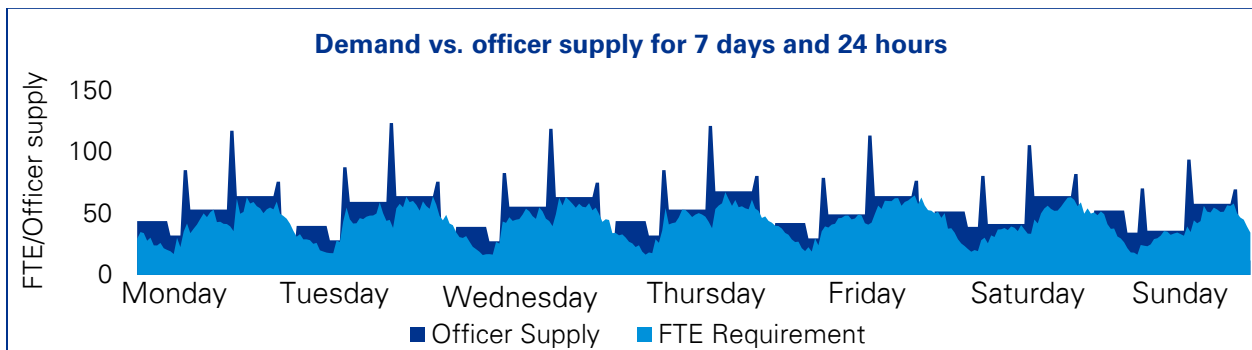
Number of officers planned to be on duty at a given day and time

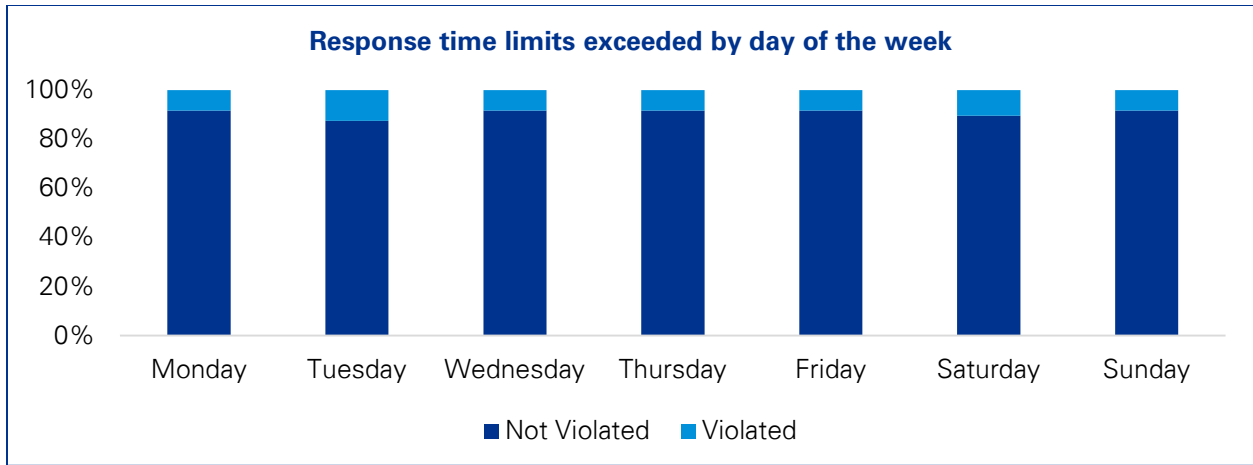
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	42	42	42	41	43	48	52
12:30 AM	42	42	42	41	43	48	52
1:00 AM	42	42	42	41	43	48	52
1:30 AM	42	42	42	41	43	48	52
2:00 AM	42	42	42	41	43	48	52
2:30 AM	42	42	42	41	43	48	52
3:00 AM	42	42	42	41	43	48	52
3:30 AM	42	42	42	41	43	48	52
4:00 AM	27	25	25	24	26	31	37
4:30 AM	27	25	25	24	26	31	37
5:00 AM	27	25	25	24	26	31	37
5:30 AM	27	25	25	24	26	31	37
6:00 AM	96	94	91	94	91	86	83
6:30 AM	96	94	91	94	91	86	83
7:00 AM	69	69	66	70	65	55	46
7:30 AM	69	69	66	70	65	55	46
8:00 AM	69	69	66	70	65	55	46
8:30 AM	69	69	66	70	65	55	46
9:00 AM	69	69	66	70	65	55	46
9:30 AM	69	69	66	70	65	55	46
10:00 AM	69	69	66	70	65	55	46
10:30 AM	69	69	66	70	65	55	46
11:00 AM	69	69	66	70	65	55	46
11:30 AM	69	69	66	70	65	55	46

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	69	69	66	70	65	55	46
12:30 PM	69	69	66	70	65	55	46
1:00 PM	132	134	129	135	132	117	96
1:30 PM	132	134	129	135	132	117	96
2:00 PM	63	65	63	65	67	62	50
2:30 PM	63	65	63	65	67	62	50
3:00 PM	63	65	63	65	67	62	50
3:30 PM	63	65	63	65	67	62	50
4:00 PM	63	65	63	65	67	62	50
4:30 PM	63	65	63	65	67	62	50
5:00 PM	63	65	63	65	67	62	50
5:30 PM	63	65	63	65	67	62	50
6:00 PM	63	65	63	65	67	62	50
6:30 PM	63	65	63	65	67	62	50
7:00 PM	63	65	63	65	67	62	50
7:30 PM	63	65	63	65	67	62	50
8:00 PM	80	82	80	82	84	77	65
8:30 PM	80	82	80	82	84	77	65
9:00 PM	17	17	17	17	17	15	15
9:30 PM	17	17	17	17	17	15	15
10:00 PM	17	17	17	17	17	15	15
10:30 PM	17	17	17	17	17	15	15
11:00 PM	42	42	41	43	48	52	42
11:30 PM	42	42	41	43	48	52	42

Southeast Division 5–8 output, 80 percent demand met

Southeast Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	91.7%	80% (Min)	1	12:00 AM	
% of response time limit exceeded – Priority 1	9.2%	10% (Max)	2	7:00 AM	
% of response time limit exceeded – All			3		
Priorities	1.2%	20% (Max)		2:00 PM	
# of officer supply per week	283	283 (Max)	4	9:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	36	140 (Max)			
Estimated total FTE cost (regular + OT)	\$19,425,120	-	-		





Number of officers planned to be on duty at a given day and time

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	56	51	50	56	54	66	67
12:30 AM	56	51	50	56	54	66	67
1:00 AM	56	51	50	56	54	66	67
1:30 AM	56	51	50	56	54	66	67
2:00 AM	56	51	50	56	54	66	67
2:30 AM	56	51	50	56	54	66	67
3:00 AM	56	51	50	56	54	66	67
3:30 AM	56	51	50	56	54	66	67
4:00 AM	56	51	50	56	54	66	67
4:30 AM	56	51	50	56	54	66	67
5:00 AM	41	36	35	41	38	50	44
5:30 AM	41	36	35	41	38	50	44
6:00 AM	41	36	35	41	38	50	44
6:30 AM	41	36	35	41	38	50	44
7:00 AM	109	112	106	109	101	103	90
7:30 AM	109	112	106	109	101	103	90
8:00 AM	68	76	71	68	63	53	46
8:30 AM	68	76	71	68	63	53	46
9:00 AM	68	76	71	68	63	53	46
9:30 AM	68	76	71	68	63	53	46
10:00 AM	68	76	71	68	63	53	46
10:30 AM	68	76	71	68	63	53	46
11:00 AM	68	76	71	68	63	53	46
11:30 AM	68	76	71	68	63	53	46

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	68	76	71	68	63	53	46
12:30 PM	68	76	71	68	63	53	46
1:00 PM	68	76	71	68	63	53	46
1:30 PM	68	76	71	68	63	53	46
2:00 PM	150	158	152	155	145	135	120
2:30 PM	150	158	152	155	145	135	120
3:00 PM	82	82	81	87	82	82	74
3:30 PM	82	82	81	87	82	82	74
4:00 PM	82	82	81	87	82	82	74
4:30 PM	82	82	81	87	82	82	74
5:00 PM	82	82	81	87	82	82	74
5:30 PM	82	82	81	87	82	82	74
6:00 PM	82	82	81	87	82	82	74
6:30 PM	82	82	81	87	82	82	74
7:00 PM	82	82	81	87	82	82	74
7:30 PM	82	82	81	87	82	82	74
8:00 PM	82	82	81	87	82	82	74
8:30 PM	82	82	81	87	82	82	74
9:00 PM	97	97	96	103	98	105	89
9:30 PM	97	97	96	103	98	105	89
10:00 PM	15	15	15	16	16	23	15
10:30 PM	15	15	15	16	16	23	15
11:00 PM	15	15	15	16	16	23	15
11:30 PM	15	15	15	16	16	23	15

Southwest Division 4–10 output, 80 percent demand met

Southwest Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	83.6%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	8.9%	10% (Max)	2	7:30 AM	
% of response time limit exceeded – All			3		
Priorities	9.5%	20% (Max)		1:00 PM	
# of officer supply per week	229	229 (Max)	4	5:30 PM	
# of watches	4	4 (Max)			
Total overtime hours	26	140 (Max)			
Estimated total FTE cost (regular + OT)	\$15,718,560	-	-		

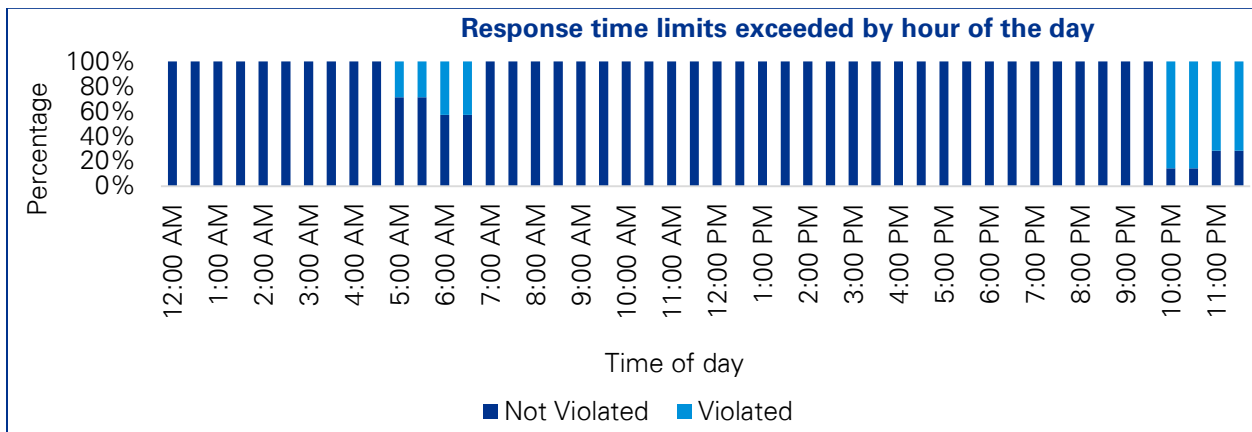
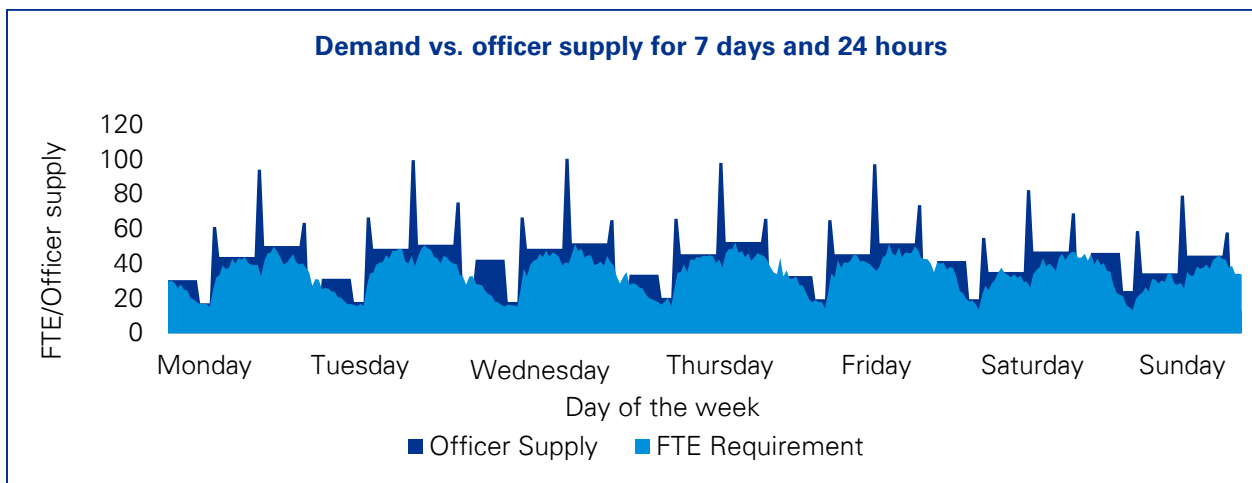
Number of officers planned to be on duty at a given day and time

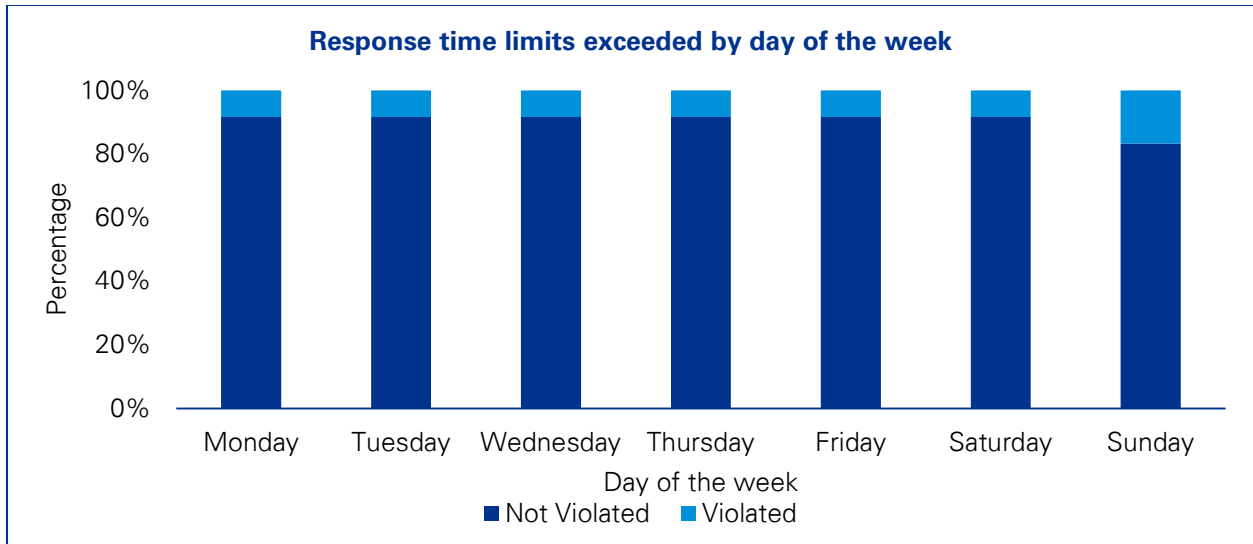
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	59	46	45	54	61	63	60
12:30 AM	59	46	45	54	61	63	60
1:00 AM	59	46	45	54	61	63	60
1:30 AM	59	46	45	54	61	63	60
2:00 AM	59	46	45	54	61	63	60
2:30 AM	59	46	45	54	61	63	60
3:00 AM	59	46	45	54	61	63	60
3:30 AM	15	24	23	25	24	26	15
4:00 AM	15	24	23	25	24	26	15
4:30 AM	15	24	23	25	24	26	15
5:00 AM	15	24	23	25	24	26	15
5:30 AM	15	24	23	25	24	26	15
6:00 AM	15	24	23	25	24	26	15
6:30 AM	15	24	23	25	24	26	15
7:00 AM	15	24	23	25	24	26	15
7:30 AM	71	86	84	83	82	71	59
8:00 AM	71	86	84	83	82	71	59
8:30 AM	71	86	84	83	82	71	59
9:00 AM	56	62	61	58	58	45	44
9:30 AM	56	62	61	58	58	45	44
10:00 AM	56	62	61	58	58	45	44
10:30 AM	56	62	61	58	58	45	44
11:00 AM	56	62	61	58	58	45	44
11:30 AM	56	62	61	58	58	45	44

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	56	62	61	58	58	45	44
12:30 PM	56	62	61	58	58	45	44
1:00 PM	83	84	83	80	81	59	58
1:30 PM	83	84	83	80	81	59	58
2:00 PM	83	84	83	80	81	59	58
2:30 PM	83	84	83	80	81	59	58
3:00 PM	83	84	83	80	81	59	58
3:30 PM	83	84	83	80	81	59	58
4:00 PM	83	84	83	80	81	59	58
4:30 PM	83	84	83	80	81	59	58
5:00 PM	83	84	83	80	81	59	58
5:30 PM	49	44	51	59	60	59	58
6:00 PM	49	44	51	59	60	59	58
6:30 PM	49	44	51	59	60	59	58
7:00 PM	49	44	51	59	60	59	58
7:30 PM	49	44	51	59	60	59	58
8:00 PM	49	44	51	59	60	59	58
8:30 PM	49	44	51	59	60	59	58
9:00 PM	49	44	51	59	60	59	58
9:30 PM	49	44	51	59	60	59	58
10:00 PM	49	44	51	59	60	59	58
10:30 PM	49	44	51	59	60	59	58
11:00 PM	46	45	54	61	63	60	59
11:30 PM	46	45	54	61	63	60	59

Southwest Division 5–8 output, 80 percent demand met

Southwest Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	90.8%	80% (Min)	1	12:00 AM	
% of response time limit exceeded – Priority 1	9.5%	10% (Max)	2	7:00 AM	
% of response time limit exceeded – All			3		
Priorities	11.0%	20% (Max)		2:00 PM	
# of officer supply per week	232	232 (Max)	4	9:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	13	140 (Max)			
Estimated total FTE cost (regular + OT)	\$15,924,480	-	-		





Number of officers planned to be on duty at a given day and time

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	39	40	54	43	42	53	59
12:30 AM	39	40	54	43	42	53	59
1:00 AM	39	40	54	43	42	53	59
1:30 AM	39	40	54	43	42	53	59
2:00 AM	39	40	54	43	42	53	59
2:30 AM	39	40	54	43	42	53	59
3:00 AM	39	40	54	43	42	53	59
3:30 AM	39	40	54	43	42	53	59
4:00 AM	39	40	54	43	42	53	59
4:30 AM	39	40	54	43	42	53	59
5:00 AM	22	23	23	26	25	25	31
5:30 AM	22	23	23	26	25	25	31
6:00 AM	22	23	23	26	25	25	31
6:30 AM	22	23	23	26	25	25	31
7:00 AM	78	85	85	84	83	70	75
7:30 AM	78	85	85	84	83	70	75
8:00 AM	56	62	62	58	58	45	44
8:30 AM	56	62	62	58	58	45	44
9:00 AM	56	62	62	58	58	45	44
9:30 AM	56	62	62	58	58	45	44
10:00 AM	56	62	62	58	58	45	44
10:30 AM	56	62	62	58	58	45	44
11:00 AM	56	62	62	58	58	45	44
11:30 AM	56	62	62	58	58	45	44

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	56	62	62	58	58	45	44
12:30 PM	56	62	62	58	58	45	44
1:00 PM	56	62	62	58	58	45	44
1:30 PM	56	62	62	58	58	45	44
2:00 PM	120	127	128	125	124	105	101
2:30 PM	120	127	128	125	124	105	101
3:00 PM	64	65	66	67	66	60	57
3:30 PM	64	65	66	67	66	60	57
4:00 PM	64	65	66	67	66	60	57
4:30 PM	64	65	66	67	66	60	57
5:00 PM	64	65	66	67	66	60	57
5:30 PM	64	65	66	67	66	60	57
6:00 PM	64	65	66	67	66	60	57
6:30 PM	64	65	66	67	66	60	57
7:00 PM	64	65	66	67	66	60	57
7:30 PM	64	65	66	67	66	60	57
8:00 PM	64	65	66	67	66	60	57
8:30 PM	64	65	66	67	66	60	57
9:00 PM	81	96	83	84	94	88	74
9:30 PM	81	96	83	84	94	88	74
10:00 PM	17	31	17	17	28	28	17
10:30 PM	17	31	17	17	28	28	17
11:00 PM	17	31	17	17	28	28	17
11:30 PM	17	31	17	17	28	28	17

Scenario Two, Option Two: Division-level model outputs, meet 100 percent of demand

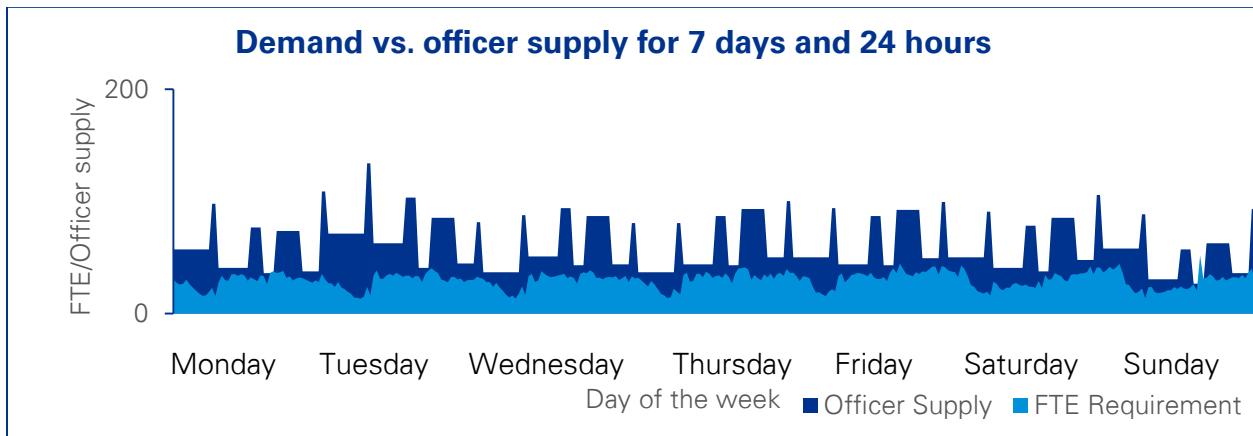
The most efficient solution found by the model involved a 5–8 shift pattern across all divisions. The model's outputs are included below.

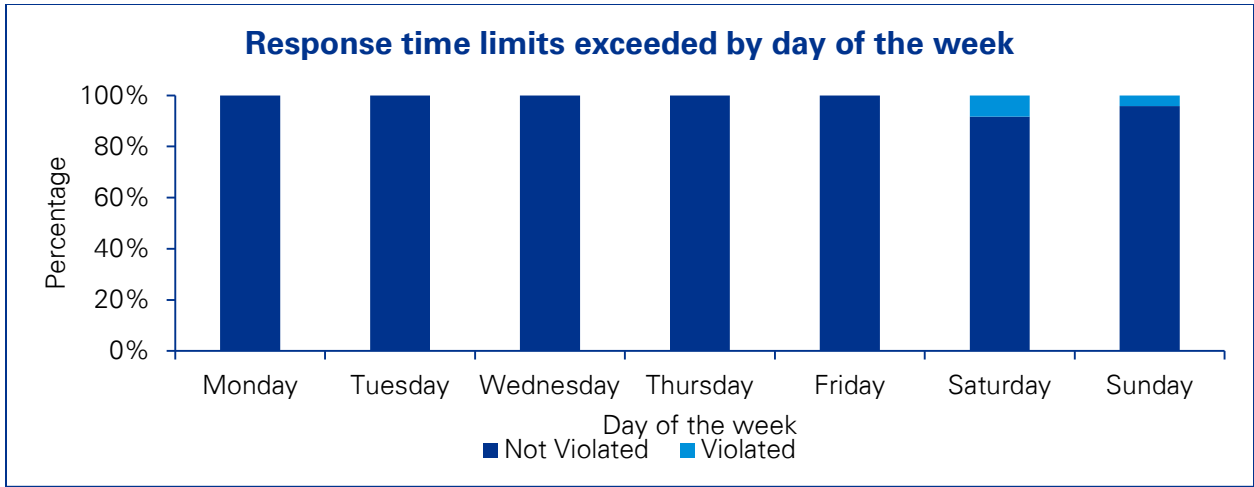
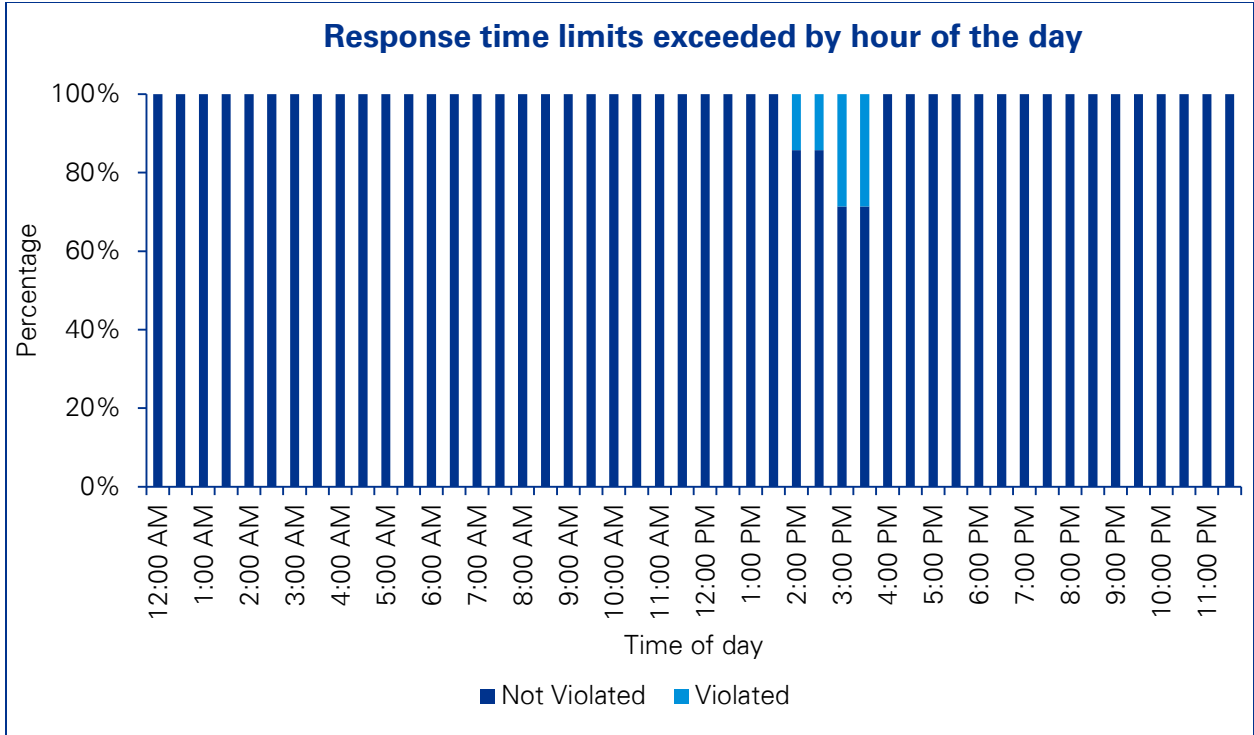
5–8 shifts across all divisions

Division	Officer supply	Days per shift	Shift length	% of demand met
Central	320	5	8	100%
North Central	202	5	8	100%
Northeast	375	5	8	100%
Northwest	295	5	8	100%
South Central	295	5	8	100%
Southeast	350	5	8	100%
Southwest	272	5	8	100%

Central Division, 100 percent demand met

Central Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	1.8%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All			3		
Priorities	0.0%	20% (Max)		12:00 PM	
# of officer supply per week	320	320 (Max)	4	4:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	0	140 (Max)			
Estimated total FTE cost (regular + OT)	\$21,964,800	-	-		





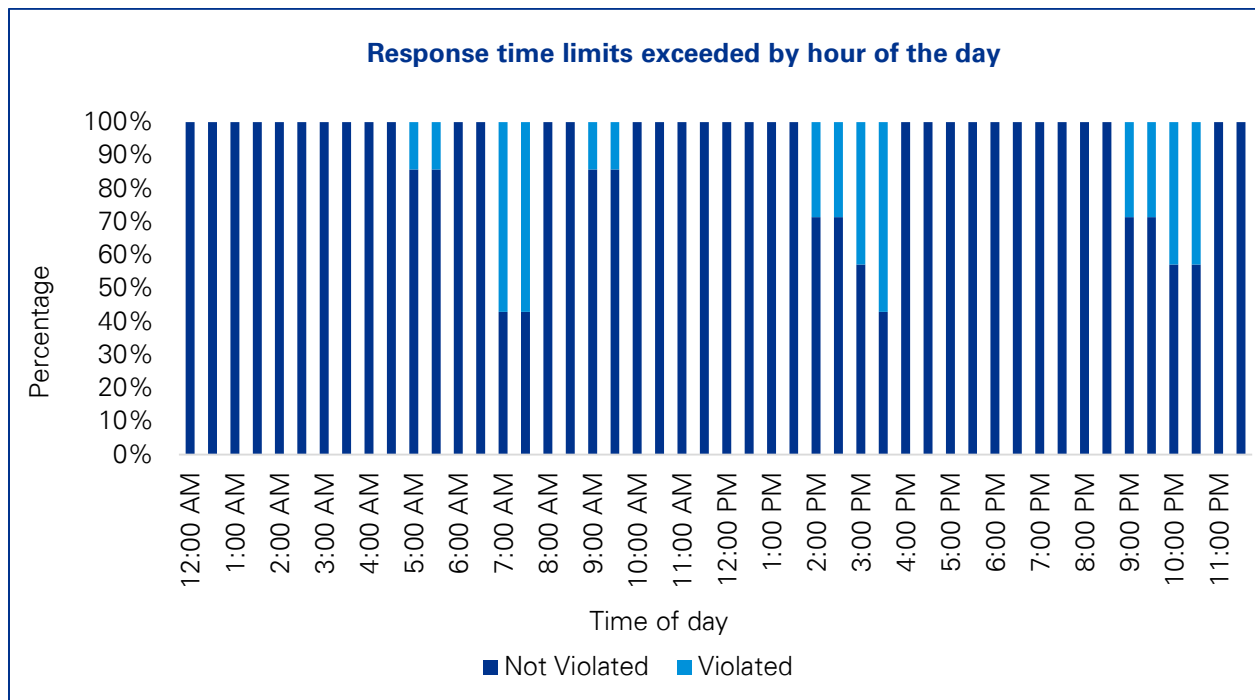
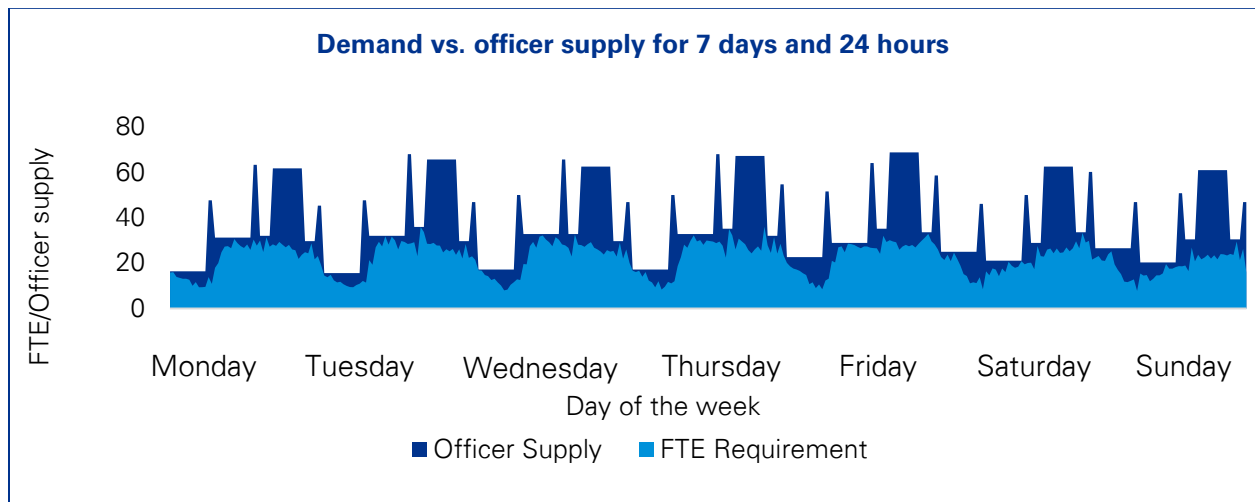
Number of officers planned to be on duty at a given day and time

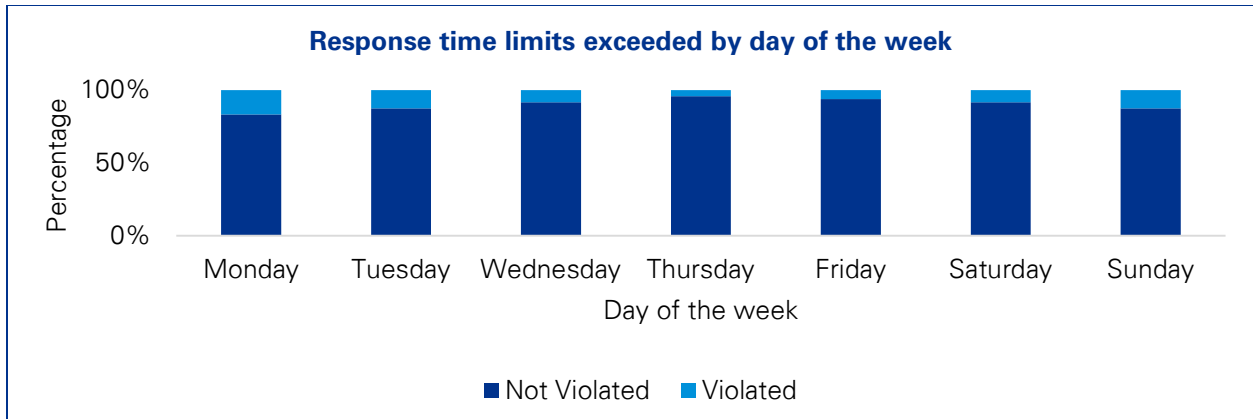
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	73	91	47	47	64	64	74
12:30 AM	73	91	47	47	64	64	74
1:00 AM	73	91	47	47	64	64	74
1:30 AM	73	91	47	47	64	64	74
2:00 AM	73	91	47	47	64	64	74
2:30 AM	73	91	47	47	64	64	74
3:00 AM	73	91	47	47	64	64	74
3:30 AM	73	91	47	47	64	64	74
4:00 AM	73	91	47	47	64	64	74
4:30 AM	73	91	47	47	64	64	74
5:00 AM	73	91	47	47	64	64	74
5:30 AM	73	91	47	47	64	64	74
6:00 AM	125	171	112	103	120	116	113
6:30 AM	125	171	112	103	120	116	113
7:00 AM	52	80	65	56	56	52	39
7:30 AM	52	80	65	56	56	52	39
8:00 AM	52	80	65	56	56	52	39
8:30 AM	52	80	65	56	56	52	39
9:00 AM	52	80	65	56	56	52	39
9:30 AM	52	80	65	56	56	52	39
10:00 AM	52	80	65	56	56	52	39
10:30 AM	52	80	65	56	56	52	39
11:00 AM	52	80	65	56	56	52	39
11:30 AM	52	80	65	56	56	52	39

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	98	132	120	111	111	100	73
12:30 PM	98	132	120	111	111	100	73
1:00 PM	98	132	120	111	111	100	73
1:30 PM	98	132	120	111	111	100	73
2:00 PM	46	52	55	55	55	48	34
2:30 PM	46	52	55	55	55	48	34
3:00 PM	46	52	55	55	55	48	34
3:30 PM	46	52	55	55	55	48	34
4:00 PM	94	109	111	119	118	109	80
4:30 PM	94	109	111	119	118	109	80
5:00 PM	94	109	111	119	118	109	80
5:30 PM	94	109	111	119	118	109	80
6:00 PM	94	109	111	119	118	109	80
6:30 PM	94	109	111	119	118	109	80
7:00 PM	94	109	111	119	118	109	80
7:30 PM	94	109	111	119	118	109	80
8:00 PM	48	57	56	64	63	61	46
8:30 PM	48	57	56	64	63	61	46
9:00 PM	48	57	56	64	63	61	46
9:30 PM	48	57	56	64	63	61	46
10:00 PM	48	57	56	64	63	61	46
10:30 PM	48	57	56	64	63	61	46
11:00 PM	139	104	103	128	127	135	119
11:30 PM	139	104	103	128	127	135	119

North Central Division, 100 percent demand met

North Central Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	9.8%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All			3		
Priorities	14.9%	20% (Max)		1:00 PM	
# of officer supply per week	202	202 (Max)	4	4:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	0	140 (Max)			
Estimated total FTE cost (regular + OT)	\$13,865,280	-	-		





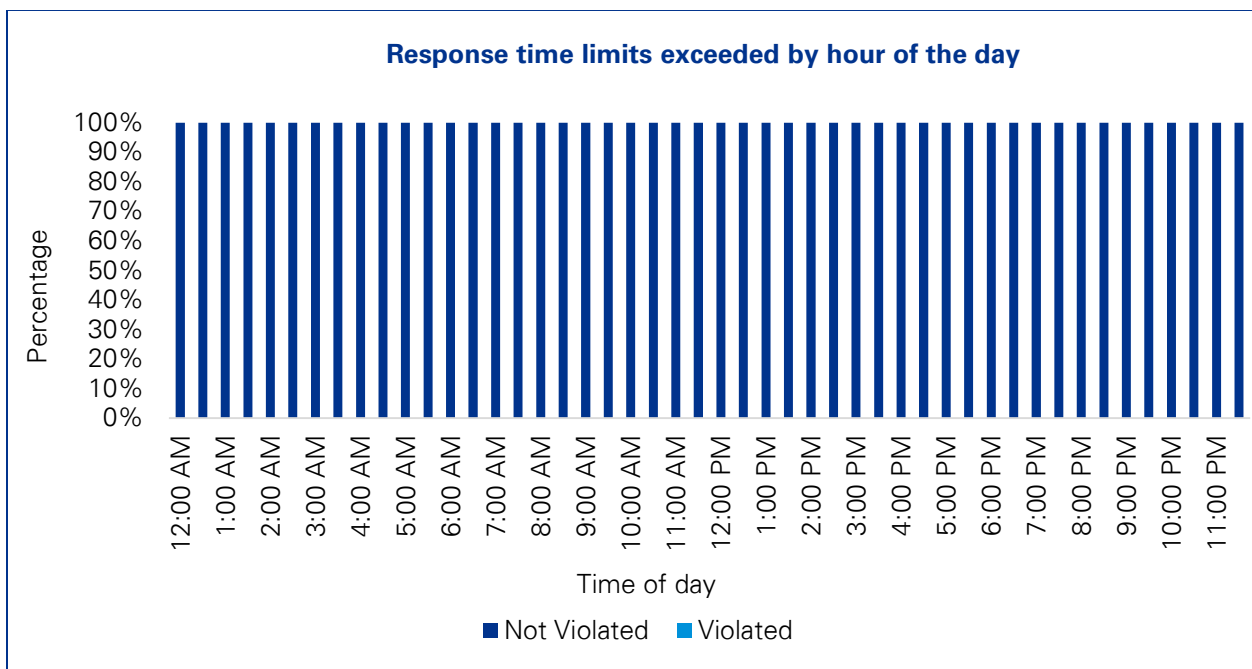
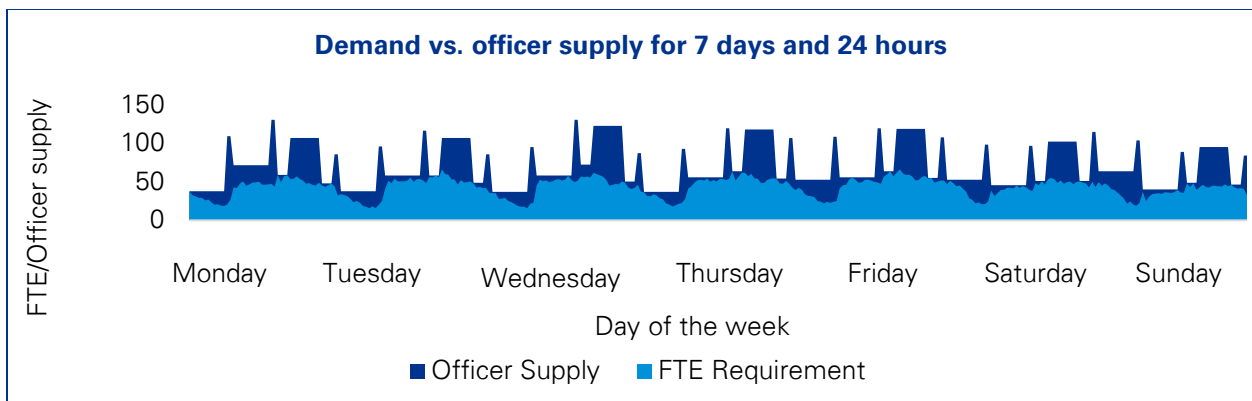
Number of officers planned to be on duty at a given day and time

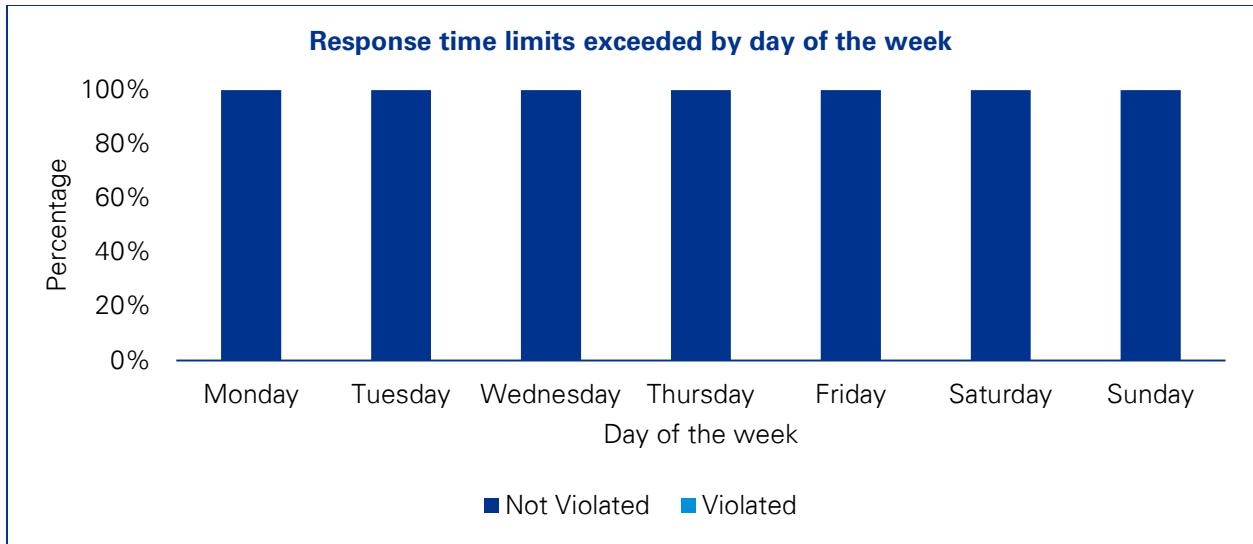
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	21	20	22	22	29	32	34
12:30 AM	21	20	22	22	29	32	34
1:00 AM	21	20	22	22	29	32	34
1:30 AM	21	20	22	22	29	32	34
2:00 AM	21	20	22	22	29	32	34
2:30 AM	21	20	22	22	29	32	34
3:00 AM	21	20	22	22	29	32	34
3:30 AM	21	20	22	22	29	32	34
4:00 AM	21	20	22	22	29	32	34
4:30 AM	21	20	22	22	29	32	34
5:00 AM	21	20	22	22	29	32	34
5:30 AM	21	20	22	22	29	32	34
6:00 AM	61	61	64	64	66	59	60
6:30 AM	61	61	64	64	66	59	60
7:00 AM	40	41	42	42	37	27	26
7:30 AM	40	41	42	42	37	27	26
8:00 AM	40	41	42	42	37	27	26
8:30 AM	40	41	42	42	37	27	26
9:00 AM	40	41	42	42	37	27	26
9:30 AM	40	41	42	42	37	27	26
10:00 AM	40	41	42	42	37	27	26
10:30 AM	40	41	42	42	37	27	26
11:00 AM	40	41	42	42	37	27	26
11:30 AM	40	41	42	42	37	27	26

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	40	41	42	42	37	27	26
12:30 PM	40	41	42	42	37	27	26
1:00 PM	81	87	84	87	82	64	65
1:30 PM	81	87	84	87	82	64	65
2:00 PM	41	46	42	45	45	37	39
2:30 PM	41	46	42	45	45	37	39
3:00 PM	41	46	42	45	45	37	39
3:30 PM	41	46	42	45	45	37	39
4:00 PM	79	84	80	86	88	80	78
4:30 PM	79	84	80	86	88	80	78
5:00 PM	79	84	80	86	88	80	78
5:30 PM	79	84	80	86	88	80	78
6:00 PM	79	84	80	86	88	80	78
6:30 PM	79	84	80	86	88	80	78
7:00 PM	79	84	80	86	88	80	78
7:30 PM	79	84	80	86	88	80	78
8:00 PM	79	84	80	86	88	80	78
8:30 PM	79	84	80	86	88	80	78
9:00 PM	38	38	38	41	43	43	39
9:30 PM	38	38	38	41	43	43	39
10:00 PM	38	38	38	41	43	43	39
10:30 PM	38	38	38	41	43	43	39
11:00 PM	58	60	60	70	75	77	60
11:30 PM	58	60	60	70	75	77	60

Northeast Division, 100 percent demand met

Northeast Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	0.0%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All			3		
Priorities	0.0%	20% (Max)		1:00 PM	
# of officer supply per week	375	375 (Max)	4	4:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	0	140 (Max)			
Estimated total FTE cost (regular + OT)	\$25,740,000	-	-		





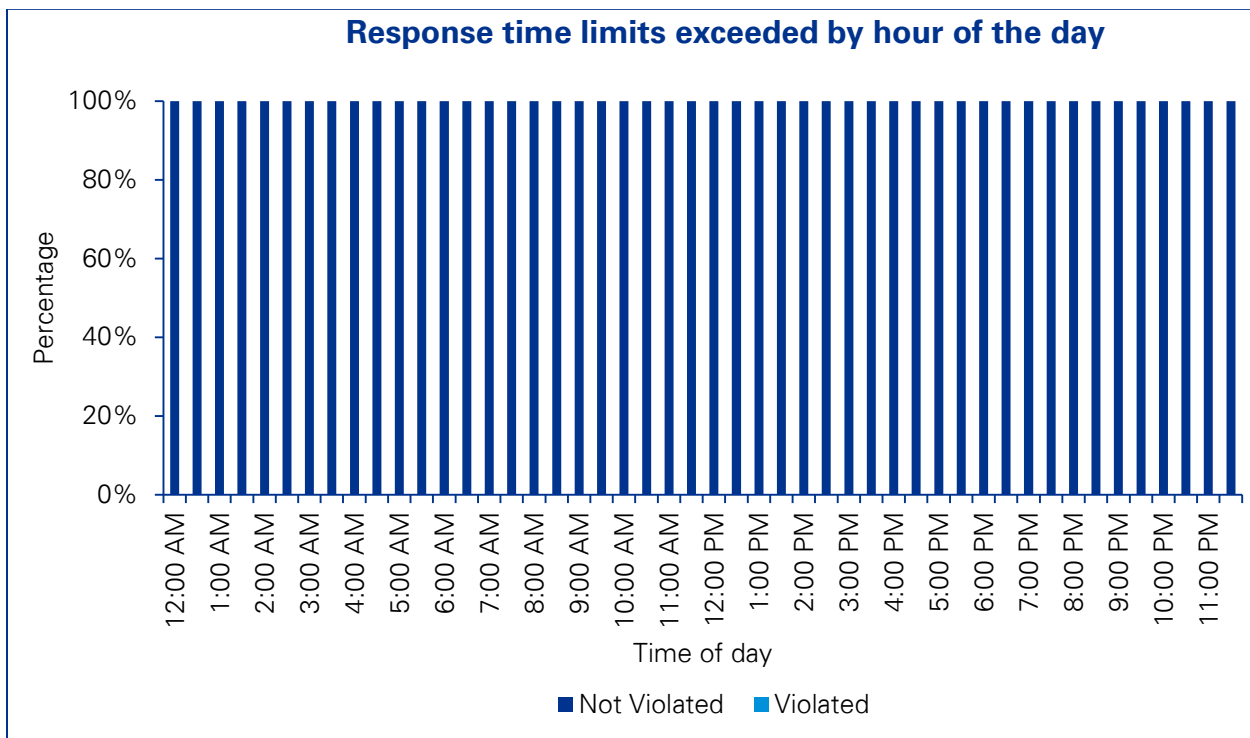
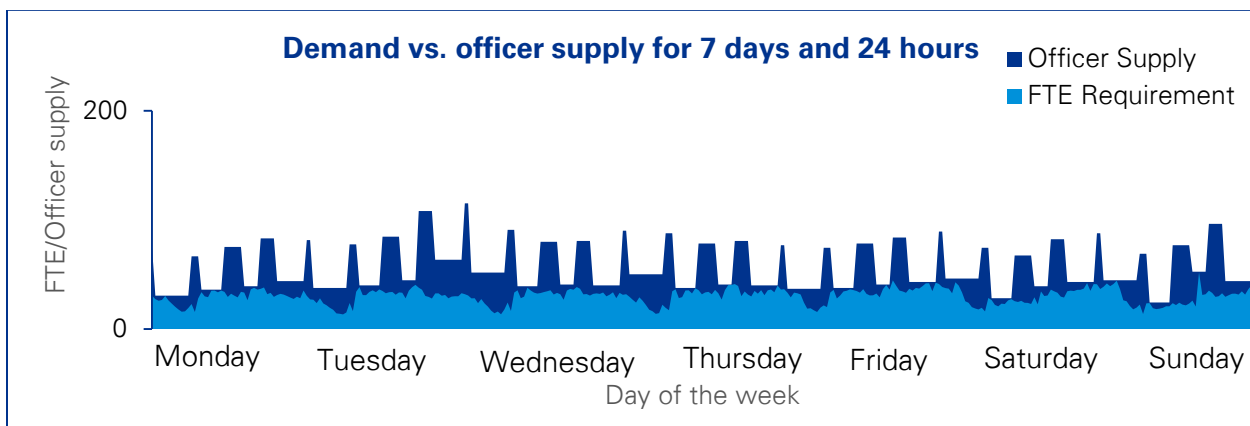
Number of officers planned to be on duty at a given day and time

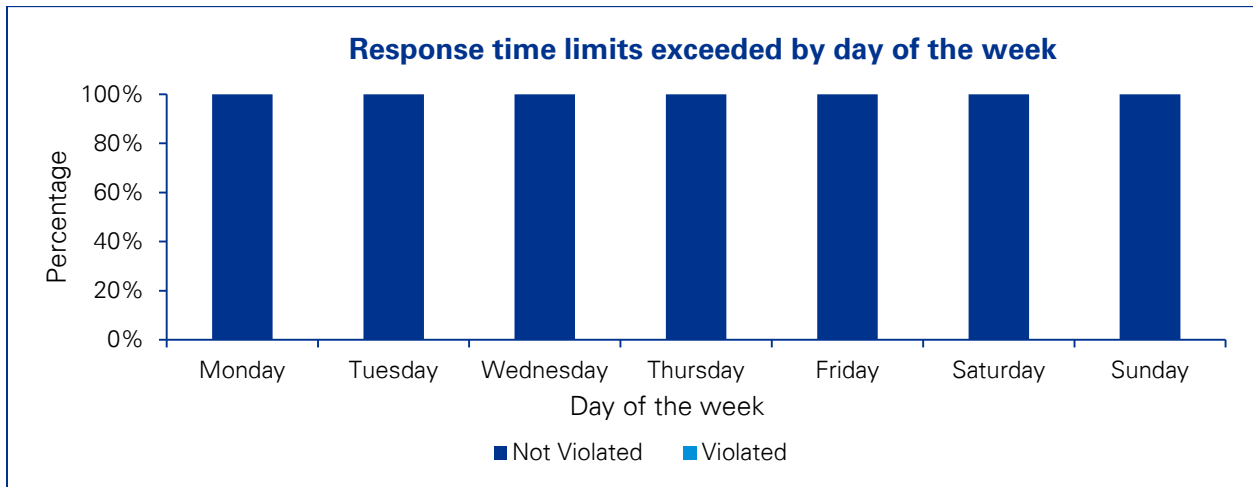
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	48	48	47	47	67	67	81
12:30 AM	48	48	47	47	67	67	81
1:00 AM	48	48	47	47	67	67	81
1:30 AM	48	48	47	47	67	67	81
2:00 AM	48	48	47	47	67	67	81
2:30 AM	48	48	47	47	67	67	81
3:00 AM	48	48	47	47	67	67	81
3:30 AM	48	48	47	47	67	67	81
4:00 AM	48	48	47	47	67	67	81
4:30 AM	48	48	47	47	67	67	81
5:00 AM	48	48	47	47	67	67	81
5:30 AM	48	48	47	47	67	67	81
6:00 AM	139	122	121	118	138	125	132
6:30 AM	139	122	121	118	138	125	132
7:00 AM	91	74	74	71	71	58	51
7:30 AM	91	74	74	71	71	58	51
8:00 AM	91	74	74	71	71	58	51
8:30 AM	91	74	74	71	71	58	51
9:00 AM	91	74	74	71	71	58	51
9:30 AM	91	74	74	71	71	58	51
10:00 AM	91	74	74	71	71	58	51
10:30 AM	91	74	74	71	71	58	51
11:00 AM	91	74	74	71	71	58	51
11:30 AM	91	74	74	71	71	58	51

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	91	74	74	71	71	58	51
12:30 PM	91	74	74	71	71	58	51
1:00 PM	166	148	166	152	152	123	113
1:30 PM	166	148	166	152	152	123	113
2:00 PM	75	74	92	81	81	65	62
2:30 PM	75	74	92	81	81	65	62
3:00 PM	75	74	92	81	81	65	62
3:30 PM	75	74	92	81	81	65	62
4:00 PM	136	136	156	150	151	130	121
4:30 PM	136	136	156	150	151	130	121
5:00 PM	136	136	156	150	151	130	121
5:30 PM	136	136	156	150	151	130	121
6:00 PM	136	136	156	150	151	130	121
6:30 PM	136	136	156	150	151	130	121
7:00 PM	136	136	156	150	151	130	121
7:30 PM	136	136	156	150	151	130	121
8:00 PM	136	136	156	150	151	130	121
8:30 PM	136	136	156	150	151	130	121
9:00 PM	61	62	64	69	70	65	59
9:30 PM	61	62	64	69	70	65	59
10:00 PM	61	62	64	69	70	65	59
10:30 PM	61	62	64	69	70	65	59
11:00 PM	109	109	111	136	137	146	107
11:30 PM	109	109	111	136	137	146	107

Northwest Division, 100 percent demand met

Northwest Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	99.7%	80% (Min)	1	11:30 PM	
% of response time limit exceeded – Priority 1	0.0%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All			3		
Priorities	0.0%	20% (Max)		11:00 AM	
# of officer supply per week	295	295 (Max)	4	4:30 PM	
# of watches	4	4 (Max)			
Total overtime hours	0	140 (Max)			
Estimated total FTE cost (regular + OT)	\$20,248,800	-	-		





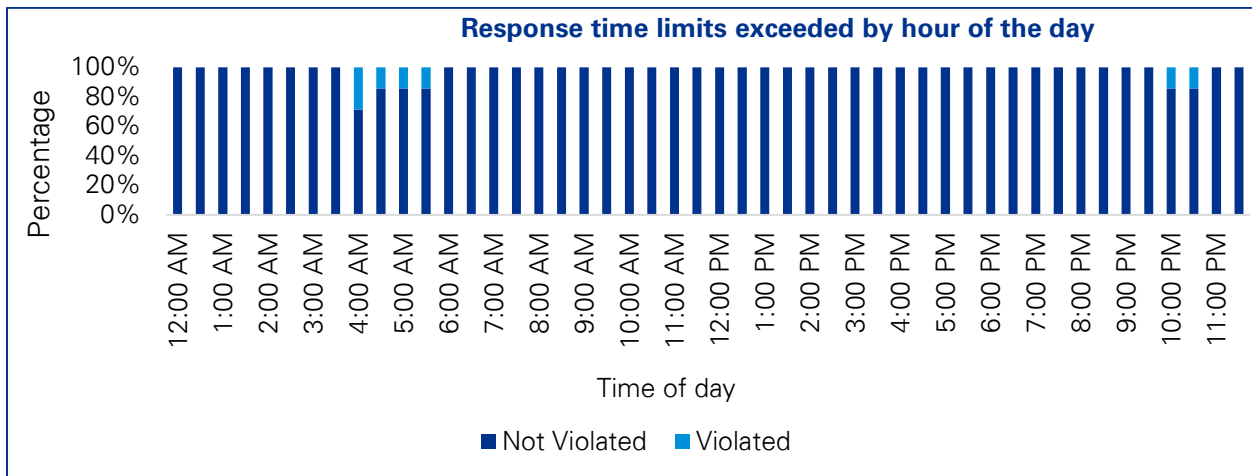
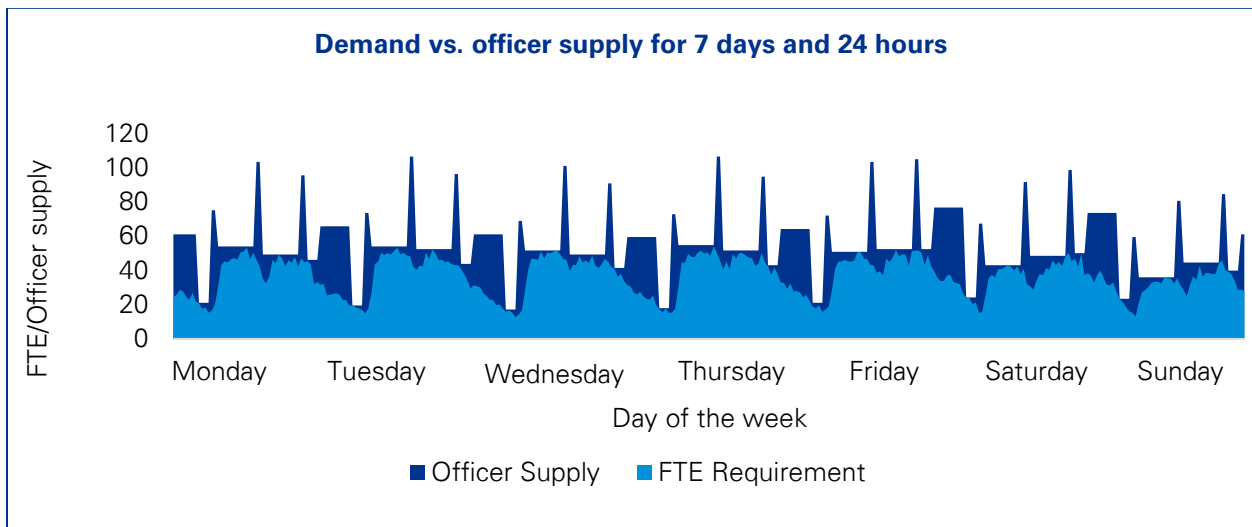
Number of officers planned to be on duty at a given day and time

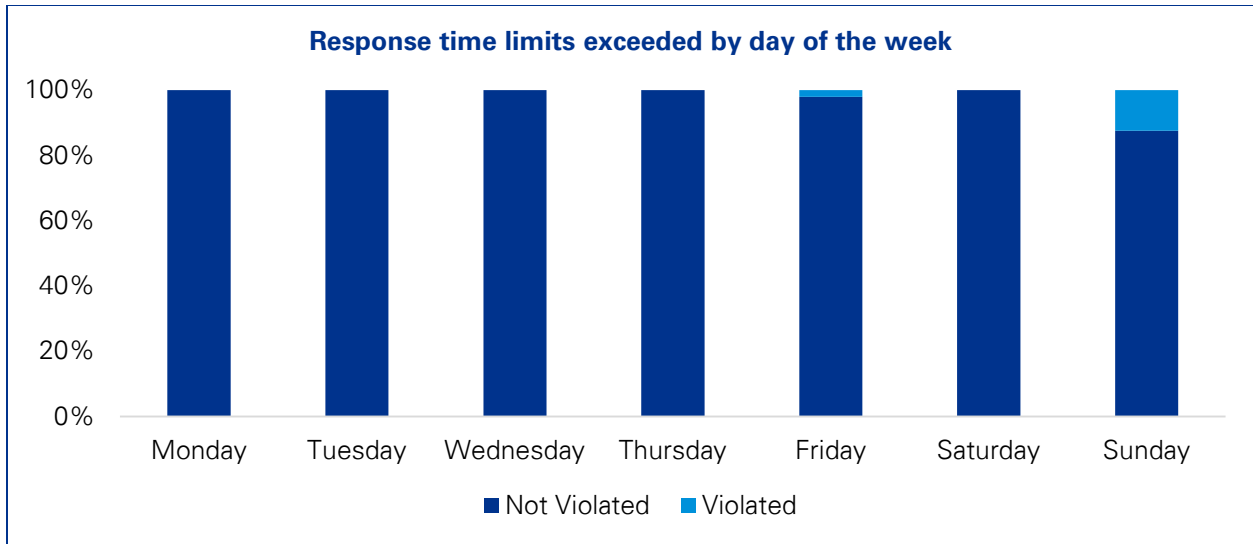
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	95	104	147	115	98	114	112
12:30 AM	39	48	66	64	47	59	57
1:00 AM	39	48	66	64	47	59	57
1:30 AM	39	48	66	64	47	59	57
2:00 AM	39	48	66	64	47	59	57
2:30 AM	39	48	66	64	47	59	57
3:00 AM	39	48	66	64	47	59	57
3:30 AM	39	48	66	64	47	59	57
4:00 AM	39	48	66	64	47	59	57
4:30 AM	39	48	66	64	47	59	57
5:00 AM	39	48	66	64	47	59	57
5:30 AM	39	48	66	64	47	59	57
6:00 AM	85	99	116	112	95	95	88
6:30 AM	85	99	116	112	95	95	88
7:00 AM	85	99	116	112	95	95	88
7:30 AM	46	51	50	48	48	36	31
8:00 AM	46	51	50	48	48	36	31
8:30 AM	46	51	50	48	48	36	31
9:00 AM	46	51	50	48	48	36	31
9:30 AM	46	51	50	48	48	36	31
10:00 AM	46	51	50	48	48	36	31
10:30 AM	46	51	50	48	48	36	31
11:00 AM	96	108	102	100	100	86	98
11:30 AM	96	108	102	100	100	86	98

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	96	108	102	100	100	86	98
12:30 PM	96	108	102	100	100	86	98
1:00 PM	96	108	102	100	100	86	98
1:30 PM	96	108	102	100	100	86	98
2:00 PM	50	57	52	52	52	50	67
2:30 PM	50	57	52	52	52	50	67
3:00 PM	50	57	52	52	52	50	67
3:30 PM	50	57	52	52	52	50	67
4:00 PM	50	57	52	52	52	50	67
4:30 PM	106	138	103	103	107	105	123
5:00 PM	106	138	103	103	107	105	123
5:30 PM	106	138	103	103	107	105	123
6:00 PM	106	138	103	103	107	105	123
6:30 PM	106	138	103	103	107	105	123
7:00 PM	56	81	51	51	55	55	56
7:30 PM	56	81	51	51	55	55	56
8:00 PM	56	81	51	51	55	55	56
8:30 PM	56	81	51	51	55	55	56
9:00 PM	56	81	51	51	55	55	56
9:30 PM	56	81	51	51	55	55	56
10:00 PM	56	81	51	51	55	55	56
10:30 PM	56	81	51	51	55	55	56
11:00 PM	56	81	51	51	55	55	56
11:30 PM	104	147	115	98	114	112	95

South Central Division, 100 percent demand met

South Central Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	2.1%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All			3		
Priorities	0.0%	20% (Max)		1:00 PM	
# of officer supply per week	295	295 (Max)	4	8:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	0	140 (Max)			
Estimated total FTE cost (regular + OT)	\$20,248,800	-	-		





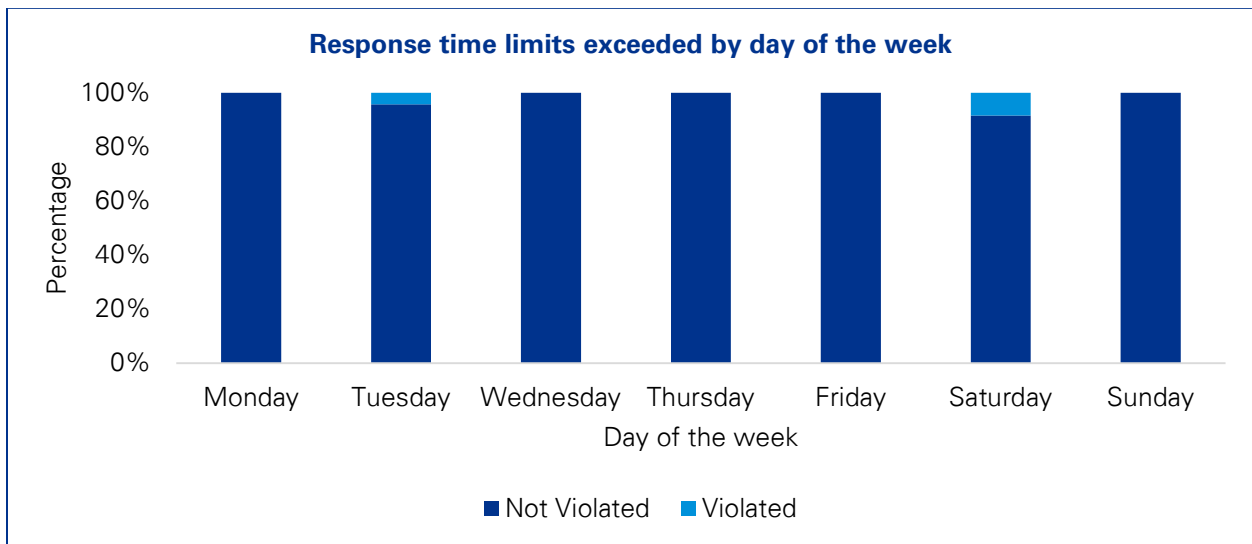
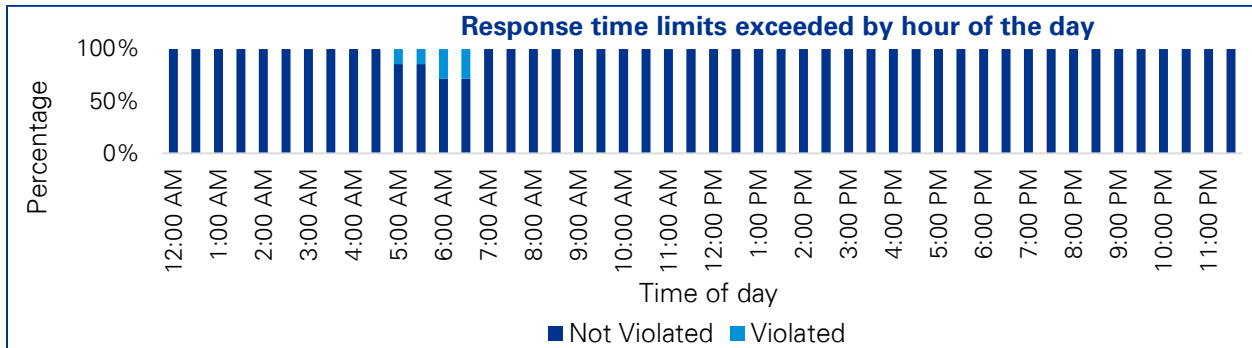
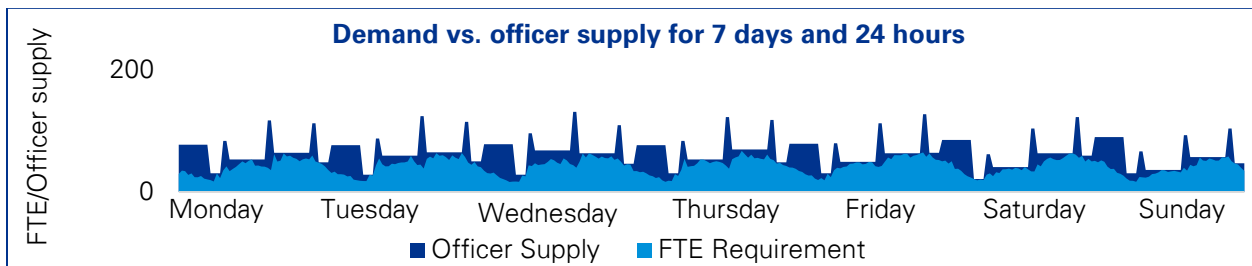
Number of officers planned to be on duty at a given day and time

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	78	84	78	76	82	98	94
12:30 AM	78	84	78	76	82	98	94
1:00 AM	78	84	78	76	82	98	94
1:30 AM	78	84	78	76	82	98	94
2:00 AM	78	84	78	76	82	98	94
2:30 AM	78	84	78	76	82	98	94
3:00 AM	78	84	78	76	82	98	94
3:30 AM	78	84	78	76	82	98	94
4:00 AM	27	25	22	23	27	31	30
4:30 AM	27	25	22	23	27	31	30
5:00 AM	27	25	22	23	27	31	30
5:30 AM	27	25	22	23	27	31	30
6:00 AM	96	94	88	93	92	86	76
6:30 AM	96	94	88	93	92	86	76
7:00 AM	69	69	66	70	65	55	46
7:30 AM	69	69	66	70	65	55	46
8:00 AM	69	69	66	70	65	55	46
8:30 AM	69	69	66	70	65	55	46
9:00 AM	69	69	66	70	65	55	46
9:30 AM	69	69	66	70	65	55	46
10:00 AM	69	69	66	70	65	55	46
10:30 AM	69	69	66	70	65	55	46
11:00 AM	69	69	66	70	65	55	46
11:30 AM	69	69	66	70	65	55	46

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	69	69	66	70	65	55	46
12:30 PM	69	69	66	70	65	55	46
1:00 PM	132	136	129	136	132	117	103
1:30 PM	132	136	129	136	132	117	103
2:00 PM	63	67	63	66	67	62	57
2:30 PM	63	67	63	66	67	62	57
3:00 PM	63	67	63	66	67	62	57
3:30 PM	63	67	63	66	67	62	57
4:00 PM	63	67	63	66	67	62	57
4:30 PM	63	67	63	66	67	62	57
5:00 PM	63	67	63	66	67	62	57
5:30 PM	63	67	63	66	67	62	57
6:00 PM	63	67	63	66	67	62	57
6:30 PM	63	67	63	66	67	62	57
7:00 PM	63	67	63	66	67	62	57
7:30 PM	63	67	63	66	67	62	57
8:00 PM	122	123	116	121	134	126	108
8:30 PM	122	123	116	121	134	126	108
9:00 PM	59	56	53	55	67	64	51
9:30 PM	59	56	53	55	67	64	51
10:00 PM	59	56	53	55	67	64	51
10:30 PM	59	56	53	55	67	64	51
11:00 PM	84	78	76	82	98	94	78
11:30 PM	84	78	76	82	98	94	78

Southeast Division, 100 percent demand met

Southeast Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	80% (Min)	1	12:00 AM	
% of response time limit exceeded – Priority 1	1.8%	10% (Max)	2	7:00 AM	
% of response time limit exceeded – All			3		
Priorities	10.7%	20% (Max)		2:00 PM	
# of officer supply per week	350	350 (Max)	4	9:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	0	140 (Max)			
Estimated total FTE cost (regular + OT)	\$24,024,000	-	-		



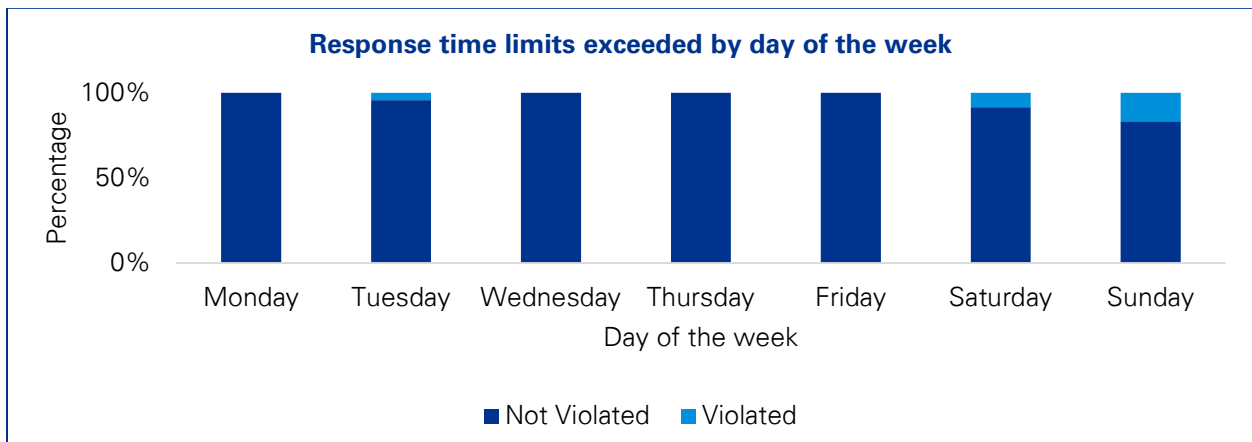
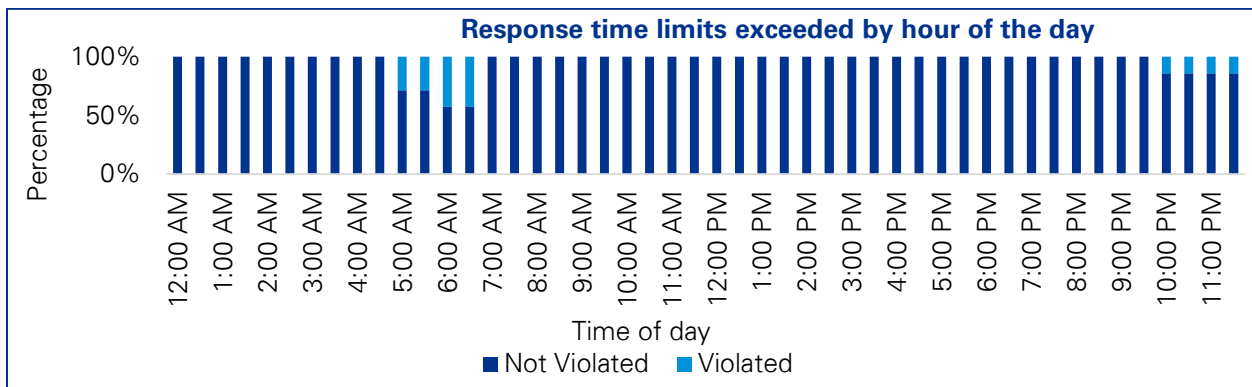
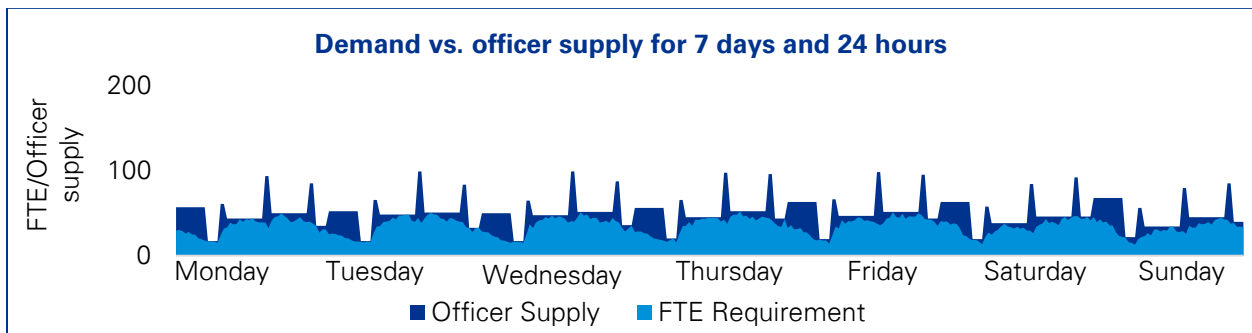
Number of officers planned to be on duty at a given day and time

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	99	98	100	98	101	109	115
12:30 AM	99	98	100	98	101	109	115
1:00 AM	99	98	100	98	101	109	115
1:30 AM	99	98	100	98	101	109	115
2:00 AM	99	98	100	98	101	109	115
2:30 AM	99	98	100	98	101	109	115
3:00 AM	99	98	100	98	101	109	115
3:30 AM	99	98	100	98	101	109	115
4:00 AM	99	98	100	98	101	109	115
4:30 AM	99	98	100	98	101	109	115
5:00 AM	39	36	36	39	39	27	39
5:30 AM	39	36	36	39	39	27	39
6:00 AM	39	36	36	39	39	27	39
6:30 AM	39	36	36	39	39	27	39
7:00 AM	107	112	123	107	102	79	85
7:30 AM	107	112	123	107	102	79	85
8:00 AM	68	76	87	68	63	52	46
8:30 AM	68	76	87	68	63	52	46
9:00 AM	68	76	87	68	63	52	46
9:30 AM	68	76	87	68	63	52	46
10:00 AM	68	76	87	68	63	52	46
10:30 AM	68	76	87	68	63	52	46
11:00 AM	68	76	87	68	63	52	46
11:30 AM	68	76	87	68	63	52	46

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	68	76	87	68	63	52	46
12:30 PM	68	76	87	68	63	52	46
1:00 PM	68	76	87	68	63	52	46
1:30 PM	68	76	87	68	63	52	46
2:00 PM	150	159	168	157	144	133	119
2:30 PM	150	159	168	157	144	133	119
3:00 PM	82	83	81	89	81	81	73
3:30 PM	82	83	81	89	81	81	73
4:00 PM	82	83	81	89	81	81	73
4:30 PM	82	83	81	89	81	81	73
5:00 PM	82	83	81	89	81	81	73
5:30 PM	82	83	81	89	81	81	73
6:00 PM	82	83	81	89	81	81	73
6:30 PM	82	83	81	89	81	81	73
7:00 PM	82	83	81	89	81	81	73
7:30 PM	82	83	81	89	81	81	73
8:00 PM	82	83	81	89	81	81	73
8:30 PM	82	83	81	89	81	81	73
9:00 PM	144	147	140	151	163	157	133
9:30 PM	144	147	140	151	163	157	133
10:00 PM	62	64	59	62	82	76	60
10:30 PM	62	64	59	62	82	76	60
11:00 PM	62	64	59	62	82	76	60
11:30 PM	62	64	59	62	82	76	60

Southwest Division, 100 percent demand met

Southwest Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	80% (Min)	1	12:00 AM	
% of response time limit exceeded – Priority 1	4.2%	10% (Max)	2	7:00 AM	
% of response time limit exceeded – All			3		
Priorities	0.0%	20% (Max)		2:00 PM	
# of officer supply per week	272	272 (Max)	4	9:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	0	140 (Max)			
Estimated total FTE cost (regular + OT)	\$18,670,080	-	-		



Number of officers planned to be on duty at a given day and time

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	73	67	64	72	81	81	87
12:30 AM	73	67	64	72	81	81	87
1:00 AM	73	67	64	72	81	81	87
1:30 AM	73	67	64	72	81	81	87
2:00 AM	73	67	64	72	81	81	87
2:30 AM	73	67	64	72	81	81	87
3:00 AM	73	67	64	72	81	81	87
3:30 AM	73	67	64	72	81	81	87
4:00 AM	73	67	64	72	81	81	87
4:30 AM	73	67	64	72	81	81	87
5:00 AM	22	22	22	26	25	25	28
5:30 AM	22	22	22	26	25	25	28
6:00 AM	22	22	22	26	25	25	28
6:30 AM	22	22	22	26	25	25	28
7:00 AM	78	84	83	84	85	74	72
7:30 AM	78	84	83	84	85	74	72
8:00 AM	56	62	61	58	60	49	44
8:30 AM	56	62	61	58	60	49	44
9:00 AM	56	62	61	58	60	49	44
9:30 AM	56	62	61	58	60	49	44
10:00 AM	56	62	61	58	60	49	44
10:30 AM	56	62	61	58	60	49	44
11:00 AM	56	62	61	58	60	49	44
11:30 AM	56	62	61	58	60	49	44

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	56	62	61	58	60	49	44
12:30 PM	56	62	61	58	60	49	44
1:00 PM	56	62	61	58	60	49	44
1:30 PM	56	62	61	58	60	49	44
2:00 PM	120	127	127	125	126	108	102
2:30 PM	120	127	127	125	126	108	102
3:00 PM	64	65	66	67	66	59	58
3:30 PM	64	65	66	67	66	59	58
4:00 PM	64	65	66	67	66	59	58
4:30 PM	64	65	66	67	66	59	58
5:00 PM	64	65	66	67	66	59	58
5:30 PM	64	65	66	67	66	59	58
6:00 PM	64	65	66	67	66	59	58
6:30 PM	64	65	66	67	66	59	58
7:00 PM	64	65	66	67	66	59	58
7:30 PM	64	65	66	67	66	59	58
8:00 PM	64	65	66	67	66	59	58
8:30 PM	64	65	66	67	66	59	58
9:00 PM	109	107	112	123	122	118	109
9:30 PM	109	107	112	123	122	118	109
10:00 PM	45	42	46	56	56	59	51
10:30 PM	45	42	46	56	56	59	51
11:00 PM	45	42	46	56	56	59	51
11:30 PM	45	42	46	56	56	59	51

Scenario Three, Option One: Division-level model outputs, meet 80 percent of demand at minimal cost

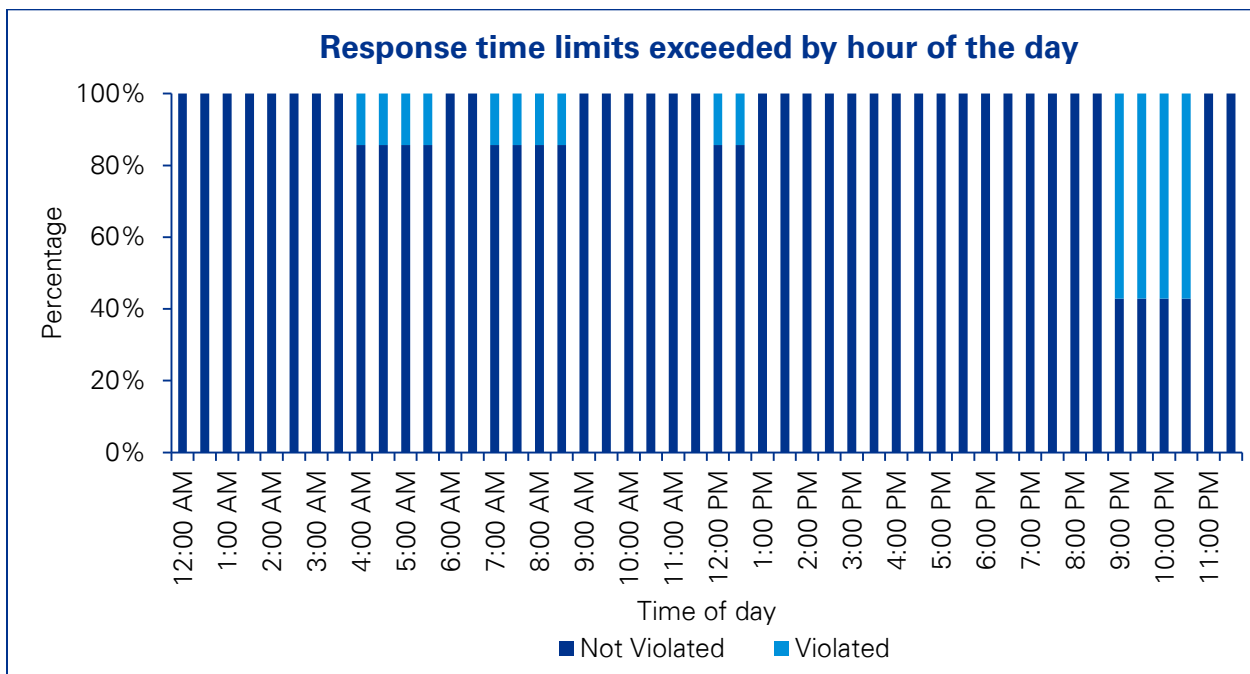
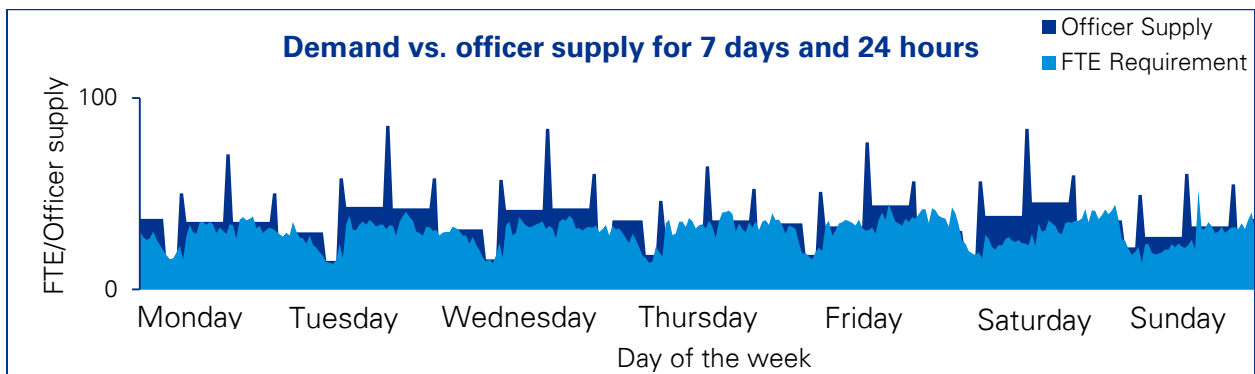
The most efficient solution found by the model involved 5–8 shifts across all divisions. The model’s outputs are included below.

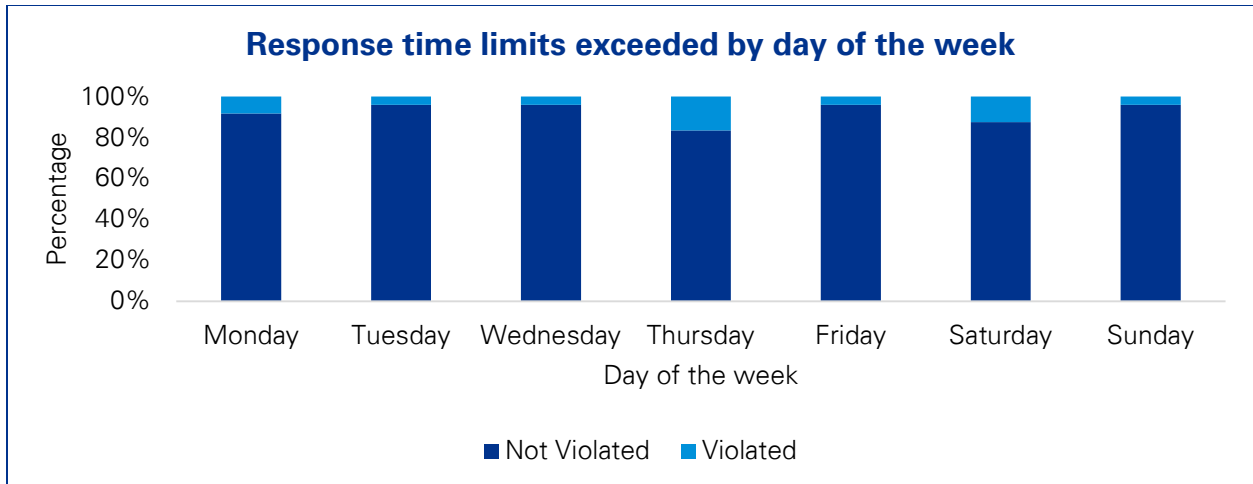
5–8 shifts

Division	Officer supply	Overtime hours	Days per shift	Shift length	% of demand met
Central	194	139	5	8	80.1%
North Central	173	16	5	8	88.1%
Northeast	236	123	5	8	80.1%
Northwest	177	108	5	8	80.1%
South Central	209	132	5	8	80.1%
Southeast	234	138	5	8	80.4%
Southwest	203	140	5	8	82.4%

Central Division, minimize FTE cost; 80 percent demand met

Central Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	80.1%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	9.8%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All					
Priorities	5.1%	20% (Max)	3	1:00 PM	
# of officer supply per week	194	500 (Max)	4	8:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	139	140 (Max)			
Estimated total FTE cost (regular + OT)	\$13,316,160	-	-		





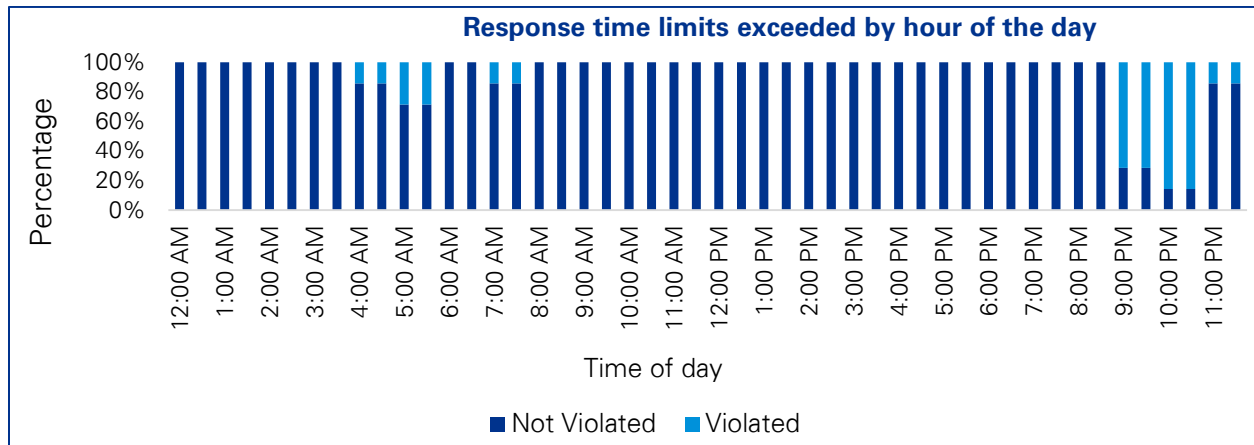
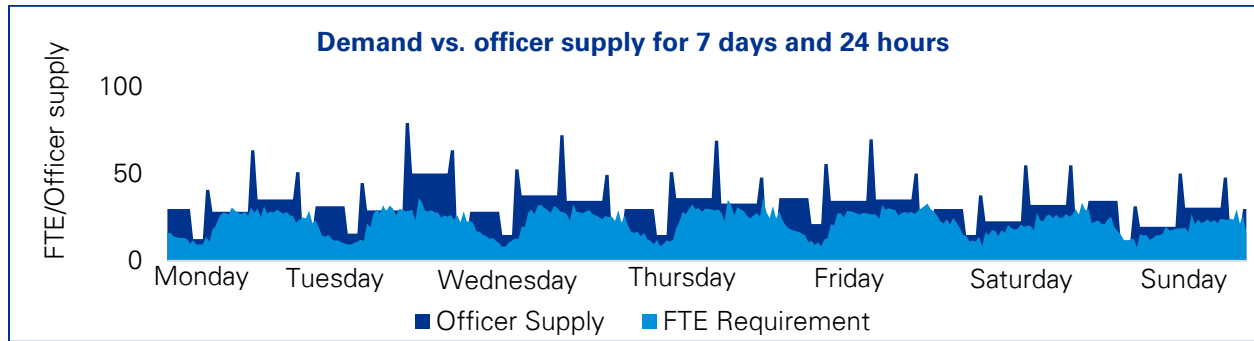
Number of officers planned to be on duty at a given day and time

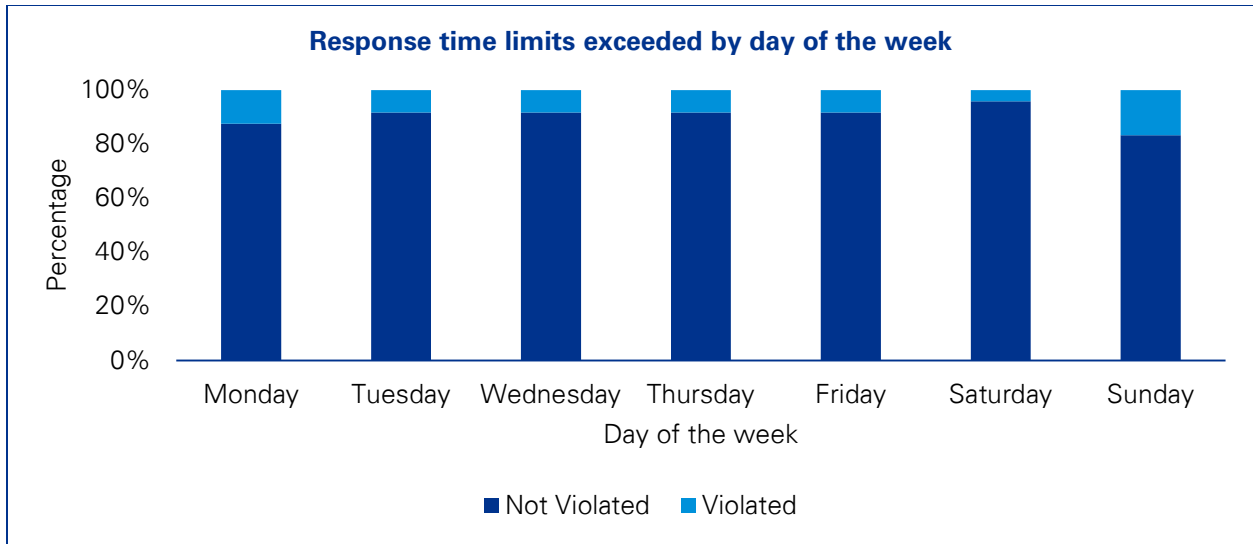
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12:00 AM	47	38	40	46	44	39	46
12:30 AM	47	38	40	46	44	39	46
1:00 AM	47	38	40	46	44	39	46
1:30 AM	47	38	40	46	44	39	46
2:00 AM	47	38	40	46	44	39	46
2:30 AM	47	38	40	46	44	39	46
3:00 AM	47	38	40	46	44	39	46
3:30 AM	47	38	40	46	44	39	46
4:00 AM	19	19	20	23	23	23	28
4:30 AM	19	19	20	23	23	23	28
5:00 AM	19	19	20	23	23	23	28
5:30 AM	19	19	20	23	23	23	28
6:00 AM	64	74	73	59	65	72	63
6:30 AM	64	74	73	59	65	72	63
7:00 AM	45	55	53	36	42	49	35
7:30 AM	45	55	53	36	42	49	35
8:00 AM	45	55	53	36	42	49	35
8:30 AM	45	55	53	36	42	49	35
9:00 AM	45	55	53	36	42	49	35
9:30 AM	45	55	53	36	42	49	35
10:00 AM	45	55	53	36	42	49	35
10:30 AM	45	55	53	36	42	49	35
11:00 AM	45	55	53	36	42	49	35
11:30 AM	45	55	53	36	42	49	35

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	45	55	53	36	42	49	35
12:30 PM	45	55	53	36	42	49	35
1:00 PM	90	109	107	82	98	107	77
1:30 PM	90	109	107	82	98	107	77
2:00 PM	45	54	54	46	56	58	42
2:30 PM	45	54	54	46	56	58	42
3:00 PM	45	54	54	46	56	58	42
3:30 PM	45	54	54	46	56	58	42
4:00 PM	45	54	54	46	56	58	42
4:30 PM	45	54	54	46	56	58	42
5:00 PM	45	54	54	46	56	58	42
5:30 PM	45	54	54	46	56	58	42
6:00 PM	45	54	54	46	56	58	42
6:30 PM	45	54	54	46	56	58	42
7:00 PM	45	54	54	46	56	58	42
7:30 PM	45	54	54	46	56	58	42
8:00 PM	64	74	77	67	72	76	70
8:30 PM	64	74	77	67	72	76	70
9:00 PM	19	20	23	21	16	18	28
9:30 PM	19	20	23	21	16	18	28
10:00 PM	19	20	23	21	16	18	28
10:30 PM	19	20	23	21	16	18	28
11:00 PM	38	40	46	44	39	46	47
11:30 PM	38	40	46	44	39	46	47

North Central Division, minimize FTE cost; 80 percent demand met

North Central Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	88.1%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	9.8%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All					
Priorities	1.8%	20% (Max)	3	1:00 PM	
# of officer supply per week	173	500 (Max)	4	8:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	16	140 (Max)			
Estimated total FTE cost (regular + OT)	\$11,874,720	-	-		





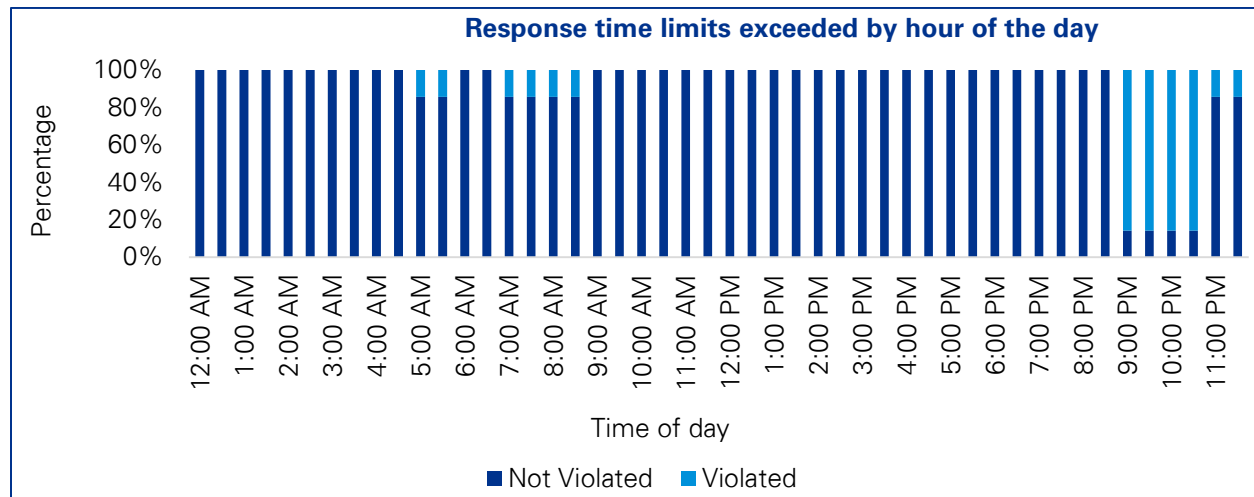
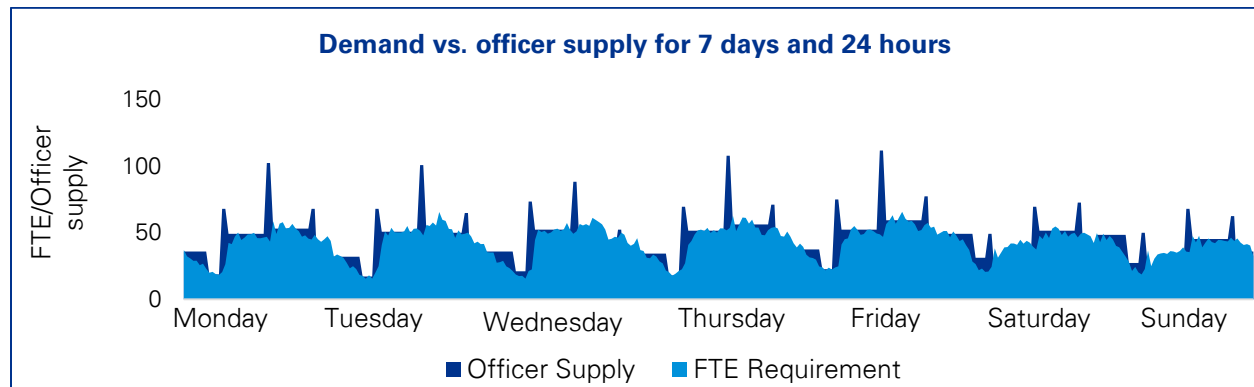
Number of officers planned to be on duty at a given day and time

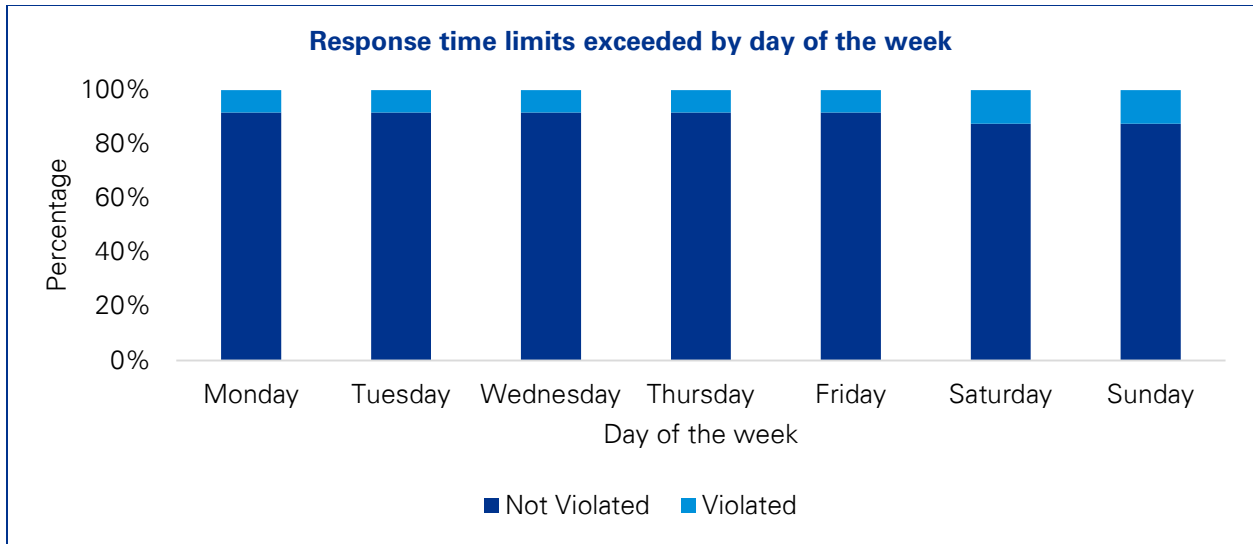
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12:00 AM	38	40	36	38	46	38	44
12:30 AM	38	40	36	38	46	38	44
1:00 AM	38	40	36	38	46	38	44
1:30 AM	38	40	36	38	46	38	44
2:00 AM	38	40	36	38	46	38	44
2:30 AM	38	40	36	38	46	38	44
3:00 AM	38	40	36	38	46	38	44
3:30 AM	38	40	36	38	46	38	44
4:00 AM	16	20	19	19	27	19	15
4:30 AM	16	20	19	19	27	19	15
5:00 AM	16	20	19	19	27	19	15
5:30 AM	16	20	19	19	27	19	15
6:00 AM	52	57	67	65	71	48	40
6:30 AM	52	57	67	65	71	48	40
7:00 AM	36	37	48	46	44	29	25
7:30 AM	36	37	48	46	44	29	25
8:00 AM	36	37	48	46	44	29	25
8:30 AM	36	37	48	46	44	29	25
9:00 AM	36	37	48	46	44	29	25
9:30 AM	36	37	48	46	44	29	25
10:00 AM	36	37	48	46	44	29	25
10:30 AM	36	37	48	46	44	29	25
11:00 AM	36	37	48	46	44	29	25
11:30 AM	36	37	48	46	44	29	25

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	36	37	48	46	44	29	25
12:30 PM	36	37	48	46	44	29	25
1:00 PM	81	101	92	88	89	70	64
1:30 PM	81	101	92	88	89	70	64
2:00 PM	45	64	44	42	45	41	39
2:30 PM	45	64	44	42	45	41	39
3:00 PM	45	64	44	42	45	41	39
3:30 PM	45	64	44	42	45	41	39
4:00 PM	45	64	44	42	45	41	39
4:30 PM	45	64	44	42	45	41	39
5:00 PM	45	64	44	42	45	41	39
5:30 PM	45	64	44	42	45	41	39
6:00 PM	45	64	44	42	45	41	39
6:30 PM	45	64	44	42	45	41	39
7:00 PM	45	64	44	42	45	41	39
7:30 PM	45	64	44	42	45	41	39
8:00 PM	65	81	63	61	64	70	61
8:30 PM	65	81	63	61	64	70	61
9:00 PM	20	17	19	19	19	29	22
9:30 PM	20	17	19	19	19	29	22
10:00 PM	20	17	19	19	19	29	22
10:30 PM	20	17	19	19	19	29	22
11:00 PM	40	36	38	46	38	44	38
11:30 PM	40	36	38	46	38	44	38

Northeast Division, minimize FTE cost; 80 percent demand met

Northeast Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	80.1%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	9.8%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All					
Priorities	1.8%	20% (Max)	3	1:00 PM	
# of officer supply per week	236	500 (Max)	4	8:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	123	140 (Max)			
Estimated total FTE cost (regular + OT)	\$16,199,040	-	-		





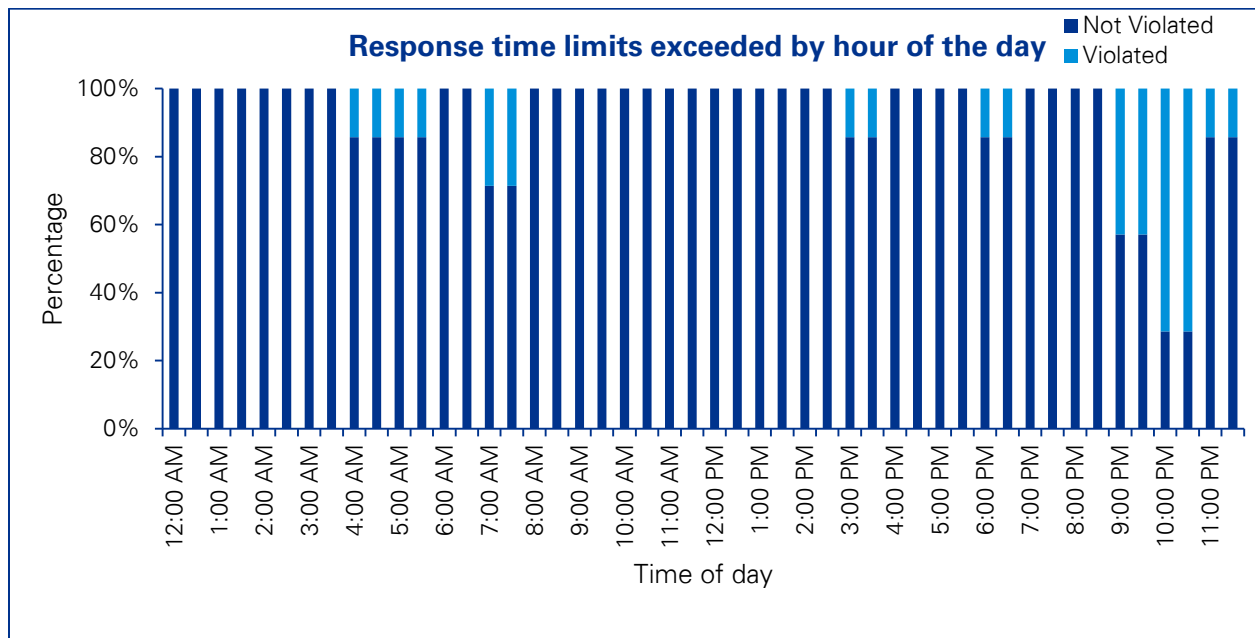
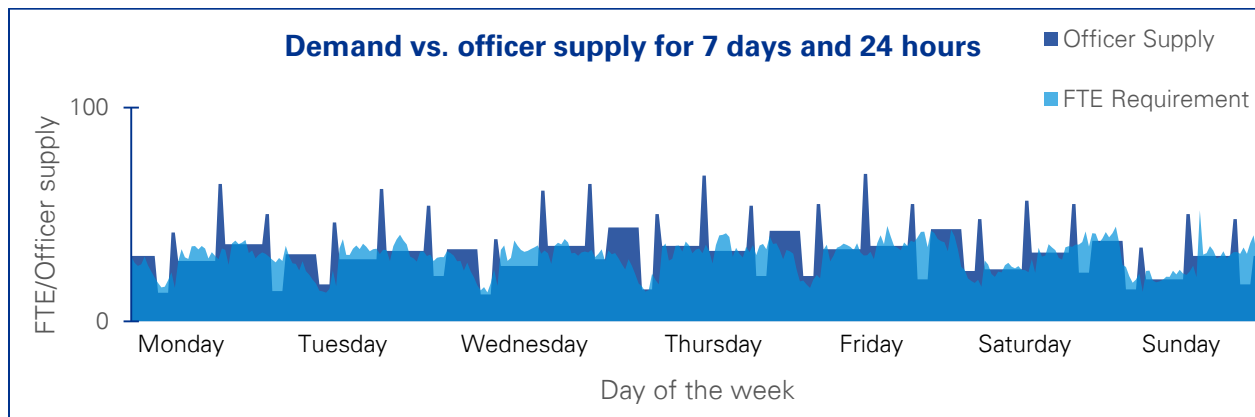
Number of officers planned to be on duty at a given day and time

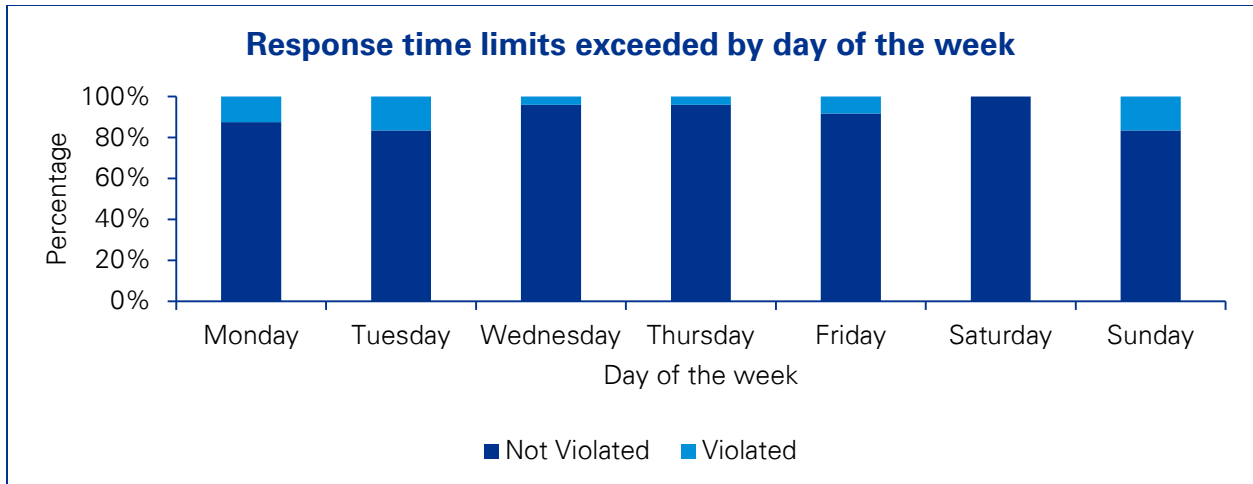
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12:00 AM	46	41	46	44	48	63	62
12:30 AM	46	41	46	44	48	63	62
1:00 AM	46	41	46	44	48	63	62
1:30 AM	46	41	46	44	48	63	62
2:00 AM	46	41	46	44	48	63	62
2:30 AM	46	41	46	44	48	63	62
3:00 AM	46	41	46	44	48	63	62
3:30 AM	46	41	46	44	48	63	62
4:00 AM	24	22	27	23	29	40	35
4:30 AM	24	22	27	23	29	40	35
5:00 AM	24	22	27	23	29	40	35
5:30 AM	24	22	27	23	29	40	35
6:00 AM	87	87	94	89	96	63	64
6:30 AM	87	87	94	89	96	63	64
7:00 AM	63	65	67	66	67	23	29
7:30 AM	63	65	67	66	67	23	29
8:00 AM	63	65	67	66	67	23	29
8:30 AM	63	65	67	66	67	23	29
9:00 AM	63	65	67	66	67	23	29
9:30 AM	63	65	67	66	67	23	29
10:00 AM	63	65	67	66	67	23	29
10:30 AM	63	65	67	66	67	23	29
11:00 AM	63	65	67	66	67	23	29
11:30 AM	63	65	67	66	67	23	29

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	63	65	67	66	67	23	29
12:30 PM	63	65	67	66	67	23	29
1:00 PM	131	129	113	138	143	89	87
1:30 PM	131	129	113	138	143	89	87
2:00 PM	68	64	46	72	76	66	58
2:30 PM	68	64	46	72	76	66	58
3:00 PM	68	64	46	72	76	66	58
3:30 PM	68	64	46	72	76	66	58
4:00 PM	68	64	46	72	76	66	58
4:30 PM	68	64	46	72	76	66	58
5:00 PM	68	64	46	72	76	66	58
5:30 PM	68	64	46	72	76	66	58
6:00 PM	68	64	46	72	76	66	58
6:30 PM	68	64	46	72	76	66	58
7:00 PM	68	64	46	72	76	66	58
7:30 PM	68	64	46	72	76	66	58
8:00 PM	87	83	67	91	99	93	80
8:30 PM	87	83	67	91	99	93	80
9:00 PM	19	19	21	19	23	27	22
9:30 PM	19	19	21	19	23	27	22
10:00 PM	19	19	21	19	23	27	22
10:30 PM	19	19	21	19	23	27	22
11:00 PM	41	46	44	48	63	62	46
11:30 PM	41	46	44	48	63	62	46

Northwest Division, minimize FTE cost; 80 percent demand met

Northwest Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	80.1%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	9.8%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All Priorities	14.3%	20% (Max)	3	1:00 PM	
# of officer supply per week	177	500 (Max)	4	8:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	108	140 (Max)			
Estimated total FTE cost (regular + OT)	\$12,149,280	-	-		





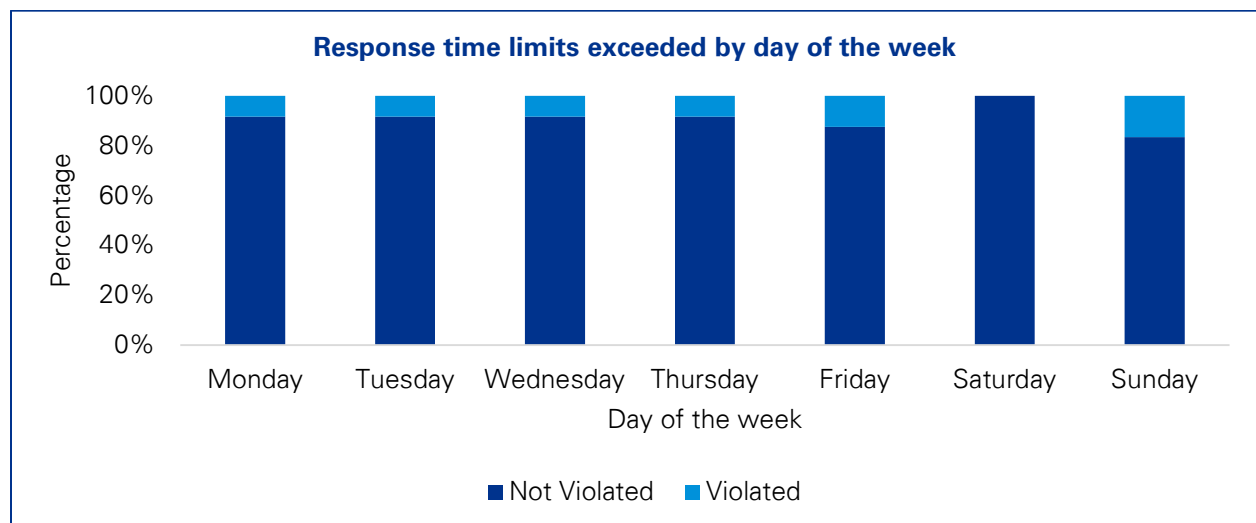
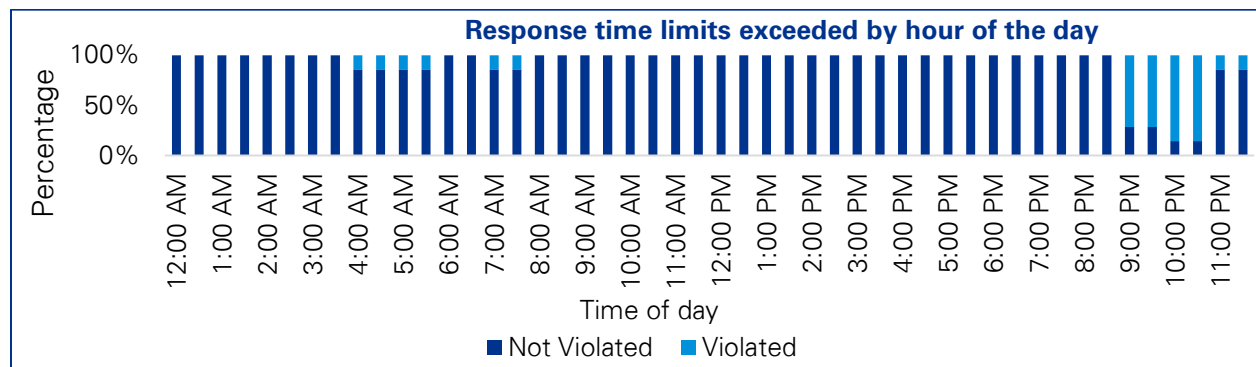
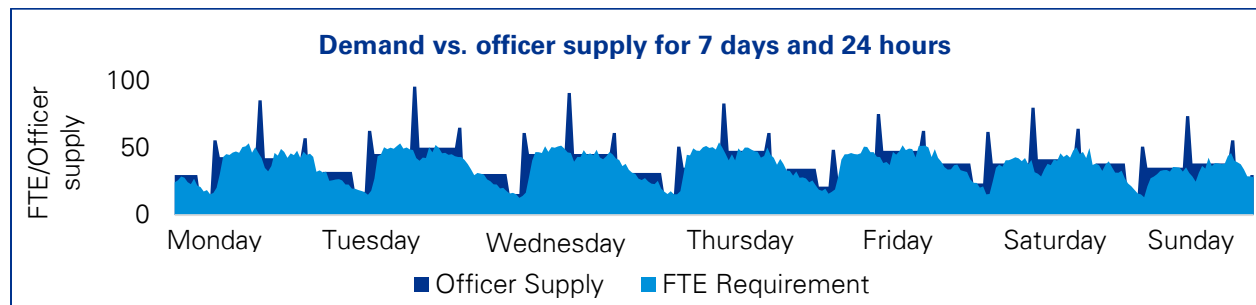
Number of officers planned to be on duty at a given day and time

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	39	40	43	56	54	55	48
12:30 AM	39	40	43	56	54	55	48
1:00 AM	39	40	43	56	54	55	48
1:30 AM	39	40	43	56	54	55	48
2:00 AM	39	40	43	56	54	55	48
2:30 AM	39	40	43	56	54	55	48
3:00 AM	39	40	43	56	54	55	48
3:30 AM	39	40	43	56	54	55	48
4:00 AM	17	22	16	19	27	30	19
4:30 AM	17	22	16	19	27	30	19
5:00 AM	17	22	16	19	27	30	19
5:30 AM	17	22	16	19	27	30	19
6:00 AM	53	59	49	64	70	61	44
6:30 AM	53	59	49	64	70	61	44
7:00 AM	36	37	33	45	43	31	25
7:30 AM	36	37	33	45	43	31	25
8:00 AM	36	37	33	45	43	31	25
8:30 AM	36	37	33	45	43	31	25
9:00 AM	36	37	33	45	43	31	25
9:30 AM	36	37	33	45	43	31	25
10:00 AM	36	37	33	45	43	31	25
10:30 AM	36	37	33	45	43	31	25
11:00 AM	36	37	33	45	43	31	25
11:30 AM	36	37	33	45	43	31	25

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	36	37	33	45	43	31	25
12:30 PM	36	37	33	45	43	31	25
1:00 PM	82	79	78	87	88	72	64
1:30 PM	82	79	78	87	88	72	64
2:00 PM	46	42	45	42	45	41	39
2:30 PM	46	42	45	42	45	41	39
3:00 PM	46	42	45	42	45	41	39
3:30 PM	46	42	45	42	45	41	39
4:00 PM	46	42	45	42	45	41	39
4:30 PM	46	42	45	42	45	41	39
5:00 PM	46	42	45	42	45	41	39
5:30 PM	46	42	45	42	45	41	39
6:00 PM	46	42	45	42	45	41	39
6:30 PM	46	42	45	42	45	41	39
7:00 PM	46	42	45	42	45	41	39
7:30 PM	46	42	45	42	45	41	39
8:00 PM	64	69	82	69	70	70	61
8:30 PM	64	69	82	69	70	70	61
9:00 PM	18	27	37	27	25	29	22
9:30 PM	18	27	37	27	25	29	22
10:00 PM	18	27	37	27	25	29	22
10:30 PM	18	27	37	27	25	29	22
11:00 PM	40	43	56	54	55	48	39
11:30 PM	40	43	56	54	55	48	39

South Central Division, minimize FTE cost; 80 percent demand met

South Central Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	80.1%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	9.8%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All Priorities	15.5%	20% (Max)	3	1:00 PM	
# of officer supply per week	209	500 (Max)	4	8:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	132	140 (Max)			
Estimated total FTE cost (regular + OT)	\$14,345,760	-	-		



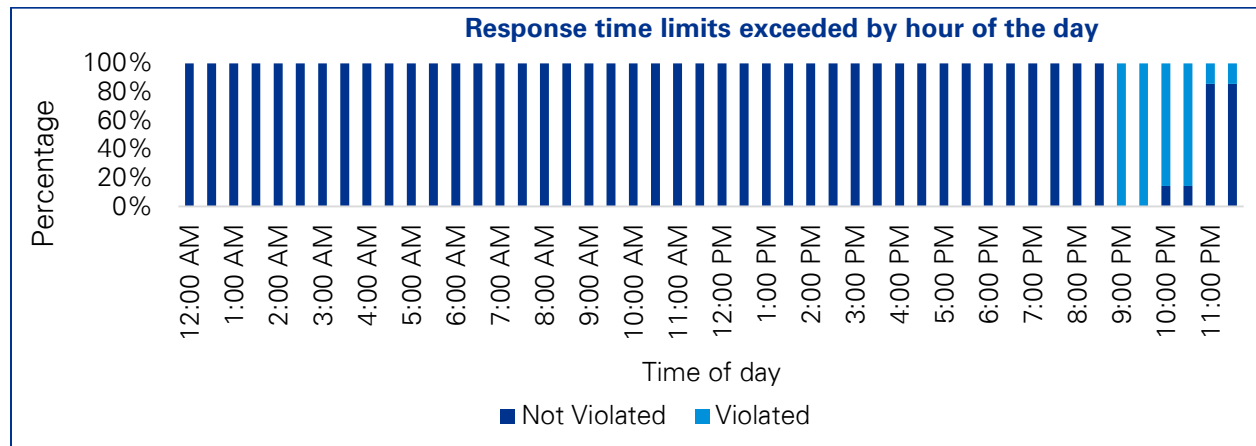
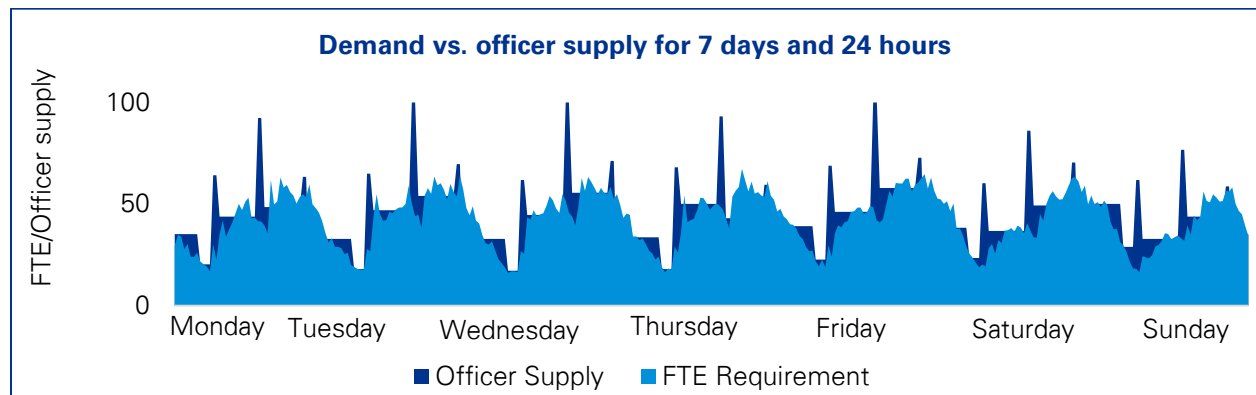
Number of officers planned to be on duty at a given day and time

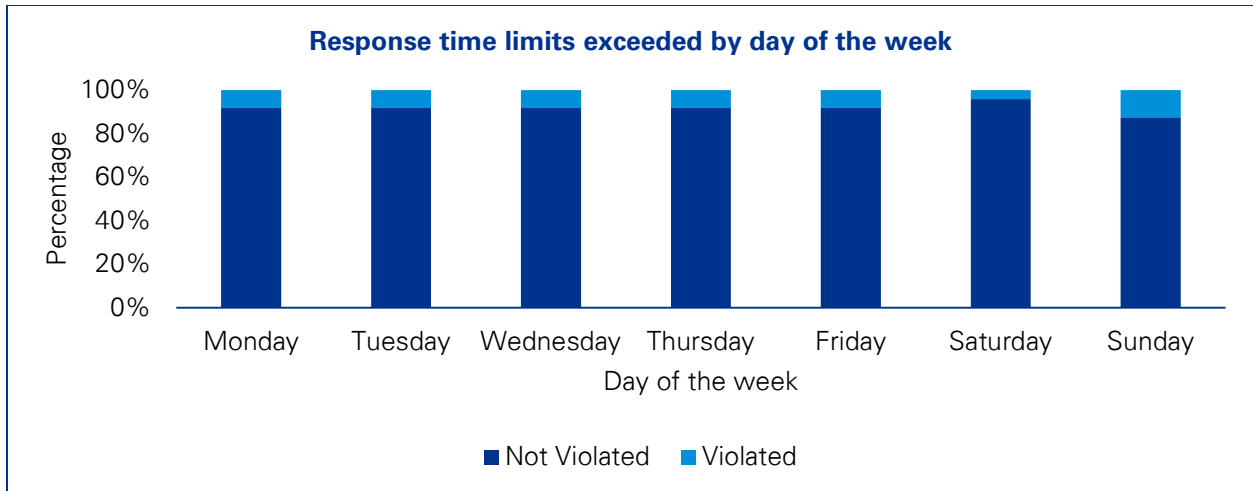
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	38	41	39	40	44	49	49
12:30 AM	38	41	39	40	44	49	49
1:00 AM	38	41	39	40	44	49	49
1:30 AM	38	41	39	40	44	49	49
2:00 AM	38	41	39	40	44	49	49
2:30 AM	38	41	39	40	44	49	49
3:00 AM	38	41	39	40	44	49	49
3:30 AM	38	41	39	40	44	49	49
4:00 AM	16	22	20	20	27	30	20
4:30 AM	16	22	20	20	27	30	20
5:00 AM	16	22	20	20	27	30	20
5:30 AM	16	22	20	20	27	30	20
6:00 AM	71	80	78	65	62	79	65
6:30 AM	71	80	78	65	62	79	65
7:00 AM	55	58	58	45	35	49	45
7:30 AM	55	58	58	45	35	49	45
8:00 AM	55	58	58	45	35	49	45
8:30 AM	55	58	58	45	35	49	45
9:00 AM	55	58	58	45	35	49	45
9:30 AM	55	58	58	45	35	49	45
10:00 AM	55	58	58	45	35	49	45
10:30 AM	55	58	58	45	35	49	45
11:00 AM	55	58	58	45	35	49	45
11:30 AM	55	58	58	45	35	49	45

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	55	58	58	45	35	49	45
12:30 PM	55	58	58	45	35	49	45
1:00 PM	109	122	116	106	96	102	94
1:30 PM	109	122	116	106	96	102	94
2:00 PM	54	64	58	61	61	53	49
2:30 PM	54	64	58	61	61	53	49
3:00 PM	54	64	58	61	61	53	49
3:30 PM	54	64	58	61	61	53	49
4:00 PM	54	64	58	61	61	53	49
4:30 PM	54	64	58	61	61	53	49
5:00 PM	54	64	58	61	61	53	49
5:30 PM	54	64	58	61	61	53	49
6:00 PM	54	64	58	61	61	53	49
6:30 PM	54	64	58	61	61	53	49
7:00 PM	54	64	58	61	61	53	49
7:30 PM	54	64	58	61	61	53	49
8:00 PM	73	83	78	78	80	82	71
8:30 PM	73	83	78	78	80	82	71
9:00 PM	19	19	20	17	19	29	22
9:30 PM	19	19	20	17	19	29	22
10:00 PM	19	19	20	17	19	29	22
10:30 PM	19	19	20	17	19	29	22
11:00 PM	41	39	40	44	49	49	38
11:30 PM	41	39	40	44	49	49	38

Southeast Division, minimize FTE cost; 80 percent demand met

Southeast Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	80.4%	80% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	9.5%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All Priorities	11.3%	20% (Max)	3	1:00 PM	
# of officer supply per week	234	500 (Max)	4	8:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	138	140 (Max)			
Estimated total FTE cost (regular + OT)	\$16,061,760	-	-		





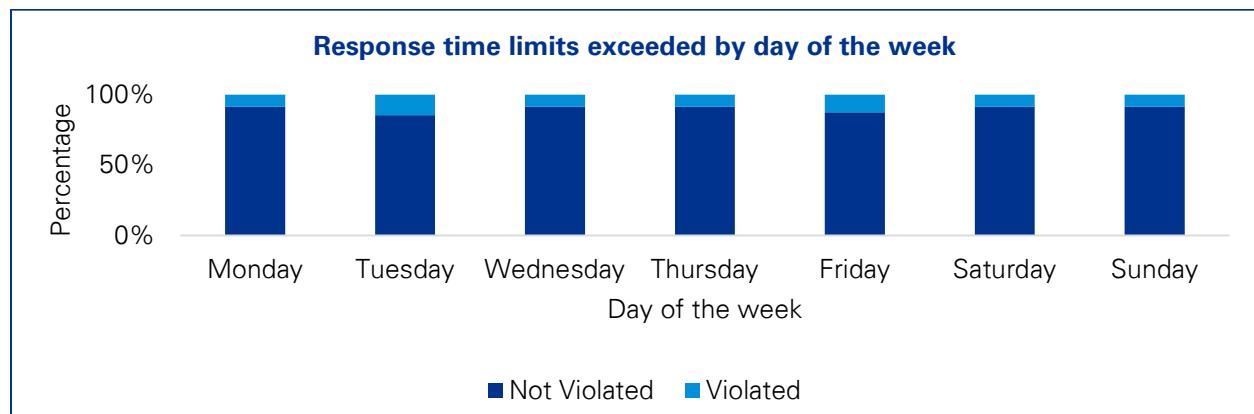
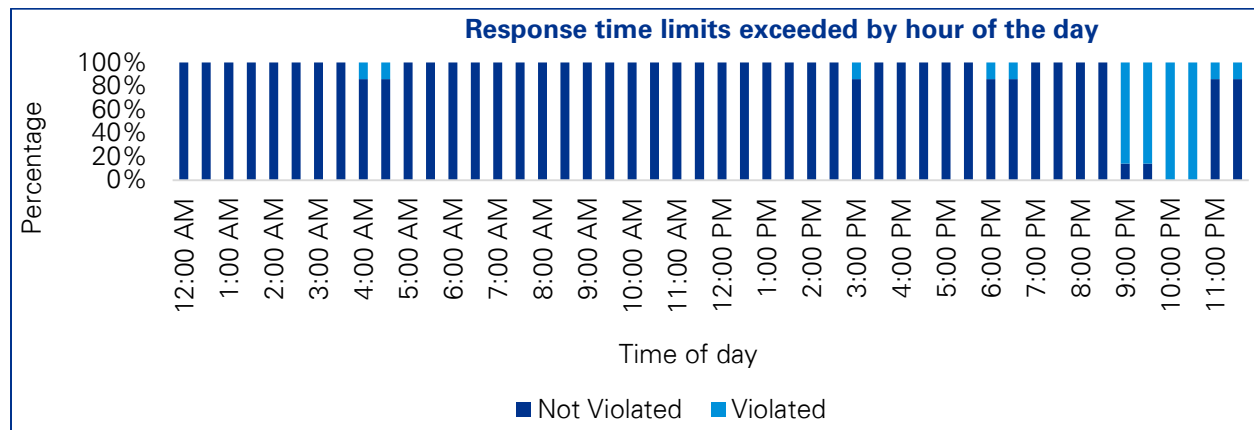
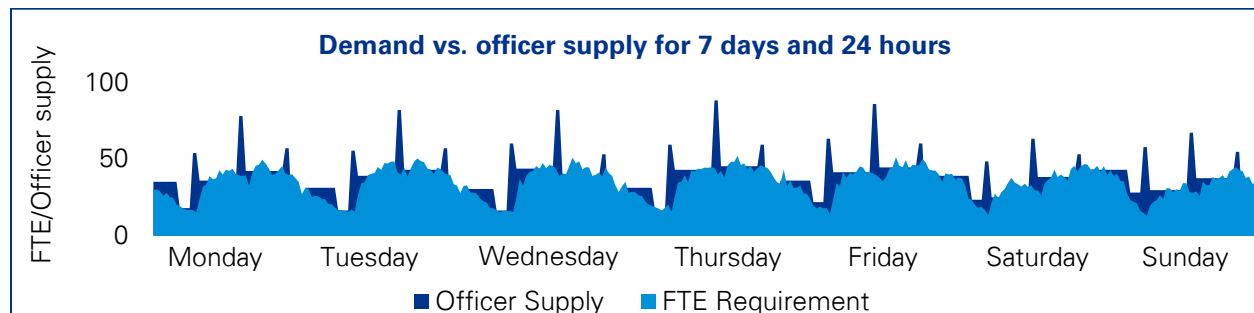
Number of officers planned to be on duty at a given day and time

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	45	42	42	43	50	49	64
12:30 AM	45	42	42	43	50	49	64
1:00 AM	45	42	42	43	50	49	64
1:30 AM	45	42	42	43	50	49	64
2:00 AM	45	42	42	43	50	49	64
2:30 AM	45	42	42	43	50	49	64
3:00 AM	45	42	42	43	50	49	64
3:30 AM	45	42	42	43	50	49	64
4:00 AM	26	23	22	23	29	30	37
4:30 AM	26	23	22	23	29	30	37
5:00 AM	26	23	22	23	29	30	37
5:30 AM	26	23	22	23	29	30	37
6:00 AM	82	83	79	87	88	77	79
6:30 AM	82	83	79	87	88	77	79
7:00 AM	56	60	57	64	59	47	42
7:30 AM	56	60	57	64	59	47	42
8:00 AM	56	60	57	64	59	47	42
8:30 AM	56	60	57	64	59	47	42
9:00 AM	56	60	57	64	59	47	42
9:30 AM	56	60	57	64	59	47	42
10:00 AM	56	60	57	64	59	47	42
10:30 AM	56	60	57	64	59	47	42
11:00 AM	56	60	57	64	59	47	42
11:30 AM	56	60	57	64	59	47	42

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	56	60	57	64	59	47	42
12:30 PM	56	60	57	64	59	47	42
1:00 PM	118	129	128	119	133	110	98
1:30 PM	118	129	128	119	133	110	98
2:00 PM	62	69	71	55	74	63	56
2:30 PM	62	69	71	55	74	63	56
3:00 PM	62	69	71	55	74	63	56
3:30 PM	62	69	71	55	74	63	56
4:00 PM	62	69	71	55	74	63	56
4:30 PM	62	69	71	55	74	63	56
5:00 PM	62	69	71	55	74	63	56
5:30 PM	62	69	71	55	74	63	56
6:00 PM	62	69	71	55	74	63	56
6:30 PM	62	69	71	55	74	63	56
7:00 PM	62	69	71	55	74	63	56
7:30 PM	62	69	71	55	74	63	56
8:00 PM	81	89	91	76	93	90	75
8:30 PM	81	89	91	76	93	90	75
9:00 PM	19	20	20	21	19	27	19
9:30 PM	19	20	20	21	19	27	19
10:00 PM	19	20	20	21	19	27	19
10:30 PM	19	20	20	21	19	27	19
11:00 PM	42	42	43	50	49	64	45
11:30 PM	42	42	43	50	49	64	45

Southwest Division, minimize FTE cost; 80 percent demand met

Southwest Division				
Key metrics	Result	Goal	Watch #	Start time
% of demand met	82.4%	80% (Min)	1	11:00 PM
% of response time limit exceeded – Priority 1	9.8%	10% (Max)	2	6:00 AM
% of response time limit exceeded – All Priorities	1.8%	20% (Max)	3	1:00 PM
# of officer supply per week	203	500 (Max)	4	8:00 PM
# of watches	4	4 (Max)		
Total overtime hours	140	140 (Max)		
Estimated total FTE cost (regular + OT)	\$13,933,920	-	-	



Number of officers planned to be on duty at a given day and time

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	45	40	39	40	46	50	55
12:30 AM	45	40	39	40	46	50	55
1:00 AM	45	40	39	40	46	50	55
1:30 AM	45	40	39	40	46	50	55
2:00 AM	45	40	39	40	46	50	55
2:30 AM	45	40	39	40	46	50	55
3:00 AM	45	40	39	40	46	50	55
3:30 AM	45	40	39	40	46	50	55
4:00 AM	23	21	21	21	28	30	36
4:30 AM	23	21	21	21	28	30	36
5:00 AM	23	21	21	21	28	30	36
5:30 AM	23	21	21	21	28	30	36
6:00 AM	69	71	77	76	81	62	74
6:30 AM	69	71	77	76	81	62	74
7:00 AM	46	50	56	55	53	32	38
7:30 AM	46	50	56	55	53	32	38
8:00 AM	46	50	56	55	53	32	38
8:30 AM	46	50	56	55	53	32	38
9:00 AM	46	50	56	55	53	32	38
9:30 AM	46	50	56	55	53	32	38
10:00 AM	46	50	56	55	53	32	38
10:30 AM	46	50	56	55	53	32	38
11:00 AM	46	50	56	55	53	32	38
11:30 AM	46	50	56	55	53	32	38

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	46	50	56	55	53	32	38
12:30 PM	46	50	56	55	53	32	38
1:00 PM	100	105	105	113	110	81	86
1:30 PM	100	105	105	113	110	81	86
2:00 PM	54	55	49	58	57	49	48
2:30 PM	54	55	49	58	57	49	48
3:00 PM	54	55	49	58	57	49	48
3:30 PM	54	55	49	58	57	49	48
4:00 PM	54	55	49	58	57	49	48
4:30 PM	54	55	49	58	57	49	48
5:00 PM	54	55	49	58	57	49	48
5:30 PM	54	55	49	58	57	49	48
6:00 PM	54	55	49	58	57	49	48
6:30 PM	54	55	49	58	57	49	48
7:00 PM	54	55	49	58	57	49	48
7:30 PM	54	55	49	58	57	49	48
8:00 PM	73	73	68	76	77	68	70
8:30 PM	73	73	68	76	77	68	70
9:00 PM	19	18	19	18	20	19	22
9:30 PM	19	18	19	18	20	19	22
10:00 PM	19	18	19	18	20	19	22
10:30 PM	19	18	19	18	20	19	22
11:00 PM	40	39	40	46	50	55	45
11:30 PM	40	39	40	46	50	55	45

Scenario Three, Option Two: Division-level model outputs, meet 100 percent of demand at minimal cost

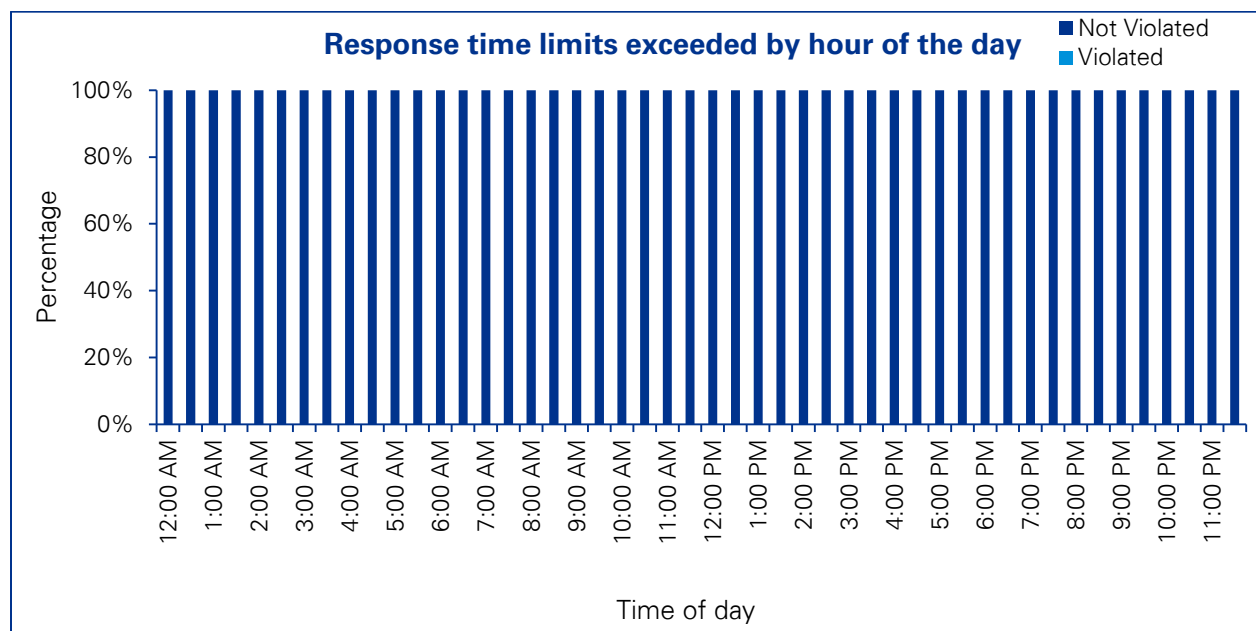
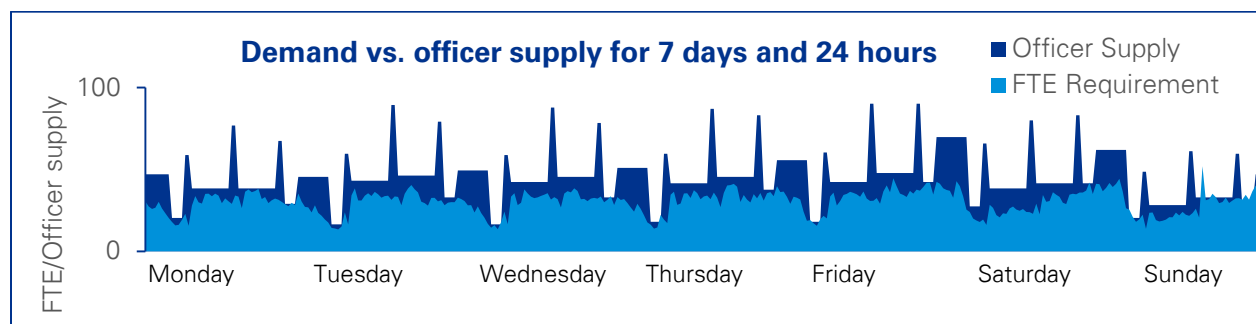
The most efficient solution found by the model involved a 5–8 shift pattern across all divisions. The model's outputs are included below.

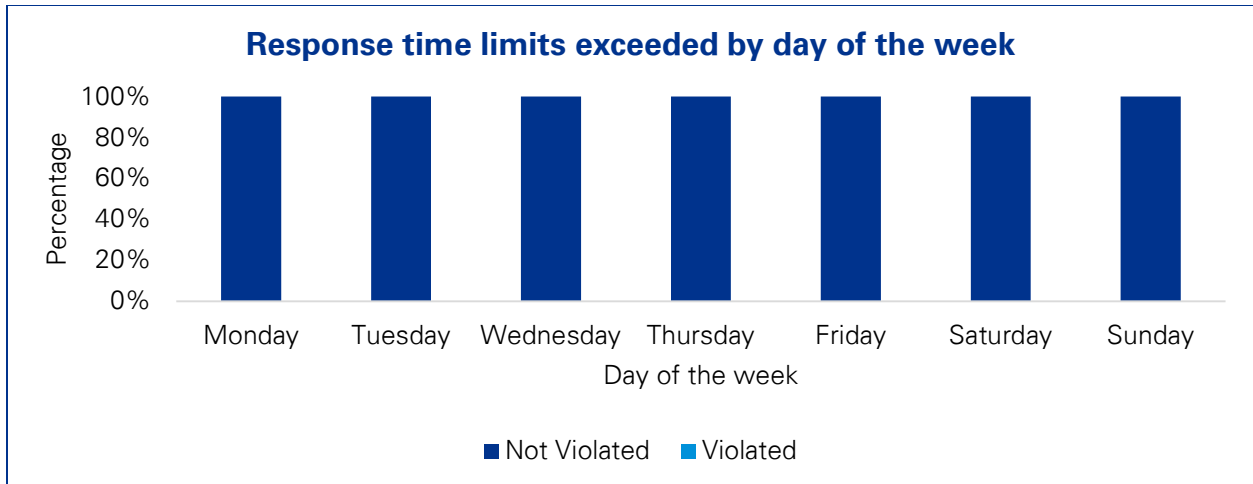
5–8 shifts across all divisions

Division	Officer supply	Overtime hours	Days per shift	Shift length	% of demand met
Central	243	137	5	8	100%
North Central	179	81	5	8	100%
Northeast	297	112	5	8	100%
Northwest	230	134	5	8	100%
South Central	257	140	5	8	100%
Southeast	305	140	5	8	100%
Southwest	243	137	5	8	100%

Central Division, minimize FTE cost; 100 percent demand met

Central Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	100% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	7.1%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All Priorities	0.0%	20% (Max)	3	1:00 PM	
# of officer supply per week	243	500 (Max)	4	8:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	137	140 (Max)			
Estimated total FTE cost (regular + OT)	\$16,679,520	-	-		





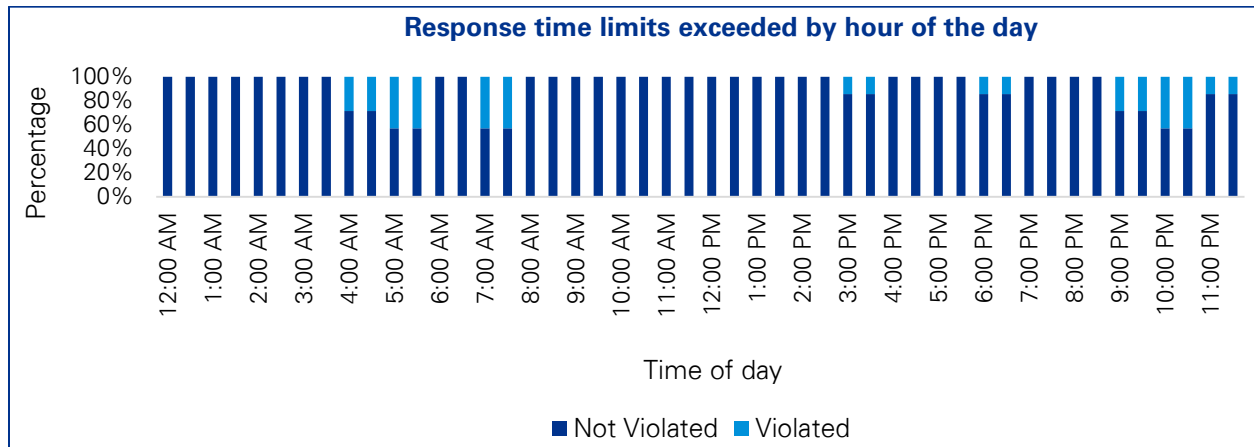
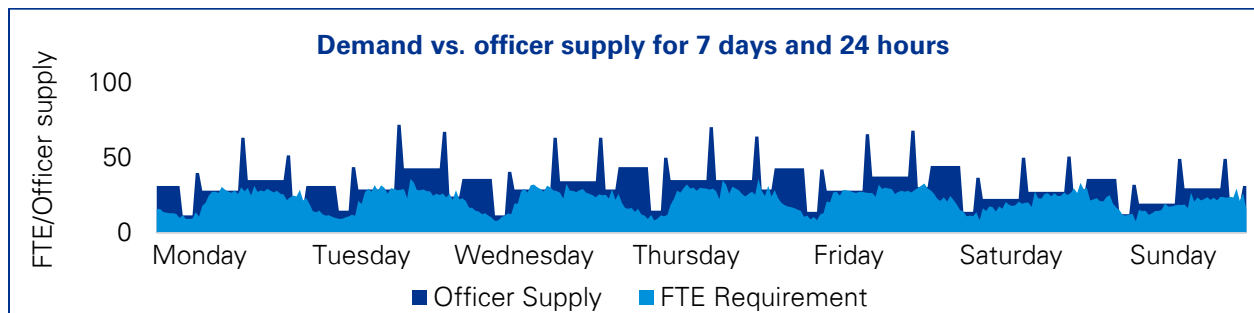
Number of officers planned to be on duty at a given day and time

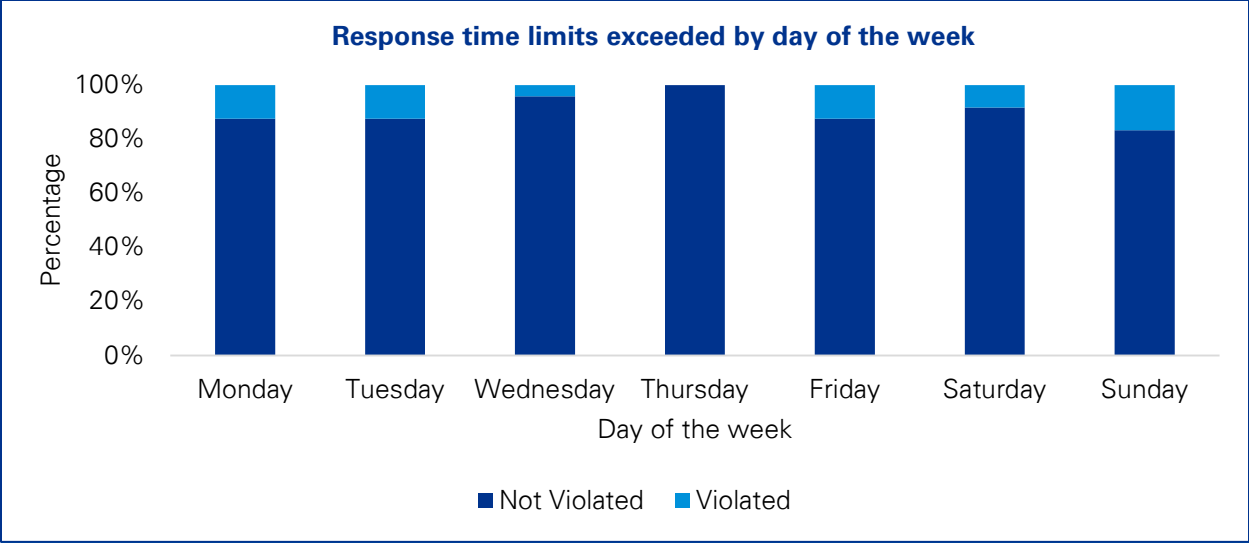
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12:00 AM	60	56	56	57	67	77	72
12:30 AM	60	56	56	57	67	77	72
1:00 AM	60	56	56	57	67	77	72
1:30 AM	60	56	56	57	67	77	72
2:00 AM	60	56	56	57	67	77	72
2:30 AM	60	56	56	57	67	77	72
3:00 AM	60	56	56	57	67	77	72
3:30 AM	60	56	56	57	67	77	72
4:00 AM	16	21	20	20	23	24	21
4:30 AM	16	21	20	20	23	24	21
5:00 AM	16	21	20	20	23	24	21
5:30 AM	16	21	20	20	23	24	21
6:00 AM	71	82	79	77	77	68	61
6:30 AM	71	82	79	77	77	68	61
7:00 AM	55	61	59	57	54	44	40
7:30 AM	55	61	59	57	54	44	40
8:00 AM	55	61	59	57	54	44	40
8:30 AM	55	61	59	57	54	44	40
9:00 AM	55	61	59	57	54	44	40
9:30 AM	55	61	59	57	54	44	40
10:00 AM	55	61	59	57	54	44	40
10:30 AM	55	61	59	57	54	44	40
11:00 AM	55	61	59	57	54	44	40
11:30 AM	55	61	59	57	54	44	40

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	55	61	59	57	54	44	40
12:30 PM	55	61	59	57	54	44	40
1:00 PM	114	123	117	118	113	96	89
1:30 PM	114	123	117	118	113	96	89
2:00 PM	59	62	58	61	59	52	49
2:30 PM	59	62	58	61	59	52	49
3:00 PM	59	62	58	61	59	52	49
3:30 PM	59	62	58	61	59	52	49
4:00 PM	59	62	58	61	59	52	49
4:30 PM	59	62	58	61	59	52	49
5:00 PM	59	62	58	61	59	52	49
5:30 PM	59	62	58	61	59	52	49
6:00 PM	59	62	58	61	59	52	49
6:30 PM	59	62	58	61	59	52	49
7:00 PM	59	62	58	61	59	52	49
7:30 PM	59	62	58	61	59	52	49
8:00 PM	94	98	95	105	112	103	93
8:30 PM	94	98	95	105	112	103	93
9:00 PM	35	36	37	44	53	51	44
9:30 PM	35	36	37	44	53	51	44
10:00 PM	35	36	37	44	53	51	44
10:30 PM	35	36	37	44	53	51	44
11:00 PM	56	56	57	67	77	72	60
11:30 PM	56	56	57	67	77	72	60

North Central Division, minimize FTE cost; 100 percent demand met

North Central Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	100% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	9.8%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All Priorities	0.6%	20% (Max)	3	1:00 PM	
# of officer supply per week	179	500 (Max)	4	8:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	81	140 (Max)			
Estimated total FTE cost (regular + OT)	\$12,286,560	-	-		





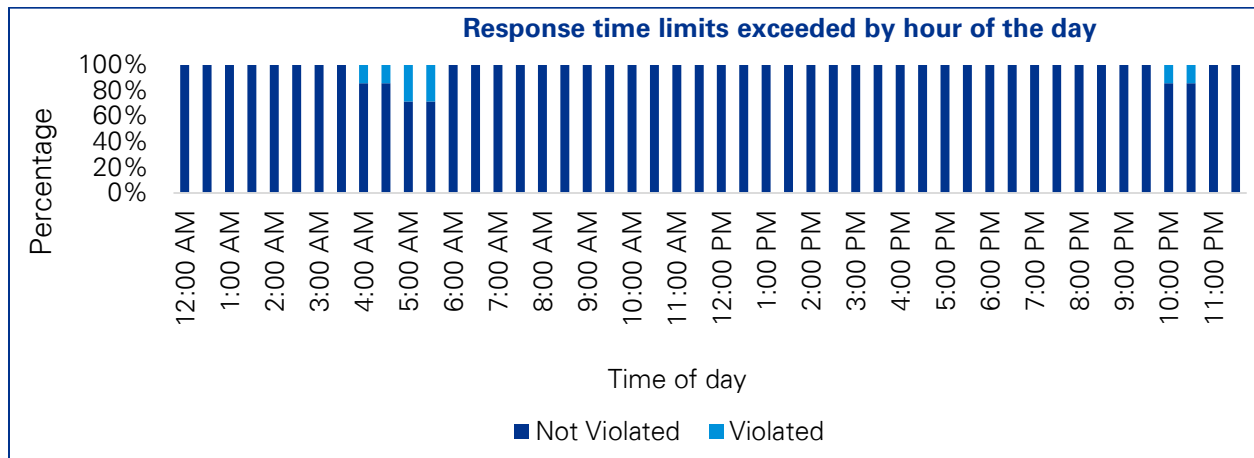
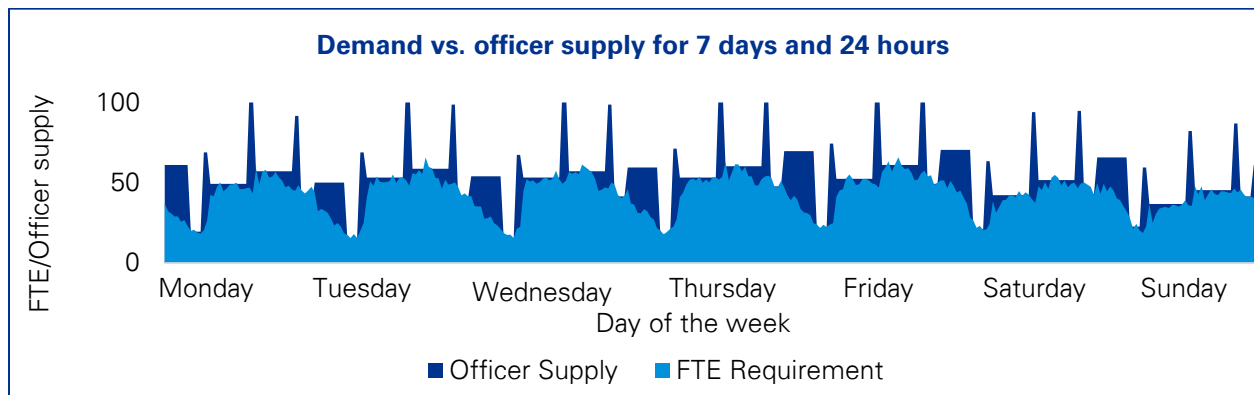
Number of officers planned to be on duty at a given day and time

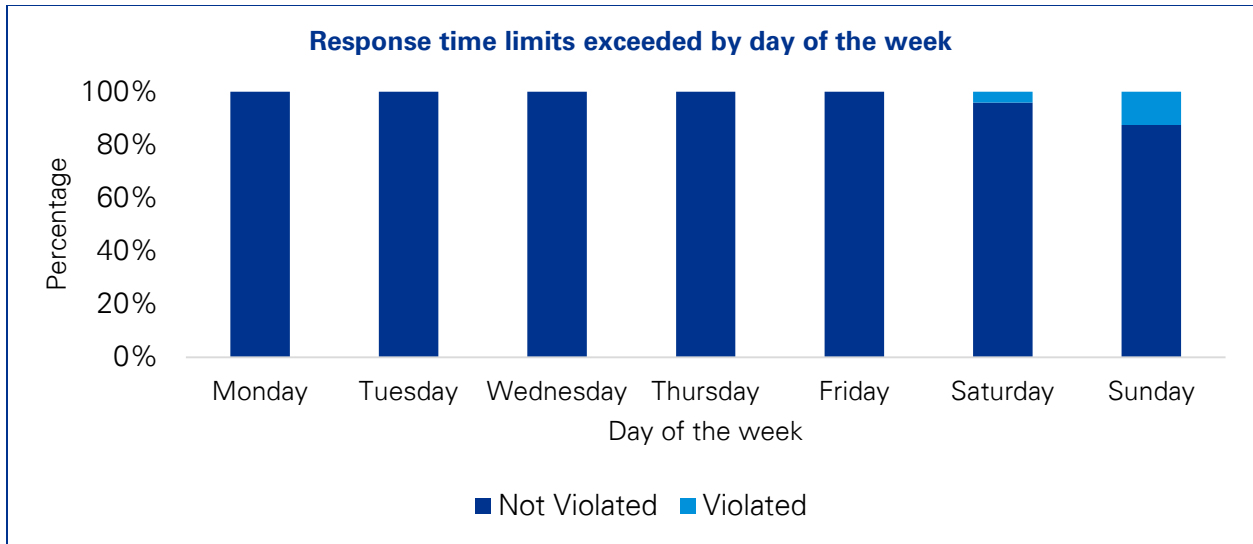
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	37	40	45	57	58	63	50
12:30 AM	37	40	45	57	58	63	50
1:00 AM	37	40	45	57	58	63	50
1:30 AM	37	40	45	57	58	63	50
2:00 AM	37	40	45	57	58	63	50
2:30 AM	37	40	45	57	58	63	50
3:00 AM	37	40	45	57	58	63	50
3:30 AM	37	40	45	57	58	63	50
4:00 AM	15	18	15	19	24	24	20
4:30 AM	15	18	15	19	24	24	20
5:00 AM	15	18	15	19	24	24	20
5:30 AM	15	18	15	19	24	24	20
6:00 AM	51	55	52	64	60	53	45
6:30 AM	51	55	52	64	60	53	45
7:00 AM	36	37	37	45	36	29	25
7:30 AM	36	37	37	45	36	29	25
8:00 AM	36	37	37	45	36	29	25
8:30 AM	36	37	37	45	36	29	25
9:00 AM	36	37	37	45	36	29	25
9:30 AM	36	37	37	45	36	29	25
10:00 AM	36	37	37	45	36	29	25
10:30 AM	36	37	37	45	36	29	25
11:00 AM	36	37	37	45	36	29	25
11:30 AM	36	37	37	45	36	29	25

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	36	37	37	45	36	29	25
12:30 PM	36	37	37	45	36	29	25
1:00 PM	82	80	81	87	82	70	63
1:30 PM	82	80	81	87	82	70	63
2:00 PM	46	43	44	42	46	41	38
2:30 PM	46	43	44	42	46	41	38
3:00 PM	46	43	44	42	46	41	38
3:30 PM	46	43	44	42	46	41	38
4:00 PM	46	43	44	42	46	41	38
4:30 PM	46	43	44	42	46	41	38
5:00 PM	46	43	44	42	46	41	38
5:30 PM	46	43	44	42	46	41	38
6:00 PM	46	43	44	42	46	41	38
6:30 PM	46	43	44	42	46	41	38
7:00 PM	46	43	44	42	46	41	38
7:30 PM	46	43	44	42	46	41	38
8:00 PM	68	73	82	76	85	71	60
8:30 PM	68	73	82	76	85	71	60
9:00 PM	22	30	38	34	39	30	22
9:30 PM	22	30	38	34	39	30	22
10:00 PM	22	30	38	34	39	30	22
10:30 PM	22	30	38	34	39	30	22
11:00 PM	40	45	57	58	63	50	37
11:30 PM	40	45	57	58	63	50	37

Northeast Division, minimize FTE cost; 100 percent demand met

Northeast Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	100% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	2.4%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All Priorities	0.0%	20% (Max)	3	1:00 PM	
# of officer supply per week	297	500 (Max)	4	8:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	112	140 (Max)			
Estimated total FTE cost (regular + OT)	\$20,386,080	-	-		





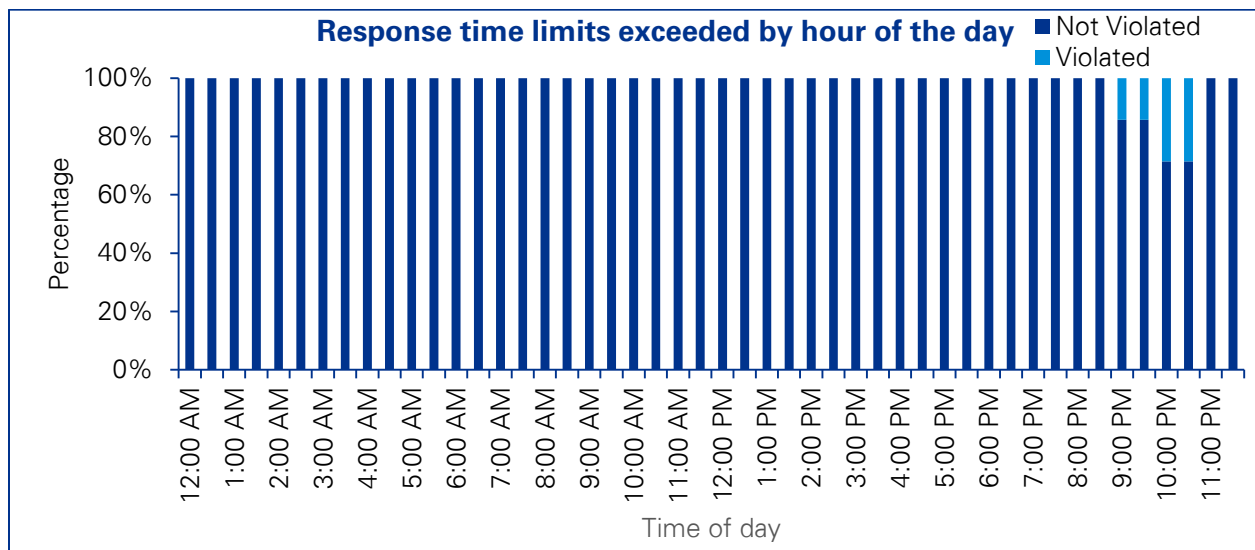
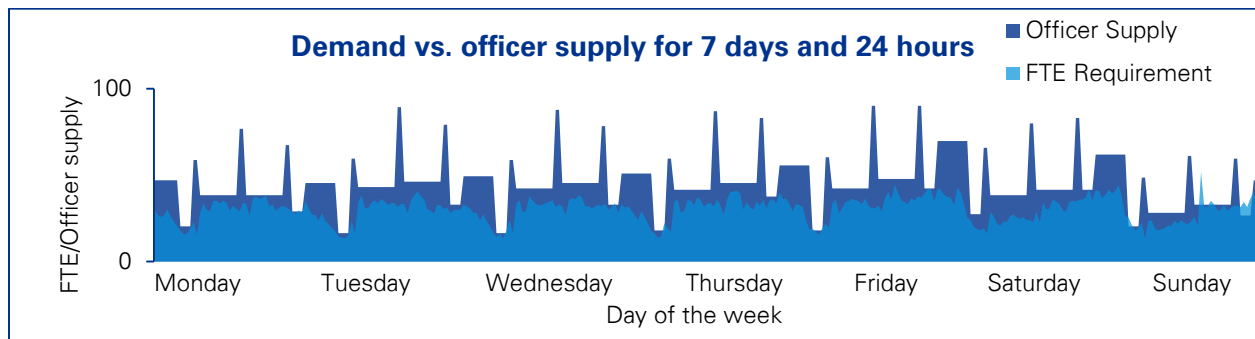
Number of officers planned to be on duty at a given day and time

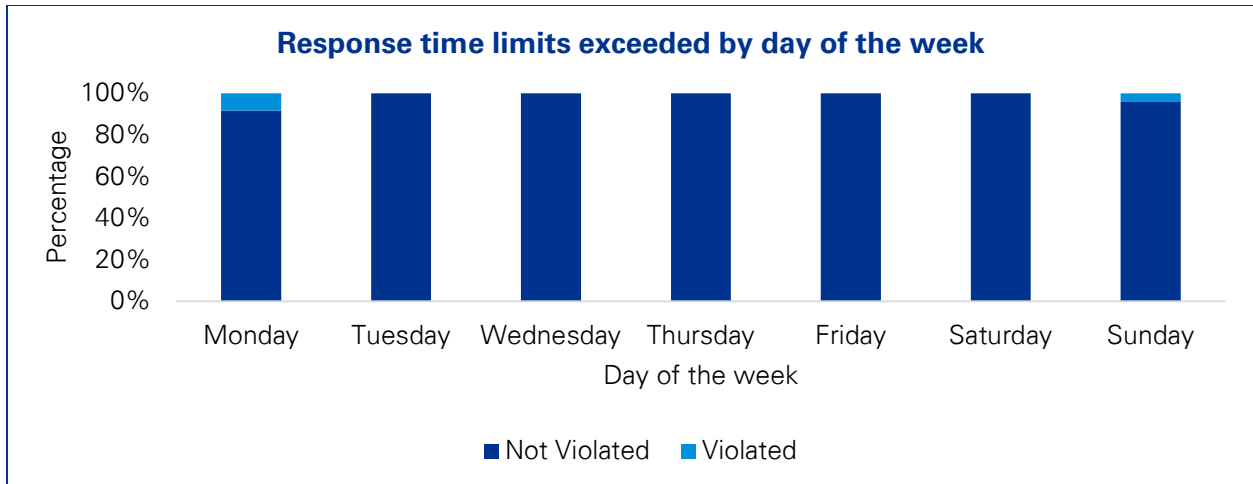
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	73	78	67	69	91	90	82
12:30 AM	73	78	67	69	91	90	82
1:00 AM	73	78	67	69	91	90	82
1:30 AM	73	78	67	69	91	90	82
2:00 AM	73	78	67	69	91	90	82
2:30 AM	73	78	67	69	91	90	82
3:00 AM	73	78	67	69	91	90	82
3:30 AM	73	78	67	69	91	90	82
4:00 AM	20	21	21	25	30	27	26
4:30 AM	20	21	21	25	30	27	26
5:00 AM	20	21	21	25	30	27	26
5:30 AM	20	21	21	25	30	27	26
6:00 AM	83	87	89	92	98	82	74
6:30 AM	83	87	89	92	98	82	74
7:00 AM	63	66	68	67	68	55	48
7:30 AM	63	66	68	67	68	55	48
8:00 AM	63	66	68	67	68	55	48
8:30 AM	63	66	68	67	68	55	48
9:00 AM	63	66	68	67	68	55	48
9:30 AM	63	66	68	67	68	55	48
10:00 AM	63	66	68	67	68	55	48
10:30 AM	63	66	68	67	68	55	48
11:00 AM	63	66	68	67	68	55	48
11:30 AM	63	66	68	67	68	55	48

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	63	66	68	67	68	55	48
12:30 PM	63	66	68	67	68	55	48
1:00 PM	136	141	141	144	146	121	106
1:30 PM	136	141	141	144	146	121	106
2:00 PM	73	75	73	77	78	66	58
2:30 PM	73	75	73	77	78	66	58
3:00 PM	73	75	73	77	78	66	58
3:30 PM	73	75	73	77	78	66	58
4:00 PM	73	75	73	77	78	66	58
4:30 PM	73	75	73	77	78	66	58
5:00 PM	73	75	73	77	78	66	58
5:30 PM	73	75	73	77	78	66	58
6:00 PM	73	75	73	77	78	66	58
6:30 PM	73	75	73	77	78	66	58
7:00 PM	73	75	73	77	78	66	58
7:30 PM	73	75	73	77	78	66	58
8:00 PM	130	121	117	138	141	122	111
8:30 PM	130	121	117	138	141	122	111
9:00 PM	57	46	44	61	63	56	53
9:30 PM	57	46	44	61	63	56	53
10:00 PM	57	46	44	61	63	56	53
10:30 PM	57	46	44	61	63	56	53
11:00 PM	78	67	69	91	90	82	73
11:30 PM	78	67	69	91	90	82	73

Northwest Division, minimize FTE cost; 100 percent demand met

Northwest Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	100% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	7.1%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All Priorities	0.0%	20% (Max)	3	1:00 PM	
# of officer supply per week	230	500 (Max)	4	8:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	134	140 (Max)			
Estimated total FTE cost (regular + OT)	\$15,787,200	-	-		





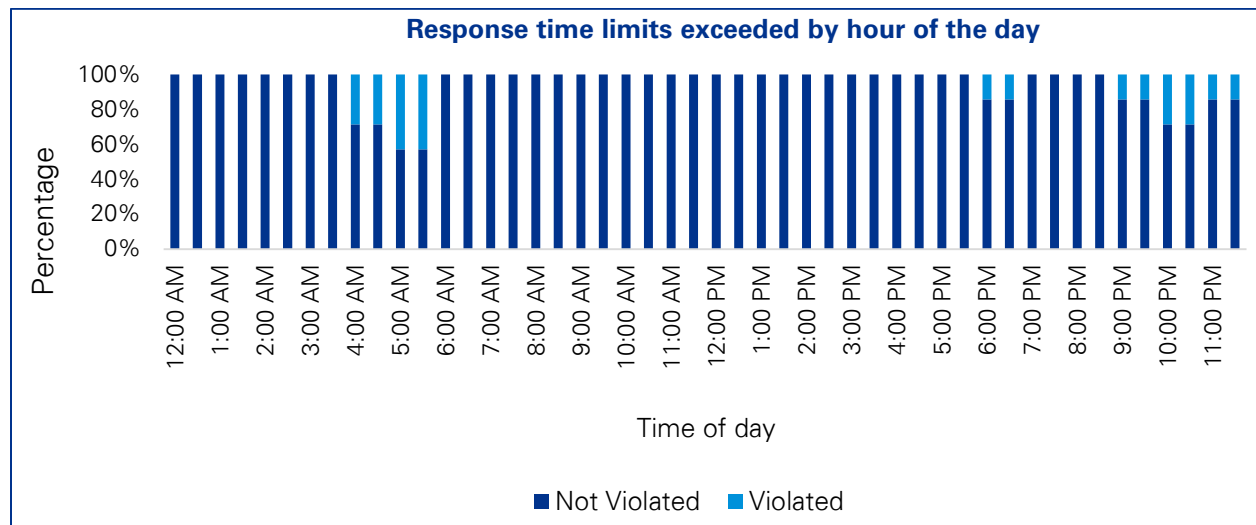
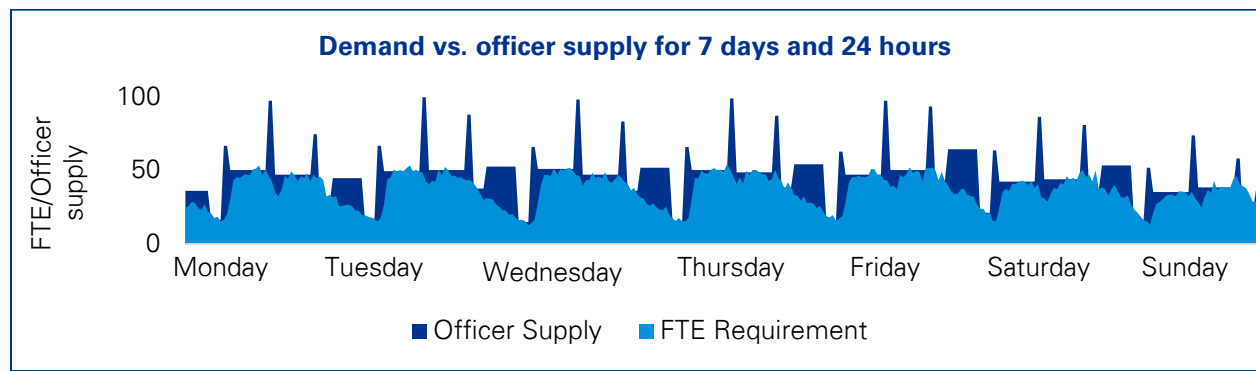
Number of officers planned to be on duty at a given day and time

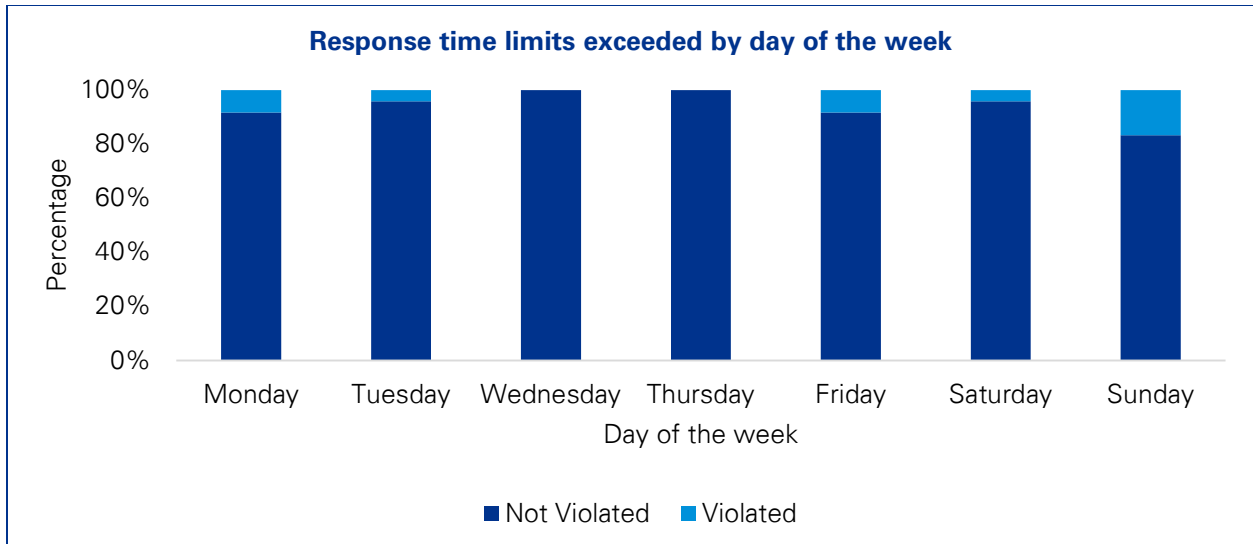
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	71	59	63	66	72	80	89
12:30 AM	71	59	63	66	72	80	89
1:00 AM	71	59	63	66	72	80	89
1:30 AM	71	59	63	66	72	80	89
2:00 AM	71	59	63	66	72	80	89
2:30 AM	71	59	63	66	72	80	89
3:00 AM	71	59	63	66	72	80	89
3:30 AM	71	59	63	66	72	80	89
4:00 AM	26	21	23	25	26	26	33
4:30 AM	26	21	23	25	26	26	33
5:00 AM	26	21	23	25	26	26	33
5:30 AM	26	21	23	25	26	26	33
6:00 AM	73	68	71	72	73	62	66
6:30 AM	73	68	71	72	73	62	66
7:00 AM	47	47	48	47	47	36	33
7:30 AM	47	47	48	47	47	36	33
8:00 AM	47	47	48	47	47	36	33
8:30 AM	47	47	48	47	47	36	33
9:00 AM	47	47	48	47	47	36	33
9:30 AM	47	47	48	47	47	36	33
10:00 AM	47	47	48	47	47	36	33
10:30 AM	47	47	48	47	47	36	33
11:00 AM	47	47	48	47	47	36	33
11:30 AM	47	47	48	47	47	36	33

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	47	47	48	47	47	36	33
12:30 PM	47	47	48	47	47	36	33
1:00 PM	97	99	96	99	98	81	80
1:30 PM	97	99	96	99	98	81	80
2:00 PM	50	52	48	52	51	45	47
2:30 PM	50	52	48	52	51	45	47
3:00 PM	50	52	48	52	51	45	47
3:30 PM	50	52	48	52	51	45	47
4:00 PM	50	52	48	52	51	45	47
4:30 PM	50	52	48	52	51	45	47
5:00 PM	50	52	48	52	51	45	47
5:30 PM	50	52	48	52	51	45	47
6:00 PM	50	52	48	52	51	45	47
6:30 PM	50	52	48	52	51	45	47
7:00 PM	50	52	48	52	51	45	47
7:30 PM	50	52	48	52	51	45	47
8:00 PM	88	92	89	98	105	101	92
8:30 PM	88	92	89	98	105	101	92
9:00 PM	38	40	41	46	54	56	45
9:30 PM	38	40	41	46	54	56	45
10:00 PM	38	40	41	46	54	56	45
10:30 PM	38	40	41	46	54	56	45
11:00 PM	59	63	66	72	80	89	71
11:30 PM	59	63	66	72	80	89	71

South Central Division, minimize FTE cost; 100 percent demand met

South Central Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	100%	(Min)	1	11:00 PM
% of response time limit exceeded – Priority 1	6.0%	10%	(Max)	2	6:00 AM
% of response time limit exceeded – All Priorities	19.0%	20%	(Max)	3	1:00 PM
# of officer supply per week	257	500	(Max)	4	8:00 PM
# of watches	4	4	(Max)		
Total overtime hours	140	140	(Max)		
Estimated total FTE cost (regular + OT)	\$17,640,480	-	-		





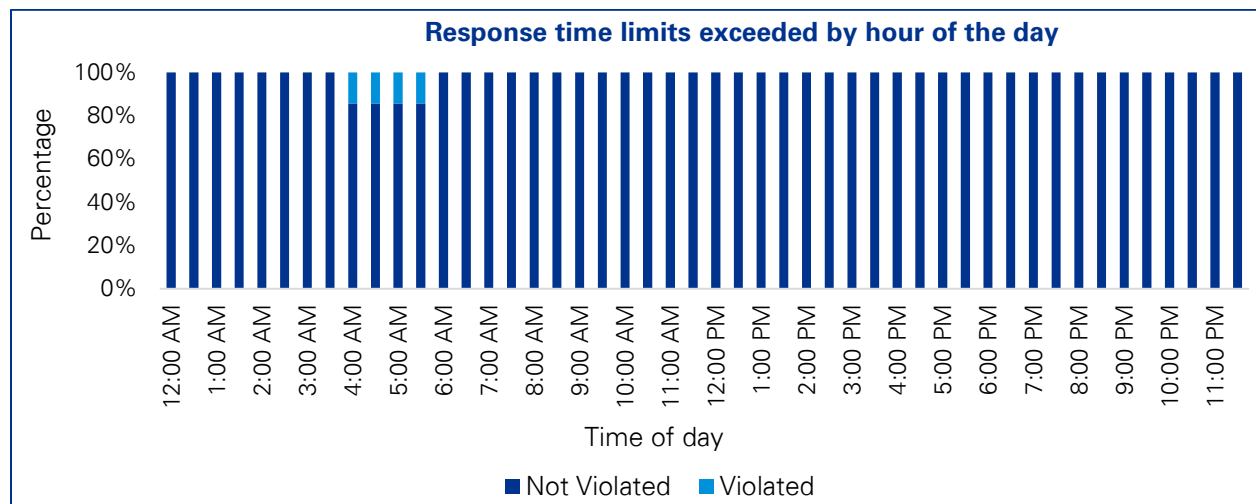
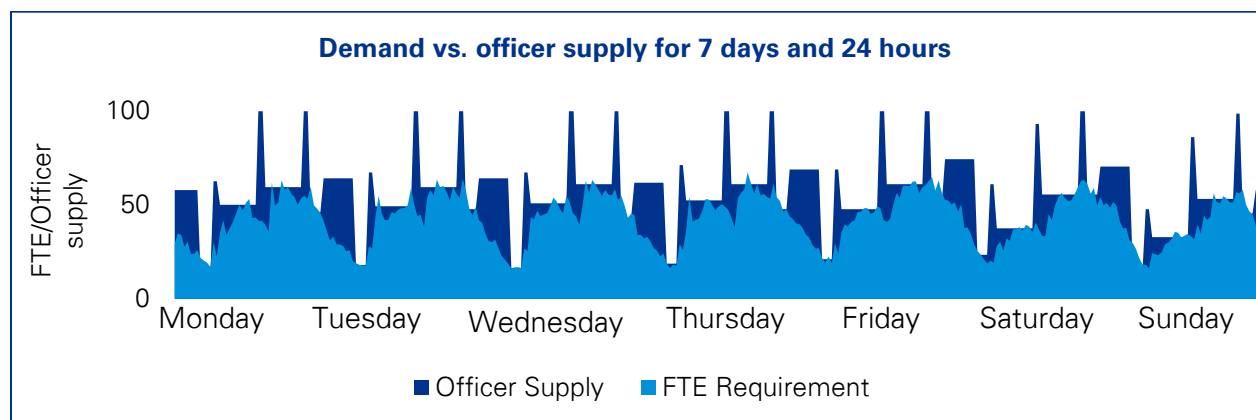
Number of officers planned to be on duty at a given day and time

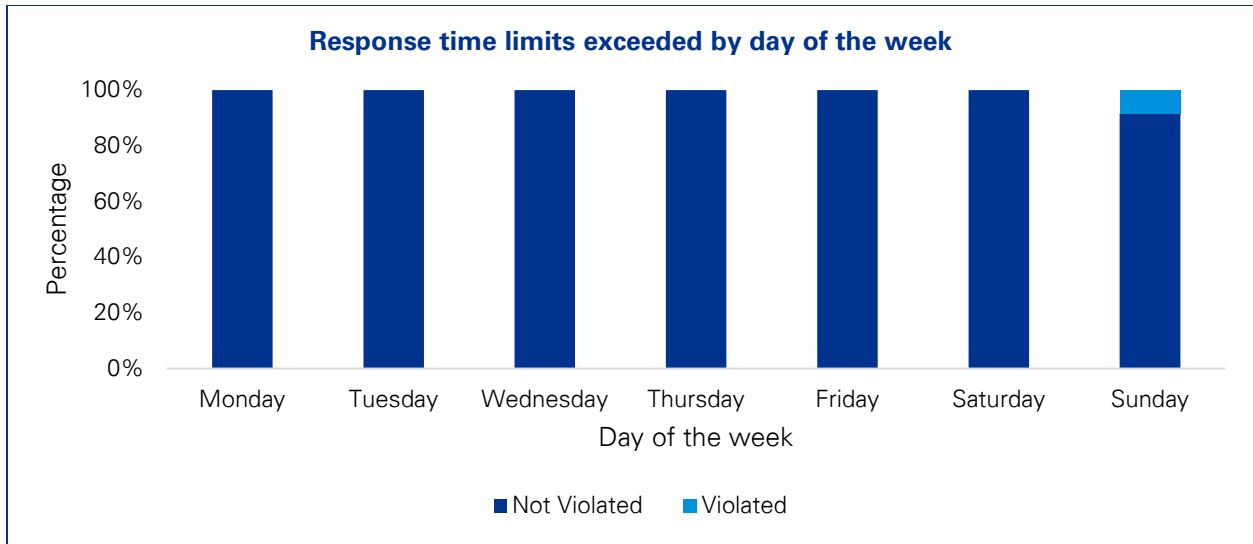
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	46	57	67	66	69	82	68
12:30 AM	46	57	67	66	69	82	68
1:00 AM	46	57	67	66	69	82	68
1:30 AM	46	57	67	66	69	82	68
2:00 AM	46	57	67	66	69	82	68
2:30 AM	46	57	67	66	69	82	68
3:00 AM	46	57	67	66	69	82	68
3:30 AM	46	57	67	66	69	82	68
4:00 AM	21	22	19	20	20	27	21
4:30 AM	21	22	19	20	20	27	21
5:00 AM	21	22	19	20	20	27	21
5:30 AM	21	22	19	20	20	27	21
6:00 AM	85	85	84	84	80	81	66
6:30 AM	85	85	84	84	80	81	66
7:00 AM	64	63	65	64	60	54	45
7:30 AM	64	63	65	64	60	54	45
8:00 AM	64	63	65	64	60	54	45
8:30 AM	64	63	65	64	60	54	45
9:00 AM	64	63	65	64	60	54	45
9:30 AM	64	63	65	64	60	54	45
10:00 AM	64	63	65	64	60	54	45
10:30 AM	64	63	65	64	60	54	45
11:00 AM	64	63	65	64	60	54	45
11:30 AM	64	63	65	64	60	54	45

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	64	63	65	64	60	54	45
12:30 PM	64	63	65	64	60	54	45
1:00 PM	124	127	125	126	124	110	94
1:30 PM	124	127	125	126	124	110	94
2:00 PM	60	64	60	62	64	56	49
2:30 PM	60	64	60	62	64	56	49
3:00 PM	60	64	60	62	64	56	49
3:30 PM	60	64	60	62	64	56	49
4:00 PM	60	64	60	62	64	56	49
4:30 PM	60	64	60	62	64	56	49
5:00 PM	60	64	60	62	64	56	49
5:30 PM	60	64	60	62	64	56	49
6:00 PM	60	64	60	62	64	56	49
6:30 PM	60	64	60	62	64	56	49
7:00 PM	60	64	60	62	64	56	49
7:30 PM	60	64	60	62	64	56	49
8:00 PM	95	112	106	111	119	103	74
8:30 PM	95	112	106	111	119	103	74
9:00 PM	35	48	46	49	55	47	25
9:30 PM	35	48	46	49	55	47	25
10:00 PM	35	48	46	49	55	47	25
10:30 PM	35	48	46	49	55	47	25
11:00 PM	57	67	66	69	82	68	46
11:30 PM	57	67	66	69	82	68	46

Southeast Division, minimize FTE cost; 100 percent demand met

Southeast Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	100%	(Min)	1	11:00 PM
% of response time limit exceeded – Priority 1	1.2%	10%	(Max)	2	6:00 AM
% of response time limit exceeded – All					
Priorities	0.0%	20%	(Max)	3	1:00 PM
# of officer supply per week	305	500	(Max)	4	8:00 PM
# of watches	4	4	(Max)		
Total overtime hours	140	140	(Max)		
Estimated total FTE cost (regular + OT)	\$20,935,200	-	-		





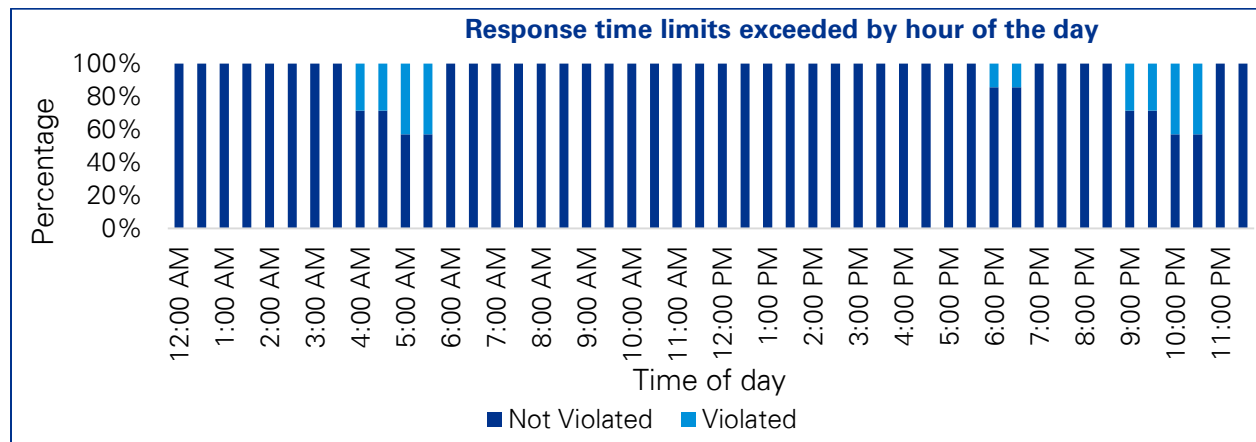
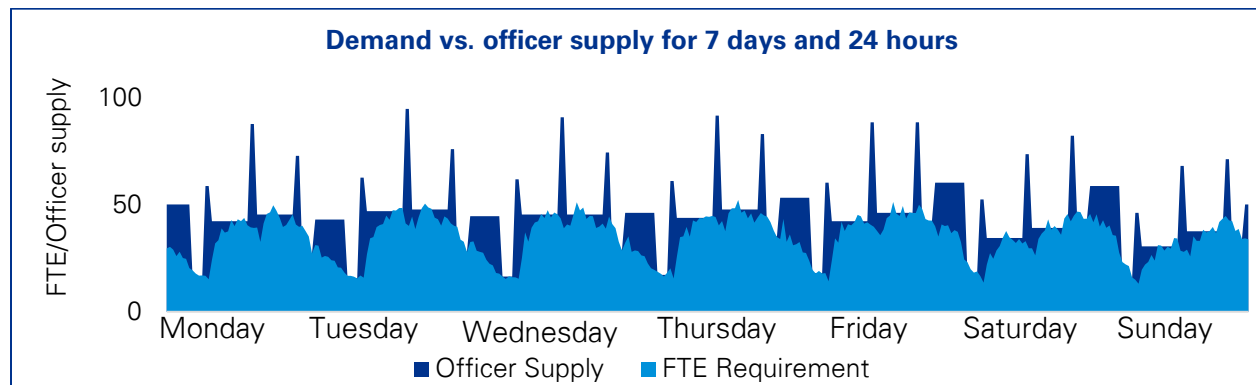
Number of officers planned to be on duty at a given day and time

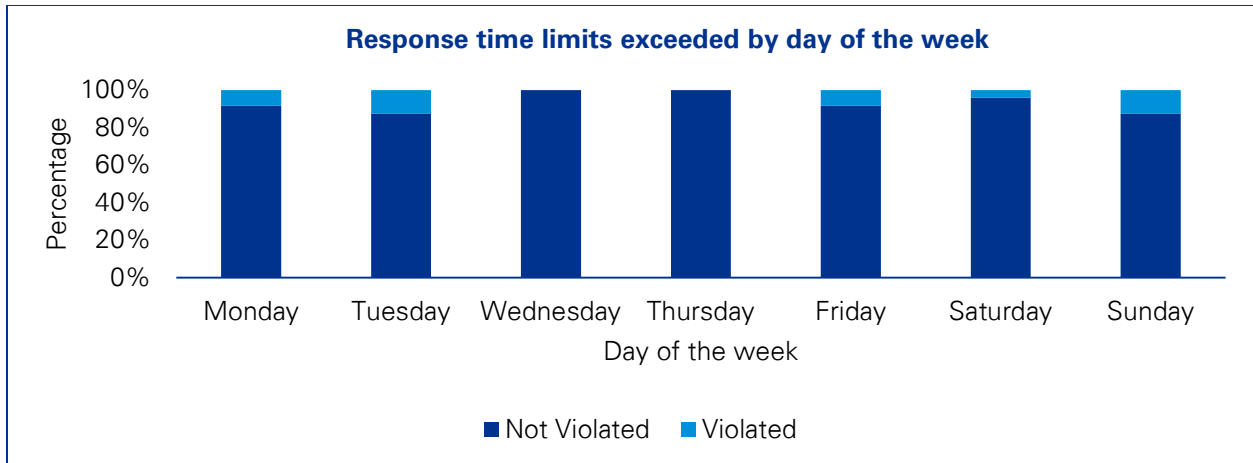
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	74	82	82	79	88	95	90
12:30 AM	74	82	82	79	88	95	90
1:00 AM	74	82	82	79	88	95	90
1:30 AM	74	82	82	79	88	95	90
2:00 AM	74	82	82	79	88	95	90
2:30 AM	74	82	82	79	88	95	90
3:00 AM	74	82	82	79	88	95	90
3:30 AM	74	82	82	79	88	95	90
4:00 AM	16	23	21	24	27	30	19
4:30 AM	16	23	21	24	27	30	19
5:00 AM	16	23	21	24	27	30	19
5:30 AM	16	23	21	24	27	30	19
6:00 AM	80	86	86	91	88	78	61
6:30 AM	80	86	86	91	88	78	61
7:00 AM	64	63	65	67	61	48	42
7:30 AM	64	63	65	67	61	48	42
8:00 AM	64	63	65	67	61	48	42
8:30 AM	64	63	65	67	61	48	42
9:00 AM	64	63	65	67	61	48	42
9:30 AM	64	63	65	67	61	48	42
10:00 AM	64	63	65	67	61	48	42
10:30 AM	64	63	65	67	61	48	42
11:00 AM	64	63	65	67	61	48	42
11:30 AM	64	63	65	67	61	48	42

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	64	63	65	67	61	48	42
12:30 PM	64	63	65	67	61	48	42
1:00 PM	140	139	143	145	139	119	110
1:30 PM	140	139	143	145	139	119	110
2:00 PM	76	76	78	78	78	71	68
2:30 PM	76	76	78	78	78	71	68
3:00 PM	76	76	78	78	78	71	68
3:30 PM	76	76	78	78	78	71	68
4:00 PM	76	76	78	78	78	71	68
4:30 PM	76	76	78	78	78	71	68
5:00 PM	76	76	78	78	78	71	68
5:30 PM	76	76	78	78	78	71	68
6:00 PM	76	76	78	78	78	71	68
6:30 PM	76	76	78	78	78	71	68
7:00 PM	76	76	78	78	78	71	68
7:30 PM	76	76	78	78	78	71	68
8:00 PM	135	137	133	139	143	142	126
8:30 PM	135	137	133	139	143	142	126
9:00 PM	59	61	55	61	65	71	58
9:30 PM	59	61	55	61	65	71	58
10:00 PM	59	61	55	61	65	71	58
10:30 PM	59	61	55	61	65	71	58
11:00 PM	82	82	79	88	95	90	74
11:30 PM	82	82	79	88	95	90	74

Southwest Division, minimize FTE cost; 100 percent demand met

Southwest Division					
Key metrics	Result	Goal	Watch #	Start time	
% of demand met	100.0%	100% (Min)	1	11:00 PM	
% of response time limit exceeded – Priority 1	7.1%	10% (Max)	2	6:00 AM	
% of response time limit exceeded – All Priorities	0.0%	20% (Max)	3	1:00 PM	
# of officer supply per week	243	500 (Max)	4	8:00 PM	
# of watches	4	4 (Max)			
Total overtime hours	137	140 (Max)			
Estimated total FTE cost (regular + OT)	\$16,679,520	-	-		





Number of officers planned to be on duty at a given day and time

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 AM	60	56	56	57	67	77	72
12:30 AM	60	56	56	57	67	77	72
1:00 AM	60	56	56	57	67	77	72
1:30 AM	60	56	56	57	67	77	72
2:00 AM	60	56	56	57	67	77	72
2:30 AM	60	56	56	57	67	77	72
3:00 AM	60	56	56	57	67	77	72
3:30 AM	60	56	56	57	67	77	72
4:00 AM	16	21	20	20	23	24	21
4:30 AM	16	21	20	20	23	24	21
5:00 AM	16	21	20	20	23	24	21
5:30 AM	16	21	20	20	23	24	21
6:00 AM	71	82	79	77	77	68	61
6:30 AM	71	82	79	77	77	68	61
7:00 AM	55	61	59	57	54	44	40
7:30 AM	55	61	59	57	54	44	40
8:00 AM	55	61	59	57	54	44	40
8:30 AM	55	61	59	57	54	44	40
9:00 AM	55	61	59	57	54	44	40
9:30 AM	55	61	59	57	54	44	40
10:00 AM	55	61	59	57	54	44	40
10:30 AM	55	61	59	57	54	44	40
11:00 AM	55	61	59	57	54	44	40
11:30 AM	55	61	59	57	54	44	40

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
12:00 PM	55	61	59	57	54	44	40
12:30 PM	55	61	59	57	54	44	40
1:00 PM	114	123	117	118	113	96	89
1:30 PM	114	123	117	118	113	96	89
2:00 PM	59	62	58	61	59	52	49
2:30 PM	59	62	58	61	59	52	49
3:00 PM	59	62	58	61	59	52	49
3:30 PM	59	62	58	61	59	52	49
4:00 PM	59	62	58	61	59	52	49
4:30 PM	59	62	58	61	59	52	49
5:00 PM	59	62	58	61	59	52	49
5:30 PM	59	62	58	61	59	52	49
6:00 PM	59	62	58	61	59	52	49
6:30 PM	59	62	58	61	59	52	49
7:00 PM	59	62	58	61	59	52	49
7:30 PM	59	62	58	61	59	52	49
8:00 PM	94	98	95	105	112	103	93
8:30 PM	94	98	95	105	112	103	93
9:00 PM	35	36	37	44	53	51	44
9:30 PM	35	36	37	44	53	51	44
10:00 PM	35	36	37	44	53	51	44
10:30 PM	35	36	37	44	53	51	44
11:00 PM	56	56	57	67	77	72	60
11:30 PM	56	56	57	67	77	72	60

Productive hours pay codes

KPMG used the pay codes listed in the table below to determine an officer's productive hours:

Productive hours category	Pay code	
Regular hours	ACTU ACTV DRRG DTHC DTHU	DTUP JRYC JRYU REGU REGC
Vacation hours	VCP1 VCP2 VCP3 VCP4 VCP5 AILC AILO AILU BLDP BLFP BLLP BLTP CAST CATL HLRC HLRU HOLC HOLU VACC VACU	VAUP VCF1 VCF2 VCF3 VCF4 VCF5 VCF6 VCMC VCMU VMUP VOF1 VOF2 VOF3 VOF4 VOF5 VUF1 VUF2 VUF3 VUF4 VUF5
Comp hours	CTU1 CTU3	
Sick hours	ALF1 ALF2	SFC3 SFC4

Productive hours category	Pay code	
	ALF3 ALF4 ALF5 ALP1 ALP2 ALP3 ALP4 ALP5 SPC1 SPC2 SPC3 SPC4 SPC5 SFC1 SFC2	SFC5 SFC6 SFP1 SFP2 SFP3 SFP4 SFP5 SFU1 SFU2 SFU3 SFU4 SFU5 SIKC SIKU SKEU
Military hours	CMC1 CMO1 CMU1 MLTW MLWO MLXC MLXU	MNMC MNMU MTPC MLTC MLTO MLTU
Disciplinary/Suspension hours	ADMC ADMO ADMU ALVW ALWP AWOP	ADC ADU ADUP APIC APIO APIU

Appendix B: An
assessment of the
Investigations
function of the
Dallas Police
Department



Improving the efficiency of public safety services

**An assessment of the
Investigations function of the
Dallas Police Department**



June 2019

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Executive summary

Purpose and scope

Project background

In 2018, the City of Dallas released a Request for Proposal to conduct a comprehensive analysis and provide feedback on how the Dallas Police Department (DPD) might most efficiently and effectively utilize its resources to better staff the department so that it may continue its efforts to reduce crime, respond to calls for service, and engage the community. KPMG was awarded the contract by the City of Dallas in December 2018 and commenced work on the six-month study with the DPD formally in January 2019. This report outlines the analysis and evaluation of the current operations and staffing within the Investigations Bureau and addresses the core requirement to provide “recommendations for staffing based on current sworn strength, work load, and job function, and to analyze the investigations functions of the department to determine most appropriate staffing levels in these units based on best practices while considering clearance and solvability rates.” KPMG’s study utilized data and analytics to analyze historical offense and case demands in addition to industry benchmarking and qualitative observations.

KPMG and DPD have worked collaboratively to review factors relating to investigations staffing: investigator productive hours, case demand, overtime trends, unit processes and policy, and other factors that impact the demands upon investigators across the investigations units. In addition to gathering and analyzing data, the project team has taken a hands-on approach to understanding investigator resource supply factors. The team visited investigations units to conduct interviews and focus groups with leadership and investigators, conducted process mapping, and conducted numerous meetings with department leadership to understand and validate both data and the current investigations operating model. This report provides context to the methodologies used and outcomes of the analysis conducted.

This report is part two of the report on the DPD Staffing Analyses, and the analysis contained within should not be considered in isolation. A consolidated report will provide the overarching recommendations for the Patrol and Investigations Bureaus and identify strategic and operational recommendations for the DPD as a whole. This report should be viewed as part of a decision-making tool only when combined with the investigations assessment and the consolidated report; together the reports will provide analysis and recommendations to inform DPD’s strategy, operating model, staffing levels, force mix, and scheduling approach.

Findings

KPMG examined a range of factors to evaluate the current state. Those factors included qualitative and quantitative indicators of efficiency and effectiveness in investigations units. The data evaluated presents a complex and inconsistent picture of operations. The DPD and the City of Dallas have consistently faced change. The data presented in this report shows an organization in flux and struggling to adapt across almost all metrics. A part of that change to the environmental context is shifts in leadership and strategy. Interviews conducted with the DPD staff and leadership noted the following four factors affected their performance significantly.



Staffing: The DPD has had a marginal reduction in staffing from its peak in 2015, losing some 60 investigators. This reduction comes on the backdrop of an increasing metro population (Dallas’s population is growing by approximately 1.4 percent per year), increased crime (the number of violent crimes grew by 15 percent from 2015 to 2017), and increased caseloads per investigator (caseload per investigator size varies by investigations unit, but on average, caseloads for felony crimes grew by approximately 70 percent from 2014 to 2018). Staff reported that this decrease in staffing has led to reduced effectiveness as opportunities for proactive investigations have been reduced. They also reported that the volume of caseloads has also caused a reduction in time spent on each case as pressure mounts to close out cases efficiently. The data reviewed by KPMG was inconclusive as to whether staffing has impacted case management effectiveness. While caseloads have increased for investigators, clearance rates have held steady against the period of peak staffing measured. This does not mean that the DPD investigations units could not have greater effectiveness with more staff, but there remain alternatives that could work just as well.

Budgets: KPMG reviewed the historical budgets of the DPD and various budget functions as a component of its review of staffing. The DPD Investigations budget has increased some 13 percent in absolute dollars since 2014. In real dollars (inflation adjusted), the Investigations Division has remained relatively flat. Its budget, relative to peer cities, is middle of the pack and substantially below the highest spender—City of Chicago. The staff attributed the budget to problems of staffing, lack of vehicles, and salaries. These issues inevitably come up in reviews of police agencies; however, the city should examine the process by which the budget is created/allocated. When considering the increased cost in labor, healthcare, equipment, and administration over time, a flat budget (adjusted for inflation) could be an indication of underfunding.

Systems and process: For this project, while intensely focused on staffing, KPMG was also tasked with reviewing operations for opportunities to improve and become more efficient and effective. The interviews that were conducted, the data evaluated, and the information not available were all factors in drawing conclusions regarding the state of the investigations operations. There were two consistent factors that arose throughout the process. The first was the investigators' interactions with the various systems they used, and we focused in particular on the RMS and the case management module. Their use of the system was inconsistent at best, resulting in a lack of performance accountability across the units as comparative benchmarks internally were impossible.

The investigations units also suffer from myriad process inconsistencies and inefficiencies. Those processes occur across the spectrum of caseload and people management. KPMG struggled with the department to parcel out detailed staffing information across units for a five-year period. Overtime information is a paper process that is collated at the division level, which prevented a detailed historical accounting of overtime by staff and unit. The investigations units also had varied processes on case management, evaluation, and assignment. While different case types may have varied components of investigations, the DPD had entirely different steps in some units where streamlining of processes would improve data capture and case processing efficiency. These are discussed in more detail in the process improvement section of this report.

Leadership and strategy: Finally, the last broad theme that came out of this study was that leadership (both changes in and lack of) have had effects on the Investigations Bureau. Staff reported that changes to leadership across all ranks have disrupted the flow of process and information through the years. The inconsistencies in management have resulted in broken processes and misallocated resources according to staff. As noted previously, the department has little to no means of broadly evaluating performance. This prevented the engagement team from verifying some of these anecdotal claims quantitatively, but it was apparent that morale has been affected and real changes did occur that changed the data trends KPMG reviewed. Further examples of this are shown in the body of this report.

Resource allocation, according to staff, is one of the prime elements linked to any known strategy. The DPD lacks a clear crime strategy that would allow for a flow-down staffing model from priorities execution. Staffing decisions are made periodically and reactively. The DPD responds to both attrition of staff and the crisis of the day to shift staff. The ideal allocation model would be based on a strategic crime reduction model, whereby staff is aligned by priority and actual workload and utilizes data and intelligence to inform decision-making. The DPD has considerable work to do in order to achieve this ideal state in the Investigations Bureau. The next steps for the DPD would be to develop a department-wide strategy followed by a Bureau plan to execute that strategy.

The shifting landscape of leadership has resulted in years of evolving strategies to reduce crime. This directly impacts the priority and focus of the investigations units. As the department responds to crime, so does the movement of staff across units. KPMG could not validate a high correlation between staff movement and caseloads between units. The conclusion, which is consistent with staff interviews, is that resourcing decisions are made more closely aligned with the crisis of the day and with little recognition for actual workload.

KPMG's review of the DPD Investigations Bureau revealed that staffing levels are indeed a key factor affecting the performance of the units. KPMG could not conclude definitively as to what the right staffing levels are to achieve optimal performance due to the factors outlined above. This report provides a roadmap and a range of process improvements that would help the DPD come closer to an answer. This report does provide a means for the Bureau to improve performance by adopting improved practices and processes, and increasing consistent use of technology already in place. Further areas of exploration for the Bureau should be in governance (unit consolidation and management) and policy (overtime use/recording, performance management, etc.).

Assumptions and challenges

KPMG began the engagement with critical assumptions about the requested data within the DPD investigations units. Those assumptions are as follows:

- Data would be readily available
- Data would be of moderate quality and require minimal data cleaning
- Data would be accurate
- Process workflows across units would be consistent, allowing for data sampling and/or broad assessment of all workload data in combination
- Historical data would be available for three to five years
- Data would be housed within same system for consistency.

The engagement team encountered problems with all of the assumptions in various forms across the requested data sets, which was discussed through validation sessions with DPD leadership during the project and acceptance of the challenges and assumptions received. While the report does contain a significant amount of data analysis, this was the result of months of effort to harvest, collate, and clean the data before the analysis could be conducted. This data was not readily available and contained significant data quality issues, which is the key reason that staffing conclusions cannot be drawn from the data.

For example, within DPD's offense data, an investigator's badge number was assigned to cases across multiple units; on average, 21 percent of investigators' badge numbers appeared in more than one unit on an annual basis within the offenses data set. However, operationally, we know that investigators are assigned to a specialized unit and may only operate within another unit due to a special assignment or if investigating a case that contains multiple offenses. Therefore, in order to provide a more accurate staffing snapshot, the project team conducted additional analysis where a detective was assigned to a primary unit, i.e., the unit in which an investigator was assigned the highest number of cases over the course of the year. In addition, due to data limitations, there is no understanding of the level of effort within the caseload analysis or understanding of active workload. The caseload per detective analysis may include "no leads" cases and also cases that are suspended and are not actively being investigated.

These examples serve to demonstrate why the data reviewed by KPMG was determined to be inconclusive and the focus of the team was to then outline the process improvements and recommendations to improve the data quality to allow staffing determinations to be made in the future.

A few of the other problems with high impact to the methodological approach were:

- Inconsistent use of the investigations case management system. The primary issue was that investigations units or individual investigators failed to consistently use all functionality within the case management system. This led to data sets across units with missing information and prevented cross-unit analysis.
- Process workflows across units are different. Information is entered into the system differently across units. This led to an inability to cross-reference performance. An example would be when a case is entered into the system, some units would do this at the point the case is assigned to the unit; others would do this after the case was evaluated for solvability or ready for submission to the district attorney.
- Directed and/or process inefficiencies that affected accurate case data. This had a significant impact on the evaluation of case processing efficiency, whereby we would look at how long it took to close cases out. The data revealed wildly inconsistent practices across units historically. In many cases,

the status of the case did not accurately reflect where the case may actually have been in the process.

- Historical staffing and overtime information was unavailable or unreliable. Some of the detailed staffing data we requested was unavailable due to how the DPD records staffing at the division level and not the unit level. It was not possible to get reliable data on historical staffing for each unit. This prevented the team from evaluating what staffing impacts have accorded on individual units or how caseloads were affected across individual investigators. Overtime information is also not recorded at the activity level but instead broadly for the unit and/or division. This made it impossible to determine the root cause for changes in overtime or the effectiveness of overtime.

This report will discuss the root causes for many of the problems encountered and the effects on the engagement. In the following chapter, we lay the foundations to address many of these issues and challenges. These process and operational modifications will allow DPD to replicate the methodology below in order to more comprehensively address questions on staffing.

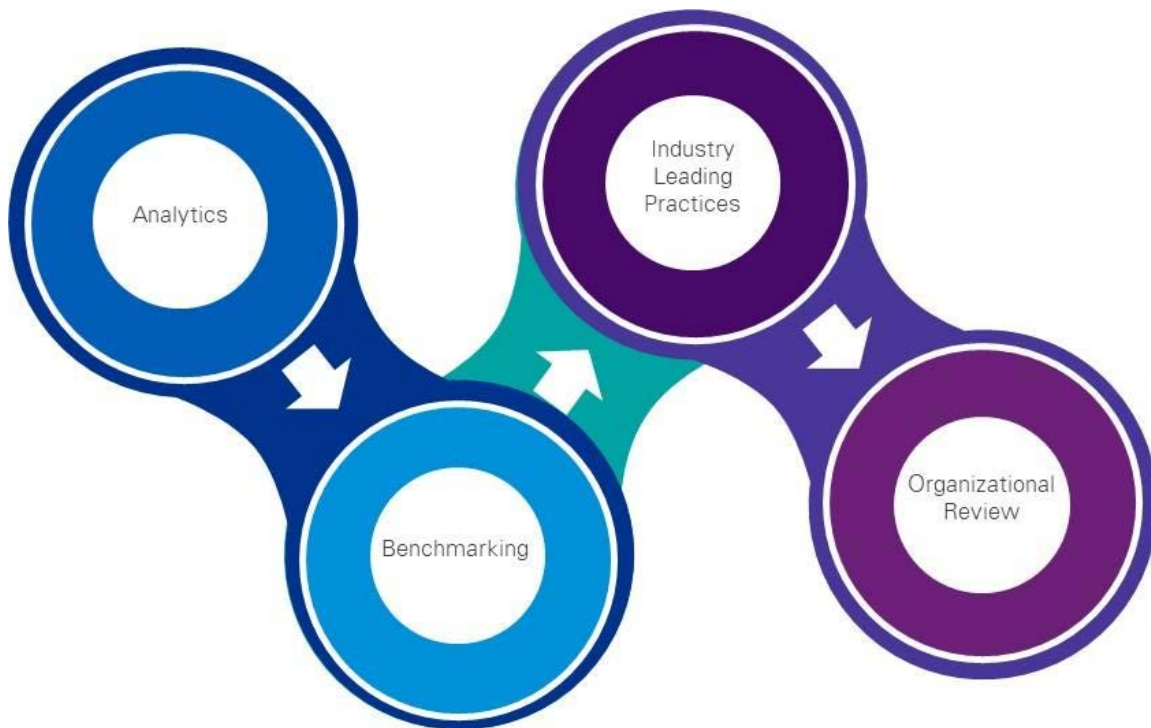
Methodology and analysis

Hypothesis

The DPD reduction in staffing has led to increased caseloads, backlogs, and decreased effectiveness. An adjustment in staffing would lead to better alignment of caseloads to leading practices for caseload management and greater effectiveness by the DPD investigations units.

Methodology

The approach to this engagement followed a broad framework to uncover opportunities and answer the core questions in the DPD request for proposal. KPMG brought a broad framework to scan the investigations units that considered these four components:



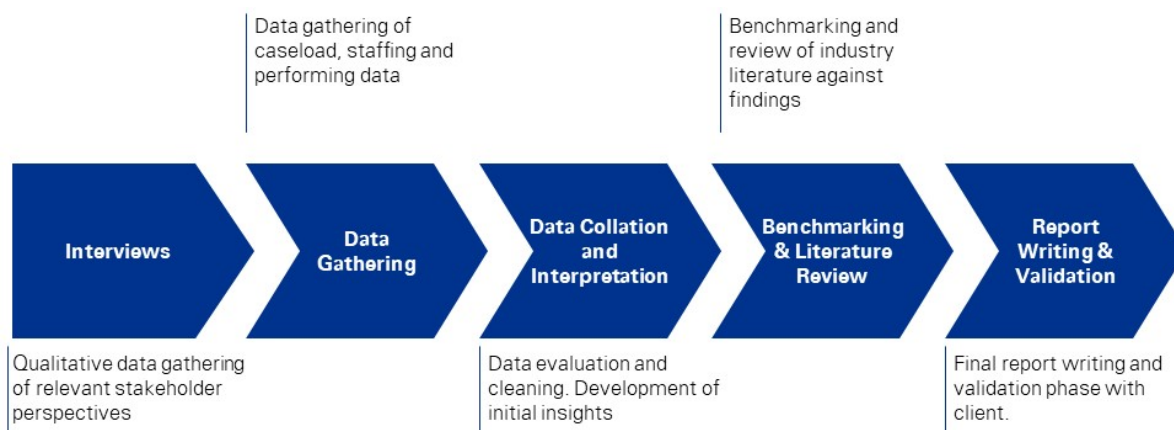
These four components allowed KPMG to broadly scan the units to understand how they operate and the effect that decreased staffing has had on the organization. This approach also allowed KPMG to evaluate the organization’s processes, systems, and strategy.

The above hypothesis was developed after initial discussions with DPD, a review of the purpose of the engagement, and the initial qualitative signals regarding the performance of the DPD investigations units. The DPD overall has had a reduction in staffing and the investigations units have also been subject to reductions in recent years. A review of the literature on investigator staffing, caseloads, efficiency, and effectiveness in large part concludes that performance decreases as staffing does if there is no corresponding decrease in caseloads. A study conducted by the Police Executive Research Forum (PERF) reviewed individual detective caseload and clearance data, which found that there was some association between detectives’ caseloads and their personal clearance rates. In general, as caseloads increased, personal clearance rates decreased.³³

Consistent with the purpose of the project to determine DPD staffing levels, the engagement team developed a framework to investigate the DPD’s historical staffing and caseloads. The team also sought to review the performance of investigators by reviewing clearance rates, case closure efficiency (time from case initiation to closure), and crime reduction. It was also critical to gather a qualitative assessment from investigators, supervisors, and DPD leadership to understand the impacts staffing may have had on the DPD and its stated objectives.

To ensure the team could deliver a comprehensive picture to the DPD, KPMG also conducted a benchmarking exercise to review budgets, staffing, clearance rates, and other factors at similar police departments in representative cities and localities. The insights developed were then cross-checked against a broad academic and industry literature review to help ensure the conclusions presented here are in line with the best-known information on staffing for investigations units. The KPMG team reviewed this methodology as it evolved with the DPD leadership throughout the course of the engagement.

The phased approach to accomplish this work was as follows:



The most relevant component of this study related to staffing levels across the investigations units. The engagement team attempted to collect the relevant data points needed to make staffing determinations.

³³ Promising Strategies for Strengthening Homicide Investigations: Findings and Recommendations from the Bureau of Justice Assistance’s Homicide Investigations Enhancement Training and Technical Assistance Project, October 2018.

The below data points were requested of the DPD to understand the deficiencies in staffing:

Staffing

- Historical payroll data for the last three years that breaks down each employee's allocation of hours by assignment including sickness, holiday, vacation, FMLA, unpaid leave, training, restored leave, regular hours worked, etc.
- Employee leave entitlement by years of service
- Policies for leave accrual by years of service
- Hiring and attrition statistics for the last year – number of new joiners and leavers by month, quarter, and year
- Detailed organizational chart for Investigations at station/unit level
- CBA and other union contracts
- Staffing allocation by function at station/unit level
- Staffing classification breakdown at station/unit level (sworn/non-sworn/civilian)
- Previously developed strategy documents, i.e., strategic plan
- Scope and span of authority documents, i.e., supervision ratios
- Overtime usage and position by hours for the past three to five years
- Overtime rate charged
- Vacant positions for the past three to five years

Workload

- Case management system data
 - All relevant data including, but not limited to, case type, offense type, open and closure dates, closure disposition, and investigating officer for the past three to five years

Interviews

The project team conducted extensive interviews and workshops with leadership and staff from several Investigator units. The insights gained from those interviewed provided the necessary qualitative context to the overall operating environment. The units reviewed were:

- Family Violence
- Auto Theft
- Robbery
- Narcotics
- Homicide

Operational and process improvements

Operational and process improvements

During the assessment of investigations units and as outlined in the data analysis within the coming chapters, KPMG identified a number of areas of opportunity to improve data recording practices and enhance the efficiency, effectiveness, and utilization of resources across the investigations units.

Process

User interaction with Records Management System (RMS) and Case Management module: DPD invested in a Records Management System in 2011, which is used within the investigations units for the storage, retrieval, retention, manipulation, archiving, and viewing of information, records, documents, and files. Within RMS, the case management module is used within the investigations units to record, manage, and track information relating to cases under investigation. During interviews and work shadowing conducted by the team, it was evident that the RMS system and case management module are utilized inconsistently across the investigations units. These inconsistencies stem from a variety of sources:

- **Lack of standardized process for system use:** Investigations units are provided with different direction on how to use the system, what fields to complete, how to record case status, and how to track activity based on the individual discretion of unit leadership. The lack of standardized processes for system usage means that it is difficult to track information across different units or measure like-to-like performance between units or over time.
- **User adoption of RMS and case management module:** Based on interviews and focus groups held with staff within the investigations units, there appears to be a lack of willingness to use the system during the investigations process. The system is only used out of necessity, and each unit appears to have established its own manual workarounds, which increases the amount of time, effort, and duplication during the investigations process. Examples of this include the printing of reports from the system to manually record information before retyping the same information into the system, establishment of Excel workbooks to track ongoing cases and record case information, printing of reports for supervisor approval, and rescanning into the system. In many instances, the system and/or department has the technical functionality that negates the manual workarounds, e.g., the installation of a PDF editor to allow for supervisor approval within the system; however, this has either not been communicated to units or a user decision is being made to not adopt the technology.
- **Lack of formalized training process:** When the RMS system was first adopted, user training was provided to all staff within the investigations units; however, when new staff members join the units and require training, it is the responsibility of the unit to schedule RMS training with the RMS team. This does not appear to happen consistently, and staff may receive training from a colleague or try to navigate the system on their own. Without the establishment of a formal process to schedule and provide training to all new staff, or provision of a standardized user guide or refresher training schedule, the system is not and will continue to not be used in an efficient manner. There is functionality within the system that is not being used optimally, which could streamline the

investigations process and prevent the “bad habits” that are being perpetuated, serving to increase the level of user frustration with the system.

General orders regarding unit case assignment: There are general orders established by the department that provide direction regarding which investigations unit a case should be assigned to according to the case type or nature of the offense. However, during interviews it became evident that the general orders are not always enforced or implemented, which causes confusion and frustration between the units. The lack of oversight or system workflow to the correct unit can cause delays in initiating contact with the member of the public and impact the level of service provided by DPD.

- **Cases assigned to the incorrect unit:** There are instances when cases are assigned to the wrong unit from staff review, which can cause a delay in the investigations process. The incorrect assignment is identified by the staff member who reviews the unit case queue and then reassigns the case to the correct unit.
- **Cases passed between units:** While the general orders outline where cases should be assigned, there are incidents where cases are “bounced” between units and cases are assigned and investigated by units to which they are not directly aligned. This may be due to the dissolution of the general assignments investigations unit that investigated those cases that did not fall neatly into a specialized category. However, when cases are passed between units, this not only delays the investigations process but also may impact the quality of the investigation if it is not being conducted by those with the correct skill sets.
- **Cases investigated by multiple units:** When an incident contains multiple offenses, then the incident is divided into multiple cases and the cases are distributed to the relevant investigations units. While this allows for the case to be investigated by an investigator with the relevant knowledge and skill set, it can also lead to a member of the public being contacted by multiple officers, repetition of the same information, and misunderstanding regarding who to contact regarding their case. From an internal process perspective, this can lead to duplication of effort regarding the number of contacts and interviews, collection and review of evidence, and additional paperwork as there appears to be limited communication between investigators across units when working on cases resulting from the same incident.

Internal case assignment and prioritization: Once a case is assigned to an investigations unit, it is reviewed and then assigned to an investigator. Each unit conducts its case assignment and prioritization differently, either by case volume, case type, geography, and/or specialization. The most common case assignment method appears to be case volume, when investigators within a unit are all assigned a similar caseload for fairness. Once cases have been assigned to an investigator, they are then assessed and the investigator reviews the cases and prioritizes the order in which contact will be made.

- **Case assignment tracked manually:** Case assignment was previously conducted by a “desk detective”; however, over recent years this role has been conducted by either a civilian assigned to the unit, an officer on modified duty, or the unit sergeant. The case assignment process involves a review of the unit workflow queue within RMS and then assignment within RMS to an investigator. Through interviews and work shadowing it appears that most units track case assignments and investigator caseloads either through an Excel workbook, or alternatively, on a paper-based system that is updated after every case is assigned. The manual tracking of case assignments adds significant administrative effort to the process and is subject to human error.
- **Lack of guidance provided for case prioritization:** Each investigator reviews their case assignments and uses their own discretion as to which cases should be prioritized. Individual units may have their own prioritization structure; however, this is not consistent across units or the bureau as a whole. There is also no system functionality to notify investigators that a new case has been assigned to their queue, which can lead to delays in the process if an investigator is not constantly checking their individual workflow. Similarly, when discussing the contact requirements for “no leads” cases during focus groups across five investigations units, the team was provided

with five different accounts of the level of contact required for “no leads” cases. This varied from solely the provision of a contact card to three phone attempts and the provision of a contact card, suggesting confusion regarding the appropriate level of service expected for these cases. A lack of standardization or direction regarding case prioritization and case management can result in varying levels of service provided to the public or prioritization that does not align to the department’s goals.

- **Lack of coordination to track crime trends, suspects, and geography:** There is currently no structure in place that assesses cases for case type trends, possible similar suspects, repeat victims, or geographical trends either at the case screening and assignment stage or during the case investigation and management process. The current system does not appear to offer this functionality, and even if a unit has access to a crime analyst, they are utilized primarily to provide assistance to unit leadership for reporting support and not to provide operational assistance. Therefore, the identification of trends within units is reliant on investigators verbally sharing information or recognizing case similarities. The lack of coordination to review cases for trends may reduce the opportunity for trend identification, suspect identification, and problem solving. Eck’s work on the topic of detective productivity and clearance rates (1984, 1999) offers suggestions as to what detectives ought to be doing to increase productivity, citing problem solving, crime analysis, and targeted investigations of repeat offenders.³⁴

Studies have found that criminal investigators are not being fully utilized by most police departments in their management of recurring crime problems. In essence, the “crime control loop” is not complete without the participation of criminal investigators in the problem-solving process (Sparrow, 2008).³⁵

Further research suggests that case management practices should position investigators to manage their caseloads and work on crime-control strategies. If appropriate control strategies are implemented, there should be a net reduction in investigator caseloads through the effective management of recurring crime problems. Research suggests that crime tends to cluster among a few problem places, offenders, and victims (Braga, 2008).³⁶

Data management

Case management tracking: Through the data exploration and mining process, the team experienced significant issues with the quality of the data extracted from RMS and the case management module. The quality issues appear to stem from the differing processes of inputting the data into the system between units and the lack of a standardized guideline for data requirements. The poor data quality, which included missing or incomplete fields, and incorrect and erroneous data, alongside the inconsistencies in how information is recorded within the system creates difficulties in conducting analysis to assess workload, caseload, performance, and resource requirements for the investigations units. The poor data quality also suggests that the information contained within the system is not reviewed regularly or used for operational decision-making. The key issues identified are outlined below.

- **Case screening:** When a case is assigned to a unit, it is reviewed for solvability by the desk detective or the resource assigned to that role, which is typically either a civilian or an employee on modified duty. This assessment results in cases being divided into two categories—leads or no leads—which determines their case assignment. “No leads” cases are either assigned to a specific investigator or modified duty resource, if available, or allocated among investigators as part of their caseload. However, there is no tracking of this information within the system, and therefore no

³⁴ “Detective workload and opportunities for increased productivity in criminal investigations,” John Liederbach, Eric J. Fritsch, and Charissa L. Womack, *Police Practice and Research*, September 8, 2010.

³⁵ Moving the Work of Criminal Investigators towards Crime Control, Anthony A. Braga, Edward A. Flynn, George L. Killing, and Christine M. Cole, March 2011.

³⁶ Ibid.

ability to identify the volume of cases that have leads or no leads, and therefore the associated level of effort. Eck argued that the investigations process works to divide cases into three groups:³⁷

1. Cases that cannot be solved with a reasonable amount of investigations effort
2. Cases solved by circumstances, which only requires that the suspects be arrested, booked, and interrogated, and a prosecutable case prepared
3. Cases that may be solved if a reasonable level of investigations effort is applied to them, but will not be solved otherwise.

These findings suggest that robust case-screening procedures and effective management interventions could improve the functioning of investigations units.³⁸ There is currently no ability to assess how DPD's cases are divided among these three groups, which makes an assessment of workload and investigator effort required difficult. The establishment of a method to record this information within the case management system would improve the ability to assess caseload, workload, and staffing requirements, and provide opportunity to improve the case screening process.

- **Activity tracking:** Case investigation activities are recorded as a “supplement” within the case management system, which is a qualitative record of what activity was conducted and/or details regarding the case. Each supplement is sent to the supervisor for review and to monitor case management activities. This information cannot be easily extracted from the system or quantified to be able to monitor investigator workload or level of activity conducted on a case.
- **Case status guidelines:** Based on information gathered within focus groups and validated through data exploration, it was evident that there are varying rules or processes for recording a case status among units and limited guidelines or checks for data quality when entering information into the system. Within the case management module data, there are two disposition statuses—Active or Closed; however, within this data set, 7 percent of all cases do not contain a case status. Within the offense data received from DPD, i.e., the data that records all incidents and associated cases, there are eight disposition codes; however, 4 percent of the cases do not contain a case status. For those that do have a case status recorded, the corresponding time and date stamp lack integrity; cases contain incorrect dates when compared to case submission dates, and many cases appear to have been closed within a short timeframe corresponding to anecdotal information received during focus groups that a department directive was received to close cases to reduce the number of open or suspended cases within the system. The meaning of each case status and when case statuses should be used appears to differ across units and, therefore, creates difficulty when making comparisons or consolidating data across units. The information recorded within the case status field is used to calculate clearance rates for units and the department and, therefore, if not completed correctly, could have an impact on department reporting and performance metrics. The inconsistency and lack of quality in case status recording does not allow for real-time or historical insight into investigator workloads, i.e., the level of effort expended on a particular case or overall investigator caseload. This can impact the department's ability to monitor investigator workload and, therefore, staffing requirements.
- **Caseload tracking:** An investigator's caseload is one method that can be used to assess the productivity and utilization of an investigator. When attempting to conduct this analysis, the team faced obstacles due to the data recording practices and the quality of the data within the system.

³⁷ “Criminal Investigation.” In *What Works in Policing? Operations and Administration Examined*, John E. Eck, Anderson Publishing Co., 1992

³⁸ Moving the Work of Criminal Investigators Towards Crime Control, Anthony A. Braga, Edward A. Flynn, George L. Kelling, and Christine M. Cole, March 2011.

The badge numbers recorded against cases appear across multiple units within the same year; however, an investigator is typically assigned to only one investigations unit. The caseload analysis was then conducted by assigning an investigator a “primary” unit; however, this then caused caseloads to jump exponentially and did not increase the confidence in the data. The team could not determine the reason for this data anomaly. One reason could be that as an investigator leaves the unit or the department, their current and historical cases get assigned to another badge number within the system. This badge number is typically that of another active investigator within the unit. This practice of reassigning cases impacts the perceived caseload of investigators within the department and may be one reason for the erroneous caseload data.

Overtime management: The current process for recording and tracking overtime involves significant manual effort and does not capture sufficient detail to be able to identify trends in overtime usage or assess if overtime is being used effectively. Overtime hours worked are manually recorded by an investigator on a “pink slip.” The pink slip is given to the sergeant to approve, and once approved is provided to the lieutenant for further approval. The sergeant then records the details of the pink slip into the Lawson system; however, only the investigator, unit, and volume of hours worked and generic reason code are recorded. The time of day, associated case number, or specific reason for the overtime is not documented within the system.

- **Manual tracking of overtime:** As briefly described above, the current process for recording and approving overtime requires the manual recording of overtime hours on a “pink slip” followed by two manual approvals before it is entered into the system. The Lawson system has functionality for the investigator to enter their overtime hours directly into the system and for supervisor approvals to be conducted, which would streamline the process through a reduction in the time taken to record and process approvals for overtime.
- **Inability to track temporal trends:** The specific time period in which the overtime was worked is not recorded when the information is entered into the Lawson system, which prevents any temporal analysis of overtime trends being conducted and does not provide insight into whether overtime is being used effectively to meet peaks in demand. This analysis could be used to improve scheduling and identify opportunities for better alignment to peaks in demand to help with overtime budgeting. The associated case number or specific activity the overtime was used for is also not documented within the system providing the department with limited ability to monitor the effectiveness of overtime usage or the level of overtime and effort being utilized on any given case.
- **Need to refine overtime activity codes:** In addition, the current activity codes used to record overtime do not provide sufficient detail to assess specifically what the overtime is being used for and, therefore, if it is being used effectively. When conducting the overtime analysis, the team received 168 overtime activity codes that are available for use within the Lawson system. However, there was no guidance to accompany the codes to determine what the codes are used for and when they should be used. When validation was sought with the department, no one was able to provide an explanation of all codes and which codes should be utilized to conduct the relevant analysis.
- **Recording of overtime at the unit level within Lawson:** When overtime is recorded within Lawson, a number of investigations units are consolidated into offense groups, e.g., Violent Crimes contains six investigations units including Homicide, Assaults, Robbery, Youth Operations, Crimes against Children, and Family Violence. When units are consolidated into offense groups, this limits the ability to drill down to conduct overtime analysis at the investigations unit level. The only way to conduct unit analysis would be to analyze at the individual officer level and then aggregate back up to the unit level. However, trend analysis over time would be difficult to conduct based on movement of investigators between units or department functions.

Data for decision-making: While the department holds weekly Compstat meetings to review crime trends and develop action plans, the investigations data does not appear to be used for operational decision-making, i.e., resource assignments, resourcing levels, performance management, or quality management. When requesting data for the patrol assessment, the team was provided with a

significant volume of data from established reports that were provided to leadership weekly. However, when requesting data for the investigations assessment, the only data that was available were extracts directly from the RMS system. There were no established reports that existed for internal reporting or measurement aside from those included within the Compstat process. This suggests that oversight or decision-making within the investigations function is based on historical or current-state processes rather than based on evidence and data.

Historical staffing levels: Similar to the challenges faced when analyzing overtime historically, the DPD was not able to provide a structured view of historical staffing at the investigations unit level. When recorded internally, unit-level staffing is aggregated into offense groups in the same manner as overtime. Historic staffing levels were aggregated through a number of data sources; however, in many instances the multiple data sources provided conflicting accounts of staffing levels. Current staffing levels are tracked through the Intelligence Workforce Management (IWM) system; however, with the lack of a structured process for recording staffing at the unit level in a consistent manner across all systems and without maintaining accurate records for historic staffing, there is no way of assessing historical staffing trends, and there is difficulty when assessing future staffing requirements.

People management

Performance management: The formal performance management process within DPD measures individuals on “meets standards” or “does not meet standards.” Information gathered during interviews and focus groups suggests that the performance management process was not implemented rigorously and did not result in any outcomes or action taken.

- **Lack of performance metrics or key performance indicators (KPIs):** There did not appear to be any formal KPIs defined for investigators working within the investigations units. The primary measure of performance used is clearance rates; however, this metric is reported externally and not used as a performance measure internally. In some units, sergeants stated that they performed random dip sampling of cases to help ensure that quality standards for case management were being met. However, this happened sporadically and did not occur through a structured process. There is no structure in place to measure productivity, utilization, case quality, caseload, or workload across all units.
- **Lack of data to provide insight into performance:** As described under the “data management” section, the establishment of performance metrics would require quality data to provide valuable insights into performance. The current quality of the data within RMS and the case management module would not present an accurate representation to be able to measure performance.

Civilian support: The use of civilians within investigations functions has been a growing trend nationally, with civilian support being utilized increasingly for specialized tasks previously conducted by investigators and also to reduce the administrative burden of investigators. There appears to be limited investment in civilian support within the investigations units with only five crime analysts, two senior criminal intelligence analysts, and one investigations support specialist as of March 2019.

- **Investigations support:** Investigations technicians or civilian investigators are often utilized to support the investigations process, defined as such in terms of their (1) non-sworn status and (2) limited enforcement powers. Civilian investigators do not have the power to arrest but are generally given the power to issue citations. Civilian investigators commonly interview victims and witnesses in misdemeanor crimes, process reports and evidence, and prepare cases for prosecution. The goal of the movement is increased efficiency—to relieve sworn investigators of the low-priority or less complex cases so that they can devote more time to solving felony crimes. For example, the Corpus Christi police department relies on civilian criminal investigators to interview victims and

witnesses for misdemeanor cases such as public intoxication and simple assault.³⁹ Likewise, civilian investigators employed by the Arlington, TX police department have full caseloads and perform investigatory tasks such as record checks and victim and witness interviews.⁴⁰

Crime analysis: As mentioned previously, the use of crime analysis within the case management process to track crime trends across victims, suspects, and geography can help improve case outcomes and identify opportunities for problem solving to reduce criminal activity in the long term. There appears to be limited availability for investigations units to utilize the existing crime analysts for operational support and case management. Those crime analysts that are available are often not specialists with the required skill sets; however, officers or investigators are filling the position either temporarily due to attrition, vacancies, or modified duty. In addition, the information and intelligence sharing from the Patrol Bureau through the Crime Reduction Teams (CRTs) that would contribute to informal crime analysis may be reduced due to the redeployment of the day shift CRT to patrol. A CRT team remains on nights; however, this may reduce the volume of intelligence that can be passed to investigators and number of warrants served, which could impact the long-term crime reduction strategy.

System integration: There are several disparate systems that are used to support the investigations process within DPD. The majority of these systems are not integrated, which appears to have led in part to the creation of manual processes to circumvent the disparate systems. For example, the Narcotics unit utilizes the CrimeNtel system to record the initial complaints, the RMS case management module to document the submission of cases for prosecution, and 44 separate Access databases to record and store information relating to investigations. While there is an internal process underway to disband the use of CrimeNtel and solely use RMS for Narcotics case management, this is not the only circumstance in which the lack of system integration increases the administrative burden during the case management process. There is no connection between the warrants tracking system and the RMS case management module; therefore, many investigators establish their own Excel workbook to log the warrant numbers and check weekly or biweekly if their warrants have been executed, as only at this point can they file their case. The manual process of tracking and checking could lead to delays in case filing and increase the chance that an arrestee may be released before the relevant case is filed. There are also separate systems to obtain crime scene evidence, body-worn camera footage, and vehicle dashcam footage. While some of this activity can be conducted online, in the case of vehicle dashcam footage, this requires an email to the corresponding patrol officer to request footage to be uploaded and escalation to a sergeant to expedite the process. The lack of system integration increases the administrative burden on investigators and increases the case management effort. This is further exemplified by the lack of clear guidance on how to utilize the systems and the correct procedures to follow.

System processes: As mentioned above, there is a lack of clear guidance or procedures on how to collect and coordinate information across multiple systems during the case management process. Due to the increased utilization of technology through CCTV, body-worn cameras, vehicle dashcams, cell phone footage, etc., there is a higher volume of evidence to collect, which increases the workload of investigators. During interviews and focus groups, each unit appeared to have established its own processes for coordinating information from the various systems. For example, the collection of 911 audio (which is now a district attorney requirement for all cases) from Communications can be processed through the completion of a form that is emailed to Communications and collected on disk from the Communications center; an email to the Fusion center, personnel of which may email the audio recording back if they have capacity; some units have access to the NICE system from which

³⁹ "Detective workload and opportunities for increased productivity in criminal investigations," John Liederbach, Eric J. Fritsch, and Charissa L. Womack, *Police Practice and Research*, September 8, 2010.

⁴⁰ "Detective workload and opportunities for increased productivity in criminal investigations," John Liederbach, Eric J. Fritsch, and Charissa L. Womack, *Police Practice and Research*, September 8, 2010.

911 audio can be pulled; one unit utilizes a civilian staff member to coordinate all audio requests; or, alternatively, relationships are used and a phone call is made to a colleague within Communications who can access the relevant recording. The presence of five alternative methods for the collection of 911 audio demonstrates the lack of a structured process, which could increase the confusion, level of effort, and time expended within the case management process.

- **Use of Fusion:** During the interview process, the use of the Fusion center was raised as a shortcut method for accessing or extracting information from the various systems. There are approximately ten resources assigned to the Fusion center, the purpose of which is defined as, “[the Fusion center] exchanges and disseminates information and intelligence data related to criminal activity, criminal enterprises and suspected terrorist activity within the Dallas Police Department’s area of operations.” Despite the limited capacity of ten resources, there appears to be significant effort expended in supplementing the case management process through the provision of information, e.g., 911 audio, uploading information to the LEA portal, extraction of cell phone footage, etc., which is not aligned to the center’s mission.

System bandwidth: It was noted during interviews that issues with system and internet bandwidth within DPD are a source of frustration when trying to download or upload evidence or case information. Interviewees noted that it could take between 1 hour and 8 hours to upload a case to the LEA portal depending on the volume of evidence and the number of people accessing the system at the same time. In another instance, it was stated that it took over four days to upload one year of evidence data to the cloud. Given the increased volume of data to be extracted or uploaded, insufficient system bandwidth to cope with the volume can impact the productivity of investigators during the case management process.

Investigations Bureau organizational analysis

Investigations Bureau organizational analysis

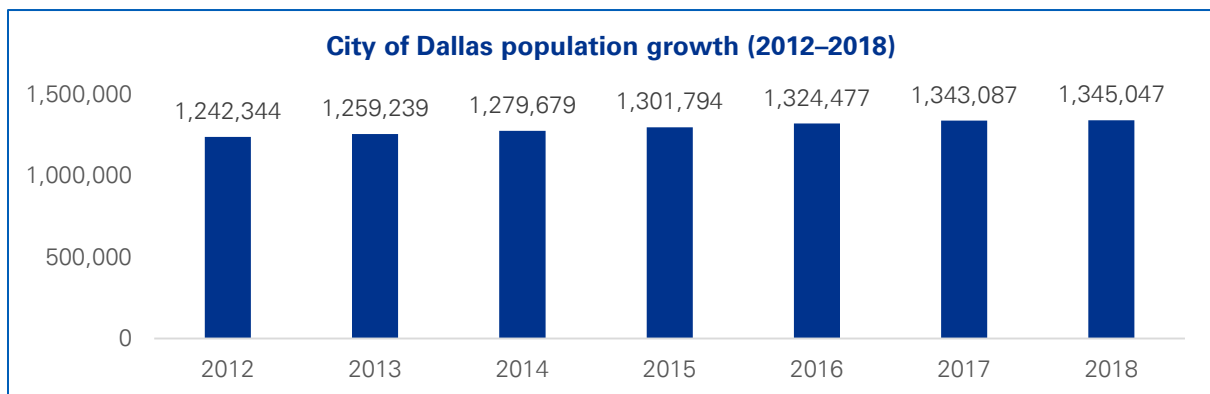
Context

Population and crime trends

The City of Dallas is the ninth largest city in the United States. From 2015 to 2017, the city's population grew by 3 percent. During this period, property crime declined by 5 percent, from approximately 44,800 offenses per year to 42,600 offenses per year. Violent crime increased by 15 percent from 2015 to 2017, growing from approximately 9,000 offenses to 10,300 offenses. The city's population continues to grow at a rate of approximately 1.4 percent per year.



Source: FBI UCR data, 2017

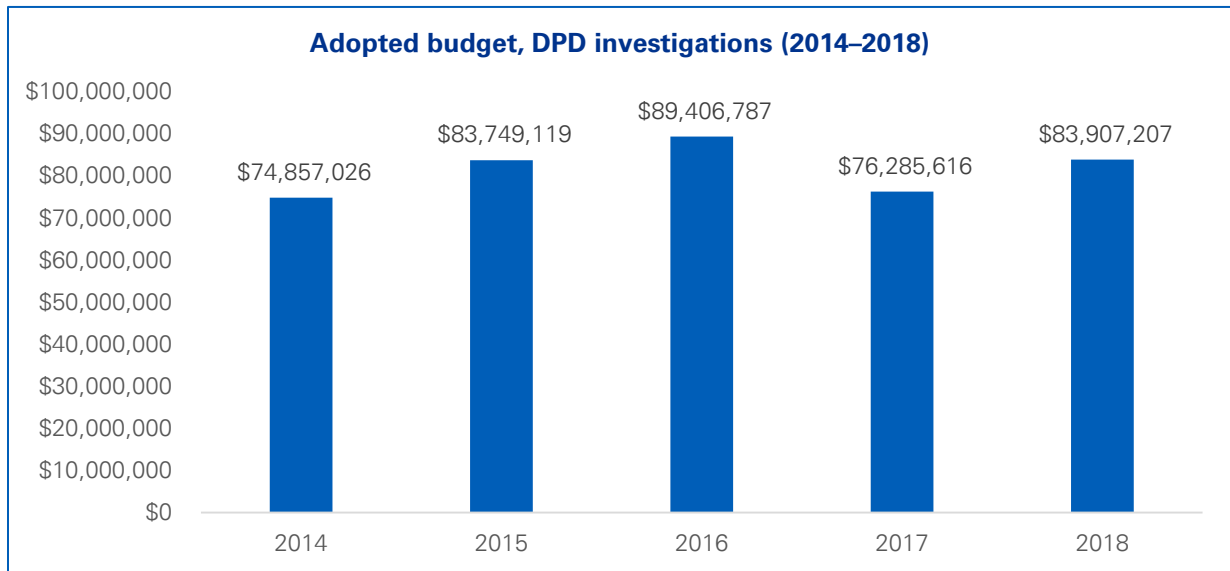


Source: U.S. Census Bureau, City and Town Population Totals: 2010–2018

Budget trends

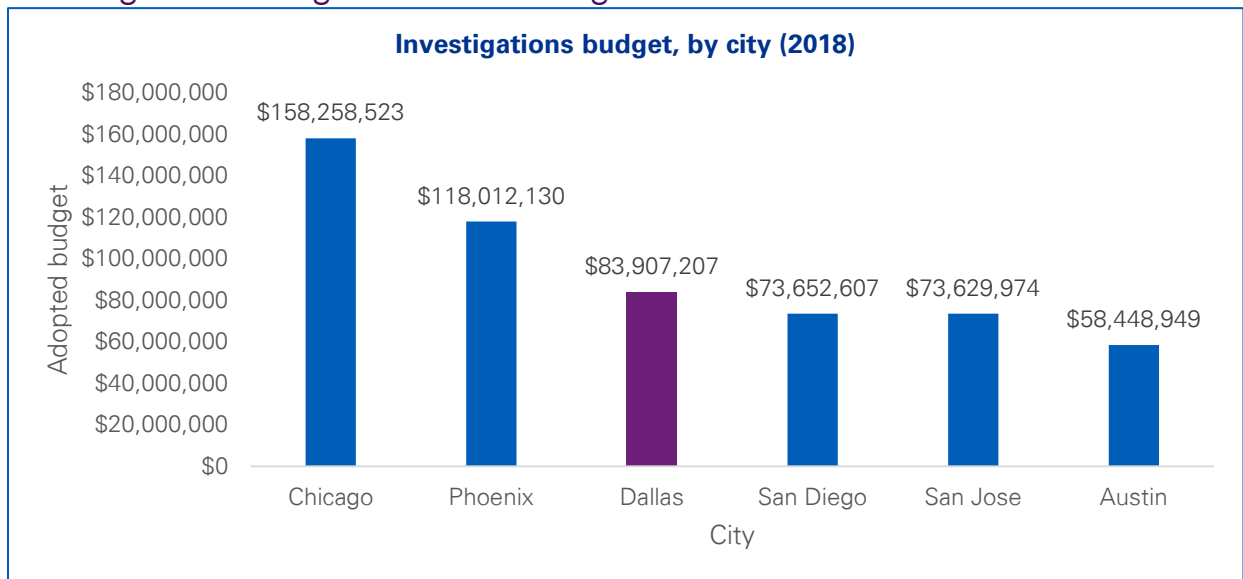
Investigations budget by year

DPD’s investigations budget, shown in the graph below, shows the cumulative budget for police criminal investigations, investigation of narcotics-related crimes, and investigation of vice-related crimes. This budget peaked at approximately \$89 million in 2016. While the adopted budget has fallen by \$5.5 million since that peak, its 2018 adopted level of approximately \$84 million is a 12 percent increase above its 2014 level. This is generally in line with growth in the overall DPD budget, which grew by 11 percent from 2014 to 2018. It also represents real growth beyond inflation: DPD’s 2014 budget would equate to approximately \$80 million in 2019, if adjusted for inflation.



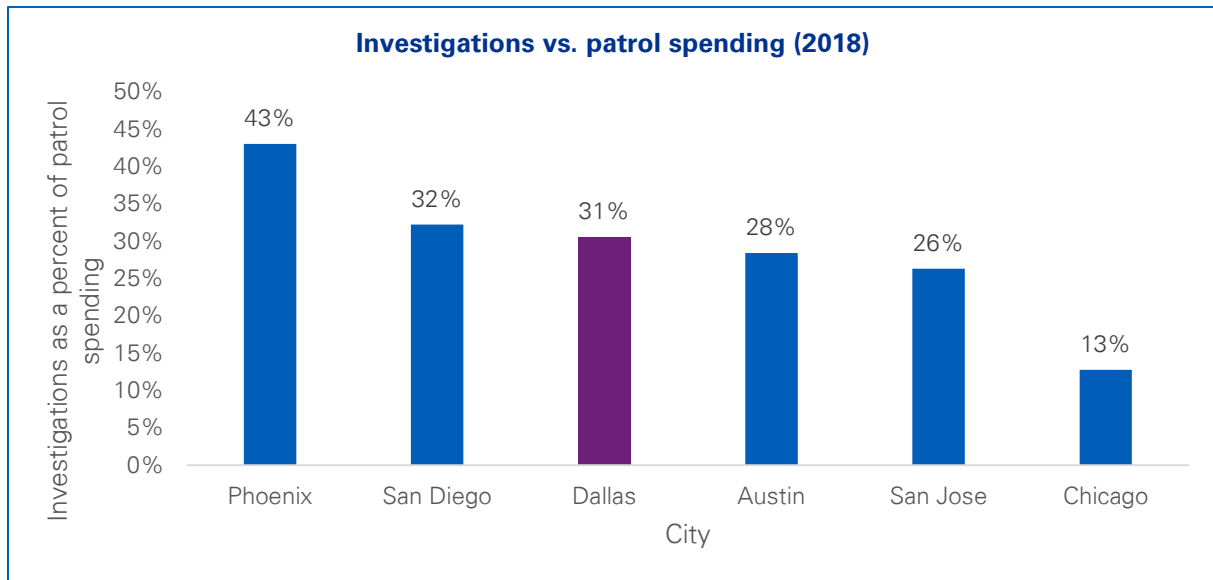
Source: City of Dallas Adopted Budget, 2014–2018

Investigations budget benchmarking



Source: Annual budget documents for the cities of Chicago, Phoenix, Dallas, San Diego, San Jose, and Austin

The project team compared DPD’s investigations budget to five comparison cities. The comparison cohort has an average investigations budget of approximately \$96 million, approximately 15 percent larger than DPD’s investigations budget of \$84 million. It is important to note that the spending differences between these cities may reflect differing populations, geographies, investigations practices, or internal goals and policies. However, the comparisons below provide insight into how Dallas spending compares to its peers.



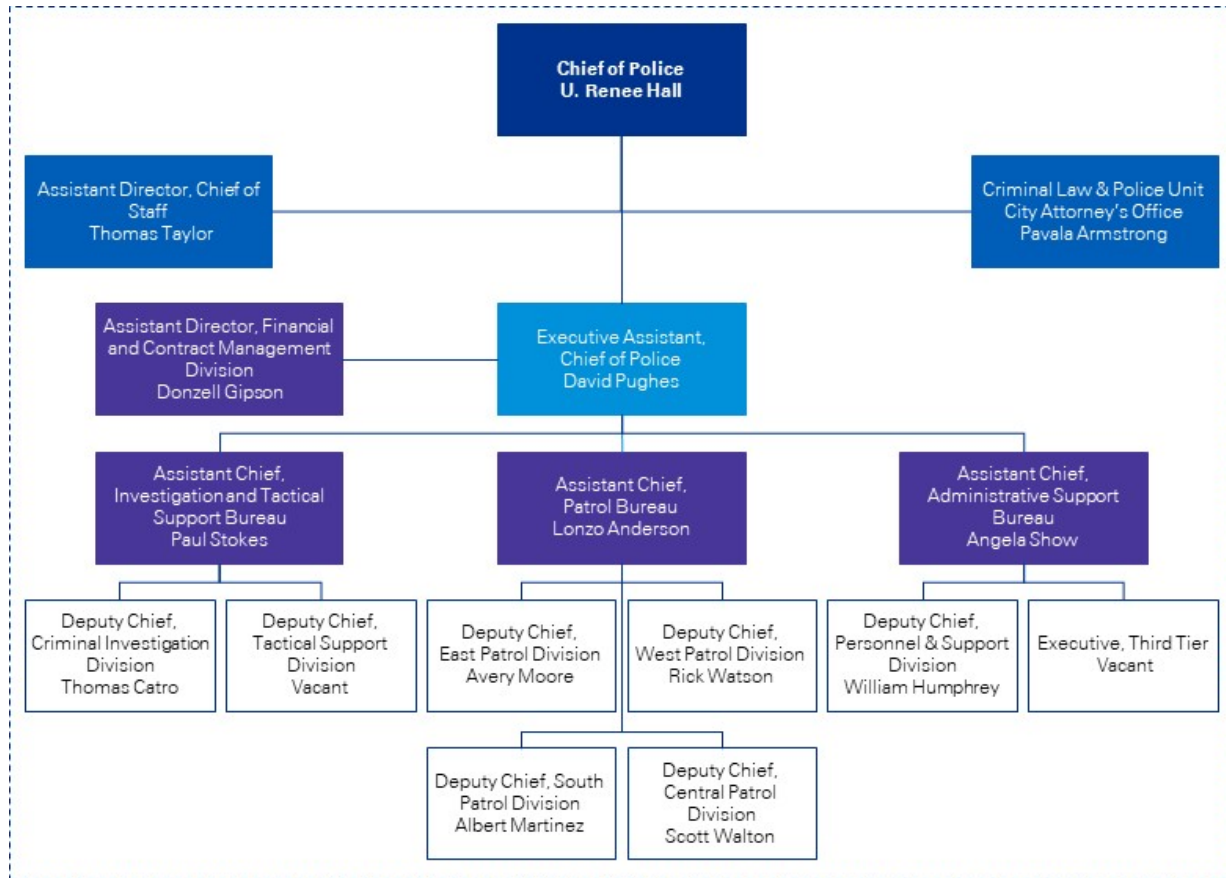
Across the comparison cities, the investigations budget was approximately one-third the size of patrol budget in 2019.

	Phoenix	San Diego	Dallas	Austin	San Jose	Chicago
Patrol budget	\$274,322,000	\$228,414,380	\$274,480,134	\$205,698,522	\$279,568,750	\$1,240,264,539
Investigations budget	\$118,012,130	\$73,652,607	\$83,907,207	\$58,448,949	\$73,629,974	\$158,258,523

Investigations Bureau staffing

Investigations within the DPD organizational structure

Headed by Chief Renee Hall, DPD is composed of three bureaus: the Administration Support Bureau, the Patrol Bureau, and the Investigations and Tactical Support Bureau. As shown in the organizational chart below, each bureau is headed by an assistant chief. This report constitutes one of three reports delivered to DPD by KPMG. This report provides an analysis of factors related to the staffing of DPD's Investigations Bureau, to include Property Crime Divisions.



The table below illustrates DPD's staffing as of March 2019, broken down by employee classification (i.e., civilian and sworn) and organizational bureau. The Investigations and Tactical Support Bureau is the smallest of DPD's three primary organizational units, employing just 20 percent of total DPD staff.

DPD staffing by bureau

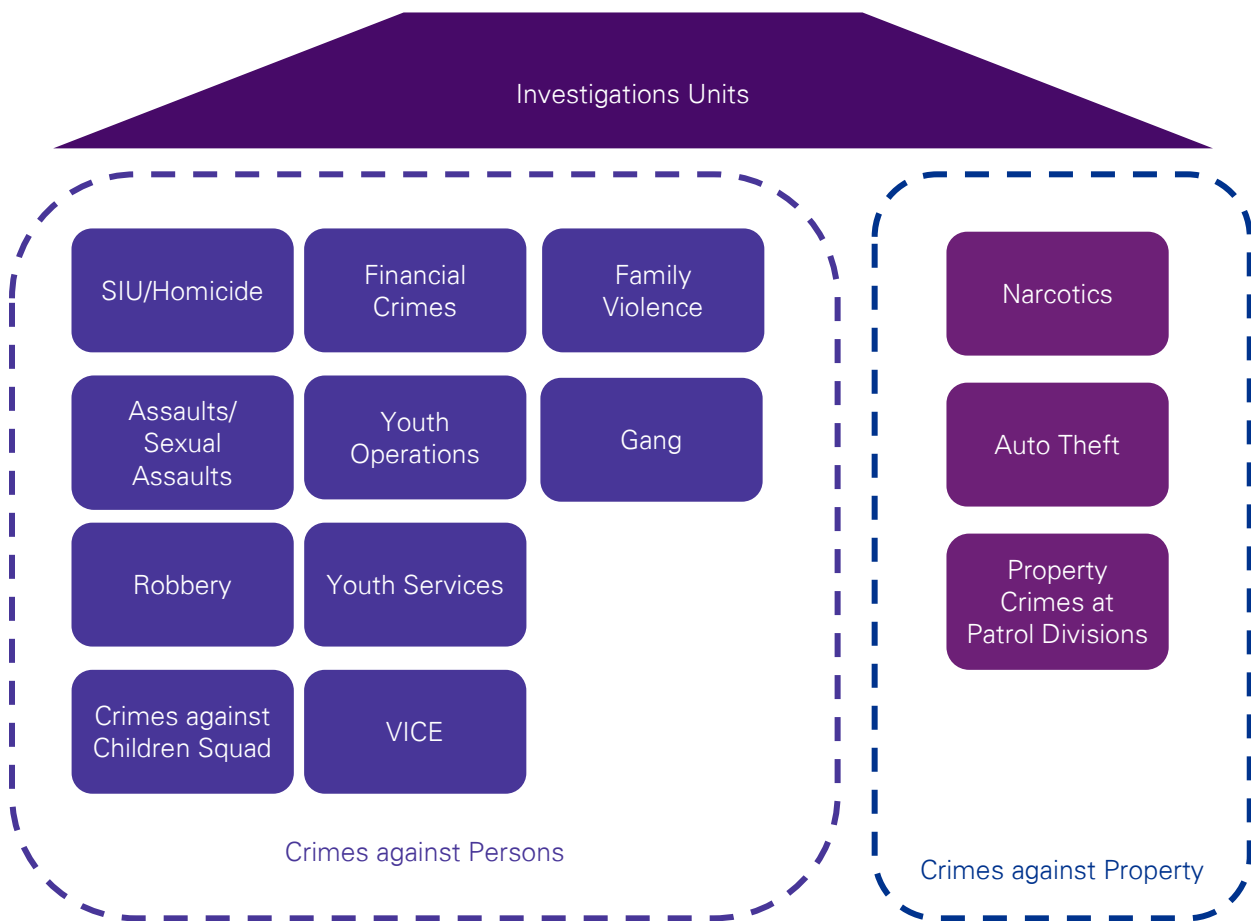
Group	Civilian	Sworn	Grand total	Distribution of staff by bureau
Administrative Support Bureau	382	357	739	21%
Investigations and Tactical Support Bureau	89	615	704	20%

Group	Civilian	Sworn	Grand total	Distribution of staff by bureau
Office of the Chief of Police	47	86	133	4%
Patrol Bureau	42	1,946	1,988	56%
Total	560	3,004	3,564	

Source: IWM data, March 2019

DPD investigations units

As detailed in the graphic below, this report examines data from ten investigations units that focus on crimes against persons, as well as three types of units that investigate crimes against property. These units are detailed in the chart and list below.



- SIU/Homicide Unit: The Special Investigations Unit investigates officer-involved shootings, resident fatalities or serious injuries in police custody, and assaults on public servants or police officers. This unit's Homicide Squad investigates cases such as murder, manslaughter, criminally negligent homicide, and suicide. The unit is located within the Investigations and Tactical Support Bureau.
- Assaults/Sexual Assaults Unit: The Assaults/Sexual Assaults Unit investigates cases involving assault, sexual assault, terroristic threat, disorderly conduct, and resistant arrest. The unit is located within the Investigations and Tactical Support Bureau.

- Robbery Unit: The Robbery Unit investigates robbery, false imprisonment, and kidnapping. The unit is located within the Investigations and Tactical Support Bureau.
- Crimes against Children Squad: The Crimes against Children Squad investigates cases involving child abuse or child exploitation. The unit is located within the Investigations and Tactical Support Bureau.
- Financial Crimes Unit: The Financial Crimes Unit investigates offenses such as forgery, credit card abuse, and identity theft. The unit is located within the Investigations and Tactical Support Bureau.
- Youth Operations Unit: The Youth Operations Unit investigates crimes committed against persons where the complainants involved are 16 years or younger. The unit is located within the Investigations and Tactical Support Bureau.
- Youth Services Unit: The Youth Services Unit investigates specialized crimes against children, such as missing persons and amber alerts. The unit is located within the Investigations and Tactical Support Bureau.
- VICE Unit: The VICE Unit investigates crimes such as gambling, prostitution, and human trafficking. The unit is located within the Investigations and Tactical Support Bureau.
- Family Violence Unit: The Family Violence Unit investigates cases involving domestic violence and violent crimes involving a family member and is located within the Investigations and Tactical Support Bureau.
- Gang Unit: The Gang Unit investigates cases involving or related to gang activity. It is located within the Investigations and Tactical Support Bureau.
- Narcotics Unit: The Narcotics Unit investigates cases involving illegal drugs. The unit is located within the Investigations and Tactical Support Bureau.
- Auto Theft Unit: The Auto Theft Unit investigates cases involving the theft of automobiles. This unit is located within the Investigations and Tactical Support Bureau.
- Property Crimes Units at Patrol Divisions: Each of DPD's seven patrol divisions has an investigations unit dedicated to investigating property crimes that occur within the geographical boundaries of the division. These units are located within DPD's Patrol Bureau, rather than the Investigations and Tactical Support Bureau.

Data and unit mapping

As mentioned within the methodology chapter, DPD’s systems use varying categories to record staffing, offense and case management, and personnel data, including varying unit names. As a result, the project team developed a mapping system to correlate data across the varying systems. In addition to the different taxonomies used across systems, the systems often held a varying granularity of information, which added an additional layer of complexity when conducting the analysis. The table below identifies the unit mapping generated by the project team to help ensure consistency when conducting the data analysis.

Offense type	Division	Unit	Offense data units	Staffing data units	Staffing data division	Org code
Crimes against persons	Investigations	SIU/ Homicide	Capers/Homicide	Violent Crimes Section	Investigations and Tactical Support Bureau	2162
	Investigations	Assault/ Sexual Assaults	Capers/Sex Assaults Capers/Assaults	Violent Crimes Section	Investigations and Tactical Support Bureau	2162
	Investigations	Robbery	Capers/Robbery	Violent Crimes Section	Investigations and Tactical Support Bureau	2162
	Investigations	Financial Crimes	Special Investigations/ Financial Crimes	Financial Investigations Unit	Investigations and Tactical Support Bureau	2161
	Investigations		Capers/Special Investigations	Intellectual Property Crimes TF Grant 16–18	Investigations and Tactical Support Bureau	2098
	Investigations	Youth Operations	Capers/Missing Persons	Violent Crimes Section	Investigations and Tactical Support Bureau	2162
	Investigations	Youth Services	Capers/Youth Services	Youth Services Section	Investigations and Tactical Support Bureau	2163
	Investigations	Crimes against Children Squad	Capers/Child Exploitation	Violent Crimes Section	Investigations and Tactical Support Bureau	2162
			Capers/Child Abuse	State Internet Crimes Against Children	Investigations and Tactical Support Bureau	1799
			Special Investigations/Child Abuse	Federal ICAC Grant 2016–2017	Investigations and Tactical Support Bureau	2063
			Special Investigations/Child Abuse	State ICAC 17–18	Investigations and Tactical Support Bureau	3563
	Investigations	Family Violence	Capers/ Family Violence	Violent Crimes Section	Investigations and Tactical Support Bureau	2162
	Special Investigations	Gang	Capers/Gang	Gang Unit	Investigations and Tactical Support Bureau	2168
	Special Investigations	VICE	Narcotics/VICE	VICE Section	Investigations and Tactical Support Bureau	2136
	Crimes against property	Patrol	Northeast Investigations	Property Crime Division/NE Property Crimes	Property Crimes Division	Patrol Bureau

Offense type	Division	Unit	Offense data units	Staffing data units	Staffing data division	Org code
	Patrol	Southeast Investigations	Property Crime Division/SE Property Crimes	Property Crimes Division	Patrol Bureau	2191
	Patrol	South Central Investigations	Property Crime Division/SC Property Crimes	Property Crimes Division	Patrol Bureau	2191
	Patrol	Southwest Investigations	Property Crime Division/SW Property Crimes	Property Crimes Division	Patrol Bureau	2191
	Patrol	Northwest Investigations	Property Crime Division/NW Property Crimes	Property Crimes Division	Patrol Bureau	2191
	Patrol	North Central Investigations	Property Crime Division/NC Property Crimes	Property Crimes Division	Patrol Bureau	2191
	Patrol	Central Investigations	Property Crime Division/CE Property Crimes	Property Crimes Division	Patrol Bureau	2191
	Investigations	Auto Theft	Special Investigations/Auto Theft	Commercial Auto Theft Interdiction Squad/17	Inactive Bureau Units	1384
				Commercial Auto Theft/Interdiction Squad	Investigations and Tactical Support Bureau	1788
				Commercial Auto Theft/Interdiction Squad FY16-17	Investigations and Tactical Support Bureau	2039
	Investigations	Auto Theft	Special Investigations/Auto Theft	Commercial Auto Theft Interdiction Sqd/17-18	Investigations and Tactical Support Bureau	3294
Special Investigations	Narcotics	Narcotics/Narcotics	Narcotics Division	Investigations and Tactical Support Bureau	2134	

Staffing trends

Total staffing, investigations units

Between 2015 and 2018, total sworn staffing across the investigations units fell by 6 percent, or 31 investigators. Staffing reached its lowest level in 2017 at 453 investigators, a reduction of approximately 60 individuals from its 2015 level, before climbing to 484 sworn investigatory staff in 2018.

Due to inconsistencies in DPD’s data collection and data tracking procedures, the project team was provided with multiple data sets to develop historical staffing snapshots at the unit level. For investigations units focused on violent crimes—specifically the Family Violence, SIU/Homicide, Assaults/Sexual Assaults, Crimes against Children Squad, Robbery, Youth Services, and Youth Operations Units—KPMG utilized data extracted from the case management system, which recorded the volume of investigators assigned cases during the period of 2014 to 2018. For all other investigations units, KPMG relied on the Organization Strength Reports from AgencyWeb, which was available beginning in 2015 through September 2018.

For current staffing numbers, the project team utilized data extracted from the IWM system, which shows DPD staffing as of March 2019.

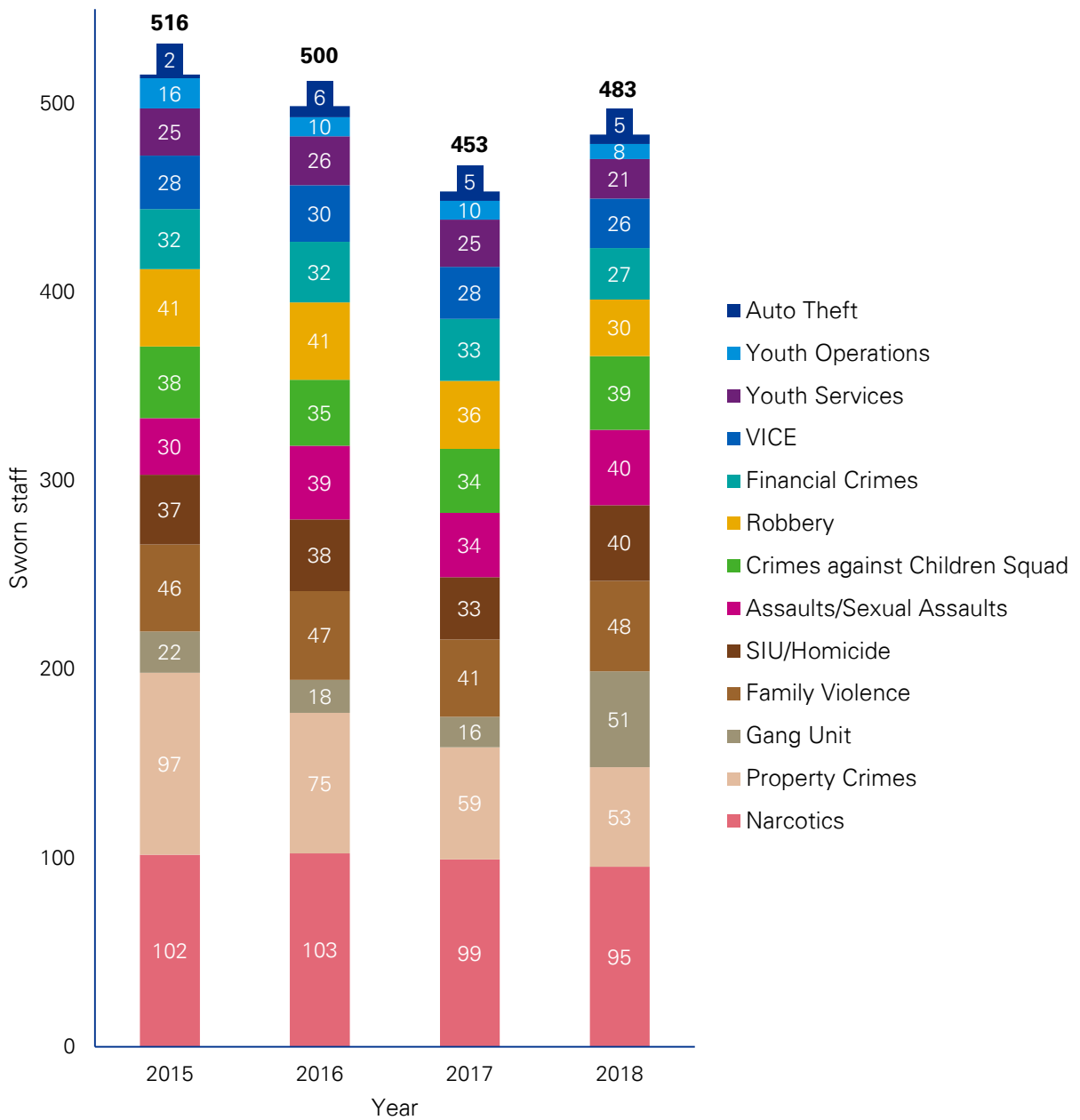
The following charts show historical staffing levels by investigations unit.

Staffing by investigations unit, 2014–2018

Unit	2014	2015	2016	2017	2018
Assaults/Sexual Assaults	28	30	39	34	40
Auto Theft	Not available	2	6	5	5
Crimes against Children Squad	38	38	35	34	39
Family Violence	38	46	47	41	48
Financial Crimes	Not available	32	32	33	27
Gang Unit	Not available	22	18	16	51
Narcotics	Not available	102	103	99	95
Property Crimes	Not available	97	75	59	53
Robbery	36	41	41	36	30
SIU/Homicide	30	37	38	33	40
VICE	Not available	28	30	28	26
Youth Operations	19	16	10	10	8
Youth Services	29	25	26	25	21
Total staffing, investigations units	Not available	516	500	453	483

Source: Violent Crimes unit data from the DPD CAPERS document (Family Violence, SIU/Homicide, Assaults/Sexual Assaults, Crimes against Children Squad, Robbery, Youth Services, and Youth Operations Units). All other staffing data is drawn from Organization Strength Reports from AgencyWeb.

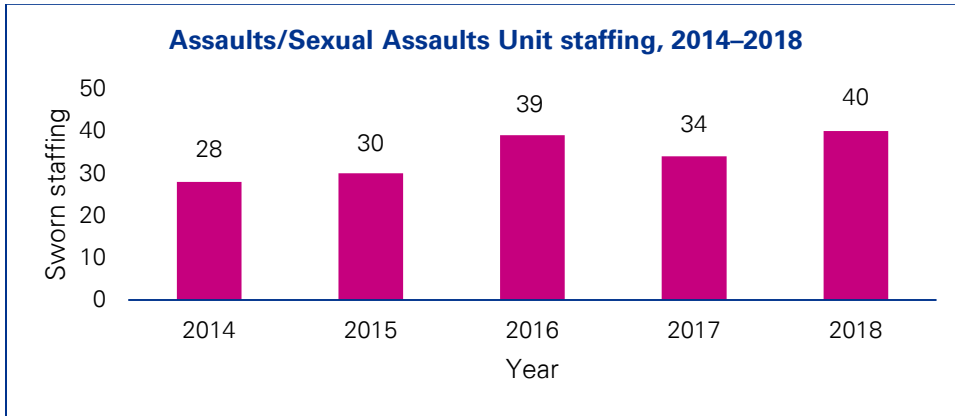
Investigations staffing, 2015–2018



Source: Violent Crimes unit data from the DPD CAPERS document (Family Violence, SIU/Homicide, Assaults/Sexual Assaults, Crimes against Children Squad, Robbery, Youth Services, and Youth Operations Units). All other staffing data is drawn from Organization Strength Reports from AgencyWeb.

Staffing by unit

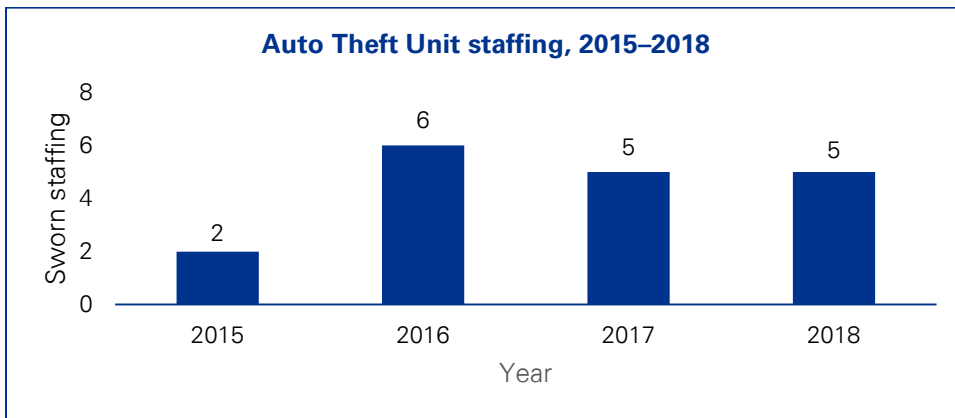
Assaults/Sexual Assaults Unit



Source: DPD case management data

From 2014 to 2018, the number of investigations staff assigned to the Assaults/Sexual Assaults Unit grew by 12 employees, or 43 percent. All of this growth stemmed from an increase in the number of investigations staff focused on assaults. The number of staff dedicated to assault investigations grew by 13 individuals during this time period, or 76 percent; meanwhile, the number of investigators focused on sexual assaults fell from 11 in 2014 to 10 in 2018.

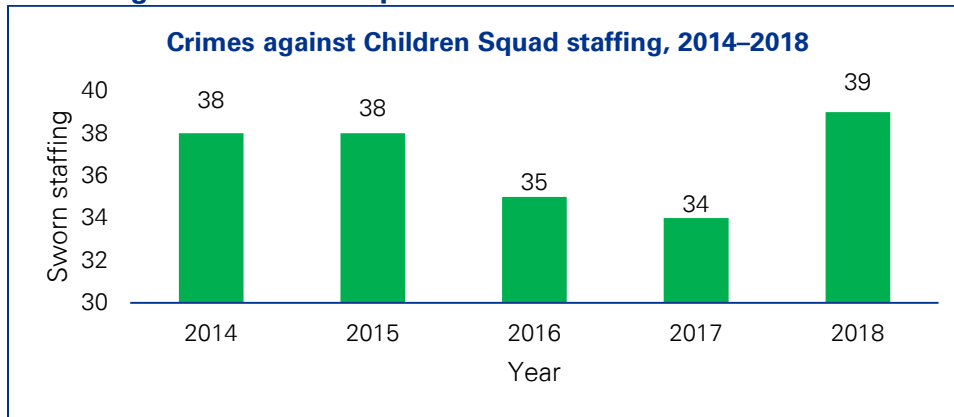
Auto Theft Unit



Source: DPD Organization Strength Report from AgencyWeb

Auto Theft Unit investigations staffing tripled from two investigators in 2015 to six in 2016. The unit's staffing has held constant with five staff in 2017 and 2018.

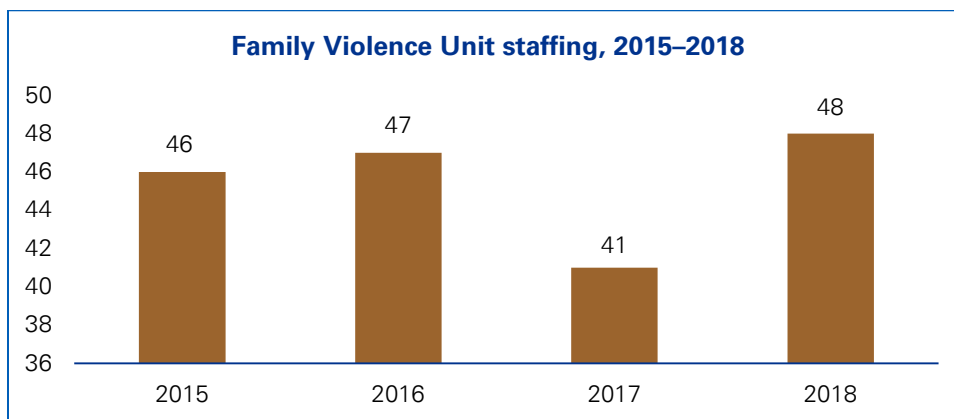
Crimes against Children Squad



Source: DPD case management data

Crimes against Children Squad investigations staffing fell by 4 investigators between 2015 and 2017; however, it has surpassed historical levels in 2018—the unit had 38 investigators in 2014 and 39 in 2018.

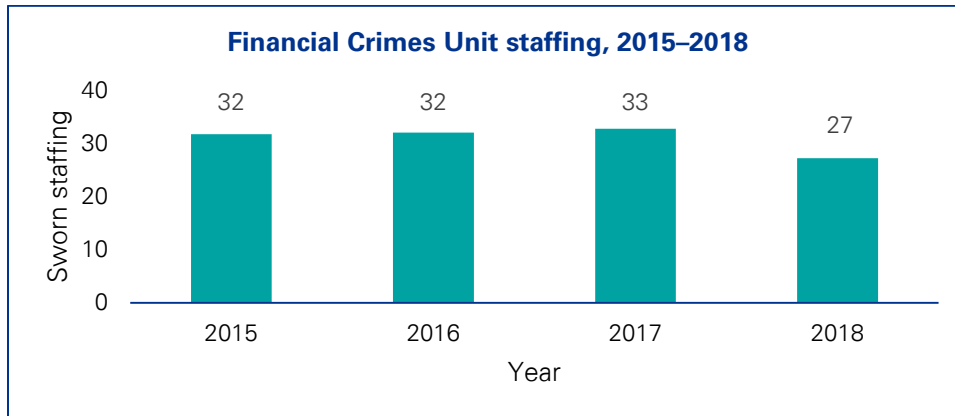
Family Violence Unit



Source: DPD case management data

Family Violence Unit investigations staffing has grown from 46 investigators in 2015 to 48 in 2018 despite a considerable reduction of 6 staff in 2017.

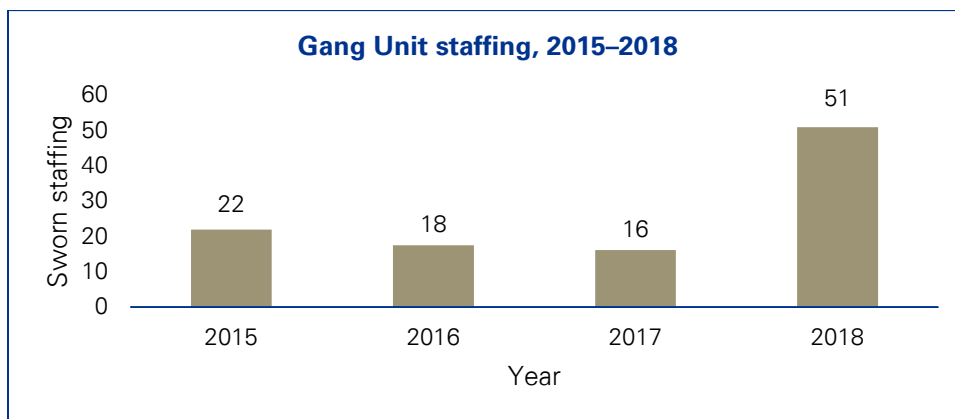
Financial Crimes Unit



Source: DPD Organization Strength Report from AgencyWeb

After holding relatively constant from 2015 to 2017, Financial Crimes Unit investigations staffing fell from 33 detectives in 2017 to 27 in 2018.

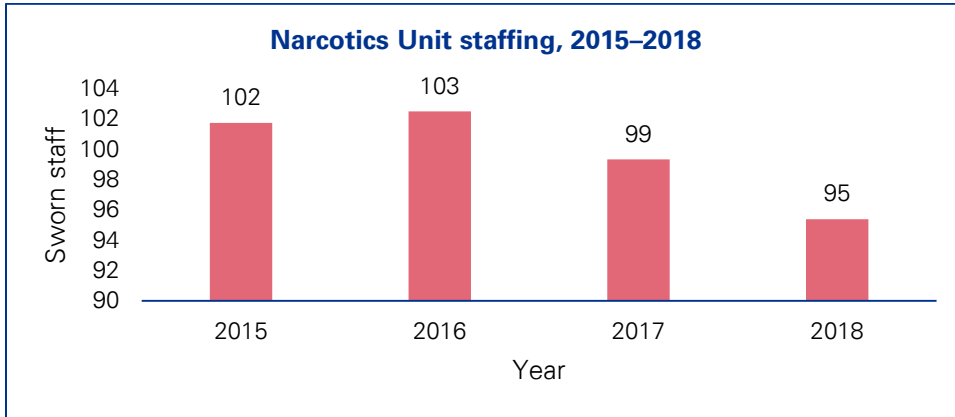
Gang Unit



Source: DPD Organization Strength Report from AgencyWeb

The number of investigators assigned to the Gang Unit more than doubled from 2015 to 2018, with 22 investigators in 2015 and 51 in 2018. All of this growth occurred in January of 2018, as the unit added 35 investigations staff.

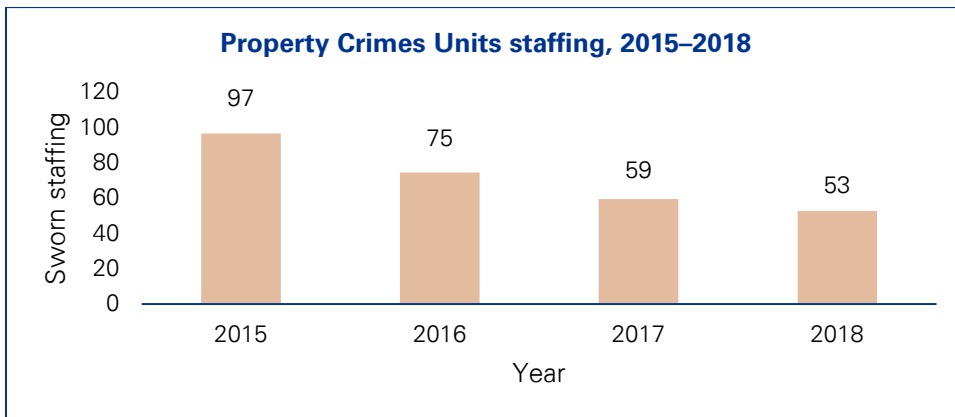
Narcotics Unit



Source: DPD Organization Strength Report from AgencyWeb

Narcotics Unit investigations staffing declined by 7 percent from 2015 to 2018, falling from 102 investigators to 95.

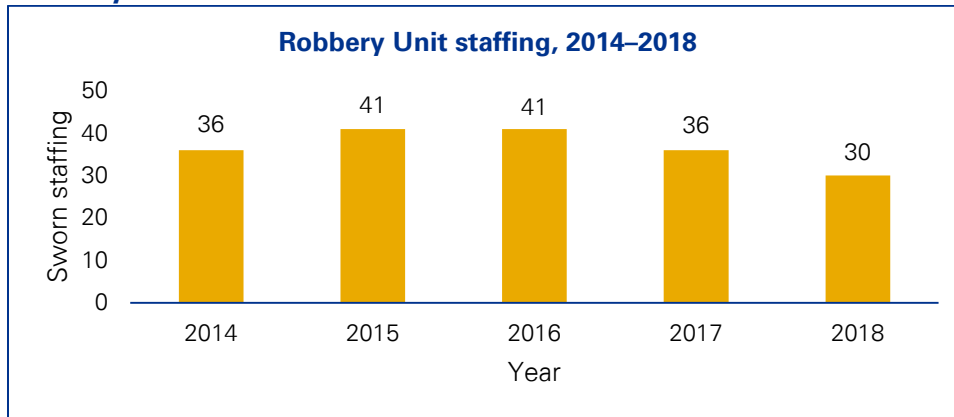
Property Crimes Investigations Units at patrol divisions



Source: DPD Organization Strength Report from AgencyWeb

Each of DPD's seven patrol divisions has investigations staff who focus on property crime investigations. This staffing level overall has declined by 45 percent from 2015 to 2018, falling from 97 to 53 investigators. DPD data recording practices do not facilitate the breakdown of historical staffing at the individual property crime unit level.

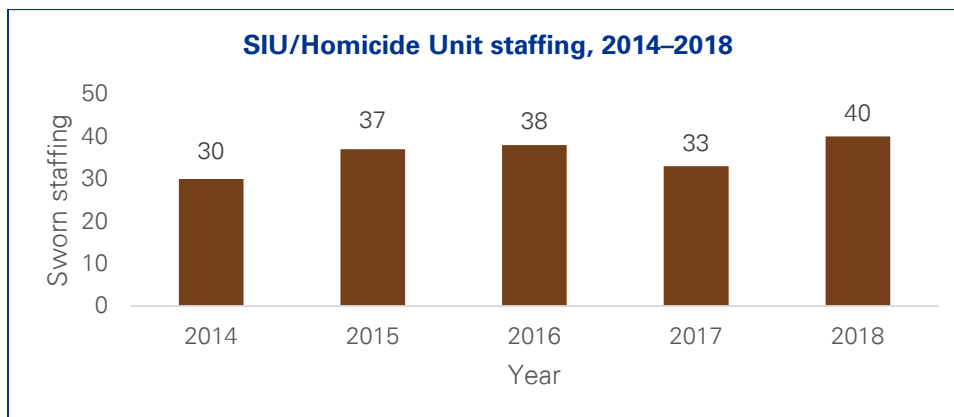
Robbery Unit



Source: DPD case management data

After growing from 36 investigators in 2014 to 41 in 2016, Robbery Unit investigations staffing has fallen to 30 investigators in 2018, a 27 percent decrease.

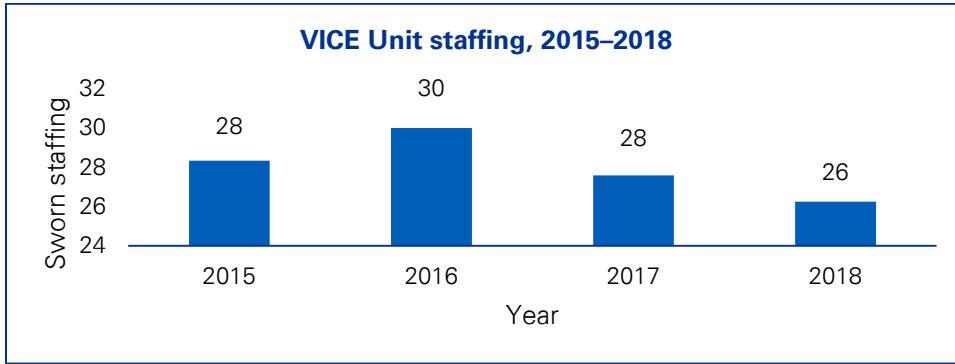
SIU/Homicide Unit



Source: DPD case management data

Investigations staffing for the SIU/Homicide Unit grew by 33 percent from 2014 to 2018, rising from 30 to 40 investigators. The majority of this growth occurred in investigators assigned to SIU investigations, which grew from 5 in 2014 to 13 in 2018. The number of homicide investigators experienced more moderate growth, rising from 25 in 2014 to 27 in 2018.

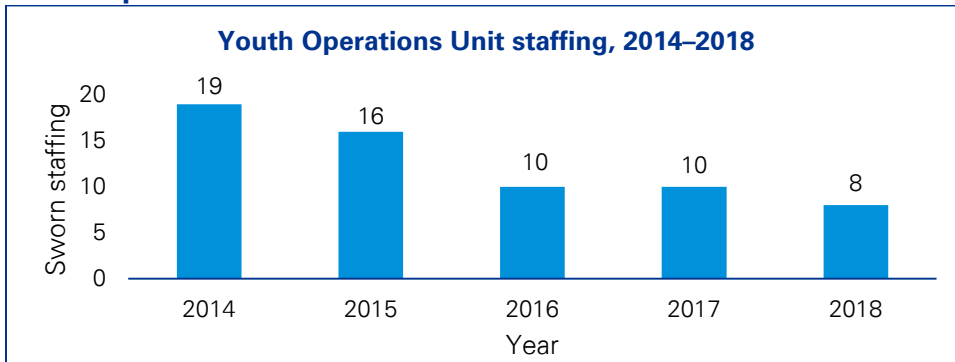
VICE Unit



Source: DPD case management data

After peaking at 30 investigators in 2016, the number of investigations staff assigned to the VICE Unit has fallen to 26 staff in 2018. It is important to note that the VICE unit was merged into the Narcotics unit in November 2017. Detectives were reassigned to VICE in July 2018 when the unit was reestablished.

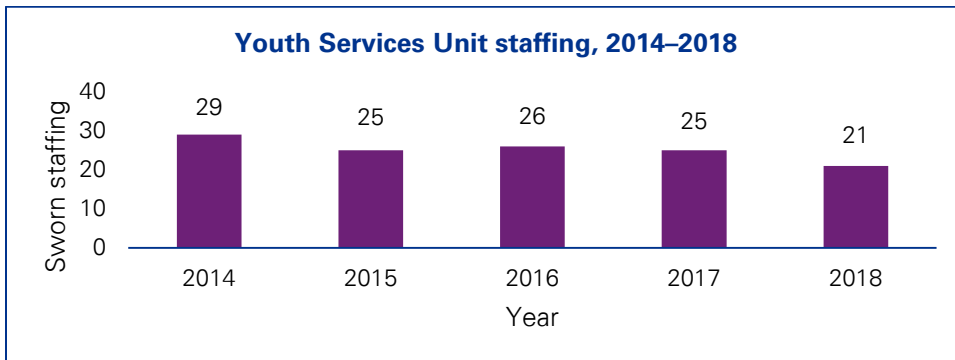
Youth Operations Unit



Source: DPD case management data

The number of investigations staff assigned to the Youth Operations Unit has declined by 58 percent since 2014, falling from 19 investigators in 2014 to 8 in 2018.

Youth Services Unit



Source: DPD case management data

Youth Services Unit investigations staffing declined by 8 investigators from 2014 to 2018, falling from 29 investigations staff to 21.

Staffing snapshot: 2019

To assess DPD's current investigations staffing, the project team relied on utilized data extracted from IWM, which shows DPD staffing as of March 2019.

Investigations assigned staffing

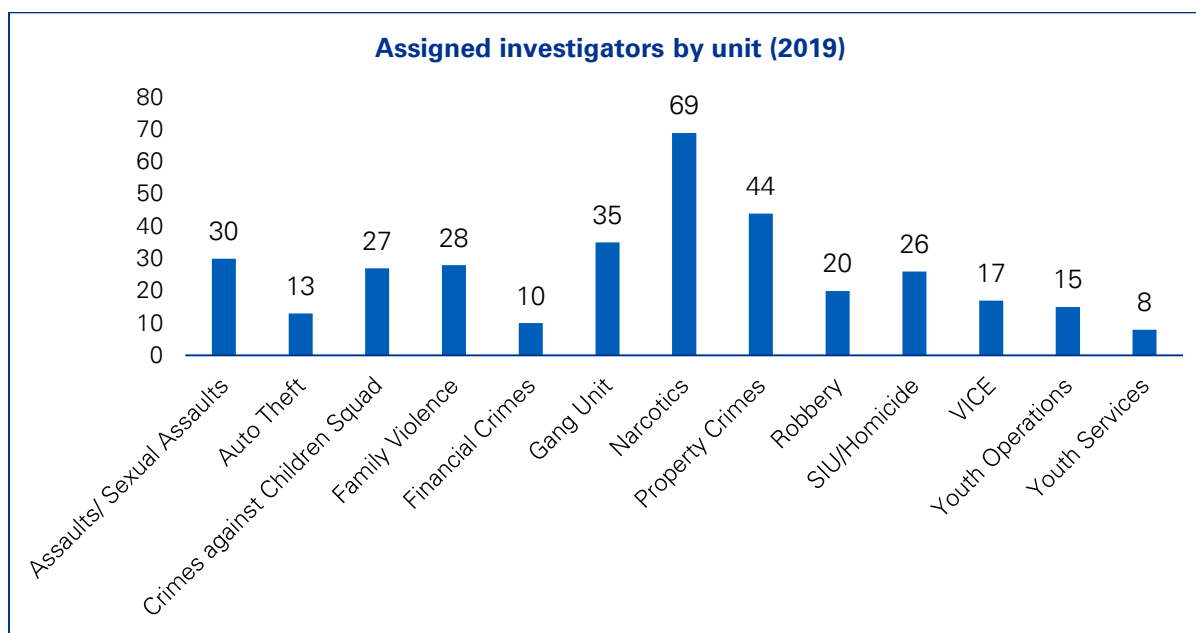
The chart below shows the number of staff assigned to each in-scope investigatory unit as of March 2019. Across all investigatory units, the analysis found a total of 444 assigned staff. This includes 342 investigators (police senior corporals), 12 police officers, and 16 civilian investigations staff (including crime technicians, investigations support analysts, police research specialists, and criminal intelligence analysts). DPD also staffs 4 caseworkers and 5 administrative staff to support its investigations units. These units are overseen by 57 sergeants and 8 senior leadership (including lieutenants and majors). Eight of the 13 in-scope units employ investigations civilian staff. The Crimes against Children Squad, Gang Unit, and Narcotics Unit employ a blend of police senior corporals and police officers. Three units (Auto Theft, Family Violence, and Narcotics) employ administrative specialists.

Narcotics is the largest investigatory unit with 90 staff, followed by the Gang Unit with 53 staff. There are 57 staff members assigned to the Property Crimes Units, split across the seven patrol divisions, as shown in the Property Crimes Staffing table below. The Auto Theft, Financial Crimes, and Youth Services Units are the smallest of DPD's investigatory units, with less than 20 staff each.

Assigned investigations staffing, Investigations Bureau

Unit	Investigator	Police officer	Civilian	Caseworker	Sergeants	Leadership	Admin.	Total
Assaults/Sexual Assaults	30	0	1	0	3	0	0	34
Auto Theft	13	0	1	0	1	0	2	17
Crimes against Children Squad	27	1	0	0	2	0	0	30
Family Violence	28	0	1	1	4	1	2	37
Financial Crimes	10	0	2	1	2	0	0	15
Gang Unit	35	7	1	0	9	1	0	53
Narcotics	69	4	1	0	14	1	1	90
Property Crimes	44	0	6	0	7	0	0	57
Robbery	20	0	0	0	2	0	0	22
SIU/Homicide	26	0	0	0	4	2	0	32
VICE	17	0	0	0	5	1	0	23
Youth Operations	15	0	3	0	2	1	0	21
Youth Services	8	0	0	2	2	1	0	13
Total	342	12	16	4	57	8	5	444

The graph below depicts the number of investigators (i.e., police senior corporals) across the in-scope investigatory units. Police officers, civilians, and sergeants are not included in this graph.



Source: IWM data

Assigned investigations staffing, Property Crimes Units

The table below shows the distribution of staffing across DPD's Property Crimes Units, which are located within each patrol division.

Division	Investigators	Crime technicians	Sergeants	Total
Central	5	1	1	7
North Central	6	1	1	8
Northeast	7	0	1	8
Northwest	8	1	2	11
South Central	5	1	0	6
Southeast	8	1	1	10
Southwest	5	1	1	7
Total	44	6	7	57

Investigations working staffing

DPD's assigned staffing for investigations, however, does not reflect the number of individuals actually working in investigatory roles due to special assignment or temporary relocation. DPD staff may be temporarily reassigned from their assigned unit to other areas within the department. As a result, the project team ran a secondary analysis on IWM data to identify the working staffing across investigatory units. This analysis identified 465 staff working across DPD's investigations units, an increase above

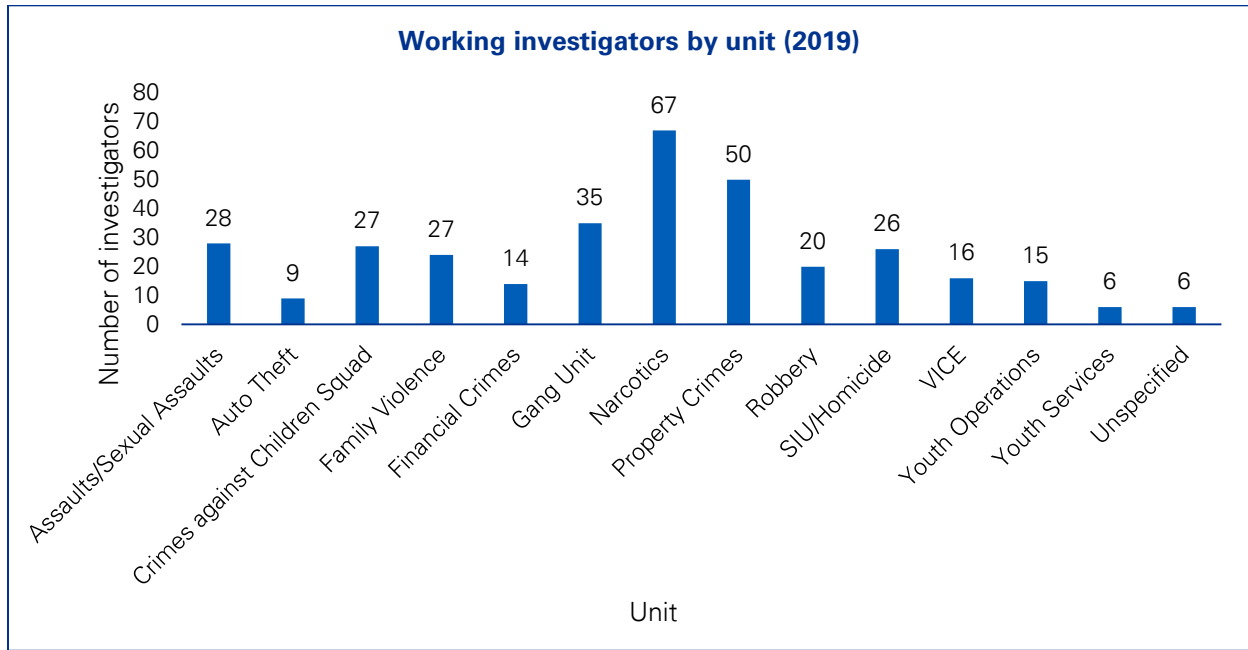
the assigned staffing level of 444. This includes 16 staff who are assigned to violent crimes (SIU/Homicide, Assaults/Sexual Assaults, and Robbery Units) or youth crimes (Crimes against Children Squad, Family Violence, Youth Operations, or Youth Services), yet whose specific unit is not specified in the data. These 16 FTEs are reflected in the Undefined category below.

DPD's working staff at the in-scope investigations units include 346 investigators (police senior corporals), 18 police officers, and 17 civilian investigations staff (which include crime technicians, investigations support analysts, police research specialists, and criminal intelligence analysts). DPD also staffs 7 caseworkers and 7 administrative staff to support its investigations units. These units are overseen by 58 sergeants and 12 senior leadership (including lieutenants and majors).

While unit-level staffing numbers differ across the assigned staff and working staff calculations, the Narcotics, Property Crimes, and Gang Units remain the largest. Youth Services and Auto Theft are the smallest units in terms of working staff. The Crimes against Children, Gang, Narcotics, and Property Crimes Units have police officers on staff in addition to investigators. Eight units have civilian investigations specialists, and four have caseworkers. Three units employ administrative specialists.

Unit	Investigator	Police officer	Civilian	Caseworker	Sergeants	Leadership	Admin.	Total
Assaults/Sexual Assaults	28	0	1	0	3	0	0	32
Auto Theft	9	0	0	0	1	0	0	10
Crimes against Children Squad	27	1	0	0	2	0	0	30
Family Violence	27	0	1	1	4	1	2	36
Financial Crimes	14	0	3	1	3	0	2	23
Gang Unit	35	10	1	0	8	1	0	55
Narcotics	67	4	1	0	14	3	2	91
Property Crimes	50	2	6	0	7	0	0	65
Robbery	20	0	0	0	2	0	0	22
SIU/Homicide	26	0	0	0	4	2	0	32
VICE	16	0	0	0	4	1	0	21
Youth Operations	15	0	3	0	2	1	0	21
Youth Services	6	0	0	2	2	1	0	11
Undefined	6	1	1	3	2	2	1	16
Total	346	18	17	7	58	12	7	465

The chart below depicts the number of investigators (police senior corporals) working in each unit. Police officers, civilians, and sergeants are not included.



Source: IWM data

There are 65 investigatory staff working within the Property Crimes Units, split across the seven patrol divisions, as shown in the Property Crimes Staffing table below. This includes a mix of investigators, police officers, civilians, and supervisory sergeants. For two of these FTEs, it was not possible to determine their patrol division from the available data.

Property Crimes working staffing

Division	Investigators	Police officers	Crime technicians	Sergeants	Total
Central	5	0	1	1	7
North Central	6	0	1	1	8
Northeast	8	0	0	1	9
Northwest	8	0	1	2	11
South Central	6	0	1	0	7
Southeast	9	0	1	1	11
Southwest	8	0	1	1	10
Unspecified	0	2	0	0	2
Total	50	2	6	7	65

Source: IWM data

Supervisory positions

The project team calculated the ratio of sergeants to nonsupervisory staff (which excludes sergeants and other leadership), using the working staff data shown above. This ratio varied significantly by unit, from a low of 1:4 in the VICE and Youth Services Units to a high of 1:14 in the Crimes against Children Squad. Across all investigatory units, DPD had a ratio of 1 sergeant to every 6.96 nonsupervisory staff—in line with their target ratio of 1:7. Nonsupervisory staff includes investigators, police officers, civilian investigations staff, caseworkers, and civilian administrative staff.

Unit	Sergeants	Nonsupervisory staff	Staff per sergeant, by unit
Assaults/Sexual Assaults	3	29	9.67
Auto Theft	1	9	9.00
Crimes against Children Squad	2	28	14.00
Family Violence	4	31	7.75
Financial Crimes	3	20	6.67
Gang Unit	8	46	5.75
Narcotics	14	74	5.29
Property Crimes	7	57	8.29
Robbery	2	20	10.00
SIU/Homicide	4	26	6.50
VICE	4	16	4.00
Youth Operations	2	18	9.00
Youth Services	2	8	4.00
Total	56	3	6.96

Productive hours

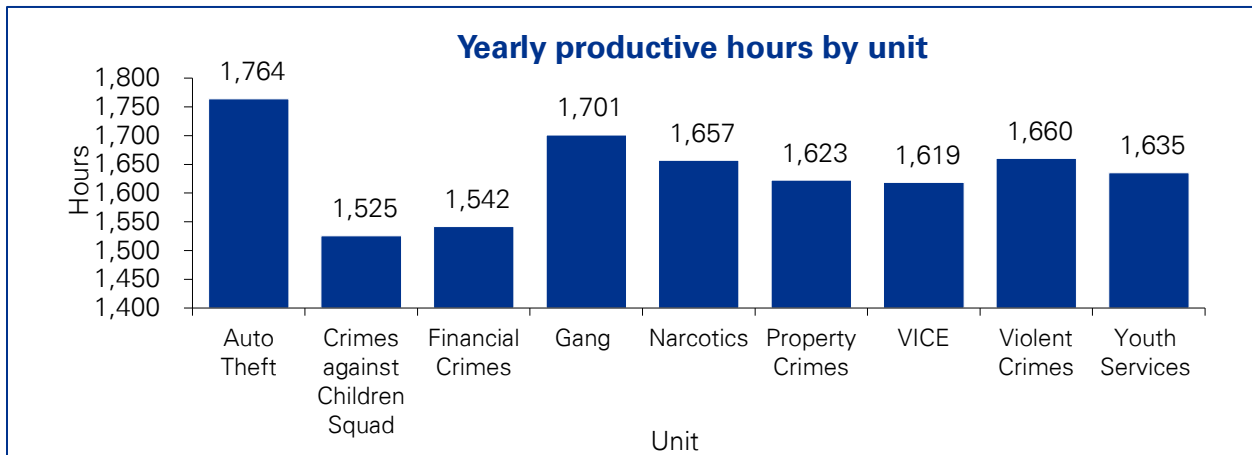
Investigator productive hours are a measure of the total time an investigator is available for work in a year, not including any overtime hours worked. Typically, a full-time salaried employee is paid for 2,080 hours over the course of a year, assuming the employee is scheduled for 40 hours per week for 52 weeks. However, a portion of these 2,080 hours is consumed by vacation, sick, and other leave factors. Productive hours quantify the remaining hours over the course of a year, during which an employee is available to work.

In the Patrol Bureau Assessment, KPMG determined that average productive hours for a DPD patrol officer are approximately 1,630 hours. Applying the same analysis to DPD’s Investigations function, KPMG found average productive hours to be 1,636 for investigators.

Based on the project team’s benchmarking research, this level of productive hours appears above average for similarly sized agencies. In a study of the Fort Worth police department, the Police Executive Research Forum found the agency’s investigators averaged 1,464 hours of investigations time per year, noting this was comparable to other large departments.⁴¹



The following chart details productive hours by investigations unit. Unit-level data was not available for all units that conduct investigations. As a result, the “Violent Crimes” category includes aggregated data for the SIU/Homicide, Assault/Sexual Assaults, Robbery, Youth Operations, and Family Violence Units. Similarly, the “Property Crimes” category includes aggregate data for the property crime investigations staff embedded within each DPD patrol division. Finally, the Vehicle Crimes Unit has not been included in this analysis, despite its investigations function, due to the lack of available data.



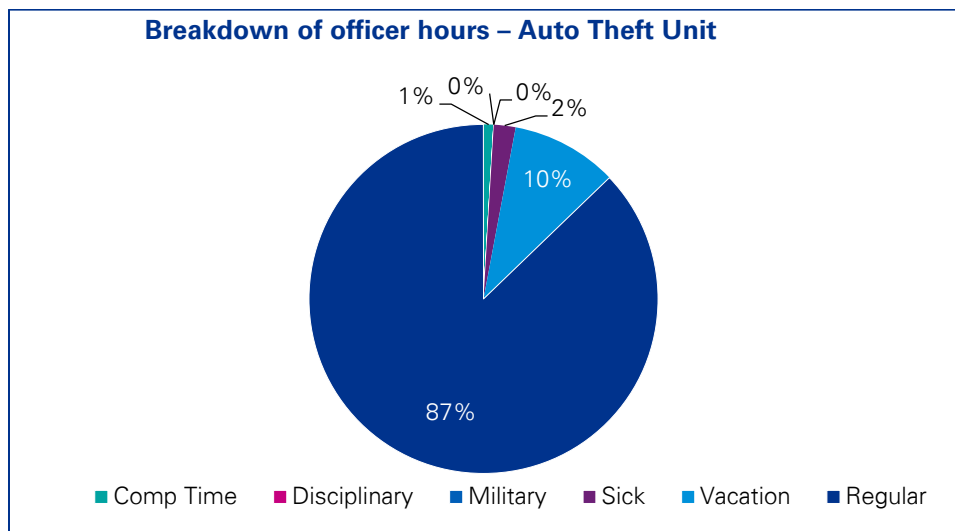
Source: DPDU data

⁴¹ Staffing study of the Fort Worth Police Department, Police Executive Research Forum, 2014.

The charts on the following pages illustrate the average allocation of investigator time in each unit, examining activities such as regular hours, vacation, sick, and comp time. Across all investigations units, vacation time holds relatively constant at 10 to 12 percent of annual investigator hours. Similarly, comp time appears relatively stable—consuming 1 to 3 percent of investigator time across all units. As a result, variations in investigator productive hours across units are primarily driven by differences in the amount of sick leave consumed, which varies from 2 percent to 11 percent, depending on the investigations unit.

Auto Theft Unit

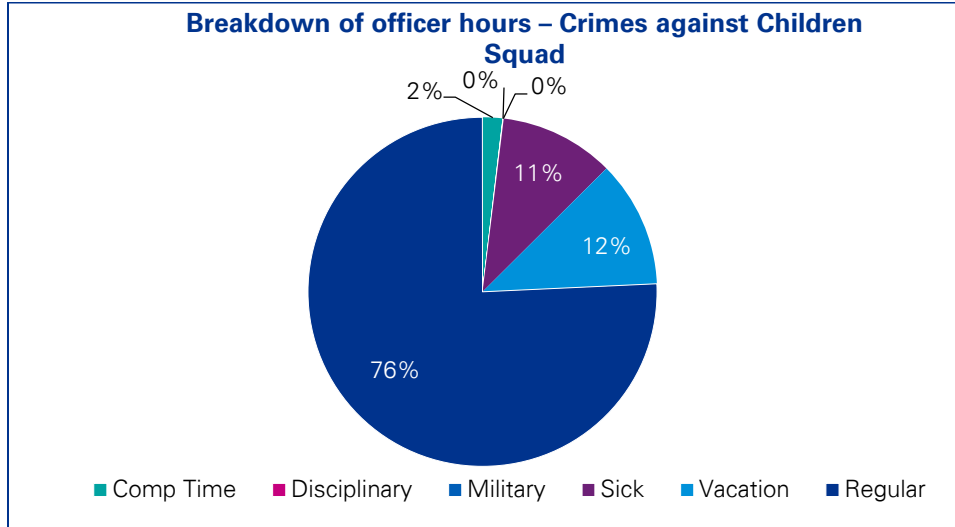
At 1,764 hours per year, the Auto Theft Unit has the highest productive hours of DPD's investigations units. As shown in the graph below, just 13 percent of investigator time is dedicated to leave, with the rest allotted to regularly assigned duties.



Source: DPDU data

Crimes against Children Squad

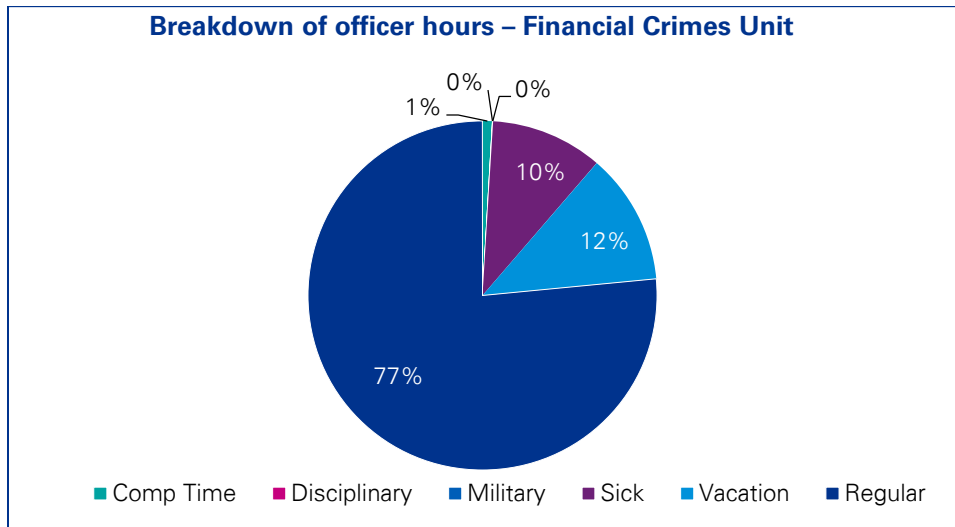
The Crimes against Children Squad has the lowest productive hours of DPD's investigations units, at 1,525 hours per year. Seventy-six percent of investigator time is dedicated to regular hours; 11 percent is recorded as sick leave and 14 percent is recorded as either vacation or comp leave.



Source: DPDU data.

Financial Crimes Unit

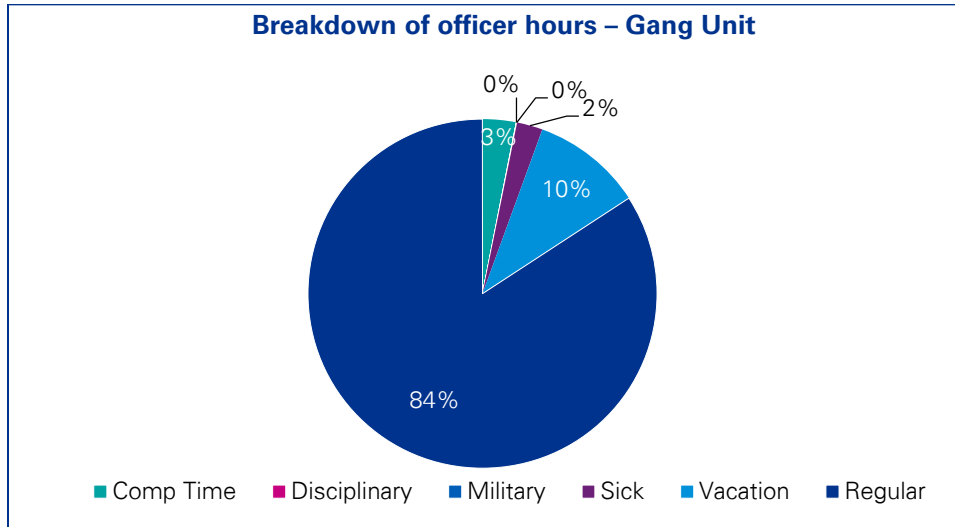
DPD's Financial Crimes Unit has annual productive hours of 1,542, below the investigations unit average of 1,636. Twenty-three percent of investigator time is consumed by vacation, sick, or comp leave. The remaining 77 percent of investigator time is dedicated to regular hours.



Source: DPDU data. Numbers may not add due to rounding.

Gang Unit

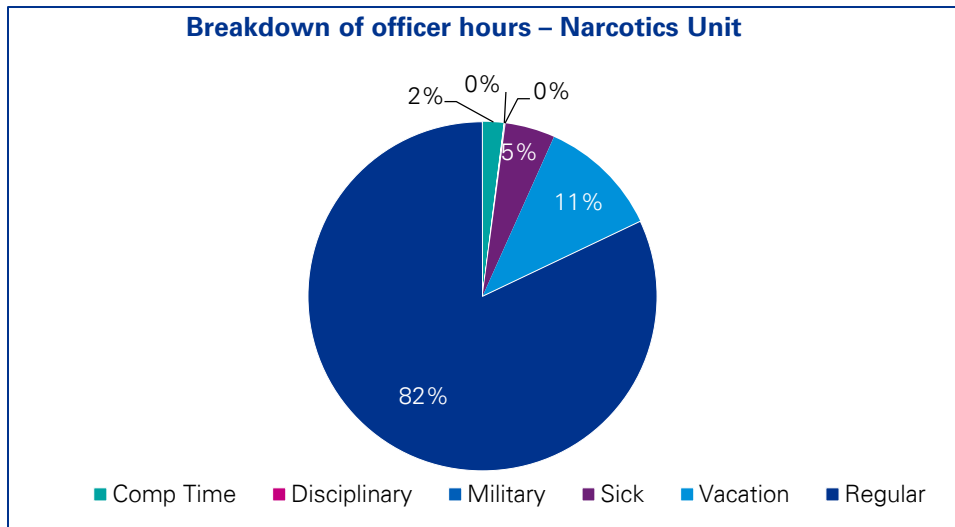
DPD's Gang Unit has annual productive hours of 1,701. Eighty-four percent of investigator time is dedicated to regular hours.



Source: DPDU data

Narcotics Unit

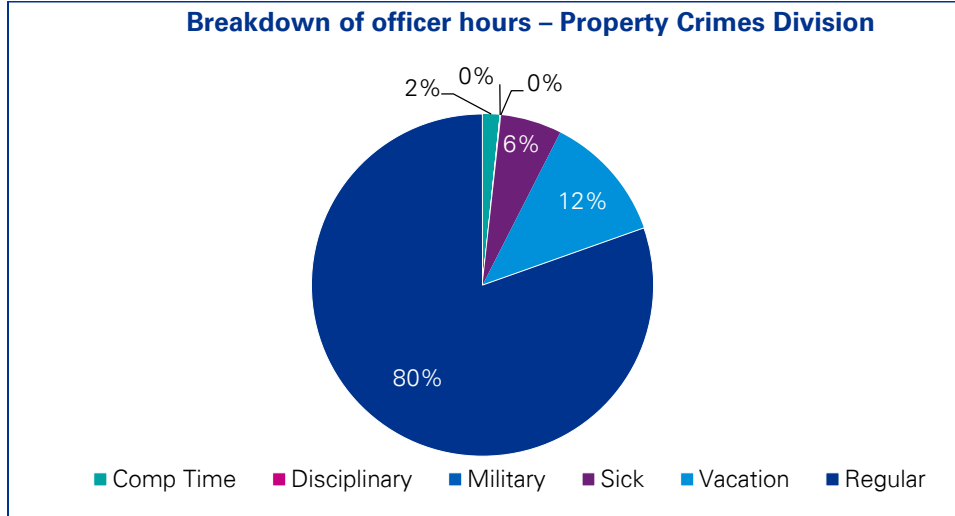
DPD's Narcotics Unit has annual productive hours of 1,657, above the DPD Investigations Unit average of 1,636. Eighteen percent of investigator hours are consumed by vacation, sick, or comp leave, with the remaining 82 percent dedicated to regular hours.



Source: DPDU data

Property Crime Units

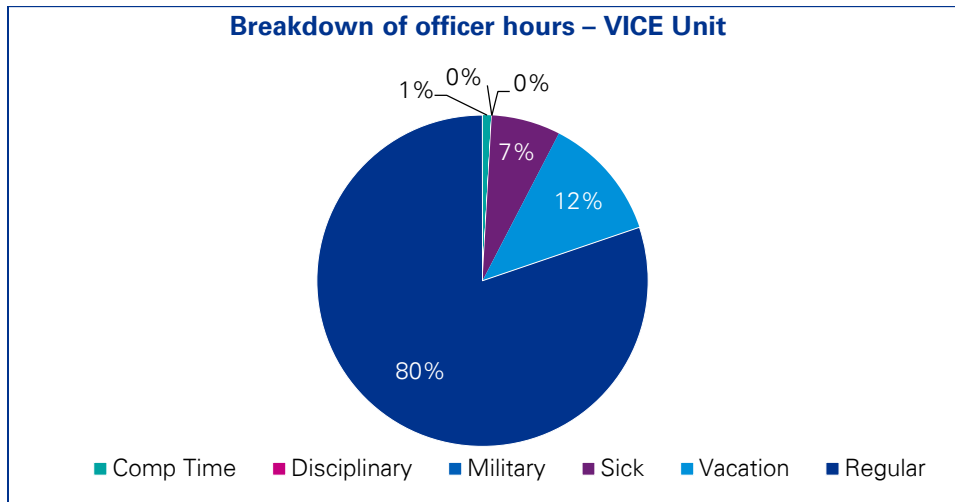
Located within DPD's Patrol Bureau, the Property Crime Investigations Units have on average annual productive hours of 1,623. Eighty percent of investigator time is dedicated to regular hours, while the remaining 20 percent is consumed by vacation, sick, or comp leave.



Source: DPDU data

VICE Unit

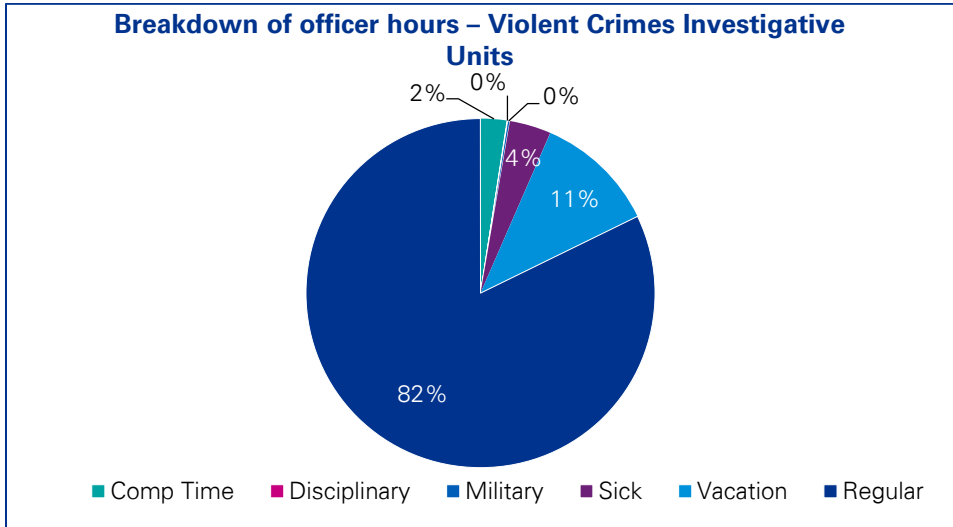
DPD's VICE Unit has annual productive hours of 1,619. Similar to the Property Crimes Investigations Units, 80 percent of investigator time is dedicated to regular hours, while the remaining 20 percent is consumed by vacation, sick, or comp leave.



Source: DPDU data

Violent Crimes

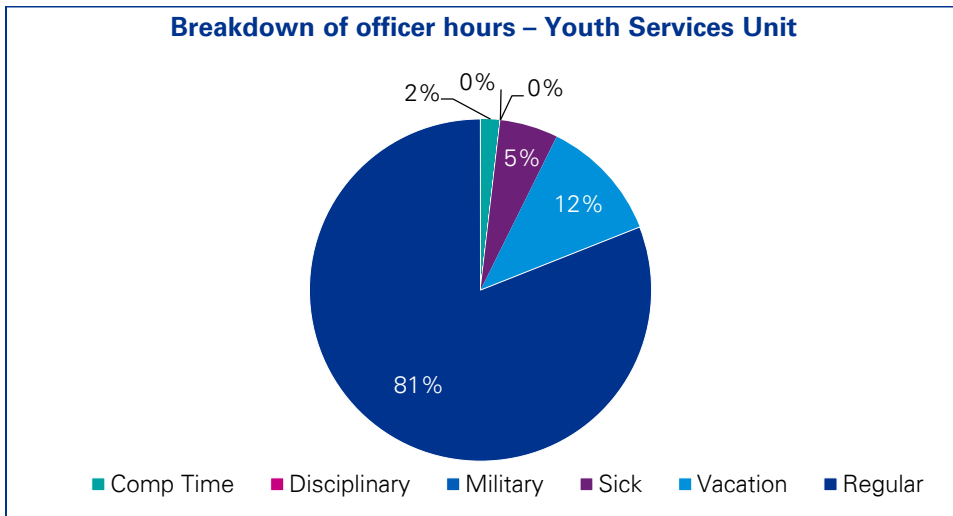
As unit-level data was not available for those investigations units within Violent Crimes, KPMG's analysis identifies the average annual productive hours across all Violent Crimes units, which includes SIU/Homicide, Assault/Sexual Assaults, Robbery, Youth Operations, and Family Violence Units. Violent Crimes Units have an average annual productive hours of 1,660, with 82 percent of investigator time dedicated to regular hours, 11 percent recorded as vacation, and 4 percent sick leave.



Source: DPDU data

Youth Services Unit

The Youth Services Unit has annual productive hours of 1,635, just one hour different from the investigations unit average of 1,636. Eighty-one percent of investigator time in the Youth Services Unit is dedicated to regular hours.



Source: DPDU data

Investigations caseload and clearance rate analysis

Caseload and clearance rate analysis

This chapter contains an analysis of DPD's investigations data, focusing on total case volume, assigned staffing, caseload per investigator and supervisor, and clearance rates. DPD records case management data in two systems: the RMS case management module for all investigations units except Narcotics, and the CrimeNtel system for the Narcotics Unit. Once a Narcotics investigation has been approved for submission to the district attorney, it is then recorded within the RMS case management module. Due to the different data sets, the analysis for these units was conducted separately. The first section of this chapter provides analysis of all investigations units except Narcotics. The second section of the chapter provides descriptive analytics for DPD's Narcotics Unit. In this chapter, analysis was conducted for the below investigations units:

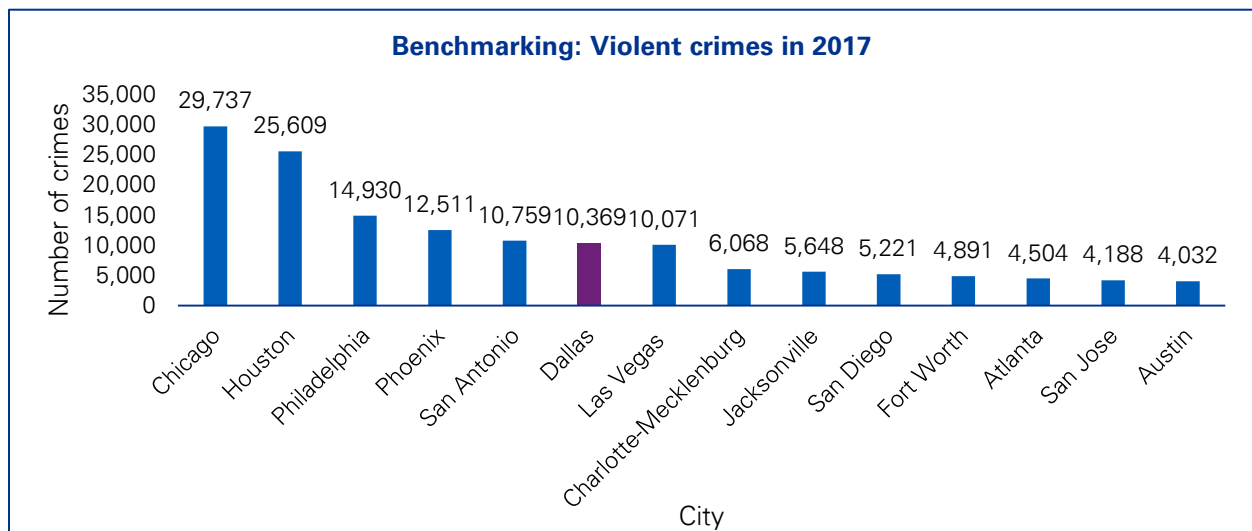
- Assaults/Sexual Assaults Unit
- Auto Theft Unit
- Crimes against Children Squad
- Family Violence Unit
- Financial Crimes Unit
- Gang Unit
- Property Crimes Units
- Robbery Unit
- SIU/Homicide Unit
- VICE Unit
- Youth Operations Unit
- Youth Services Unit

DPD crime rates, in context

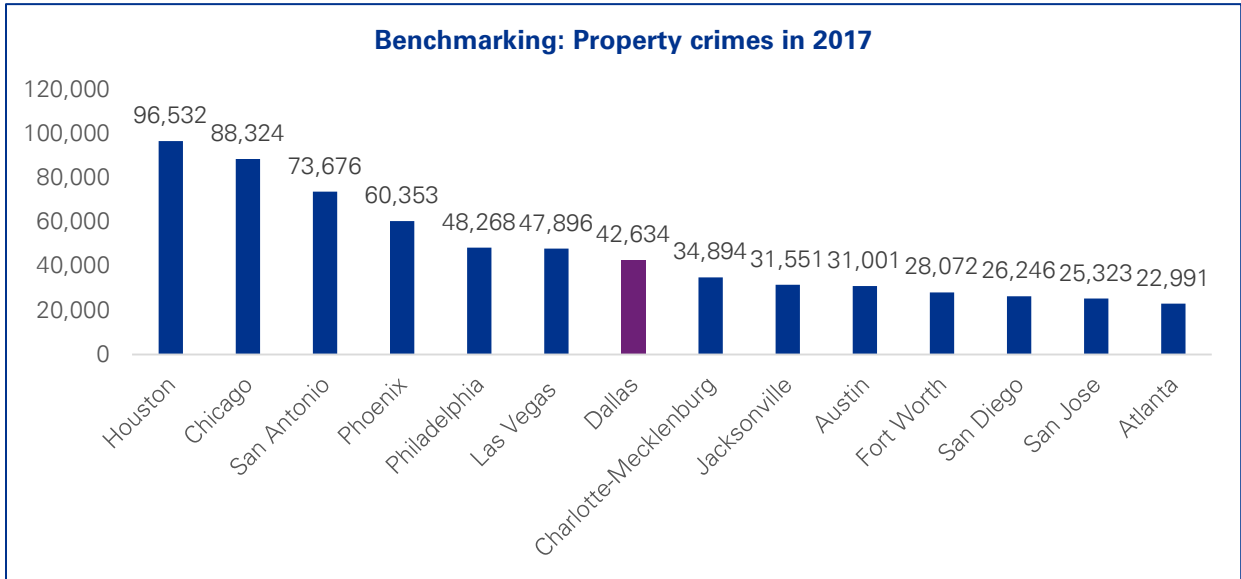
The team identified 13 cities, based on similar population size and number of law enforcement personnel, against which to provide benchmark comparisons. Dallas is the eighth largest city within the comparator group, yet has the sixth highest violent crime rate and the seventh highest property crime rate.

City	Population	Total law enforcement employees	Violent crime	Property crime
Chicago	2,706,171	13,566	29,737	88,324
Houston	2,338,235	6,334	25,609	96,532
Phoenix	1,644,177	3,816	12,511	60,353
Las Vegas	1,627,244	5,379	10,071	47,896
Philadelphia	1,575,595	7,347	14,930	48,268
San Antonio	1,520,712	2,929	10,759	73,676
San Diego	1,424,116	2,282	5,221	26,246
Dallas	1,338,551	3,658	10,369	42,634
San Jose	1,037,529	1,346	4,188	25,323
Austin	971,949	2,366	4,032	31,001
Charlotte-Mecklenburg	914,609	2,341	6,068	34,894
Jacksonville	894,638	3,094	5,648	31,551
Fort Worth	873,069	2,198	4,891	28,072
Atlanta	481,343	2,087	4,504	22,991

Source: FBI UCR data, 2017



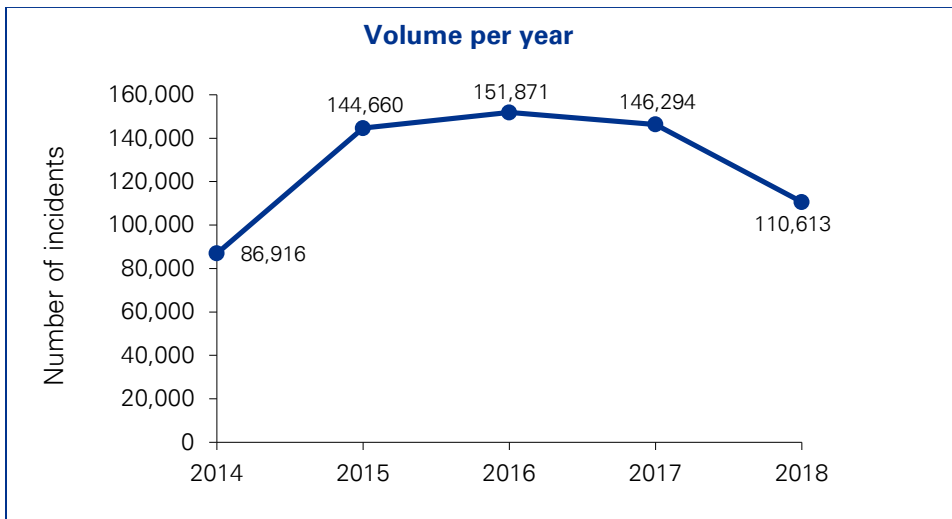
Source: FBI UCR data, 2017



Source: FBI UCR data, 2017

Case volume

Total case volume



Source: DPD offenses data

Looking at the five-year trend, the total number of annual cases across all investigations units, excluding Narcotics, grew by approximately 24,000 cases or 27 percent from 2014 to 2018. The total number of cases across all investigations units, excluding Narcotics, peaked in 2016 at approximately 152,000 before declining in 2017 and 2018.

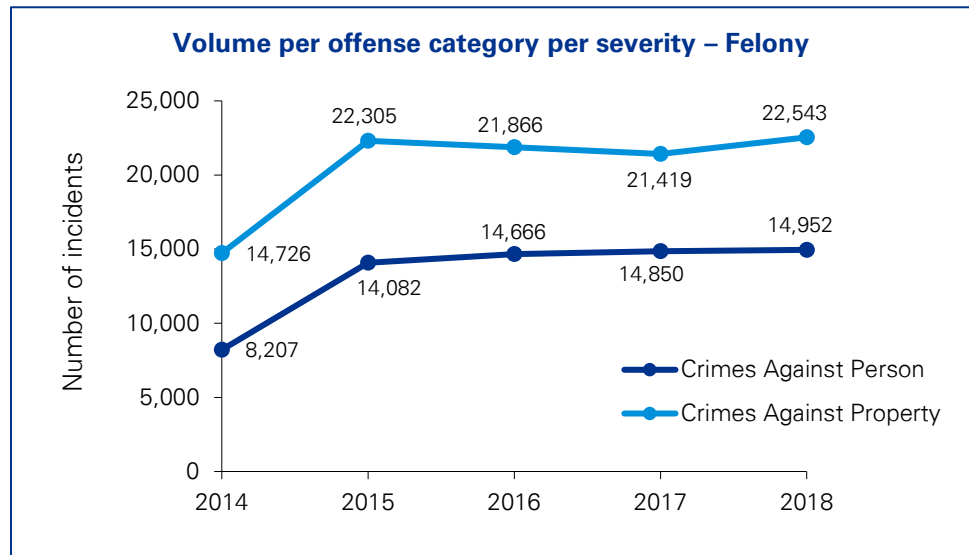
Case volume per offense category

There are two types of offense categories used within the analysis: crimes against persons and crimes against property. Crimes against persons are defined as crimes whose victims are individuals. For the investigations units detailed in this report, units such as Assaults/Sexual Assaults, Crimes against Children,

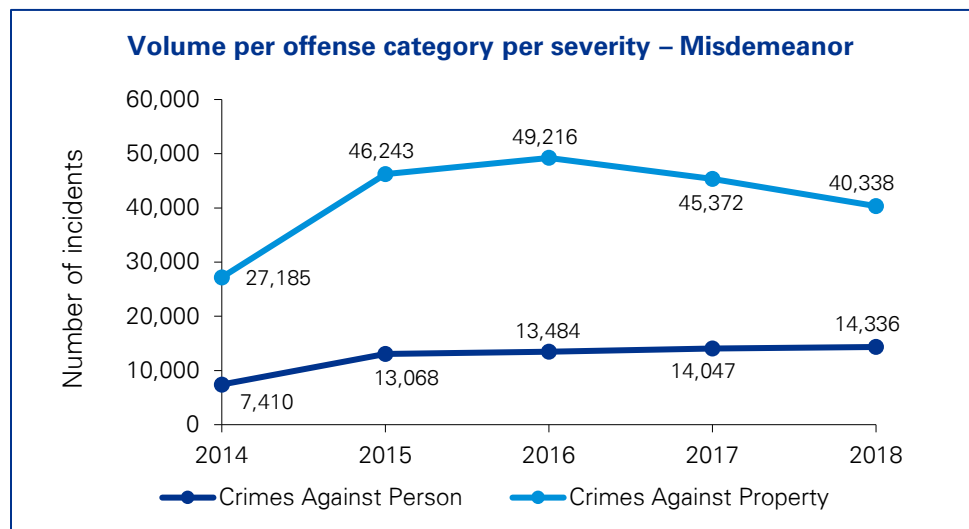
Family Violence, Gang, Robbery, SIU/Homicide, VICE, Youth Operations, and Youth Services would be categorized as crimes against persons.

Crimes against property include crimes designed to acquire money or property.

Auto Theft, Financial Crimes, and Property Crimes would be categorized as crimes against property.⁴²



DPD's offense data categorizes crimes as felonies or misdemeanors; within the data, some offenses also lack a categorization and are "not categorized" or "NC" within the data set. There were also a series of additional categories within the data set, which appeared to be erroneous data and were cleaned from the data set for the purposes of this analysis.



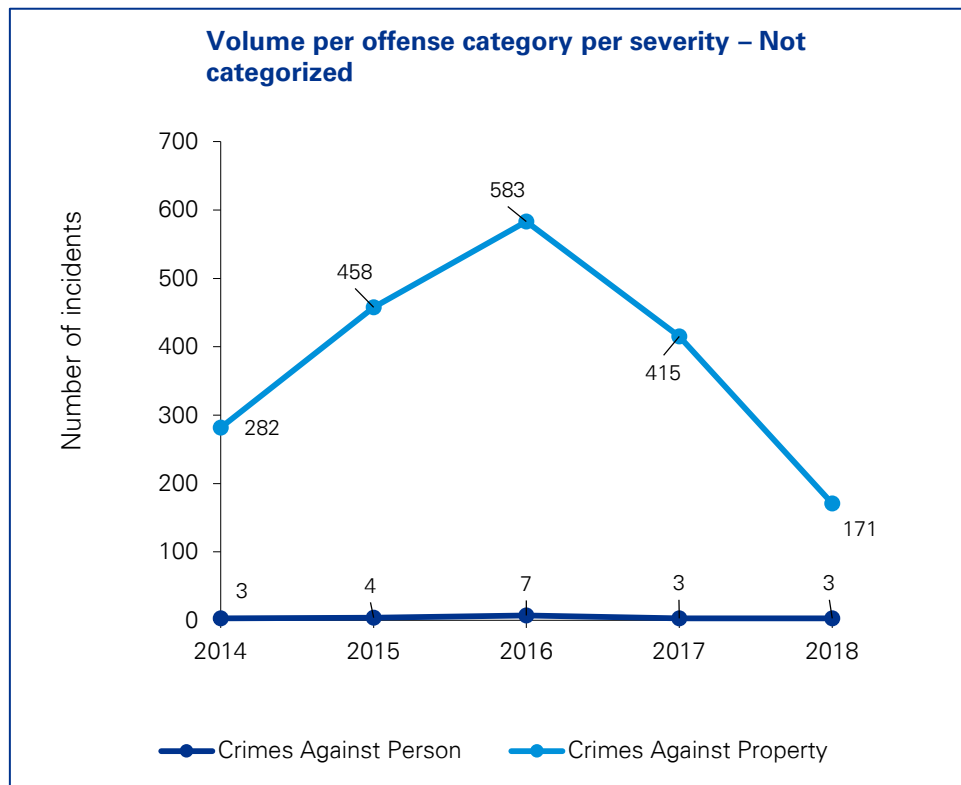
Source: DPD offenses data

Source: DPD offenses data

Each year, crimes against property exceeded the number of crimes against persons, at both the felony and misdemeanor levels, as well as for crimes whose severity is not categorized.

⁴² "Crimes Against Persons, Property, and Society," FBI Uniform Crime Reporting Program, <https://ucr.fbi.gov/nibrs/2012/resources/crimes-against-persons-property-and-society>.

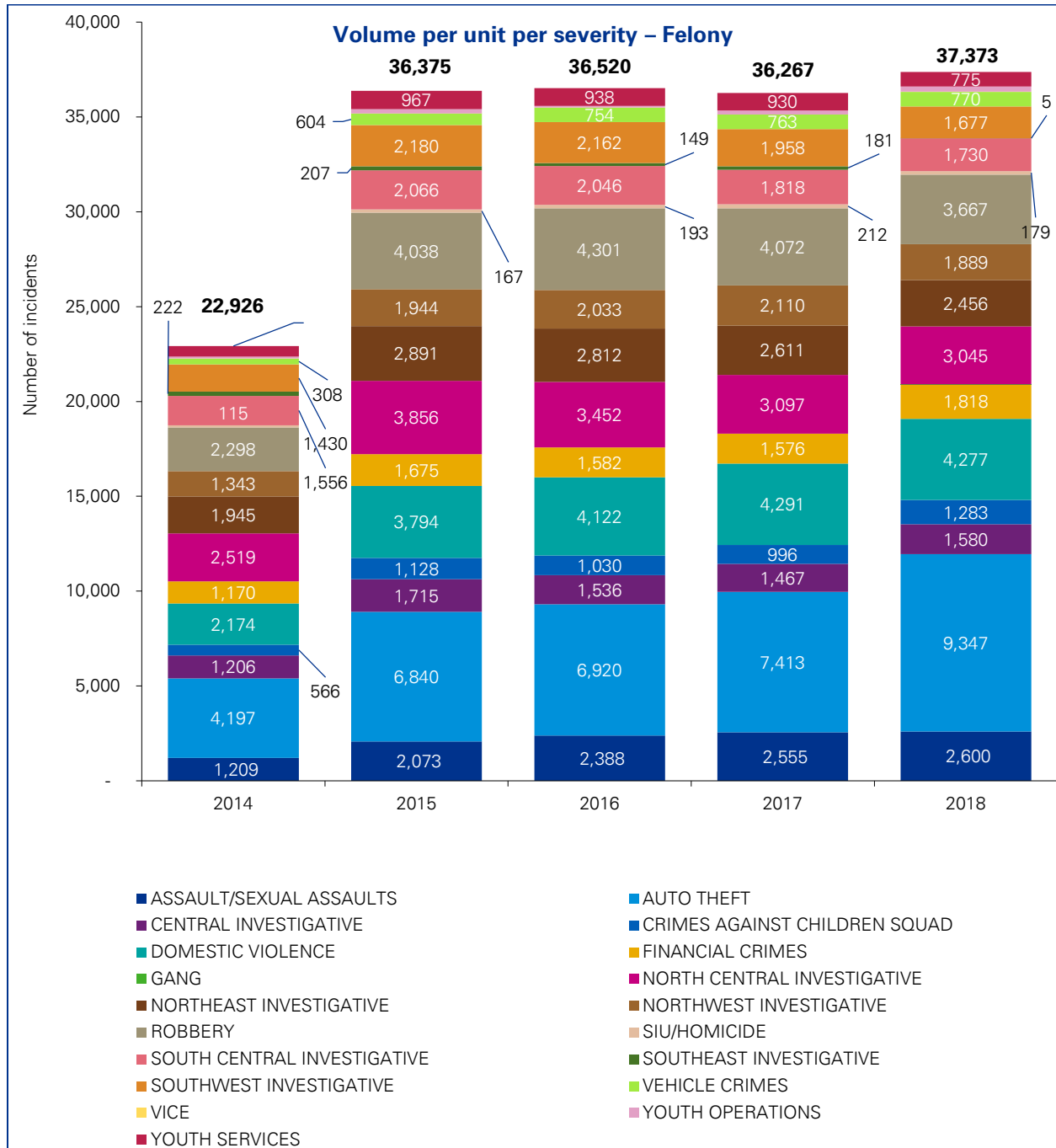
The increase in volume in the number of overall offenses in 2016 (illustrated in the "Total case volume" graph on page 319) appears driven by a spike in misdemeanor property crime, which was approximately 49,200 incidents in 2016. The number of uncategorized property crimes also spiked in 2016; however, uncategorized crimes compose only a small percentage of DPD's total annual offenses.



Note: For all analytics relating to case volume, there may be discrepancies in case volume totals due to variations in data quality and data recording practices.

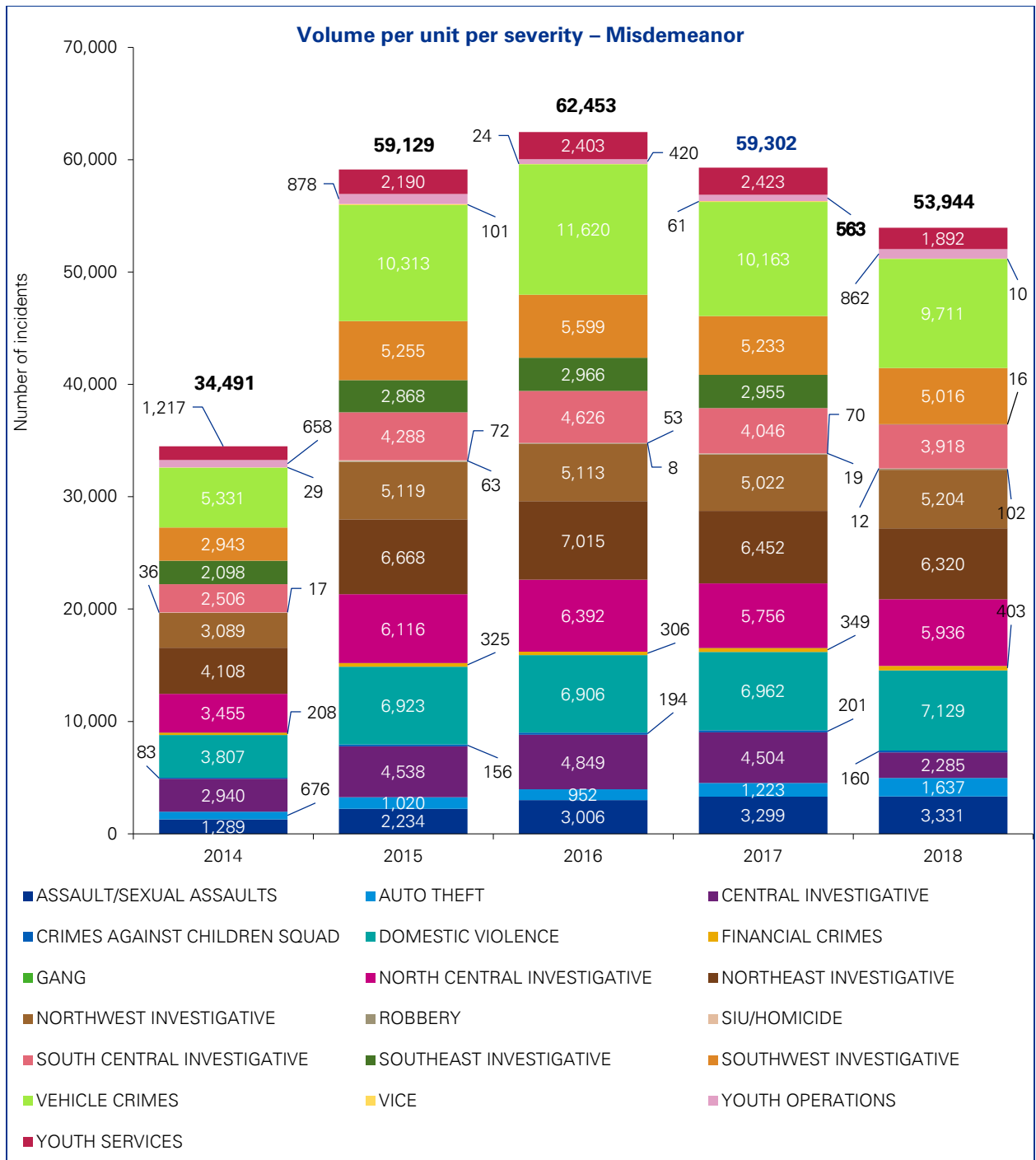
Volume per unit per severity

When combined, Property Crime investigations across all seven patrol divisions constitute the largest share of felony offenses. Following this, Auto Theft Unit investigations comprise the second largest share of felony offenses, followed by Family Violence investigations and Robbery investigations.



Source: DPD offenses data

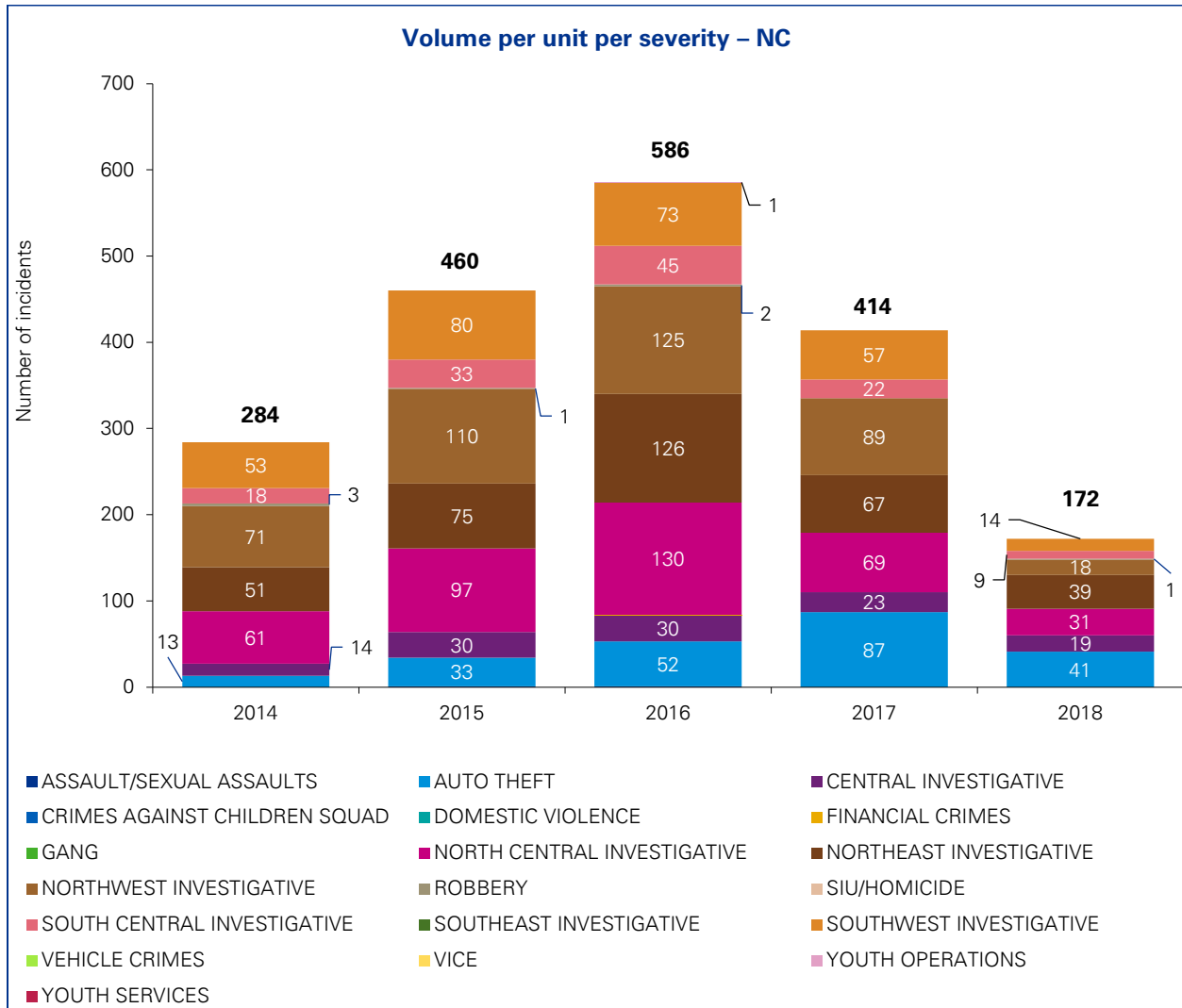
*Units in the graph above are listed in alphabetical order, with Assaults/Sexual Assaults at the bottom and Youth Services at the top. The legend can be read from left to right and then top to bottom.



Source: DPD offenses data

*Units in the graph above are listed in alphabetical order, with Assaults/Sexual Assaults at the bottom and Youth Services at the top. The legend can be read from left to right and then top to bottom.

At the misdemeanor level, when combined, Property Crime investigations across all seven patrol divisions constitute the largest share of misdemeanor offenses. Robbery composes the second largest share of offenses, followed by Family Violence and Assault/Sexual Assault investigations.



Source: DPD offenses data

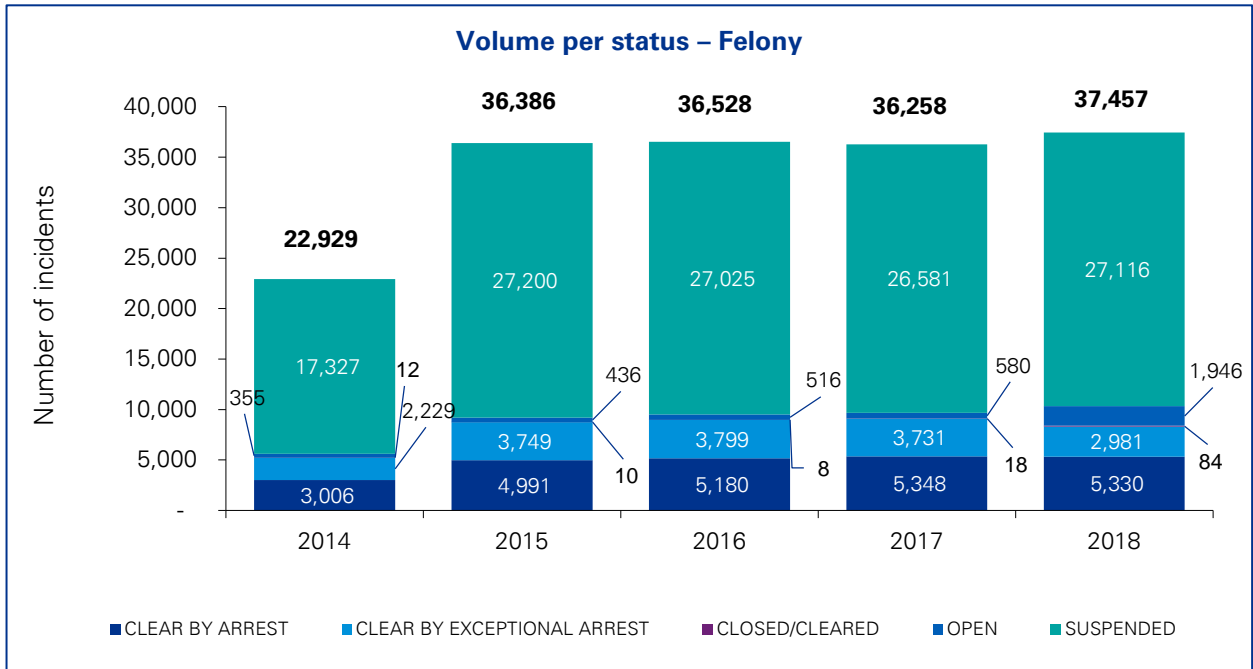
*Units in the graph above are listed in alphabetical order, with Assaults/Sexual Assaults at the bottom and Youth Services at the top. The legend can be read from left to right and then top to bottom.

Uncategorized crimes are disproportionately composed of property crimes investigations across DPD's seven patrol divisions.

Volume per disposition

There are five main dispositions for a case; clear by arrest and clear by exceptional arrest are those cases that have had a charge laid and contribute to positive case clearance rates. Closed/Cleared are cases that have been closed with no outcome, suspended cases have undergone an initial

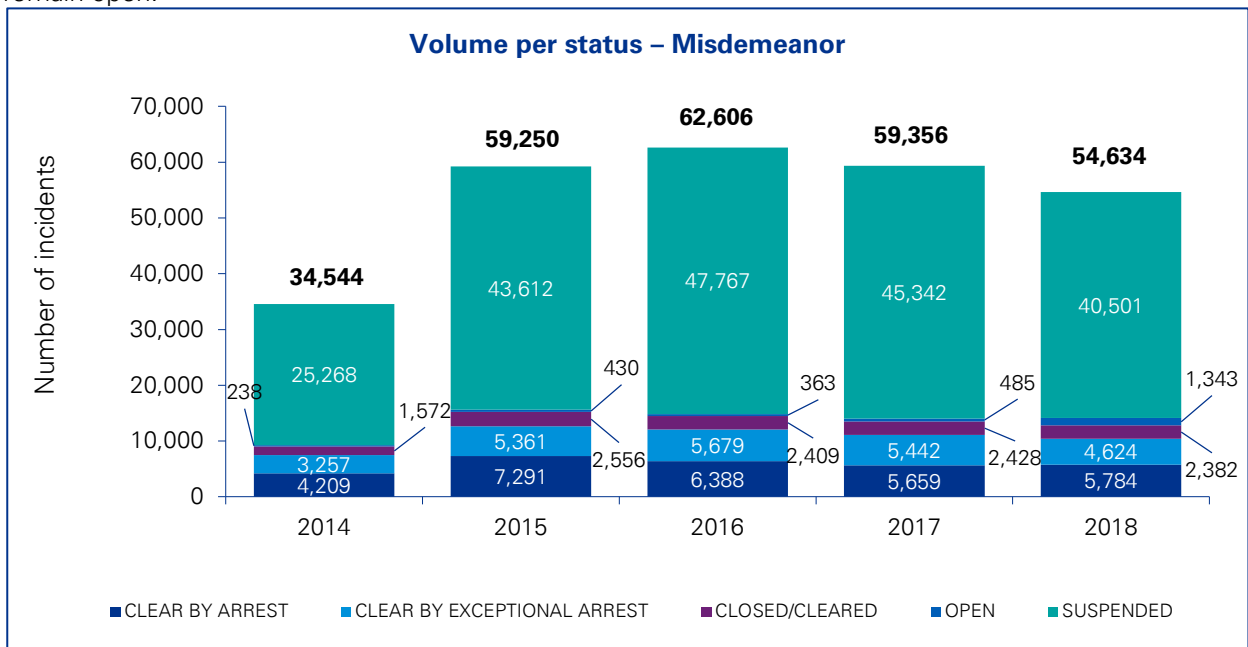
investigation but are pending further leads or victim contact, and those recorded as open are still undergoing investigation.



Source: DPD offenses data

Each year, 22 to 25 percent of felony cases result in an arrest, and 72 to 76 percent are suspended. For 2014 to 2017, only 1 percent of cases remain open. For 2018, 5 percent of cases remain open.

For misdemeanor offenses, 19 to 22 percent of cases result in an arrest, and 73 to 76 percent are suspended. For 2014 to 2017, only 1 percent of cases remain open. For 2018, just 2 percent of cases remain open.

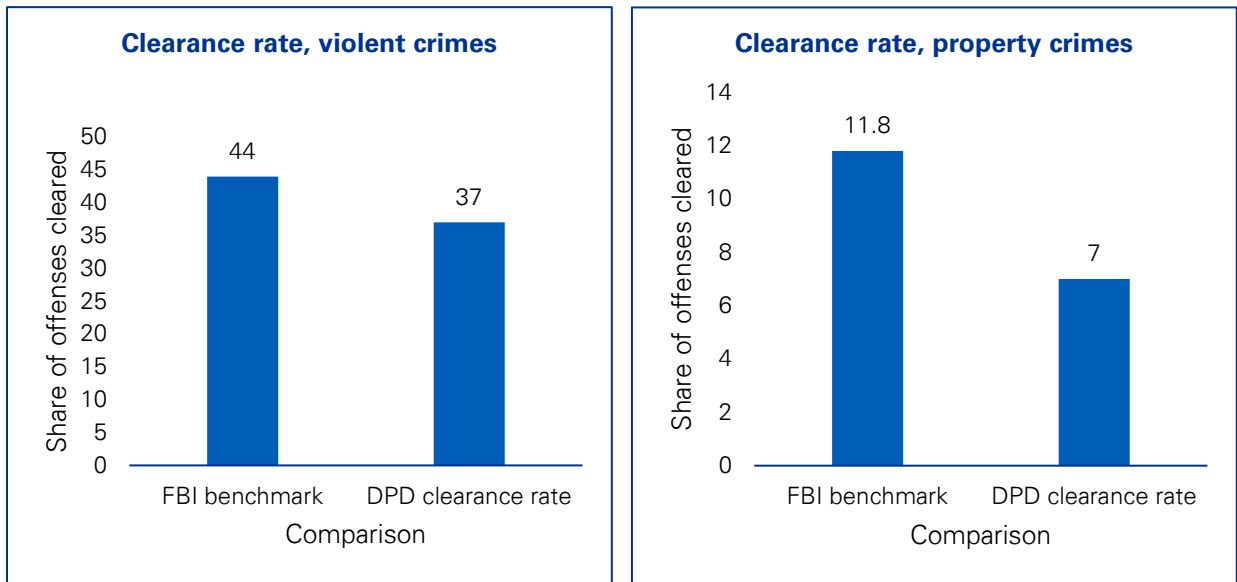


Source: DPD offenses data

DPD clearance rates, in context

As the City of Dallas has experienced this increase in violent crime, DPD's clearance rates, as determined by the number of crimes that are cleared (i.e., a charge being laid) divided by the total number of crimes recorded for violent and property crimes, appear to be below the benchmark statistics provided by the FBI's Uniform Crime Reporting (UCR) program. The FBI UCR program provides a national benchmarking clearance rate for cities with a population of 1 million or more of 44 percent for violent crimes and 11.8 percent for property crimes. DPD's clearance rate for 2017 was 37 percent for violent crimes and 7 percent for property crimes.

In the following chapters, this report investigates factors that contribute to DPD's current clearance rates, including investigations staffing, caseload, and practices.



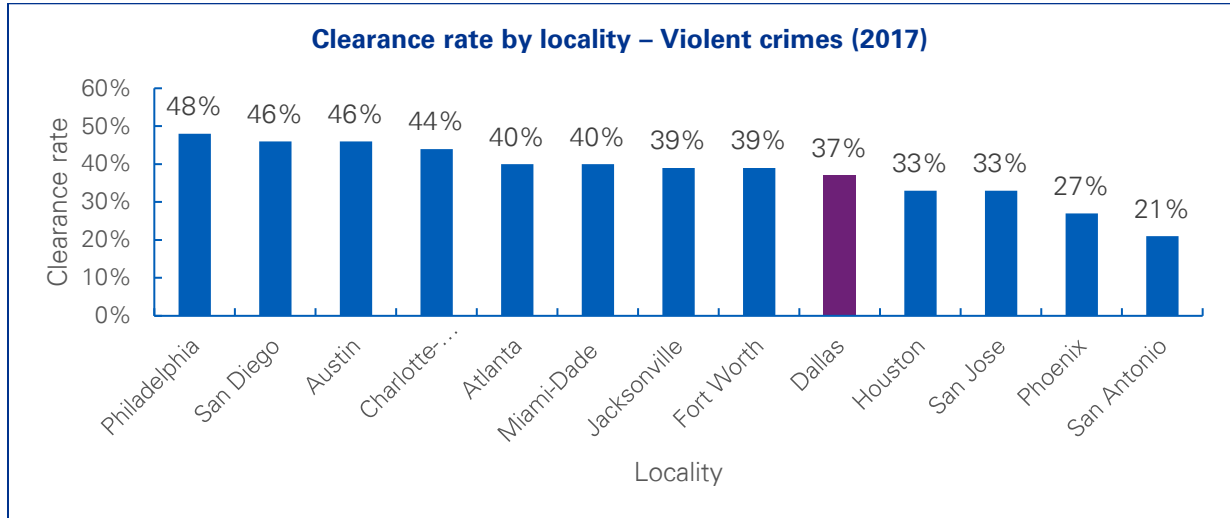
Source: FBI Crime Data Explorer, 2017⁴³

Additionally, DPD's clearance rates for both violent crime and property crime are below the clearance rates achieved by comparison cities, as illustrated in the project team's benchmarking research on the following page.

⁴³ FBI Crime Data Explorer, 2017, <https://crime-data-explorer.fr.cloud.gov/>.

Benchmarking: clearance rate, violent crime

At 37 percent, DPD's average clearance rate for violent crimes was just below the average of 38 percent for the comparison cohort in 2017. The FBI UCR recommends a violent crimes clearance rate of 44 percent.

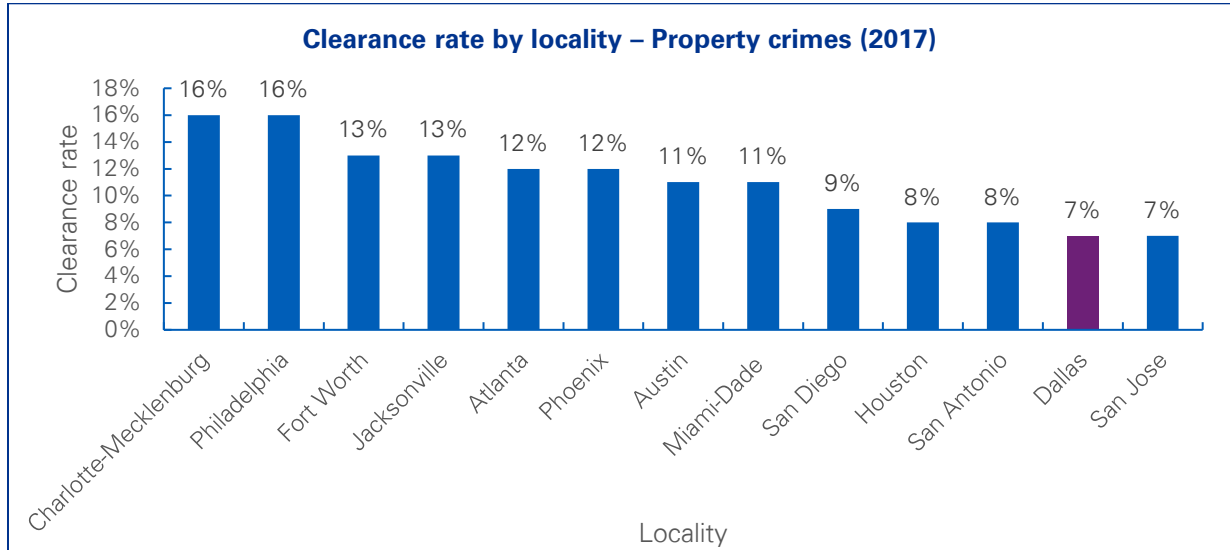


Source: FBI Crime Data Explorer, 2017⁴⁴

⁴⁴ FBI Crime Data Explorer, 2017, <https://crime-data-explorer.fr.cloud.gov/>.

Benchmarking: clearance rate, property crime

At 7 percent, DPD’s clearance rate for property crimes was the lowest of the comparison cohort in 2017, below the average of 11 percent. The FBI UCR recommends a property crimes clearance rate of 11.8 percent.



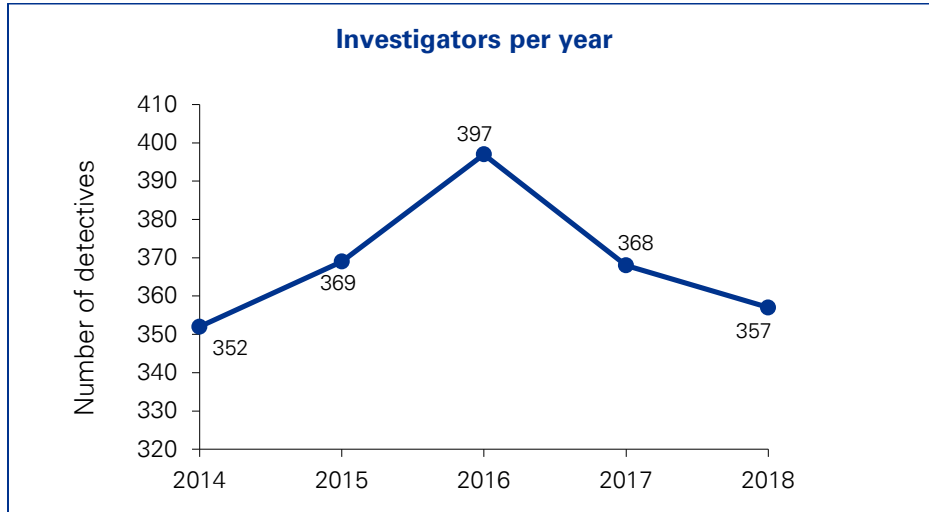
Source: FBI Crime Data Explorer, 2017

Staffing

In the previous chapter, the project team utilized various staffing data sets to track changes in DPD’s investigations staffing by year, including the case management system data, organizational staffing reports from AgencyWeb, and IWM data. In this chapter, the project team conducted analysis on DPD’s offenses data set to identify the number of investigators and supervisors working through a count of the officer badge numbers assigned to cases. Due to the differing data sets, the staffing numbers in this chapter may not correlate directly with those in the previous chapter due to inconsistencies between DPD’s data sets and recorded practices. For example, the staffing analysis in the previous chapter was able to aggregate staffing totals for all investigations units through the combination of multiple data sets. However, DPD’s offenses data set does not include all data from the Narcotics Unit, which is tracked within disparate systems. As a result, the graphs below show staffing data for all in-scope units other than the Narcotics Unit; staffing data for the Narcotics Unit is shown in separate graphics at the end of this chapter.

Investigators per year

The number of investigators working across DPD’s investigations units, with the exception of Narcotics, peaked in 2016 at 397. Investigator staffing has fallen since this peak, and its 2018 level is comparable to DPD’s 2014 staffing.



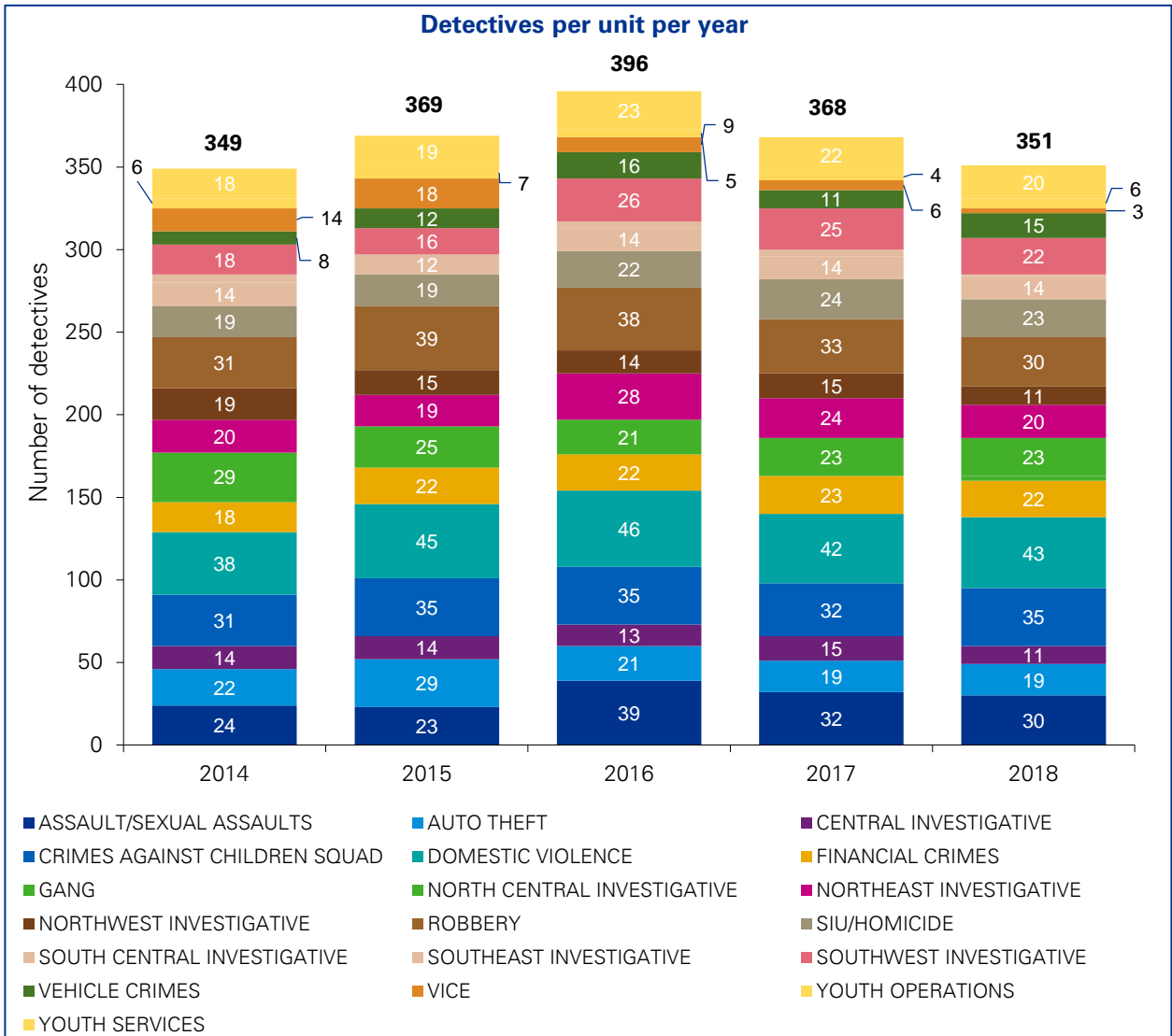
Source: DPD offenses data

Investigators per unit per year

In DPD’s offense data, an investigator’s badge number was assigned to cases across multiple units; however, operationally we know that investigators are assigned to a specialized unit and may only operate within another unit due to a special assignment or if investigating a case that contains multiple offenses. Therefore, in order to provide a more accurate staffing snapshot in the below analysis, detectives have been assigned to a primary unit, which is the unit in which an investigator was assigned the highest number of cases over the course of the year. The staffing numbers below may not align directly with those listed in the previous chapter, as they are drawn from different data sets which, due to DPD recording practices, do not correlate.

The table below depicts the data anomaly outlined above: on average, 21 percent of investigators’ badge numbers appeared in more than one unit on an annual basis within the offenses data set.

Year	Average number of units per officer	Percent of officers with multiple units
2014	1.49	28%
2015	1.38	23%
2016	1.34	19%
2017	1.46	22%
2018	1.13	11%



Source: DPD offenses data

*Units in the graph above are listed in alphabetical order, with Assaults/Sexual Assaults at the bottom and Youth Services at the top. The legend can be read from left to right and then top to bottom.

Reviewers per year

The project team also analyzed DPD offenses data to assess the number of supervisory positions across investigations units. While DPD policy typically staffs one supervisor for every seven

investigators, DPD’s current ratio of reviewers to investigators has remained largely constant at approximately 1:5 each year.



Source: DPD offenses data

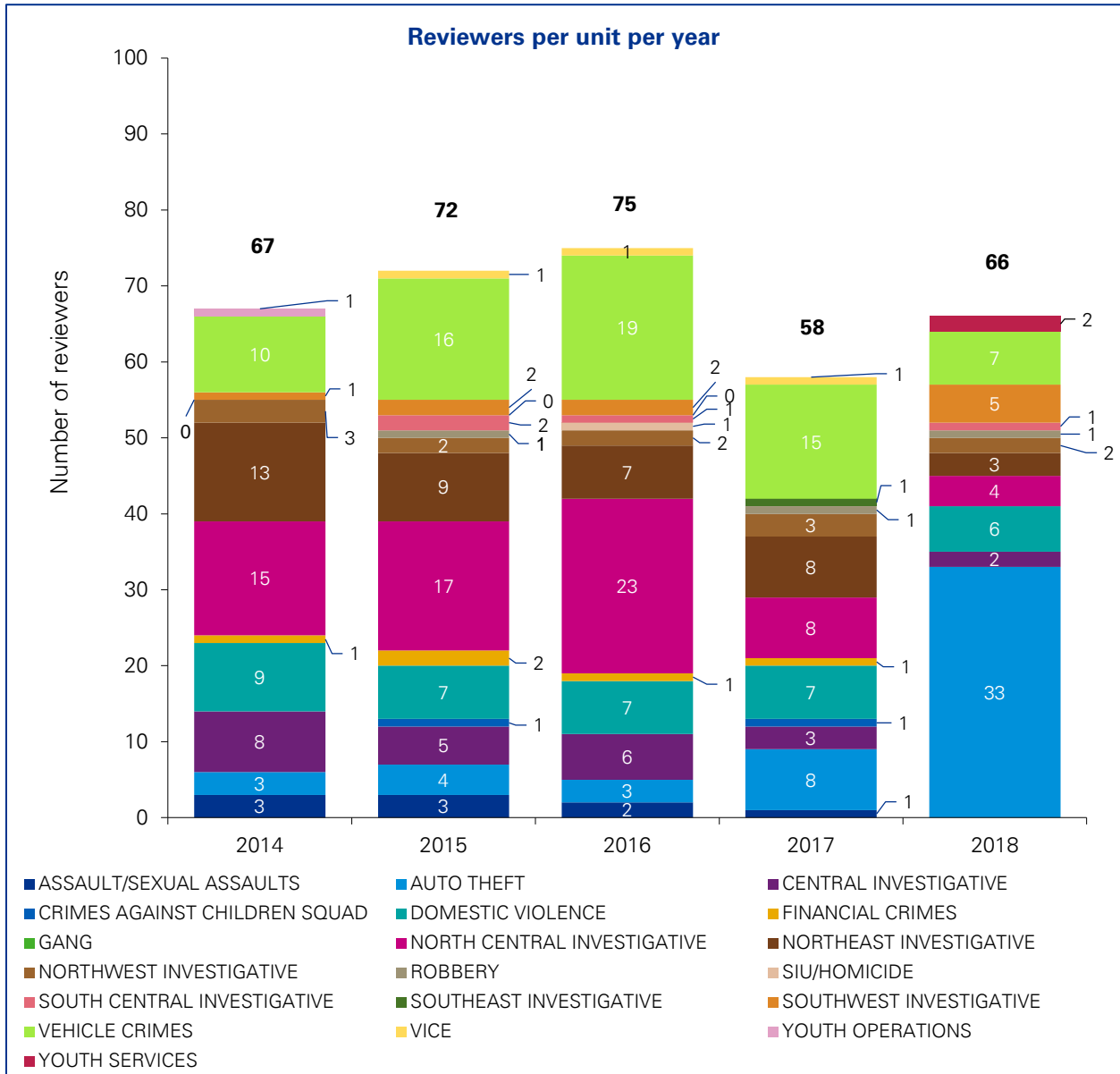
Reviewers per unit per year

The same data anomaly experienced with investigators was also evident when analyzing supervisory staffing. Therefore, within this analysis, reviewers, i.e., sergeants, have also been assigned a primary unit, which is the unit in which the reviewer had the most assigned cases over the course of the year.

The table below depicts the data anomaly outlined above. On average, 83 percent of sergeants’ badge numbers appear across 11 units on an annual basis within the offenses data set.

Year	Average number of units per reviewer	Percent of reviewers with multiple units
2014	11.8	89%
2015	10.3	83%
2016	8.7	86%
2017	10.3	83%
2018	11.4	73%

There are significant fluctuations in some units in the number of reviewers assigned per year, which may reflect errors in the data. For example, the number of Auto Theft reviewers appears to jump from 8 in 2017 to 33 in 2018. Focusing on broad trends, reviewers appear to the Auto Theft and Property Crimes Units in excess of DPD's recommended 1:7 ratio of reviewers to staff.

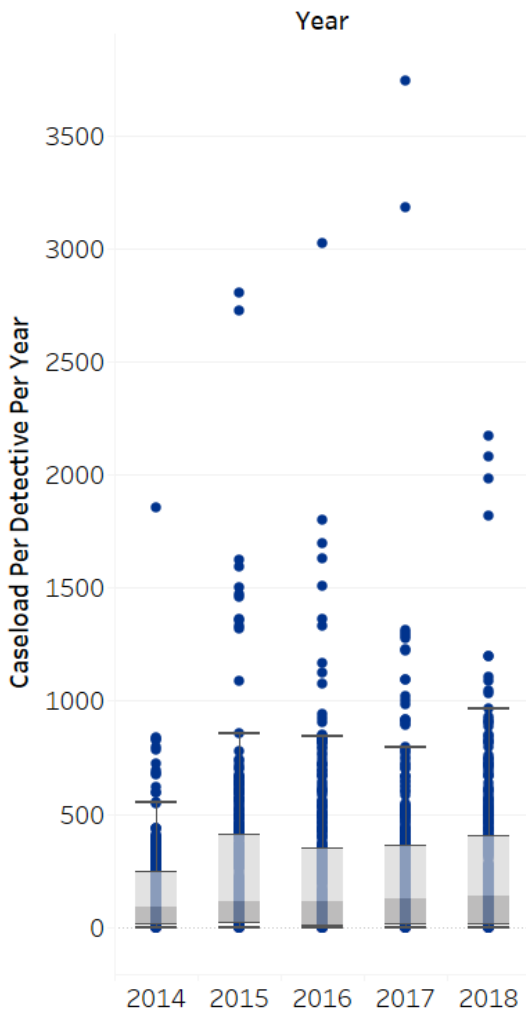


Source: DPD offenses data

*Units in the graph above are listed in alphabetical order, with Assaults/Sexual Assaults at the bottom and Youth Services at the top. The legend can be read from left to right and then top to bottom.

Caseload

Caseload per detective per year



This graph serves to illustrate the wide variance in DPD’s caseload data. There are significant outlier data points showing individuals with caseloads greater than 1,000. This is primarily due to the current data recording practices. The unreliability of the data creates a significant obstacle to determining staffing levels for DPD’s investigative units.

The box and whisker chart on the left illustrates the caseload per detective across all investigations units, by year. The gray box highlights caseloads that are in the 25th to 7th percentile in terms of size. The line where the color shifts from light gray to dark gray identifies the median caseload size.

Based on the graph at left, the median caseload per detective appears to have grown from 2014 to 2018. Similarly, detectives in the 75th percentile of caseload size have a caseload of approximately 400 in 2018, as opposed to approximately 300 in 2014.

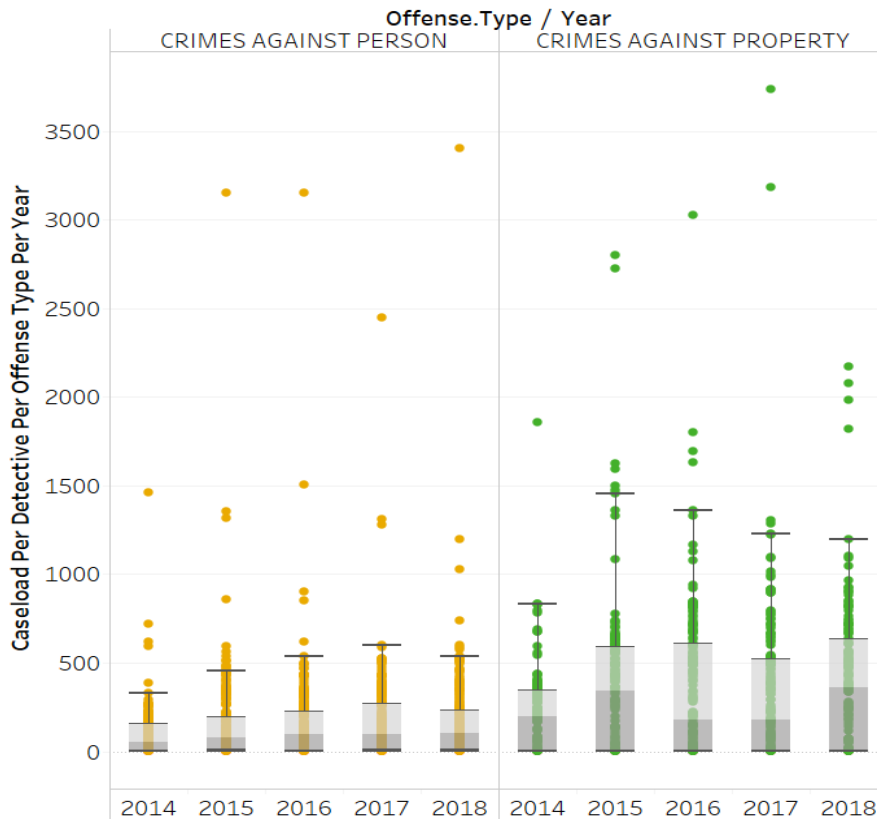
This report will provide a closer analysis of trends in caseload size in the unit-level analysis later in this chapter.

Source: DPD offenses data

Caseload per detective per year, by offense category

This graph serves to illustrate the wide variance in DPD’s caseload data. There are significant outlier data points showing individuals with caseloads greater than 3,000. This is primarily due to the current data recording practices. The unreliability of the data creates a significant obstacle to determining staffing levels for DPD’s investigative units.

Caseloads for crimes against persons are significantly smaller than those for crimes against property. While caseloads grew across both offense categories from 2014 to 2018, property crimes caseloads are two to three times larger than persons crimes caseloads as of 2018. Literature does recommend larger caseloads for property crimes, as opposed to persons crimes. For example, studies of industry standards find an average of 8 to 12 cases per month assigned to persons detectives, as opposed to 15 to 20 cases per month assigned to investigators focused on property crimes.⁴⁵ This would equate to 96 to 144 cases per year for persons cases and 156 to 240 cases per year for property crimes. The median caseload in the chart below appears in line with this caseload level for persons crimes, yet above the recommended caseload for property crimes. The unit-level caseload analysis later in this chapter provides a deeper examination of DPD’s current caseload sizes compared to recommended levels, by crime type.



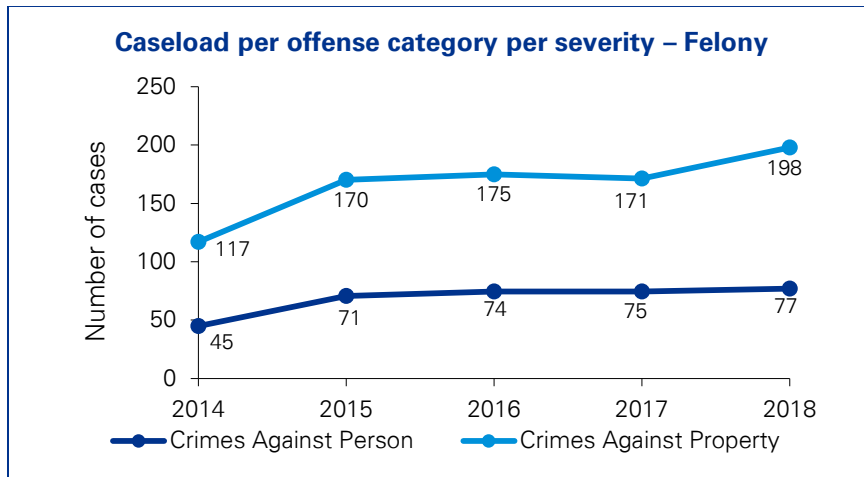
Source: DPD offenses data

⁴⁵ Report on the Staffing and Workload Study, Matrix Consulting Group, February 22, 2019.

Caseload per offense category per severity

The average caseload per detective for felony crimes against property is more than twice the average caseload for felony crimes against persons. Page 336 onwards provides an analysis of caseload size at the unit level.

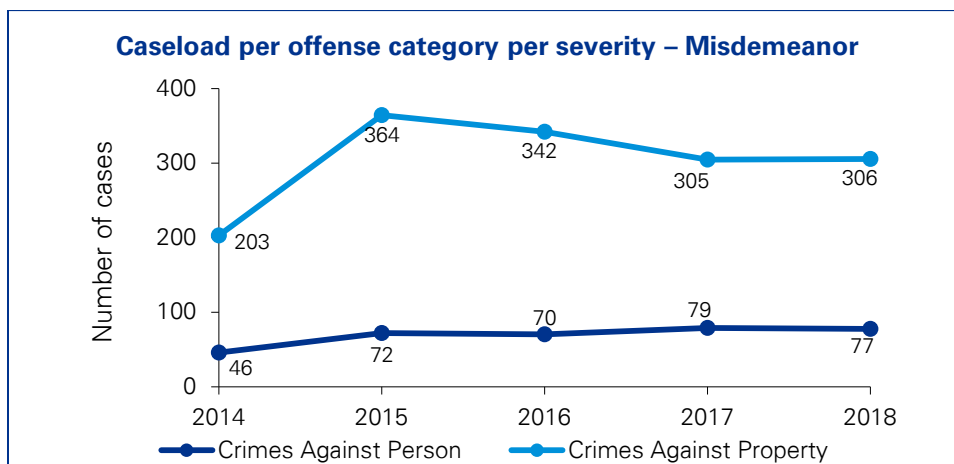
Caseloads for both types of felony crimes increased significantly from 2014 to 2015. Crimes against persons caseloads remained largely constant from 2016 to 2018 between 70 and 80 cases, while crimes against property caseloads have decreased from 364 in 2015 to 306 in 2018.



Source: DPD offenses data

Similar trends are apparent at the misdemeanor level as well. Property crimes have caseloads well above those for crimes against persons. Both misdemeanor crime types saw increases in caseload size from 2014 to 2015.

While misdemeanor crimes against persons and felony crimes against persons have similar volumes—averaging 45 to 79 cases per investigator per year, depending on the year—misdemeanor crimes against property have a greater volume than felony property crimes.



Source: DPD offenses data

Caseload per detective, by unit and year

As noted above, in DPD's offense data, investigators appear to be assigned to cases across multiple units. However, in practice, detectives are assigned to a specialized unit and may only operate within another unit due to a special assignment or if investigating a case that contains multiple offenses. The project team therefore conducted two sets of analysis, which are outlined below. In the first analysis, the project team calculates the caseload per detective, based on the current data structure allowing detectives to be assigned cases across multiple units. In the second analysis, the caseloads reflect that investigators have been assigned to a primary unit, which is the unit in which an investigator was assigned the highest number of cases over the course of the year; therefore, caseloads are based on their case assignment within the primary unit. In some cases, these two methodologies produce varying results. However, in others, we have been able to draw a general assumption regarding average caseload volume. Due to the data discrepancies the project team experienced when undertaking this assessment, we have outlined a number of data management process improvements later within the report.

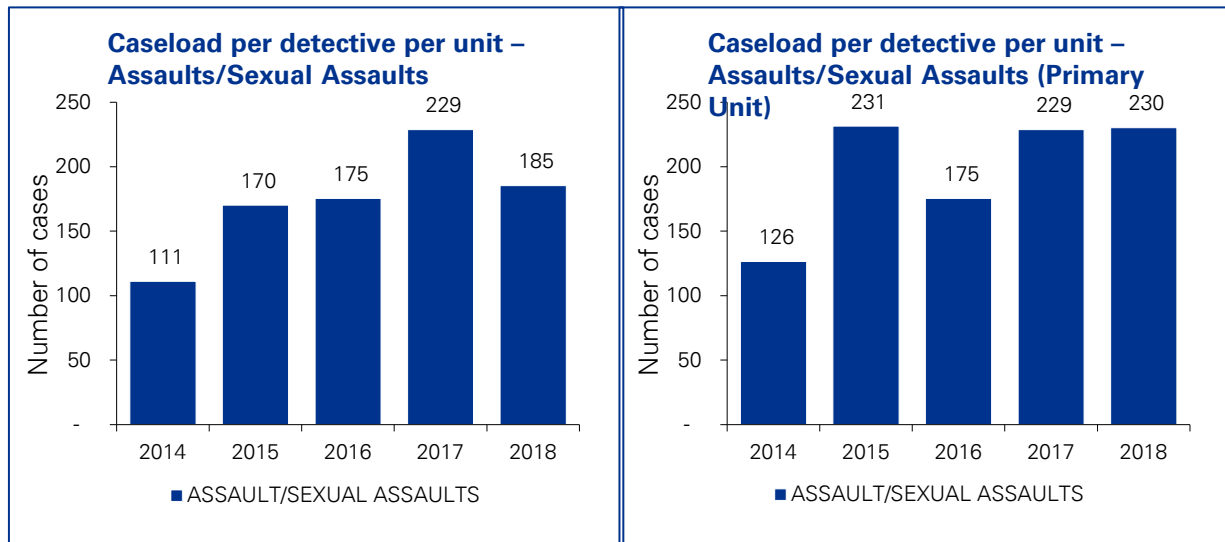
It is important to note that the graphs and analysis below illustrate *all* cases assigned to each unit: some of these cases may be "no leads" cases, which in most cases require victim contact but no investigation, and/or suspended cases, which are not actively being investigated. The level of effort and workload associated with these cases cannot be determined within the data and may not consume significant investigative time. However, as data showing which cases are suspended or lacking leads was not available, the project team has included all assigned cases in its analysis. This may result in inflated caseload sizes for some units and, therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.

Assaults/Sexual Assaults Unit

While there are significant variations between the graphs in 2015 and 2018, it appears that investigators in the Assaults/Sexual Assaults Unit may have a caseload that fluctuates between 170 and 230 cases per year, averaging the figures from the two methodologies. Based on these calculations, the caseload per detective for this unit increased by 75 percent from 2014 to 2018.

However, it is important to note that, given the data available, the caseload figures in this analysis include all cases assigned to a unit, which may include "no leads" cases and suspended cases and,

therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.



Source: DPD offenses data

Studies of industry standards find an average of 8 to 12 active assault cases per detective per month; this caseload may fall as low as 3 to 5 active cases per detective for felony cases.⁴⁶ This would yield a range of 36 to 144 cases per year, below the DPD Assaults/Sexual Assaults unit range of 170 to 230. However, it is important to note that, given the data available, the caseload figures in this analysis include all cases assigned to a unit, which may include “no leads” cases and suspended cases and, therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.

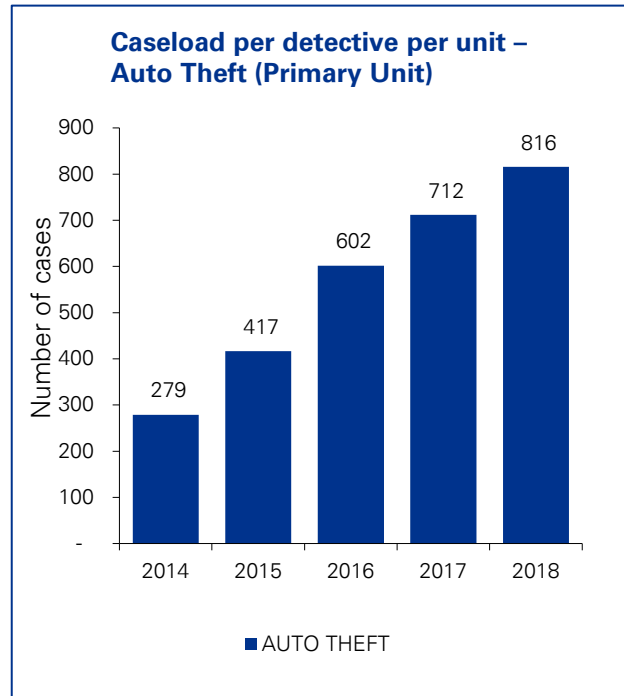
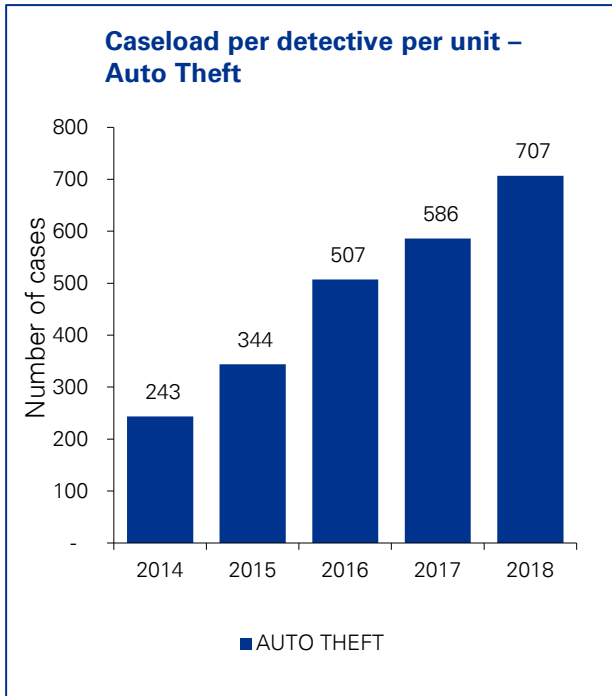
Auto Theft Unit

While caseload size differed across the two graphs for the Auto Theft Unit, there appears to be a clear trend toward larger caseloads from 2014 to 2018. Averaging the figures from the two methodologies, the caseload per detective for this unit increased by nearly 200 percent from 2014 to 2018.

⁴⁶ “Allocation of Personnel: Investigations,” 2014, Sheriff William Prummell, <https://www.evawintl.org/Library/DocumentLibraryHandler.ashx?id=604>; Report on the Staffing and Workload Study, Matrix Consulting Group, February 22, 2019.

Studies of industry standards find an average of 12 to 20 active property crimes cases per detective per month.⁴⁷ This would yield a range of 144 to 240 cases per year, in line with the DPD Auto Theft Unit's average of 174 to 198.*

However, it is important to note that, given the data available, the caseload figures in this analysis include all cases assigned to a unit, which may include "no leads" cases and suspended cases and, therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.



Source: DPD offenses data

*The range depicted lists the average caseload across all years from each methodology.

Crimes against Children Squad

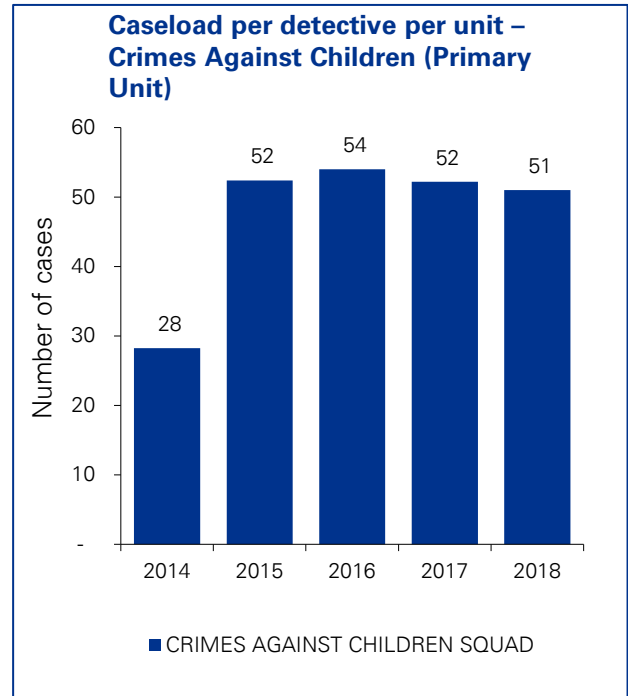
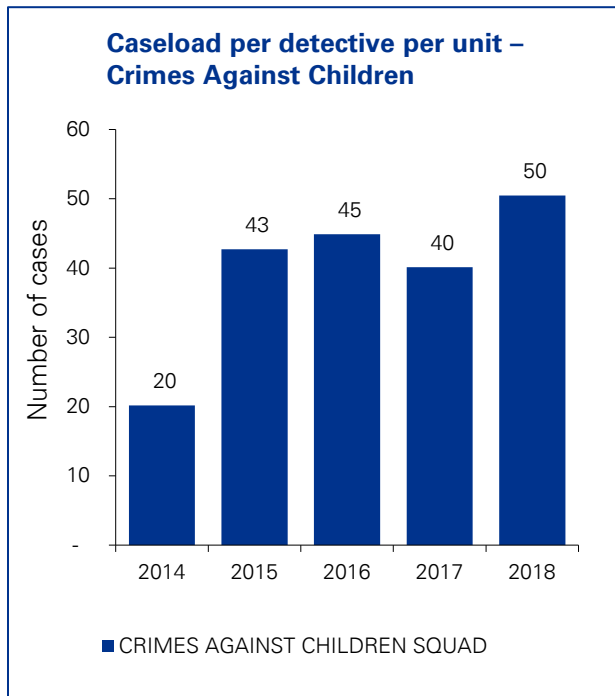
Based on the findings displayed in the graphs below, the caseloads of investigators in the Crimes against Children Squad appear to have grown significantly from 2014 to 2015, and held relatively steady since then at 40 to 50 cases per detective per year. Averaging the figures from the two methodologies, the caseload per detective for this unit increased by 110 percent from 2014 to 2018.

In benchmark locality Fort Worth, Crimes against Children Unit investigators have an average caseload of 177 cases per year. DPD's Crimes against Children Squad caseloads average 40 to 48 cases per year.* An industry study of investigator productivity in the state of Florida identified an industry standard of 72 to 96 cases per detective per year for major crimes such as those investigated by the Crimes against Children Squad.⁴⁸

⁴⁷ Report on the Staffing and Workload Study, Matrix Consulting Group, February 22, 2019.

⁴⁸ "Allocation of Personnel: Investigations," 2014, Sheriff William Prummell, <https://www.evawintl.org/Library/DocumentLibraryHandler.ashx?id=604>.

A separate review of industry standards nationwide finds an average of 8 to 12 active crimes against persons cases per detective; this caseload may fall as low as 5 to 8 active cases per detective for more complex cases or sex crimes.⁴⁹



However, it is important to note that, given the data available, the caseload figures in this analysis include all cases assigned to a unit, which may include “no leads” cases and suspended cases and, therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.

Source: DPD offenses data

*The range depicted lists the average caseload across all years from each methodology.

Family Violence Unit

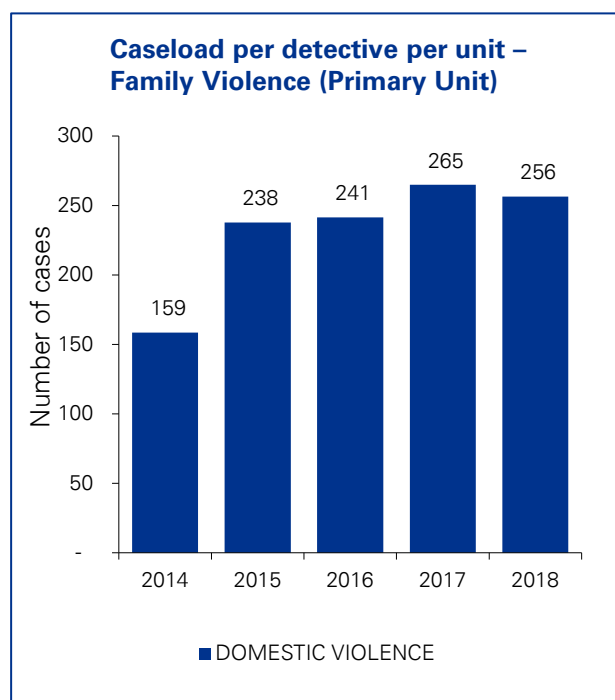
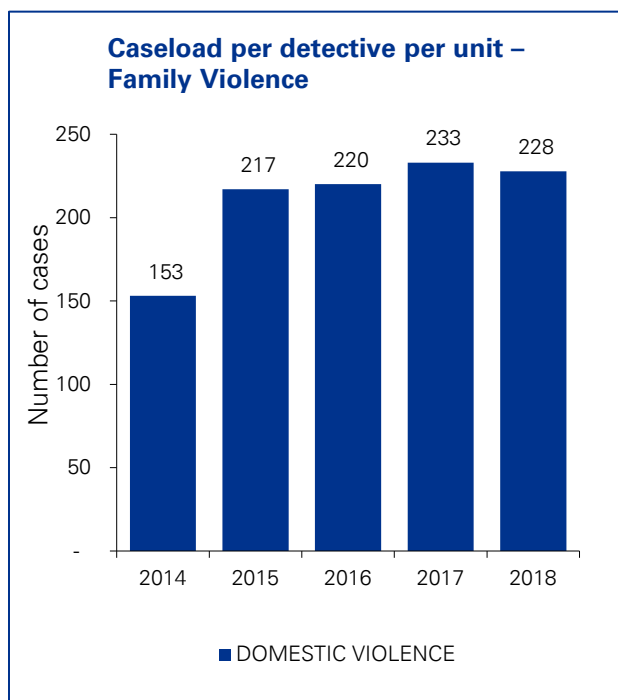
The two methodologies produce results that are in general alignment for the Family Violence Unit. Caseloads appear to have grown from approximately 150 to 160 per detective in 2014 to 230 to 260 per detective in recent years. Averaging the figures from the two methodologies, the caseload per detective for this unit increased by 55 percent from 2014 to 2018.

Studies of industry standards find an average of 20 to 30 active domestic violence cases per detective per month.⁵⁰ This would yield an industry standard range of 240 to 360 cases per year, in line with the DPD Family Violence Unit caseloads average of 210 to 232 cases per year.*

⁴⁹ Report on the Staffing and Workload Study, Matrix Consulting Group, February 22, 2019.

⁵⁰ Ibid.

However, it is important to note that, given the data available, the caseload figures in this analysis include all cases assigned to a unit, which may include “no leads” cases and suspended cases and, therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.



Source: DPD offenses data

*The range depicted lists the average caseload across all years from each methodology.

Financial Crimes Unit

While there is variation in the caseloads produced by the two methodologies, caseloads for the Financial Crimes Unit appear to be in the general range of 100 to 150 cases per detective per year. Averaging the figures from the two methodologies, the caseload per detective for this unit increased by 49 percent from 2014 to 2018.

Studies of industry standards find an average of 10 to 20 active white collar crime cases per detective per month, although this range can fall to 8 to 12 for more complex cases.⁵¹ Similarly, in a study of investigator productivity in the state of Florida, Prummell identifies an industry standard of 12 to 15 cases per detective per month for property crimes.⁵²

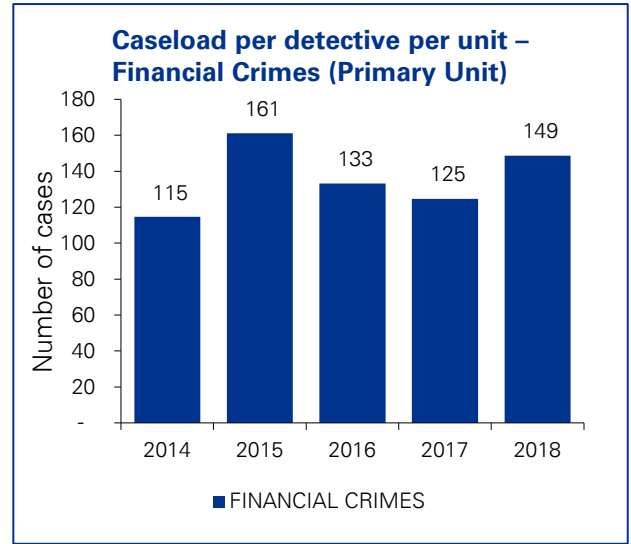
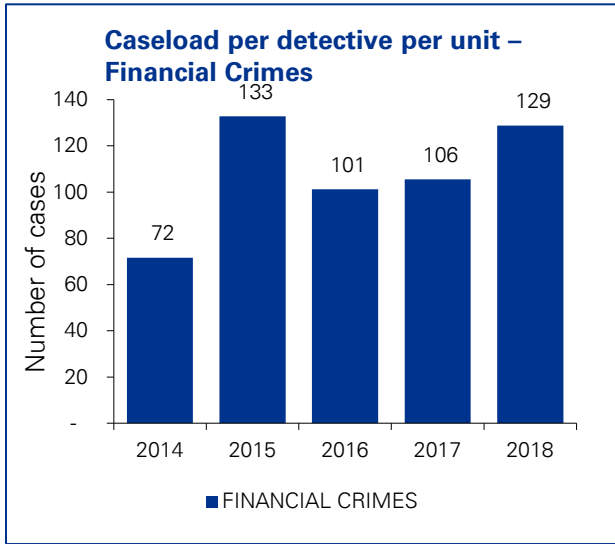
These benchmarking standards yield a range of 96 to 180 cases per year, largely in line with the Financial Crime Unit’s average caseload of 108 to 136 cases per year.*

However, it is important to note that, given the data available, the caseload figures in this analysis include all cases assigned to a unit, which may include “no leads” cases and suspended cases and,

⁵¹ Report on the Staffing and Workload Study, Matrix Consulting Group, February 22, 2019.

⁵² “Allocation of Personnel: Investigations,” 2014, Sheriff William Prummell, <https://www.evawintl.org/Library/DocumentLibraryHandler.ashx?id=604>.

therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.

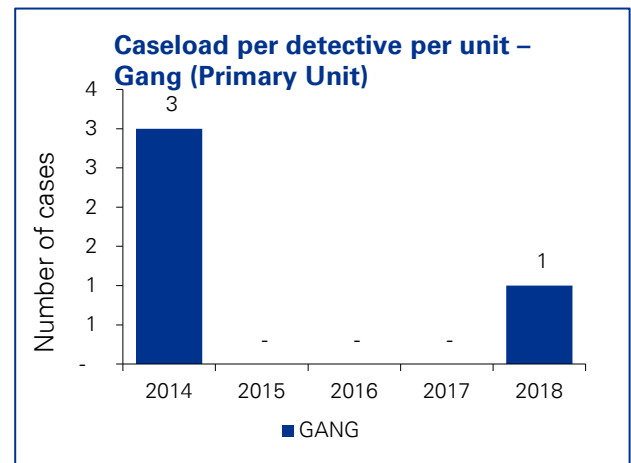
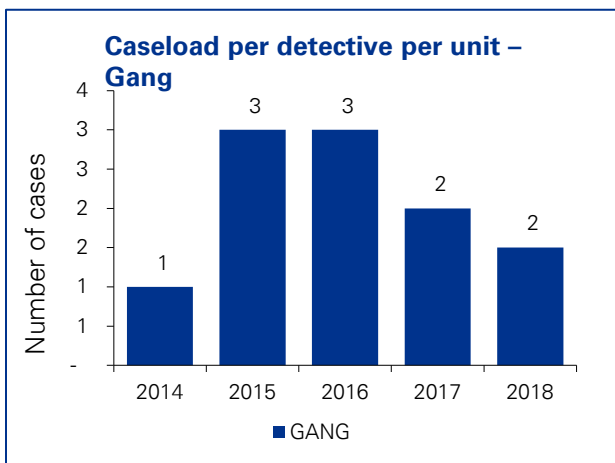


Source: DPD offenses data

*The range depicted lists the average caseload across all years from each methodology.

Gang Unit

Only a small number of entries in the offenses data set are recorded as being handled by the Gang Unit. Through validation with DPD, the project team was told that offenses typically are not assigned to the Gang Unit as the primary unit. Rather, they are assigned to investigators from a separate unit as the primary unit, with the Gang Unit playing a secondary role. These data recording practices may explain the lower caseloads and gaps in data in the graphs below.



Source: DPD offenses data

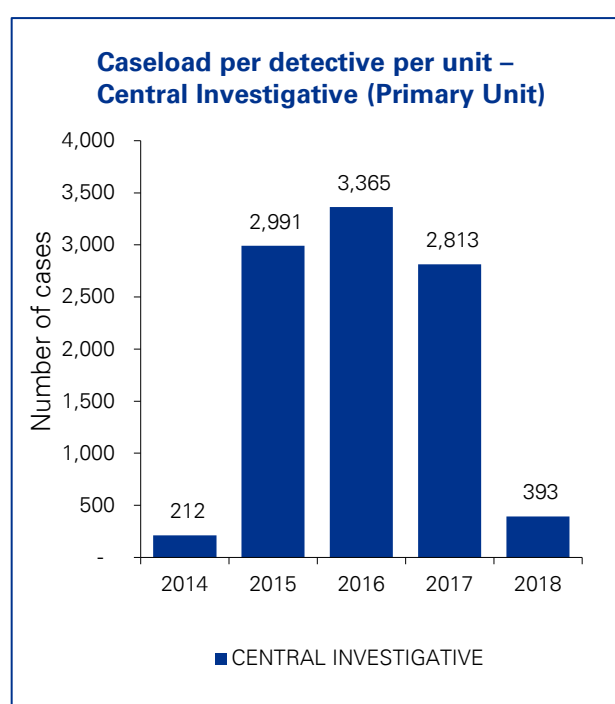
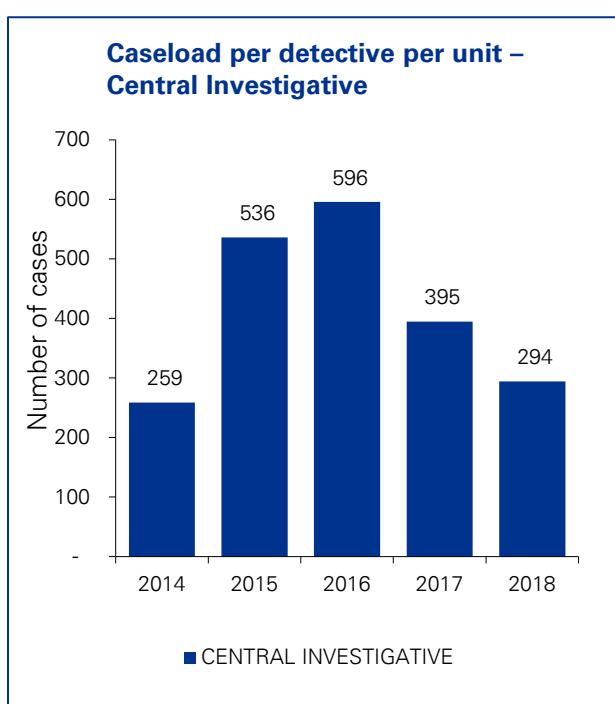
Property Crimes Units

Central Investigations Unit

The primary unit data set for the Central Investigations Unit produces unlikely caseload sizes for 2015 through 2017. As a result, it is difficult to verify whether the caseload sizes produced in either analysis are reliable. Averaging the figures from the two methodologies, the caseload per detective for this unit increased by 46 percent from 2014 to 2018.

Studies of industry standards find an average of 12 to 20 active property crimes cases per detective per month.⁵³ This would yield a range of 144 to 240 cases per year.

However, it is important to note that, given the data available, the caseload figures in this analysis include all cases assigned to a unit, which may include “no leads” cases and suspended cases and, therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.



Source: DPD offenses data

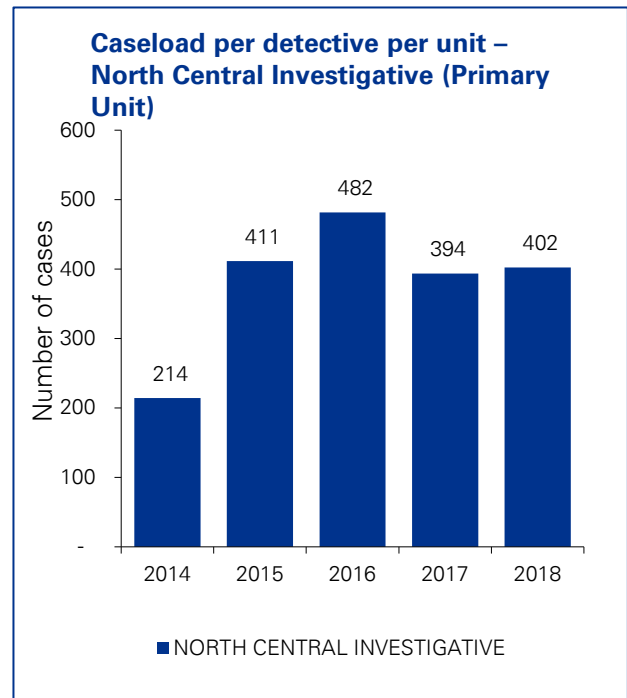
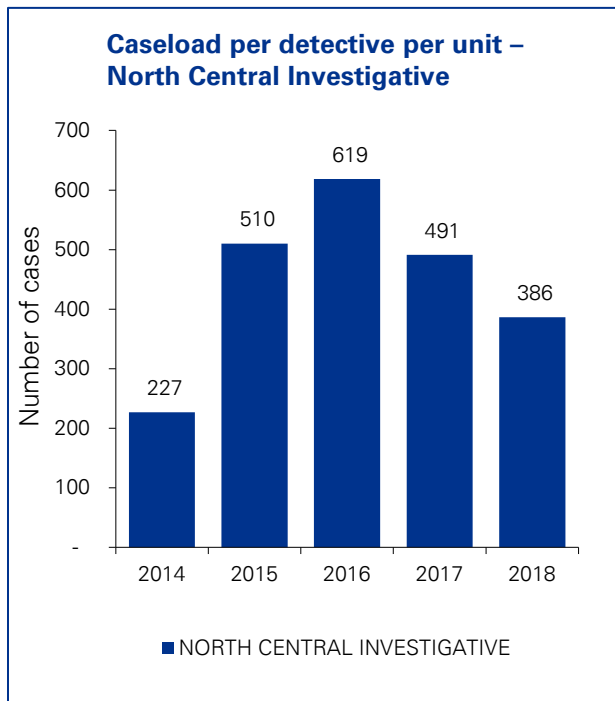
North Central Investigations Unit

While there were significant differences in caseload size between the two methodologies, caseloads in the North Central Investigations Unit appear to have grown from 2014 to 2016 and before declining in recent years, perhaps hovering around 400 cases per detective per year in 2018. Averaging the figures from the two methodologies, the caseload per detective for this unit increased by 79 percent from 2014 to 2018.

⁵³ Report on the Staffing and Workload Study, Matrix Consulting Group, February 22, 2019; “Allocation of Personnel: Investigations,” 2014, Sheriff William Prummell, <https://www.evawintl.org/Library/DocumentLibraryHandler.ashx?id=604>.

Studies of industry standards find an average of 12 to 20 active property crimes cases per detective per month. This would yield a range of 144 to 240 cases per year, below the North Central Investigations Unit’s caseload range.

However, it is important to note that, given the data available, the caseload figures in this analysis include all cases assigned to a unit, which may include “no leads” cases and suspended cases and, therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.



Source: DPD offenses data

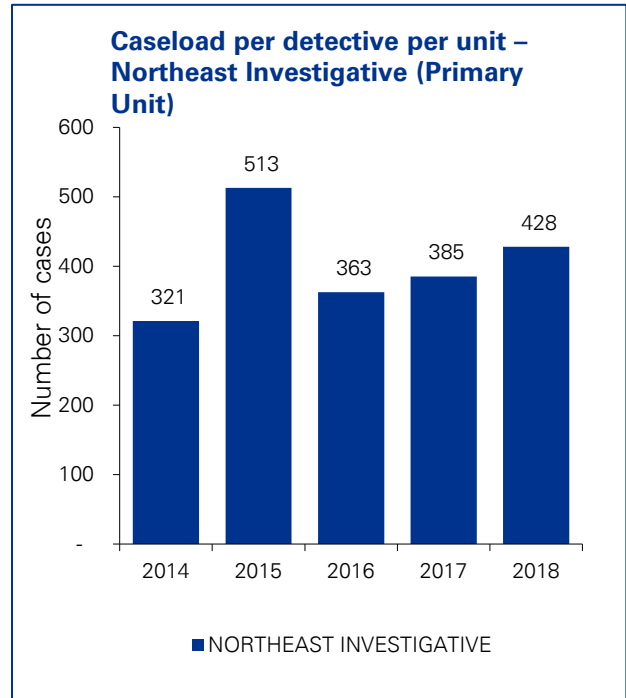
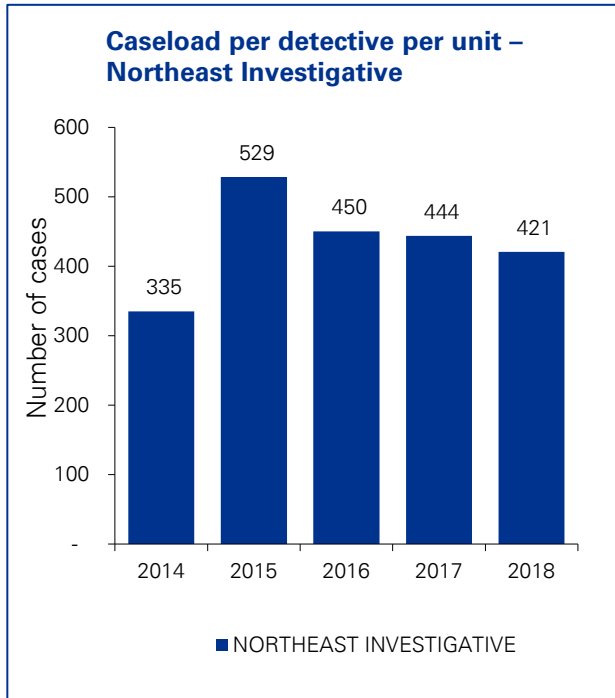
*The range depicted lists the average caseload across all years from each methodology.

Northeast Investigations Unit

The two methodologies produce results that largely correlate for the Northeast Investigations Unit. Caseload sizes appear to have grown from approximately 330 cases in 2014 to a peak of approximately 500 cases in 2015, before trending down into the 400s in recent years. Averaging the figures from the two methodologies, the caseload per detective for this unit increased by 29 percent from 2014 to 2018.

Studies of industry standards find an average of 12 to 20 active property crimes cases per detective per month. This would yield a range of 144 to 240 cases per year, below the Northeast Investigations Unit's caseload range of 402 to 436 cases per year.*

However, it is important to note that, given the data available, the caseload figures in this analysis include all cases assigned to a unit, which may include "no leads" cases and suspended cases and, therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.



Source: DPD offenses data

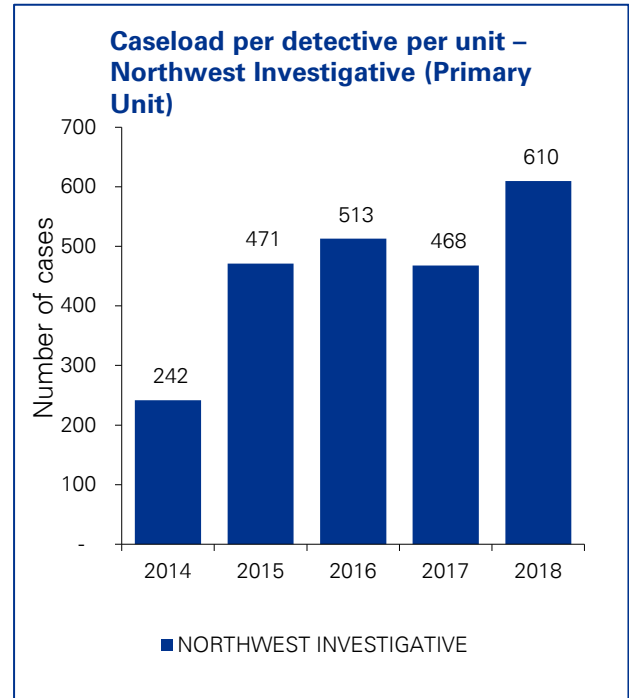
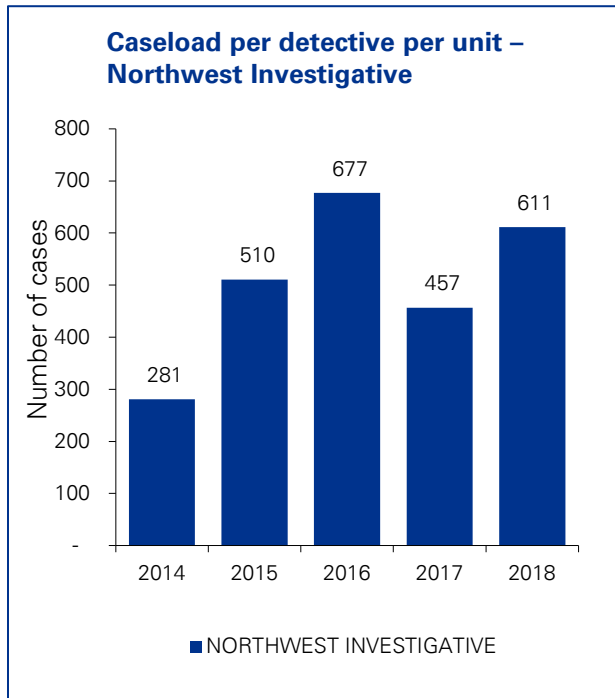
*The range depicted lists the average caseload across all years from each methodology.

Northwest Investigations Unit

While there are variations in the data for 2014 to 2016, the caseload per detective in the Northwest Investigations Unit appears to have been approximately 450 in 2017 and 600 in 2018. Averaging the figures from the two methodologies, the caseload per detective for this unit increased by 134 percent from 2014 to 2018.

Studies of industry standards find an average of 12 to 20 active property crimes cases per detective per month. This would yield a range of 144 to 240 cases per year, below the Northwest Investigations Unit’s caseload range of 461 to 507 cases per year.*

However, it is important to note that, given the data available, the caseload figures in this analysis include all cases assigned to a unit, which may include “no leads” cases and suspended cases and, therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.



Source: DPD offenses data

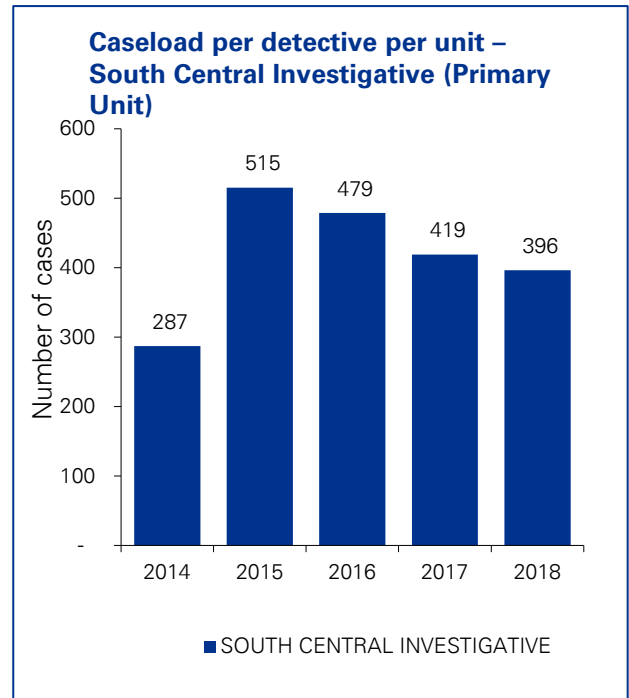
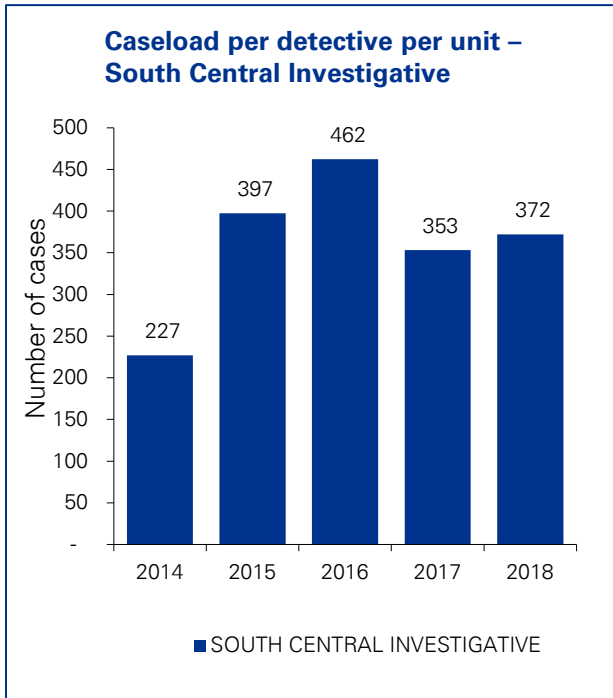
*The range depicted lists the average caseload across all years from each methodology.

South Central Investigations Unit

While there is significant variation in the results produced by the two methodologies, the caseload per detective in the South Central Investigations Unit appears to have ranged from 350 to 450 in recent years. Averaging the figures from the two methodologies, the caseload per detective for this unit increased by 49 percent from 2014 to 2018.

Studies of industry standards find an average of 12 to 20 active property crimes cases per detective per month. This would yield a range of 144 to 240 cases per year, below the South Central Investigations Unit’s caseload range of 362 to 419 cases per year.*

However, it is important to note that, given the data available, the caseload figures in this analysis include all cases assigned to a unit, which may include “no leads” cases and suspended cases and, therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.



Source: DPD offenses data

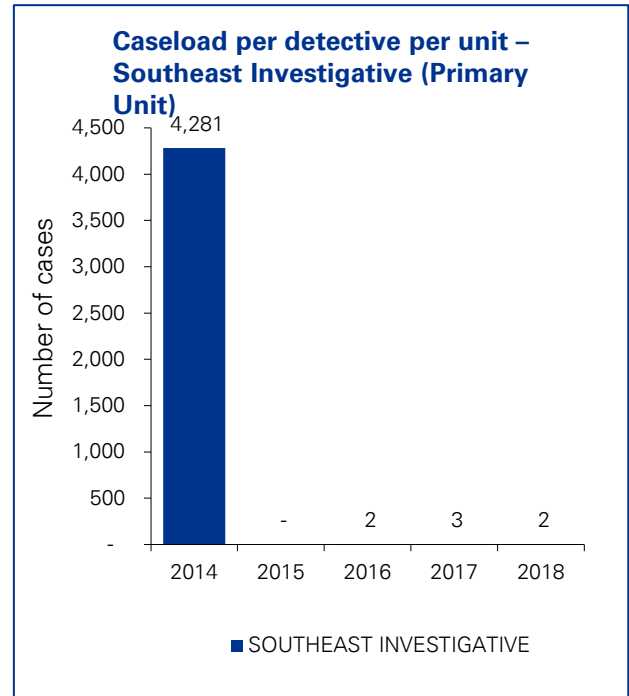
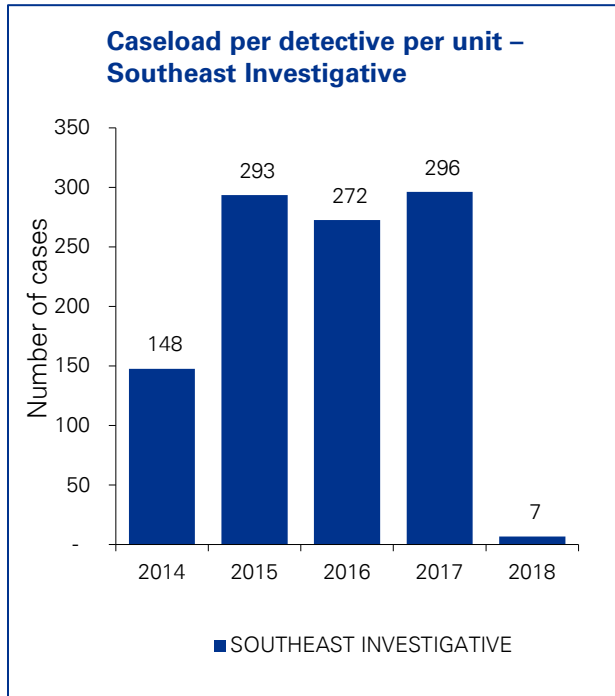
*The range depicted lists the average caseload across all years from each methodology.

Southeast Investigations Unit

The primary unit data set for the Southeast Investigations Unit produces unlikely caseload sizes across all years. As a result, it is difficult to verify whether the caseload sizes produced in the first graph are reliable. Additionally, both methodologies show unusually small caseloads in 2018, which calls into question the reliability of DPD’s data for this unit.

Studies of industry standards find an average of 12 to 20 active property crimes cases per detective per month. This would yield a range of 144 to 240 cases per year.

However, it is important to note that, given the data available, the caseload figures in this analysis include all cases assigned to a unit, which may include “no leads” cases and suspended cases and, therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.



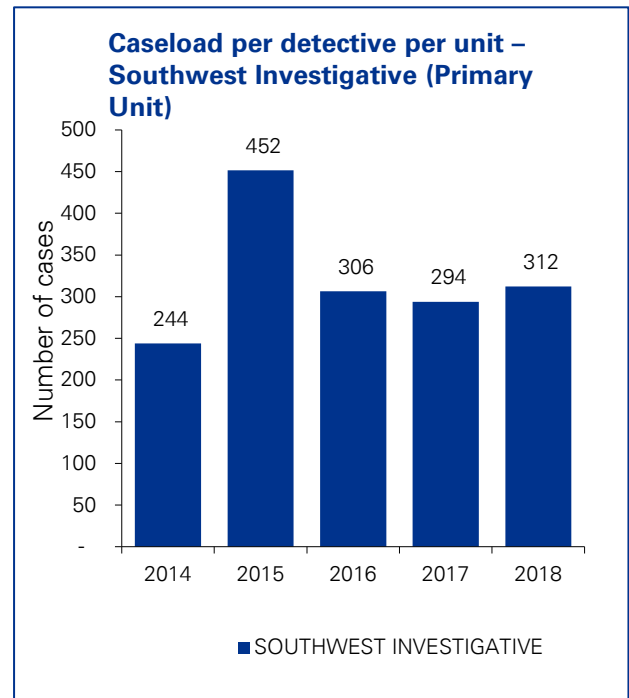
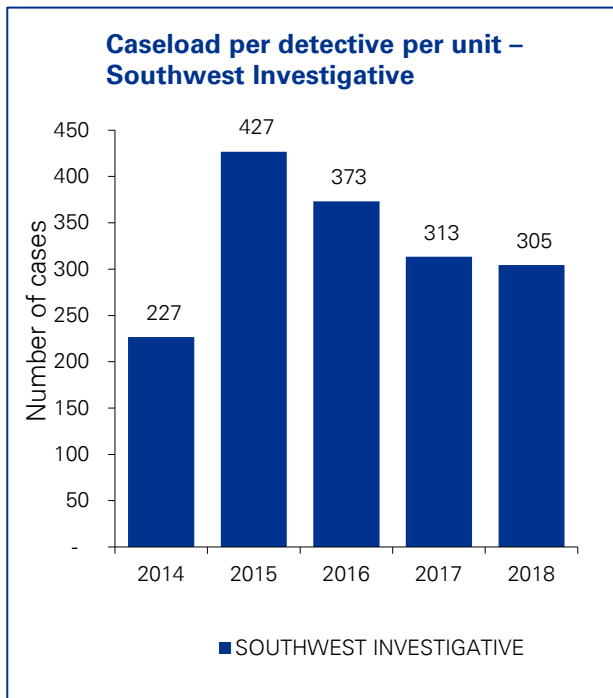
Source: DPD offenses data

Southwest Investigations Unit

There is general alignment between the two methodologies for the Southwest Investigations Unit. Caseloads appear to have increased significantly from 2014 to 2015 before stabilizing at approximately 300 to 350 cases per detective per year in the years since. Averaging the figures from the two methodologies, the caseload per detective for this unit increased by 31 percent from 2014 to 2018.

Studies of industry standards find an average of 12 to 20 active property crimes cases per detective per month. This would yield a range of 144 to 240 cases per year, which is below the Southwest Investigations Unit’s caseload range of 322 to 329 cases per year.*

However, it is important to note that, given the data available, the caseload figures in this analysis include all cases assigned to a unit, which may include “no leads” cases and suspended cases and, therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.



Source: DPD offenses data

*The range depicted lists the average caseload across all years from each methodology.

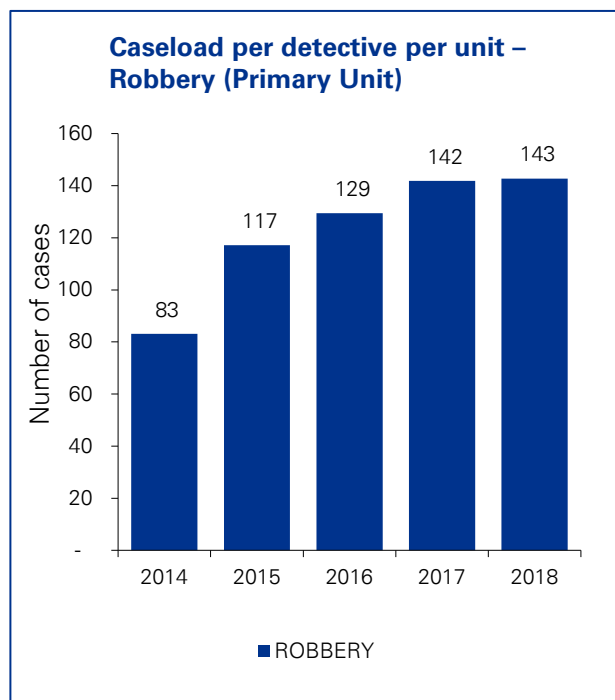
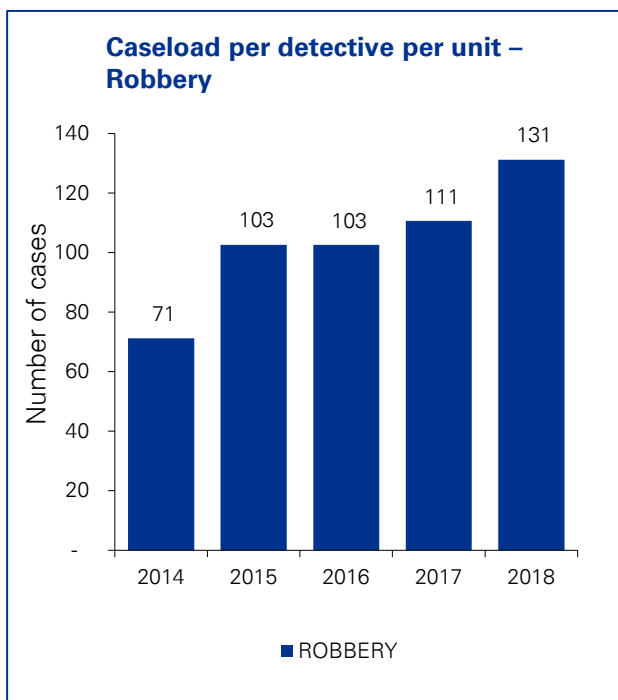
Robbery Unit

Caseloads in the Robbery Unit appear to have grown from 2014 to 2018, reaching approximately 130 to 140 cases per investigator in 2018. Averaging the figures from the two methodologies, the caseload per investigator for this unit increased by 77 percent from 2014 to 2018.

Studies of industry standards find an average of 8 to 12 active crimes against persons cases per detective per month. This would yield a range of 96 to 144 cases per year. Robbery caseloads are typically in line with this level, ranging from 104 to 123 cases per year.* In benchmark city Fort Worth, Robbery detectives have an average caseload of 10.25 cases per month, or 123 per year.⁵⁴

⁵⁴ Report on the Staffing and Workload Study, Matrix Consulting Group, February 22, 2019.

However, it is important to note that, given the data available, the caseload figures in this analysis include all cases assigned to a unit, which may include “no leads” cases and suspended cases and, therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.



Source: DPD offenses data

*The range depicted lists the average caseload across all years from each methodology.

SIU/Homicide Unit

In both methodologies, the caseload per investigator in the SIU/Homicide Unit appears to range from 40 to 60 per year. Averaging the figures from the two methodologies, the caseload per investigator for this unit increased by 48 percent from 2014 to 2018.

There is considerable industry research relating to best practice within homicide investigations. The Justice Department’s Bureau of Justice Assistance (BJA) suggests that investigators work in pairs while investigating homicide cases, thereby allowing one lead investigator and one in a supporting role. For this staffing pattern, BJA recommends investigators have a caseload of three to four cases per year in a lead investigator role, though this number may vary depending on the solvability of the case.⁵⁵ An optimum squad size appears to be one supervisor and four investigators, with investigators rotating as the lead investigator.⁵⁶ This recommendation is based on best practices and on concerns that an

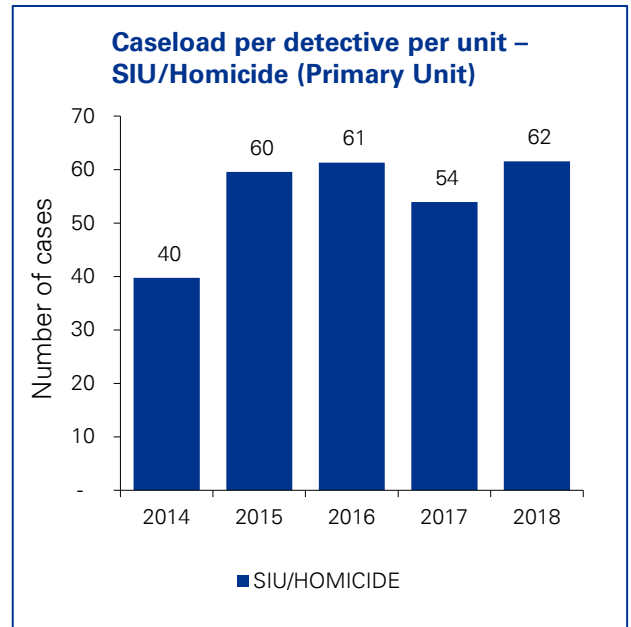
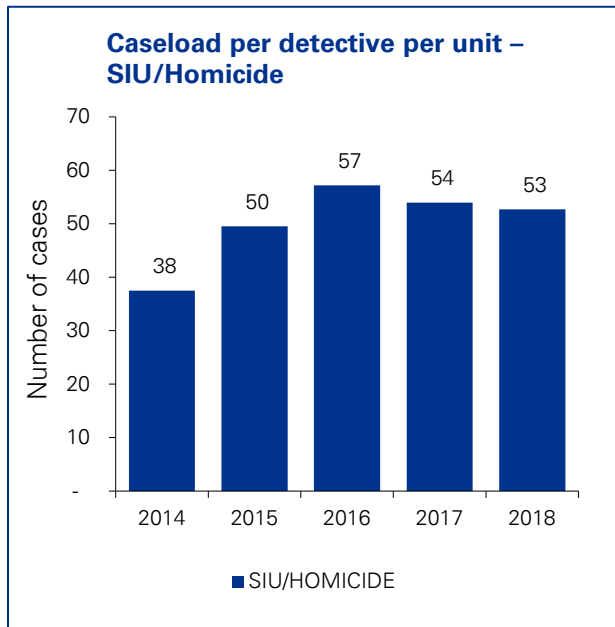
⁵⁵ Promising Strategies for Strengthening Homicide Investigations: Findings and Recommendations from the Bureau of Justice Assistance’s Homicide Investigations Enhancement Training and Technical Assistance Project, October 2018.

⁵⁶ Ibid.

increase in detectives' caseloads can be related to a decline in clearance rates. The average caseload for an LAPD homicide detective is about six new murders per year.⁵⁷

Based on the project team's analysis of DPD's offense data, DPD's SIU/Homicide Unit caseloads range from 50 to 55 cases per year.*

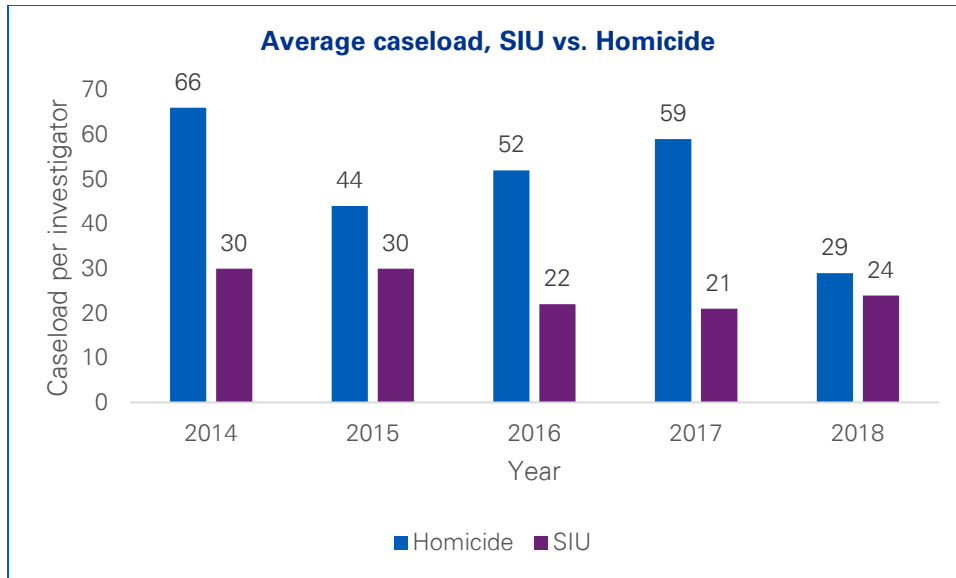
However, it is important to note that, given the data available, the caseload figures in this analysis include all cases assigned to a unit, which may include "no leads" cases and suspended cases and, therefore, comparison against active caseload benchmarks cannot reliably be used to determine workload or staffing requirements.



Source: DPD offenses data

*The range depicted lists the average caseload across all years from each methodology.

⁵⁷ Promising Strategies for Strengthening Homicide Investigations: Findings and Recommendations from the Bureau of Justice Assistance's Homicide Investigations Enhancement Training and Technical Assistance Project, October 2018.



The project team further analyzed the caseload split within the SIU/Homicide unit, as they are aggregated within the data. This analysis found that Homicide caseloads are significantly larger than recommended industry benchmarks, averaging 50 cases per investigator across the five years as opposed to 5 to 8 cases per investigator per year. Homicide caseloads fell significantly in 2018, however, shrinking by 50 percent to 29 cases per investigator.

Year	Investigators, SIU	Investigators, Homicide	Total
2014	5	23	28
2015	7	30	37
2016	11	27	38
2017	9	24	33
2018	13	27	40

Staffing across the SIU/Homicide Unit grew by 40 percent from 28 investigators in 2014 to 40 investigators in 2018. The number of investigators dedicated to SIU cases more than doubled during this period, from 5 to 13. The number of investigators focused on homicides grew by 4 investigators, or 17 percent.

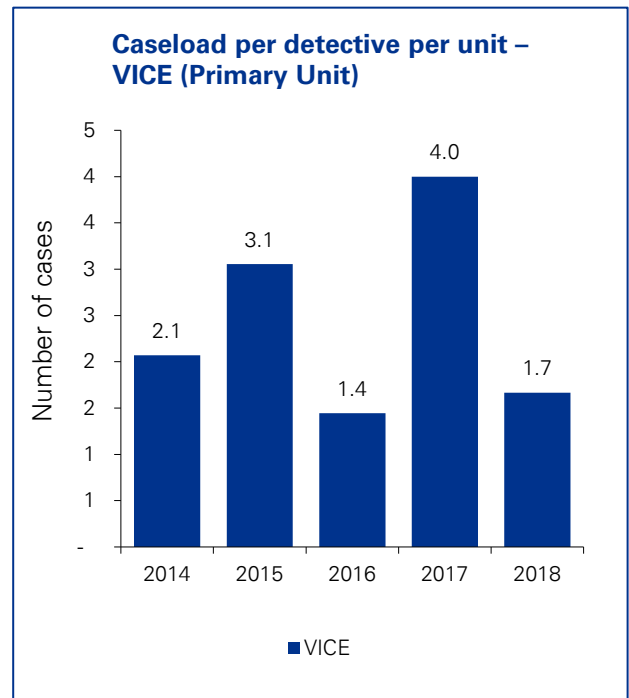
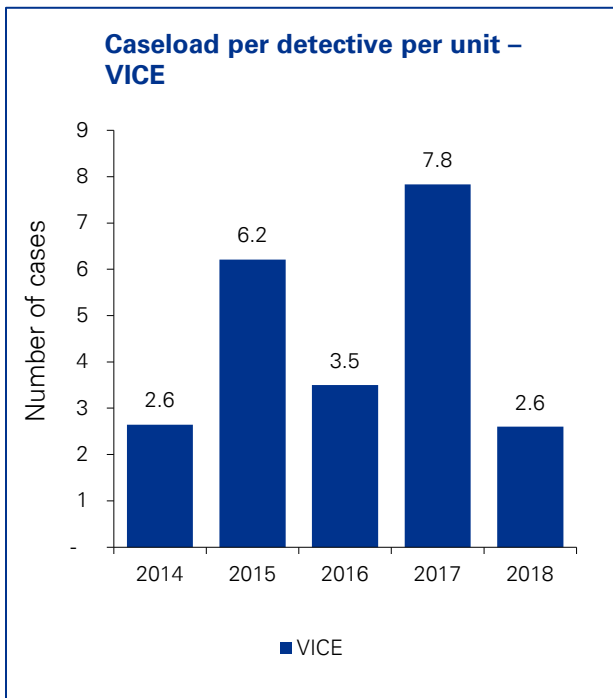
Based on these findings, the caseload for SIU investigators declined slightly from 2014 to 2018, as both the number of cases and number of staff grew. The caseload for homicide investigators fell as the number of homicide cases declined significantly in 2018.

Year	Cases, SIU	Cases, Homicide	Total
2014	150	1,528	1,678
2015	213	1,334	1,547
2016	240	1,412	1,652
2017	185	1,414	1,599
2018	308	789	1,097

The number of cases investigated by the unit declined by 35 percent from 2014 to 2018. This decline occurred in the number of homicide cases investigated, which declined by approximately 50 percent over the five-year period. The number of SIU cases each year approximately doubled during this period.

VICE Unit

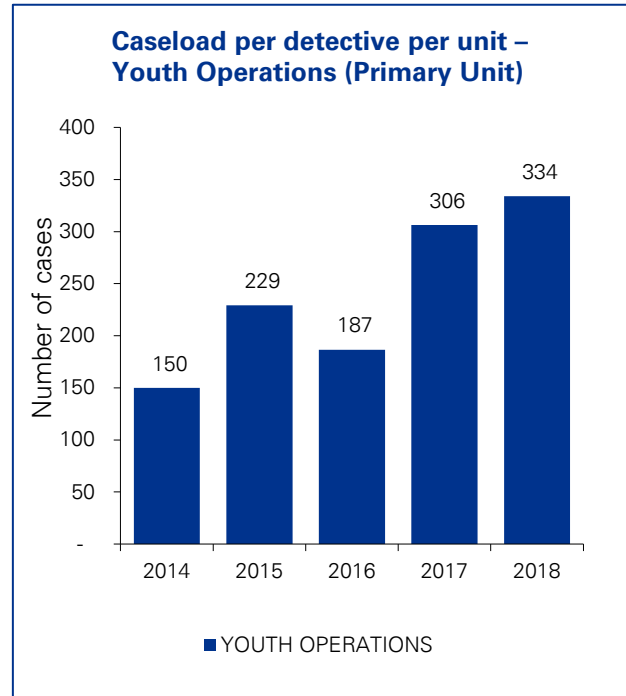
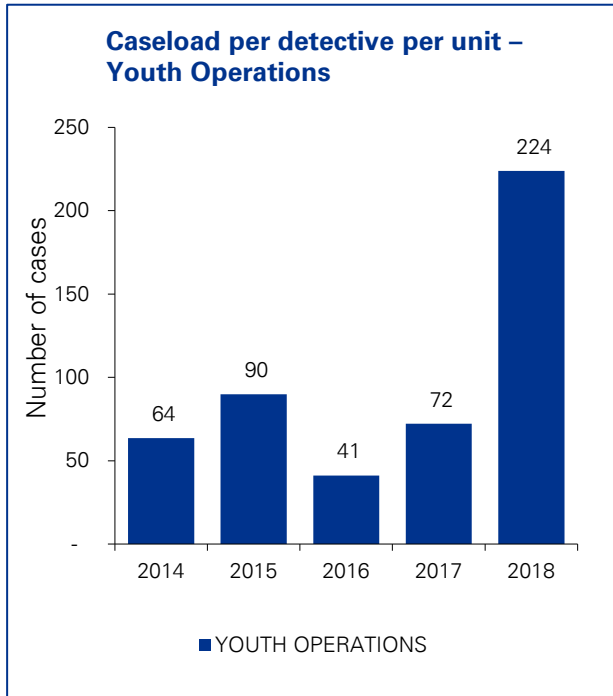
Caseloads in the VICE Unit are extremely small in comparison to other units in both sets of analyses, with the caseload per detective per year ranging from one to eight. It should be noted that the VICE Unit was merged into the Narcotic Unit in November 2017 due to staffing reductions. As of July 2018, it has been reestablished as an independent investigations unit.



Source: DPD offenses data

Youth Operations Unit

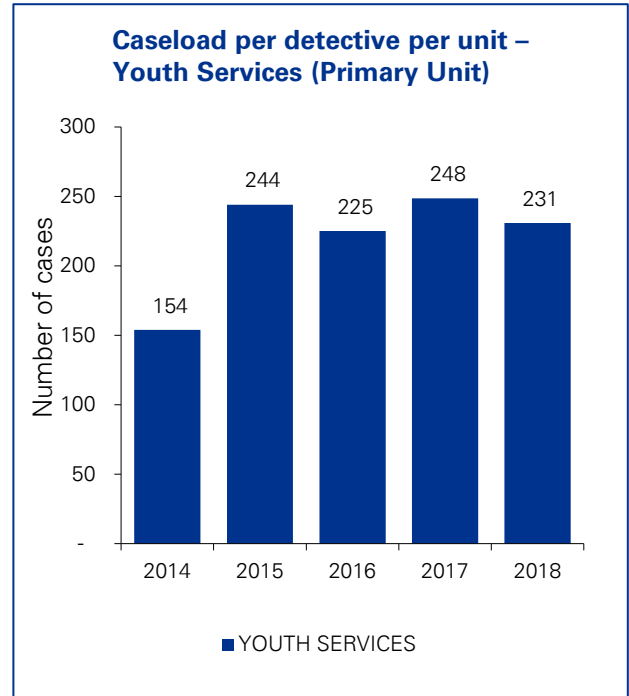
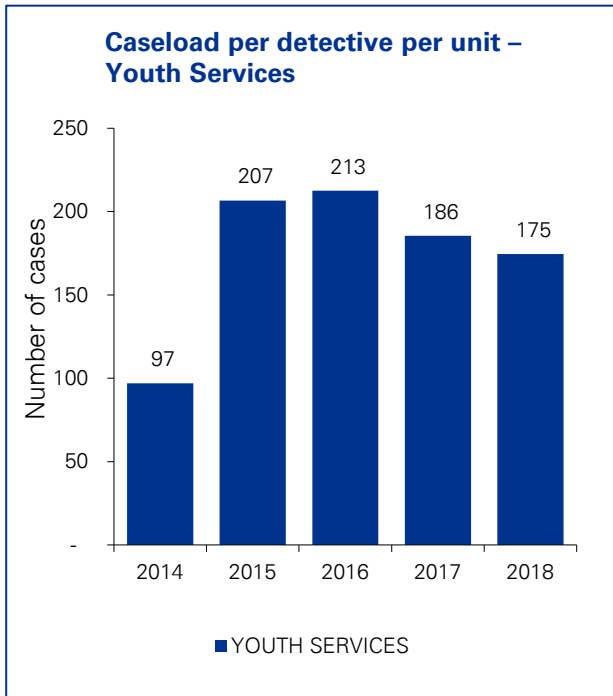
There is significant variation between the findings from the two methodologies for the Youth Operations Unit, which makes it difficult to determine an average caseload per detective per year within the unit. Averaging the figures from the two methodologies, the caseload per detective for this unit increased by 161 percent from 2014 to 2018.



Source: DPD offenses data

Youth Services Unit

While there are variations between the two methodologies, it appears reasonable to assume that caseloads for the Youth Services Unit are between 190 and 240 cases per year. Averaging the figures from the two methodologies, the caseload per detective for this unit increased by 62 percent from 2014 to 2018.

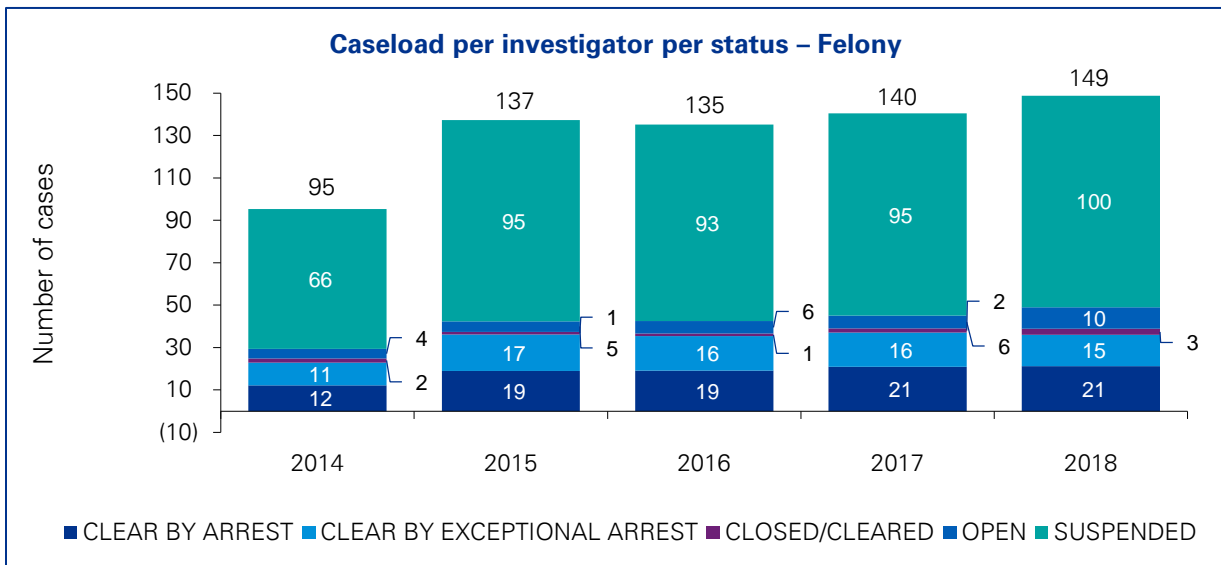


Source: DPD offenses data

Caseload per detective, by disposition

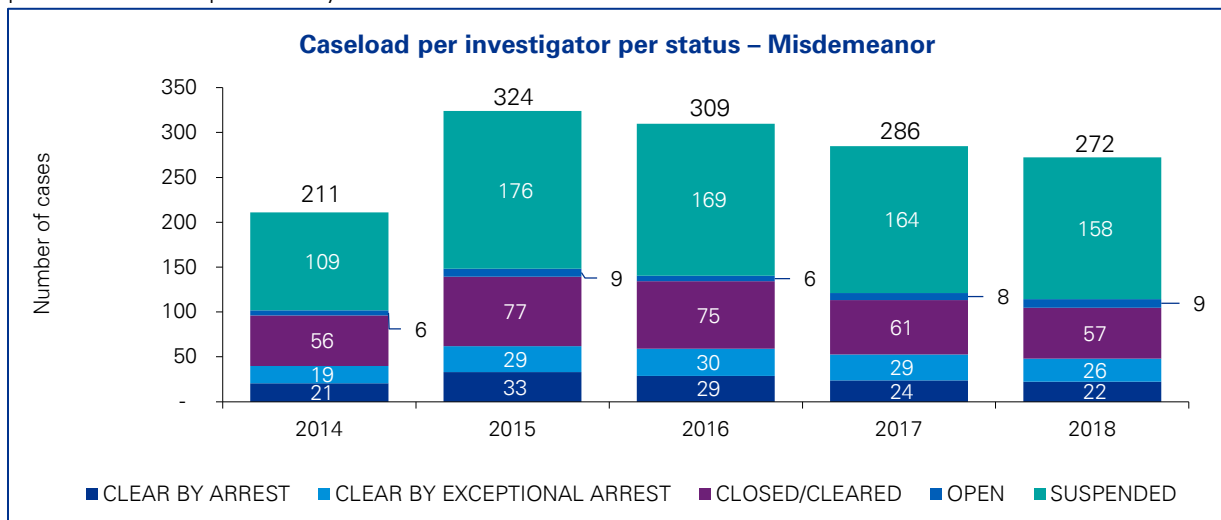
This analysis illustrates the average caseload per investigator, broken down by how the case was resolved: whether it was cleared by arrest, suspended, closed without resolution, or whether the case remains open. The project team cleaned the data used in the calculations below, removing offenses with dispositions marked as N/A and eliminating a small number of offenses labeled as W, CL, D, SW, or Unfounded—which appeared to be outliers or erroneous data.

For felony offenses within each investigator’s caseload, approximately 25 percent were cleared by arrest or exceptional arrest each year, and approximately 70 percent are suspended. Approximately 5 percent of cases remain open, although this number grows to 7 percent in 2018.



Source: DPD offenses data

For misdemeanor offenses within each investigator’s average caseload, 18 to 19 percent result in an arrest; approximately 50 to 60 percent are suspended; 20 to 30 percent are closed/cleared; and 2 to 3 percent remain open each year.



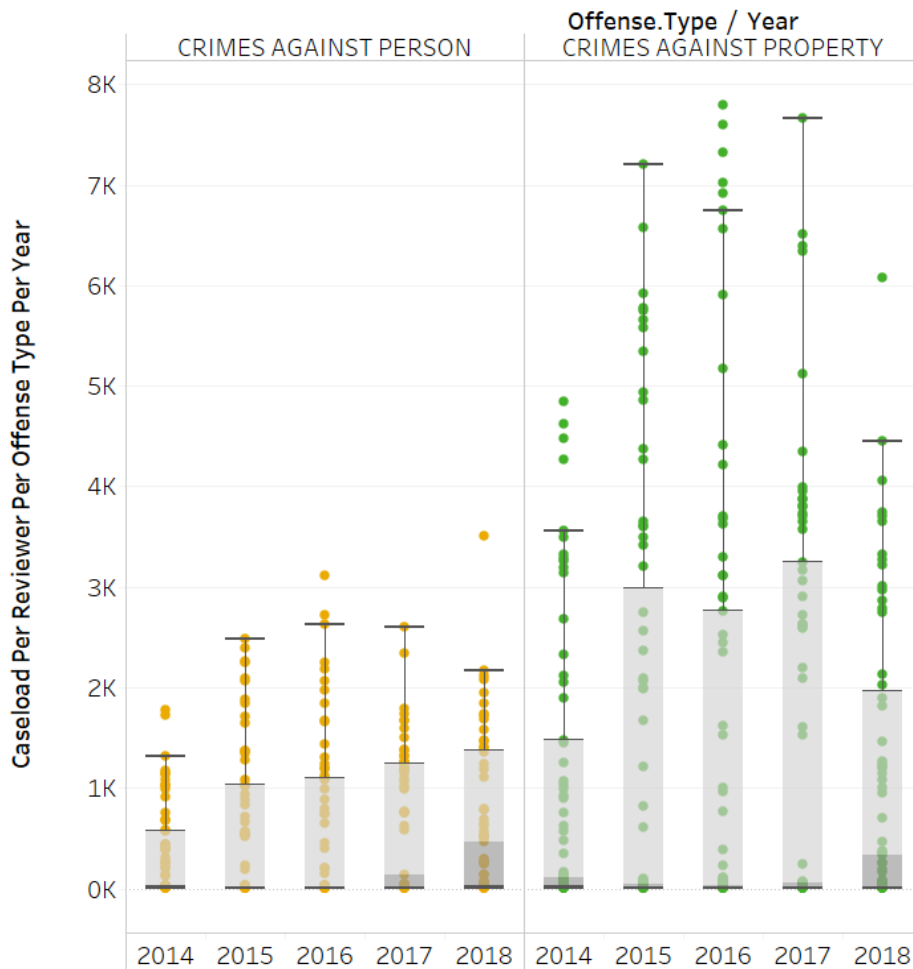
Source: DPD offenses data

Caseload per reviewer per year, by year and offense category

This graph serves to illustrate the wide variance in DPD’s caseload data. There are significant outlier data points showing individuals with caseloads greater than 7,000. This is primarily due to the current data recording practices. The unreliability of the data creates a significant obstacle to determining staffing levels for DPD’s investigative units.

This ratio of reviewers to detectives yields high caseloads per reviewer. The box and whisker chart below depicts the caseload per reviewer across all investigations units, by year and offense category. The gray box highlights caseloads that are in the 25th to 7th percentile in terms of size. The line where the color shifts from light gray to dark gray identifies the median caseload size. DPD’s offenses data set shows significant shifts in the median caseload per review, by year—with significant growth occurring from 2017 to 2018. It is possible that a shift of this magnitude reflects inconsistencies in DPD’s data recording processes.

As discussed in the following pages, industry standards proscribe a caseload of approximately 96 to 144 cases per year for crimes against persons detectives and 156 to 240 cases per year for property crimes detectives. With a detective to reviewer ratio of 7:1, this standard would result in a caseload of approximately 670 to 1,000 for crimes against persons reviewers and 1,100 to 1,700 for property crimes reviewers.



Source: DPD offenses data

Average time per case, by case type

DPD's current data recording practices do not facilitate the recording of time and effort on case management and, therefore, it is not possible to calculate the average number of hours consumed per investigation, by unit. Literature on police investigations staffing, however, does outline a process to use average time consumption data to inform an agency's staffing levels. For example, the Florida Chapter of Association of Police Planning and Research Officers (APPRO) developed a two-part formula to calculate an investigation's personnel needs, which relied on the following average time consumption metrics:⁵⁸

- Burglary: 5.48 hours
- Robbery: 8.90 hours
- Property crime: 3.24 hours
- Person's crime: 6.99 hours
- Aggravated assault/battery: 3.55 hours

The project team's literature review identified similar benchmarks for auto thefts and homicide, drawing on studies of the City of Houston's investigations practices:⁵⁹

- Auto theft: 3 hours
- Homicide: 250 hours

As it assesses its staffing levels, DPD may want to consider modifying its data recording practices in order to enable the calculation of average time per case in its investigations units. Alternatively, DPD can consider using the benchmark metrics above to assess whether its current staffing levels provide sufficient coverage to meet demand for investigations time.

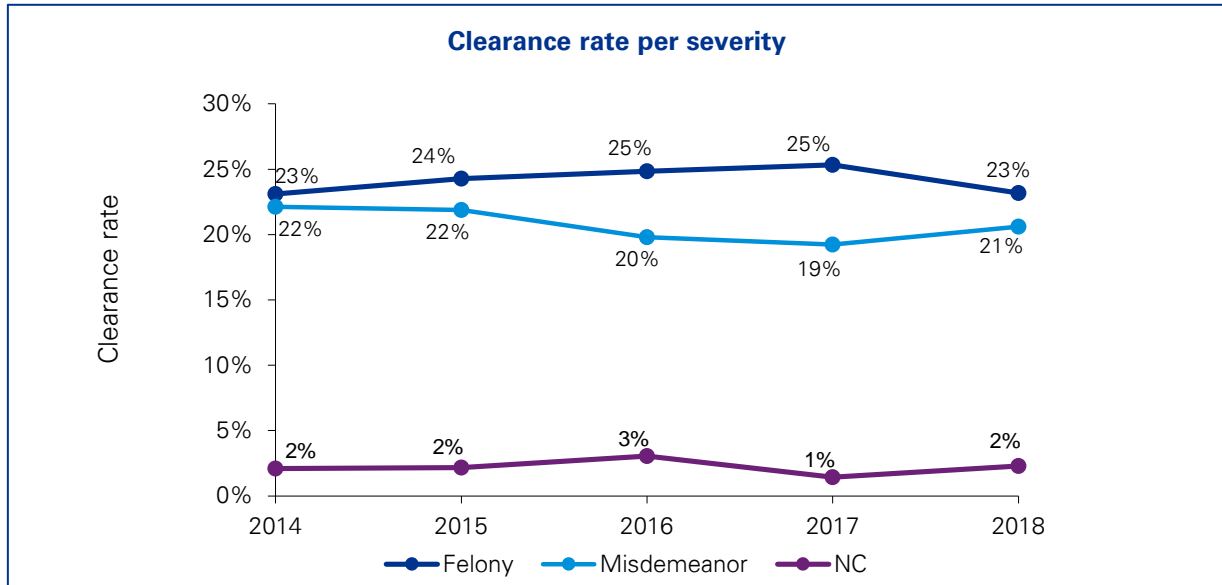
⁵⁸ "Allocation of Personnel: Investigations," 2014, Sheriff William Prummell, <https://www.evavintl.org/Library/DocumentLibraryHandler.ashx?id=604>; "Houston Police Department Operational Staffing Model," Police Executive Research Forum and Justex Systems, Inc., May 2014, https://www.houstontx.gov/hpd_staffing_report-2014may.pdf; Report on the Staffing and Workload Study, Matrix Consulting Group, February 22, 2019.

⁵⁹ "Houston Police Department Operational Staffing Model," Police Executive Research Forum and Justex Systems, Inc., May 2014, https://www.houstontx.gov/hpd_staffing_report-2014may.pdf.

Clearance rate

Clearance rate per severity

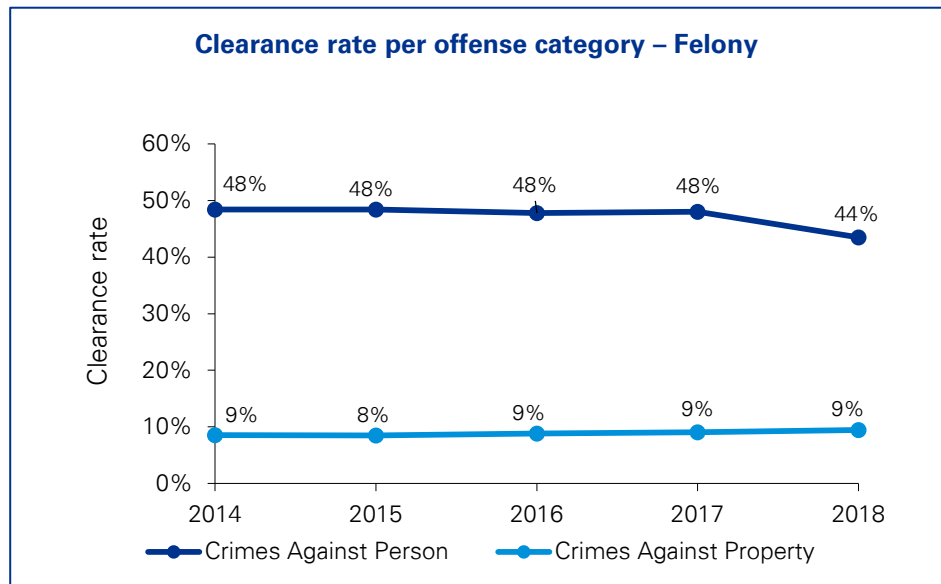
Clearance rates reflect the number of crimes that are “cleared” or solved from the total number of recorded crimes each year. The clearance rate is highest for felonies investigated by DPD, hovering between 23 and 25 percent each year. DPD’s clearance rate for misdemeanors is slightly lower, at 19 to 22 percent per year.



Source: DPD offenses data

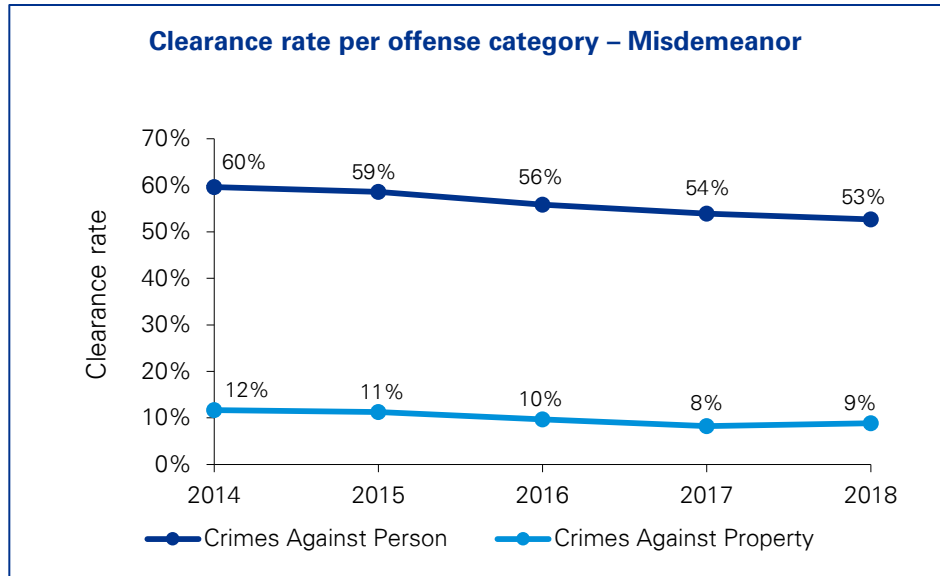
Clearance rate by offense category

Approximately half of felony crimes against persons in Dallas are cleared. This number held steady at 48 percent from 2014 to 2017, before declining slightly to 44 percent in 2018. It is possible this 2018 rate will rise, as 5 percent of felony cases from that year remain open. Felony property crimes have a lower clearance rate at 8 to 9 percent each year.



Source: DPD offenses data

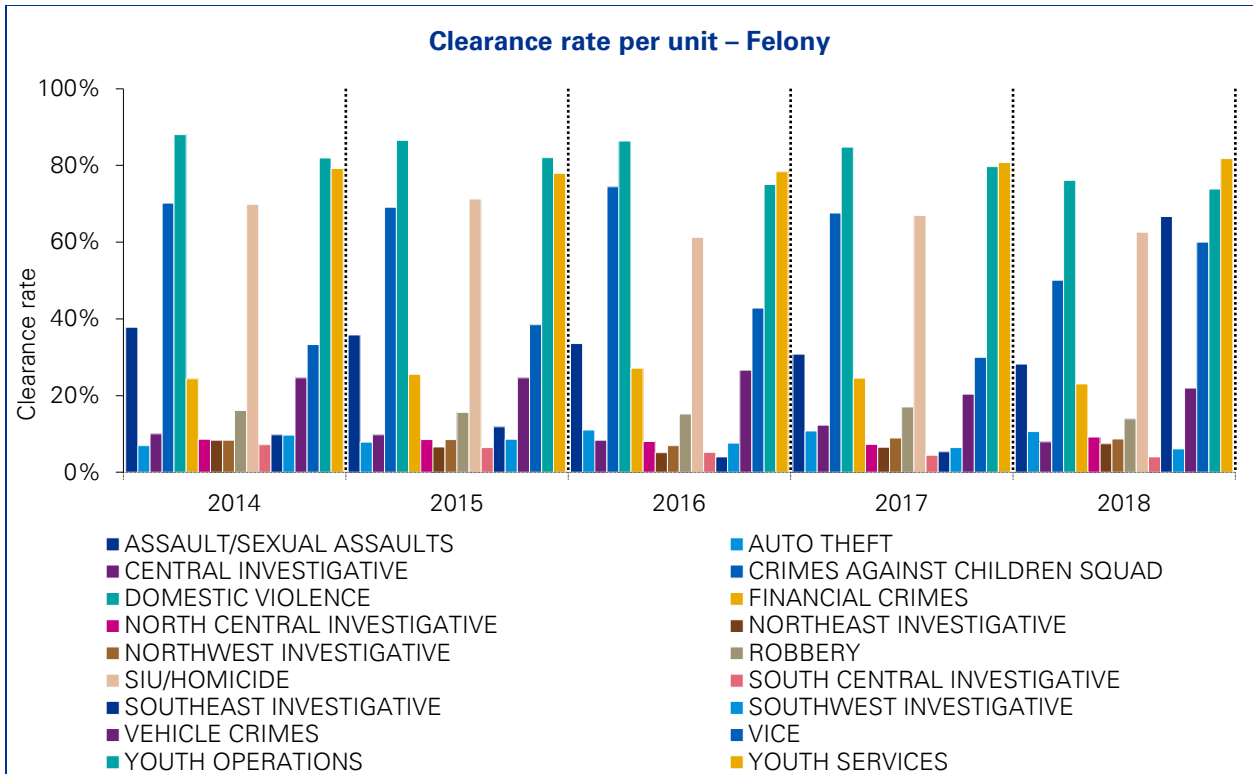
Misdemeanor crimes against persons also have a higher clearance rate than misdemeanor property crimes. The crimes against persons clearance rate has declined since 2014, falling from 60 percent in 2014 to 54 percent and 53 percent in 2017 and 2018, respectively. It is possible that this 2018 clearance rate may increase slightly, as 2 percent of misdemeanor cases from that year remain open.



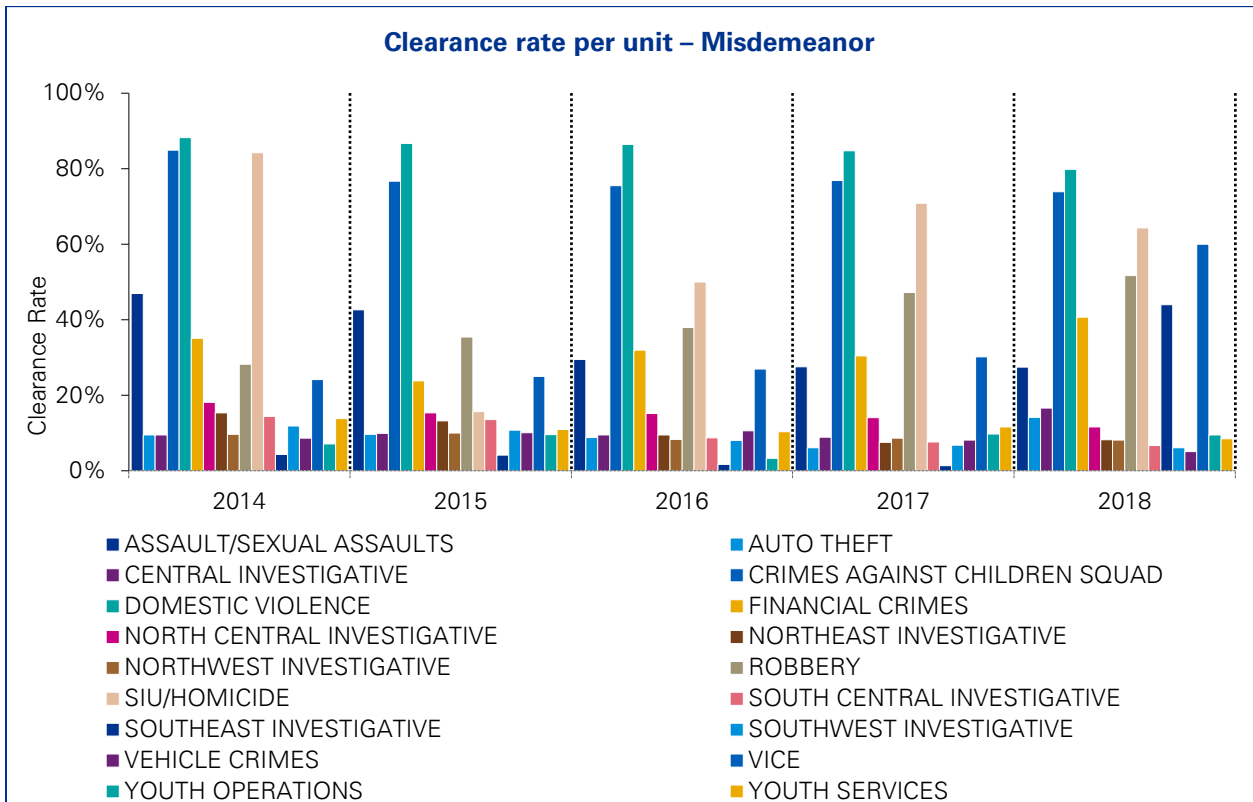
Source: DPD offenses data

Clearance rate per unit

Clearance rates vary significantly by investigations unit, which is in line with the data above suggesting clearance rates depend on the type and complexity of the crime. Felony Family Violence cases have the highest clearance rate, averaging 84 percent across 2014–2018. SIU/Homicide Unit cases average 66 percent across the five years, as does the Crimes against Children Unit. Youth Operations and Youth Services average 79 and 80 percent, respectively. Felony property crimes appear to have the lowest clearance rates, while felony crimes against persons offenses have higher clearance rates. This may stem from the smaller caseloads assigned to felony crimes against persons cases. Data from the Gang Unit was not sufficiently robust for inclusion in this comparison.



Source: DPD offenses data



Source: DPD offenses data

At the misdemeanor level, Family Violence crimes again have the highest clearance rate at 85 percent over the five years of data. The Crimes against Children Unit averages a clearance rate of 78 percent. There is significant variability by year in the data for the SIU/Homicide Unit, with clearance rates ranging from 16 percent to 84 percent. At the misdemeanor level, clearance rates for the Youth Operations and Youth Services units are much lower, averaging 8 percent and 11 percent, respectively, from 2014 to 2018. Once again, data from the Gang Unit was not sufficiently robust for inclusion in this comparison.

DPD unit-level clearance rates compared to FBI benchmarks

The FBI’s Uniform Crime Report provides benchmark clearance rates by crime type. For crimes that are handled by a single unit at DPD, the project team has compared that benchmark clearance rate to the relevant unit’s average clearance rate from 2015 to 2017 in the table below. DPD’s clearance rates for felony murder, manslaughter, and rape offenses appear in line with FBI benchmarks. However, DPD’s clearance rates for robbery, aggravated assault, and property crime lag behind the targets established by the FBI.

Clearance rate	Murder and nonnegligent manslaughter	Rape	Robbery	Aggravated assault	Motor vehicle theft	Property crime
FBI benchmark, 2015–2017 average	65%	38%	31%	53%	8%	12.7%
DPD average, 2015–2017 – Felony	67%	33%	16%	33%	10%	7%
DPD average, 2015–2017 – Misdemeanor	N/A	N/A	40%	33%	8%	9%

Source: DPD offenses data and FBI UCR, 2015–2017

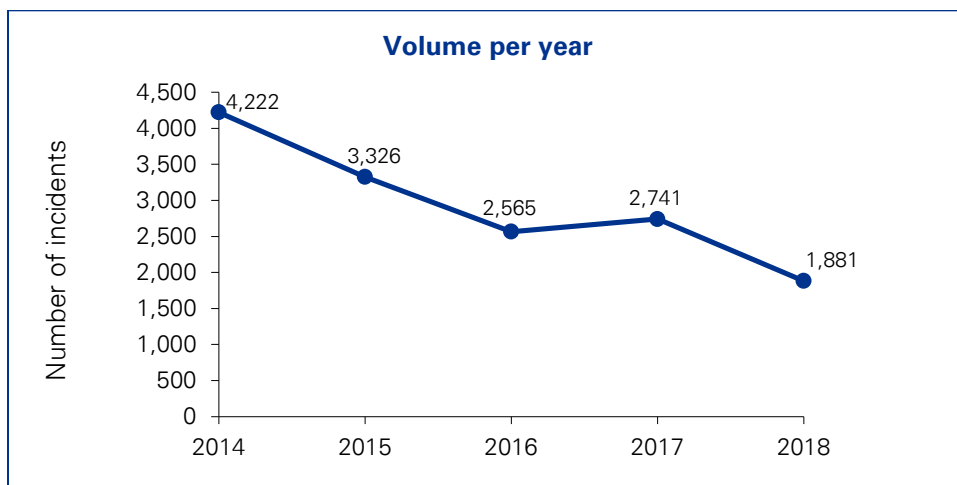
Narcotics Unit analysis

Narcotics Unit data is analyzed separately due to DPD recording practices, which store Narcotic Unit data in a separate database, the CrimeNtel system. Due to the sensitive nature of Narcotics cases, access to case management data was limited. The high-level analysis that could be extracted from the data set provided by DPD is outlined below.

Case volume

The number of annual narcotics incidents fell by 55 percent from approximately 4,200 in 2014 to 1,900 in 2018. This number could be significantly impacted by data recording practices that do not accurately document all cases investigated. Tips are received and recorded in the CrimeNtel system to be assigned to a Narcotics investigator. The tip is investigated; however, it is only recorded within the RMS case management system if the case is ready for submission to the district attorney. This may

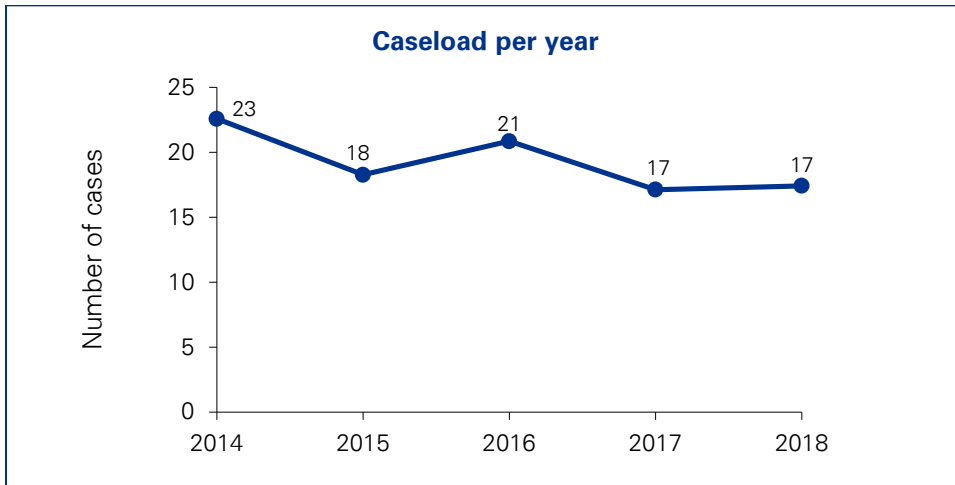
lead to an understated volume of cases and effort within the Narcotics Unit as not all cases investigated are tracked to the same extent.



Source: CrimeNtel and offenses data

Narcotics Unit caseload

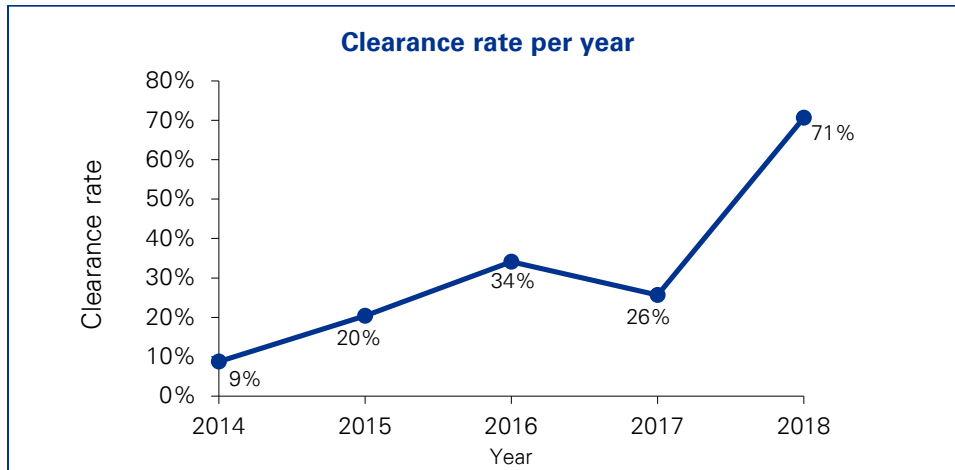
According to the project team's analysis of Narcotics Unit data, investigators average 17 to 23 cases per year. This caseload appears to have declined from 2014 to 2018.



Source: CrimeNtel and offenses data

Narcotics Unit clearance rate

There is significant variability in the clearance rate for the Narcotics Unit by year. Annual clearance rates rose from 9 percent in 2014 to 71 percent in 2018. DPD may benefit from reviewing its data collection practices to determine whether this level of variation reflects actual changes in the Narcotics Unit clearance rate or other factors such as recording practices.



Source: CrimeNtel and offenses data

Conclusion

Conclusion

KPMG's review of the DPD Investigations Division and its staffing revealed some significant findings. First, there is a lack of strategy that guides the historical and current staffing of the DPD Investigations Bureau. The reactive nature of operations has resulted in a staffing framework that is aligned to no specific prioritization of offense categories. Second, there lacks a data-driven performance management framework that would allow for the alignment of staff based on workload and/or performance. This is known because of the poor state of data within the DPD investigations units. Data needs to be improved to accurately capture resourcing factors such as staff movement and overtime usage. Case management data needs to be improved to accurately determine the performance and workload of individual investigators.

This report has provided significant insight into the nature of the DPD Investigations Bureau. KPMG cautions that the data presented here should be viewed as signals or indicators of the Bureau's performance. It is likely that the data sets reviewed are more representative of process and not performance. Where we observe caseloads being reduced, that could be due to less proactive activity with the reduction of special teams that generate their own workload. Where we have seen caseloads or volume increase, this could have been due to new policies focusing on specific crimes, thus creating temporary detection bias in the data sets. Ultimately, the data scientists that evaluated the DPD data were unable to find strong correlations with staffing trends, case volume, caseloads, or other relevant performance factors.

This report provides numerous opportunities for the DPD to improve performance and efficiency. Those opportunities include advancement of the DPD strategy, improvement in processes, changes in data capture, and increased utilization of leading practices for case management. These opportunities, if explored further and changes implemented, would allow the department to determine staffing and evaluate performance on a routine basis. Furthermore, when combined with the other recommendations KPMG is making for the organization, the DPD should expect substantial progress toward fulfilling its organizational vision.

The purpose of this report is not to provide final recommendations on staffing requirements for DPD's Investigations Bureau, but to analyze and evaluate patterns relating to case volume, caseload, investigator utilization, and process improvements. Investigations workload cannot be as easily converted into quantitative methodologies to determine potential staffing requirements, as it can with the Patrol Bureau. As demonstrated within this report, a lack of standardized operating procedures and data recording practices lead to limited and unreliable data upon which staffing decisions should not be made. The requirements for staffing within the Investigations Bureau should be data driven, based on budgetary and overtime data, case management data, and offense data combined to determine the required investigator productivity and utilization to achieve the outcomes desired by the DPD.

Appendices

Appendix C: Data Tracker

Data received	Subject	Date
Telephone Directory	Talent Management	Dec-18
Northeast Patrol Details	Talent Management	Dec-18
Northeast Org Chart INV – December 2018	Talent Management	Dec-18
Northeast Org Chart – December 2018	Talent Management	Dec-18
Sw Detail 1st Watch 12-2018	Talent Management	Dec-18
Sw Detail 2nd Watch 12-2018	Talent Management	Dec-18
Sw Detail 3rd Watch 12-2018	Talent Management	Dec-18
Sw Org Chart Dec 2018 for Division and CEU	Talent Management	Dec-18
Northeast Patrol Division Org Chart and Details	Talent Management	Dec-18
South Central Details	Talent Management	Dec-18
South Central Investigative Unit Org Chart	Talent Management	Dec-18
North Central Org Chart	Talent Management	Dec-18
North Central Details	Talent Management	Dec-18
Northwest Patrol Details and Org Chart	Talent Management	Dec-18
Southeast Patrol Details	Talent Management	Dec-18
Southeast Org Chart December 2018	Talent Management	Dec-18
Narcotics and Traffic Org Chart	Talent Management	Dec-18
Investigations Bureau Org Chart	Talent Management	Dec-18
Central 4th Watch CRT Details	Talent Management	Dec-18
Central Division Watch 1 Detail	Talent Management	Dec-18
Central Patrol Org Chart – December 2018	Talent Management	Dec-18
Central NPO	Talent Management	Dec-18
Central Division Watch 2 Detail	Talent Management	Dec-18
Central Division Watch 3 Detail	Talent Management	Dec-18
Central 1st	Talent Management	Dec-18
Central 2nd	Talent Management	Dec-18
Central 3rd	Talent Management	Dec-18
Central Investigative Unit Detail	Talent Management	Dec-18
South Central Patrol Org Chart	Talent Management	Dec-18
North Central Patrol and Investigations Org Chart	Talent Management	Dec-18
Central 2nd Watch CRT Details	Talent Management	Dec-18
Police Technology Org Chart 12-19-2018	Talent Management	Dec-18
Org Chart from IWM	Talent Management	Dec-18
Detention	Talent Management	Dec-18
Environmental	Talent Management	Dec-18
Legal	Talent Management	Dec-18

Open Records	Talent Management	Dec-18
Property Unit	Talent Management	Dec-18
Records	Talent Management	Dec-18
Auto Pound	Talent Management	Dec-18
Communication Services Org Chart Eff 12-26-18	Talent Management	Dec-18
2013-2018 DPD Five Year Strategic Plan.pdf	Reports	Dec-18
130418 - Dallas PD Apr 18 update.ppt	Reports	Dec-18
130617 - DPD Strategy Retreat pres v3.ppt	Reports	Dec-18
Dallas Police Technology Final.pdf	Reports	Dec-18
Jericho study.pdf	Reports	Dec-18
Management and Efficiency Study 2004.pdf	Reports	Dec-18
PSCJ_3_DPD-2018-Strategic-Priorities_Combined_032618.pdf	Reports	Dec-18
DPD Budget History	Financial	Dec-18
Org Chart - October 2018.vsd	Talent Management	Dec-18
Detail sheets BWC	Talent Management	Dec-18
ORG Chart Property Crimes – Oct 2018	Talent Management	Dec-18
NC Master Details	Talent Management	Dec-18
NC Org Chart	Talent Management	Dec-18
NC Division Org Chart December 2018	Talent Management	Dec-18
KPMG_DPD_Crime	Reports	Jan-19
KPMG.mdf	Reports	Jan-19
DPDC FY16 10-01-2015 to 09-30-2016.xlsx (Pay and position schedule)	Talent Management	Jan-19
DPDC FY17 10-01-2016 to 09-30-2017.xlsx (Pay and position schedule)	Talent Management	Jan-19
DPDC FY18 10-01-2017 to 09-30-2018.xlsx (Pay and position schedule)	Talent Management	Jan-19
DPDC FY19 10-01-2018 to 12-04-2018.xlsx (Pay and position schedule)	Talent Management	Jan-19
DPDU FY16 2 02-10-2016 to 06-28-2016.xlsx	Talent Management	Jan-19
DPDU FY16 1 10-01-2015 to 02-09-2016.xlsx	Talent Management	Jan-19
DPDU FY16 3 06-29-2016 to 9-30-2016.xlsx	Talent Management	Jan-19
Org Numbers and Bureaus as of 2019-01-09.xlsx	Talent Management	Jan-19
Meet and Confer 2016 Final Signed Agreement.pdf	Talent Management	Jan-19
December 12, 2018 Agenda Item-81 - Attachment_Memo_120718 (1).pdf	Talent Management	Jan-19
18-1834 Attachments B-4 and B-5 Executive Schedules.pdf	Talent Management	Jan-19
DPDU FY17 2 02-08-2017 to 06-27-2017.xlsx	Talent Management	Jan-19
DPDU FY17 3 06-28-2017 to 09-30-2017.xlsx	Talent Management	Jan-19
Lawson Pay Codes.xlsx	Talent Management	Jan-19
DPDU FY18 1 10-01-2017 to 02-06-2018.xlsx	Talent Management	Jan-19
DPDU FY17 1 10-01-2016 to 02-07-2017.xlsx	Talent Management	Jan-19
DPDU FY18 3 06-27-2018 to 09-30-2018.xlsx	Talent Management	Jan-19
DPDU FY18 2 02-07-2018 to 06-26-2018.xlsx	Talent Management	Jan-19

Personnel_Rules_2017.pdf (Union Pay Rules)	Talent Management	Jan-19
DPDU FY19 10-01-2018 to 12-11-2018.xlsx	Talent Management	Jan-19
AD 3-72 Family and Medical Leave.pdf	Talent Management	Jan-19
Lawson Activity Codes.xlsx	Talent Management	Jan-19
Attrition for FY18 by officer including reason for leaving.xlsx	Talent Management	Jan-19
2019-01-04 DPDU Uniform Base Salaries and special pays.xlsx	Talent Management	Jan-19
2019-01-04 DPDC Civilian Base Salaries and special pays.xlsx	Talent Management	Jan-19
Central_Beats	Patrol	Jan-19
Central_Division	Patrol	Jan-19
Central_Sectors	Patrol	Jan-19
NorthEast_Beats	Patrol	Jan-19
NorthEast_Division	Patrol	Jan-19
NorthEast_Sectors	Patrol	Jan-19
SouthEast_Beats	Patrol	Jan-19
SouthEast_Division	Patrol	Jan-19
SouthEast_Sectors	Patrol	Jan-19
SouthWest_Beats	Patrol	Jan-19
SouthWest_Division	Patrol	Jan-19
SouthWest_Sectors	Patrol	Jan-19
NorthWest_Beats	Patrol	Jan-19
NorthWest_Division	Patrol	Jan-19
NorthWest_Sectors	Patrol	Jan-19
NorthCentral_Beats	Patrol	Jan-19
NorthCentral_Division	Patrol	Jan-19
NorthCentral_Sectors	Patrol	Jan-19
SouthCentral_Beats	Patrol	Jan-19
SouthCentral_Division	Patrol	Jan-19
SouthCentral_Sectors	Patrol	Jan-19
Calls by Problem Type EOY2018	Reports	Jan-19
New Response Time Report_2018_EOY	Reports	Jan-19
NIBRS Daily Arrest Summary EOY2018	Reports	Jan-19
NIBRS EOY Arrest TAAG Summary_2018_EOY	Reports	Jan-19
NIBRS EOY Beat Report_2018	Reports	Jan-19
NIBRS EOY RA Report_2018	Reports	Jan-19
NIBRS EOY Ranked TAAG Comparisons_2018_EOY	Reports	Jan-19
NIBRS EOY Sector Report by Watch_2018	Reports	Jan-19
NIBRS EOY Sector Report_2018	Reports	Jan-19
NIBRS EOY Weekly Compstat Report by Watch_2018_EOY	Reports	Jan-19
NIBRS EOY Weekly Compstat Report_2018	Reports	Jan-19
NIBRS Monthly Progression EOY2018	Reports	Jan-19
NIBRS REPORT Admin Daily EOY2018	Reports	Jan-19

NIBRS REPORT Compstat Daily by Watch EOY2018	Reports	Jan-19
NIBRS REPORT Compstat Daily EOY2018	Reports	Jan-19
NIBRS REPORT EOY TAAG Compstat_2018	Reports	Jan-19
NIBRS Weekly Admin Council Report EOY_2018	Reports	Jan-19
Patrol Response Time Report_CITY EOY2018	Reports	Jan-19
Admin Compstat Daily Brief EOY2014	Reports	Jan-19
Admin Compstat Daily Brief EOY2013	Reports	Jan-19
Compstat Daily Crime Briefing EOY2012	Reports	Jan-19
Compstat Daily Crime Briefing EOY2015	Reports	Jan-19
Compstat Daily Crime Briefing EOY2016	Reports	Jan-19
Compstat Daily Crime Briefing EOY2017	Reports	Jan-19
NIBRS REPORT Compstat Daily EOY2018 (1)	Reports	Jan-19
Response Times EOY 2012	Reports	Jan-19
Response Times EOY 2013	Reports	Jan-19
Response Times EOY 2014	Reports	Jan-19
Response Times EOY 2015	Reports	Jan-19
Response Times EOY 2016	Reports	Jan-19
Response Times EOY 2017	Reports	Jan-19
Response Times EOY 2018	Reports	Jan-19
407 Transfer Procedures	Reports	Jan-19
2012_2019BidComparisons.xlsx	Talent Management	Jan-19
202 Patrol Bid Process.doc	Talent Management	Jan-19
407 Transfer Procedures.pdf	Talent Management	Jan-19
Sgt Bid Counts.xlsx	Talent Management	Jan-19
TAAG_2018_CouncilDistricts.pdf	Maps	Jan-19
TAAG_By Division.pdf	Maps	Jan-19
Recruiting Background Personnel Basic In-Service Academy 12.24.18.xlsx	Talent Management	Jan-19
Southwest 1st watch Jan14.docx	Patrol Schedules	Jan-19
Southwest 1st watch master.docx	Patrol Schedules	Jan-19
Southwest 2nd watch Jan14.docx	Patrol Schedules	Jan-19
Southwest 2nd watch master.docx	Patrol Schedules	Jan-19
Southeast 1st watch Jan14.docx	Patrol Schedules	Jan-19
Southeast 1st watch master.docx	Patrol Schedules	Jan-19
Southeast 2nd watch Jan14.docx	Patrol Schedules	Jan-19
Southeast 2nd watch master.docx	Patrol Schedules	Jan-19
Southeast 3rd watch Jan14.docx	Patrol Schedules	Jan-19
Southeast 3rd watch master.docx	Patrol Schedules	Jan-19
South Central 1st watch Jan14.docx	Patrol Schedules	Jan-19
South Central 1st watch master.docx	Patrol Schedules	Jan-19
South Central 2nd watch Jan14.docx	Patrol Schedules	Jan-19
South Central 2nd watch master.docx	Patrol Schedules	Jan-19
South Central 3rd watch Jan14.docx	Patrol Schedules	Jan-19
South Central 3rd watch master.docx	Patrol Schedules	Jan-19

Northwest 1st watch Jan14.docx	Patrol Schedules	Jan-19
Northwest 1st watch master.docx	Patrol Schedules	Jan-19
Northwest 2nd watch master.docx	Patrol Schedules	Jan-19
Northwest 2nd watch Jan14.docx	Patrol Schedules	Jan-19
Northwest 3rd watch Jan14.docx	Patrol Schedules	Jan-19
Northwest 3rd watch master.docx	Patrol Schedules	Jan-19
Northeast 1st watch Jan14.docx	Patrol Schedules	Jan-19
Northeast 1st watch Master.docx	Patrol Schedules	Jan-19
Northeast 2nd watch Jan14.docx	Patrol Schedules	Jan-19
Northeast 2nd watch Master.docx	Patrol Schedules	Jan-19
Northeast 3rd watch Jan14.docx	Patrol Schedules	Jan-19
Northeast 3rd Watch Master.docx	Patrol Schedules	Jan-19
North Central 1st watch Jan14.docx	Patrol Schedules	Jan-19
North Central 1st watch master.docx	Patrol Schedules	Jan-19
North Central 2nd watch Jan14.docx	Patrol Schedules	Jan-19
North Central 2nd watch master.docx	Patrol Schedules	Jan-19
North Central 3rd watch Jan14.docx	Patrol Schedules	Jan-19
North Central 3rd watch master.docx	Patrol Schedules	Jan-19
Central 1st Watch Jan 14th.docx	Patrol Schedules	Jan-19
Central 1st Watch Master.docx	Patrol Schedules	Jan-19
Central 2nd watch Jan14.docx	Patrol Schedules	Jan-19
Central 2nd Watch Master.docx	Patrol Schedules	Jan-19
Central 3rd watch Jan 14.docx	Patrol Schedules	Jan-19
Central 3rd Watch Master.docx	Patrol Schedules	Jan-19
Central 2nd Watch CRT Details.pdf	Patrol Schedules	Jan-19
Central 4th Watch CRT Details.pdf	Patrol Schedules	Jan-19
AD 3-72 Family and Medical Leave.pdf	Talent Management	Jan-19
Personnel_Rules_2017.pdf	Talent Management	Jan-19
2015-01 #2 EOM JAN Sworn Strength.pdf	Talent Management	Jan-19
2015-01 #5 EOM JAN Civilian Strength.pdf	Talent Management	Jan-19
2015-02 #2 EOM FEB Sworn Strength.pdf	Talent Management	Jan-19
2015-02 #5 EOM FEB Civilian Strength.pdf	Talent Management	Jan-19
2015-03 #2 EOM MAR Sworn Strength.pdf	Talent Management	Jan-19
2015-03 #5 EOM MAR Civilian Strength.pdf	Talent Management	Jan-19
2015-04 #2 EOM APR Sworn Strength.pdf	Talent Management	Jan-19
2015-04 #5 EOM APR Civilian Strength.pdf	Talent Management	Jan-19
2015-05 #2 EOM MAY Sworn Strength.pdf	Talent Management	Jan-19
2015-05 #5 EOM MAY Civilian Strength.pdf	Talent Management	Jan-19
2015-06 #2 EOM JUN Sworn Strength.pdf	Talent Management	Jan-19
2015-06 #5 EOM JUN Civilian Strength.pdf	Talent Management	Jan-19
2015-07 #2 EOM JUL Sworn Strength.pdf	Talent Management	Jan-19
2015-07 #5 EOM JUL Civilian Strength.pdf	Talent Management	Jan-19
2015-08 #2 EOM AUG Sworn Strength (1).pdf	Talent Management	Jan-19

2015-08 #2 EOM AUG Sworn Strength.pdf	Talent Management	Jan-19
2015-08 #5 EOM AUG Civilian Strength.pdf	Talent Management	Jan-19
2015-09 #2 EOM SEP Sworn Strength.pdf	Talent Management	Jan-19
2015-09 #5 EOM SEP Civilian Strength.pdf	Talent Management	Jan-19
2015-10 #2 EOM OCT Sworn Strength.pdf	Talent Management	Jan-19
2015-10 #5 EOM OCT Civilian Strength.pdf	Talent Management	Jan-19
2015-11 #2 EOM NOV Sworn Strength.pdf	Talent Management	Jan-19
2015-11 #5 EOM NOV Civilian Strength.pdf	Talent Management	Jan-19
2015-12 #2 EOM DEC Sworn Strength.pdf	Talent Management	Jan-19
2016-01 #2 EOM JAN Sworn Strength.pdf	Talent Management	Jan-19
2016-02 #2 EOM FEB Sworn Strength.pdf	Talent Management	Jan-19
2016-02 #5 EOM FEB Civilian Strength.pdf	Talent Management	Jan-19
2016-03 #2 EOM MAR Sworn Strength.pdf	Talent Management	Jan-19
2016-03 #5 EOM MAR Civilian Strength.pdf	Talent Management	Jan-19
2016-04 #2 EOM APR Sworn Strength.pdf	Talent Management	Jan-19
2016-04 #5 EOM APR Civilian Strength.pdf	Talent Management	Jan-19
2016-05 #2 EOM MAY Sworn Strength.pdf	Talent Management	Jan-19
2016-05 #5 EOM MAY Civilian Strength.pdf	Talent Management	Jan-19
2016-06 #2 EOM JUN Sworn Strength.pdf	Talent Management	Jan-19
2016-06 #5 EOM JUN Civilian Strength.pdf	Talent Management	Jan-19
2016-07 #2 EOM JUL Sworn Strength.pdf	Talent Management	Jan-19
2016-07 #5 EOM JUL Civilian Strength.pdf	Talent Management	Jan-19
2016-08 #2 EOM AUG Sworn Strength.pdf	Talent Management	Jan-19
2016-08 #5 EOM AUG Civilian Strength.pdf	Talent Management	Jan-19
2016-09 #5 EOM SEP Civilian Strength.pdf	Talent Management	Jan-19
2016-10 #2 EOM OCT Sworn Strength.pdf	Talent Management	Jan-19
2016-10 #5 EOM OCT Civilian Strength.pdf	Talent Management	Jan-19
2016-11 #5 EOM NOV Civilian Strength.pdf	Talent Management	Jan-19
2016-12 #2 EOM DEC Sworn Strength.pdf	Talent Management	Jan-19
2016-12 #5 EOM DEC Civilian Strength.pdf	Talent Management	Jan-19
2017-01 #2 EOM JAN Sworn Strength.pdf	Talent Management	Jan-19
2017-01 #5 EOM JAN Civilian Strength.pdf	Talent Management	Jan-19
2017-02 #2 EOM FEB Sworn Strength.pdf	Talent Management	Jan-19
2017-02 #5 EOM FEB Civilian Strength.pdf	Talent Management	Jan-19
2017-03 #2 EOM MAR Sworn Strength.pdf	Talent Management	Jan-19
2017-03 #5 EOM MAR Civilian Strength.pdf	Talent Management	Jan-19
2017-04 #2 EOM APR Sworn Strength.pdf	Talent Management	Jan-19
2017-04 #5 EOM APR Civilian Strength.pdf	Talent Management	Jan-19
2017-05 #2 EOM MAY Sworn Strength.pdf	Talent Management	Jan-19
2017-05 #5 EOM MAY Civilian Strength.pdf	Talent Management	Jan-19
2017-06 #2 EOM JUN Sworn Strength.pdf	Talent Management	Jan-19
2017-06 #5 EOM JUN Civilian Strength.pdf	Talent Management	Jan-19
2017-07 #2 EOM JUL Sworn Strength.pdf	Talent Management	Jan-19

2017-07 #5 EOM JUL Civilian Strength.pdf	Talent Management	Jan-19
2017-08 #2 EOM AUG Sworn Strength.pdf	Talent Management	Jan-19
2017-08 #5 EOM AUG Civilian Strength.pdf	Talent Management	Jan-19
2017-09 #2 EOM SEP Sworn Strength.pdf	Talent Management	Jan-19
2017-09 #5 EOM SEP Civilian Strength.pdf	Talent Management	Jan-19
2017-10 #2 EOM OCT Sworn Strength.pdf	Talent Management	Jan-19
2017-10 #5 EOM OCT Civilian Strength.pdf	Talent Management	Jan-19
2017-11 #2 EOM NOV Sworn Strength.pdf	Talent Management	Jan-19
2017-11 #5 EOM NOV Civilian Strength.pdf	Talent Management	Jan-19
2017-12 #2 EOM DEC Sworn Strength.pdf	Talent Management	Jan-19
2017-12 #5 EOM DEC Civilian Strength.pdf	Talent Management	Jan-19
2018-01 #2 EOM JAN Sworn Strength.pdf	Talent Management	Jan-19
2018-01 #5 EOM JAN Civilian Strength.pdf	Talent Management	Jan-19
2018-02 #5 EOM FEB Civilian Strength.pdf	Talent Management	Jan-19
2018-03 #2 EOM MAR Sworn Strength.pdf	Talent Management	Jan-19
2018-03 #5 EOM MAR Civilian Strength.pdf	Talent Management	Jan-19
2018-04 #2 EOM APR Sworn Strength.pdf	Talent Management	Jan-19
2018-04 #5 EOM APR Civilian Strength.pdf	Talent Management	Jan-19
2018-05 #2 EOM MAY Sworn Strength.pdf	Talent Management	Jan-19
2018-06 #2 EOM JUN Sworn Strength.pdf	Talent Management	Jan-19
2018-06 #5 EOM JUN Civilian Strength.pdf	Talent Management	Jan-19
2018-07 #2 EOM JUL Sworn Strength.pdf	Talent Management	Jan-19
2018-07 #5 EOM JUL Civilian Strength.pdf	Talent Management	Jan-19
2018-08 #2 EOM AUG Sworn Strength.pdf	Talent Management	Jan-19
2018-08 #5 EOM AUG Civilian Strength.pdf	Talent Management	Jan-19
2018-09 #2 EOM SEP Sworn Strength.pdf	Talent Management	Jan-19
2018-09 #5 EOM SEP Civilian Strength.pdf	Talent Management	Jan-19
Calls by Hour PRI ALL.pdf	Reports	Jan-19
Calls by Hour PRI1.pdf	Reports	Jan-19
Calls by Hour PRI2.pdf	Reports	Jan-19
Calls by Hour PRI3.pdf	Reports	Jan-19
Calls by Hour PRI4.pdf	Reports	Jan-19
CE CALLS BY DOW HOD.pdf	Reports	Jan-19
CE-2019-FIRST.xls	Reports	Jan-19
CE2019.xls	Reports	Jan-19
Central Bid Statistics.pdf.ktlm1g6.partial	Reports	Jan-19
PctHourDay_WGraph P1.pdf	Reports	Jan-19
PctHourDay_WGraph P2.pdf	Reports	Jan-19
PctHourDay_WGraph P3.pdf	Reports	Jan-19
PctHourDay_WGraph P4.pdf	Reports	Jan-19
Calls by Hour ALL.pdf	Reports	Jan-19
Calls by Hour P1.pdf	Reports	Jan-19
Calls by Hour P2.pdf	Reports	Jan-19

Calls by Hour P3.pdf	Reports	Jan-19
Calls by Hour P4.pdf	Reports	Jan-19
NC-2019-FIRST.xls	Reports	Jan-19
NC2019.xls	Reports	Jan-19
North Central Bid Statistics.pdf	Reports	Jan-19
PctHourDay_WGraph ALL.pdf	Reports	Jan-19
PctHourDay_WGraph P1.pdf	Reports	Jan-19
PctHourDay_WGraph P2.pdf	Reports	Jan-19
PctHourDay_WGraph P3.pdf	Reports	Jan-19
PctHourDay_WGraph P4.pdf	Reports	Jan-19
SE-scheduler-1545228252.xls	Reports	Jan-19
Calls by Hour P1 (1).pdf	Reports	Jan-19
Calls by Hour P2 (1).pdf	Reports	Jan-19
Calls by Hour P3 (1).pdf	Reports	Jan-19
Calls by Hour P4 (1).pdf	Reports	Jan-19
Calls by Hour PALL.pdf	Reports	Jan-19
NE DOW TOD.pdf	Reports	Jan-19
NE-2019-FIRST.xls	Reports	Jan-19
NE2019.xls	Reports	Jan-19
Northeast Bid Statistics.pdf	Reports	Jan-19
PctHourDay_WGraph ALL (1).pdf	Reports	Jan-19
PctHourDay_WGraph P1 (1).pdf	Reports	Jan-19
PctHourDay_WGraph P2 (1).pdf	Reports	Jan-19
PctHourDay_WGraph P3 (1).pdf	Reports	Jan-19
PctHourDay_WGraph P4 (1).pdf	Reports	Jan-19
Calls by Hour All (1).pdf	Reports	Jan-19
Calls by Hour P1 (2).pdf	Reports	Jan-19
Calls by Hour P2 (2).pdf	Reports	Jan-19
Calls by Hour P3 (2).pdf	Reports	Jan-19
Calls by Hour P4 (2).pdf	Reports	Jan-19
Northwest Bid Statistics.pdf	Reports	Jan-19
NW-2019-FIRST.xls	Reports	Jan-19
NW2019.xls	Reports	Jan-19
PctHourDay_WGraph ALL (2).pdf	Reports	Jan-19
PctHourDay_WGraph P1 (2).pdf	Reports	Jan-19
PctHourDay_WGraph P2 (2).pdf	Reports	Jan-19
PctHourDay_WGraph P3 (2).pdf	Reports	Jan-19
PctHourDay_WGraph P4 (2).pdf	Reports	Jan-19
Calls by Hour ALL (2).pdf	Reports	Jan-19
Calls by Hour P1 (3).pdf	Reports	Jan-19
Calls by Hour P2 (3).pdf	Reports	Jan-19
Calls by Hour P3 (3).pdf	Reports	Jan-19
Calls by Hour P4 (3).pdf	Reports	Jan-19

PctHourDay_WGraph ALL (3).pdf	Reports	Jan-19
PctHourDay_WGraph P1 (3).pdf	Reports	Jan-19
PctHourDay_WGraph P12.pdf	Reports	Jan-19
PctHourDay_WGraph P2 (3).pdf	Reports	Jan-19
PctHourDay_WGraph P3 (3).pdf	Reports	Jan-19
PctHourDay_WGraph P4 (3).pdf	Reports	Jan-19
Calls by Hour ALL (3).pdf	Reports	Jan-19
Calls by Hour P1 (4).pdf	Reports	Jan-19
Calls by Hour P2 (4).pdf	Reports	Jan-19
Calls by Hour P3 (4).pdf	Reports	Jan-19
Calls by Hour P4 (4).pdf	Reports	Jan-19
PctHourDay_WGraph ALL (4).pdf	Reports	Jan-19
PctHourDay_WGraph P1 (4).pdf	Reports	Jan-19
PctHourDay_WGraph P12 (1).pdf	Reports	Jan-19
PctHourDay_WGraph P2 (4).pdf	Reports	Jan-19
PctHourDay_WGraph P3 (4).pdf	Reports	Jan-19
PctHourDay_WGraph P4 (4).pdf	Reports	Jan-19
Binder1.pdf	Reports	Jan-19
Calls by Hour All (4).pdf	Reports	Jan-19
Calls by Hour P1 (5).pdf	Reports	Jan-19
Calls by Hour P2 (5).pdf	Reports	Jan-19
Calls by Hour p3 (5).pdf	Reports	Jan-19
Calls by Hour p4 (5).pdf	Reports	Jan-19
PctHourDay_WGraph ALL (5).pdf	Reports	Jan-19
PctHourDay_WGraph P1 (5).pdf	Reports	Jan-19
PctHourDay_WGraph P12 (2).pdf	Reports	Jan-19
PctHourDay_WGraph P2 (5).pdf	Reports	Jan-19
PctHourDay_WGraph P3 (5).pdf	Reports	Jan-19
PctHourDay_WGraph P4 (5).pdf	Reports	Jan-19
OffensesByCaseMgnt	CAD	Jan-19
Priority Breakdown by Problem	CAD	Jan-19
Arrest_CVS.csv	CAD	Jan-19
ArrestCharge_CVS.csv	CAD	Jan-19
CBD 1st Watch 2018	Patrol Schedules	Jan-19
CBD 2nd Watch 2018	Patrol Schedules	Jan-19
CBD 3rd Watch 2018	Patrol Schedules	Jan-19
Central 1st Watch 2018	Patrol Schedules	Jan-19
Central 3rd Watch 2018	Patrol Schedules	Jan-19
North Central 1st Watch 2018	Patrol Schedules	Jan-19
North Central 3rd Watch 2018	Patrol Schedules	Jan-19
Northeast 1st Watch 2018	Patrol Schedules	Jan-19
Northeast 2nd Watch 2018	Patrol Schedules	Jan-19
Northeast 3rd Watch 2018	Patrol Schedules	Jan-19

Northwest 1st Watch 2018	Patrol Schedules	Jan-19
Northwest 2nd Watch 2018	Patrol Schedules	Jan-19
Northwest 3rd Watch 2018	Patrol Schedules	Jan-19
Southcentral 1st Watch 2018	Patrol Schedules	Jan-19
Southcentral 2nd Watch 2018	Patrol Schedules	Jan-19
Southcentral 3rd Watch 2018	Patrol Schedules	Jan-19
Southeast 1st Watch 2018	Patrol Schedules	Jan-19
Southeast 2nd Watch 2018	Patrol Schedules	Jan-19
Southeast 3rd Watch 2018	Patrol Schedules	Jan-19
Southwest 1st Watch 2018	Patrol Schedules	Jan-19
Southwest 2nd Watch 2018	Patrol Schedules	Jan-19
Southwest 3rd Watch 2018	Patrol Schedules	Jan-19
Job Classification Specifications from HR as of 2019-01-03.xlsx	Patrol Schedules	Jan-19
RIGHT Care One Pager (11 Months)	Reports	Feb-19
Patrol Activity Sheet – Scanned from a Xerox multifunction device	Patrol Schedules	Feb-19
Expeditor Emails	Patrol Schedules	Feb-19
Jail Contract including Amendments.PDF	Contracts	Feb-19
Traffic Patrol – FW DPD – additional data requests	Traffic Schedule	Feb-19
2018-2019 Major Special Events List.docx	Reports	Feb-19
CBD Details	Patrol Schedules	Jan-19
NIBRS reports	Reports	Jan-19
Divisional shape files	Maps	Feb-19
CAD_RO Data	CAD Data	Feb-19
CAD_INC Data	CAD Data	Feb-19
Arrest Data	CAD Data	Feb-19
Attrition for FY17 by officer including reason for leaving	Financial	Feb-19
Sworn Attrition for FY17	Financial	Feb-19
IWM DPD Staffing with Assigned Working Funding Orgs as of 2019-02-07	Financial	Feb-19
Temp Limited Duty as of 2019-02-07	Financial	Feb-19
Current Technology Projects Related to Patrol	Reports	Feb-19
RIGHT Care One Pager (11 Months)	Reports	Feb-19
RCT2018AnnualReport	Reports	Feb-19
KPMG Report Right Care Calls	Reports	Feb-19
Jan 29.Dec30. RCT Weekly Report	Reports	Feb-19
<u>KPMG Calls Data.csv</u>	CAD Data	Feb-19
<u>Offenses20142015.csv</u>	CAD Data	Feb-19
<u>Offenses20162017.csv</u>	CAD Data	Feb-19
<u>Offenses2018.csv</u>	CAD Data	Feb-19
<u>Calls 2014.csv</u>	CAD Data	Feb-19
<u>Calls 2015.csv</u>	CAD Data	Feb-19
<u>Calls 2016.csv</u>	CAD Data	Feb-19
<u>Calls 2017.csv</u>	CAD Data	Feb-19

Calls 2018.csv	CAD Data	Feb-19
Calls 2019.csv	CAD Data	Feb-19
IWM DPD Staffing with Assigned Working Funding Orgs as of 2019-03-05.xlsx	Talent Management	Mar-19
IWM employee workgroup tiers as of 2019-03-07.xlsx	Talent Management	Mar-19
MarkOut.csv	CAD Data	Mar-19
MarkOut_OOS_Log.csv	CAD Data	Mar-19
Response_Time_Script.docx	CAD Data	Mar-19
OOS_Log_MarkOut_1.csv	CAD Data	Mar-19
RMS Powerpoint Guidelines.pptx	Reports	Mar-19
SOP Change Request.docx	Reports	Mar-19
Thumbs.db	Reports	Mar-19
911 volume 1.pdf	Reports	Mar-19
911 volume 2.pdf	Reports	Mar-19
Thumbs.db	Reports	Mar-19
Alarm Unit SOP 7-2010.pdf	Reports	Mar-19
Thumbs.db	Reports	Mar-19
SOP Auto Pound 101306 -Revised 12-1-17.pdf	Reports	Mar-19
Thumbs.db	Reports	Mar-19
Auto Theft SOP Final Draft 2017.pdf	Reports	Mar-19
Thumbs.db	Reports	Mar-19
BODY CAMERA TEAM SOP Rev. 10-16-2016 Posted.pdf	Reports	Mar-19
Thumbs.db	Reports	Mar-19
SOP. BOMB COMMERCIAL.doc	Reports	Mar-19
SOP. BOMB CRITICAL TASK.doc	Reports	Mar-19
SOP. BOMB EOU REVISED.doc	Reports	Mar-19
SOP. BOMB HOMICIDE.doc	Reports	Mar-19
SOP. BOMB RANGE PROC.doc	Reports	Mar-19
SOP.BOMB UNIT.doc	Reports	Mar-19
COPS SOP Revised 2017 (002).pdf	Reports	Mar-19
Thumbs.db	Reports	Mar-19
Canine Approval.pdf	Reports	Mar-19
canine SOP.pdf	Reports	Mar-19
SOP. CANINE UNIT.doc	Reports	Mar-19
SOP. CANINE UNIT.pdf	Reports	Mar-19
~\$ne-up SOP.doc	Reports	Mar-19
SOP - CAPERS Combined.pdf	Reports	Mar-19
Thumbs.db	Reports	Mar-19
DPD Camera Unit SOP 4-2012.pdf	Reports	Mar-19
CE_EOY2018.pdf	Reports	May-19
CITY_EOY2018.pdf	Reports	May-19
EOY2018_AggAssltFV.pdf	Reports	May-19
EOY2018_AggAssltNFV.pdf	Reports	May-19

EOY2018_BMV.pdf	Reports	May-19
EOY2018_BurgBus.pdf	Reports	May-19
EOY2018_BurgRes.pdf	Reports	May-19
EOY2018_Compstat.pdf	Reports	May-19
EOY2018_CompstatNVC.pdf	Reports	May-19
EOY2018_CompstatVC.pdf	Reports	May-19
EOY2018_Murder.pdf	Reports	May-19
EOY2018_OtherTheft.pdf	Reports	May-19
EOY2018_Rape.pdf	Reports	May-19
EOY2018_RobberyBusn.pdf	Reports	May-19
EOY2018_RobberyIndv.pdf	Reports	May-19
EOY2018_SexOffenses.pdf	Reports	May-19
EOY2018_Shoplift.pdf	Reports	May-19
EOY2018_UUMV.pdf	Reports	May-19
NC_EOY2018.pdf	Reports	May-19
NE_EOY2018.pdf	Reports	May-19
NW_EOY2018.pdf	Reports	May-19
SC_EOY2018.pdf	Reports	May-19
SE_EOY2018.pdf	Reports	May-19
SW_EOY2018.pdf	Reports	May-19

Appendix D: Meeting and Interview Tracker

Meeting	Purpose	Attendees	Date
DPD Steering Committee	Project Management	DPD Steering Committee	1/14/2019
DPD Patrol Leadership	Patrol Study	Patrol Leadership	1/14/2019
DPD Investigations Leadership	Investigations Study	Investigations Leadership	1/15/2019
Data Discussion	Patrol Study	1 x Sergeant	1/15/2019
DPD Communications Tour	Patrol Study	1 x Lieutenant, 1 x Sergeant, 1 x Dispatcher	1/23/2019
South Central Patrol Division	Patrol Study	1 x Major, 1 x Lieutenant, 1 x Sergeant, 2 x Patrol Officer	1/23/2019
Central Business District Patrol Division	Patrol Study	1 x Deputy Chief, 2 x Lieutenant, 1 x Sergeant, 3 x Patrol Officer	1/24/2019
Northwest Patrol Division	Patrol Study	1 x Major, 1 x Lieutenant, 2 x Sergeant, 4 x Patrol Officer	1/24/2019
Southeast Patrol Division	Patrol Study	1 x Major, 1 x Sergeant, 4 x Patrol Officer	1/29/2019
Southwest Patrol Division	Patrol Study	1 x Major, 1 x Sergeant, 3 x Patrol Officer	1/29/2019
Central Patrol Division	Patrol Study	1 x Major, 1 x Sergeant, 4 x Patrol Officer	1/29/2019
North Central Patrol Division	Patrol Study	1 x Major, 1 x Sergeant, 4 x Patrol Officer	1/30/2019
Northeast Patrol Division	Patrol Study	1 x Major, 1 x Sergeant, 4 x Patrol Officer	1/31/2019
South Central Property Crimes Unit	Investigations Study	1 x Lieutenant, 1 x Sergeant, 3 x Detective	2/12/2019
Southeast Property Crime Unit	Investigations Study	1 x Sergeant, 4 x Detective	2/12/2019
Northeast Property Crime Unit	Investigations Study	1 x Sergeant, 4 x Detective	2/13/2019
Northwest Property Crime Unit	Investigations Study	1 x Sergeant, 3 x Detective	2/13/2019

Robbery Unit	Investigations Study	1 x Major, 1 x Lieutenant, 1 x Sergeant, 5 x Detective	2/13/2019
Narcotics Unit	Investigations Study	1 x Lieutenant, 1 x Sergeant, 5 x Detective	2/13/2019
Family Violence Unit	Investigations Study	1 x Lieutenant, Sergeant, 5 x Detective	02/27/2019
Family Violence Unit/Auto-Theft Unit	Investigations Study	1 x Major	02/27/2019
Narcotics Unit	Investigations Study	2 x Major	02/27/2019
RMS Unit	Investigations Study	1 x Sergeant, 2 x Detective	02/27/2019
Family Violence Unit	Investigations Study	1 x Detective	02/28/2019
Auto-Theft Unit	Investigations Study	1 x Sergeant, 6 x Detective	02/28/2019
Narcotics Unit	Investigations Study	1 x Sergeant, 1 x Detective	03/21/2019
Narcotics Unit	Investigations Study	1 x Sergeant, 1 x Detective, 1 x Intelligence Analyst	03/21/2019
Property Crimes – Jack Evans	Investigations Study	1 x Major	02/29/2019
NPO Unit – Northeast	Patrol Study	2 x Officer, 1 x Corporal	03/13/2019
NPO Unit – Southwest	Patrol Study	2 x Officer, 1 x Corporal	03/13/2019
NPO Unit – Southeast	Patrol Study	2 x Officer, 1 x Corporal	03/13/2019
Ride Observation – Northeast	Patrol Study	2 X Officer	03/12/2019
Ride Observation – Southeast	Patrol Study	2 x Officer	03/12/2019
Ride Observation – Northwest	Patrol Study	2 x Officer	03/12/2019
Ride Observation – Central	Patrol Study	2 x Officer	03/12/2019
Data validation session	Patrol Study	DPD Leadership	04/02/2019
Data validation session	Patrol Study	DPD Leadership	04/03/2019

Appendix E: Source Tracker

Source document
Promising Strategies for Strengthening Homicide Investigations: Findings and Recommendations from the Bureau of Justice Assistance's Homicide Investigations Enhancement Training and Technical Assistance Project, October 2018.
Staffing study of the Fort Worth Police Department, Police Executive Research Forum, 2014.
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Report on the Staffing and Workload Study, Matrix Consulting Group, February 22, 2019.
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"Detective workload and opportunities for increased productivity in criminal investigations," John Liederbach, Eric J. Fritsch, and Charissa L. Womack, <i>Police Practice and Research</i> , September 8, 2010.
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FBI Uniform Crime Reporting Program, 2017, https://ucr.fbi.gov/crime-in-the-u.s/2017/crime-in-the-u.s.-2017/topic-pages/clearances .
FBI Crime Data Explorer, Houston, 2017, https://crime-data-explorer.fr.cloud.gov/explorer/agency/TXHPD0000/crime/2007/2017 .
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Contact us

Ian McPherson
Principal, Justice & Security
Advisory
ianmcpherson@kpmg.com

Bill Zizic
Managing Director, Justice &
Security Advisory
wzizic@kpmg.com

Brendan Davis
Director, Justice & Security
Advisory
brendandavis@kpmg.com

Caoimhe Thornton
Manager, Justice & Security
Advisory
caoimhethornton@kpmg.com

www.kpmg.com

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