


**CITY AND COUNTY OF SAN FRANCISCO
BOARD OF SUPERVISORS
BUDGET AND LEGISLATIVE ANALYST**

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Policy Analysis Report

To: Supervisor Avalos
From: Budget and Legislative Analyst's Office 
Re: Best Practices Related to Police Staffing and Funding Levels
Date: January 26, 2016

Summary of Requested Action

Your office requested that the Budget and Legislative Analyst conduct a review of public policy best practices related to police staffing and funding levels. You asked that this review include a survey of studies of the correlations between crime levels (both violent and property crimes) and factors such as police staffing levels or spending, education spending, social services spending, and income inequality.

You also asked that this review include a survey of modern methodologies for determining appropriate police staffing levels, and an assessment of the pros and cons of various approaches (such as determining staffing levels based on population, officer workload, response time, etc.).

For further information about this report, contact Severin Campbell at the Budget and Legislative Analyst's Office.

Executive Summary

Proposition D, passed by voters in 1994, amended the City Charter to require the San Francisco Police Department (SFPD) to maintain 1,971 full-duty sworn officers on the police force at all times. The rationale behind the 1,971 figure is not known.

The SFPD determines staffing allocations based on the 1,971 minimum staffing level. According to interviews with SFPD senior management, the Department does not conduct staffing analyses to determine the appropriate level of staffing. Rather, they are always striving to reach their Charter mandated 1,971 minimum staffing level. Currently, they have approximately 252 fewer police officers than mandated.

Since the Department has never reached its minimum staffing level, it is unclear whether 1,971 police officers are sufficient to meet public safety needs.

A review of the criminology literature suggests that many factors including police staffing levels, education, employment, wages and local law enforcement policies may be influential on crime levels. However, there is no single solution, such as increased police presence alone, to decrease crime levels, as the causes and effects of crime are often interconnected and difficult to isolate. The evidence does not definitively conclude that increasing the number of police corresponds to a reduced crime rate.

Budget and Legislative Analyst

The Budget and Legislative Analyst surveyed public policy best practices in determining police staffing levels. There are four common methodologies used by police departments throughout the country: a workload-based approach, a minimum staffing approach, a per capita approach and an authorized level approach. The preferred approach by experts in the field, as well as professional organizations, is the workload-based approach as it considers historical workload data, such as calls for service, and reflects an agency's policy priorities.

Based on the Budget and Legislative Analyst's review of public policy best practices, a minimum staffing level based on population is not considered a rigorous and analytical staffing methodology. Rather, any changes to the SFPD's minimum staffing level should be based on a workload-based assessment that accounts for department-specific conditions, as well as a comprehensive examination of historical workload data.

Project Staff: Amanda Guma, Jadie Wasilco, Linden Bairey and Severin Campbell

Correlations Between Crime Levels and Other Factors

A review of the criminology literature suggests that there is no single solution to reducing crime, and that its causes and effects are often interconnected and difficult to isolate. Additionally, there is no proven combination of policy solutions guaranteed to reduce crime. Crimes differ in their causes, and a solution that decreases property crime, such as burglary, may have no effect on violent crime, such as homicide.

Education, employment, wages, police staffing and local law enforcement policies levels are some of the key factors¹ identified by experts as influential on crime levels.

Education

Increased educational attainment is often associated with decreased criminal activity, as higher levels of education typically result in higher wages, therefore lessening the need to commit crime to earn money. Given the ability to earn higher wages, the potential negative repercussions of committing a criminal act will be greater for a person with a higher education level. Additionally, an individual with higher educational attainment may place more weight on potential future earnings and consider the likelihood and effects of getting caught when contemplating committing a crime.

Early childhood education can also be influential in deterring crime. One study² found that children who participated in preschool intervention for one or two years had lower rates of juvenile arrests, violent arrests and dropping out of high school.

A 2011 study³ suggests that education may affect criminal activity in three primary ways: income effects, time availability and risk-aversion.

1. Income effects: Higher wages, generally a result of increased educational attainment, reduce crime, both at the individual and aggregate levels.⁴ One study found that falling wages in the 1970s and 1980s likely influenced the increase in crimes committed by youth during that time

¹ As per the request, we also reviewed the literature for information regarding the impact of social services spending on crime rates, but we did not identify relevant studies or reports to include.

² Arthur Reynolds, et al. "Long-term effects of an early childhood intervention on educational achievement and juvenile arrest: A 15-year follow-up of low-income children in public schools", *Journal of the American Medical Association*, 2001.

³ Stephen Machin et al, "The Crime Reducing Effect of Education", *The Economic Journal*, May 2011.

⁴ Jeff Grogger, "Market Wages and Youth Crime", *Journal of Labor Economics*, October 1998.; Machin and Meghir, "Crime and Economic Incentives." *The Journal of Human Resources*, Autumn 2004; Eric Gould et al. "Crime Rates and Labor Market Opportunities in the United States: 1979-1997", *The Review of Economics and Statistics*, February 2002.

**Effect of Education on
Criminal Activity:**

1. *Higher earning potential*
2. *Less time available to participate in crime*
3. *Increased risk-aversion*

period, and concludes that youth crime levels are responsive to fluctuations in wages earned.⁵

2. Time availability: Time spent in school limits the time youth are available to participate in criminal activity. A 1994 study⁶ found that the amount of time spent at school and work during a year is negatively correlated with the likelihood of arrest. Conversely, a 2008 study⁷ found that the amount of time spent in prison, and the number of times an individual is caught committing a crime, both greatly increase the likelihood that individual will drop out of high school.
3. Risk-aversion: One study⁸ suggests that individuals with higher education levels are increasingly risk-averse. Therefore they would likely avoid punishment resulting from criminal activity, which could lead to a decrease in crimes committed. Another study⁹ concludes that youth who drop out of school tend to focus on immediate costs of education (stress, boredom, foregone income) and less on the future gains from additional education.

Evidence shows that individuals convicted of crimes tend to be less educated than the rest of the population. In 1997, about 41 percent of inmates in U.S. prisons and jails had not completed high school, compared to 18 percent of adults in the general population.¹⁰

While education may be negatively correlated with crime, it is difficult to suggest that the relationship is causal, or that an increase in education necessarily causes a decrease in crime. First, unobservable individual characteristics may contribute to both an individual's low educational achievement and his/her criminal behavior, making it impossible to isolate the particular causal effect of education. Second, it is difficult to determine whether or not criminal behavior influences educational attainment, or whether an individual's educational attainment influences his/her criminal behavior.

Finally, measuring crime is difficult. Data based on incarceration, conviction, or arrest records may be biased, as these crime statistics capture only those individuals who were caught. Given that crime is inherently covert, it is impossible to truly observe.

⁵ Jeff Grogger, "Market Wages and Youth Crime", Journal of Labor Economics, October 1998.

⁶ Ann Witte, et al. "Work and crime: An exploration using panel data", National Bureau of Economic Research, 1994.

⁷ Randi Hjalmarsson. "Criminal justice involvement and high school completion", Journal of Urban Economics, 2008.

⁸ Lance Lochner, "Education, Work and Crime: A Human Capital Approach", International Economic Review, August 2004.

⁹ Philip Oreopoulos. "Do dropouts drop out too soon? Wealth, health and happiness from compulsory schooling", Journal of Public Economics, 2007.

¹⁰ Caroline Wolf Harlow. "Education and Correctional Populations. Bureau of Justice Statistics Special Report", 2003.

Income and Unemployment

The effects of income and unemployment on youth crime have been widely studied, and are closely related to the effects of education on crime, discussed above. Empirical evidence suggests that higher wages earned through legal employment reduce crime. Some economists model crime as the alternative to work, suggesting that individuals should commit less crime as their wages increase.

Effect of Income & Unemployment on Crime

- 1. Individuals commit less crime as their wages increase*
- 2. Significant relationship between labor market conditions and crime rates*

A 1998 study¹¹ analyzed whether property crimes increased in the 1970s and 1980s as a result of falling wages during the same time period. The analysis focused exclusively on property crimes, and concluded that falling wages may have played a role in the increase of youth crime in the 1970s and 1980s, and that youth offending behavior is responsive to wages earned. The study results also suggest that the wage gap between blacks and whites accounts for approximately a quarter of the racial differential in crime participation rates, and that increased wages earned with age largely explain the tendency for criminal participation to decrease with age.

Another study, published in 2002, examined the impact of wages and unemployment on crime, and concluded that both are significantly related to crime. It additionally found that wages have played a larger role in the crime trends in recent decades.¹² The results suggest that among young, unskilled men—those typically most likely to commit crime—there is a significant relationship between the labor market conditions experienced by these individuals and crime rates. From 1979 to 1997, the wages of unskilled men fell by 20 percent in the United States, and property and violent crime rates increased by 21 percent and 35 percent, respectively. The study finds that the decrease in wages explains more than 50 percent of the increase in both types of crime over the time period.

Police Staffing Levels

Economic theory predicts that crime should decrease with an increased police presence, as individuals would be deterred by the greater likelihood of being caught.¹³ However, at least four major studies in recent years¹⁴ have surveyed the criminology literature and found either no relationship, or a positive relationship between police presence and crime.

¹¹ Jeff Grogger, "Market Wages and Youth Crime", *Journal of Labor Economics*, October 1998.

¹² Eric Gould et al. "Crime Rates and Labor Market Opportunities in the United States: 1979-1997", *The Review of Economics and Statistics*, February 2002.

¹³ Gary Becker. "Crime and Punishment: An Economic Approach", *Journal of Political Economy*, 1968.

¹⁴ Samuel Cameron. "A Disaggregated Study of Police Clear-up Rates for England and Wales", *Journal of Behavioral Economics*, 1988; Thomas B. Marvell, et al. "Specification Problems, Police Levels, And Crime Rates;" John Eck, et al. "Have Changes in Policing Reduced Violent Crime? An Assessment of the Evidence" in *The Crime Drop in America*, 2000; Steven Levitt, et al. "Economic Contributions to the Understanding of Crime", *Annual Review of Law and Social Science*, December 2006.

**Effect of Police Staffing
Levels on Crime**

1. *No clear relationship*
2. *Correlations between crime and staffing levels could be due to other factors*

The causal relationship¹⁵ between police staffing levels and crime rates remains uncertain and ambiguous. As previously discussed, crime data is often incomplete—not all crimes committed are reported to the police, and therefore not all are recorded into police statistics. There are various reasons that a correlation between recorded crime and police presence might exist:

1. Increased crime rates may prompt departments to hire more police officers. Therefore, areas experiencing higher crime rates could have an increased police presence.
2. A larger police presence increases the likelihood that a crime will be observed and recorded.
3. More staff at a police station may affect the number and quality of incident reports officially recorded.
4. If a greater police presence boosts public confidence, public reporting rates may also increase.

Law Enforcement Priorities, Policies and Practices

Since 2011, there have been significant changes in local policies impacting law enforcement practices in California. While there is not yet sufficient data to draw meaningful conclusions regarding the impact of these policy changes, there are some observable trends to note, as well as ongoing policy issues to consider, as discussed below.

Assembly Bill 109

Assembly Bill 109 (AB 109), commonly referred to as Public Safety Realignment, reclassified non-serious, non-violent and non-sexual crimes in California from felonies to misdemeanors. The primary purpose of the legislation was to reduce the number of inmates in State prisons in order to comply with federal mandates, and encourage local jurisdictions to implement evidence-based best practices in corrections in order to reduce recidivism and support the successful reentry of offenders into society.

Although data is limited due to the relative recent nature of this reform, initial studies¹⁶ have shown an increase in property crimes (specifically motor vehicle thefts) statewide following the implementation of AB 109. Table 1 below details crimes by type committed in San Francisco from 2008 through 2014.

¹⁵ Vollaard and Hamed, “Why the Police Have an Effect on Violent Crime After All”, Journal of Law and Economics, November 2012.

¹⁶ Most notably, the Public Policy Institute of California published a May 2015 report titled, “Realignment, Incarceration and Crime Trends in California”.

Table 1: Total Number of Crimes Committed in San Francisco by Type, 2008-2014

	2008	2009	2010	2011	2012	2013	2014	Average
People-Related								
Homicide	98	45	50	50	69	48	45	58
Rape	166	179	147	131	108	161	355	178
Robbery	4,108	3,423	3,180	3,088	3,484	4,202	3,224	3,530
Assault	2,372	2,310	2,386	2,105	2,116	2,653	3,137	2,440
<i>Subtotal</i>	<i>6,744</i>	<i>5,957</i>	<i>5,763</i>	<i>5,374</i>	<i>5,777</i>	<i>7,064</i>	<i>6,761</i>	<i>6,206</i>
Property-Related								
Burglary	5,401	5,197	4,557	4,408	5,317	5,931	5,237	5,150
Larceny	25,142	24,399	23,905	24,304	28,242	36,527	33,730	28,036
Vehicle Theft	5,758	4,913	3,903	4,174	5,339	5,866	6,126	5,154
Arson	235	198	156	161	207	227	241	204
<i>Subtotal</i>	<i>36,536</i>	<i>34,707</i>	<i>32,521</i>	<i>33,047</i>	<i>39,105</i>	<i>48,551</i>	<i>45,334</i>	<i>38,543</i>
Total	43,280	40,664	38,284	38,421	44,882	55,615	52,095	44,749

Source: FBI Uniform Crime Reporting and SFPD Department Data

While this table does show that certain crimes—including vehicle theft—have increased since 2011, it is too soon to draw definitive conclusions about the relationship between the crime rate and AB 109, given the limitations of the data.

Proposition 47

Even more recently, in November 2014, California voters passed Proposition 47, which converted from felonies to misdemeanors drug possession for personal use and property offenses (theft, shoplifting, receipt of stolen property and check fraud) valued at \$950 or less. The legislation also permits re-sentencing for anyone currently serving a prison sentence for a reclassified misdemeanor.

Local police chiefs, including San Francisco Police Chief Suhr, have cited anecdotal evidence of a further increase in property crimes as a result of this measure. However, it is too early in the implementation of Proposition 47 to draw conclusions from the crime data.

Policing Deployment and Crime Data Tracking

Reducing crime, and improving public safety, can also be achieved by adopting different models for officer deployment using best practices and/or crime data. Over the past two decades, two major changes in the deployment of police officers have been widely adopted across the country, including in San Francisco: increased crime data tracking and community policing.

Crime Data Tracking

CompStat, the common term for enhanced crime data tracking, uses computerized crime mapping to guide police deployment decisions. The purpose

of CompStat is to identify crime trends so that resources can be targeted at areas where crime is concentrated, or hot spots. It allows police departments to determine the effectiveness of deployment practices, and to reduce crime through more effectively deployed officers. The San Francisco Police Department adopted CompStat in late 2009, and holds monthly CompStat meetings that are open to the public.

**Comparison Cities:
Survey Results**

Five of the seven cities surveyed use CompStat.

Austin, TX
Chicago, IL
Dallas, TX
Oakland, CA
Portland, OR
San Jose, CA
San Diego, CA

The Budget and Legislative Analyst conducted a survey of police departments in seven cities comparable to San Francisco: Austin, TX, Chicago, IL, Dallas, TX, Oakland, CA, Portland, OR, San Diego, CA and San Jose, CA. With the exception of Portland and San Diego, the other five departments surveyed use CompStat. Austin uses CompStat data but also tracks performance measures and results with separate analysis tools. Oakland uses CompStat to measure and track crime, but not for hot spot deployment, as the department has little ability to shift patrol resources based on identified need.

Community Policing

Community policing seeks to use existing department resources to reduce crime levels with a focus on prevention. Community policing typically requires that the department assign officers to a specific geographic area consistently, to foster relationships between the officers and members of the community. These efforts lead to the adoption of policies and strategies that reinforce the importance of community engagement in managing public safety, including engagement in multidisciplinary, community team approaches for planning, implementing, and responding to crisis situations.

This model of police deployment was recently recommended as a best practice by the President’s Task Force on 21st Century Policing, and has been adopted by the SFPD. In FY 2015, the Board of Supervisors approved a new administrative position to provide ongoing leadership of the community policing function.

In the same survey of comparable cities discussed above, all departments reported using some form of community policing. In most cases however, community policing does not impact staffing assumptions or levels. However, in Oakland, there are 35 non-patrol officers, or one per patrol beat, that are assigned to be Community Resource Officers. In Portland, the overall minimum staffing level for each shift incorporates the need for officer time to engage members of the community in positive ways.

Police Staffing Methodologies

The Budget and Legislative Analyst conducted a literature review of public policy best practices in determining police staffing levels. There are four common methodologies used by police departments throughout the country:

1. Workload-Based Approach
2. Minimum Staffing Approach
3. Per Capita Approach
4. Authorized Level Approach

The preferred approach by experts in the field, as well as professional organizations, is the workload-based approach, as it incorporates actual workload demand, such as calls for service, based on historical data, and is reflective of an agency's policy priorities.

Each of the four approaches is unique and has its own advantages and disadvantages, outlined in Table 2 below. However, there are no national standards as to how cities should determine their police department staffing levels due to the extensive variation that exists between departments and cities.

Table 2: Police Staffing Methodologies

Police Staffing Methodology	Description	Advantages	Disadvantages
Workload-Based Approach	Systematically analyzes historical and projected workload demand to determine staffing needs that meet agency goals	<ul style="list-style-type: none"> • Based on actual workload demand • Reflective of agency's policy priorities and decisions • Provides a concrete staffing level to maintain • Common approach reinforced through organizational policy and practice 	<ul style="list-style-type: none"> • No universally accepted standards • Requires complicated and extensive calculations • Software licensed by private companies and consultants hired to perform analysis can be expensive
Minimum Staffing Approach	<p>Establishes a minimum number of officers that must be deployed at any one time to maintain officer safety and provide an adequate level of protection to the public.</p> <p>Overall staffing levels are determined based on minimum deployment levels.</p>	<ul style="list-style-type: none"> • Present in many collective bargaining agreements (though not in San Francisco) 	<ul style="list-style-type: none"> • Lack of flexibility to adjust the level based on current conditions • No objective standards to develop the minimum staffing level • Calculation does not necessarily reflect workload • Minimum staffing levels can be set so high that they must be backfilled with overtime • Staffing decisions could be made to meet this minimum level rather than optimizing the available resources and accurately meeting workload demand.

Police Staffing Methodology	Description	Advantages	Disadvantages
Per Capita Approach	Determines an optimum ratio of officers per resident within the jurisdiction	<ul style="list-style-type: none"> • Methodologically simple • Allows for easy comparison to other jurisdictions 	<ul style="list-style-type: none"> • Does not consider differences in community conditions, needs or expectations • Does not address how officers spend their time, or the quality of efforts
Authorized Level Approach	Uses available budgetary resources to specify the number of police officers to be hired	<ul style="list-style-type: none"> • Reflects availability of budget resources • Usually based on a formal staffing analysis • Can use political influence during the budget process to establish desired standards 	<ul style="list-style-type: none"> • Numbers do not necessarily reflect workload • Department could meet workload demand with fewer officers than the authorized level, but perceived to be understaffed • Unless agencies staffed above the authorized levels, they would often fall below given turnover and attrition

Source: Wilson, Jeremy M. and Alexander Weiss. (2012). *A Performance-Based Approach to Police Staffing and Allocation*. Office of Community Oriented Policing Services, U.S. Department of Justice and Michigan State University.

Workload-Based Approach

Police departments that use a workload-based staffing approach systematically analyze historical workload data in order to project the agency’s staffing needs that will enable them to meet their policy goals. Generally, departments use a computer-aided dispatch (CAD) system to understand their workload history. In this approach, policy decisions such as desired response times and peak demand staffing levels must be determined in the initial stages of the analysis, allowing for clear goals and objectives to guide the department’s staffing model. The workload-based analysis allows departments to create a police force that is reflective of actual workload demand, as well as the community’s policy preferences.

A workload-based approach is effective because it is evidence-based and reflective of an agency’s policy priorities. In order to create such a model, an agency must make clear policy decisions, understand tradeoffs, and provide a significant amount of data for a variety of inputs to the staffing model. For example, if a department wants to decrease the response time for emergency calls, this may affect the department’s capacity to pursue other activities, such as self-initiated community policing activities.

Support for Workload – Based Approach

- *Commission on Accreditation for Law Enforcement Agencies*
- *International City / County Management Association*

The disadvantages of a workload-based approach are that there are no universally accepted standards for conducting the analysis, and designing the model requires extensive data from the outset. Complex calculations are often needed to analyze the data, which not all departments are capable of handling. This methodology also relies on averages used in the estimates, and by definition, workload demand will often exceed the average, and could potentially affect the agency's performance during peak workload periods.

Consultants and software to facilitate this process can be expensive. However, there is a free commonly used software program available called the Police Personnel Allocation Model developed by the National Highway Transportation Safety Administration (NHTSA).

Professional law enforcement and management organizations across the country including the Commission on Accreditation for Law Enforcement Agencies (CALEA) and the International City/County Management Association (ICMA) support the workload-based approach. This Police Personnel Allocation Model is further discussed in the section titled "Conducting a Workload-Based Assessment" below.

Minimum Staffing Approach

The minimum staffing approach requires a department to determine the minimum number of patrol officers that must be deployed at a time in order to provide an adequate level of protection and service to the public. Based on this minimum, a department can determine their annual staffing needs. This approach is common across cities, and reinforced through organizational policy and practice as well as perceived need. Minimum staffing levels are often included in collective bargaining agreements, giving them significant weight during the budget negotiation process.

A key advantage of a minimum staffing approach is that it allows for one exact number to be used as a base staffing level, providing assurance to the public that minimum safety standards are met when the established staffing level is maintained.

Disadvantages of this approach are that there are no objective standards, and these numbers often become frozen in time with little flexibility for adjustment based on current conditions. The minimum staffing level can also become perceived as the optimal staffing level, without considering changes in workload demand, deployment models, or available resources within a department. Once determined, minimum staffing levels become difficult to modify, especially when established by voter proposition or memorialized into collective bargaining agreements. Additionally, when staffing levels fall below the minimum level, managers must use overtime to backfill staff in order to meet the minimum level. This practice is costly, and may not reflect the actual needs of the department.

SFPD's Minimum Staffing Level

Proposition D, approved by voters in 1994, amended the City Charter to require that the SFPD maintain a minimum of 1,971 full-duty sworn officers at all times.

The SFPD currently utilizes the minimum staffing level approach, which was determined by Proposition D in 1994, amending the City Charter.¹⁷ The Charter amendment requires that the SFPD maintain a minimum of 1,971 full duty sworn officers at all times. This figure is regularly referred to in policy and budget discussions. However, the minimum staffing level is not included in the police officer collective bargaining agreement in San Francisco.

Dynamic Minimum Staffing Model

One notable recommendation in a staffing analysis of the Portland Police Department in Oregon¹⁸ suggested the department should develop and regularly update the organizational data and adjust the authorized staffing level accordingly. This approach suggests the staffing model should be dynamic, rather than static, and reflect the changing nature of the department on a regular basis. Following this recommendation, departments could develop a model to determine their minimum staffing level which they could regularly update with the most current data, including projected growth. Cities could then maintain minimum staffing levels for shorter periods of time, accurately reflecting the city's conditions.

Per Capita Approach

Per Capita Approach

Many jurisdictions report on their ratio of officers to residents, because the DOJ regularly reports on this ratio, making it easy to compare to other jurisdictions.

The per capita staffing approach allows agencies to determine an optimal ratio of officers per resident within a city. The advantage of this approach is that it is methodologically simple, and allows for quick comparisons to other cities for benchmarking purposes. However, comparisons made by the per capita approach are generally discouraged because the variation across cities is so great, that comparisons hold little weight. As a result, there is not a nationally accepted ratio for officer to resident staffing levels. Critical differences amongst cities are listed in Table 3 below.

Table 3: Differences Between Cities that Influence Police Staffing Levels

Key Differences	
• Population	• Workload intensity
• Density	• Policing style
• Crime rates	• Service delivery
• Demographics	• Geography
• Economic characteristics	• Weather

Source: Wilson, Jeremy M. and Alexander Weiss. (2012). *A Performance-Based Approach to Police Staffing and Allocation*. Office of Community Oriented Policing Services, U.S. Department of Justice and Michigan State University.

¹⁷ San Francisco City Charter Section 4.127

¹⁸ Matrix Consulting Group. "Police Bureau Staffing Study, Portland, Oregon", March 2015.

The Department of Justice’s Bureau of Justice Statistics reports on the average ratio of full-time officers in police departments per 1,000 residents. Departments across the country regularly use these averages to compare their own officer to resident ratios to other jurisdictions, since the data is readily available. While these numbers allow for cursory comparisons, experts concur that the per capita approach is too simplistic to reflect the unique needs of each community. In fact, the International Association of Chiefs of Police (IACP), a non-profit organization of police executives, explicitly advises against using the per capita approach to determine police staffing ratios.¹⁹

Authorized Level Approach

The authorized level approach uses a city’s available budgetary resources to determine the number of police officers that can be financially supported. This approach is financially responsible because it only allows a city to hire the number of officers that it can afford.

The disadvantage of the authorized level approach is that staffing levels are determined in a manner that does not prioritize workload demand considerations. Decisions regarding the authorized level often build upon decisions made in previous years and reflect the political climate of the moment, rather than the most rigorous and data-driven staffing analysis. Unless agencies staff above the authorized levels, they would regularly be understaffed due to retirements, separations and delays in recruitment, if they are not accurately built into the model.

In addition, police departments could theoretically meet workload demand with a fewer number of officers than the authorized level, but would still maintain the perception of being understaffed because of the established authorized staffing level.

SFPD’s Staffing Methodology

According to senior SFPD management, SFPD does not conduct regular staffing analyses. Rather, they staff based on need, while striving to meet the Charter-mandated minimum 1,971 sworn staffing level. The Department has only met this requirement in one month since it was established in 1994. As of August 2015, the SFPD currently has 1,719 full-duty sworn officers, 252 short of the Charter-mandated minimum staffing level.

Leaders within SFPD agree with the idea that staffing should be an objective process that considers numerous factors. However, at this time, the department does not utilize technology as much as they could in order to track officer’s

Authorized Level Approach
Although using budgetary resources to determine staffing levels is fiscally responsible, it often builds upon the status quo of previous years, rather than reflecting rigorous, data-driven staffing analysis.

¹⁹ International Association of Chiefs of Police. “Police Officer to Population Ratios, Bureau of Justice Statistics Data”, Research Center Directorate Perspectives.

performance and routines. Although SFPD does not conduct an in-depth staffing analysis, the department does routinely analyze CompStat data to allocate staff resources. The department has also recently completed a district station boundary analysis to redefine station districts in alignment with community and service needs.

Staffing Methodologies Used By Other Cities

The Budget and Legislative Analyst collected data regarding police staffing methodologies in seven cities that are comparable to San Francisco: Austin, Chicago, Dallas, Oakland, Portland, San Diego and San Jose.

Table 4: Police Staffing Methodologies Used in Comparable Cities

Workload-Based	Per Capita	Budget-Authorized	Minimum Staffing
Chicago	Austin*	Austin	Oakland
Dallas		San Diego	Portland
Portland*		San Jose	

**Austin and Portland both use multiple approaches for their staffing analysis.*

Source: Budget & Legislative Analyst survey of police departments

As shown in Table 4 above, the cities surveyed use a mixture of the staffing methodologies described in this report. Chicago, Dallas and Portland all use the recommended workload-based model. In Chicago, the model is augmented by crime analyses that look at developing trends and identify areas of the city where additional patrols might be useful. In Dallas and Portland, the number of total staff needed by division is determined based on the number of calls and the number of offenses that occur annually in each division.

Some cities, such as Portland and Austin, use more than one staffing approach. Portland uses a hybrid model consisting of workload-based and minimum staffing components. The number of officers that is assigned to each of the three precincts in the city is based on calls for service at the precinct. For each shift, in each precinct, there is a minimum staffing level.

Austin uses a hybrid per capita and budget authorized staffing model. The per capita calculation for the number of sworn patrol officers is two officers for every 1,000 residents. Austin also has a budget ordinance that authorizes the hiring of a defined number of positions by rank annually, and acts as the upper limit on the number of positions that can be filled.

San Diego has a recommended staffing level for each of its ten area stations, but the number of officers hired and retained is ultimately determined by the annual budget appropriation to the department. In contrast, the City of Oakland is required to maintain a minimum staffing level of 678 sworn officers as a result of the passage of Measure Z in the fall of 2014, which also prohibits the department from terminating employees if the number of sworn officers falls below 800.

Conducting a Workload-Based Staffing Analysis

In order to conduct a workload-based staffing analysis, departments must input several data variables into a staffing model or software program. A report commissioned by the U.S. Department of Justice Community-Oriented Policing Services division identifies six general steps in conducting a workload-based assessment:

1. Examine the distribution of calls for service by hour of day, day of week, and month
2. Examine the nature of calls for service
3. Examine time consumed on calls for service
4. Calculate the agency's shift relief factor
5. Establish performance objectives
6. Provide staffing estimates

Commonly used sources of data for these assessments include historical computer-aided dispatch (CAD) data, data reflective of policy decisions (i.e. target response times), agency practice (i.e. current staffing levels) and static data (i.e. miles of roadways).

The Police Personnel Allocation Model (PAM) is a commonly used free software program commissioned by the National Highway Traffic Safety Administration in the 1990s.²⁰ The Budget and Legislative Analyst examined the PAM model as an example of how to conduct a staffing analysis due to its accessibility. However, experts caution that it might not be appropriate for urban areas such as San Francisco as PAM's stated limitations include: it doesn't allow for modeling of alternative service and staffing levels, it cannot be used to forecast staffing needs, and it generates an estimate rather than an exact number of personnel needed to meet a service level.

PAM places key input data into the following categories: calls for service variables, performance objectives, jurisdiction characteristics, immediate availability variables and policy decision variables. Of the 34 data inputs, 19 of the variables are at least partially policy decisions, emphasizing the importance that these questions have on the results of the staffing model. The variables included in a PAM model are shown in Table 5 below.

²⁰ The Police Personnel Allocation Model was originally developed in the 1990s by Northwestern University's Center for Public Safety for the National Highway Traffic Safety Administration (NHTSA) and recently updated in 2007 by Anacapa Sciences.

Table 5: Workload-Based Staffing Analysis

Category of Model Input	Data Variable ²¹
Calls for Service Variables	<ul style="list-style-type: none"> • Total number of calls for service • Average service time per call
Performance Objectives Linked to Deployment Density	<ul style="list-style-type: none"> • Size of jurisdiction • Average response time for emergency and non-emergency calls • Response time goals for emergency and non-emergency calls • Patrol officer visibility • Officer availability to respond to emergencies
Jurisdiction Characteristics	<ul style="list-style-type: none"> • Miles of roadways • Average patrol speed • Average hours in work week • Shift length • Shift relief factor
Immediate Availability Variables	<ul style="list-style-type: none"> • Percentage of calls that cannot be preempted • Percentage of administrative activities that cannot be preempted • Percentage of self-initiated activities that cannot be preempted
Policy Variables	<ul style="list-style-type: none"> • Officer visibility • Officer time spent on administrative tasks • Self-initiated patrol time • Average number of officers supervised by each field supervisor • Percentage of field supervisor time spent on patrol activities

Source: Police Executive Research Forum and Justex Systems. Houston Police Department Operational Staffing Model, May 2014.

PAM then outputs a report providing different scenarios as to how the department could allocate its limited resources within its budgetary means, all while meeting designated policy goals. Hypothetical scenarios can also be modeled, if desired.

Other common software includes: Ops Force Deploy, a web-based tool developed by Corona Solutions, Managing Patrol Performance (MPP), a queuing model developed by MIT that is used by some large urban areas including Los Angeles and San Diego, and the Model for Allocation of Patrol Personnel (MAPP), a software program developed by the University of North Texas. A variety of other

²¹ The 34 data inputs are condensed for the purposes of this table.

private consulting companies also conduct similar analyses with their own proprietary methods.

Survey of Workload-Based Approach Analyses

Office of Community Oriented Policing Services, U.S. Department of Justice

In 2009, the Office of Community Oriented Policing Services (COPS) within the U.S. Department of Justice commissioned a study on police staffing and allocation which examined the workload-based staffing approaches of 20 police agencies across the country. The study found that while some agencies conduct staffing analyses regularly, often times, analyses are only conducted during an organizational or leadership change, or during budget or labor negotiations. In addition, many patrol staffing decisions were made in a reactive, rather than proactive manner, which can lead to an inefficient allocation of resources.

Listed in Table 6 below are the most common input variables included in a workload-based staffing analysis found by the study.

Table 6: Common Workload-Based Staffing Analysis Input Variables

Input Variables	
<ul style="list-style-type: none">• Calls for service• Response time• Patrol allocation• Shift distribution• Geography	<ul style="list-style-type: none">• Officer to population ratio• Mandatory minimum levels• Data from workload assessments• "Game-time" decisions at shift level

International City/County Management Association

The International City/County Management Association (ICMA)'s Center for Public Safety Management, a non-profit professional association of local government administrators and managers conducted a survey of 61 cities across 26 states in order to understand which staffing model input variables were correlated with changes in staffing levels. The study concluded that calls for service and peak-demand staffing were the most common indicators of increased staffing levels within departments, whereas crime rates, response times and service demands were less common indicators of higher staffing levels.

Based on their survey, ICMA concluded that police departments should utilize more sophisticated data analysis in determining their staffing levels. This includes further analyzing the intensity of police service calls separately from solely the number of police service calls, as different types of calls for service result in different amounts of officer time demanded to respond and resolve the issue. Overall, the ICMA recommends that patrol allocation staffing models should consider the factors listed below.

1. Responding to service demand (critical and non-critical)
2. Maintaining spatial and time distribution to assure rapid response to emergency situations
3. Providing reassuring visibility to the community
4. Engaging in active crime deterrent efforts
5. Remaining alert on emergency standby for critical situations

Limitations to a Workload-Based Model

Although the workload-based approach is the preferred staffing analysis method, it does have some limitations, listed below.

1. It relies heavily on averages in producing estimates. If workload demands exceed the average levels, which they will by definition, it could affect agency performance.
2. Models do not differentiate the job functions of police units (i.e. if calls are handled by supervisors or non-sworn staff).
3. Calls for service are heavily weighted, rather than other inputs.

It is generally agreed upon that the benefits of this approach outweigh these limitations. However, departments should be cognizant of these limitations and consider them when analyzing their staffing models.

Political Factors

Departments must keep in mind that as the political climate within their city changes, policy priorities will shift, which could have significant effects on allocation needs and inputs in the staffing model. The policy priorities susceptible to political influence should be carefully considered by the department so that staffing models are not subject to drastic fluctuation over time.

For example, one study concluded that the size of police departments has been shaped by whether or not the city experienced a race riot from 1980-2000, and to a lesser extent, the size of the minority population and the violent crime rate.²² Political unrest heightens public awareness and discourse around such issues, and can influence staffing decisions. Another study found that increases in police department staffing levels are disproportionately concentrated during mayoral and gubernatorial election years.²³

²² Elaine Sharp. "Policing Urban America: A New Look at the Politics of Agency Size", *Social Science Quarterly*, June 2006.

²³ Steven Levitt. "Using Electoral Cycles in Police Hiring to Estimate the Effect of Police on Crime", *The American Economic Review*, June 1997.

Alternative Service Delivery Systems

Some departments civilianize duties traditionally performed by sworn officers, such as responding to non-emergency traffic incidents, either for budgetary reasons since civilian officers are generally paid less than sworn officers, or to free sworn officers' time so they are able to perform other duties. However, this can place an increased budgetary demand on departments that must meet a minimum staffing level of sworn officers to hire additional sworn officers, even if their tasks are being completed at the same level of service by non-sworn officers.

In such cases, it would be useful for departments to have the flexibility to amend the minimum staffing levels to reflect the civilianization of tasks previously performed by sworn officers. For example, minimum staffing levels could be adjusted annually or on some other time schedule (every two or five years) prior to the budget process based on a workload assessment. This could be done in conjunction with a review of recivilianization efforts within the department, to understand the actual need for sworn officers, and budgetary savings that can be realized by civilianizing positions. Once this analysis is conducted, an adjusted minimum staffing level that more accurately reflects current conditions could be set.

In San Francisco, City Charter Section 16.123 directs the Controller and Chief of Police to identify positions within the SFPD that could be filled by civilian, rather than sworn, personnel, and to convert those positions from sworn to civilian as they become vacant. The minimum staffing level would then be reduced by that number of positions if the Controller and Chief of Police jointly certify that the reduction will not decrease the number of police officers dedicated to neighborhood community policing, patrol and investigations and will not substantially interfere with the delivery of police services or the ability of the Police Department to protect the public in the event of an emergency.

In June 2010, the Controller's Office recommended that SFPD civilianize 251 positions. While significant progress has been made, SFPD is still in the process of civilianizing all recommended positions.

Findings from Other Cities' Police Staffing Performance Audits

The Budget and Legislative Analyst examined publicly available staffing analyses and performance audits of six urban police departments conducted by consultants to understand commonalities in staffing issues amongst them. The six cities compared are: San Diego, CA, Honolulu, HI, Boston, MA, Seattle, WA, San Jose, CA and Portland, OR. The most common recommendation within the performance audits surveyed was that departments should incorporate more detailed data analysis into their staffing models, an idea supported by the workload-based staffing approach discussed above. These audits demonstrate that police departments across the country are also evaluating how to determine optimal staffing levels, and have generally reached the conclusion that the more data used in the analysis, the better.

Comparison Cities: Survey Results

The most common recommendation from performance audits in six cities was to incorporate more detailed data analysis into their staffing models.

Influence of Community Policing on Staffing Levels

As previously discussed, SFPD is dedicated to expanding its community policing effort, which emphasizes working with neighborhood residents to co-produce public safety, including identifying problems and collaborating on implementing solutions.

Community policing efforts are time intensive, as they require sworn officers to spend a portion of their on-duty time engaging with the community, rather than carrying out traditional patrol duties. Additionally, officers are expected to provide a high level of attention to the community that may or may not be reflective of actual crime in the area. The effectiveness of community policing is also harder to measure than traditional policing given the types of activities it involves such as community engagement and outreach.

According to SFPD senior management, this requires officers to perform more duties, often with the similar amount of resources, while maintaining an adequate public safety level.

Policy Considerations

The Board of Supervisors recently considered the SFPD's own minimum staffing level. As previously discussed, the SFPD's minimum full-duty sworn officer level of 1,971 was established by voter proposition in 1994, and written into the City Charter upon passage.

File No. 15-0628 "Establishing a Population-Based Police Staffing Policy" was passed by the full Board on June 23, 2015, but returned unsigned by the Mayor on July 3, 2015. This resolution recommends an increase in SFPD staffing levels based on the population increase the City has experienced since 1994, when the minimum staffing level was established. San Francisco's population has increased 13.3 percent, from 742,316 in 1994 to 841,138 in 2014. The resolution proposes the same 13.3 percent increase in staffing levels to increase the Charter-mandated minimum staffing level to 2,233.

However, it is not clear that the original 1,971 minimum staffing level was based on a calculation that included population when it was established in 1994. Therefore, a percentage increase in the staffing level based on a change in population might not be an equivalent increase.

Additionally, based on the Budget and Legislative Analyst's review of public policy best practices, a minimum staffing level based on population is not considered a rigorous and analytical staffing methodology. Rather, the Board should request that any changes made to the minimum staffing level should be based on a workload-based assessment that accounts for department-specific conditions, as well as a comprehensive examination of historical workload data.