

# Office of the City Auditor

# Police & Fire Public Safety Dispatcher Overtime Audit



May 2015

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## Executive Summary

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The Office of the City Auditor (OCA) received, through its Fraud Hotline program, an anonymous complaint regarding inappropriate payment of night shift differential (NSD) pay to Public Safety Dispatchers (dispatchers). In reviewing the merits of the complaint, we found that both the Fire and Police (Departments) Communications Centers' dispatchers worked an extensive amount of overtime. As a result, we conducted this audit to evaluate the Departments' internal controls and staffing practices for managing dispatcher overtime and special pay compensation.

During the audit period, the Departments' Communications Centers consistently answered and dispatched police, fire and medical-related calls for service within industry standards. In 2013 alone, dispatchers answered over 700,000 incoming calls and made over 310,000 outbound calls. To process these calls within specified performance thresholds, both Communications Centers deploy their staff resources according to minimum staffing levels established by the Departments.

However, the number of dispatcher position vacancies is so high that the Communications Centers must rely heavily on personnel to work significant amounts of overtime. In 2014, overtime costs in the Communications Centers totaled more than \$1.3 million, an increase of 13% from two years prior. Overtime hours comprised 22% of all dispatcher work hours, or an equivalent of 18 dispatcher positions. Extensive overtime can result in an unhealthy work environment and can lead to high employee turnover, decreased quality of service, increased safety-related incidents, and a decline in performance due to fatigue. These issues are more pronounced in law enforcement and emergency services, such as among 9-1-1 communications personnel.

The Communications Centers have been understaffed for several years as the City of Long Beach's (City) recruitment efforts have not been able to meet the Departments' needs. The recruitment process, which is lengthy and infrequent, results in a limited amount of qualified candidates. And, of those hired, only 40%, on average, finish the one-year probationary period. With turnover inherently high in the emergency dispatch profession, it is imperative that the City's recruitment and hiring be expanded and more strategically directed. Without this sustained emphasis on recruitment, given past results, it will take up to 12 years to reach budgeted staffing levels for the dispatcher positions.

The audit assessed the Communications Centers' historical call volume and applied industry call-answering performance standards to determine the appropriate level of

dispatcher personnel. As a result of this analysis, we found that the budgeted number of Police dispatchers at 60 matched our calculations for the amount of Police dispatchers required to meet scheduling needs. The Police Department has been scheduling dispatcher work hours equivalent to or in excess of the 60 positions. The Fire Department, on the other hand, is only budgeted for 19 dispatcher positions but need 24-25 dispatchers according to our calculations. While overtime can be used to cover a portion of full-time position requirements, using overtime to cover 5-6 positions, or 20-25% of your scheduling needs is risky and creates a work environment where working very long hours is the norm. We believe a thorough staffing analysis by both Departments is warranted.

The audit also found other issues with how overtime is allocated, resulting in a small number of dispatchers working considerably more overtime than the rest of the staff. In addition, both Departments are using inefficient manual processes for managing time and dispatcher schedules that result in a lack of supporting documentation in some instances. Both Departments have an automated time and scheduling system that is currently being used for other personnel within the Departments and should also be implemented by the Communications Centers.

We would like to thank the staff of the Police, Fire, Civil Service and Disaster Preparedness and Emergency Communications Departments for their cooperation and assistance during this audit. We respectfully request that in one year, management provide a status of the progress made in implementing the recommendations detailed in this report.

## Background

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The Office of the City Auditor (OCA) operates a Fraud Hotline to allow for City employees, citizens, and/or vendors to be able to report fraud easily and confidentially. The OCA received a fraud hotline complaint regarding inappropriate night shift differential (NSD) pay to Public Safety Dispatchers (dispatchers). During our preliminary investigation, we reviewed payroll data for Fire and Police Department dispatchers. As part of the preliminary work performed, we noted an extensive amount of overtime being paid to dispatchers, which led us to expand the scope of our audit to review overtime charges and how staffing practices may have contributed to the increased overtime.

**This audit was triggered by an anonymous complaint to the City Auditor's Fraud Hotline, leading us to investigate the payment of the night-shift special pay and the extensive use of overtime to staff the Communications Centers.**

The Fire and Police Communications Centers are charged with answering and dispatching police, fire and medical-related calls. On a daily basis in 2013, the Communications Centers answered over 1,900 emergency and non-emergency calls. To process these calls within specified timeframes, both the Fire and Police Departments must provide adequate dispatcher staffing resources on a 24/7/365 basis. Tasked with the essential public safety role in ensuring quick response to emergencies, the Communications Centers must maintain a dispatcher workforce that is appropriately staffed, highly trained, and effectively organized and deployed.

### Call Answering and Dispatching Process

**The City uses a standard triaging and dispatching process, with the Police Communications Center serving as the first or primary answering point for all 9-1-1 calls.**

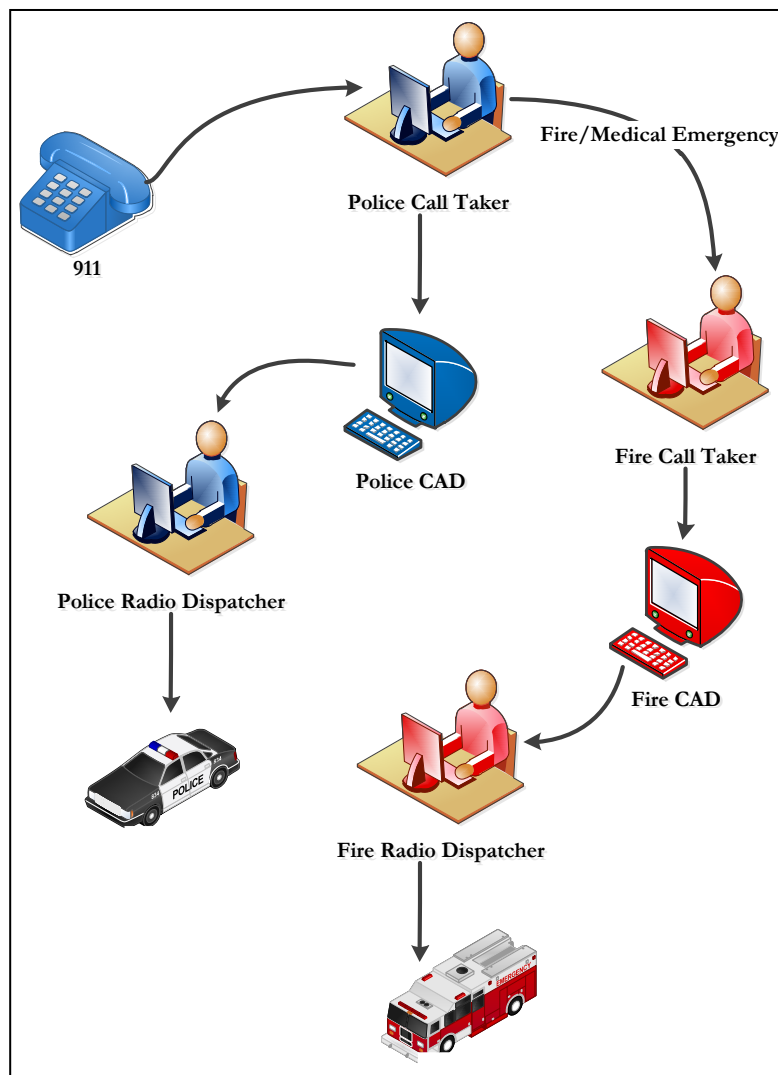
All calls for police, fire, and medical, including both emergency and non-emergency services, are routed first through the Police Communications Center, which acts as the City's primary 9-1-1 public-safety answering point (PSAP). Dispatchers at the Police Communications Center initially triage these calls, and will rout fire and medical calls to their counterpart dispatchers at the Fire Communications Center, which serves as the City's secondary PSAP.

Both Departments use the "Public Safety Dispatcher" job classification title to staff their Communications Centers. However, at the operations level, the dispatcher position can generally be divided into two primary responsibilities – "call-taking" and "radio-dispatching."

The dispatchers are cross-trained in both call-taking and radio dispatching within their respective departments, and may perform either function during a shift.

Incoming calls are fielded first by “call-takers,” who are responsible for evaluating, documenting, prioritizing, and forwarding calls to the appropriate resource, whether it is a police, fire channel or another City entity. Key call information is entered and captured in the Computer Aided Dispatch (CAD) system. Calls that require field response from police patrol or fire/paramedic units are routed by the “call-takers” to “radio dispatchers,” who are charged with dispatching the appropriate emergency personnel (police, fire, and paramedic), and maintaining two-way communication with these field units. Chart 1 illustrates the call-taking and radio-dispatching processes.

**Chart 1.**  
**Communications Centers’ Call-Taking and Radio-Dispatching Processes**

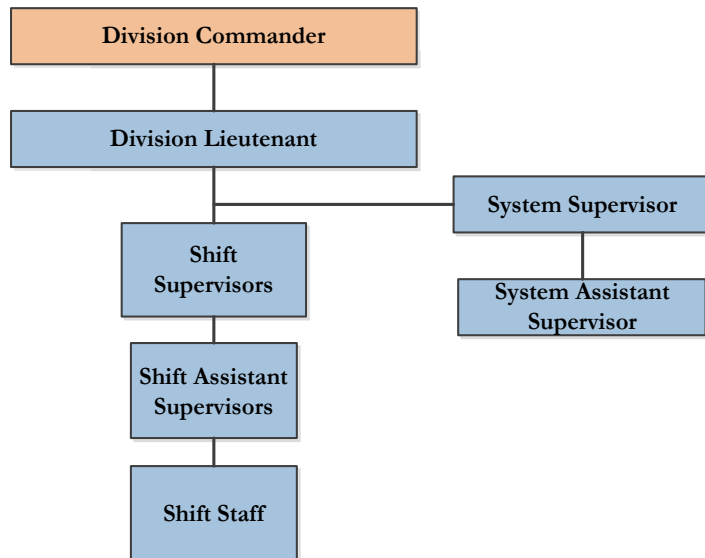


## Organization and Staffing

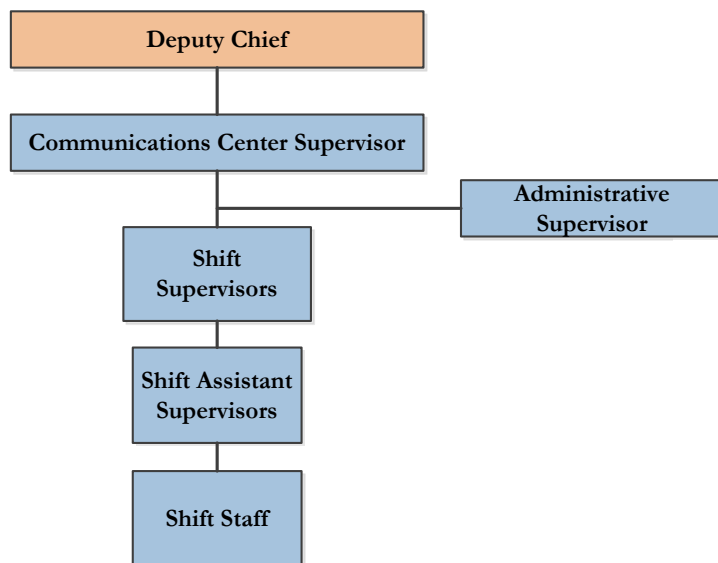
Although the City has plans for consolidating the two Communications Centers under one department, they have operated independently but are co-located at the Emergency Communications and Operations Center.

The Police Communications Center is an operating unit of the Communications and Training Division within the Department's Support Bureau. As illustrated in Chart 2, the Police Communications Center is under the command of a sworn Police Commander, with each work shift consisting of a civilian supervisor, assistant supervisor, and dispatcher staff. In Fiscal Year (FY) 2015, the Police Communications Center was budgeted for 60 dispatcher positions and had 56 filled as of November 2014, including trainees. In addition to civilian dispatcher personnel, the Police Communications Center utilize trained sworn Police Officers on an as-needed basis and, as of

**Chart 2.**  
**Organizational Structure**  
**Police Department Communications Center**



**Chart 3.**  
**Organizational Structure**  
**Fire Department Communications Center**



November 2014, hired two part-time civilian dispatchers (retired Long Beach dispatchers) to fill dispatcher shifts.

The Fire Communications Center is an operating unit within the Communications Division, Support Services Bureau. As shown in Chart 3, the Fire Communications Center is under the command of a sworn Deputy Chief, with a civilian Communications Center Supervisor overseeing day-to-day operations. Each work shift is assigned with a civilian supervisor, assistant supervisor, and dispatchers.



In FY 2015, the Fire Communications Center was budgeted for 19 dispatchers and had 17 positions filled as of November 2014, including trainees.

### Call Volume and Workload

**Police dispatchers processed an average of 820,000 inbound and outbound calls per year, or an average of 2,248 Police calls daily.**

**Fire Dispatchers processed over 162,000 calls in 2013, including answering over 68,000 emergency calls.**

As the City's primary PSAP, Police dispatch answered on average 487,000 inbound emergency calls and 86,000 non-emergency calls per year, as shown in Table 1 below. Police dispatch also made an average of 247,000 outbound calls per year. On an average day during Calendar Years (CYs) 2011-13, Police dispatchers answered a total of 1,570 incoming calls and made 678 outgoing calls.

**Table 1.**  
**Inbound and Outbound Calls**  
**Police Communications Center**  
**CY 2011 – CY 2013**

Year (CY)	Inbound		Outbound	Total
	Emergency	Non-Emergency		
2011	470,215	94,598	208,102	772,915
2012	496,352	83,772	258,013	838,137
2013	493,658	80,150	276,162	849,970
<b>Avg.</b>	<b>486,742</b>	<b>86,173</b>	<b>247,426</b>	<b>820,341</b>

In CY 2013, the Fire Communications Center answered over 68,000 inbound emergency calls and nearly 60,000 non-emergency calls per year, as well as making over 34,000 outbound calls, as shown in Table 2 below. In CY 13, Fire dispatchers processed weekly averages of 2,429 inbound and 658 outbound calls. This workload translates to answering an average of 346 inbound calls and making an average 94 outbound calls per day.

**Table 2.**  
**Inbound and Outbound Calls**  
**Fire Communications Center**  
**CY 2013\***

Year (CY)	Inbound		Outbound	Total
	Emergency	Non-Emergency		
2013	68,316	59,526	34,202	162,044

\* Prior years' data were unavailable at the time of the audit.



For more details on hourly and weekly call volume trends and fluctuations, please see Appendix II of this report.

### Dispatching Performance

To receive State cost recovery funding associated with operating the City's primary 9-1-1 PSAP, the Police Communications Center must adhere to the standard that, during the busiest hour of any shift, 90% of 9-1-1 calls be answered within 10 seconds.

**In 2013, the Police Communications Center answered nearly 95% of all emergency calls within 10 seconds, surpassing the established performance standard.**

This performance standard mirrors that promulgated by the National Emergency Number Association (NENA), the leading professional organization solely focused on 9-1-1 policy, technology and operations issues. Internal data indicates the Police Communications Center has been meeting this performance target in answering emergency calls, as shown in Table 3 below. The data shows that, on average, Police dispatchers answered emergency calls within three seconds and nearly 95% of emergency calls within 10 seconds.

**Table 3.  
Emergency Call-Answering Performance  
Police Communications Center  
CY 2013\***

911 Calls			7-Digit Emergency Calls**		
Count	Avg. Answer Time	% Answered w/in 10 secs.	Count	Avg. Answer Time	% Answered w/in 10 secs.
257,554	0:00:03	94.6%	216,085	0:00:03	95.4%

\*Data excludes April and parts of May due to technical issues to the data management system.

\*\*These are calls made to the Communications Center through the 7-digit emergency line.

**In 2013, Fire Dispatchers answered 97% of all emergency calls within 15 seconds, also surpassing the industry performance standard.**

Since the Fire Communications Center is not the primary PSAP, it does not need to meet any performance standard for funding purposes. In our assessment of Fire dispatcher staffing, we used the standard set forth by the National Fire Protection Association (NFPA), which promotes a performance standard of answering 95% of emergency calls within 15 seconds. The NFPA is the leading fire safety industry organization that sets various fire-related operating and training standards and codes for usage and adoption by fire safety agencies. As shown in Table 4 below, internal data

indicates Fire dispatch met this performance target in answering emergency calls in CY 2013. The data shows Fire dispatchers answered 97% of all emergency calls within 15 seconds.

**Table 4.**  
**Emergency Call-Answering Performance**  
**Fire Communications Center**  
**CY 2013**

<b>Answered Within:</b>	<b>911 Calls</b>	<b>% of Total - 911 Calls</b>	<b>7-Digit* Emergency</b>	<b>% of Total - 7-Digit Emergency Calls</b>	<b>Total</b>	<b>% of Total</b>
0 To 5 secs.	35,849	76%	16,247	77%	52,096	76%
6 To 10 secs.	8,580	18%	3,764	18%	12,344	18%
11 To 15 secs.	1,490	3%	672	3%	2,162	3%
Greater Than 15 secs.	1,299	3%	540	2%	1,839	3%
<b>Total</b>	<b>47,218</b>	<b>100%</b>	<b>21,223</b>	<b>100%</b>	<b>68,441</b>	<b>100%</b>

\*These are calls made to the Communications Center through the 7-digit emergency line.

## Objective & Methodology

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The objective of our audit was to evaluate the Police and Fire Departments' (Departments) internal controls and staffing practices for managing dispatch communications overtime and special pay compensation. Our audit scope encompassed work schedules and payroll records occurring between October 1, 2010 and June 30, 2014, as well as historic call volume and staffing levels within this time period. During our audit, we performed the following procedures:

- ❖ Obtained and reviewed the Departments' policies and procedures surrounding scheduling and deployment, as well as those related to overtime and special pay;
- ❖ Reviewed applicable regulations related to overtime and special pay, including the Memorandum of Understanding between the City of Long Beach and the International Association of Machinists & Aerospace Workers, the City's Night Shift Differential Policy 3.4, and the Fair Labor Standards Act.
- ❖ Reviewed national and California standards regarding answering times of emergency calls;
- ❖ Interviewed personnel to obtain an understanding of internal controls related to our audit objective, staff scheduling and deployment, Communications Centers consolidation plans, among other issues;
- ❖ Analyzed and determined optimal Departments' staffing and workload levels of Public Safety Dispatchers (PSD);
- ❖ Analyzed three years of daily payroll data for all PSDs;
- ❖ Selected a statistically significant sample of payroll records and related schedules during the audit period for further review; and
- ❖ Surveyed comparable emergency communications centers for information related to staffing practices and use of overtime. The following jurisdictions were surveyed:

*Fire Dispatch Centers Surveyed:*

- Verdugo Fire Communications Center
- San Diego Fire and Rescue Department
- Los Angeles County Fire Department

- City of Torrance Fire Department

*Police Dispatch Centers Surveyed:*

- Los Angeles Police Department
- Los Angeles County Sheriff's Department
- Santa Ana Police Department
- Anaheim Police Department
- San Jose Police Department
- Irvine Police Department
- Glendale Police Department

We conducted this audit in accordance with the U.S. Government Accountability Office's Generally Accepted Government Auditing Standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

## Results & Recommendations

The objective of this audit focused on the appropriateness of the overtime and special pay compensation being paid by the Police and Fire Departments (Departments), which required us to evaluate the staffing and scheduling practices of dispatchers in the Communications Centers. Our audit found that the amount of overtime being paid was reasonable based on the significant number of open positions. The use of extensive overtime to cover shifts is required in order for the Departments to continue to answer calls within industry standards.

Over the past three years, the total cost of dispatcher overtime is significant at \$3.8 million. Table 5 below illustrates the overtime hours and costs from 2012 to 2014, showing total overtime costs increasing by 13% for the period.

**Table 5.**  
**Dispatcher Overtime Costs**  
**CY 2012 – CY 2014**

Year (CY)	Police Overtime Hours*	Police Overtime Paid*	Fire Overtime Hours	Fire Overtime Paid	Total Overtime Hours	Total Overtime Paid
2012	15,659	\$729,133	8,895	\$419,154	24,554	\$1,148,287
2013	16,606	\$819,173	11,243	\$562,043	27,849	\$1,381,216
2014	16,087	\$784,905	10,970	\$517,998	27,057	\$1,302,903
<b>Total</b>	<b>48,352</b>	<b>\$2,333,211</b>	<b>31,108</b>	<b>\$1,499,195</b>	<b>79,460</b>	<b>\$3,832,406</b>

\*These totals do not include the use of trained sworn Police Officers on an as-needed basis.

Our audit found that the Communications Centers were severely understaffed for the years we reviewed, and it does not appear recruitment efforts are sufficient to meet demand going forward. Faced with inadequate staffing levels over the next several years, the use of extensive overtime will be required to cover position vacancies. The continued use of extensive overtime is not an ideal situation for this safety-sensitive position and exposes staff to an unhealthy work environment over the long term.

### **This report addresses concerns in four areas:**

1. Staffing levels need further assessment.
2. Enhanced recruitment is critically needed.
3. Allocation of overtime can be improved.
4. Manual processes should be automated.

## ***#1. Staffing levels need further assessment***

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**The Departments determine staffing levels based on experience, but our analysis indicates a more extensive assessment of required positions and scheduling is warranted.**

We could not assess the appropriateness of overtime payments without determining whether staffing levels were reasonable. Therefore, we attempted to review the Departments' processes and methods for determining the appropriate number of dispatchers. Emergency dispatch centers must establish minimum staffing levels to meet scheduling needs. These minimum staffing levels are expected to ensure that adequate staffing resources are available at any time during the day to answer dispatch emergency calls within a specified timeframe or performance standard. The Departments do not appear to use a systematic process for determining staffing levels other than analyzing call volume numbers. The established minimum staffing levels used for scheduling resources, according to staff, appear to be developed over time based on experience.

In order to assess the validity of the Departments' staffing levels, we reviewed call center industry literature and staffing models and employed a generally accepted method for determining call-taker staffing requirements that uses the Erlang C call traffic mathematical formula.<sup>1</sup> Fundamentally, the Erlang C formula states that the minimum number of call-takers a call center requires at various times of the day is based on three key factors:

- a) the volume of incoming calls received;
- b) the average duration of time it takes for call-taker to handle each call; and
- c) the percent of incoming calls to be answered within a given number of seconds.

Note that we used data from the dispatch telephone systems to determine the volume and process duration time for outgoing calls. Appendix I to this report provides further explanation of how we used the Erlang C variables and other variables in our staffing calculations.

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<sup>1</sup> The Erlang formula, used to determine the required number of lines or circuits within a telephone system and the number call-takers needed to handle a given volume of calls, was developed by Agner K. Erlang, a Danish mathematician, statistician and engineer, in the early 20th century. The Erlang formula is a foundational element of present day telecommunication network studies.

**The Police Department's internally established minimum staffing levels for Police dispatchers is 9% higher than determined by our Erlang C Formula calculation.**

As shown in Table 6 below, the minimum staffing levels being scheduled by the Police Department requires 5.5 more full time employees (FTE) (65.5 FTEs) than the staffing requirement we calculated using the Erlang C formula (60.0 FTE). Minimum staffing levels employed by the Fire Department are more consistent with our calculations.

**Table 6.  
Comparison of Calculated Erlang Based Staffing Requirements to  
Department Minimum Staffing Levels**

	Police FTEs	Fire FTEs
Calculated Erlang-based staffing requirement	60.0	24.6
Department minimum staffing levels	65.5	25.4

To determine if the Departments were staffing to their minimum levels, we compiled the amount of hours actually paid to dispatchers for the past three calendar years, as shown in Table 7 below. We found that the Police Communications Center employed, on average, about 50 dispatchers on staff per year, but paid annual work hours that equated to a total of 60 positions, comprised of average actual straight hours paid equivalent to 49.5 dispatcher FTEs and overtime hours paid equivalent to 10.5 FTEs.

**Actual Police dispatcher hours worked were likely higher than the required staffing level based on the Erlang Formula, when the use of as-needed Police Officers is taken into consideration.**

**The actual Fire dispatcher hours worked were lower (less than one FTE) than the Erlang C Formula calculation.**

However, the 60 FTE total does not reflect the Police Communications Center's usage of up to seven sworn Police Officers to augment the dispatch floor on an as-needed basis. Actual hours worked by Police Officers as dispatchers were unavailable at the time of the audit. With this resource, the Police Department's overall hours paid was likely more than 60 FTEs, bringing them closer to their minimum staffing level of 65.5.



**Table 7.**  
**Total Dispatcher Hours Worked**  
**and Total Number of Employees**  
**Annual Average, CYs 2012 -2014**

	Annual Average	
	Police FTEs	Fire FTEs
Actual hours paid	49.5	15.4
Actual overtime hours paid	10.5	7.3
<i>Total equivalent</i>	<i>60.0*</i>	<i>22.7</i>
Actual number of employees	50	16

\*This total does not include the use of trained sworn Police Officers as as-needed dispatchers.

The Fire Communications Center employed on average 16 dispatchers per year, but had average actual paid hours per year equating to 22.7 FTEs, which is below their minimum staffing level and our calculated staffing requirement. This average total deployment of Fire dispatchers per year consists of 15.4 dispatcher FTEs working straight time hours and another 7.3 FTEs in overtime hours.

**Recommendation #1:** We understand the critical nature of ensuring the Communications Centers are adequately staffed to meet call volume. A thorough analysis of required minimum staffing levels should be performed to ensure scheduling meets demand and limits the use of overtime where possible.

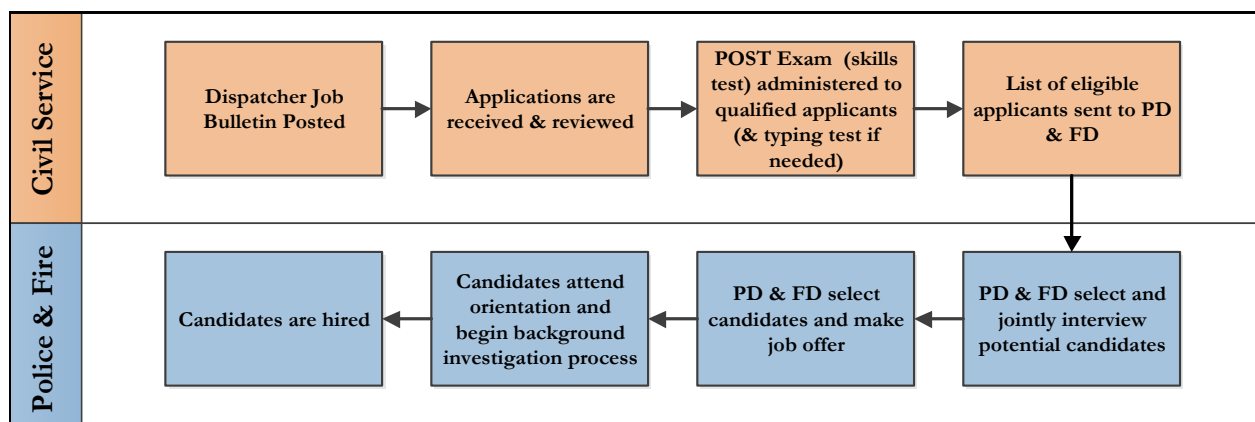
## ***#2. Enhanced recruitment is critically needed***

**Past recruitment and hiring practices have not been able to meet staffing needs.**

Both the Fire and Police Communications Centers are significantly understaffed and have been so for the past few years. Based on the Erlang C Formula calculation, Fire is 35% understaffed and Police is facing a 19% shortage in personnel. To answer historic call volume within performance standards, both Communications Centers require more dispatchers than are currently employed. This explains the need for the Communications Centers to resort to using a significant level of overtime to meet call workload.

Both the Police and Fire Departments have historically conducted one dispatcher recruitment process per year. Since the Departments utilize the same job classification and requirements, the hiring of dispatchers is a joint effort consisting of the Police, Fire and the Civil Services Departments. Chart 4 illustrates the recruitment process:

**Chart 4.**  
**Dispatcher Recruitment Process**



Newly hired dispatchers must complete a one-year probationary program, which includes four to five weeks of classroom training followed by on-the-floor training with live calls. The high-stress and multi-tasking nature of the dispatcher job results in relatively high turnover during the training and probationary period. The Police and Fire Communications Centers have average retention rates of new hires of only 34% and 46%, respectively. In other words, the majority of recruits do not become fully fledged, certified emergency dispatchers.

**Retention of dispatcher recruits pass the probationary period is difficult. On average, only 34%-46% of Long Beach recruits become fully fledged dispatchers.**

In addition, over the next five years, the Police and Fire Departments could lose more dispatchers as a result of retirement. This, coupled with the amount of current vacancies that need to be filled and a lengthy hiring process, will make it difficult for the Departments to become adequately staffed, and will require continued reliance on extensive overtime to cover scheduling needs, as well as possibly using sworn police officers for this civilian function.

**To reach the required staffing levels calculated by the Erlang Formula within the next 4-5 years, the City needs to double its recruitment efforts.**

Table 8 projects how long it will take for Police and Fire Communications Centers to become fully staffed based on the staffing levels calculated by the Erlang Formula, which determined that the Fire and Police Communications Centers require 24 and 60 positions, respectively. The projections assume one to two recruitments per year, past hiring outcomes and expected retirement of tenured employees.

**Table 8.**  
**Dispatcher Staffing Projections**  
**FY 2015 – FY 2017**

	Recruitments per Year	Calculated Erlang-Based FTEs	Projected Ending FY15 FTEs	Projected Ending FY16 FTE	Projected Ending FY17 FTE
Police	1	60	44	46	48
	2	60	47	51	55
Fire	1	24	14	15	15
	2	24	15	17	18

Based on these assumptions, it may take the Police Department four to 12 years to become fully staffed using one and two recruitments, respectively. The projections for Fire are considerably worse. If the Fire Department were to only use one annual recruitment, the Fire Communications Center's staffing level would not reach 24 FTEs until 2031. With two recruitments per year, the Department could reach 24 FTEs in five years.

The Fire Communications Center's current budgeted FTEs at 19 is five positions fewer than needed staffing levels. If the Fire Department continues to cap dispatch personnel at 19 FTEs, they are only meeting 79% of their scheduling needs. Attempting to cover almost 20% of personnel needs with overtime over the long-term is risky and exposes staff to an unhealthy work environment of consistently long days with little relief.

**Recommendation #2: The Fire Department should adjust its budget to reflect dispatcher FTEs that are reasonable to meet scheduling needs, which will reduce the need for extensive use of overtime.**

### Current Recruitment

The number of recruitments each year is limited due to the amount of time to complete the process. In the past four years, the City has had three regular recruitments (one each in 2011, 2012, and 2014), and one lateral recruitment (in 2013). Complete timeline information was obtained for the two regular recruitments in 2012 and 2014. The 2012 recruitment required 12 months to complete, defined as from the time the job was posted to the time the new recruits were hired. The 2014 recruitment lasted nine months.

**Compared to benchmark agencies, the City's dispatcher hiring process appears to take three months longer to complete.**

Benchmark results from comparable jurisdictions concur that the process is time consuming, starting with hundreds of applications, but ending with the hiring of only a handful of candidates. However, it appears it takes the City approximately three months longer (10-month average vs. 7-month average) to hire dispatchers than the benchmark average. While the Police and Fire Departments have been actively hiring, the lengthy process is contributing to ongoing vacancies and related high usage of overtime hours.

**Recent improvements have been made to shorten the hiring process, including transition to a more accessible dispatcher aptitude examination and expansion of candidate background investigative resources.**

The Departments are considering ways to improve the recruitment process. The use of a new testing agency and assistance with background checks could potentially shorten the process, along with using lateral recruitments. In addition, we believe that enhancing outreach efforts and providing keyboard training internally may also improve recruitment results.

### Alternative Applicant Testing

One of the reasons for the lengthy recruitment process is the standard test being used to identify qualified applications. At the time of our audit, Civil Service was using the *Entry-Level Dispatcher Selection Test Battery* sponsored by the California Commission on Peace Officer Standards and Training (POST). This POST exam is designed to measure a candidate's aptitude for performing public safety dispatcher work. Civil Service must request testing materials from POST, schedule and administer the test to candidates, and then forward test results to POST for grading and wait for results. On average, the POST testing process has

required approximately two months, from the time testing materials were requested from the State to when the results were received.

In an attempt to reduce this timeframe, both Police and Fire have stated that they are moving towards using an outside company, National Testing Network (NTN), to administer a similar skills aptitude test that will replace the current POST exam and eliminate the need for Civil Service to oversee the actual testing process. This should allow for more flexibility and efficiency, providing the Departments with an eligible candidate list more quickly. At the time of our audit, the Departments had not begun using NTN, but they expect to be able to increase the number of recruitments from one to two per year with the implementation of this test.

### *Assistance with Background Investigations*

Besides the testing portion of the hiring process, the Departments stated that the background investigation has been another factor contributing to the lengthy process. Background investigations have been handled internally by the Police Department, but are not a priority if the Department is doing background investigations on police officer recruits. When faced with multiple background investigations, significant delays can occur. In an effort to speed up the hiring process, the Police Department has contracted with three outside firms to assist in the completion of employee investigations. However, because the additional investigative resources are new to the hiring process, we were unable to determine if this action will actually decrease the time it takes to hire dispatchers.

### *Lateral Recruitments*

Besides the regular competitive recruitment open to all candidates who meet the minimum requirements, the Departments can perform lateral recruitments. Lateral recruitments are opened to candidates who already possess the required dispatcher certifications and are usually employed as a dispatcher for another jurisdiction. Additionally, the Departments have begun a recruitment that is open to certified dispatch professionals seeking only part-time employment; these are usually City retirees who once held the position. At this juncture, it is too early to determine whether these new initiatives can increase staffing to sufficient levels.

### *Outreach Activities*

The City's past outreach and recruitment activities have been limited to dissemination of job listings on several external websites and Civil Service conducting informational workshops at the start of a recruitment. In comparing the City's efforts to the benchmark agencies'

outreach activities, we found many of the benchmark agencies appear to engage in more proactive recruitment efforts. These outreach activities include:

- Conduct outreach activities at local community and college career days, job recruitment fairs, and community events.
- Conduct presentations and disseminate job information at criminal justice classes at community colleges.
- Post dispatcher job openings on college job and career bulletins.
- Post dispatcher job openings on social media and on various external websites, including [apcointl.org](http://apcointl.org), [careersingovernment.com](http://careersingovernment.com), [911dispatch.com](http://911dispatch.com), [lawenforcementjobs.com](http://lawenforcementjobs.com), [linkedin.com](http://linkedin.com), [craigslist.org](http://craigslist.org), and [cpa.org](http://cpa.org).
- Utilize a recruiting/marketing firm hired to reach more candidates.
- Send email notifications regarding job openings to local and regional professional dispatcher and PSAP manager associations.

Since this position is so difficult to fill, performing more outreach can be a key component in reaching new audiences that were not previously aware of job postings.

### *Communications Center Consolidation*

In FY 2013, the City created the Department of Disaster Preparedness and Emergency Communications (DDPEC) to help consolidate and implement more efficient and concerted emergency efforts. Part of DDPEC's efforts is a plan to consolidate the Fire and Police Communications Centers where dually trained call-takers would be able to diagnose all law enforcement, fire and medical calls. Dispatch consolidation would allow Police and Fire to share personnel resources, potentially resulting in cost savings and the reduction of overtime. Consolidation could also lead to improvements in service and process efficiencies, as the need to transfer fire and medical calls to separate call-takers would be eliminated.

However, consolidation efforts have yet to be realized due to the inability to fill open dispatch positions. With current dispatchers already working maximum overtime, there is very limited opportunity for dispatchers to be cross-trained and dually certified in both Police and Fire dispatching. Therefore, consolidation efforts are contingent upon the success of timely and expanded recruitment, hiring and training of new dispatchers.

In November 2014, DDPEC provided a presentation to the City Council's Public Safety Committee on the status of the consolidation effort. The presentation document indicated that cross training could begin sometime in 2015, as both Departments would be close to being fully staffed. However, based on retention rates and possible retirements, it does not appear that the Communications Centers would be adequately staffed for several years (previously noted in Table 8). All of the possible benefits from having a consolidated center will continue to be deferred until recruitment efforts are enhanced.

**Recommendation #3: As a group, Fire, Police, DDPEC and Civil Service should continue to work together to find ways to increase the number of recruitments and potential applicants. Results from changing testing programs and hiring additional background investigators should be evaluated as quickly as possible to determine if results are positive. In addition, enhanced outreach should be considered to expand the applicant pool.**



### #3. Allocation of overtime can be improved

**The current method for allocating overtime results in the top five dispatchers working between 30-50% of total overtime for the department.**

This audit conducted a break-even analysis that determined using overtime is more cost effective than hiring an FTE up to 31 to 33 hours per dispatcher per week. However, it is not operationally feasible to have employees work that much overtime. Continued reliance on excessive overtime on a long-term basis can lead to a number of negative consequences, such as employee burnout, morale problems, increased absenteeism, and higher employee turnover.

**In 2013, Long Beach Fire and Police Dispatchers worked on average 318 and 43 more overtime hours, respectively, than the average of their counterparts in comparable agencies.**

#### Benchmarking Results

In our benchmark analysis, of which the results are shown in Table 9 below, we found a wide variance in the amount of overtime as a percentage of pay amongst the agencies surveyed.

**Table 9.  
Comparison of Overtime Hours per Dispatcher  
CY 2011 – CY 2013**

Dispatch Agency	Avg. overtime hours per year per employee	Overtime hours as % of total annual hours paid
Long Beach Police Communications Center	236	11%
Anaheim Police Department	335	16%
Glendale Police Department	267	13%
Irvine Police Department	213	10%
Santa Ana Police Department	201	10%
San Jose Police Department	94	5%
Los Angeles County Sheriff's Department	49	2%
<i>Average - police dispatch agencies</i>	<i>193</i>	<i>9%</i>
Long Beach Fire Communications Center	561	27%
San Diego Fire and Rescue Department	419	20%
Verdugo Fire Communications Center	404	19%
Los Angeles County Fire Department	104	5%
City of Torrance (consolidated fire/police)	44	2%
<i>Average - fire/consolidated dispatch agencies</i>	<i>243</i>	<i>12%</i>

While Police at 11% was close to the average, Fire was considerably higher than those in the benchmarking study. This is mainly due to Fire currently having almost one-third of their staffing usage being filled with overtime.

**Compressed workweeks are common in emergency dispatch, but high overtime usage in Long Beach increases the likelihood of working excessively long work days or more work days, posing safety and performance risks.**

Long Beach dispatchers work relatively longer work shifts, 10 or 12 hours. When overtime is added to regular work shifts, the work day can be very long. Studies have shown that in law enforcement and across other industries, working excessively long work shifts, particularly those that are 12 hours or more, can lead to increased fatigue and safety-related incidents, and decreased quality of service, communication and cognitive performance.<sup>2</sup> These issues are more pronounced in law enforcement and emergency services, including not only first responders, but also 9-1-1 communications personnel. As shown in Table 10, the maximum number of hours a Police

dispatcher can work within a 24-hour period is consistent with agencies benchmarked, but Fire dispatchers, at 18 hours, are on the high end compared to most of their counterparts.

**Table 10.**  
**Comparison of Dispatcher Work Shifts**

Dispatch Agency	Work shift (hours)	Maximum work hours within a 24-hour period	Minimum required rest time between shifts
Long Beach Police Communications Center	10	14.5	9.5
Los Angeles County Sheriff's Department	12	19	N/A
Glendale Police Department	12	18	6
Los Angeles Police Department	8	16	8
Santa Ana Police Department	12	16	8
Anaheim Police Department	12	16	8
Irvine Police Department	12	16	5
San Jose Police Department	10	14	10
Long Beach Fire Communications Center	12	18	6
Los Angeles County Fire Department	12	24	10
Verdugo Fire Communications Center	12	16	8
San Diego Fire and Rescue Department	12	16	8
City of Torrance (consolidated fire/police)	13	16	8

<sup>2</sup> Karen L. Amendola et al., “The Shift Length Experiment: What We Know About 8-, 10-, and 12-Hour Shifts in Policing,” (Washington, D.C: The Police Foundation, 2011), 21-33.

The Police Communications Center schedules dispatcher overtime in two- or three-hour increments, with internal policy stating that a dispatcher will not be required to work more than 14.5 hours in one day. On the other hand, the Fire Communications Center schedules overtime in six-hour increments and restricts dispatchers to no more than 18 hours per day.

While both the Fire and Police Departments strive to minimize the number of days in which dispatchers work the maximum number of hours, working such long hours creates an unhealthy work environment and certain risks for the City.

**Recommendation #4: We recommend Fire consider capping the maximum number of continuous hours worked in one shift to 16 hours, similar to other police and fire agencies surveyed.**

### Overtime Allocation

**Overtime hours were disproportionately worked among both Fire and Police Dispatchers, potentially creating public safety and workplace risks.**

Overtime is not spread evenly among Long Beach dispatchers, as it is concentrated amongst a smaller segment of the workforce. As shown in Table 11 below, the top five dispatchers in each department working the most overtime comprised a large proportion of total overtime hours and costs. For the Police Communications Center, 10% of the workforce is receiving 31% of the CY 14 overtime paid.

**Table 11.  
Top 5 Overtime Earners  
CY 2014**

Dispatcher		1	2	3	4	5	Totals
Police	Overtime Hours	1,284	815	776	712	660	4,247
	% of Total Overtime Hours	9%	6%	5%	5%	5%	30%
	Overtime Paid	\$70,214	\$32,383	\$43,035	\$39,711	\$31,063	\$216,406
	% of Total Overtime Paid	10%	5%	6%	6%	4%	31%
Fire	Overtime Hours	1,402	1,110	971	911	905	5,299
	% of Total Overtime Hours	13%	11%	9%	9%	9%	51%
	Overtime Paid	\$75,016	\$59,486	\$49,231	\$39,983	\$42,595	\$266,311
	% of Total Overtime Paid	14%	11%	10%	8%	8%	51%

It is a similar situation within the Fire Communications Center, where 31% of the workforce received 51% of the total overtime hours and pay in CY 2014.

On a monthly basis, dispatch supervisors identify the shifts that need to be filled with overtime, in order to meet minimum staffing requirements. In seniority order, dispatchers are given the opportunity to sign up for overtime on a voluntary basis. Any remaining overtime slots, after all voluntary sign ups have taken place, are filled on a mandatory basis<sup>3</sup>. Dispatchers are assigned required overtime shifts based on ascending seniority and cumulative, year-to-date mandatory overtime hours worked. Under this process, the allocation of overtime is disproportionate. Since both Departments are relying heavily on extensive overtime to meet scheduling needs, allowing a small number of senior employees to work so much overtime only contributes to an unhealthy work environment.

**Recommendation #5: The Police and Fire Communications Centers should set a limit on the cumulative number of overtime hours that can be worked by a dispatcher.**

#### 4/10 and 3/12 Workweek

As noted in the previous section, compressed workweeks are common in the emergency communications industry. The Police dispatchers work a 4/10 workweek, which means they work four 10-hour shifts, equaling 40 hours, per week. The 4/10 workweek allows the Police Communications Center to overlap work shifts, allowing it to increase staffing levels during periods of increased call volume. In Police dispatch, this ability is important because call volume can fluctuate more from hour to hour and day to day, than the call volume of Fire dispatch.

**Fire dispatchers are scheduled to work 42 hours per week, creating two automatic hours of overtime per week. This costs the City up to \$52,600 per year in overtime costs.**

The Fire Communications Center employs a 3/12 workweek, in which dispatchers work three 12-hour shifts per week, equaling a total of 36 hours per week. To reach the required 40 hours per week for full-time status, all Fire dispatchers work a fourth six-hour shift on Tuesdays. This modified 3/12 workweek requires Fire dispatchers to work a total of 42 hours per week with two hours of overtime “built-in” to their regular workweek. Based on payroll

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<sup>3</sup> In Police Communications, slots are opened to a small cadre of police officers who are trained and authorized to work in the Communications Center before mandatory overtime is assigned.

data, we estimated that it costs approximately \$52,600 in “built-in” overtime each year as a result of this scheduling practice.

As we noted earlier, a 3/12 workweek is common among emergency communications centers. However, we found that some other communications centers that utilize the 3/12 workweek do so in ways that do not include any fixed or “built-in” overtime hours into the regular workweek.

**Recommendation #6: As Fire reaches budgeted dispatcher FTE levels, it should consider restructuring the dispatcher workweek or schedule to discontinue the fixed or built-in two hours of overtime per week.**

#### *#4. Manual processes should be automated*

**The manual processes used to manage overtime and the application of how night-shift differential is paid is not always in-line with best practices.**

##### *Controls over Overtime Usage*

The Police and Fire Communications Centers use manual files to schedule and track time worked by dispatchers, even though an automated scheduling system is available. Center supervisors are responsible for creating and maintaining manual schedules, including any overtime shifts worked, or changes in schedule due to employees' absence. The use of manual files is time consuming and makes it difficult to track whether overtime paid to employees was actually worked.

**In CY 2014, an estimated \$65,000 of dispatcher overtime pay lacked the proper supporting documentation.**

When reviewing daily and weekly schedules, we noted instances where overtime hours recorded did not always match overtime paid per payroll records. We found that 3% and 8% of Police and Fire dispatcher overtime payroll records sampled, respectively, had no supporting documentation in the dispatch work schedules to justify the overtime paid. In dollar terms, this is estimated at approximately \$23,500 of Police and \$41,400 of Fire dispatcher overtime that was paid in CY 2014 without any supporting documentation. Dispatch management indicated that these hours are likely to be associated with non-routine dispatch activities and may be documented outside manual schedules. Inconsistent documentation of these overtime hours makes it difficult to track and verify.

Scheduling of sworn police officers and firefighters within the Departments is managed with an industry known public safety scheduling software called Kronos Telestaff (Kronos). However, this software is not being used to schedule dispatchers in the Communications Centers. The use of Kronos in the Centers would increase oversight and save time currently spent on manual scheduling. Kronos functionality includes scheduling, assignment of overtime, and bidding for vacation or shift slots. It can also be integrated with 3<sup>rd</sup> party software (such as CAD or payroll systems). The use of this automated system will save supervisors time, as well as allow for better tracking of hours and overtime shifts. In addition, reports can be generated from the software to manage scheduling needs and overtime usage.

**Recommendation #7: The Departments should use their existing Kronos Telestaff software to schedule and manage dispatchers' schedules.**

### Controls over Night Shift Differential Pay

The policies governing special pay for working night or graveyard shifts is defined in two documents: a) the Memorandum of Understanding (MOU) between the City and the International Association of Machinist & Aerospace Workers (IAM), which represents dispatcher personnel; and b) the City's Personnel Policy and Procedures, Policy #3.4.

These policies state that the night shift differential (NSD) pay should be paid to any permanent full-time employee whose regular schedule requires the employee to work between the hours of 6:00 p.m. and 6:00 a.m. If the employee works 50% or more of their regular shift between 6:00 pm and 6:00 a.m., all regularly scheduled hours worked are paid an additional \$1.25 per hour. Table 12 illustrates the NSD paid to both Police and Fire dispatchers over the past three years, with \$69,424 paid in CY 2014.

**Table 12.**  
**NSD Paid to Dispatchers**  
**CY 2012 – CY 2014**

<b>Year (CY)</b>	<b>NSD Hours</b>	<b>NSD Paid</b>
2012	65,167	\$81,460
2013	61,040	\$76,300
2014	55,539	\$69,424
<b>Total</b>	<b>181,746</b>	<b>\$227,184</b>

Table 13 below summarizes different situations on how NSD is to be paid. During our review, 12% of Police and 20% of Fire dispatcher records sampled were not eligible to receive NSD as per the scenarios listed in Table 13. This equates to approximately 7,371 hours for a total NSD payment of \$9,200 being incorrectly paid in CY 2014.

**Table 13.**  
**NSD Eligibility**

<b>Example</b>	<b>Eligible for NSD</b>
All hours worked by dispatchers regularly scheduled on night shift	Yes
Overtime worked on a night shift performed by a dispatcher regularly scheduled on day shift.	No
Overtime worked continuously after a dispatcher's regularly scheduled night shift	Yes
Overtime worked prior to the start of dispatcher regularly scheduled night shift.	No
Overtime hours that are not continuously worked beyond dispatcher regularly scheduled night shift (i.e. working another shift on regular day off).	No



We were unable to verify an additional 1% of Police and 3% of Fire dispatcher NSD payroll records, due to the fact that the manual schedule did not contain information to support the NSD hours paid. The manual schedule did not contain documentation of all overtime shifts worked, or the time period that the hours were worked; therefore, we were unable to verify if hours qualified for NSD.

**Recommendation #8: Review internal processes to ensure NSD is being paid appropriately based on MOU and City policy.**

# Appendix I:

## Methodology for Determining Staffing Requirements

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### Introduction

As part of our examination of the use of overtime, we assessed the adequacy of the current dispatcher staffing levels and of the established minimum staffing levels in meeting expected call volume within the preferred timeframes. The primary responsibilities of the floor-level dispatcher position can be summarized as follow:

- 1) Intake of incoming emergency and non-emergency calls.
- 2) Dispatch of calls via radio to appropriate emergency-response units in the field.
- 3) Make outgoing calls to obtain additional information, verify dropped calls, or to meet other administrative needs.

To effectively estimate the annual staffing level requirement for floor dispatchers, our staffing methodology calculated the levels of staffing required to perform each of the three primary dispatcher responsibilities on an hourly basis. Each calculation involved different variables and assumptions. Once an overall hourly base staffing level requirement is determined, we then incorporated operating variables (24/7/365 operations) and expected employee leave and other non-work hours to arrive at a total annual staffing level requirement for the dispatch floor.

### *Calculating call-taker positions*

To perform this analysis, we utilized a call center staffing calculator software, called CC Modeler Professional, that generates a staff level for each hour that is required to answer the call volume within a specified performance metric. The software is based on a generally accepted call center traffic mathematical algorithm, called the Erlang C,<sup>4</sup> for determining net call-taker staffing requirements. The Erlang C formula states that the minimum number of call-taking positions a call center needs at various times of the day is based on the following

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<sup>4</sup> The Erlang formula, used to determine the required number of lines or circuits within a telephone system and the number call-takers needed to handle a given volume of calls, was developed by Agner K. Erlang, a Danish mathematician, statistician and engineer, in the early 20th century. The Erlang formula is a foundational element of present day telecommunication network studies.

key variables: incoming calls per hour, service level performance metric, average call duration, and average wrap-up time.

- *The volume of incoming calls received by the call center within a one-hour period.* Average hourly call volume was determined using data generated from the Police and Fire Communications Centers' telephone communications systems. Since incoming call volume can be unpredictable, we accommodated for potential peaks in our staffing methodology by increasing expected average hourly call volume by 20%, from which we calculated the staffing levels needed to meet incoming call workload.
- *The average duration of time it takes for call-taker to handle each call.* The average call duration encompasses the time between when the call-taker answers the call and the time the call-taker ends the call or forwards the call to the dispatcher for radioing the field units. The average call duration is captured by the dispatch telephone system and is summarized in the data reports. The average call duration for an incoming call to Police Communications and Fire Communications was 81 seconds and 75 seconds, respectively.

The time needed for data entry or other administrative tasks after each call, referred to as post-talk wrap time, is also required by the Erlang C formula. Since the dispatch telephone system does not capture wrap time, we used estimated values. For the Police Communications Center, we used the 60-second wrap time guideline set by the California Governor's Office of Emergency Services 9-1-1 Operations Manual. For the Fire Communications Center, without any stated guideline, we used an average of 30 seconds for the wrap time.

- *The percent of incoming calls to be answered within a given number of seconds (this is often referred to as the performance standard).* To receive State cost recovery funding associated with operating the City's primary 9-1-1 PSAP, the Police Communications Center must adhere to the National Emergency Number Association (NENA) standard that, during the busiest hour of any shift, 90% of 9-1-1 calls be answered within 10 seconds. In assessing Fire Dispatcher staffing, we used the standard set forth by the National Fire Protection Association (NFPA), which promotes a performance standard of answering 95% of emergency calls within 15 seconds.

### ***Calculating radio dispatching positions***

In addition to call-taking, another major function of the floor-level Public Safety Dispatcher is radio dispatching emergency calls to response units out in the field. The number

of radio dispatching positions are driven not by call volume (as are call-taker positions), but rather by the need to cover a certain number of radio channels at any given time. Both the Fire and Police Communications Centers have established minimum staffing levels for radio dispatching positions on an hourly basis. Our methodology used these minimum levels to calculate our staffing projections.

### ***Calculating positions for processing outgoing calls***

In addition to answering calls for service, call-takers make outgoing calls to investigate hang-up calls, to contact external resources, or to request for additional information. We used data from the telephone systems to determine the volume and processing duration time for outgoing calls. The average call duration for an outgoing call from Police Communications and Fire Communications was 44 seconds and 53 seconds, respectively. For both dispatch centers, we used an estimated 10 seconds for average wrap time after each call has been made.

### ***Determining an annual total staffing level requirement***

Once we have calculated the number of hourly positions needed for call-taking, radio dispatching and outbound call processing, we need to adjust these staffing level requirements to account for a 24/7/365 operations and for expected employee leave, non-work hours, and vacancy. To determine an overall annual staffing requirement that takes into account expected employee leave and non-work hours, we used the per employee averages of actual benefited time off and other leave hours. We also estimated on-duty time in which the dispatchers were not performing their core duties; such on-duty, non-work hours include training, meals, breaks, and other unaccounted time.

To accommodate for the 24/7/365 operation of the Police and Fire Communications Centers, the calculation to determine an overall annual staffing level needs to ensure that positions are filled 7 days per week and 24 hours per day. To do so, we incorporated the dispatcher work shift schedules. Police dispatchers work four 10-hour shifts per week, while Fire dispatchers work three 12-hour shifts plus one modified shift per week. Lastly, the staffing calculation also needs to consider expected vacancy rates in the dispatcher workforce. We used historical three-year average turnover rate among Public Safety Dispatchers II through IV to make adjustments to our staffing calculation.

### **Step 1: Calculate the average hourly call volume**

Average hourly call volumes for inbound and outbound calls are needed to estimate the level of staffing required for call-taking positions. Call volume averages by the hour of the day are shown in Table 1 below. For the Police Communications Center, averages were based

on call data for CYs 2011 through 2013, while only CY 2013 call data was available for Fire Communications Center. The actual incoming call volume at any given hour can fluctuate below or above this average. To accommodate these peaks in our staffing analysis, these average values for incoming calls were multiplied by an estimated peak volume adjustment of 20%, which we determined to provide a reasonable buffer. In other words, staffing levels should be sufficient to field incoming call volumes up to 20% above the average.

**Table 1.**  
**Average Call Volume by Hour of the Day (adjusted +20%)**  
**Police and Fire Communications Centers**

Hour of Day	Police		Fire	
	Avg. Inbound Calls	Avg. Outbound Calls	Avg. Inbound Calls	Avg. Outbound Calls
0:00	62	22	11	3
1:00	50	18	10	3
2:00	44	16	8	2
3:00	31	11	7	2
4:00	26	9	6	2
5:00	30	11	7	2
6:00	42	15	10	2
7:00	57	20	16	4
8:00	76	27	25	5
9:00	86	31	22	4
10:00	93	33	24	5
11:00	97	35	24	5
12:00	99	36	23	5
13:00	104	37	24	5
14:00	110	40	24	5
15:00	112	40	24	5
16:00	114	41	23	5
17:00	106	38	24	5
18:00	102	37	23	5
19:00	98	35	21	5
20:00	96	35	19	5
21:00	92	33	17	4
22:00	86	31	15	4
23:00	77	28	13	3
Hourly Avg.	79	28	17	4

## **Step 2: Develop a base total floor-level position requirement**

In this step, as shown in Tables 2 and 3, we calculated the staffing levels required to perform the three major tasks of the floor-level Police and Fire dispatcher.

- a) Call-taking – The CC Modeler Professional software, using the Erlang C formula, determined that the Police Communications Center required an average of 6.28 dispatcher positions per hour during each day to answer incoming calls. The Erlang C equation also determined that the Fire Communications Center required an average of 2.62 dispatcher positions per hour during each day to answer incoming calls.
- b) Radio dispatching – From the established minimum staffing levels, Department management identified the number of radio dispatching positions for each hour of the day. These numbers were used to calculate the annual staffing level required to dispatch calls to responding field units.

Based on the Police Communications Center's minimum levels for dispatcher positions, the center would also require an hourly average of 2.3 positions to dispatch calls to the appropriate resources. The Fire Communications Center's minimum staffing levels require at least 1.00 dispatcher per hour to dispatch calls to the appropriate resources.

- c) Making outgoing calls – Call-takers make outgoing calls when necessary. Since these outgoing calls are not required to be processed within a specific timeframe, the Erlang C formula was not appropriate to determine staffing requirements. The calculation used is more straightforward.

For example, ten outgoing Police calls made within an hour requires 10.5 minutes (10 calls at 53 seconds per call plus 10 seconds for wrap time) of staff time, or 0.175 hours (10.5 minutes divided 60). The latter is equivalent to the number of dispatcher positions, since a dispatcher working all 60 minutes in an hour would equate to one position.

Based on this methodology, we determined that a total 0.42 Police dispatcher positions and 0.07 Fire dispatcher positions would be required per hour to make expected outgoing calls.

In sum, the Police Communications Center would need a total of 9.00 positions of dispatchers per hour on the dispatch floor to perform these three primary functions.

**Table 2.**  
**Base Hourly Call-Taker and Dispatcher Staff Requirements**  
**Police Communications Center**

Hour of Day	Positions Required			
	Incoming Calls	Dispatching	Outgoing Calls	Total
<b>0:00</b>	5.29	3.00	0.33	8.62
<b>1:00</b>	5.00	3.00	0.27	8.27
<b>2:00</b>	4.29	2.29	0.24	6.81
<b>3:00</b>	4.00	1.00	0.16	5.16
<b>4:00</b>	3.00	1.00	0.14	4.14
<b>5:00</b>	3.86	1.00	0.16	5.02
<b>6:00</b>	4.00	1.00	0.22	5.22
<b>7:00</b>	5.00	2.00	0.30	7.30
<b>8:00</b>	6.00	2.00	0.41	8.41
<b>9:00</b>	7.00	2.00	0.46	9.46
<b>10:00</b>	7.00	2.00	0.50	9.50
<b>11:00</b>	7.00	2.00	0.52	9.52
<b>12:00</b>	7.29	2.00	0.54	9.81
<b>13:00</b>	7.89	2.00	0.56	10.41
<b>14:00</b>	8.00	2.00	0.59	10.59
<b>15:00</b>	8.00	3.00	0.60	11.60
<b>16:00</b>	8.00	3.00	0.61	11.61
<b>17:00</b>	8.00	3.00	0.57	11.57
<b>18:00</b>	7.86	3.00	0.55	11.41
<b>19:00</b>	7.29	3.00	0.52	10.81
<b>20:00</b>	7.00	3.00	0.51	10.51
<b>21:00</b>	7.00	3.00	0.49	10.49
<b>22:00</b>	7.00	3.00	0.46	10.46
<b>23:00</b>	6.00	3.00	0.41	9.41
<b>Hourly Avg.</b>	<b>6.28</b>	<b>2.30</b>	<b>0.42</b>	<b>9.00</b>

Other the other hand, the Fire Communications Center would need a total of 3.69 dispatcher positions per hour on the dispatch floor to perform these three primary functions.



**Table 3.**  
**Base Hourly Call-Taker and Dispatcher Staff Requirements**  
**Fire Communications Center**

Hour of Day	Positions Required			
	Incoming Calls	Dispatching	Outgoing Calls	Total
0:00	2.00	1.00	0.05	3.05
1:00	2.00	1.00	0.04	3.04
2:00	2.00	1.00	0.04	3.04
3:00	2.00	1.00	0.03	3.03
4:00	2.00	1.00	0.03	3.03
5:00	2.00	1.00	0.03	3.03
6:00	2.00	1.00	0.04	3.04
7:00	2.71	1.00	0.07	3.78
8:00	3.00	1.00	0.09	4.09
9:00	3.00	1.00	0.08	4.08
10:00	3.00	1.00	0.09	4.09
11:00	3.00	1.00	0.08	4.08
12:00	3.00	1.00	0.08	4.08
13:00	3.00	1.00	0.08	4.08
14:00	3.00	1.00	0.09	4.09
15:00	3.00	1.00	0.09	4.09
16:00	3.00	1.00	0.09	4.09
17:00	3.00	1.00	0.09	4.09
18:00	3.00	1.00	0.08	4.08
19:00	3.00	1.00	0.08	4.08
20:00	3.00	1.00	0.09	4.09
21:00	2.86	1.00	0.07	3.93
22:00	2.29	1.00	0.07	3.36
23:00	2.00	1.00	0.06	3.06
Hourly Avg.	2.62	1.00	0.07	3.69

### **Step 3: Determine total annual staffing requirement**

To estimate the total number of dispatchers needed to staff these positions on a 24/7/365 basis for an entire year, we need to determine the number of annual FTEs to staff one floor position on a 24/7/365 basis. This staffing factor comprises the following components:

- a) Leave/occupancy factor – Dispatchers cannot constantly work around the clock. Even during their work shifts, dispatchers are not always constantly working, as they are required to breaks or participate in training and other administrative duties. They are

also entitled to benefited leave and other time off hours. The staffing calculation must consider these indirect or non-work hours. In this step, we took into account the average leave, other time-off and indirect work hours that a dispatcher is expected to take to determine the total number of hours a dispatcher is available to dedicate to direct call-taking or dispatching work. The calculation of the leave/occupancy factor is shown in Table 4 below. The leave factor means that, as a result of employee leave trends, the Police and Fire Communications Centers need 1.49 and 1.52 FTEs, respectively, to cover each needed position.

**Table 4.**  
**Calculation of Leave/Occupancy Factor**  
**Police and Fire Communications Centers**

	Per Police Dispatcher	Per Fire Dispatcher
<b>(A) Annual hours on shift</b>	2,088	2,088
<b>(B) Annual average non-work hours:</b>		
<i>Vacation</i>	126	127
<i>Sick leave</i>	82	110
<i>Other benefit time off</i>	174	195
<i>Training and other admin. time off</i>	18	18
<i>Meals and breaks</i>	200	197
<i>Other non-work time</i>	85	69
<b>(C) Net annual average working hours (A - B)</b>	<b>1,404</b>	<b>1,372</b>
<b>(D) Leave/occupancy factor (A / C)</b>	<b>1.49</b>	<b>1.52</b>

- b) 7-day workweek adjustment – Police dispatchers work four 10-hour shifts per week, and Fire dispatchers work three 12-hour shifts plus one adjusted shift per week plus. To make the adjustment for the seven-day workweek, we divide the number of days in a week (7) by the number of work days (4 for Police and 3.33 for Fire) in a week. Thus, the Departments need to provide for 1.75 Police dispatchers to cover each position per work week, and 2.10 Fire dispatchers to cover each position per work week.
- c) 24-hour operation adjustment – Because the Police and Fire Communications Centers are involved in emergency dispatch, the staffing calculation must reflect the reality that the centers operate 24-hours per day year round. To adjust for this type of operation, we divide the number of hours in a day (24 hours) by the number of hours in each work shift (10 hours for Police and 12 hours for Fire). The adjustment reflects the fact that the Police and Fire Communications Center need to allow for 2.4 shifts or 2.0 shifts, respectively, each day to cover one position.

- d) Vacancy factor – The staffing calculation also needs to consider expected vacancy rates in the dispatcher workforce. We used historical three-year average turnover rates among Public Safety Dispatchers II through IV to make adjustments to our staffing calculation.

The results of Step 3 are illustrated in Table 5 below. Note that the product of the first three components equals the staffing factor, which represents the total number of annual FTEs to staff one floor position on a 24/7/365 basis. In other words, taking into consideration expected employee leave and non-productive hours, we estimated that it would require a total of 6.25 Police dispatcher FTEs and 6.39 Fire dispatcher FTEs to staff one required floor position on a 24/7/365 basis.

**Table 5.**  
**Calculation of Annual Dispatcher FTEs Required**  
**Police and Fire Communications Centers**

	Police	Fire
(A) Avg. floor dispatcher positions required per hour	9.00	3.69
(B) Leave/occupancy factor	1.49	1.52
(C) Workweek adjustment	1.75	2.10
(D) 24-hour shift adjustment	2.40	2.00
(E) <i>Staffing factor</i> ( $B \times C \times D$ )	6.25	6.39
(F) Vacancy factor	7%	4%
<b>Total annual FTE positions required (<math>A \times E</math>) <math>\times</math> (1 + F)</b>	<b>60.0</b>	<b>24.6</b>

The total estimated annual FTE level is calculated by multiplying the hourly average of floor positions (call-takers and dispatchers) and the staffing factor. To take into consideration the expected turnover of these positions, this estimated total staffing level is then adjusted by the expected turnover rate. As a result, our staffing methodology determined that annual totals of 60.0 FTEs and 24.6 FTEs are required in the Police and Fire Communications Centers, respectively, to meet the expected annual floor dispatch workload.

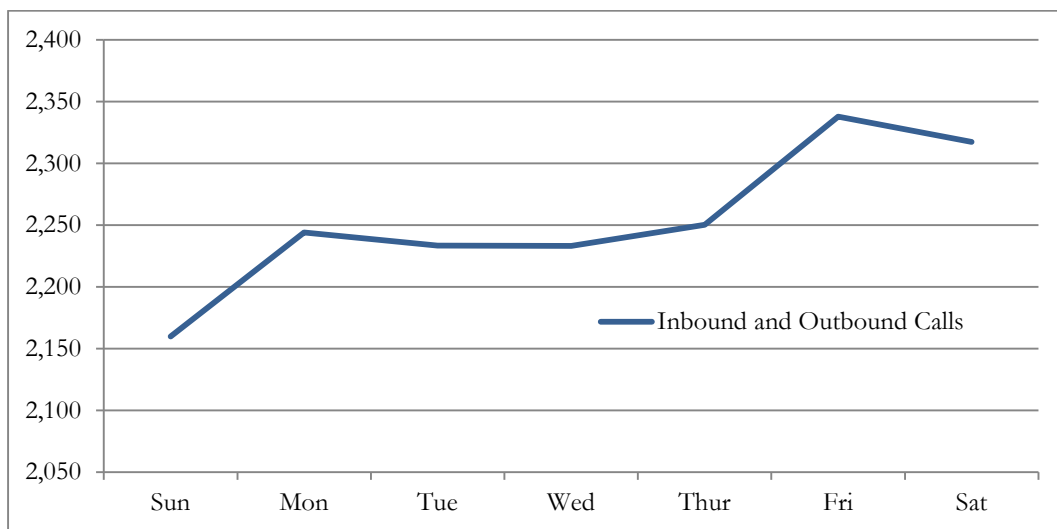
## Appendix II:

### Daily and Weekly Call Volume

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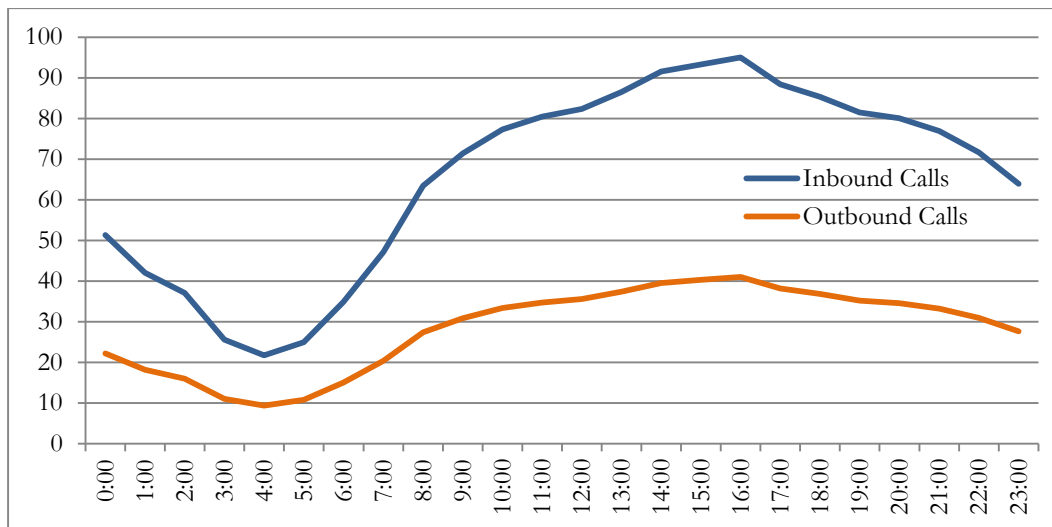
On an average day during Calendar Years (CY) 2011-13, Police Public Safety Dispatchers (dispatchers) answered a total of 1,570 incoming calls and made 678 outgoing calls. As shown in Chart 1 below, during an average week, Sundays were usually the slowest in the Police Communications Center, with an average of 1,504 inbound and 656 outbound calls. Workload gradually rose as the week proceeded, with inbound call volume increasing by over 8% from Sunday to Saturday. Incoming call volume was at its highest on Fridays and Saturdays.

**Chart 1.**  
**Average Call Volume by Day of Week**  
**Police Department Communications Center**  
**CYs 2011-13**



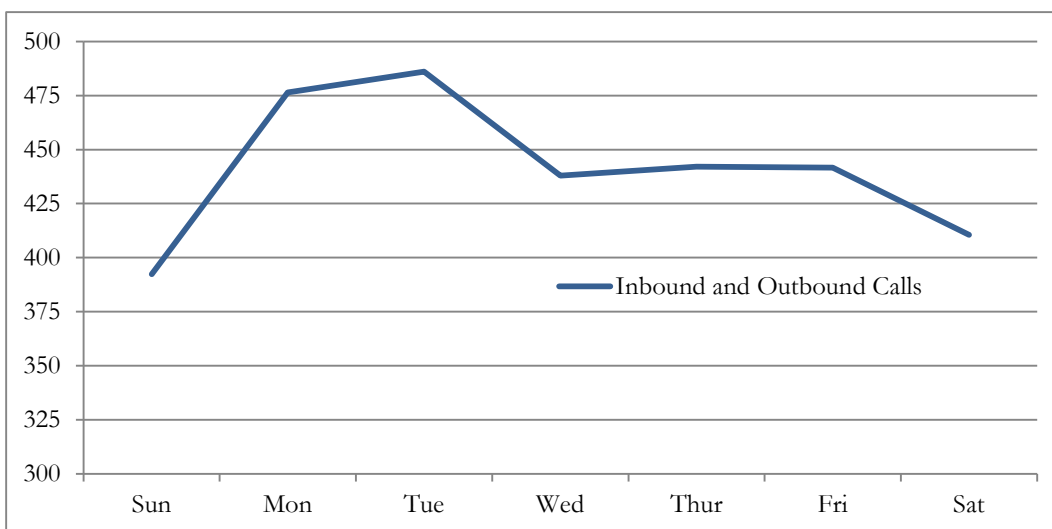
In an average hour, Police dispatchers processed 65 inbound and 28 outbound calls. Citizen-initiated calls for service followed a usual pattern in which call traffic fell in the early morning hours, rose gradually throughout the day, and peaked in the afternoon. As shown in Chart 2 below, incoming calls peaked between 4:00 p.m. to 5:00 p.m., with an average of 95 calls. Expectedly, during this hour, Police dispatchers made the most outgoing calls at 41 calls.

**Chart 2.**  
**Average Call Volume by Hour of Day**  
**Police Department Communications Center**  
**CYs 2011-13**



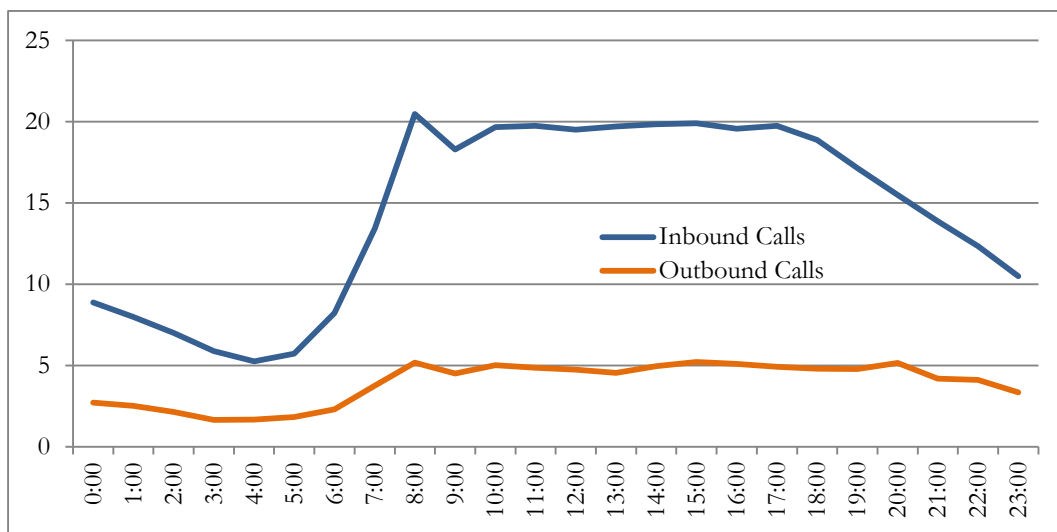
In CY 2013, Fire dispatchers answered an average of 346 inbound calls and made an average 94 outbound calls per day. Call volume received by Fire dispatch throughout the average week is different than the flow of calls into the Police dispatch. Rather than receiving the most calls on Fridays and Saturdays, Fire dispatchers answered the most calls on Mondays and Tuesdays, as shown in Chart 3 below. On average, Mondays and Tuesdays processed 13% more inbound and outbound calls than Fridays and Saturdays.

**Chart 3.**  
**Average Call Volume by Day of Week**  
**Fire Department Communications Center**  
**CYs 2011-13**



Call traffic flow was also different throughout the day. In an average hour, Fire dispatchers answered 14 inbound calls and made four outbound calls. Call traffic was at its slowest between midnight and 7:00 a.m., as shown in Chart 4 below, averaging around seven incoming calls per hour. Thereafter, calls rose dramatically and, from 8:00 a.m. to 7:00 p.m., maintained at around 20 incoming calls per hour. Starting at 7:00 p.m. and well into the evening and early morning, the call volume into the Fire Communications Center would gradually decline.

**Chart 4.**  
**Average Call Volume by Hour of Day**  
**Fire Department Communications Center**  
**CYs 2011-13**





**Date:** May 4, 2015

**To:** Patrick H West, City Manager *T.H.*

**From:** Robert Luna, Chief of Police *R.L.*  
Michael Duree, Fire Chief *M.D.*  
Reginald Harrison, Director, Disaster Preparedness & Emergency Communications *R.H.*

**For:** Laura Doud, City Auditor

**Subject:** **Management Response to Police & Fire PSD Overtime Audit – April 17, 2015**

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The Police (PD), Fire (FD) and Disaster Preparedness and Emergency Communication (DC) Departments would like to thank the City Auditor and staff for their assistance in conducting an audit of the Police and Fire Public Safety Dispatcher (PSD) overtime usage. The audit scope encompassed work schedules and staffing reports occurring between October 1, 2010 and June 30, 2014, as well as historic call volume and staffing levels within this time period. The audit was completed in a professional, productive and collaborative manner.

The PD Communications Center is the primary answering point for all 9-1-1 calls for service. During the audited period (as the audit details), PD PSDs processed an average of 820,000 total calls per year (emergency, non-emergency and outbound calls), an average of 2,248 calls daily. Calls requiring fire or emergency medical services are transferred to the FD Communications Center. FD PSDs processed over 162,000 calls in 2013 (emergency, non-emergency and outbound calls), including answering over 68,000 emergency calls. Both the PD and FD Communications Centers answered calls for service within national standards.

Several new efficiencies which address many of the concerns raised in the audit regarding staffing levels and overtime usage were implemented or completed shortly after the audited period through the collaboration of the PD, FD, DC, Human Resources (HR) and Technology and Innovation departments' participation in the Emergency Communication Consolidation Project. The audit recognizes that the results of these efficiencies could have significant impacts in critical areas identified in the audit, however, the results were outside of the timeframe audited and, therefore, not included in the report. The audit validates and confirms the importance of moving forward with those efficiencies implemented in 2014, including:

#### **Recruitment and Training Efficiencies**

**National Testing Network** – On August 20, 2014, the Civil Service Commission approved the recommendation to implement the use of the National Testing Network (NTN) for applicants applying for PSD positions. NTN contracts with public safety departments across the country to provide professional test administration services. Additionally, NTN provides access to lists of pre-

screened candidates ready for further processing and employment consideration. Through this process, recruitment for PSDs can occur on a regular and predictable schedule, saving time and money for the City. On August 22, 2014, the Civil Service Department initiated its first NTN recruitment for PSDs, resulting in 324 certified candidates to date. This candidate pool is much larger than the average number of candidates certified in the previous three recruitment processes. We thank the Civil Service Commission for their assistance with this new and productive recruitment tool.

**Contracting for Additional Background Investigators** - In July 2014, the City Manager authorized the City to contract with three background investigative companies to provide pre-employment background investigations for candidates for various City positions, including PSDs. The contracts provide a continuous avenue for the completion of PSD background investigations.

**Increase the Number and Size of Applicant Classes** – The combination of these efficiencies, NTN testing and additional background investigators, have led to an ability to schedule and conduct recruitments in a more consistent and predictable manner. Those efficiencies have increased the PSD applicant pool and, consequently, increased the potential recruit class size. As the audit points out, during the past four years, the City has conducted three regular PSD recruitments. This year, alone, we will conduct two class selections. The current PD PSD recruitment class began with a class size of 14 candidates, the maximum their trainers could support (currently 10 are in the training program). The current class size for the FD PSD recruit class is 4, the maximum their trainers could support (4 remain in the training program).

With the conclusion of the classes initiated in 2015, both the PD and FD Communication Centers' staffing levels are predicted to be filled, except for normal attrition from retirements and resignations. The reduction in vacancies to date has resulted in a forecasted 35% decrease in overtime for PD and FD in FY 2015.

We would like to thank the City Auditor for the extensive work, findings, and analysis performed during this audit. The management responses hereafter will address policies, procedures, internal controls, and overall operations of the Communications Center.



## **Results & Recommendations and Management Response**

### ***Concern #1 – Staffing Levels need further assessment***

*Recommendation #1: A thorough analysis of required minimum staffing levels should be performed to ensure scheduling meets demand and limits the use of overtime where possible.*

Response to Recommendation #1: Both PD and FD support the recommendation to perform an analysis of minimum staffing levels and review scheduling procedures. It should be noted that PD conducts an annual review of workload and call volume to ensure adequate staffing to meet minimum performance guidelines as set forth by industry standards. The FD also regularly reviews and updates their policies and procedures on staffing levels to ensure that they meet National Fire Protection Association (NFPA) performance standards on answering emergency calls. Additionally, both PD and FD supervision continuously monitor staffing levels and overtime worked to generate work schedules and make sure that they meet minimum staffing levels by shift.

### ***Concern #2 – Enhanced recruitment is critically needed***

*Recommendation #2: The Fire Department should adjust its budget to reflect FTEs that are reasonable to meet scheduling needs, which will reduce the need for extensive use of overtime.*

Response to Recommendation #2: As noted in the response to recommendation #1, Fire supports a thorough analysis of required minimum staffing levels, which would include an analysis of the efficiency and operationally effective balance of FTEs and overtime, which considers the employee's well-being. If this analysis leads to a recommendation to increase staffing levels, Fire would address this through the City's budget process, which takes into account all the critical services provided by the City of Long Beach.

*Recommendation #3: As a group, Fire, Police DPEC and Civil Service should continue to work together to find ways to increase the number of recruitments and potential applications.*

Response to Recommendation #3: PD, FD, DC and Civil Service agree with the recommendation. As a best practice, and in partnership, PD, FD, DC, HR, Civil Service, regularly evaluate the effectiveness of the recruitment, testing, processing, hiring, and training and retention practices for the PSD position. Civil Service disseminates the PSD job listings on external websites to target PSD students and existing PSD professionals. Civil Service, PD and FD staff also conduct multiple informational workshops at the beginning of each recruitment to vet candidates' questions and provide a realistic picture of the PSD position to

improve the quality of the candidate pool. Civil Service also uses an email distribution system/list with over 100 municipalities, veteran-affiliated organizations, non-profits, universities and other organizations to publicize all classified job openings and testing processes on a weekly basis to increase the candidate pool. Recent improvements to the recruitment process have garnered significant applicant pools; therefore, the goal would be to continue to improve the quality of the pool.

Moving forward, we will continue to work with our partners to enhance outreach and recruitment efforts. Recently, NTN was contracted to oversee the written portion of the application process, which has more than doubled the number of qualified candidates made available to the departments for screening. The current certified list provided by Civil Service should allow both PD and FD to reach their goals for filling vacancies.

Additional forms of recruitment have been implemented, such as the recruitment of experienced non-career and lateral PSDs. FD, PD, DC, and Civil Service are committed to on-going evaluations to determine the results of the recruitment and hiring processes.

***Concern #3 – Allocation of overtime can be improved***

*Recommendation #4: Fire should consider capping the maximum number of continuous hours worked in one shift to 16 hours.*

**Response to Recommendation #4:** The FD agrees with this recommendation in concept; in particular, capping the maximum number of continuous hours worked in one shift to 16 hours. This may be an effective solution to the disparity recently found in the audit. However, with current 12-hour shifts, the efficiency of this resolution remains in question. We will continue to evaluate and are willing to explore a pilot study.

*Recommendation #5: The Police and Fire Communications Centers should set a limit on the cumulative number of overtime hours that a dispatcher can work.*

**Response to Recommendation #5:** The PD and FD support this recommendation. The current sign-up process for available overtime shifts will remain the same. However, unless exigent circumstances mandate otherwise, the Communications Center will strive to impose a 20-hour per week limit on the number of overtime hours an employee can work. This will allow for an enhanced equitable distribution of available overtime shifts. The PD and FD will revise policies and procedures as necessary, and follow required procedures for notification to employees of the policy change.

Recommendation #6: *As Fire reaches the budgeted dispatcher FTE levels, it should consider restructuring the dispatcher workweek or schedule to discontinue the fixed or built-in two hours of overtime per week.*

Response to Recommendation #6: The FD agrees with this recommendation. The implementation of the NTN application process and the hiring of additional background investigators was intended to streamline and expedite the hiring process. As expressed earlier in this report, we are seeing positive results from these two efficiency initiatives. It has been contemplated and planned, that once staffed to sufficient levels FD, will restructure the dispatcher workweek or schedule to discontinue the built-in overtime hours inherent in the work schedule.

***Concern #4 – Manual processes should be automated***

Recommendation #7: *The Department should use their existing Kronos Telestaff software to schedule and manage dispatchers' schedules.*

Response to Recommendation #7: The PD and FD support this recommendation. We recognize PSD scheduling is a complex process and requires an efficient system. We are exploring the use of Kronos Telestaff as a scheduling tool within both the PD and FD dispatch centers. Automated scheduling software could mitigate costs, scheduling errors, and compliance violations. It is anticipated, that in early May, various staff will attend a three-day, intensive training class on Kronos Telestaff software. The goal is to implement the Telestaff system as soon as practical.

Recommendation #8: *Review internal processes to ensure NSD is being paid appropriately based on MOU and City Policy*

Response to Recommendation #8: The PD and FD support this recommendation. Subsequent to the audit, PD and FD Communications Center personnel have met with HR staff regarding the correct use and coding of NSD. This information has been disseminated for proper timesheet documentation. All NSD and overtime hours should be substantiated by time cards, which are first verified and signed by the supervisor, prior to being submitted to payroll.

The Audit Report states that an estimated \$65,000 (PD and FD combined) of dispatcher overtime pay lacked the proper supporting documentation. It appears that these findings were based on a review of the staffing records at the dispatch centers, but not the payroll records maintained by the departments' Administration Bureaus. Administrative overtime incurred for staff training, briefings, meetings, SWAT call outs, special events, Officer Involved Shooting (OIS) review board, committee meetings, etc. are not logged with operational overtime on staffing records, thereby resulting in the belief that \$65,000 in overtime was not supported. All administrative and operational overtime hours

May 4, 2015  
Laura Doud, City Auditor  
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are reviewed, approved by supervision and documented on employee timecards per established policies, procedures and protocols.

In conclusion, both PD and FD PSDs are an integral part of the City's first response team. PSDs bridge the communication gap between the community and our first responders, including: police officers, firefighters, paramedics, animal control officers, public works employees, tow truck drivers, as well as other City service providers. The critical role of the Long Beach Communications Centers requires dedicated and motivated staff members. The men and women who comprise the Emergency Communications team are professionals with a strong desire to provide effective and efficient service to the City of Long Beach. It is the goal of the PD, FD and DC departments to provide a secure and dependable working environment for the employees to thrive and provide the most effective and efficient service for their customers, the first responders and the community.

cc:

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