Bureau of Emergency Communications:
Analysis of Staffing Requirements and Employee Retention Strategies

February 2002

Office of the City Auditor
Portland, Oregon

CITY OF

PORTLAND, OREGON

OFFICE OF THE CITY AUDITOR
Audit Services Division

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February 26, 2002

TO: Vera Katz, Mayor
Jim Francesconi, Commissioner
Charlie Hales, Commissioner
Dan Saltzman, Commissioner
Erik Sten, Commissioner
Carl Simpson, Director, Bureau of Emergency Communications

SUBJECT: Audit of the Bureau of Emergency Communications, Report #285

Attached is Report #285, an audit of the Bureau of Emergency Communications. The study was included in our annual Audit Schedule published in July of 2001.

As a follow-up to our recommendations, we ask that the BOEC Director provide a status report in six months, detailing steps taken to address the report's recommendations. This status report should be submitted to the Audit Services Division and coordinated through the Commissioner's Office.

We appreciate the cooperation and assistance we received from staff in the Bureau of Emergency Communications and the Commissioner's Office in conducting and preparing the report.

GARY BLACKMER
City Auditor

Audit Team: Richard Tracy
Ken Gavette
Abhay Thatte

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A Report by the Audit Services Division
Report #285

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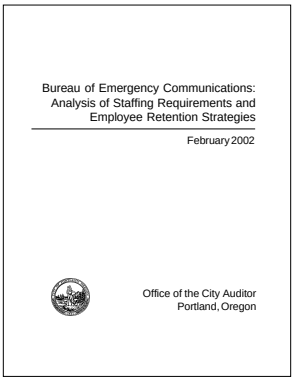

Production/Design

This report was produced in-house using desktop publishing software on Pentium III personal computers, and a Hewlett Packard Laserjet PCL/Postscript laser printer. It was printed at the Printing and Distribution Division of the City's Bureau of General Services. Adobe PageMaker 6.5 Plus was used to design and layout the finished product. Tables were created and drawn manually using PageMaker. Some text was initially written in Microsoft Word, then imported into PageMaker for formatting and layout.

Desktop Publishing: Robert Cowan

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Summary

The City of Portland's Bureau of Emergency Communications is responsible for answering 9-1-1 calls and dispatching police, fire, and medical units to emergency incidents. The Bureau provides services to all public safety agencies within Multnomah County and receives about 900,000 emergency and non-emergency calls each year. To ensure that calls are answered and vehicles are dispatched quickly at all hours of the day, the Bureau must employ an adequate number of trained and motivated employees. This audit evaluates the Bureau's performance in meeting call-answering goals, scheduling the optimal number of staff, and hiring and retaining employees.

We conducted our audit during the summer and fall of 2001. During the course of our work, the Bureau was under the direction of an Interim Director. A permanent director assumed responsibility for management of the Bureau at the conclusion of our fieldwork.

Calls answered on time but improvement is possible

The Bureau currently deploys a sufficient number of staff during most periods of the day to achieve its overall target of answering 90 percent of 9-1-1 calls within 20 seconds. Our analysis shows that over the past four years during the

busiest month of the year, the Bureau answered 89 percent of all 9-1-1 calls on time. The most recent data for July and August of 2001 shows that the Bureau exceeded performance targets, answering 92 percent and 92.2 percent of 9-1-1 calls within 20 seconds, respectively.

However, there are time periods when callers experience longer delays and more frequently abandon calls before talking to an operator. Poorer performance generally occurs when call volume is highest and too few staff are working to answer calls quickly. Our analysis shows that it would be possible to develop revised shift schedules that would better balance call workload with available staff and help improve call answering performance during these busy times.

Opportunities to meet goals with fewer resources

We believe it is also possible to use fewer resources to achieve call answering performance goals. Specifically, we estimate that if BOEC call-takers could reduce the average amount of time spent processing each call, they would need to deploy fewer staff resources on regular and/or overtime. Our analysis shows that the Bureau spends more time on average processing each call than in prior years and other agencies we surveyed. While reducing processing times would require some staff to handle more calls than they currently do, we estimate the Bureau could realize a minimum savings of $375,000 annually. Additional savings could also be realized incrementally over time through better leave management, performance monitoring, and staff training.

In addition, there may be opportunities to find efficiencies in dispatch scheduling as well, but the Bureau currently lacks data on workload and processing times needed to assess the reasonableness of current dispatch staff levels and performance.

Challenges in hiring and retaining employees

The Bureau faces a number of challenges in hiring and retaining a sufficient number of employees to perform call answering and dispatch duties. Like other 9-1-1 agencies, BOEC has had difficulty attracting a sufficient number of qualified candidates to work irregular hours under stressful conditions. Adequate staff levels have also been affected by low trainee certification rates in recent years, and may be further impacted by higher retirements in the next decade. Our employee satisfaction survey administered in August revealed a very low level of employee job satisfaction in a number of areas ranging from Bureau leadership to supervisory methods.

BOEC management has taken steps over the past several years to address some of these challenges. Recent actions include regular professional development meetings for supervisors, and increased coaching time for trainees. We believe a number of additional steps such as formal training for coaches, employee involvement, and annual performance assessments should help to improve satisfaction and increase retention.

Recommendations

We make a number of recommendations in Chapter 4 of this report to help ensure the Bureau hires, schedules, and retains an optimal number of staff to meet its critical public safety responsibilities. In brief, we recommend that the Bureau in coordination with its user agencies:

- develop and implement more rigorous methods for determining staffing requirements and developing shift schedules
- explore opportunities to save resources by achieving more ambitious call processing time targets
- Develop an action plan that sets specific goals for hiring, training and retaining sufficient staffing levels
- improve training and coaching procedures that result in increased training certification and retention rates
- develop complete and clear descriptions of supervisory roles and responsibilities
- implement a comprehensive plan to improve the quality of Bureau communication

Chapter 1 Introduction

The Bureau of Emergency Communications (BOEC) is the Primary Public Safety Answering Point (PPSAP) for Multnomah County. Each year the Bureau handles about 900,000 emergency and non-emergency calls. Because of the critical public safety role performed by BOEC, it is important that it is staffed, funded, and organized appropriately to provide quick response to emergencies.

This audit was approved by the City Auditor and included in the Audit Service Division's 2000 audit schedule. We conducted the audit in accordance with generally accepted government auditing standards, and limited the scope of our review to those areas specified in the audit scope and methodology section of this report.

During the course of our audit work in the summer and fall of 2001, the Bureau was under the direction of an Interim Director. A new director was selected in the fall of 2001, and assumed responsibility for BOEC at the conclusion of our fieldwork.

BOEC organizational background

The mission of the Bureau of Emergency Communications (BOEC) is to provide 9-1-1 call-taking and dispatch services to the citizens of Multnomah County. BOEC is the Primary Public Safety Answering Point (PPSAP) as defined by Oregon Statute for all of Multnomah County. Through an intergovernmental agreement, BOEC provides services to a variety of police, fire and medical agencies for Portland, Multnomah County, Gresham, Troutdale, Fairview, Wood Village, Maywood Park, Fire District 14 (Corbett), and Fire District 30 (Sauvie Island).

The intergovernmental agreement stipulates that the PPSAP center will be operated by the City of Portland. Portland has central administrative authority and is responsible for managing and maintaining the center. The agreement also stipulates that only certified call-takers and dispatchers will be assigned to answer emergency calls, and all are employed by the City of Portland. The City agrees to meet certain performance goals which are reported on a periodic basis to various oversight committees.

Costs are shared by participating jurisdictions based on an agreed-upon methodology. The current funding method calls for BOEC's total operating costs to be allocated among user jurisdictions based on their populations. Thus, Portland pays about 80 percent of the operational cost of the center. This population-based method was adopted in October 2000 after the participating jurisdictions agreed that the previous method was overly complex and varied too much from year to year to provide for adequate financial planning. The old method was based on a number of factors such as population, share of police dispatch positions, and number of incidents created.

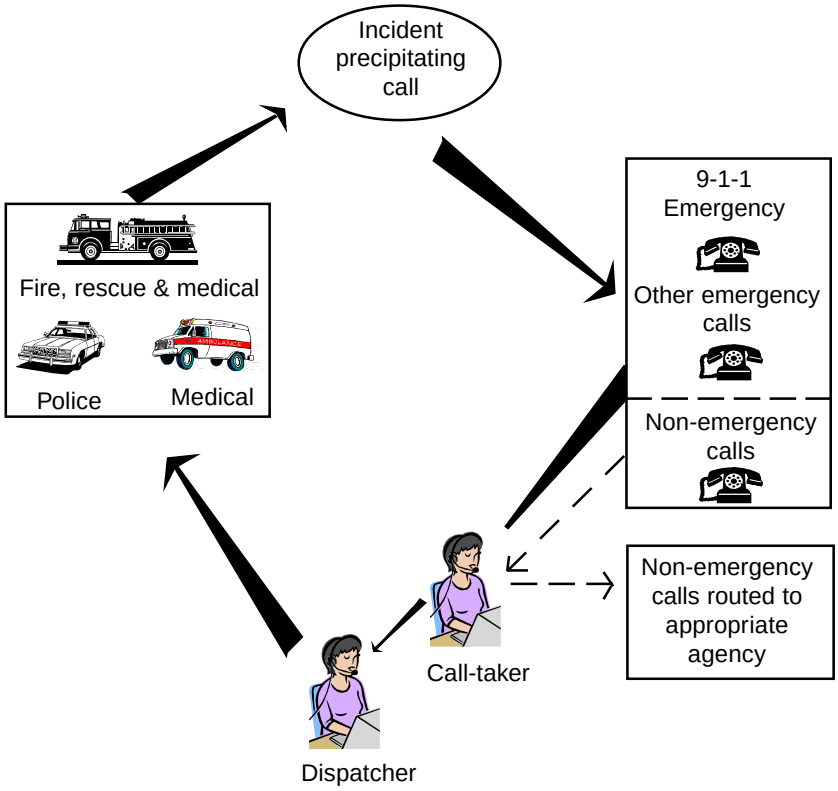
Several oversight committees have been established to review the policies and budgets of BOEC. The User Board is comprised of representatives of each of the jurisdictions' fire, police, and medical agencies plus three citizens. The Finance Committee is made up of finance personnel from each of the jurisdictions and has a primary role in developing and reviewing budgets. The Advisory Board is comprised of elected officials from each of the jurisdictions.

How emergency calls are received and dispatched

The primary task of BOEC emergency operators is to receive calls from the public and to route them to the appropriate police, fire, or medical responder. As calls come in to BOEC, the first available operator answers the call and determines the nature of the problem. This is normally handled by an employee acting in the call-taking position. If the call is an emergency, the call-taker establishes an electronic record of the incident and begins to relay information to another BOEC employee (acting as a radio dispatcher), so the appropriate emergency units can be notified and dispatched. After notification by BOEC, fire, medical, or police units travel to the incident and provide assistance upon arrival at the scene.

The communication center operates twenty-four hours per day, 365 days per year. BOEC call-taker and dispatch staff are classified as Emergency Communication Operators (ECOs). Certified ECOs are expected to be both call-takers and dispatchers, and work 10-hour shifts with four days on and three days off. At any given time, about one-half the ECOs on duty act as call-takers and one-half act as dispatchers. For the purposes of this study we will use these terms to distinguish the functions.

Figure 1 How calls are routed through the 9-1-1 system



In order to provide quick response to emergency calls the Bureau must have an optimum number of operators answering calls at any given time of the day and night. The optimum number of operators is based on the predicted number of incoming calls, the types of emergencies, and the estimated length of time each call should take to handle. We discuss the details of the Bureau's staffing methodology in Chapter 2.

In order to manage the emergency response system, BOEC maintains an elaborate system of time and voice recordings that can be used to assess performance, monitor operations, and maintain appropriate staffing levels. The

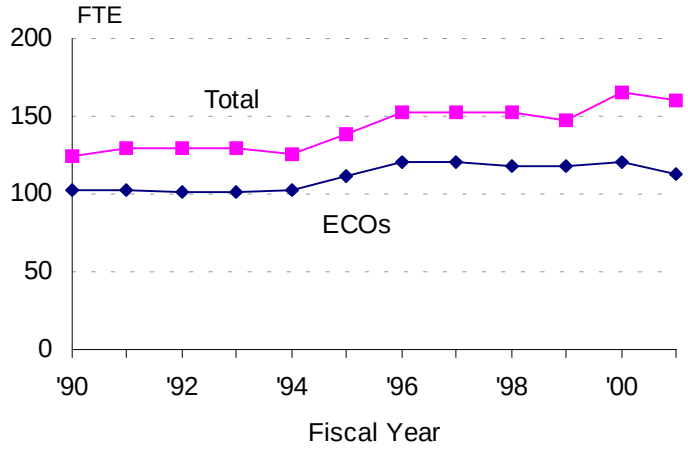
primary tool for processing this information is the Computer Aided Dispatch (CAD) system maintained and operated by BOEC.

Bureau spending, staffing and workload

Over the past 10 years, BOEC's expenditures have increased from an inflation-adjusted $9.9 million in FY1990-91 to $13.7 million in FY2000-01 (a 38 percent increase). Personnel represent approximately 79 percent of BOEC costs.

Staffing levels have grown from 125 in FY1989-90 to 165 in FY1999-00, declining to 160 in FY2000-01. Call-takers and dispatchers comprise about 70 percent of BOEC staff positions. Operations supervisors make up another 10 percent, with administrative, management, and information technology personnel making up the remainder. In FY2001-02, sixteen information technology positions were transferred to the Bureau of Information Technology as part of the City of Portland's administrative services review reorganization. Figure 2 shows ECO positions compared to total Bureau positions through FY2000-01.

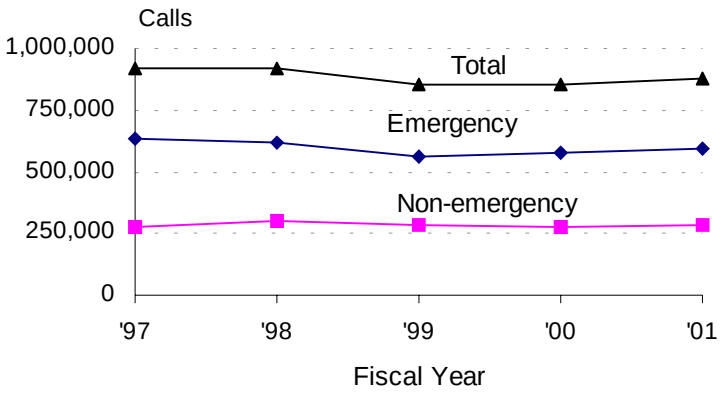
Figure 2 Budgeted positions at BOEC



SOURCE: City of Portland budget documents

Over the past five years, the Bureau's call volume has declined slightly, from a high of 922,259 total calls in FY1997-98 to 852,035 calls in FY1999-00. About two-thirds of those were emergencies. The rest were classified as non-emergency calls. In recent years, call volume has not increased along with the growth in population. While the population of Multnomah County has increased by about 6 percent over the past five years, total calls have declined by 4 percent, and emergency calls have dropped from 635,525 to 591,935, a 7 percent decline.

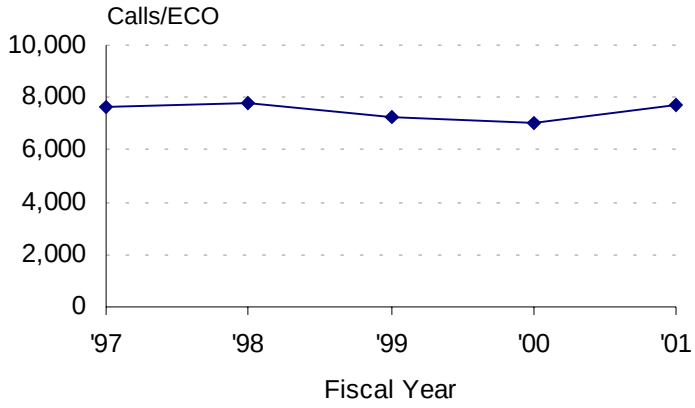
Figure 3 Calls received at BOEC



SOURCE: BOEC reports

The Bureau eliminated eight ECO positions in FY2000-01 in response to the decline in call load in recent years. Workload for operators has varied significantly but has generally remained in a range between 7,000 and 8,000 calls per ECO per year, as shown in Figure 4.

Figure 4 Calls per budgeted ECO position

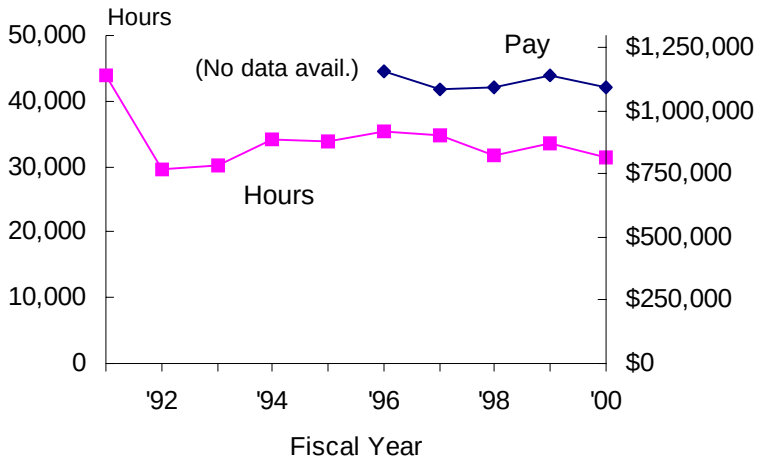


SOURCE: City of Portland budget documents and BOEC reports

When the minimum staffing level for a shift cannot be attained due to staff shortages, supervisors request, within union contract guidelines, off-duty personnel to work overtime. Overtime and compensatory time expenditures have remained steady over the last five years at about $1.1 million. In addition, the number of overtime hours have held relatively steady over the past nine years (see Figure 5).

Our review of BOEC overtime reports shows that, after adjusting for inflation, overtime payments for Operations activities decreased by 14 percent from FY1995-96 to FY1999-00. However, overtime payments for training were up 142 percent during the same period. Increases in training overtime were related to academy and in-service training. In 1995 the State of Oregon Department of Public Safety Standards and Training mandated an additional 16 hours of in-service training for Emergency Communications Operators. The Bureau uses overtime to pay for this activity.

Figure 5 Overtime hours and pay, adjusted for inflation



SOURCE: BOEC overtime pay reports

Call-taking and dispatching performance

BOEC's intergovernmental agreement stipulates that emergency calls should be answered and units dispatched within a certain time frame. The Bureau's overall goal is to answer calls within 20 seconds, 90 percent of the time. More specific goals are set for dispatching calls depending on their level of severity and whether they are police, fire, or medical emergencies. For example, the goal to dispatch police and fire units to highest priority calls is 90 percent of all calls within 60 seconds, while the goal for EMS dispatch of the highest priority calls is 90 percent of all calls within 90 seconds.

BOEC reports mixed success in meeting these goals. As discussed in Chapter 2, call-takers have generally met their target for answering calls. Dispatch times for police, however, have fallen far short of targets. Discussions with BOEC and our prior audit work showed that the reason for

this is that police dispatch targets have not been realistically set. To be useful, these measures should be reexamined and be assigned reasonable targets.

Scope, methodology and objectives

We concentrated our work on the deployment of personnel and on the hiring and retention of operators because of the impact of staffing on organizational performance and costs. We focused our work on the Operations Division because its activities make up over 90 percent of total Bureau expenditures and staffing. Specifically, our objectives were to:

- identify opportunities for BOEC to improve the scheduling and productivity of staff in order to improve performance and reduce costs
- identify opportunities for BOEC to minimize the impact of employee turnover by improving its hiring, training, and retention efforts

In order to understand the staff scheduling process for Emergency Communication Operators, we conducted interviews with operators and supervisors, and participated in almost 30 hours of observation on various shifts. We compared BOEC staffing methods to other generally accepted staff scheduling methods used in both the public and private sectors. We developed an estimate of full-time staff needed to meet performance requirements in the most efficient manner.

To understand employee turnover and satisfaction, we conducted a survey of Emergency Communication Operators. The anonymous survey was conducted during the

week of July 20-27, 2001 and was delivered to all Emergency Communication Operators. We received 60 returned surveys for a response rate of about 60 percent. To validate the survey results, obtain more detail, and develop recommendations for improving employee satisfaction, we conducted a series of three focus groups that included both operators and supervisors. Appendix C contains complete survey results.

In addition, we surveyed other cities to compare our staff scheduling techniques and our methods for hiring, training, and employee retention. Twenty-two jurisdictions responded to our survey, and we followed up with telephone interviews with some 9-1-1 centers to gain additional information. We did not use comparative cost information from the surveys because of the widely varying funding methods of other agencies. During conversations with other agencies it became clear that standardizing costs would take more effort than anticipated on both our part, and on the part of survey participants.

A significant area that was not fully examined during our field work was the productivity of personnel working in radio dispatch. At any given time about half the operators working on the communication floor are dispatchers and half are call-takers. The number of on-duty radio dispatchers is determined by the public safety agencies. Because the Bureau does not keep detailed records on dispatch performance, we could not verify that the number of dispatchers assigned to various shifts is optimal. Future audit work should verify that the number of dispatchers needed is based on actual dispatch workload.

We did not examine the acquisition and justification for technological equipment and systems, or staffing levels in other parts of the organization. We recommend that future studies review the costs and justifications for technology acquisition and technology staffing levels, as well as the overall cost of the organization compared to other agencies.

Chapter 2 Determining optimal staffing: Performance goals met but staffing improvements are possible

Emergency communication centers must ensure that an optimal number of staff are working at the right time of day to answer calls and dispatch emergency vehicles within specified time frames. Our analysis of BOEC staffing levels and performance goals shows that the Bureau currently deploys a sufficient number of staff to meet its overall target of answering at least 90 percent of all 9-1-1 calls within 20 seconds.

However, while call-taking performance goals are currently being met, there are periods during the day when performance declines, resulting in delays and a higher percent of abandoned calls. Poorer performance during busy times of the day is caused primarily by current shift schedules that deploy too few staff during busy periods, and too many staff during slow times. Our analysis shows that it would be possible to develop other shift schedules that would better balance call workload among shifts, and result in improved call answering performance during busy times of the day.

In addition, we believe that there may be opportunities to use fewer resources to achieve call-taking performance goals. Specifically, we estimate that, if the Bureau could reduce the average amount of time spent processing each

call, they would need fewer equivalent positions than are currently deployed.

Finally, the Bureau lacks the data on dispatch workload and processing times necessary to analyze the reasonableness of dispatch staff levels and performance. It may be possible to identify additional efficiencies if this information were available.

Determining 9-1-1 center staffing requirements

Emergency communication centers like the Bureau of Emergency Communications face a number of challenges in determining the right number of staff to effectively handle 9-1-1 calls. These challenges include significant variation in the number of calls received by hour of day and day of week; the need to schedule staff 24 hours a day, 365 days a year; and the unpredictability of emergency incidents and staff absences. The ideal staffing level would ensure that call answering and dispatch goals are met with the fewest number of staff working.

Our review of industry literature and generally accepted staffing models shows that there are several factors to consider in estimating optimal staffing levels:

- staffing requirements should be based on the achievement of clear performance goals and productivity standards. For example, goals could be the percent of calls that will be answered within a certain number of seconds, the number of calls staff should handle per hour, or the percent of calls dispatched to emergencies within a specified time frame.

- staff should be deployed so that staffing levels closely match the volume of incoming calls. That is, more staff should be assigned when call volume is high, and fewer staff should be assigned when call volume is low.
- estimates of staffing requirements should take into consideration experience with vacations, sick leave, training, and other periods when staff will not be available for work. In other words, to compensate for staff absences, staff levels should be multiplied by a "leave factor" based on past experience of absences.
- staffing estimates should incorporate methods for achieving staff minimums when unexpected conditions occur. For example, methods could include using overtime, supervisors, or back-up staff to handle unexpectedly high call volume or to fill in for high sick leave or other unexpected absences.

A generally accepted method for determining net call-taker staffing requirements is known as the Erlang traffic model. This technique, developed by Danish researcher Agner Krarup Erlang, is used to design telecommunications networks and call center staffing.

According to the model, the minimum number of call-takers a call center needs at various times of the day is based on a few key factors:

- the number of calls the call center receives per time period, such as an hour

- how long it takes to handle each call, on average, and
- the percent of incoming calls to be answered within a given number of seconds.

Changes in these three variables will increase or decrease the required number of call-takers. For example, the more calls a call center receives per hour, the greater will be the staff required to answer a given percentage of calls within a specific time frame. If the average call is handled quicker, then fewer staff will be needed. If the goal were to answer calls faster, more staff would be needed.

BOEC Information Services staff collects a great deal of valuable information on call volume and performance, and has used the Erlang model. In fact, BOEC's data collection and analysis is better than most 9-1-1 systems that responded to our survey.

Goals met but call-taking performance declines during busy periods

The Bureau deploys a sufficient number of staff to meet call answering goals. We estimate that BOEC currently deploys the equivalent of about 116 annual full-time positions to answer calls and perform dispatch duties. While the Bureau currently has 109 authorized budget positions for call-taking and dispatch, additional "position equivalents" are deployed through staff and supervisory overtime, and from supervisory assistance on regular time. Figure 6 shows our estimate of the composition of the annual equivalent positions currently deployed by BOEC to answer calls and perform dispatch duties.

Figure 6 Composition of currently deployed equivalent positions

Staff work category	# of annual equivalent positions
Regular time - ECO staff	97
Overtime hours - ECOs and supervisors	15
Regular time - Supervisors performing call-taking or dispatching	4
TOTAL deployed equivalent positions	**116**

SOURCE: Audit Services estimate based on BOEC payroll and personnel data for January through October 2001

Data provided by BOEC indicates that there were an average of about 97 Operations ECOs working straight-time hours for the January 2001 to October 2001 time period. Further, we estimate that BOEC also used the equivalent of about 15 FTEs in Operations overtime. Finally, we included 4 FTE equivalents to account for the time supervisors do call-taking and dispatching in support of ECOs on an ad hoc basis, for a total of 116 equivalent FTEs.

Figure 7 shows call answering performance in August of 1998, 1999, 2000, and 2001. It shows that 9-1-1 calls were answered on average within 20 seconds about 88.7 percent of the time – slightly lower than the established target of 90 percent of the time. However, because August is the busiest call-volume month of the year, performance in lower volume months will also generally meet or be better than established targets. The most recent data for July and August of 2001 shows that the Bureau exceeded performance targets, answering 92 percent and 92.2 percent of all 9-1-1 calls within 20 seconds, respectively.

Figure 7 9-1-1 call answering performance, month of August

	Aug. 1998	Aug. 1999	Aug. 2000	Aug. 2001	Combined Total
# of 9-1-1 calls received	43,070	42,411	48,250	50,360	184,091
% answered within 20 seconds	88.0%	86.4%	87.4%	92.2%	88.7%

Note: Does not include "other emergency" or non-emergency calls.

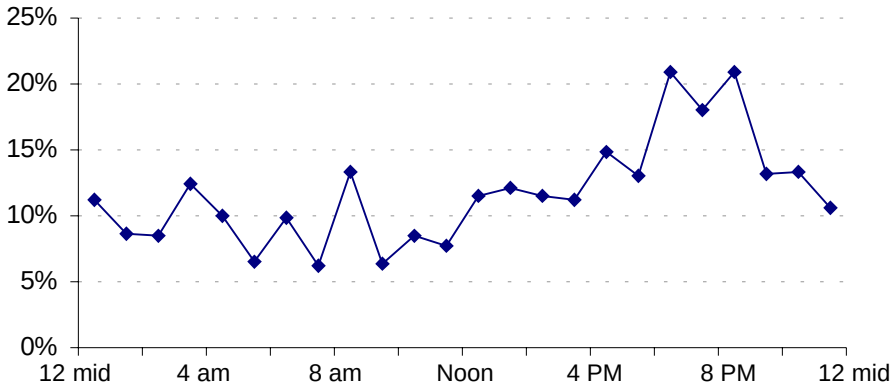
SOURCE: BOEC Monthly Workload and Performance Reports

While the Bureau currently meets its call-taking goal on average, data we received show there are certain times of the day when performance on certain key indicators suffers. During high call volume times, generally between 11 AM and 11 PM, people are less likely to get a prompt answer to an emergency call and a higher percentage of callers abandon their calls before an operator can answer.

Our analysis of hourly 9-1-1 call volume data for the month of August for the years 1998, 1999 and 2000 shows that peak-period call-answering performance was worse than at less busy times of the day. As shown in Figure 8, the percent of 9-1-1 calls not answered within 20 seconds was higher during the busy period in the afternoon and evening.

In addition, during these busy times, callers abandoned emergency calls far more frequently than during other times. As Figure 9 shows, callers who called in the afternoon and evening were much more likely to abandon their calls, compared with callers who called in the early morning hours.

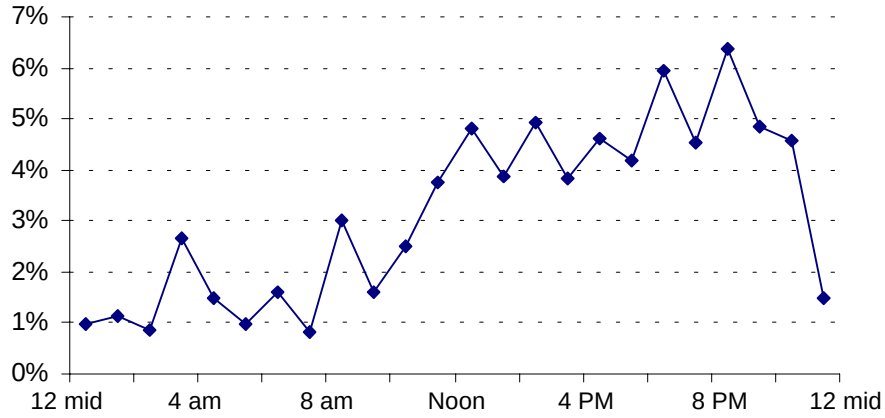
Figure 8 Percent of 9-1-1 calls not answered within 20 seconds: August monthly data, 1998-2000 average



Note: Does not include "other emergency" or non-emergency calls.

SOURCE: BOEC Monthly Workload and Performance Reports, August 1998 - 2000

Figure 9 Percent of 9-1-1 or other emergency calls abandoned before BOEC response: May-August 2001

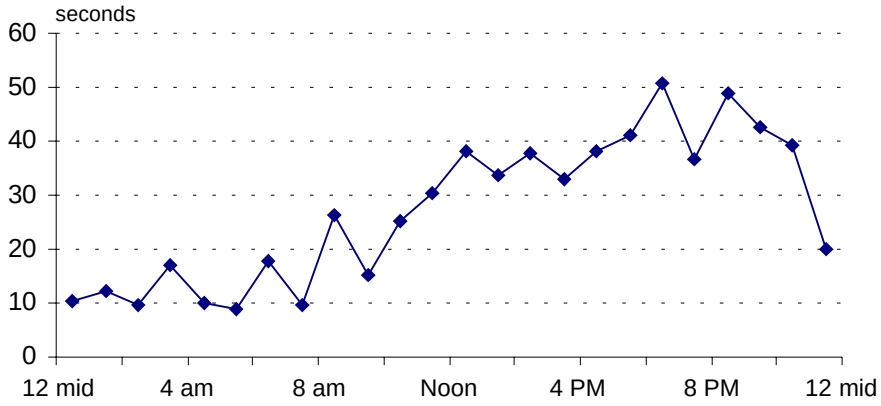


Note: Does not include non-emergency calls.

SOURCE: BOEC Meridian Max half-hour data

Finally, as shown in Figure 10, the slowest-to-be-answered emergency calls during busy periods were answered far slower than the slowest-to-be answered calls during less-busy periods. For the period May to August 2001, the average delay for the slowest-to-be answered calls during the busy period was 39 seconds, compared with 15 seconds during the night and morning hours.

Figure 10 **Average time taken (seconds) to answer slowest-to-be-answered 9-1-1 or other emergency calls: May - August 2001**



Note: Does not include non-emergency calls.

SOURCE: BOEC Meridian Max half-hour data

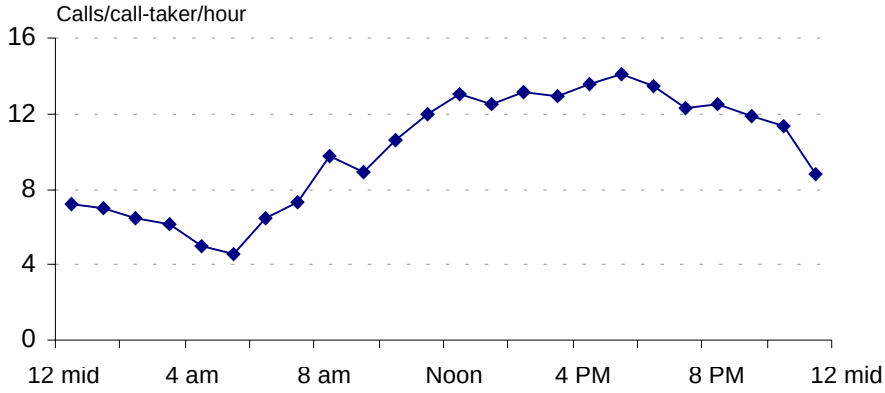
Factors affecting call answering performance

We believe that poorer performance during busy hours is due to 1) higher call-taker workloads during those times, and 2) shift schedules that do not adequately match staffing to workload variations.

Figure 11 shows that call-taker workload varies significantly by time of day. On average, call-takers working

during the busy period in the afternoon and evening handle about 13 calls per hour, compared with about 7 calls per hour in the late night and morning hours.

Figure 11 Average number of calls handled per call-taker per hour: May-August 2001

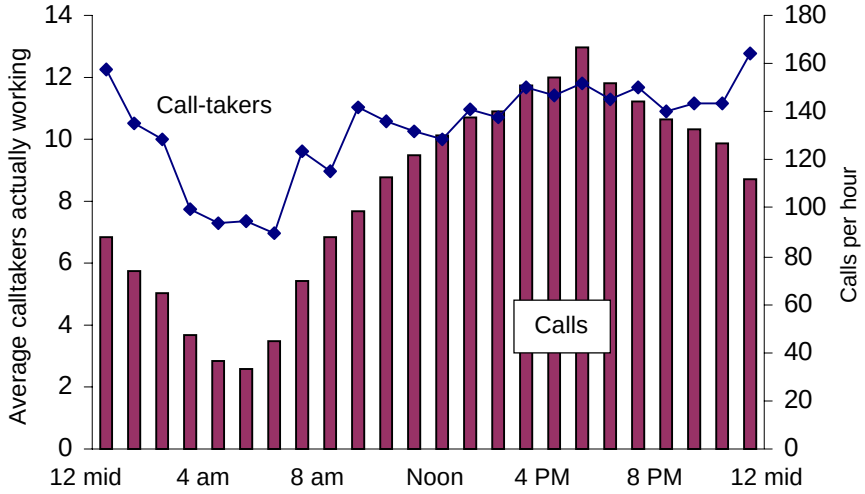


Note: Includes all calls, emergency and non-emergency

SOURCE: Audit Services computation using BOEC Meridian Max half-hour data and monthly call volume data

We also believe that the Bureau's staffing levels could be improved to better match staff with call volume fluctuations so that more staff are working when it is busy and fewer staff are working when slow. Figure 12 shows the average number of calls per hour for the four month period, May to August 2001, and the average number of call-takers working. The correlation of staff to calls is .79. A perfect correlation would be 1.00.

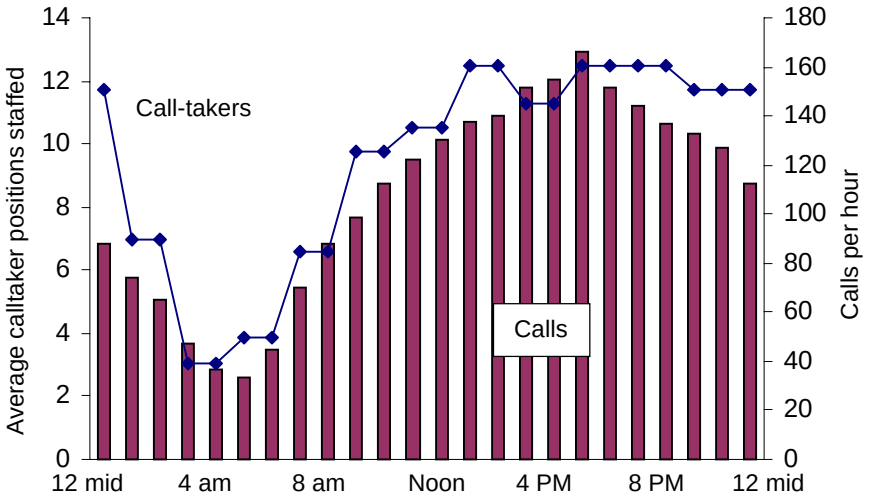
Figure 12 Correlation of actual call-takers working and call volume by hour = .79



SOURCE: BOEC Meridian Max half-hour data and monthly call volume data

Using the Erlang traffic model, and identical call volume data, we developed a revised staffing plan that deploys more staff during busy periods and fewer staff during slow times (see Appendix A for a more complete discussion of methodology). As shown in Figure 13, this plan results in staff levels that track more closely with call volume fluctuations. The resulting correlation of call-taking staff to calls is .93. The model bases the staffing requirements on meeting the performance goal of at least 90 percent of calls answered within 20 seconds. Using the busiest months (May through August) as the base call volume months ensures that performance targets will be met in the other less busy months as well.

Figure 13 Correlation of auditor example staffing plan and call volume by hour = .93



SOURCE: Audit Services analysis; BOEC Meridian Max half-hour data and monthly call volume reports

Reducing call processing times offers savings opportunities

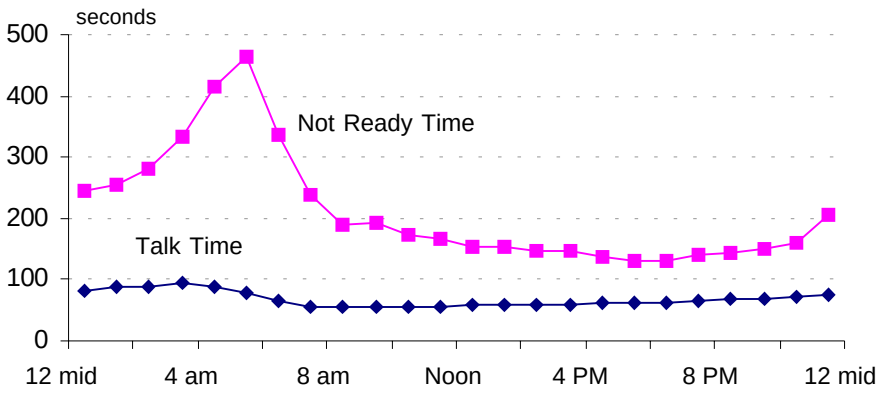
We also believe there may be opportunities to reduce operational spending if BOEC could achieve lower average Call Processing times.

Average Call Processing time is a key factor affecting staffing levels and call answering performance. Call Processing time is comprised of two parts: *Call Talk Time* and *Not Ready Time*. Call Talk Time is time spent obtaining information from the caller regarding the nature of the incident, and includes any time the caller is put on hold. Not Ready Time includes call wrap-up activities, such as ensuring that all call information is accurately and completely entered into BOEC's computer system.

Figure 14 shows average Call Talk and Not Ready times for 9-1-1 and other emergency calls for May-August 2001.

Average total Call Processing time during this period was 4:05 minutes – Call Talk Time averaged 1:05 minutes and Not Ready Time averaged 3:00 minutes. On average, Call Talk Time is relatively uniform during all hours of the day and night. However, Not Ready Time is much higher during slow periods than during peak periods, increasing to over seven minutes per call between 5:00 AM and 6:00 AM. One reason could be that call-takers are under little pressure to finish post-call wrap-up tasks promptly when incoming call volume is low. During peak call times, operators may finish calls faster in order to answer new incoming calls. BOEC Operations managers we spoke with also believe this is the case.

Figure 14 Average "Talk Time" and "Not Ready Time" (seconds) per emergency call: May - August 2001



Note: Does not include non-emergency calls.

SOURCE: BOEC Meridian Max half-hour data

The sum of Call Talk Time and Not Ready Time constitutes Call Processing time and, when call volume is high, this influences how many calls each call-taker handles per hour, which in turn affects call answering performance. Interviews with BOEC Operations managers indicated that there is no standard for how long wrap-up time should be. However, supervisors do monitor Not Ready Time when their workload allows.

To estimate potential savings available to the Bureau by reducing Call Processing time, we assumed two Call Processing time targets, 3:13 minutes and 2:10 minutes. The 3:13 minute target is based on the shortest average hourly processing time achieved by call-takers during May to August 2001. The 2:10 minute target is the average Call Processing time we calculated based on times reported by other cities we surveyed. In addition, according to BOEC's Information Services staff, the historical average call-processing time at BOEC had been about 2:15 minutes.

Figure 15 compares our estimate of full-time equivalent positions needed to meet performance goals during the busiest months of the year with the number of full-time equivalent positions currently deployed by the Bureau. Our estimate includes both staff and overtime resources needed to answer calls promptly. As shown, if the Bureau could reduce average Call Processing times, we estimate that the Bureau would need from 8 to 22 fewer full-time equivalent positions to accomplish call-taking and dispatching duties – a savings of about $375,000 to $1,000,000 annually (see Appendix A for more explanation on methodology).

The high end savings estimate is based on a higher level of call processing performance than BOEC could be expected to achieve in the near future. However, with directed efforts in a number of areas, additional savings above the minimum are realistic and achievable over time. These actions include effective management of staff leave, control over overtime use, and improved call-taker training and monitoring. Realistic but aggressive call processing time standards could also help the Bureau achieve these additional savings.

Figure 15 Estimate of annual Full-time Equivalents* needed using two faster Call Processing time targets

	Call Processing Time Target	
	3:13 minutes	**2:10 minutes**
Estimate of base need	102	88
Trainees and coaching need	6	6
Estimate of FTE/overtime* needed	108	94
BOEC current equivalent positions deployed	116	116
Difference/savings over current	**<8>**	**<22>**

* includes staff resources which may be contributed by Operations overtime

SOURCE: Audit Services estimate and BOEC payroll and personnel data

Dispatching effectiveness and efficiency not reviewed because of data limitations

We could not assess the reasonableness of dispatcher staffing levels because BOEC does not maintain detailed hourly or individual data on dispatcher activity. Currently, the BOEC User Board requires a minimum of six to eight dispatch assignments at all times. A minimum of four to six of these are for Police dispatch, and two to four positions are for fire and medical dispatch.

Portland's Central, East and Southeast precincts have one dedicated dispatch position each from 11:00 AM to 3:00 AM. The North and Northeast precincts combined have one dedicated dispatch position in the same time period. Unincorporated Multnomah County is assigned one police dispatch position 24 hours each day. From 3:00 AM to 11:00 AM, the Central precinct shares one dispatch position with the combined North/Northeast precinct. Similarly, the East and Southeast precincts share one dispatch position from 3:00 AM to 11:00 AM. There is also another position for radio communications called the 'Net 8' position that has a dedicated dispatcher 24 hours of each day. This position for 'Net-8' provides real-time background data for various police related functions.

According to Operations managers, four dispatchers are usually assigned to fire and medical dispatch duties. However, two of these dispatchers usually assist with call-taking duties.

Dispatch staff deployment is based on the requirements of user agencies. The Bureau does not maintain data on dispatch or workload by hour of day, nor has it established

individual dispatch goals or standards for handling dispatches within certain time frames. Without this data it is difficult to determine optimal staffing levels and to identify opportunities for improving dispatch productivity.

Chapter 3 Opportunities to improve hiring, training, and employee retention strategies

Like other organizations, the performance of the Bureau of Emergency Communications is largely dependent on maintaining a sufficient number of employees who are well-trained, highly motivated, and adequately rewarded. BOEC's efforts to maintain optimal staffing levels are challenged by several factors:

- the inherent difficulty of recruiting and retaining qualified personnel willing to work as a 9-1-1 operator
- a recent decline in the number and percent of new hires that successfully complete the Bureau's training and certification program
- a potentially large exodus of experienced staff due to retirements over the next several years
- low level of employee satisfaction that contributes to staff turnover

Our review shows that while Bureau managers recognize these problems and have taken actions to address many of them, the Bureau should consider additional steps to improve methods for hiring, training, and supervising employees. In addition, a concerted effort is needed to

improve employee satisfaction through better communication, job enrichment, and recognition. This could help improve trainee retention and reduce the loss of veteran employees. These improvements should help control Bureau overtime costs, and ensure that enough staff are on the job to answer citizen calls quickly and dispatch public safety agencies effectively to emergencies.

Challenges to employing sufficient number of emergency operators

The Bureau faces four major challenges in its effort to recruit, train, and retain an adequate number of employees. This section discusses each of these challenges.

1. Staffing problems common in 9-1-1 industry

Our interviews with administrators of four other 9-1-1 centers, newspaper accounts from other cities, and professional literature indicates that problems attracting qualified applicants and retaining veteran employees in the 9-1-1 industry are common throughout the country.

All four administrators told us that 9-1-1 centers are having trouble hiring and keeping good employees. One administrator said his organization used to get 700 - 800 responses to a hiring advertisement, but now may only get 150. Of those, only two may be qualified to be hired.

In addition, newspaper accounts from across the country report high vacancy rates, high job stress, and reduced call-handling performance.

A special committee report to the Association of Public Communication Officials (APCO) entitled: *9-1-1 Center Staffing: A Crisis in Public Safety* helped confirm the 9-1-

1 industry's concern over staff shortages. The APCO study found that the primary reasons people leave or are uninterested in emergency communications jobs are the shifts required to provide 24 hour-a-day service, the requirement to work holidays and weekends, inadequate salary, and job stress. Unfortunately, except for salary, there is little the Bureau can do about these job conditions.

2. Low rate of training certification

The percent of new hires who completed BOEC's ECO training program and received their certification has fluctuated greatly during the past ten years. The certification rate ranged from a high of 71 percent of the trainees hired in 1997 to a low of 22 percent of those hired in 1999. Rates have gone up and down, but the hiring classes of 1999 and 2000 represent two of the lowest years of the ten-year period with 22 percent and 31 percent, respectively. It is too early to predict the potential success of the 2001 hiring classes. While the Bureau's average certification rate of 42 percent during the past ten years is about average according to a leading emergency communication trade organization, three of eight 9-1-1 centers we contacted reported certification rates in excess of 65 percent.

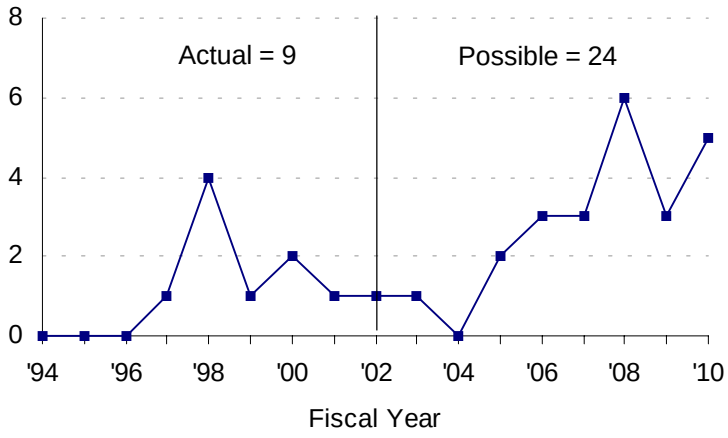
Also, the number of employees actually being certified has been declining recently. An average of eight trainees were certified from hirings made during each of the past ten years, but only four trainees were certified from those hired in 1999; and only five were certified from year 2000 hires. These replacements are just below the number necessary to keep pace with turnover among ECOs.

Trainees are also taking longer to complete the initial certification in call-taking than in previous years. This increases the likelihood that trainees will drop out. In 1997, 100 percent of trainees who eventually certified in call-taking did so in less than nine months. The percentage declined steadily to 50 percent in 2000.

3. Upcoming retirements will place additional pressure on staffing levels

In addition to a downturn in certification rates, BOEC faces the prospect of an unusually high number of retirements in the next few years. While the Bureau lost nine ECOs to retirement over the past eight years, there is the possibility that as many as twenty-four could retire in the next nine years. In addition, eight supervisors become eligible for retirement in the next three years. Supervisors are usually hired from the ranks of the ECOs. As shown in Figure 16, BOEC may experience a significant increase in retirements near the end of this decade. Increased retirements, along with normal turnover, puts pressure on staffing levels and could result in more use of overtime, longer hours, and increased workload for the remaining ECOs.

Figure 16 Actual and possible ECO retirements at BOEC



Note: "Possible" means ECOs *eligible* for retirement. In addition, eight supervisors are eligible for retirement within three years.

SOURCE: BOEC personnel records

4. Employees report relatively low overall job satisfaction

Based on our interviews with BOEC employees and the results of an employee survey we administered, we believe that job satisfaction is a contributor to turnover and retention rates among ECOs.

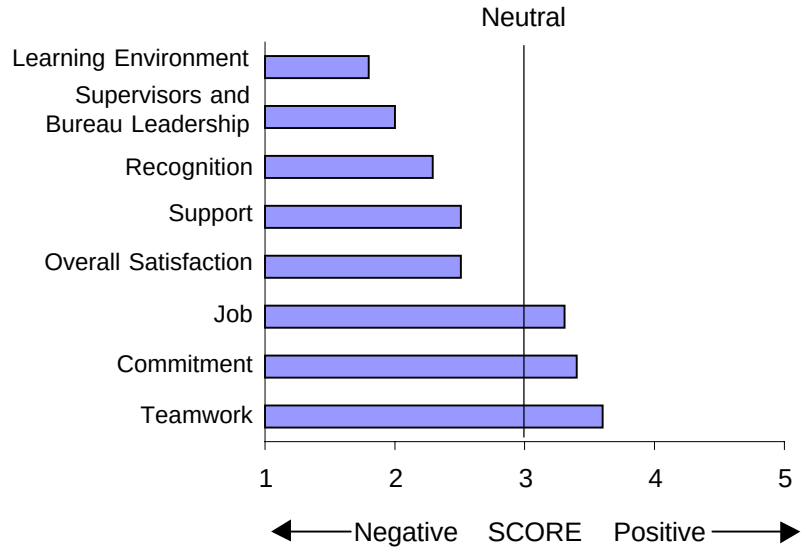
The graph below summarizes the results of our survey administered during July 20-27, 2001. See Appendix C for a discussion of methodology and complete results.

In general, survey results refer to "supervisors" as the level of management which has direct supervisory responsibility for ECOs. The term "management" refers generally to all levels from supervisor to Director unless otherwise noted.

It is important to remember that the results of this survey reflect the perceptions of the employees who submitted them. They may, or may not, reflect objective reality. However, when it comes to keeping employee satisfaction and retention high, and turnover low, perception may be as important as objective reality. Differences in perception and reality may reflect a need for better communication between management and employees.

As shown by Figure 17, employees have many positive and negative feelings about working at BOEC. While employees feel most positive about the teamwork shown in getting work accomplished, they feel very negative about how the organization gathers and uses information from employees to correct problems and improve the job. On average, employees rated their overall satisfaction as 2.5, just below the neutral midpoint, in the negative range.

Figure 17 Employee survey results, by topic area (July 20-27, 2001)



SOURCE: Audit Services employee satisfaction survey

The most significant findings are as follows:

Employees feel the need for more frequent and better communication with supervisors and upper-level management. The lowest rated domain of questions related to the Bureau as a learning organization. Employees feel that the Bureau managers do not do a good job of listening and acting upon their concerns. In particular they feel that management is not attuned to what is happening on the communication center floor and does not collect information from employees about working conditions. This perception was also reflected in interviews and focus group discussions where employees expressed a desire to have more frequent and better quality interaction with supervisors and other managers. In addition, employees in the focus group believe that administrative staff who do Bureau purchasing do not have a sufficient understanding of how ECOs do their daily work. Employees also expressed frustration that upper-level Bureau managers, as well as staff from the Commissioner's Office, rarely, if ever, visit the center on nights or weekends.

Employees believe supervisors need better and more consistent training. The next lowest rated domain dealt with supervisors and BOEC leadership. The survey indicates that many employees think Bureau supervisors need to have better supervisory skills, such as general communication and the fair application of discipline. Fairness was the issue most often mentioned in the narrative section of the survey. Almost one-half of respondents specifically mentioned the need for supervisors and managers to be more fair. Employees in our focus group said they believe fairness refers to equitable application of discipline,

as well as opportunities to sign up for time-off and for additional training. The employee focus group also expressed the perception that supervisors do not have a high level of understanding of either the communication center's equipment, or standard operating procedures. In addition, the response to the statement, "The Bureau has strong leadership", received the lowest rating of any statement on the survey.

Employees feel the need for more recognition. The third lowest rated domain, with an average score of 2.3, was recognition. Employees in our focus group explained their perception that they get positive recognition from their peers on the communication center floor, but not from supervisors. On the other hand, supervisors said that they frequently write letters and memos of commendation for good jobs, and have an employee banquet each year.

Employees see disrespectful attitudes in the communication center as contributing to a negative work environment. While not specifically covered in the satisfaction survey, current and former employees, and outside observers, told us that there is a significant amount of inappropriate language and disrespectful attitudes during work hours that contributes to poor morale. While we did not see this attitude displayed during our observation periods, we heard this comment from several sources both inside and outside the communication center. Focus group participants agreed that inappropriate behavior, such as yelling at other employees and using bad language, gets out of hand sometimes and creates a generally negative atmosphere. Several former employees specifically told us that is why they left BOEC. Some current employees said

that, along with forced overtime, the generally negative atmosphere is a major problem.

Employees also feel positive about various aspects of their job.

Employees are committed to their work. Survey respondents believe their job is important; they are proud of the work they do, and most plan to stay for the foreseeable future. This was reiterated in individual interviews.

Employees said that attributes of the job itself are not a significant issue. They are somewhat satisfied with their level of pay and benefits, and think the job offers a satisfactory level of variety, independence and decision-making. These are all important attributes in job satisfaction.

Employees are somewhat satisfied with teamwork among co-workers. Employees in both the survey and our focus groups expressed good working relationships at BOEC. Many have good friends at work and trust their coworkers to do a high quality job.

Employee retention and turnover problems affect Bureau performance and cost

The failure to hire, train, and employ an optimal number of ECO staff can have a significant adverse impact on Bureau performance and costs. As shown in Chapter 2, inadequate staffing can slow call-answering, increase the number of abandoned calls, and contribute to higher costs.

In addition, BOEC loses a considerable investment in hiring and training costs when employees leave, resign, retire, or are terminated. We estimate that for each certified employee who leaves, it costs about $160,000 to hire

and train a replacement. This includes the costs of lost productivity, trainees' salaries, coaches' salaries, administrators' training salaries, and the costs for hiring and testing applicants.

The Bureau loses about five certified operators each year, for a total hiring and retraining cost of about $800,000. In addition, on average about eleven trainees fail to make it through the training program each year, representing a sizable lost investment depending on how long they stay in training before departing. Some stay as long as 12 to 18 months before leaving. Although some turnover is inevitable, and even desirable, the high cost of replacement illustrates the importance of retaining experienced employees and as many trainees as possible.

BOEC management practices and efforts to address staffing challenges

The Bureau has attempted to address these challenges by implementing a number of human resource management activities, including the following.

Manpower planning

Despite turnover in important human resource-related positions, BOEC monitors staffing levels closely and plans for staffing needs. The Bureau produces reports on hires, separations, projected retirements, and keeps detailed records on the progress of trainees and the availability of personnel based on their level of certification. The Bureau also projects hiring needs based on the recent rates of attrition and trainee certification. They keep detailed records on the use of overtime by division and by activity. As discussed later in this section, BOEC has a detailed

recruiting and selection process, and a training program that meets the certification requirements of the State of Oregon.

Recruitment and selection

BOEC conducts two large-scale recruitments each year. They have found the most effective means of advertising to be in the *Oregonian*, by word of mouth, and on the City's internet web site. In some cases, as many as 200 persons may submit applications, with only about 12 receiving conditional offers of employment after a series of tests and background checks.

After completing the written application, applicants are given a written test. This is a test specifically for public safety telecommunications, and is designed by the International Personnel Management Association. An interactive computer test called CritiCall has recently been given to applicants. This interactive software tests applicant multitasking and decision-making abilities in dispatch-type simulated situations.

Applicants who pass these tests are given personal interviews by BOEC personnel before they are offered conditional employment. If they accept, they submit to psychological testing by a local psychologist who specializes in public safety personnel. They also undergo drug tests and reference checks.

We found these steps to be typical of the other agencies we contacted, and in the professional literature we reviewed.

Training

Emergency Communication Operators are required to meet State standards and be certified by the State Department of Public Safety Standards and Training (DPSST). BOEC is the only 9-1-1 system in the State to have an in-house training program approved by the DPSST. According to the Bureau this saves the City money by avoiding sending trainees to classes at the State training facility in Monmouth, Oregon.

New employees are classified as trainees until they are certified in call-taking, police radio dispatch, and obtaining information such as subject background checks and license plate information from various public safety databases. Employees are not required to be certified as fire dispatchers before being fully certified and gaining permanent employment. If new employees do not receive certification for call-taking and police dispatch within eighteen months, they are terminated.

New trainees spend the first eight weeks in the BOEC training academy. The academy consists of one-half day of classroom training and one-half day of field trips with police officers, and trips to learn such things as street names and numbering systems. Following the academy, trainees are assigned a coach who sits with them on actual shifts until they are certified. The coaches evaluate trainees every day, and report their progress on Daily Observation Reports. These reports are the primary tool for documenting a trainee's performance. Every two weeks the coach, the trainee, and the Operations Supervisor meet to discuss the trainee's progress. If there are areas in need of special attention, the trainee may be put on a Corrective

Action Plan that identifies things the trainee should work on and establishes a time frame for improvement.

Other 9-1-1 centers we surveyed have similar mixes of classroom and on-the-job training. One significant difference we found was that all of the larger centers have probation periods of 12 months or less for trainees to become certified. However, some of these were police or fire department emergency systems that only require operators to be trained in one or two of the three disciplines (police, fire, and medical).

Several changes have been instituted in recent months to help increase the success rate of trainees. Recent changes include: increasing the amount of simulation work in place of long observation periods, extending direct coaching into the final phase of training, and retooling classroom methods, including introducing new methods of teaching geography, and daily and weekly tests intended to increase retention of classroom material.

Additional actions needed to improve hiring, training, supervision, and staff retention

We believe that the Bureau should consider taking several additional actions to control staff turnover and improve retention rates. Several of the suggestions below are a synthesis of ideas we obtained from three focus groups that we held with Bureau ECO staff and supervisors. At each meeting, staff and supervisors were asked to affirm the findings of the employee survey results and discuss actions the Bureau could take to improve employee satisfaction and retention, and address specific problem areas. In addition, some of these ideas are based on our analysis of current methods compared to other possible approaches

that may warrant experimentation. We recognize that some of these suggestions may require additional time and resources but given the potential effect of understaffing and the cost of replacing experienced employees, reasonable efforts should be directed to making improvements.

Recruitment frequency – Bureau records indicate that the number of hires and certifications generally increases with the number of times the Bureau conducts a formal recruitment process during the year. In recent years, the Bureau has conducted one or two recruitments. However, in previous years, as many as three or four recruitments were held. As a result, the Bureau had more applicants to choose from, more trainees, and eventually a higher number of trainees reaching certification. The Bureau should evaluate the number of recruitments that should be conducted each year as a part of the annual staff planning process and increase recruitments in light of staffing needs and expected turnover.

Coaching practices and rotation policies – BOEC training methods seem appropriate and consistent with other 9-1-1 centers and with State DPSST expectations for the certification of trained emergency communication operators. However, our interviews with current and previous trainees indicated that coaching was one of the most frequently mentioned areas of dissatisfaction. Specifically, trainees complained of frequent changes in coaching assignments, variations and inconsistencies in coaching styles and performance assessments, and constant negative feedback from coaches.

Our random review of Daily Observation Reports showed that in some instances trainees were assigned to many different coaches during their training period. One trainee had four changes in coaching assignments in a five month period and another trainee had thirteen coaches during a ten month period. These changes were in addition to short duration assignments due to coaches taking leave.

The daily reports appeared detailed and complete, and bimonthly reviews seemed to appropriately concentrate on trainee strengths, weaknesses and areas for improvement. Corrective Action Plans were clear and concise about trainee performance and areas needing improvement and how the improvement would be evaluated. While it was difficult to gauge the amount of negativity from reviewing these documents, the tone seemed critical but factual.

We also could not easily discern variations in coaching styles and approaches from reviewing documents. However, if there is an inconsistency in approach, as reported by some trainees, it may result from not having a formal initial training program for coaches. Employees believe that more formal training for coaches could improve coaching techniques, evaluation methods, and consistency when coaching assignments are changed. While coaching changes cannot be eliminated due to scheduled and unscheduled leave, these changes should be kept to a minimum.

Supervision and leadership – Literature on human resource management points to a variety of factors that affect employee job satisfaction and job retention. In addition to the nature of the job and pay and benefit levels, the quality

of supervision and management is a critical feature that contributes to satisfaction on the job. Specifically, employees are more satisfied when they receive appropriate feedback from supervisors and are treated fairly and with respect. As discussed previously, almost half of the respondents to our survey felt that managers and supervisors did not treat employees fairly, particularly as it related to discipline and to opportunities to obtain additional training and special leave.

We believe that supervisors could benefit from more training to improve active listening skills. Many employees felt that while supervisors asked about employee satisfaction, they did not seem to really hear and understand employee complaints. Both supervisors and staff agreed that efforts could be made to increase opportunities for staff to periodically work off the emergency floor on special administrative assignments and training. Focus group participants also agreed that management and supervisors should promote civil behavior and professional communications at the communication center. Management should establish clear expectations for behavior and ensure these expectation are clearly communicated to all. Both supervisors and staff should be held accountable for their behavior.

We also believe that the Bureau could benefit from more management visibility on the communications center floor including periodic visits to all shifts by the Commissioner, the Director, and other top managers. In addition, supervisors should increase the frequency and quality of contact and communication with employees. The tone for positive behavior is best established by the leaders of the organization.

Communication and recognition techniques – Employees had a number of ideas for improving the quality of communication at the Bureau. The most popular idea identified by focus group participants was for the Bureau to implement an annual satisfaction survey, like the one we administered, in order to check progress in improving satisfaction and to identify continuing problem areas. Focus groups and facilitated workshops could help follow-up on survey results and help build team cohesion and understanding. Some employees also expressed a need to have more voice in the decisions at the Bureau through more involvement in staff meetings. Others felt that a better newsletter was needed to replace the former one that was discontinued. Overall, more positive downward and upward communication would help uncover problem areas and identify solutions for dissatisfaction.

While supervisors believe that recognition and commendations are given frequently, many employees believe that the public and management do not fully appreciate the difficulty of their work environment. We believe that management should consider implementing an annual performance review program that would provide a vehicle for the recognition of positive work performance and the identification of how the organization could help improve the work environment and remove barriers to better performance. This annual performance review would not focus on discipline or job evaluation but instead provide an opportunity for staff and management to communicate about how to improve the work environment and the performance of the organization. Management may wish to consider asking

employees for a self-evaluation and an upward evaluation of their supervisors' performance in helping them perform their work.

Chapter 4 Recommendations

In order to help the Bureau of Emergency Communications improve call-taking performance during busy times and explore opportunities for staffing efficiencies, we recommend that the Bureau take the following actions:

1. ***Develop and implement more rigorous methods for determining call-taking staffing requirements, and for deploying staff on shift configurations.***

   We suggest that the Bureau more fully integrate and use a staffing model such as the Erlang traffic model to estimate call-taking staffing requirements. This would require establishing clearer standards for call-processing times in conjunction with existing call-taking performance goals. The results of the staffing requirements estimates should then be used to make operational decisions about staffing levels and shift configurations. Shift schedules should be developed that result in a better match of assigned staff to the incoming call workload.

   The Bureau should also consider establishing a twelve-shift configuration that could further refine the match between staff working and variations in call and

dispatcher workload, and improve call-taking performance. Negotiations with labor representatives may be needed to pursue this option.

2. ***Explore opportunities to reduce staffing requirements by establishing and implementing more ambitious call processing time targets.***

   The Bureau should experiment with establishing, implementing, and monitoring revised call processing standards that result in quicker handling of incoming calls during slow periods. At a minimum, *Not Ready* times should be reduced so that call-processing performance is more uniform throughout the day. These efforts should point to opportunities to reduce the amount of resources (both straight and overtime) needed to perform call-taking duties.

3. ***Prepare periodic reports on call processing times to monitor Bureau and call-taker performance and to annually adjust the model used to estimate staffing requirements.***

   These reports could be used by User Board representatives and Bureau management to monitor performance, identify problem areas, and establish corrective action.

4. ***Collect more detailed data on dispatch workload to assess performance, staffing efficiency, and optimal dispatch staffing levels.***

   With User Board assistance, the Bureau should evaluate current methods for establishing minimum dispatch staffing levels to determine if current levels are justified by workload levels, performance goals, and productivity standards. The Bureau may need to start collecting more detailed data on dispatch activities to evaluate performance and productivity, and to establish common benchmarks to measure performance against. In addition, the Bureau and the User Board may wish to review current dispatch performance goals to determine if current goals are realistic and appropriate.

To help the Bureau of Emergency Communications control staff turnover and increase job satisfaction, several steps should be taken to improve recruiting, training, supervision, and communications. Specifically, we recommend the following:

5. ***Develop an action plan that sets specific goals for hiring, training, and retaining sufficient staff to address staffing requirements identified in Recommendation #1.***

   The plan should cover several years and identify annual goals for reaching desired staffing levels taking into consideration turnover, retirements, new hires, and

training completion rates. The Bureau should use the plan to guide recruitment frequency, training duration, and the use of overtime to address vacancies and emergency needs. The Bureau should assign one upper level management staff to develop and monitor the plan's implementation.

6. ***Take additional steps to improve the training program in order to increase completion rates for each trainee group.***

The Bureau should provide more formal training to coaches so that coaching methods and trainee evaluations are more consistent and effective. The frequency of coaching changes should be kept to a minimum so that trainees receive consistent feedback on performance and corrective action plans. The Bureau should also consider developing a method so that coaches can receive feedback from trainees on the strengths and weaknesses of coaching efforts.

7. ***Develop a clear and complete description of the roles and responsibilities of supervisory personnel, and provide supervisory training if necessary.***

Bureau management should develop clear expectations for supervisory performance and behavior to ensure operations staff are treated fairly and consistently. Clear standards should exist on how to apply discipline, provide training, and offer special leave or assignments. Supervisors should spend sufficient time interacting with floor staff to monitor performance, provide

assistance, and help solve problems. The Director should ensure that appropriate behavior, language, and mutual respect is expected at all times.

8. ***Develop and implement a plan to improve the quality of communication at the Bureau.***

The communication plan could include: an annual employee satisfaction survey; focus groups and other activities to encourage team building; newsletters and Bureau-wide communication events; opportunities for staff involvement in management and administrative decisions; and opportunities for dialogue on problem areas.

The Commissioner, Director, and other management staff should increase their visibility at the communication center through more frequent visits to all shifts.

The Bureau should also consider implementing an annual performance appraisal process for all employees. The annual appraisal process should focus on ways to improve the work environment and performance of the organization, rather than on individual performance evaluations. The process should highlight strengths and positive accomplishments, equipment and training needs, and goals for the future.

Appendices

Appendix A Methodology for determining staffing requirements

A staff scheduling system uses information developed from a call traffic model, such as the Erlang model, as a starting point for estimating the number of call-taker and dispatcher FTEs needed. Working with the Erlang model, and using recent call volume and staff leave data from the Bureau, we worked through such a system and developed an estimate of call-takers and dispatchers needed. This estimate represents an example of what could be accomplished using the approach we recommend. Other estimates and staffing configurations could be developed using different assumptions.

The process consisted of four basic steps: 1) calculating a preliminary "base" total of call-taker floor positions required using the Erlang model and User Board requirements for the number of dispatch floor positions; 2) adjusting the base staff requirement by a staffing factor and adding a "safety" factor; 3) testing the preliminary total number to see if it works considering various operational constraints by developing an actual schedule based on existing shifts and work days; and 4) adjusting for additional staff needed to coach and oversee less-than-fully-productive trainees.

Step 1: Developing a "base" total floor position requirement

The Erlang calculation estimates the number of positions needed by hour on the communication floor to answer calls in a timely manner.

As shown in Figure 18, the Erlang model estimates that an hourly average of 9.00 call-taker floor positions are needed to meet call answering goals, assuming a call processing time average of 3:13 minutes. User agency requirements result in an average of 7.33 floor positions to handle fire and police dispatch requirements. Average minimum dispatcher floor position levels are based on user agency requirements and are not derived from a statistical analysis of dispatcher workload.

Step 2: Applying a staffing and safety factor to estimate total floor positions

In order to estimate the actual number of staff FTEs needed to fill floor positions 24 hours a day, seven days a week, for an entire year, we estimated a staffing factor. This staffing factor takes into account the average amount of leave and other time off an employee could be expected to take. We estimate that the Bureau needs 6.05 annual equivalent staff FTEs (the staffing factor) for each floor position required. The factor is made up of three parts: the leave factor, an adjustment for the seven day work week, and an adjustment for 24 hour operations.

This leave factor takes into account the fact that staff earn and use many different kinds of leave. Based on discussions with BOEC Information Services staff, we calculated a leave factor for the high leave summer months of 2001. Figure 19 presents a leave breakout for one hypothetical call-taker or dispatcher in one year. It is important

Figure 18 Base call-taker and dispatcher staff requirements

Hour of Day	Call-taker floor positions (Erlang Model) *	Dispatcher floor positions (user agency minimums)
midnight - 1:00am	8	8
1:00 - 2:00	7	8
2:00 - 3:00	6	8
3:00 - 4:00	5	6
4:00 - 5:00	4	6
5:00 - 6:00	4	6
6:00 - 7:00	5	6
7:00 - 8:00	7	6
8:00 - 9:00	8	6
9:00 - 10:00	9	6
10:00 - 11:00	9	6
11:00 - noon	10	8
noon - 13:00	11	8
13:00 - 14:00	11	8
14:00 - 15:00	11	8
15:00 - 16:00	12	8
16:00 - 17:00	12	8
17:00 - 18:00	13	8
18:00 - 19:00	12	8
19:00 - 20:00	11	8
20:00 - 21:00	11	8
21:00 - 22:00	11	8
22:00 - 23:00	10	8
23:00 -midnight	9	8
Average	**9.00**	**7.33**

* Using 3:13 minute average call process standard

SOURCE: Audit Services computations, BOEC Operations Division

to bear in mind that these are averages for the typical ECO, based on aggregate data for all ECOs and that not all the categories are applicable for all ECOs.

The calculated leave factor in this time period was 1.44.

Figure 19 Calculation of leave factor: BOEC Summer 2001 leave averages

Annual hours on shift	2,080
Annual hours not working:	
Lunch and breaks	160
Vacation & Holidays	271
Sick leave	120
Unpaid leave	49
"Other" leave	37
Union activities	1
TOTAL non -working hours	638
Actual hours working	1,442

2,080 hours in shift / 1,442 average work hours = 1.44 leave factor

Note: BOEC ECOs are paid for 1,976 hours per year (9.5 hours per shift). We use 2,080 because shifts are defined as 10 hours in length.

SOURCE: Audit Services calculation based on BOEC payroll data

To make an adjustment for the seven day work week, we divide the number of days in a week (7) by the number of work days in a week (4) (BOEC Operations staff work four 10-hour shifts each week). Therefore, the Bureau needs to allow for 1.75 people for each work week.

To make an adjustment for BOEC's twenty-four hour a day operation, we divide the number of hours in a day (24) by the number of hours in each shift (10). Therefore, the Bureau needs to allow for 2.4 shifts each day to cover one position.

The final staffing factor is calculated by multiplying the leave factor (1.44) by the week adjustment (1.75) times the 24 hour shift adjustment (2.4) (1.44 x 1.75 x 2.4 = 6.05). This is the staffing factor used in our estimates of call-taking and dispatching annual equivalent staff needed.

Upon the advice of Bureau personnel, we added three FTE staff as an additional safety factor to account for variations in call volume, shift availability, and scheduling constraints. Figure 20 shows the calculation for the "base" total FTEs needed before additions for trainees and coaches.

Figure 20 Calculation of "base" FTEs required to answer at least 90% of calls within 20 seconds

Average call-taker floor positions required*	9.00
Average dispatcher floor positions required	7.33
Total call-takers & dispatcher floor positions required	16.33
Multiply by staffing factor	x 6.05
Annual FTE required	99
Add "safety factor"	+ 3
TOTAL annual equivalents required	**102**

* Using 3:13 minute average call processing standard

SOURCE: Audit Services calculations; BOEC Operations and IS Division data

Step 3: Developing a work schedule

The preceding estimates are based on the average of call-taking and dispatching staff required across all hours of the day. In order to operationalize this data and make it work in the real world, constraints such as available shift schedules must be considered. For example, BOEC has 10 shifts and employs a weekly staffing pattern of four consecutive days on and three consecutive days off. This staffing pattern of having different people working on different days of the week and different hours of the day provides flexibility but also complicates the scheduling process. To accommodate this, the Operations Division uses an interactive spreadsheet which allows the manager to distribute personnel onto different shifts and days of the week, while simultaneously seeing the resulting number of staff that would be scheduled to work each hour of the day. Thus, BOEC can try to fit the "right" number of people to each hour of the day based on established experience-based minimums or, as we suggest, on minimums established using a call traffic model.

We used the Operation Division's spreadsheet to help distribute our estimate of required staffing. Our trial and error attempt shows that our preliminary base staff requirements can work fairly well when existing shift scheduling constraints are considered. Our estimate using the 3:13 minute call-processing constraint suggests that BOEC could create a schedule with the staffing level of 102 annual equivalent ECOs identified in the previous section, and meet the 90% overall performance target.

Figure 21 shows the shifts BOEC uses and our example staffing levels for each shift on each day of the week.

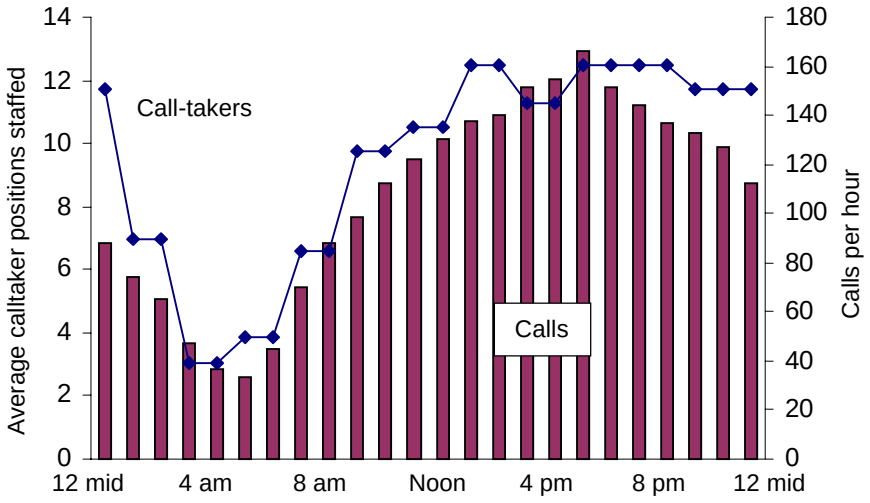
Figure 21 Example staffing levels and shift configuration

DAYS OFF:	SMT	MTW	TWT	WTF	TFS	FSS	SSM	Totals on shift
DAYS ON:	**WTFS**	**TFSS**	**FSSM**	**SSMT**	**SMTW**	**MTWT**	**TWTF**	
Early morning (5am-3pm)	2	2	2	2	2	2	3	15
Morning (7am-5pm)	2	2	2	2	1	1	2	12
Mid morn (9am-7pm)	1	2	2	2	2	2	2	13
Late morn (11am-9pm)	1	1	1	1	1	1	1	7
Early afternoon (1pm-11pm)	1	1	0	0	1	1	1	5
Afternoon (3pm-1am)	2	2	2	2	2	1	1	12
Evening (5pm-3am)	2	2	2	2	2	3	2	15
Late eve (7pm-5am)	2	2	1	1	2	2	3	13
1st night (9pm-7am)	1	0	1	1	1	0	1	5
2nd night (11pm-9am)	1	1	1	1	1	0	0	5
Totals	**15**	**15**	**14**	**14**	**15**	**13**	**16**	**102**

SOURCE: Audit Services analysis

Figure 22 illustrates the high correlation (.93) between the call-taker positions that would be available by hour from our example staffing plan and total hourly call volume. This correlation is an improvement on the .79 correlation of BOEC call-taker staffing during May to August 2001.

Figure 22 Correlation of auditor example staffing plan and call volume by hour = .93



SOURCE: Audit Services analysis; BOEC Meridian Max half-hour data and monthly call volume reports

In addition, by adding two more shifts starting at 1:00 AM and 3:00 AM, the Bureau could further fine tune workload and call-taker scheduling. After ensuring that dispatcher position requirements were satisfied at all hours, our 12-shift scheduling model was able to achieve an even higher correlation between call volume and average hourly call-taker availability.

Step 4: Additional resources for trainees and coaches

The "base" number of ECO annual equivalents required to do call-taking and dispatching work has to be increased to account for the fact that trainee ECOs are not fully productive and that a large percentage of their training time is spent being supervised by lead ECOs who serve as coaches.

Based on information we received from the Bureau's Operations and Training Divisions we estimate that about 6 annual equivalent FTEs should be added to account for the training program. When this effect is factored in, we estimate that a reasonable level of BOEC Operations annual equivalent staffing is about 108 which can be achieved through a combination of fully certified staff, trainees, overtime, and supervisory assistance.

The 108 FTE estimate can be compared with the total *actual* call-taking plus dispatching annual equivalent FTEs we estimated BOEC is using currently. Thus, Figure 23 shows our estimate of FTEs BOEC currently uses (116), the total equivalent FTE we estimate would be required, and the savings that could result. In addition, Figure 23 shows the savings that could result by reducing call-processing time to 2:10 minutes.

Figure 23 Estimate of annual Full Time Equivalents* needed using two faster Call Processing time targets

	Processing Time Target	
	3:13 minutes	**2:10 minutes**
Estimate of base need	102	88
Trainees and coaching need	6	6
Estimate of FTE/overtime* needed	108	94
BOEC current equivalent positions deployed	116	116
Difference/savings over current	**<8>**	**<22>**

* includes staff resources which may be contributed by Operations overtime

SOURCE: Audit Services estimate and BOEC payroll and personnel data

Our staffing estimates tend toward the "high" side. Many conservative assumptions were built into our estimates of total annual equivalent FTEs required, both for the 3:13 minute and 2:10 minute average call process time assumptions.

- The staffing factor calculation we employed uses leave data for the summer months, when leave usage tends to be highest. This results in a higher FTE estimate than if a leave factor had been calculated using all-year data.
- We use call volume data for the months of May through August. Average call volume in these months tends to be about 8 percent higher than the overall average for all 12 months of the year. Using high call volume months results in the Erlang model requiring a higher number of call-takers by hour, and this pushes up the final FTE required figure.
- We assume that the minimum 90 percent call answer target applies to all calls. In reality, the performance goal applies to only 9-1-1 calls. Assuming it applies to all calls results in higher call-taker requirements. In reality, in peak-call-volume situations, BOEC adopts a system in which 9-1-1 calls are given higher priority for answer than non-emergency calls.

Appendix B Methodology for determining call volume

BOEC classifies the calls it receives into three basic types: 9-1-1 emergency calls, other emergency calls and non-emergency calls. The sum of these three types of calls comprises the total volume of calls handled by BOEC call-takers. BOEC provided the Auditor's Office with four months of half-hour call volume data (May, June, July and August 2001). This data has information on two types of calls (9-1-1 and other emergency calls) for every half-hour segment for these four months. After the half-hours were aggregated to whole hours, we were able to calculate the average 9-1-1 and other emergency call volume by hour for this time period.

This call volume data does not have detail of non-emergency calls by half hour. BOEC was, however, able to provide us with information that showed *aggregate* 9-1-1, other emergency, and non-emergency call volume for each month for the years 1996 through 2000. During this five-year time period, there were a total of 3,009,297 calls that were 9-1-1 and other emergency calls and 1,425,249 non-emergency calls. Thus, from 1996 to 2000, the ratio of non-emergency calls to 9-1-1 and other emergency calls was 0.47.

To estimate the total number of calls by hour, we added the 0.47 non-emergency call factor to the hourly average of actual 9-1-1 and other emergency calls. The report uses this estimate of total calls by hour for all the graphs and tables displayed and analyses performed, unless otherwise noted.

Appendix C Employee satisfaction survey

There is a great deal of literature on why employees leave jobs and on employee retention. Basically, employees stay at a job when they are satisfied, that is, when the job or employer meets certain requirements. Which elements/ requirements are most important is subject to much debate and probably varies from job to job. Generally, people stay at jobs when the job itself suits them in terms of complexity, variety and flexibility, when the managers give them a certain level of feedback, recognition and involvement in decision-making, when pay and benefits are considered fair, and when they view their jobs as important and with intrinsic value. Employees also must have a sense that they are treated fairly and with respect.

In order to gauge ECO employee satisfaction with the Bureau and guide recommendations for improvements, we conducted an employee satisfaction survey during the week of July 20-27, 2001. About 60 percent of the ECOs submitted responses.

The survey consisted of 41 statements to which employees gave their impressions concerning the degree to which they agreed. We designed the survey to elicit information on a variety of subjects including pay, recognition, feedback, teamwork and respect. For purposes of analysis, the statements were grouped upon receipt into the following seven categories, or domains:

- *Learning environment*- Employee perception of BOEC as an organization that gathers and uses information and ideas from employees on how well the organization works, and how problems could be corrected.
- *Supervisors and Bureau leadership*- Employee perceptions concerning the quality of supervisors and their relationship to others.
- *Recognition*- Employee perceptions concerning the degree to which they are appreciated by the Bureau and the public.
- *Support*- How well BOEC provides training and equipment to do their jobs.
- *Teamwork* - How well the employees and supervisors work as a group to accomplish their objectives.
- *Job itself*- How well employees are satisfied with the characteristics of the job of dispatching and call-taking
- *Commitment*- How committed the employees are to both BOEC and to the job of dispatching in general.

In order to both validate the survey results and discuss ideas for recommendations, we conducted a series of three focus group meetings with employees and managers. A lower score indicates a negative perception by employees about that domain. Three is the neutral midpoint of the scale from 1 (most negative) to 5 (most positive). Employees rated their overall satisfaction with the Bureau at 2.5, slightly below neutral.

As could be expected, employees have a wide range of positive and negative feelings about their place of employment. The domains provide a general framework for identifying areas needing improvement. Nevertheless, the results of our analysis are subject to interpretation, and the formulation of appropriate solutions could vary accordingly.

The following material is a reproduction of the original survey instrument. For ease of presenting the raw average scores, we have added a column to the far right of the page containing the average score for each statement.

July 20, 2001

Emergency Operator and Supervisor
EMPLOYEE SATISFACTION SURVEY

BOEC Emergency Operators and Supervisors:

This Employee Satisfaction Survey is part of the City Auditor's work on a study of the 911 Center operations. Please take a few minutes to give us your views by answering the following questions. We hope to get complete responses from all employees, on all shifts.

Your answers will be anonymous. However, your views, in combination with those of others, are an extremely important part of our study. Your survey will go directly to the Audit Services Division for review and interpretation. For your answers to be included in our study, please place it in interoffice mail by **July 27, 2001**. An addressed envelope is enclosed for your convenience.

Thank you *very* much.

Audit Services Division

Please circle the number that best describes your feeling toward the following statements:

	Disagree Strongly			Agree Strongly		**Average Score**
My salary is fair for my responsibilities.	1	2	3	4	5	**3.5**
I have the materials and equipment I need to do my work right	1	2	3	4	5	**3.0**
My supervisor regularly talks to me about my progress	1	2	3	4	5	**2.2**
My daily work was accurately presented to me before I was hired	1	2	3	4	5	**3.1**
I am given the right level of decision-making authority	1	2	3	4	5	**2.9**
I know what is expected of me at work	1	2	3	4	5	**3.5**
I would recommend BOEC as a place of employment to others	1	2	3	4	5	**2.1**
I have the appropriate amount of independence on the job	1	2	3	4	5	**2.9**
This last year, I had opportunities to learn and grow	1	2	3	4	5	**2.2**
I receive adequate training to do my job	1	2	3	4	5	**2.8**
My performance evaluations are used to improve my job performance	1	2	3	4	5	**2.0**
Recently, I received recognition or praise from someone at work for doing good work	1	2	3	4	5	**2.7**
I have enough variety in my work	1	2	3	4	5	**3.4**
Management is attuned to, and knows what is happening in the call center	1	2	3	4	5	**1.6**
The general public appreciates the work I do	1	2	3	4	5	**2.2**

	Disagree Strongly				Agree Strongly	Average Score
My benefits are fair	1	2	3	4	5	**3.7**
Our organization collects information from employees about how well things work	1	2	3	4	5	**1.6**
My co-workers appreciate my work	1	2	3	4	5	**3.2**
There is someone at work who encourages my development	1	2	3	4	5	**2.5**
When something goes wrong, the Bureau corrects the underlying problem so it will not happen again	1	2	3	4	5	**1.5**
I would recommend this kind of work to others	1	2	3	4	5	**2.5**
My supervisors care about me as a person	1	2	3	4	5	**2.2**
My supervisors actively solicit and use our suggestions for improving things at work	1	2	3	4	5	**1.6**
We, as a Bureau, learn from our mistakes	1	2	3	4	5	**2.0**
Discipline is handled in a fair and consistent manner on my shift	1	2	3	4	5	**1.7**
I believe my job is important	1	2	3	4	5	**4.6**
My Supervisors are qualified to do their work	1	2	3	4	5	**2.5**
Top bureau managers are qualified to do their work	1	2	3	4	5	**1.9**
The Bureau treats me fairly	1	2	3	4	5	**2.5**
Overall, people on my shift work together as a team	1	2	3	4	5	**3.4**
My co-workers are committed to doing quality work	1	2	3	4	5	**3.6**
The Bureau appreciates a job well done	1	2	3	4	5	**2.1**
I have a good friend at work	1	2	3	4	5	**4.3**
Given the nature of my work, Bureau management does what it can to make this a good place to work	1	2	3	4	5	**1.8**
I feel I can trust my co-workers to do their job well	1	2	3	4	5	**3.3**
At work, my opinions seem to count	1	2	3	4	5	**2.1**
As an organization, we know where we are going and how to get there	1	2	3	4	5	**1.9**
The Bureau has strong leadership	1	2	3	4	5	**1.4**
I intend to stay here for the foreseeable future	1	2	3	4	5	**3.5**
I am proud of the work I do at BOEC	1	2	3	4	5	**4.2**

	Disagree Strongly			Agree Strongly		Average Score
OVERALL, how satisfied are you with BOEC as a place to work?	1	2	3	4	5	**2.5**

What are the *three* most important things BOEC could do to increase your satisfaction as an employee?
(Feel free to name more.)

Other comments?

(Use additional sheets, if necessary)

Don't forget back page ➨

How long have you worked for BOEC? .....
- Less than one year
- One year to two years
- Two years to five years
- Five years to ten years
- More than ten years

My job classification is .....
- Emergency Communications Operator Trainee
- Emergency Communications Operator I
- Emergency Communications Operator II
- Emergency Communications Supervisor I
- Other _____

I am also a Coach/Lead .....
- Yes
- No

To which shift are you regularly assigned? .....
- Early morning
- Morning
- Mid-morning
- Late morning
- Early Afternoon
- Afternoon
- E-Relief
- Late evening
- First night
- Second night

Remember, all answers are **anonymous**, so do not include your name. Use the enclosed, addressed interoffice envelope to return your survey. If you prefer, you may send through the regular mail to:

Audit Services Division
1221 SW 4th Ave., #310
Portland, OR 97204

Our interoffice address is: 131/310/Audit Services

NOTE: If you wish for the Audit Services Division to contact you for more information, you may include a name and contact number on this form, or contact us at 503-823-4005.

Responses to the Audit

CITY OF
PORTLAND, OREGON

Dan Saltzman, Commissioner
1221 S.W. 4th Avenue, Room 230
Portland, Oregon 97204
Telephone: (503) 823-4151
Fax: (503) 823-3036
dsaltzman@ci.portland.or.us

February 19, 2002

Gary Blackmer
City Auditor
City of Portland
1221 SW Fourth Ave., Room 310
Portland, OR 97204

Dear Gary,

Thank you for the fine work contained within, *Bureau of Emergency Communications (BOEC) Analysis of Staffing Requirements and Employee Retention Strategies.* This report by Audit Services does an excellent job of clearly stating recommendations the BOEC director and I wholeheartedly agree with.

When I hired Carl Simpson as the BOEC director in October of 2001 I made it abundantly clear to him that staff morale and employee recruitment and retention were to be his top priorities. Many of the recommendations you have made were already being developed and implemented as this report was finalized. Carl has addressed these in the bureau's response.

One recommendation I would like to address is number 8, the need for improved communication at the bureau. You refer to the need for more visibility of management as well as the Commissioner in charge. I absolutely agree. To this end, I have begun meeting all new employees in BOEC's training academy and will continue to make a concerted effort to be more visible around the bureau. My bureau liaison is attending all Labor/Management, User Board, Finance Committee, and Advisory Committee meetings as well as dropping into the bureau during all shifts. Carl has already increased visibility of management dramatically.

I commend you and your staff for the excellent work contained within this report and am certain it will help serve the public.

Sincerely,

Dan Saltzman

DS:mg

CITY OF

PORTLAND, OREGON

BUREAU OF EMERGENCY COMMUNICATIONS

Dan Saltzman, Commissioner
Carl Simpson, Director
9911 S.E. Bush Street
Portland, Oregon 97266-2562
503.823.0911

February 19, 2002

To: Gary Blackmer
City Auditor

From: Carl Simpson
Director Bureau of Emergency Communications

Subject: Bureau response to the Staffing Requirements and Employee Retention Analysis

Gary,

On behalf of Commissioner Saltzman, his staff and the Leadership Team at the Bureau of Emergency Communications, I would like to thank you and your associates for the extraordinary work put into the *Analysis of Staffing Requirements and Employee Retention Strategies*. The resulting document provides a comprehensive overview of the Bureau of Emergency Communications operational practices and the recommendations provide realistic opportunities for process improvement.

The findings addressed in this audit represent data taken from the summer and fall of 2001. A significant number of process changes have since occurred and correspond directly to the recommendations you and your team have presented. I have a very strong sense that you will be pleased with the results of the process changes in place and the positive direction we have taken in the first three months of my tenure as Director.

Sincerely,

Carl Simpson

CC: Dan Saltzman
Commissioner

CITY OF

PORTLAND, OREGON

BUREAU OF EMERGENCY COMMUNICATIONS

Dan Saltzman, Commissioner
Carl Simpson, Director
9911 S.E. Bush Street
Portland, Oregon 97266-2562
503.823.0911

Analysis of Staffing Requirement and Employee Retention Strategies

Audit Response

19 February 2002

1. Develop and implement more rigorous methods for determining call-taking staffing requirement, and for deploying staff on shift configurations.

Bureau Goal 1

Continually ascertain that call-takers are scheduled to work when the call load dictates.

Strategy

- Continue to use the recommended Erlang Model.

  In-progress, to be monitored by Operations Manager and the BIT Site Coordinator.

- Work with BIT (Bureau of Information Technology) to ensure that the best and most current data is always available to Bureau Operations.

  In-progress, requiring continual follow-up by the Operations Manager.

- Monitor staffing requirements monthly, evaluate actual call volume and compare to unscheduled overtime usage.

Measure of Success

The schedule is developed, refined and applied so that call volume is evenly distributed among all the call-takers and 9-1-1 calls for service are answered within 20 seconds 90% of the time.

2. Explore opportunities to reduce staffing requirements by establishing and implementing more ambitious call processing time targets.

Bureau Goal 2

Staffing levels are consistently monitored and operations are as productive and efficient as possible.

Strategy

- The Bureau staff will evaluate current call processing times to develop a baseline and routinely compare it to the industry standards.
- Management will provide MisQT Training for all supervisors. The reports from the application will provide supervisors with detailed call processing information.
- Supervisors will review call-processing times with all operators during regularly scheduled file reviews, the Bureau's current version of a personnel evaluation.
- Using the established baseline, the Bureau will monitor call-processing times and report those figures to the Commissioner on a quarterly basis.

Measure of Success

Call processing targets are established, verified and routinely utilized to measure the efficiency of the Bureau.

3. Prepare periodic reports on call processing time to monitor Bureau and call-taker performance and to annually adjust the model used to estimate staffing requirements.

Bureau Goal 3

Prepare and review periodic reports to measure call-processing time and call-taker performance.

Strategy

- The data to evaluate call processing times and call-taker performance is currently available to all management staff.

- Call upon BIT to assist in the evaluation of the quality of current reports. If current reports are acceptable and provide sufficient detail, instruct supervisors how to access the information.

- If the current report is of little or no value, work with Bureau resources (BIT) to develop refined reports.

- The Bureau currently reviews the Erlang Model every six months and adjusts the schedule to match the staffing requirements.

Measure of Success

Call-processing times will be within variances 90% of the time and 9-1-1 calls will be answered within 20 seconds 90% of the time.

4. Collect more detailed data on dispatch workload to assess performance, staffing efficiency, and optimal staffing levels.

Bureau Goal 4

Continually ascertain that the Bureau is staffed efficiently with optimum resources.

Strategy

- Use currently available reports to verify operations are staffed as efficiently as possible.
- Supervisors will review production statistics with call-takers during regular file reviews.
- The Operations Manager will determine which reports will be reviewed with call-takers.

NOTE: These are the current reports available to supervisors and managers:

1. Number of call-takers on-duty during all hours (30 minute increments).
2. Number of calls received, by center, by call-taker.
3. Percent of 9-1-1 calls answered within 20 seconds.
4. Number of calls abandoned (hang-ups).
5. Maximum answering delay in seconds.
6. Talk times, by Bureau and by call-taker (30 minute increments).
7. Average call-processing time by Bureau and by call-taker.

Measure of Success

The Bureau is functioning efficiently, call processing times are within industry standards and 9-1-1 calls are answered within 20 seconds 90% of the time.

5. Develop an action plan that sets specific goals for hiring, training and retaining sufficient staff to address staffing requirements identified in Recommendation Number One.

Bureau Goal 5A

Continually Improve Hiring and Selection Practices at the Bureau.

Strategies

- Increase the number of training academies from two to three, with up to ten trainees per academy. For the past three years the Bureau has conducted two academies per year and the total number of certified operators has dropped from a high of 91 to the current level of 83, a reduction of almost 10%. Additionally, five certified team members will be able to retire in the next three years.

  Completed 01/03/02

- Re-evaluate the ECO T (trainee) position description to ensure it is current, well written and accurately represent the work and tasks performed by incumbent staff in today's highly technical environment. It was last updated in 1993.

  In-Progress: Tentatively scheduled to be completed by 04/01/02.

- All selection processes will be reviewed, sanctioned and supported by BHR.

  Completed 01/02/02

- Improve the diversity of our applicants by participating in job fairs and non-traditional recruiting as much as possible. Obtain assistance from the Affirmative Action Office.

  In-progress: Tentatively scheduled to meet with AAO in mid-March and beyond.

  Supervisory Affirmative Action Training completed on 01/30/02.

- Job announcement will be re-written to reflect recent changes in the 9-1-1 industry.

  Completed 01/02/02

- ECO T interview questions will be re-written, approved by BHR.

  Completed 01/02/02

- Evaluate the *desired* psychological profile utilized by department psychologist to better identify candidates with exceptional team work and communication skills.

  Completed 11/15/01 – found the Bureau was using a police officer profile rather than a call-taker / dispatcher profile.

- Only validated testing mechanisms will be used for applicant screening.

  Completed 01/02/02

Measure of Success

Success rates for academy graduation increases from 83% to 90%, or better without regard for color, gender, age, sexual orientation, religion or race.

6. Take additional steps to improve the training program in order to increase completion rates for each training group.

Bureau Goal 6

Improve On The Job Training (OJT) program to increase graduation rate to better than 50%.

Strategies

- Provide adult learning and communication training for coaches (dispatcher trainers)

  Communications training for coaches and supervisors

  Tentatively scheduled for 02/24/02

  Nationally recognized Emergency Communications coach trainer will be in Portland conducting "The Exceptional Trainer" at PCC.

  Most, if not all coaches will attend the training on 03/27 – 03/28/02

- Affirmative Action training for all union stewards

  Tentatively scheduled for 03/01/02

- Create and deploy a performance evaluation program. Utilize the feedback from the OPS floor, supervisors and BHR to develop a fair, consistent and easy to administer performance evaluation.

  In-progress. Dusted off a program that was almost 100% developed and we are waiting for feedback from BHR. Possible kick-off 3Q.

- Create a part-time position for separated employees. During the past four years, a number of certified team members have left for a variety of reasons. Had a part-time option been available, we may have been able to keep them. Twenty hours on the schedule is far better than zero hours.

  In-progress. Interim Operations Manager and Director working with BHR to develop a program that supports the Bureau and organization needs.

- Develop a staffing model spreadsheet that tracks the current status of certified, retiring, separating and in-training personnel.

  In-progress. The spreadsheet calculates the projected certified positions, based on an ever changing and dynamic work force.

- Improve Communication from Training Manager

  Training Manager should provide weekly updates on trainee progress and status, as well as a two to three month calendar for coach assignments.

- Conduct Regular Coaches meetings. Training Manager should conduct monthly coaches meeting on a regular basis, and publish the meeting time weeks in advance. Supervisors, managers and the Director should attend.

- Coaches should be surveyed to determine the effectiveness of each Academy training, determine the level of readiness when trainees begin OJT.

- Academy teaching assignments should be rotated to give all coaches an opportunity to lead classes.

- Director and Training staff should vigilantly evaluate the retention data.

- Supervisors will need to be held accountable for the timely submission of bi-weekly reports.

- Reassign from current resources an additional supervisor to the Training Department to bring the staffing up to 2.5 people in 2002. Additional reassignments could be made as the need is determined.

- Seek input from BHR, BOEC Leadership Team, and Commissioner's Office Staff.

- Exit interviews will be conducted on ALL separating employees, regardless of reason.

    Practice changed on 11/10/01

- In general, the best strategy to keep people is to graduate them from training; Once an ECOT is certified, retention increases to 97% based on records dating to 1996 maintained at the Bureau.

- Mandatory twice-yearly In-Service training should be filled with value to the dispatchers and call-takers. The schedule should be filled with relevant, pertinent information in a fast-paced and organized manner.

- Dispatchers should be provided opportunities for advanced training, both in the area of job skills and life skills. Spanish language lessons, stress management, Tai Chi, Microsoft programs and drop-in forums could be utilized to improve retention and job satisfaction.

- Evaluate current recognition system and review for process improvement. Obtain feedback from the operators and evaluate the criteria on an on-going basis.

Measure of Success

Retention rate improves from 23% (1999 – 2001) to better than 50%. Coaching job satisfaction is improved by being involved and people feel valued.

7. Develop a clear and complete description of the roles and responsibilities of supervisory personnel, and provide supervisory training if necessary.

Bureau Goal 7A

Supervisory personnel will understand his or her job responsibilities, the Director's expectations and each supervisory and management team member unilaterally supports the Bureau vision.

Strategy

- Supervisors and managers will review job descriptions with each direct report. Make changes if appropriate, determine whether or not the job description matches the actual duties and support the vision of the Bureau.

  Director to Manager and Director to ECS2 completed on 1/31/02.

- Develop and refine job and behavior expectations. A mutually agreed upon understanding of expectation should be created by each manager for his or her supervisor.

- Responsibilities may change when the Operations Manager is on board.

Measure of Success

Supervisor and manager job satisfaction increases as expectations are more clear, accountability is high and people know how their efforts impact the Bureau goals, and what is expected of them. People are successful in their positions and train others to follow in their footsteps.

Bureau Goal 7B

Supervisors have the training and tools needed to confidently supervise, instruct and continually develop positive working relationships with all customers and Bureau personnel.

Strategy

- Leadership training is well underway with the "Professional Development Series." The series, which began on 5 December 2001, is conducted on first, third, and fourth Wednesdays of every month and runs for two hours, twice a day.

- SOP Review. During each training session, a Bureau Standard Operation Procedure is reviewed.

- Training is conducted at 1 p.m. and 11 p.m. Topics include, but are not limited to:

1. Labor Law, EEOC, Title 7, Civil Rights Act of 1962, etc.
   TBD

2. Drug and Alcohol Act of 1988
   Completed in three consecutive sessions from 12/26/01 – 01/09/02

3. Virtue of Consistency
   Completed on 12/05/01

4. Confidentiality
   Completed on 12/19/01

5. Diversity / Affirmative Action
   Completed on 02/06/02

6. Safety
   TBD

7. Management Skills
   Continuing series. Part One of Four "Twelve Fatal Errors Managers Make and How to Avoid Them" began on 01/30/02.

8. Communication
   Tentatively scheduled for 02/24/02

9. Budget Processes
   Reviewed weekly during Leadership Team meetings

10. Radio Technologies
    TBD

11. Computer Trouble Shooting
    TBD

12. Overcoming Negativity in the Workplace

    TBD

13. MisQT – Call Processing reporting
TBD

Measure of Success

Bureau Training will never stop or be complete. Team members will be expected to continually stretch and learn all aspects of his or her job. Managers will assist supervisors with professional development and each person will have the opportunity to participate in training.

8. Develop and implement a plan to improve the quality of communication at the Bureau.

Bureau Goal 8

To improve intra-departmental communications within the Bureau and ALL team members are aware of

Strategies

- Establish current capabilities, communication flows, and identify all methods and systems we use to communicate.

  In-progress – Communications Focus Group

- Gather an ad hoc team of call-takers, dispatchers, supervisors and determine the best means to deliver (and receive) information in the most efficient, timely and consistent manner.

  In-progress – Communications Focus Group

- Develop an easy-to-read matrix that identifies what type of information should be delivered in which medium.

  In-progress – Communications Focus Group

- Review the appropriateness of the strategy on an on-going basis, preferably every six months.

  Scheduled for a review in August 2002.

- Teams that work together should meet *regularly* with the team leader, supervisor, manager or Director.

  Coaches and the Training Manager
  Director and the Leadership Team
  Operations Manager and the Supervisors

- Managers should meet monthly with all direct reports in a one-on-one setting. Meeting frequency can increase if the manager deems it important or there exists barriers to improvement.

- Supervisors should meet monthly with all direct reports in a one-on-one setting.

- Bureau Managers with high profile, high interest projects should provide the Bureau with a weekly or periodic update, possibly via e-mail.

- Reinforce communication retention with a "Bureau Information Quiz" and award prizes to the team member who can best answer all of the questions.

- Provide e-mail for all team members. Managers acknowledge and return e-mail in a timely basis.

- All managers practice open door management, and "walk the talk."

- All managers should "see and be seen" on the Operations floor at varying hours and days of the week.

- The Commissioner and his staff should visit the Operations floor on a quarterly basis.

Measure of Success

People feel informed and generally know what is going on around the Bureau.

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