OFFICE OF THE

CITY AUDITOR

AN AUDIT OF THE SAN JOSE POLICE DEPARTMENT - COMMUNICATIONS DIVISION'S STAFFING AND SCHEDULING

- THE SAN JOSE POLICE DEPARTMENT CAN SAVE AS MUCH AS $860,000 PER YEAR IN PERSONNEL COSTS AND IMPROVE ITS SERVICE TO THE PUBLIC BY OPTIMIZING ITS DEPLOYMENT OF DISPATCHERS IN THE CITY'S COMMUNICATIONS CENTER

- THE SAN JOSE POLICE DEPARTMENT'S COMMUNICATIONS DIVISION CAN IMPROVE ITS MANAGEMENT REPORTING

A REPORT TO THE

SAN JOSE

CITY COUNCIL

MAY 1995 95-03

CITY OF SAN JOSÉ, CALIFORNIA

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GERALD A. SILVA
City Auditor

May 31, 1995

Honorable Mayor and Members
of the City Council
801 North First Street, Room 600
San Jose, CA 95110

Transmitted herewith is a report on *An Audit Of The San Jose Police Department - Communications Division's Staffing And Scheduling*. This report is in accordance with City Charter Section 805.

An Executive Summary is presented on the blue pages in the front of this report while an Administration response is shown on the yellow page(s) before the Appendices.

In addition, we have included some comments on the Administration's response. These comments are on the green pages immediately following the Administration's response.

I will present this report to the Finance Committee at its June 14, 1995, meeting. If you need additional information in the interim, please let me know. The City Auditor's staff members who participated in the preparation of this report are Nestor Baula, Ruth Garcia Merino, and Gregory Elliott.

Respectfully submitted,

Gerald A. Silva
City Auditor

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EXECUTIVE SUMMARY

In accordance with the City Auditor's 1993-94 Audit Workplan, we have initiated an audit of the San Jose Police Department's (SJPD) Communications Division (Division) staffing and scheduling. We conducted this audit in accordance with generally accepted government auditing standards and limited our work to those areas specified in the Scope and Methodology section of this report.

The City Auditor's Office thanks the SJPD's Division management and staff for its cooperation during the audit.

THE SAN JOSE POLICE DEPARTMENT CAN SAVE AS MUCH AS $860,000 PER YEAR IN PERSONNEL COSTS AND IMPROVE ITS SERVICE TO THE PUBLIC BY OPTIMIZING ITS DEPLOYMENT OF DISPATCHERS IN THE CITY'S COMMUNICATIONS CENTER

The SJPD's Bureau of Technical Services, Communications Division, employs 115 public safety dispatchers (PSDs) to answer 911 calls and non-emergency calls at the city of San Jose's Communications Center (Center) to provide coverage 24 hours a day 365 days a year. During the course of our audit,

- The Division changed to off-hook answering. As a result, average 911 call answering improved from 11 seconds in June 1994 to 3 seconds in February 1995. In addition, call answering improved from 33 percent of 911 calls answered within 5 seconds in June 1994 to 83 percent of 911 calls answered within 5 seconds in February 1995.

- The Division implemented procedural changes to lower the maximum 911 call-answering time. As a result, the number of 911

calls that took over 60 seconds to answer decreased from 771 calls in August 1994 to approximately 4 calls in February 1995. In addition, the percentage of 911 calls that were lost because callers hung up before their calls were answered decreased from 6 percent in August 1994 to 2 percent in February 1995.

These improvements notwithstanding, our review also revealed the following regarding the Center's staffing and resultant efficiency and effectiveness:

- The Division staffs the Center with a 5-shift pattern with no shift starting later than 9 p.m. and allows 45 minutes for PSD briefings and
- The average PSD is on short-term or long-term leave or training 22.6 percent of the time.

In our opinion, the Center's current staffing pattern is inherently inefficient and costly and has caused the following consequences:

- The Center's staffing pattern does not correspond to call volume-driven staffing demand. As a result, significant overstaffing occurs during some periods of the day while understaffing occurs during other periods of the day;
- The Center frequently falls below its own minimum staffing level in spite of PSDs earning $300,000 per year in paid overtime or compensatory time off;
- The Division did not meet one of its four emergency call-answering objectives in 1991-92, 1992-93, or 1993-94;
- The Division's revised emergency call-answering objectives since 1993-94 are slower than the objectives the state of California recommends;
- During June and August 1994, 15 percent and 21 percent, respectively, of those emergency callers whom PSDs deemed not to be in an emergency situation hung up after being put on hold. Those callers who hung up did so after PSDs put them on hold an average of

2 minutes 10 seconds in June 1994 and 2 minutes 31 seconds in August 1994. Further, there were 7 days during June 1994, 11 days during August 1994, 8 days during September 1994, and 8 days in February 1995 that an emergency caller whom a PSD deemed not to be in an emergency situation was put on hold for at least 15 minutes with one caller being put on hold for at least 34 minutes; and

- During February 1995, 24 percent of those emergency callers whom PSDs deemed not to be in an emergency situation hung up after being put on hold. This is twice the percentage of calls lost when compared to February 1994.

In May 1995, the Division will assume responsibility for non-emergency report-writing calls that the SJPD's Operations Support Services Division currently handles. The Division has proposed to the City Administration that it can assume this additional responsibility by adding 9 PSDs, for a total of 124 PSDs. However, our review indicates that unless the Division either adds 12 more PSDs or deploys its existing PSDs more efficiently the conditions described for emergency callers whom PSDs deem not to be in an emergency situation will be perpetuated after May 1995 and the Division will continue to function below its own minimum staffing level. Finally, the City Auditor's Office used a computer model to optimize the scheduling of PSDs in the Center. The results of our optimization were that the Division can (1) eliminate 10 PSD positions while at the same time significantly improve its ability to function at or above its minimum staffing level, (2) avoid periods of overstaffing, and (3) save the City $860,000 per year in regular personnel, overtime, and compensatory time costs. Accordingly, we recommend that the SJPD and the City Administration use the information in this report to develop, and forward to the City Council for concurrence, a staffing proposal for the Center that is both responsive to the public's emergency calling needs and the least costly to the City.

THE SAN JOSE POLICE DEPARTMENT'S COMMUNICATIONS DIVISION CAN IMPROVE ITS MANAGEMENT REPORTING

During our audit, we noted the Division's computer system does not generate information regarding the length of time it takes to answer 911 calls which are deemed to be non-emergency and transferred to a secondary tier call-taker. We also noted that the Division has inconsistently reported on its Center call volume. Further, the Division does not report the maximum call-answering delays for answered or lost emergency and non-emergency dispatch calls.

Finally, the Division is lacking an analyst position to assist in management reporting. In our opinion, the Division should generate information regarding the length of time it takes to answer non-emergency 911 calls, itemize the calls it receives by type of call, report on the maximum call-answering delays for answered and lost emergency and non-emergency dispatch calls, and include such information in its trimester program management reports. Accordingly, we recommend that the Division and the City Manager request funding for a senior analyst position for the Bureau of Technical Services during the mid-year 1995-96 budget review process.

RECOMMENDATIONS

We recommend that the San Jose Police Department's Communications Division and the City Manager's Office:

Recommendation #1:

Use the information in this report to develop, and forward to the City Council for concurrence, a staffing proposal for the Communications Center that is both responsive to the public's emergency calling needs and the least costly to the City. (Priority 2)

In addition, we recommend that the San Jose Police Department's Communications Division:

Recommendation #2:

Program its computer system to generate call-answering times for those emergency calls deemed to be non-emergencies and transferred to a secondary tier call-taker. (Priority 3)

Recommendation #3:

Itemize on its program management reports the calls it receives by type of call such as emergency, non-emergency, and other calls. (Priority 3)

Recommendation #4:

Include in its program management reports computer-generated information regarding maximum call-answering delays and lost emergency and non-emergency calls. (Priority 3)

Recommendation #5:

Request funding for a senior analyst position in the Bureau of Technical Services during the mid-year 1995-96 budget review process. (Priority 3)

Recommendation Requiring Budget Action

Of the preceding recommendations, #5 cannot be implemented absent additional funding. Accordingly, the City Manager should request during the mid-year 1995-96 budget review process that the City Council appropriate an amount sufficient to implement recommendation #5.

INTRODUCTION

In accordance with the City Auditor's 1993-94 Audit Workplan, we have initiated an audit of the San Jose Police Department's Communications Division staffing and scheduling. We conducted this audit in accordance with generally accepted government auditing standards and limited our work to those areas specified in the Scope and Methodology section of this report.

The City Auditor's Office thanks the Police Department's Communications Division management and staff for their cooperation during the audit.

SCOPE AND METHODOLOGY

The San Jose Police Department (SJPD) Bureau of Technical Services consists of two divisions: the Operations Support Services Division and the Communications Division. This report deals with the Police Dispatch Operations section, which is a major part of the Communications Division (Division). This report does not cover the Fire Dispatch Operations section which is located in the same facility as the Police Dispatch Operations section.

Our audit objectives were

- To review the Division's staffing and scheduling procedures and
- To find ways to make the Division's staffing and scheduling more economical, efficient, and effective.

The major part of our audit involved learning the nature of the Division's staffing and workload; gathering data on the Division's emergency, non-emergency, and report-writing call volume; and constructing computer optimization models for the scheduling of public safety dispatchers (PSD) at the Communications Center. Appendix C describes our methodology for the computer optimization models that we produced for this audit.

Our audit also included interviewing officials and staff of the Division and the Budget Office; observing the work of the PSDs and police data specialists; attending field officer briefings; and participating in a police patrol car ride-along.

The documentation we reviewed included:

- PSD staffing schedules
- Division staffing and workload information
- Division internal management reports
- State of California 911 program standards
- Various Police Department memoranda

We performed telephone surveys of other jurisdictions and an on-site visit of the Oakland Communications Center. Finally, we met with officials from State of California 911 Program and also from Pacific Bell.

We performed only limited testing to determine the accuracy and reliability of information in the various computer reports used. Such testing included observation, walk-through, and comparison of the Division's internal management reports. We met with Division and Pacific Bell officials to review information regarding the accuracy and reliability of the computer-generated information. We did not review the general and specific application controls for the computer systems used in compiling the various computer reports we reviewed.

BACKGROUND

The San Jose Police Department's (SJPD) Bureau of Technical Service oversees the Communications Division (Division), which is responsible for answering emergency calls and dispatching the appropriate service units. The chart on the following page shows the Bureau of Technical Services', including the Division's, dispatch operations.

ORGANIZATION CHART

The Police Dispatch Operations

The two main tasks involved in the Police Dispatch Operations are call taking and radio dispatching.

Call Taking

Public safety dispatchers (PSDs) Is and IIs answer calls requiring the dispatch of a police officer. The Division has a two-tier system for answering emergency and non-emergency calls. The primary tier call-takers answer 911 calls and 7-digit emergency phone calls.[1] The secondary tier call-takers answer calls that are non-emergency but may require the dispatch of a police officer. If a primary tier call-taker receives a 911 or 7-digit emergency call which the call-taker determines is not an emergency, the primary tier call-taker transfers the call to a secondary tier call-taker in order to be immediately available for another emergency call. Furthermore, if all primary tier call-takers are busy and a 911 or 7-digit emergency call comes in to the Division, the call will roll over to a secondary tier call-taker. If the secondary tier call-taker is busy with a non-emergency call, the secondary tier call-taker will put the non-emergency call on hold and answer the emergency call.

Radio Dispatching

PSD IIs assigned to the radio positions receive requests for police dispatch from the call-takers electronically via the computer-aided dispatch

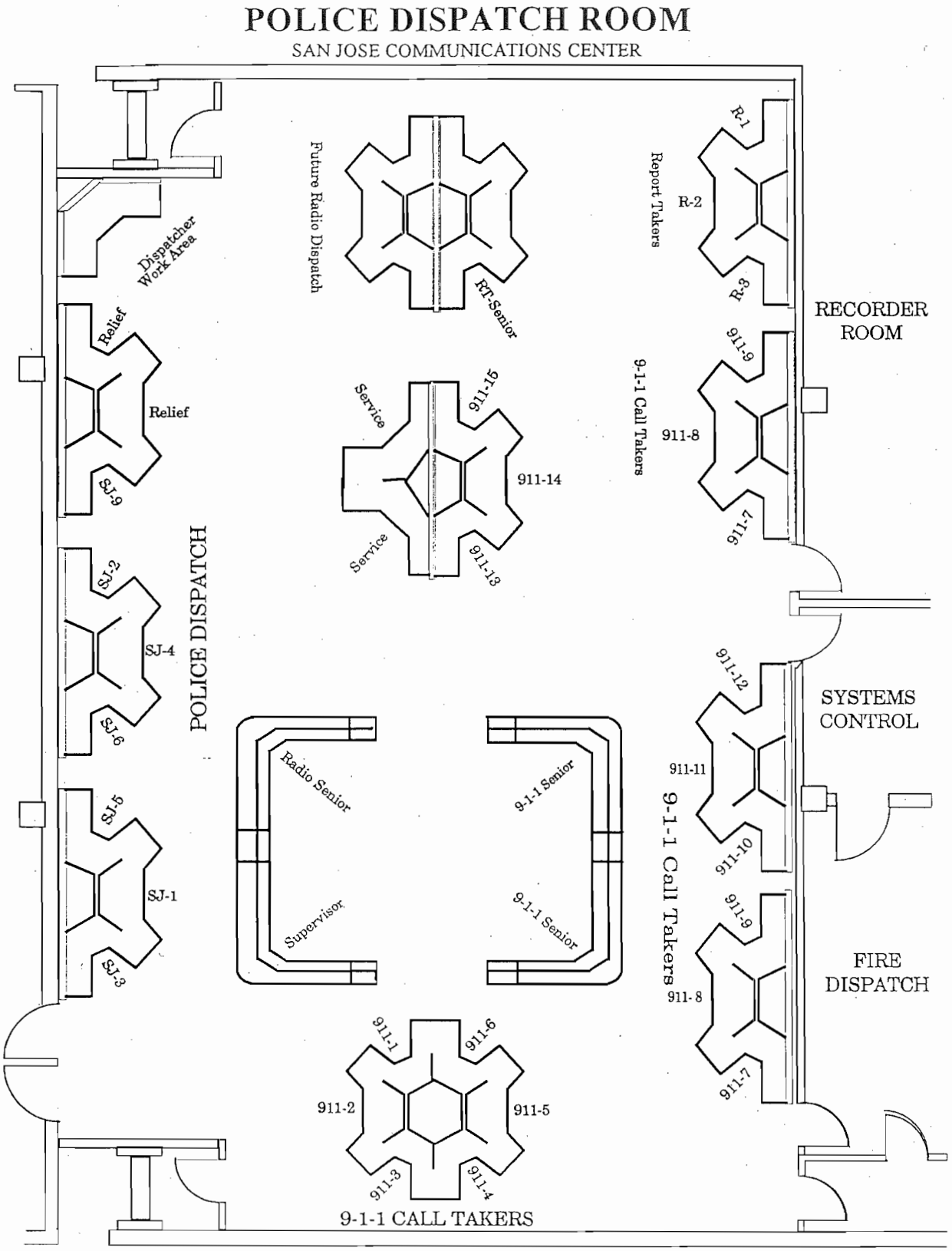
[1] The types of callers that use the 7-digit emergency phone number include: (1) reporting parties who do not want their phone numbers or addresses displayed and documented in the computer system, (2) alarm companies, and (3) out-of-town callers reporting emergencies in San Jose.

(CAD) system. The radio dispatchers are responsible for dispatching and coordinating police field units. The radio dispatchers use voice communication, the CAD, and the Mobile Data Terminal systems to communicate with the police field units and to monitor and update the status of all units.

The San Jose Police Department's Communications Center

The PSDs' workstations are located in the control room of the Communications Center building. The control room can accommodate up to 37 workstations for PSD Is and IIs. Currently, 33 of the 37 workstations are equipped and 4 workstations are not equipped. Prior to 1993, the control room had 29 equipped workstations. These consisted of 7 radio channel workstations, 2 service workstations, 2 relief workstations, and 18 call-taker workstations. During 1993-94, 4 additional workstations were equipped for the report-writing program, which will be transferred from the Operations Support Services Division in May 1995. These 4 report-writing workstations can also be used as call-taker workstations. A floor plan of the control room is shown on the following page.

CHART II


POLICE DISPATCH ROOM
SAN JOSE COMMUNICATIONS CENTER
Dispatcher Work Area
Future Radio Dispatch
RT-Senior
Report Takers
R-1
R-2
R-3
RECORDER ROOM
Relief
Relief
SJ-9
Service
911-15
911-14
Service
911-13
9-1-1 Call Takers
911-9
911-8
911-7
SJ-2
SJ-4
SJ-6
POLICE DISPATCH
911-12
SYSTEMS CONTROL
Radio Senior
Supervisor
9-1-1 Senior
9-1-1 Senior
911-11
911-10
9-1-1 Call Takers
SJ-5
SJ-1
SJ-3
911-9
911-8
911-7
FIRE DISPATCH
911-1
911-6
911-2
911-5
911-3
911-4
9-1-1 CALL TAKERS

The Public Safety Dispatchers' Working Hours Match Those Of The Patrol Officers

Before the city of San Jose (City) took over police dispatching from Santa Clara County in 1990, SJPD management felt that relations between the patrol officers and dispatchers needed improving. When the City assumed the public safety dispatch responsibility, it sought to improve the working relationship of the patrol officers and PSDs. With that in mind, the SJPD implemented a 4-day, 10-hour workweek for the police dispatch staff. This workweek put the PSDs on the same schedule as patrol officers and allowed the PSDs to attend joint briefings with the patrol officers. The main objectives for having the PSDs work the same schedule as patrol officers are that (1) the joint briefings will foster a spirit of camaraderie between the PSDs and the patrol officers and (2) dispatch staff scheduling can be matched with field operations.

The Memorandum Of Agreement Provisions Regarding Working Hours

The Division's staff belongs to the Municipal Employees Federation. The 1993-95 Memorandum of Agreement (MOA) allows the 4-day, 10-hour workweek. The MOA states that

> *Employees required to perform duties as support personnel of uniformed classifications assigned a schedule of four (4) ten (10) hour shifts per work week may also be assigned a schedule of four (4) ten (10) hours shifts per work week.*

In addition, the MOA states that

> *Employees assigned to radio dispatch operations in either the Fire or Police Departments may work alternate work schedules, based upon the needs of the department and the need to provide quality service to the public. Due to the critical nature of the position and the*

restrictions placed upon the employees, any shift of 8 hours or greater will include a 30 minute paid lunch break.

With respect to holiday compensation, the MOA states that

In lieu of the holiday compensation . . ., employees in the Public Safety Dispatcher class series (I, II, Senior and Supervising Public Safety Dispatcher) shall be paid an amount equal to 5.623% of base salary as holiday pay. Employees who are paid such holiday-in-lieu pay may be required to work on holidays, and do not receive any other form of holiday compensation under any other section of this Agreement.

Major Accomplishments

In Appendix B, the SJPD informs us of its major accomplishments regarding the Communications Division. According to the Chief of Police, its major accomplishments are

- In October of 1994, the Police and Fire chiefs reorganized the Communications Division by transferring the fire communications function back to the Fire Department;
- Since the Communications Center's inception, the dispatcher attrition rate has decreased each year to a low of 3.4 percent for 1993-94. This is the lowest rate in the state of California for large communications facilities;
- For 1993-94, only 21 sustained 911 service complaints were received while 1.4 million telephone calls were processed in the same period;
- A rigorous examination process has proved to be a major contributing factor to a low attrition rate resulting in considerable savings for the City. Additionally, dispatchers have actively participated in community policing projects. The Communications Center has received national and local positive media coverage highlighting the training and professionalism of

the staff as well as compliments for the Disaster Hot Line used during the recent floods; and

- In May 1995, the Communications Center will take over the function of TRAC from the Information Center.

FINDING I

THE SAN JOSE POLICE DEPARTMENT CAN SAVE AS MUCH AS $860,000 PER YEAR IN PERSONNEL COSTS AND IMPROVE ITS SERVICE TO THE PUBLIC BY OPTIMIZING ITS DEPLOYMENT OF DISPATCHERS IN THE CITY'S COMMUNICATIONS CENTER

The San Jose Police Department's (SJPD) Bureau of Technical Services, Communications Division (Division), employs 115 public safety dispatchers (PSDs) to answer 911 calls and non-emergency calls at the city of San Jose's Communications Center (Center) to provide coverage 24 hours a day 365 days a year. During the course of our audit,

- The Division changed to off-hook answering. As a result, average 911 call answering improved from 11 seconds in June 1994 to 3 seconds in February 1995. In addition, call answering improved from 33 percent of 911 calls answered within 5 seconds in June 1994 to 83 percent of 911 calls answered within 5 seconds in February 1995.

- The Division implemented procedural changes to lower the maximum 911 call-answering time. As a result, the number of 911 calls that took over 60 seconds to answer decreased from 771 calls in August 1994 to approximately 4 calls in February 1995. In addition, the percentage of 911 calls that were lost because callers hung up before their calls were answered decreased from 6 percent in August 1994 to 2 percent in February 1995.

These improvements notwithstanding, our review also revealed the following regarding the Center's staffing and resultant efficiency and effectiveness:

- The Division staffs the Center with a 5-shift pattern with no shift starting later than 9 p.m. and allows 45 minutes for PSD briefings and

- The average PSD is on short-term or long-term leave or training 22.6 percent of the time.

In our opinion, the Center's current staffing pattern is inherently inefficient and costly and has caused the following consequences:

- The Center's staffing pattern does not correspond to call volume. As a result, significant overstaffing occurs during some periods of the day while understaffing occurs during other periods of the day;

- The Center frequently falls below its own minimum staffing level in spite of PSDs earning $300,000 per year in paid overtime or compensatory time off;

- The Division did not meet one of its four emergency call-answering objectives in 1991-92, 1992-93, or 1993-94;

- The Division's revised emergency call-answering objectives since 1993-94 are slower than the objectives the state of California recommends;

- During June and August 1994, 15 percent and 21 percent, respectively, of those emergency callers whom PSDs deemed not to be in an emergency situation hung up after being put on hold. Those callers who hung up did so after PSDs put them on hold an average of 2 minutes 10 seconds in June 1994 and 2 minutes 31 seconds in August 1994. Further, there were 7 days during June 1994, 11 days during August 1994, 8 days during September 1994, and 8 days in February 1995 that an emergency caller whom a PSD deemed not to be in an emergency situation was put on hold for at least 15 minutes with one caller being put on hold for at least 34 minutes; and

- During February 1995, 24 percent of those emergency callers whom PSDs deemed not to be in an emergency situation hung up after being put on hold. This is twice the percentage of calls lost when compared to February 1994.

In May 1995, the Division will assume responsibility for non-emergency report-writing calls that the SJPD's Operations Support Services Division currently handles. The Division has proposed to the City Administration that it can assume this additional responsibility by adding 9 PSDs, for a total of 124 PSDs. However, our review indicates that unless the Division either adds 12 more PSDs or deploys its existing PSDs more efficiently the conditions described for emergency callers whom PSDs deem not to be in an emergency situation will be perpetuated after May 1995 and the Division will continue to function below its own minimum staffing level. Finally, the City Auditor's Office used a computer model to optimize the scheduling of PSDs in the Center. The results of our optimization were that the Division can (1) eliminate 10 PSD positions while at the same time significantly improve its ability to function at or above its minimum staffing level, (2) avoid periods of overstaffing, and (3) save the City $860,000 per year in regular personnel, overtime, and compensatory time costs. Accordingly, we recommend that the SJPD and the City Administration use the information in this report to develop, and forward to the City Council for concurrence, a staffing proposal for the Center that is both responsive to the public's emergency calling needs and the least costly to the City.

The City Of San Jose's Communications Center

The SJPD's Bureau of Technical Services, Communications Division, employs 115 PSDs to answer 911 calls and non-emergency calls at the Communications Center. The 115 PSDs include 14 authorized PSD positions that were added in August 1992. Of these additional 14 PSD positions 6 are

primarily assigned to the call-back function.[2] Thus, 109 PSDs are available for call-answering (call-takers) and dispatch (radio channel operators) duties.

During The Course Of Our Audit,
The Division Changed To Off-Hook Answering.
As A Result, Average 911 Call Answering Improved
From 11 Seconds In June 1994 To 3 Seconds In February 1995.
In Addition, Call Answering Improved From 33 Percent
Of 911 Calls Answered Within 5 Seconds In June 1994
To 83 Percent Of 911 Calls Answered Within 5 Seconds In February 1995.

In July 1994, in response to a City Auditor recommendation, the SJPD's Communications Division changed to an off-hook system to answer emergency calls. By using an off-hook system to answer emergency calls, the City Auditor had estimated the Center could improve its emergency call response times by 4 to 5 seconds without having to increase staffing.

The Communications Center Has Improved Its Emergency Call-Answering Response Time By Using An Off-Hook System

Prior to July 1994, the Division used an on-hook answering system. With an on-hook answering system the call-taker must press a button to answer a call. In an off-hook answering system, a zip tone announces the call and the call-taker can immediately speak with the caller without having to press a button. During the first trimester of 1993-94, the Division, using an on-hook answering system, had an average answering time of 9.2 seconds. In contrast, the city of San Diego, California, using an off-hook answering system, had an average answering time of 4 seconds. The city of Oakland, California, also using an off-

[2] Call-backs must be made when persons call 911 and hang up before the call is answered. Some of these call hang-ups are crime or domestic violence-related.

hook system, had an answering time of 4 to 7 seconds. Based on this information, the City Auditor's Office recommended to Division management that the Division change to the off-hook system.

In July 1994, the Division management changed the Center to an off-hook system. We compared 911 telephone-answering statistics from the Division's System Status Reports for February 1994, June 1994, September 1994, November 1994, and February 1995. Table 1 summarizes the Center's call-answering performance during February 1994 and June 1994, when the Center was still using an on-hook answering system, to August 1994, November 1994, and February 1995, after the Center had switched to an off-hook answering system.

TABLE 1

COMPARISON OF THE COMMUNICATIONS CENTER'S 911 CALL ANSWERING DURING FEBRUARY 1994 AND JUNE 1994 USING AN ON-HOOK ANSWERING SYSTEM TO AUGUST 1994, NOVEMBER 1994, AND FEBRUARY 1995 USING AN OFF-HOOK ANSWERING SYSTEM

	On-Hook Answering System		Off-Hook Answering System		
Month	**February 1994**	**June 1994**	**August 1994**	**November 1994**	**February 1995**
Average Call-Answering Time In Seconds	10	11	10	5	3
Maximum Call-Answering Time In Seconds	139	117	144	109	75
Percentage Of 911 Calls Answered Within 5 Seconds	38	33	69	82	83
Percentage Of 911 Calls Answered Within 10 Seconds	69	62	72	85	87
Percentage Of 911 Calls Answered Within 15 Seconds	82	76	75	88	90
Number Of 911 Calls Offered	24,835	31,638	33,254	24,549	25,372

Table 1 shows the dramatic improvement in call answering the Center has attained since changing from on-hook to off-hook answering.

The Division Implemented Procedural Changes To Lower The Maximum 911 Call-Answering Time. As A Result, The Number Of 911 Calls That Took Over 60 Seconds To Answer Decreased From 771 Calls In August 1994 To Approximately 4 Calls In February 1995. In Addition, The Percentage Of 911 Calls That Were Lost Because Callers Hung Up Before Their Calls Were Answered Decreased From 6 Percent In August 1994 To 2 Percent In February 1995.

In November 1994, as part of our audit, we presented to Division management our findings regarding the number of calls that the Center took more than 60 seconds to answer. Specifically, we informed Division management that for the months of June, August, and September 1994 the Center took over 60 seconds to answer 2,468 emergency (911 and 7-digit) calls. Our calculations were based on the Division's June, August, and September 1994 monthly computer-generated daily information Delayed Call Spectrum reports and are summarized in Table 2.

TABLE 2

SUMMARY OF EMERGENCY CALLS ANSWERED IN OVER 60 SECONDS DURING JUNE, AUGUST, AND SEPTEMBER 1994

Call Descriptions	June 1994	August 1994	September 1994	Totals
Total Emergency Calls Offered[3]	38,089	39,841	37,259	115,189
Total Emergency Calls Handled[4]	29,645	30,476	28,877	88,998
Number Of 911 Calls Answered In Over 60 Seconds	260	771	482	1,513
Number of 7-Digit Emergency Calls Answered In Over 60 Seconds	302	360	293	955
Total Emergency Calls Answered In Over 60 Seconds	562	1,131	775	2,468

[3] **Calls Offered** comprise calls handled, transferred, and lost.

[4] **Calls Handled** are answered calls that are not transferred.

The Division's computer-generated System Status Reports also document the maximum daily delay in answering calls. The daily maximum delay for 911 emergency calls exceeded 100 seconds during 6, 21, and 12 days in the months of June, August, and September 1994, respectively. The maximum daily delay for 7-digit emergency calls exceeded 100 seconds during 16, 24, and 25 days during the months of June, August, and September 1994, respectively.

In response to the above information, Division management implemented procedural changes to lower both the number of calls answered in over 60 seconds and the maximum delays. Specifically, the timing of an audible alarm, which indicates a 911 call waiting to be answered, was changed from approximately 45 seconds to exactly 20 seconds. Other procedural changes included improved call-taker supervision, relief coordination for lunch and breaks, and reporting of calls delayed over 60 seconds to Division management. As a result, our review of the Division's February 1995 System Status Report showed that the Division has significantly improved its emergency call answering as is shown in Table 3.

TABLE 3

SUMMARY OF EMERGENCY CALLS ANSWERED
IN OVER 60 SECONDS DURING FEBRUARY 1995

Call Description	February 1995
Total Emergency Calls Offered	31,104
Total Emergency Calls Handled	24,401
Number of 911 Calls Answered In Over 60 Seconds	4
Number of 7-Digit Emergency calls Answered In Over 60 Seconds	61
Total Emergency Calls Answered In Over 60 Seconds	65

During February 1995 the Division answered no emergency calls in over 100 seconds. Although February emergency call volume is usually about 19 percent less than an average summer month, the number of February 1995 emergency calls answered in over 60 seconds is 92 percent less than June, August, and September 1994.

911 Calls Lost Because Callers Hung Up Before Their Calls Were Answered Decreased From 6 Percent In August 1994 To 2 Percent In February 1995

We reviewed the computer-generated 911 and 7-digit emergency line Lost Call Reports for June and August 1994. These reports show the length of time elapsed before a caller hangs up. The number of emergency calls lost for June and August 1994 averaged approximately 6 percent of calls offered. This amount represents approximately 4,544 emergency callers in June and August 1994 who hung up before a call-taker answered their calls. Approximately 57 percent and 63 percent of those 911 callers whose calls were lost in June and August, respectively, waited over 15 seconds before they hung up. The average delay before a 911 caller hung up was 19 and 23 seconds in June and August 1994, respectively. In addition, there were three days in August 1994 when 911 callers waited from 3-1/2 minutes to almost 7 minutes before hanging up. A PSD "calls back" those callers who call 911 and hang up before their calls are answered. If the caller who hung up does not answer when a PSD "calls back," the Center dispatches a police officer to the location from which the call was made.

It appears that as a consequence of the procedural changes noted above, both the 911 maximum answering time and the number of 911 calls lost have decreased. In February 1995, only 2 percent of 911 callers hung up prior to their

calls being answered. This percentage compares favorably to summer 1994 as well as to February 1994 when 6 percent of callers hung up before their calls were answered.

These improvements notwithstanding, our review also revealed the following regarding the Center's staffing and resultant efficiency and effectiveness.

The Division Staffs The Center With A 5-Shift Pattern With No Shift Starting Later Than 9 P.M. And Allows 45 Minutes For PSD Briefings

5-Shift Staffing Pattern With Restricted Starting Times

The Division uses 115 PSDs to staff the Center on a 5-shift, 4-day-a-week, 10-hour-a-day basis to provide 24-hour-a-day coverage 365 days a year. The starting times for the Center's current 5-shift staffing pattern are as follows:

6:15 a.m.
8:30 a.m.
3:00 p.m.
6:00 p.m.
9:00 p.m.

As is shown above, the Center restricts starting times so that no shift starts after 9 p.m. According to Division officials, the decision to restrict starting times to no later than 9 p.m. was based upon Division concerns for PSD safety and morale and to prevent fatigue. Conversely, optimizing PSD staffing to correspond with Center call volume was not a determinant factor when the Division restricted shift starting times to no later than 9 p.m.

45-Minute PSD Briefings

Since 1990, PSDs have attended joint briefings at the beginning of their shifts with SJPD patrol officers. Their briefings are held in the briefing room which is located one floor below the Center. Bureau of Field Operations (BFO) briefings begin at 6:30 a.m., 3 p.m., and 9 p.m., and last from 10 to 40 minutes. After BFO briefings, PSDs may hold a 15-minute briefing with the supervising PSD. Senior PSDs brief PSDs for the 8:30 a.m. and 6 p.m. overlay shifts. As such, a PSD can spend 45 minutes, or more, of his or her 10-hour workday in briefings. Oftentimes, these briefings occur during high call volume times of the day or when the number of PSDs actually available to answer calls is relatively low.

The Average PSD Is On Short-Term Or Long-Term Training Or Leave Approximately 22.6 Percent Of The Time.

PSDs are unavailable to perform their call-handling or dispatch tasks when they are (1) absent, (2) on short-term annual training, (3) on long-term leaves, or (4) in the entry-level or promotional training programs.

The Center experiences staffing shortages when PSDs are on extended absences such as medical (maternity, family, or worker compensation) or other types of paid or unpaid leave. Staffing shortages also occur due to vacancies or when new or promoted PSDs are in the training program. According to Division management, new PSDs are in training from six months to a year and promoted PSDs are in training from four to eight months. In September 1994, 19 percent of the authorized staff was on extended absences and unavailable to work a regular shift because: 7 PSDs were on leave, 1 PSD was on special administrative

assignment, 12 PSDs were in the training program, and 2 positions were vacant. In October 1994, 21.7 percent of the authorized staff was on extended absences and unavailable to work a regular shift. Furthermore, in October 1994, 4 PSDs who were on extended absences and not available to work a regular shift during the prior month were either transferred, resigned, or terminated.

The City Auditor's Office and the City Manager's Budget Office have jointly agreed that based upon historical trends during 1993 and 1994 that the average PSD is on short- or long-term leave 22.6 percent of the time as shown in Table 4.

TABLE 4

SUMMARY OF AVERAGE PSD SHORT- AND LONG-TERM ABSENCES

Absence Type	Hours Per Year	Percentage of Available Annual Hours
Training	40	1.9
Vacation	100	4.8
Sick Leave	80	3.8
Comp Time	60	2.9
Entry or Promotional Training	110	5.3
Unpaid Leave	80	3.8
Total	470	22.6*

*Total does not foot because of rounding.

As is shown above, PSDs are not available to perform call-handling or dispatch tasks for 22.6 percent of the available 2,080 annual hours.

The Center's Staffing Pattern Is Inherently Inefficient And Costly

In our opinion, the Center's current staffing pattern is inherently inefficient and costly. We arrived at our conclusion by calculating the Center's hourly call

volume-driven staffing demand and comparing that staffing demand to the Center's actual staffing pattern.

The Center's Staffing Pattern Does Not Correspond To Call Volume-Driven Staffing Demand. As a Result, Significant Overstaffing Occurs During Some Periods Of The Day While Understaffing Occurs During Other Periods Of The Day

Call Volume-Driven Staffing Demand

In order to compare the Center's actual PSD staffing pattern to the call volume-driven staffing demand, we had to first determine call volume by the day of the week and time of day. In order to do this, we first documented the historical call volume workload for emergency and non-emergency calls described in Appendix C. After we documented emergency and non-emergency call volume we needed to forecast the number of PSDs required on an hourly basis to handle the call-taking, radio, service, and relief workload. We refer to the number of PSDs needed on an hourly basis as the call volume-driven staffing demand. We considered historical call-handling time and information from Division management and from another jurisdiction in order to estimate the call volume-driven staffing demand.

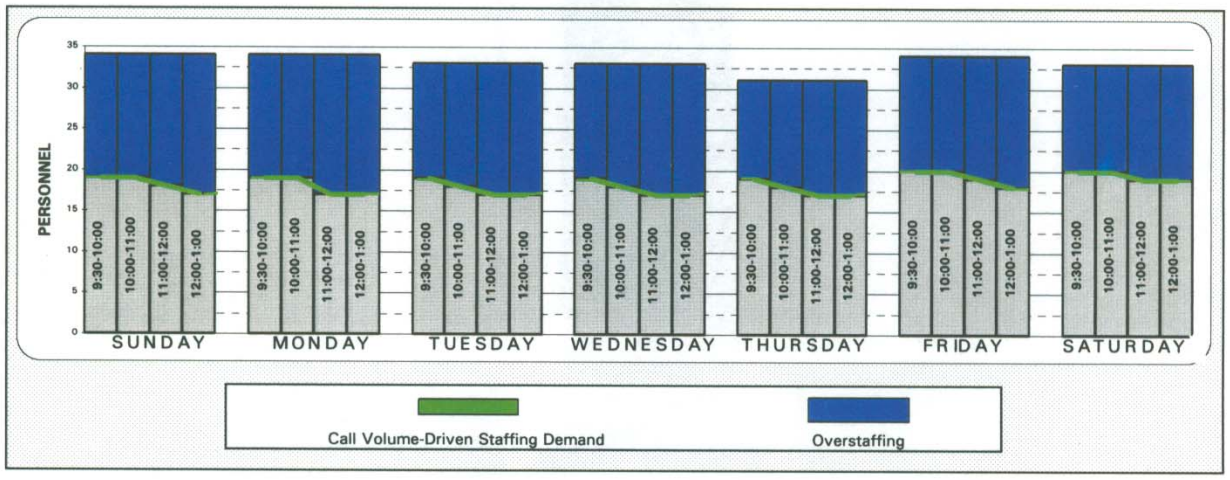
The Center's Staffing Pattern Does Not Correspond To Call Volume-Driven Staffing Demand. As A Result, Significant Overstaffing Occurs During Some Periods Of The Day While Understaffing Occurs During Other Periods Of The Day

Our review of scheduled staffing as of September 1994 (93 PSDs) at the Center revealed the current 5-shift pattern results in significant overstaffing during certain periods of each day when compared to workload demand. The scheduled staffing does not include all authorized positions because some PSDs are on long-term leave or training as discussed in the previous section of this

report. Some of the staffing overlaps are intentional because the Division wants additional staff at peak times. At other times, the Division uses staffing overlaps to allow dispatchers to attend briefings at the beginning of their shifts. However, some overlap is not needed and, therefore, could be eliminated. The overstaffing is the difference between the number of PSDs required to handle the call-taking, radio, service, and relief workload and the staff actually on duty. For example, Graph 1 shows that on Sundays there is an excess of more than 15 dispatchers at various times between 9:30 p.m. and 1 a.m.

GRAPH 1*

DAILY OVERSTAFFING OCCURRING FROM 9:30 P.M. TO 1 A.M.



* Based on 93 available PSDs.

Since December 1993, the Division has utilized part of the overlap staff for telephone report writing from 9:30 p.m. to 1 a.m. Telephone report writing involves answering calls and documenting what the citizen has called to report. Telephone report writing does not require the Center to dispatch a patrol officer.

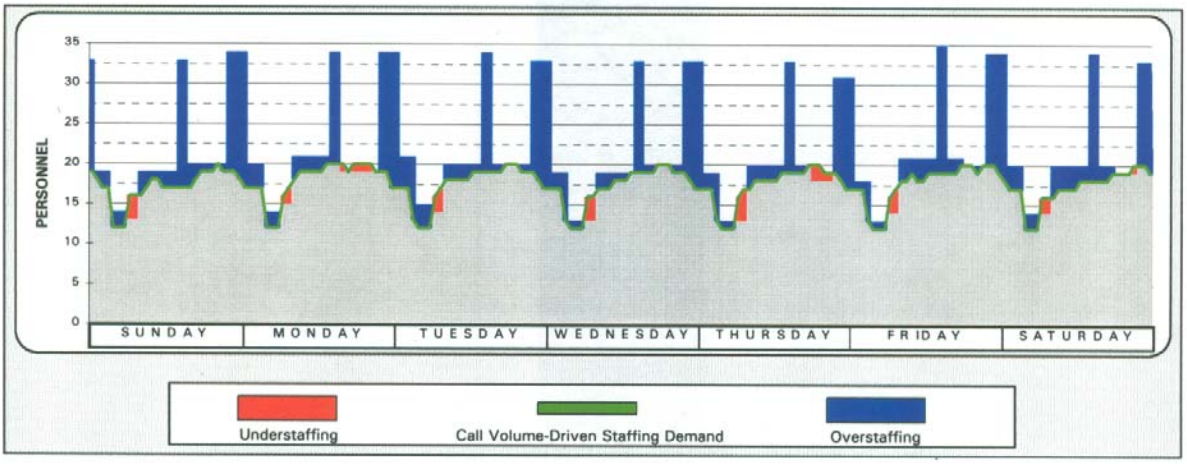
The Current 5-Shift Pattern

We compared the scheduled staffing levels in September 1994 to the Division's call volume-driven staffing demand. We found that, absent overtime, the Division cannot meet the call volume-driven staffing demand we calculated.[5]

Graph 2 compares September 1994's scheduled 5-shift staffing pattern to our calculation of call volume-driven staffing demand.

GRAPH 2

SEPTEMBER 1994 SCHEDULED 5-SHIFT STAFFING PATTERN COMPARED TO CALL VOLUME-DRIVEN STAFFING DEMAND*



* Graph 2 does not reflect telephone report-writing workload even though the Division does utilize some of its 9:30 p.m. to 1 a.m. overlap staff to handle telephone report writing.

[5] The scheduled staffing shown in Graph 2 is the staff scheduled during the semi-annual bidding process and excludes those PSDs on long-term leave and long-term training. Furthermore, we excluded those PSDs who bid during the shift-bidding process because they are expected to return prior to the next shift bid but who continue to be on long-term leave. Graph 2 shows 93 scheduled PSD Is and IIs and does not reflect short-term absences.

Graph 2 shows that in addition to significant periods of overstaffing, there were eleven times during the week when the number of PSDs scheduled to be on duty was less than the call volume-driven staffing demand we calculated.

The Center Frequently Falls Below Its Own Minimum Staffing Level In Spite Of PSDs Earning $300,000 Per Year In Paid Overtime Or Compensatory Time Off

The Division sets minimum hourly staffing levels for PSD Is and IIs. These levels are currently set as shown in Table 5.

TABLE 5

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DIVISION'S HOURLY MINIMUM STAFFING REQUIREMENT

Hour	Minimum Staffing		Hour	Minimum Staffing
Midnight	21		Noon	19
1:00 AM	16		1:00 PM	19
2:00 AM	16		2:00 PM	19
3:00 AM	16		3:00 PM	21
4:00 AM	12		4:00 PM	21
5:00 AM	12		5:00 PM	21
6:00 AM	12		6:00 PM	21
7:00 AM	15		7:00 PM	21
8:00 AM	15		8:00 PM	21
9:00 AM	19		9:00 PM	21
10:00 AM	19		10:00 PM	21
11:00 AM	19		11:00 PM	21

Our review revealed that the Center is frequently staffed below its own minimum staffing requirements. We judgmentally selected four weeks of the Division's shift deployment reports. The shift deployment reports show actual staff by shift and include absence and overtime information. We reviewed shift deployment reports showing actual staffing for the weeks ending May 22, 1994; June 10, 1994; October 8, 1994; and December 8, 1994; and the day of September 11, 1994. Our analysis showed that for every day we reviewed, staffing, including overtime staff, was below the Center's minimum required staffing during at least two hours of each day. Table 6 summarizes the hours below minimum staffing on each day reviewed.

TABLE 6

NUMBER OF HOURS THAT THE COMMUNICATIONS CENTER WAS BELOW MINIMUM STAFFING DURING THE WEEKS ENDING MAY 22, 1994; JUNE 10, 1994; OCTOBER 8, 1994; AND DECEMBER 8, 1994

Number Of Hours Below Minimum For The Week Ending	Days of the Week							
	Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Total Hours Below Minimum
May 22, 1994	6	8	3	8	6	5	6	42
June 10, 1994	4	2	6	9	8	3	9	41
October 8, 1994	9	5	7	3	8	3	12	47
December 8, 1994	11	8	6	8	8	8	12	61

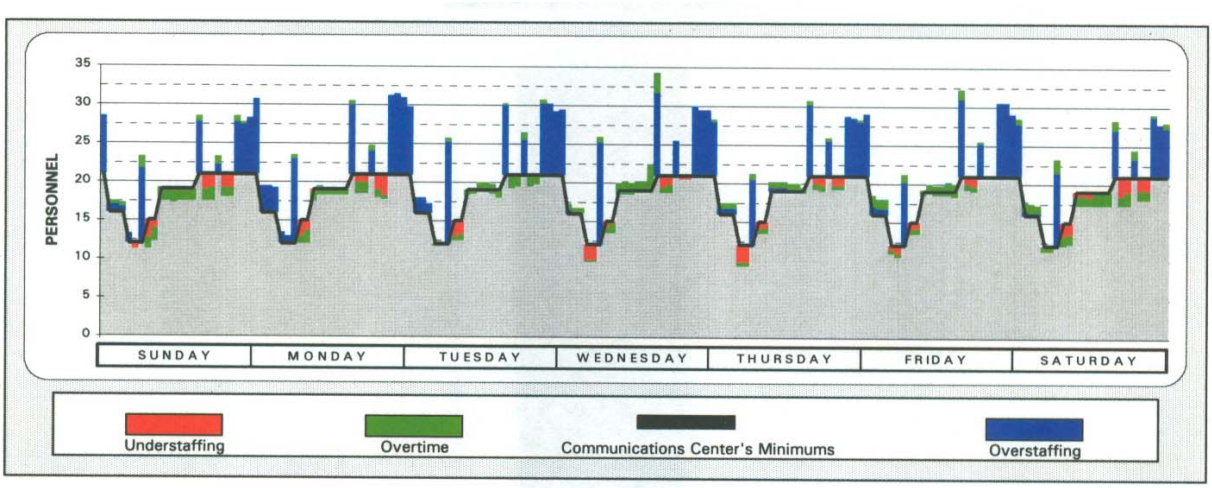
Also, on September 11, 1994, five hours were staffed below minimum staffing levels.

Graph 3 compares the Center's average staffing for the four weeks shown in Table 6 to the Center's minimum staffing levels. The number of staff below

minimum staffing ranged from one to 7 PSDs and is represented in red on the graph. Overtime is represented in green.

GRAPH 3

COMPARISON OF MINIMUM STAFFING REQUIREMENT TO AVERAGE ACTUAL STAFFING FOR THE WEEKS ENDING MAY 22, 1994; JUNE 10, 1994; OCTOBER 8, 1994; AND DECEMBER 8, 1994



Thus, despite periods of overstaffing and the use of overtime and compensatory time, the Center frequently falls below its own minimum staffing requirement.

Appendix D shows the data graphed by individual weeks. These graphs show a pattern of the times of the day when actual staffing falls below minimum staffing. These times are from 7 a.m. to 9 a.m., from 4 p.m. to 6 p.m., and from 7 p.m. to 9 p.m.

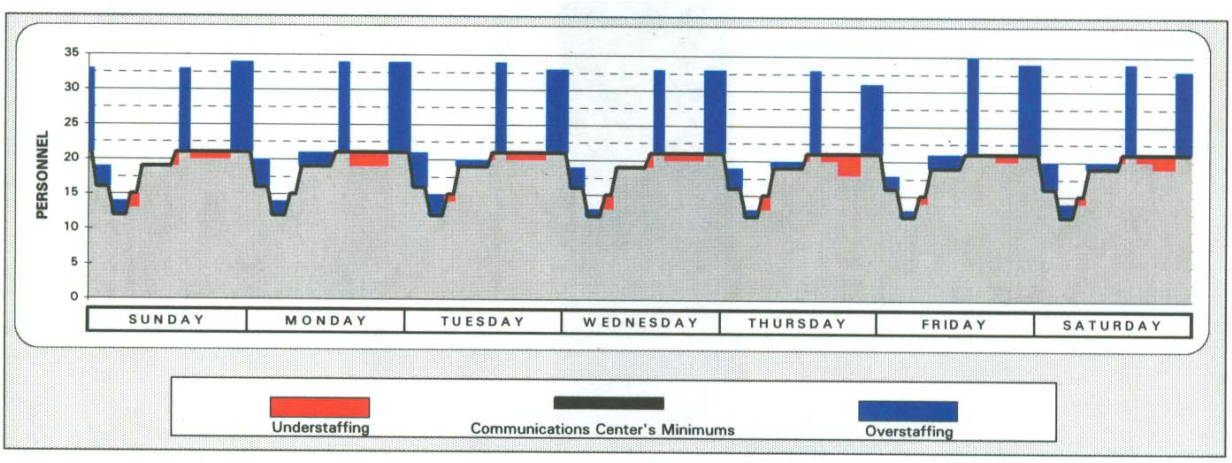
The Current 5-Shift Pattern

We compared the Center's scheduled staffing levels in September 1994 to the Center's minimum staffing requirement. We found that, absent overtime, the Center cannot meet its own minimum staffing requirement.[6]

Graph 4 compares September 1994's scheduled 5-shift pattern to the Center's minimum staffing requirement.[7]

GRAPH 4

SEPTEMBER 1994 SCHEDULED 5-SHIFT STAFFING PATTERN
COMPARED TO CENTER'S HOURLY MINIMUM STAFFING REQUIREMENT



[6] The scheduled staffing shown in Graph 4 is the staff scheduled during the semi-annual bidding process and excludes those PSDs on long-term leave and long-term training. Furthermore, we excluded those PSDs who bid during the shift-bidding process because they are expected to return prior to the next shift bid but who continue to be on long-term leave. Graph 4 shows 93 scheduled PSD Is and IIs and does not reflect short-term absences.

[7] We also show the hourly number of PSDs compared to the minimum requirement in Appendix E.

Graph 4 shows that in addition to significant periods of overstaffing there were eighteen times during an average week in September 1994 when the number of PSDs scheduled to be on duty was less than the Center's own minimum staffing requirement.

Increase In Overtime Costs

During calendar year 1994, the Center experienced an increase in overtime and compensatory time costs. Table 7 compares the overtime and compensatory time earned for PSD Is and IIs for calendar years 1993 and 1994 and shows an 88 percent increase in estimated overtime and compensatory time costs.

TABLE 7

CALENDAR YEARS 1993 AND 1994 OVERTIME AND COMPENSATORY TIME COSTS

	12 Months Ending December 1993	12 Months Ending December 1994	Percentage Increase From 1993 To 1994
Overtime hours	1,721	3,945	129
Overtime paid (at time and a half)	$59,161	$130,102	120
Compensatory time (hours shown are extended at time and a half)	4,937	8,431	71
Estimated compensatory time cost	$108,614	$185,482	71
Total estimated overtime and compensatory time costs	$167,775	$315,584	88

As shown in Table 7, PSDs earned more than $300,000 in paid overtime and compensatory time in 1994. In spite of this significant increase over 1993's

paid overtime and compensatory time, the Center was frequently unable to meet its own minimum staffing requirement.

The Division Did Not Meet One Of Its Four Emergency Call-Answering Objectives In 1991-92, 1992-93, Or 1993-94

The performance objectives or the service level benchmarks for the Division for 1993-94 include:

1. To answer 95 percent of the 911 calls within 15 seconds;
2. To maintain an overall average answer time of 12 seconds for 911 calls;
3. To maintain an average call-processing time of 1.5 minutes for Priority 1 calls for service;[8] and
4. To dispatch 90 percent of Priority 1 calls within 90 seconds of receipt of the call by the dispatcher.

Prior to 1993-94, the Division's first two objectives shown above were to

1. Answer 90 percent of 911 calls within 10 seconds and
2. Answer 911 calls within an average of 15 seconds.

Our review revealed that the Division has not met one of its four emergency call-answering objectives as shown in Table 8.

[8] A Priority 1 call is a life-endangering situation or major felony and requires immediate dispatch.

TABLE 8

EMERGENCY CALL-ANSWERING OBJECTIVES 1991-92, 1992-93, AND 1993-94

	Results		
Emergency Call-Answering Objectives	**1991-92**	**1992-93**	**1993-94**
1991-92 Through 1992-93			
• Answer 90% of 911 calls within 10 seconds	74%	68%	
• Maintain an overall average answering time of 15 seconds for 911 calls	10 seconds	10.2 seconds	
1993-94			
• Answer 95% of 911 calls within 15 seconds			84%
• Maintain an overall average answering time of 12 seconds for 911 calls			10.2 seconds
• Maintain an average call-processing time of 1.5 minutes for Priority 1 calls for service			1.37 minutes
• Dispatch 90% of Priority 1 calls within 90 seconds of receipt of the call by the dispatcher.[9]	87.1%	88.56%	88%

As is shown above, the Division did not meet its first call-answering objective in 1991-92, 1992-93 (answer 90 percent of calls within 10 seconds), or 1993-94 (answer 95 percent calls within 15 seconds).

[9] The Division notes that this objective was not met for two reasons: (1) The workload of the PSDs at peak activity times is such that calls cannot be dispatched as quickly and (2) the lack of available field resources to take the calls due to police officer staffing shortages. An audit of this objective was not within the scope of this audit.

The Division's Revised Emergency Call-Answering Objectives Since 1993-94 Are Slower Than The Objectives The State Of California Recommends

The Division's current emergency call-answering objectives are slower than those the state of California recommends. As mentioned above, the Division's revised 1993-94 objectives were to

1. Answer 95 percent of the calls within 15 seconds and
2. Answer 911 calls within an average of 12 seconds.

In contrast, the state of California's 911 non-mandatory standard states that *"During the busiest hour of any shift, ten seconds should be targeted as the maximum amount of time incoming 911 calls are to be answered."*

During June And August 1994, 15 Percent And 21 Percent, Respectively, Of Those Emergency Callers Whom PSDs Deemed Not To Be In An Emergency Situation Hung Up After Being Put On Hold

When a primary tier call-taker determines that a 911 or 7-digit emergency call is a non-emergency situation, the primary tier call-taker transfers the call to a secondary tier dispatcher.[10] These transferred calls may require a police dispatch. Some of these transferred calls are lost when the caller hangs up after being put on hold. In June and August 1994, an average of 15 percent and 21 percent, respectively, of these transferred dispatch calls were lost. Those callers who hung up did so after PSDs put them on hold an average of 2 minutes 10 seconds in June 1994 and 2 minutes 31 seconds in August 1994. Further, there were 7 days during June 1994, 11 days during August 1994, and 8 days during

[10] See page 6 for explanation of primary and secondary tier call-takers.

September 1994 that an emergency caller whom a PSD deemed in a non-emergency dispatch situation was put on hold for at least 15 minutes. Further, on September 11, 1994, one caller was put on hold for at least 34 minutes. It should be noted that this call occurred when staffing was below the Division's minimum (see section on "**The Center Frequently Falls Below Its Own Minimum Staffing Level In Spite Of PSDs Earning $300,000 Per Year In Paid Overtime Or Compensatory Time Off**" on page 27). Finally, our review of the February 1995 computer-generated management reports shows that there were 8 days in February 1995 that a caller deemed to be in a non-emergency situation was put on hold for at least 15 minutes.

During February 1995, 24 Percent Of Those Emergency Callers Whom PSDs Deemed Not To Be In An Emergency Situation Hung Up After Being Put On Hold. This Is Twice The Percentage Of Calls Lost When Compared To February 1994

We compared information regarding calls deemed not to be in an emergency situation and transferred to a secondary tier call-taker during February 1994 with February 1995. Table 9 summarizes the emergency calls transferred and lost volume.

TABLE 9

SUMMARY OF EMERGENCY CALLS DEEMED TO BE NON-EMERGENCY, TRANSFERRED, AND LOST DURING FEBRUARY 1994 AND FEBRUARY 1995

Call Description	Month: February 1994	Month: February 1995	Change
Total 911 and 7-digit emergency calls	30,174	31,104	3%
Number of emergency calls deemed not to be emergencies and transferred to secondary tier call taker	5,129	6,516	27%
Number of calls deemed not to be emergencies and transferred and for which caller hung up.	626	1,533	145%
Calls deemed not to be emergencies and transferred and for which caller hung up.	12%	24%	100%

Based upon our review of the Division's computer-generated reports, it appears that during the course of our audit the Center's emergency call-handling performance improved significantly. However, during the same period, the Center's handling of callers deemed not to be in an emergency situation, but for whom a police dispatch may be required, not only did not improve but appears to have deteriorated.

In May 1995, The Division Will Assume Responsibility For Non-Emergency Report-Writing Calls

Telephone Report Writing

Telephone report writing involves answering citizen calls and documenting the information citizens provide when they report a crime to the SJPD.

Currently, Information Center[11] police officers and police data specialists located at the Police Administration Building answer citizen calls and subsequently manually write the citizen report. According to the SJPD, the Information Center handled approximately 35 percent of the total crime reports the entire department took during the last three years. This is an average of 3,486 telephone reports each month.

According to the SJPD, in recent years, the Information Center police officers and the police data specialists have found it increasingly difficult to handle the growing volume of reports taken over the telephone. In addition to telephone calls, Information Center police officers are required to assist citizens who come into the lobby to report incidents and provide security for the Police Administration Building. The SJPD determined that the Information Center is able to answer only 47 percent to 53 percent of the calls it receives. The other calls are lost, meaning that the callers hung up before they were able to talk to anyone at the SJPD. These lost calls have generated a number of citizen complaints.

Proposed Transfer Of The Telephone
Report-Writing Function To The Communications Center

From December 1, 1993, to March 10, 1994, the Bureau of Technical Services conducted a pilot project in which Communications Center personnel took over the telephone report-writing function from the Information Center for several hours each day. As a result of this pilot project, the Bureau of Technical

[11] The Information Center is within the Operations Support Services Division of the Bureau of Technical Services.

Services determined that the number of lost calls during the day decreased significantly. Given the success of the pilot project, the Bureau of Technical Services prepared a draft report proposing to transfer telephone report writing from the Information Center to the Communications Center.[12] Under the March 1994 draft proposal, telephone report writing would change from a manual to an automated process. In addition, a new section to be named the Telephone Report Automation Center (TRAC)[13] would handle telephone report writing.

In August 1994, the Budget Office authorized 9 PSD Is and one senior PSD to staff the TRAC function. These PSDs were hired in late 1994. The Division plans to implement the TRAC program in May 1995.

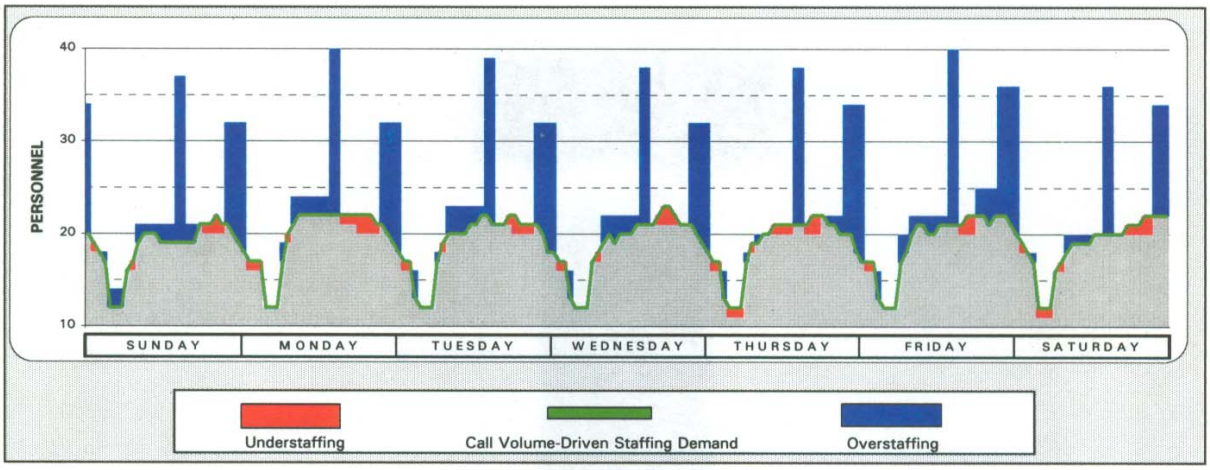
We prepared a staffing pattern for the current and the TRAC program based on the current staffing pattern for the 124 authorized positions and compared it to the call volume-driven staffing demand we calculated for the Center. We also subtracted the 22.6 percent long- and short-term absence factors (see page 23) when we prepared a 5-shift staffing pattern for 124 PSDs. Graph 5 shows that the Division could not staff the Center and meet the call volume-driven staffing demand without incurring significant overtime in spite of the fact that there will be fifteen times during the week that significant overstaffing will occur.

[12] The original design of the Communications Center included workstations for report taking. These workstations had been vacant since the completion of the building in anticipation of eventually assuming the report-writing function.

[13] The proposed TRAC will use a call-screening process to increase the number of calls handled. The Division estimates that only one-third of the calls need reports. During the two-week pilot program conducted in March 1994 at the Communications Center with PSDs answering calls, the percentage of calls answered increased to the point where only 3 percent of the calls were lost on one of the days during the two-week pilot period.

GRAPH 5

ONE WEEK'S CURRENT STAFFING PATTERN* WITH TRAC COMPARED TO CALL VOLUME-DRIVEN STAFFING DEMAND WITH TRAC



* Staff shown reflects 124 authorized positions less 22.6 percent allowance for long-term leaves and training and short-term absences.

The call volume-driven staffing demand shown in Graph 5 is based on the TRAC program operating 7 days a week 24 hours a day. We determined TRAC demand at this time because eventually the Division plans to implement TRAC operating daily 24 hours a day. The Division plans to initially staff TRAC from 9 a.m. to 6:30 p.m. Monday through Friday and from 9 p.m. to midnight daily utilizing the 9:30 p.m. to 1 a.m. overlap staff. However, the 1993 Information Center workload reports indicated that the peak workload times were from 7 a.m. to 8 p.m. during nine months and from 7 a.m. to 4 p.m. or 8 a.m. to 5 p.m. and from 6 p.m. to 10 p.m. for the other three months. Therefore, our calculated TRAC demand provides TRAC service during peak times, whereas the Division's planned deployment of staff does not.

Absent Changes To Its Current 5-Shift Pattern And 45-Minute Briefing Periods, The Division Will Need A Total Of 136 PSDs In Order To Function At Its Own Minimum Staffing Level

As noted earlier in this report, the Budget Office authorized 9 additional PSD Is in August 1994 to staff the TRAC program. Adding the additional staff to the existing 115 PSD Is and IIs results in a total of 124 PSD Is and IIs. As noted on page 23, during the course of this audit the Budget and City Auditor's Offices concluded that PSDs are not available to perform call handling or dispatch tasks for 22.6 percent of the available 2,080 annual hours. This resulted in the Budget Office revising the Center's PSD I and II requirements from 124 PSDs to 136 PSDs. The Budget Office qualified its revision by stating that it would consider funding the additional 12 positions only to improve the Center's 7-digit emergency and non-emergency service given the General Fund's financial condition and General Fund budget priorities. Thus, absent changes to its current 5-shift pattern and 45-minute briefing periods, the Division will need a total of 136 PSDs in order to function at its own minimum staffing level after assuming TRAC responsibilities.

Computer Optimization

Part of our review of the Division's staffing was to use a computer optimization model to optimize the scheduling of PSDs at the Center and to compare those results to current staffing. To construct a computer optimization model for scheduling PSDs in the Center, we used the computer program Microsoft Excel Solver. Solver uses numeric methods for determining optimal allocation of scarce resources--in this case, personnel resources. This process is also known as linear programming. Appendix C describes the computer

optimization model in more detail. Appendix C also describes the historical workload data.

Staffing Assumptions

To determine the staffing requirement based on call volume, we made some assumptions regarding the amount of time required to handle a call. Emergency call-taking talk time averages about two minutes. We estimated call-takers could handle either one emergency or one non-emergency call every four minutes. The city of Phoenix, Arizona's, communications center also uses a criterion of one call every four minutes. While we were not able to project the effect of calls received simultaneously in the model, we assumed that secondary tier call-takers, who are designated to answer non-emergency calls, could handle simultaneously received emergency calls. Furthermore, in addition to staffing based on the emergency call volume, we added one call-back position 24 hours a day for those emergency callers who hang up before their calls are answered. Finally, the model allows 30 minutes for dispatcher briefings at the beginning of each shift.

We assumed a minimum of 6 call-takers to answer emergency and non-emergency calls and perform call-backs during any hour of the day. The minimum requirement becomes significant during the dawn hours of the morning when call volume averages are low. The Division operations manager stated that considering the size of the city of San Jose, this is the responsible level of staffing for an acceptable standard of service level.

Reports from the TRAC pilot program show an average of 111 seconds for call screening and 577 seconds for report writing. We estimated that report

writing would require 2 minutes (120 seconds) for a call requiring screening only and 12 minutes (720 seconds) for a call requiring both the initial call screening and report writing.

Radio, Service, And Relief Workload Constraints

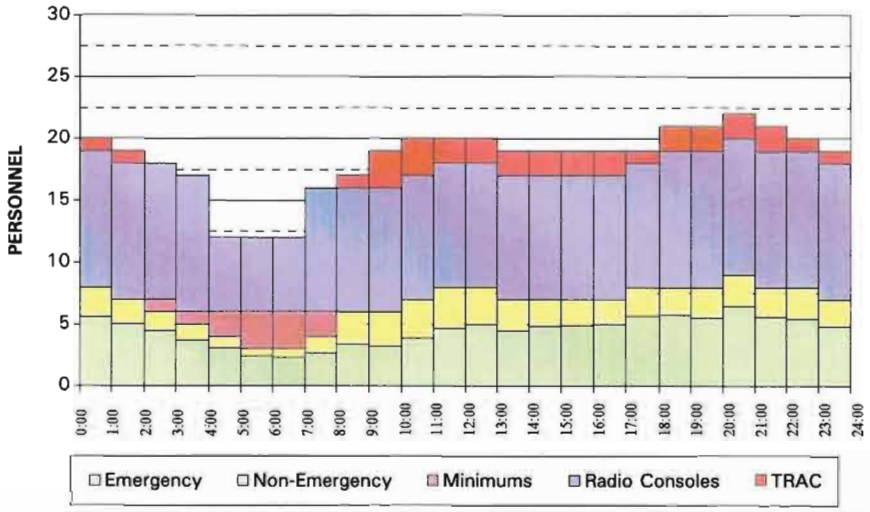
We reviewed the level of staffing for the radio, service, and relief positions with the Division's operations manager. These positions are generally fixed hourly requirements with 6 positions staffed 24 hours a day, 4 positions staffed 20 to 21 hours a day, and one position staffed 10 hours a day.

Hourly Call Volume-Driven Staffing Demand

We refer to the number of PSDs needed to handle the call-taking, radio, service, and relief workload on an hourly basis as the call volume-driven staffing demand. The call volume-driven staffing demand we calculated is shown in Graphs 6 through 12 on the following pages.

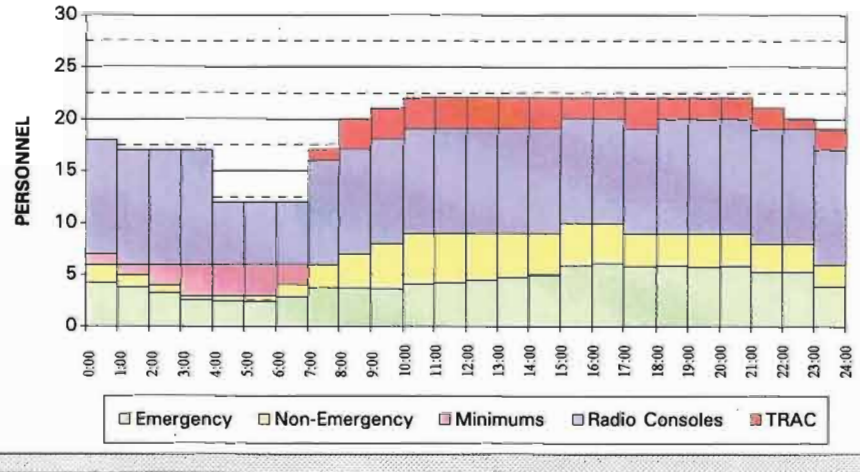
GRAPH 6

SUNDAY'S HOURLY CALL VOLUME-DRIVEN STAFFING DEMAND BY WORKLOAD CATEGORY



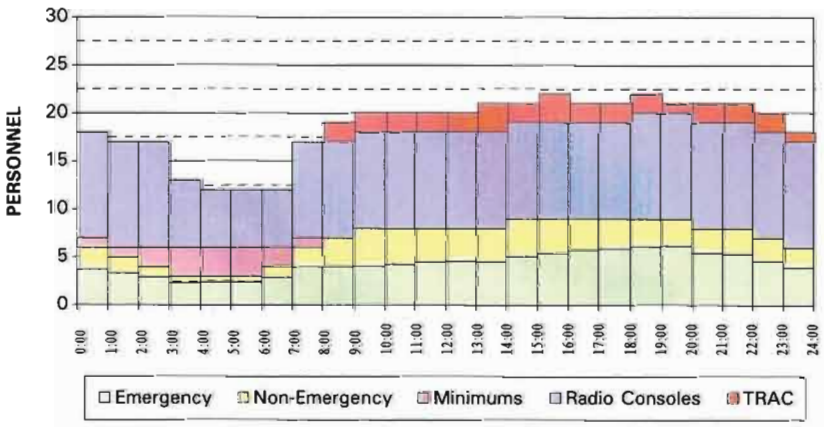
GRAPH 7

MONDAY'S HOURLY CALL VOLUME-DRIVEN STAFFING DEMAND BY WORKLOAD CATEGORY



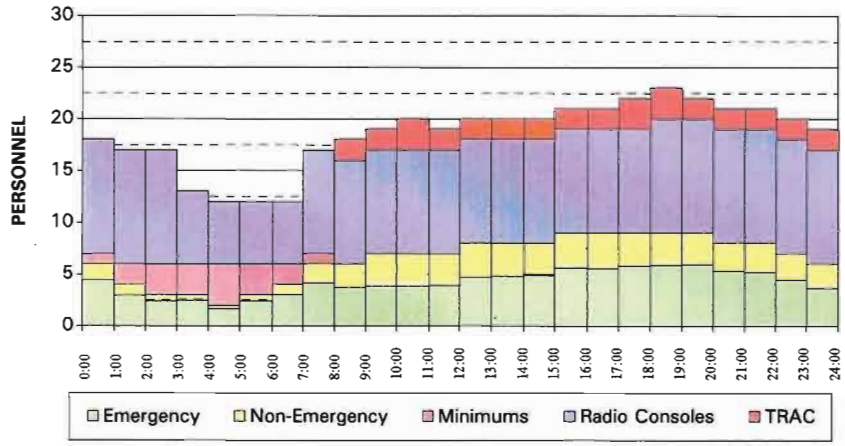
GRAPH 8

TUESDAY'S HOURLY CALL VOLUME-DRIVEN STAFFING DEMAND BY WORKLOAD CATEGORY



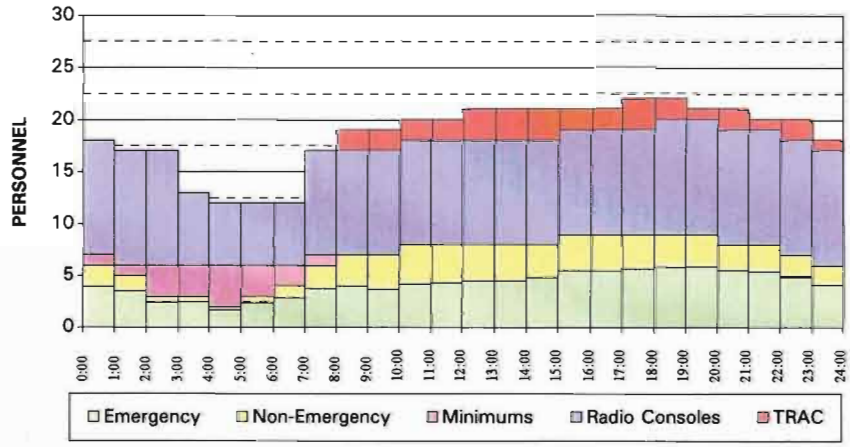
GRAPH 9

WEDNESDAY'S HOURLY CALL VOLUME-DRIVEN STAFFING DEMAND BY WORKLOAD CATEGORY



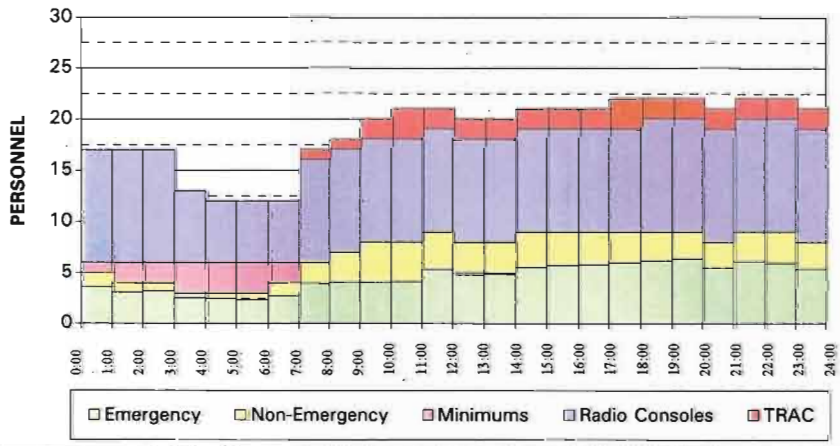
GRAPH 10

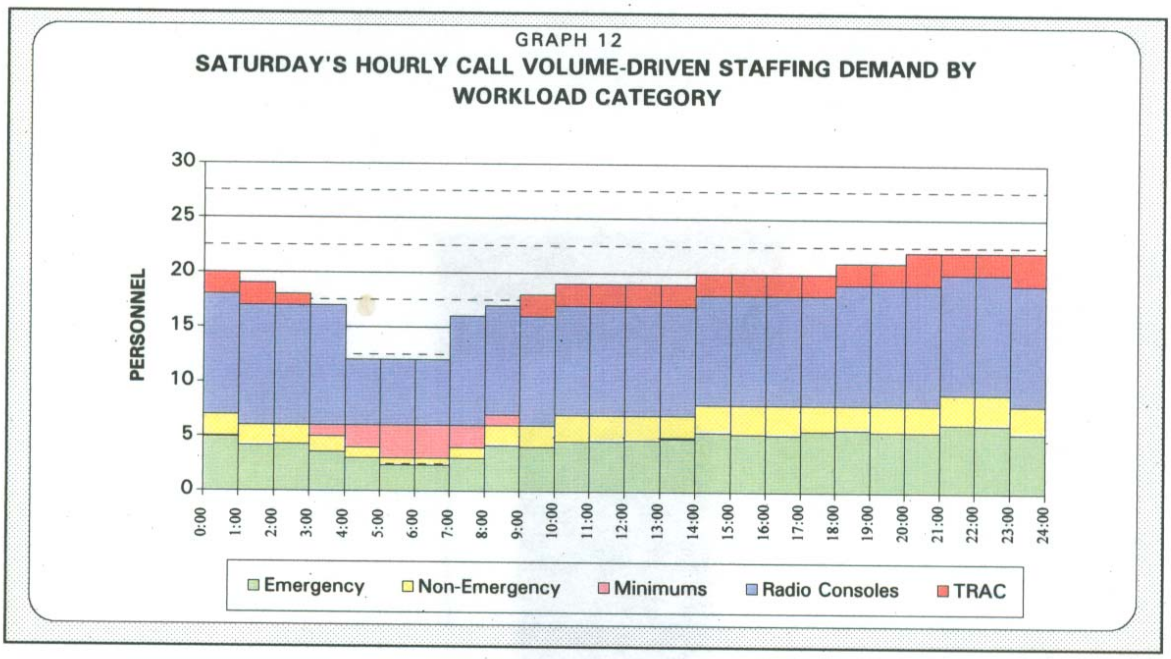
THURSDAY'S HOURLY CALL VOLUME-DRIVEN STAFFING DEMAND BY WORKLOAD CATEGORY



GRAPH 11

FRIDAY'S HOURLY CALL VOLUME-DRIVEN STAFFING DEMAND BY WORKLOAD CATEGORY



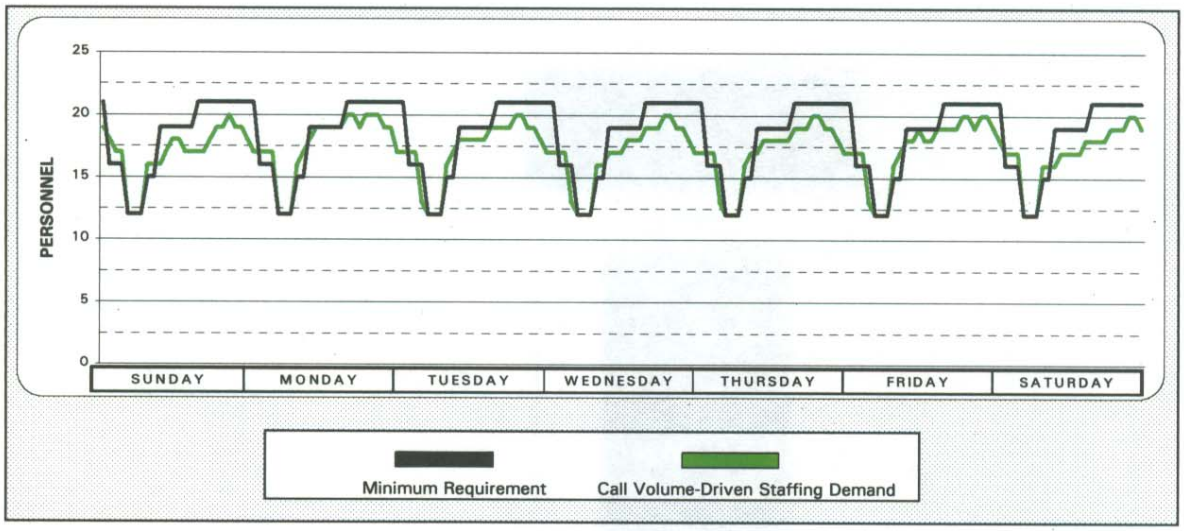


Comparison Of Calculated Call Volume-Driven Staffing Demand
Without TRAC To the Center's Minimum Staffing Requirement

We compared the call volume-driven staffing demand without TRAC we calculated to the Center's minimum staffing requirement. (See page 27 for a description of the Center's minimum staffing requirement.) We found that the call volume-driven staffing demand we calculated is very similar to the Center's own minimum staffing requirement as is shown below in Graph 13.

GRAPH 13

COMPARISON OF CALL VOLUME-DRIVEN STAFFING DEMAND
WITHOUT TRAC TO THE CENTER'S MINIMUM STAFFING REQUIREMENT



In our opinion, the similarities shown in Graph 13 demonstrate that basing staffing on our calculated call volume-driven staffing demand will not in any way jeopardize public safety.

The Results Of Our Optimization Were That The Division Can (1) Eliminate 10 PSD Positions While At The Same Time Significantly Improve Its Ability To Function At Or Above Its Minimum Staffing Level, (2) Avoid Periods Of Overstaffing, And (3) Save The City $860,000 Per Year In Regular Personnel, Overtime, And Compensatory Time Costs

Current Personnel Costs

The Division's 1992-93 budget for salaries and benefits, including supervision and management, was $8,328,374. We estimate that salaries and benefits, including bilingual, shift differential, and holiday pay, for PSD Is and IIs on average total approximately $56,000 per PSD. This amounts to $6,440,000 for the current complement of 115 PSD Is and IIs. Our estimate is

based on actual salaries and estimated benefits paid during two pay periods in April 1994.

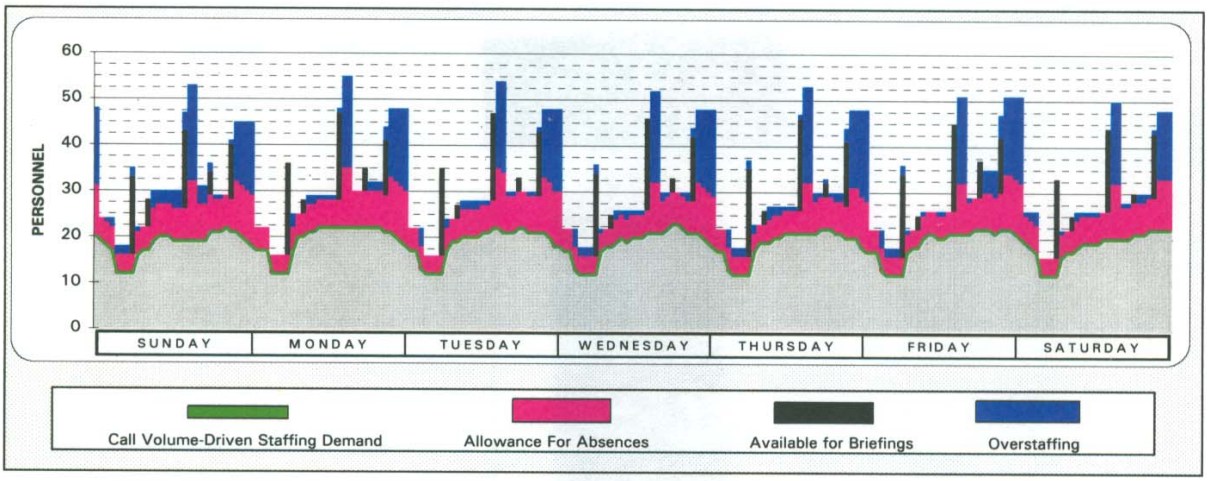
A 10-Shift Pattern Would Save $860,000 Per Year
Without Reducing The Center's Responsiveness To Citizen Calls

We used the computer optimization model to optimize the transfer of telephone report writing using the Center's current 5-shift pattern and also a 10-shift pattern. We estimate that optimizing on a 10-shift pattern would save the Division as much as $560,000 per year in regular personnel costs and $300,000 in overtime and compensatory time costs when compared to the 124 authorized PSD positions.

The current 5-shift optimized model shown in Graph 14 results in a base of 102 positions. Using a 22.6 percent short-term and long-term absence factor on the model results in a staff requirement of 132 positions. Graph 14 shows the optimized deployment of these 132 positions.

GRAPH 14

ONE WEEK'S COMPUTER-OPTIMIZED 5-SHIFT STAFFING PATTERN
WITH TRAC COMPARED TO CALL VOLUME-DRIVEN STAFFING DEMAND

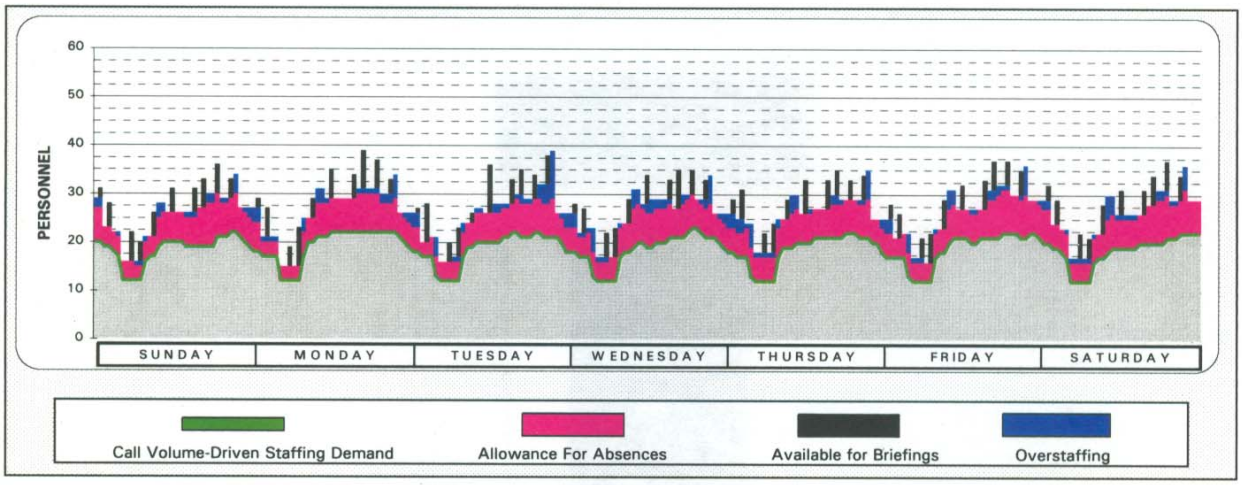


As is shown in Graph 14, by optimizing on a 5-shift pattern, we have eliminated all staff shortages and minimized to the extent possible the overstaffing that is inherent in a 5-shift pattern.

Graph 15 shows that our optimized 10-shift pattern, including staffing to cover long- and short-term absences and training will require only 114 PSDs. These 114 PSDs consist of 88 base positions plus 26 positions to cover the 22.6 percent short- and long-term absence factor. Appendix F shows the actual number of PSDs the call volume-driven staffing demand requires for each shift under the 10-shift pattern.

GRAPH 15

ONE WEEK'S COMPUTER-OPTIMIZED 10-SHIFT STAFFING PATTERN
WITH TRAC COMPARED TO CALL VOLUME-DRIVEN STAFFING DEMAND



Graph 15 shows the optimized use of 88 base PSDs and the additional 26 PSDs required to satisfy the 22.6 percent allowance for absences, long-term leaves, and training.[14] The hourly number of PSDs is shown in Appendix F. Appendix G shows the schedule of PSDs.

The significance of Graph 15 is that it shows that an optimized 10-shift, 114-PSD staffing pattern provides the same protection against understaffing and far less overstaffing than an optimized 5-shift, 132-PSD staffing pattern (Graph 14). Further, based on estimated personnel costs of $56,000 per PSD per year, an optimized 10-shift, 114-PSD staffing pattern requires 10 fewer PSDs than the Center's current 124-PSD staffing pattern. Thus, an optimized 10-shift pattern would save the City $560,000 in regular personnel costs and $300,000

[14] Because the PSDs on long-term leave would not be scheduled at the semi-annual shift-bidding process, the number of PSDs available would be less than those shown in Graph 15.

per year in overtime and compensatory time costs per year. This $300,000 savings results from an optimized 10-shift staffing pattern providing minimum staffing at all times while the current 5-shift pattern does not.

Summary Of Computer Optimization Alternatives With TRAC

Using the computer optimization model, we developed nine other shift patterns with varying costs or cost savings. Table 10 on the following page summarizes the results of our computer optimization with TRAC. In addition to the current 5-shift configuration, we also ran alternative shift configurations. We ran a 5-shift configuration with starting times different from the current starting times. We also ran alternative eight and ten shifts. We ran three models where the latest starting time was 12:30 a.m. The summary shows the number of shifts and starting times used in each alternative and the resulting required number of positions. We also show the number of sub-shifts. The summary also shows the difference in required positions and the estimated cost or cost savings associated with the difference in the number of positions with respect to the different alternatives.

As shown in the summary, the 10-shift pattern shows the lowest cost. The Division objects to starting times later than 10 p.m. Therefore, we ran the computer model with the latest starting time at 10 p.m. That alternative requires 13 more PSDs than the optimized 10-shift pattern with no restrictions on starting times. For comparison purposes, we also ran alternatives which begin at 11 p.m. and 12:30 a.m. The 11 p.m. and the 12:30 a.m. alternatives resulted in requiring 11 and 9 more PSDs, respectively, than the optimized 10-shift pattern with no restrictions on starting times.

TABLE 10
SUMMARY OF COMPUTER OPTIMIZATION RESULTS WITH TRAC

	COMPARISON BASE Daily 13-Hour TRAC Service***	ALTERNATIVE OPTIMIZED SHIFTS Daily 24-Hour TRAC Service				RESTRICTING STARTING TIME Daily 24-Hour TRAC Service		
	CURRENT 5 SHIFTS (not optimized)	CURRENT 5 SHIFTS	5 SHIFTS	8 SHIFTS	10 SHIFTS	10 SHIFTS**** With Latest Starting Time At 10:00 PM	6 SHIFTS**** With Latest Starting Time At 11:00 PM	7 SHIFTS**** With Latest Starting Time At 12:30 AM
Starting Times	6:15 AM 8:30 AM 3:00 PM 6:00 PM 9:00 PM	6:30 AM* 8:30 AM 3:00 PM 6:00 PM 9:00 PM	1:30 AM 6:30 AM 11:00 AM 4:00 PM 6:00 PM	1:30 AM 5:30 AM 6:30 AM 8:30 AM 11:00 AM 3:00 PM 4:00 PM 8:00 PM	12:30 AM 1:30 AM 5:30 AM 6:30 AM 8:30 AM 11:00 AM 3:00 PM 4:00 PM 6:00 PM 8:00 PM	6:00 AM 6:30 AM 7:30 AM 8:30 AM 10:00 AM 1:00 PM 3:30 PM 5:00 PM 6:00 PM 10:00 PM	6:30 AM 8:30 AM 10:00 AM 4:00 PM 6:00 PM 11:00 PM	6:30 AM 8:30 AM 10:00 AM 1:30 PM 4:00 PM 6:00 PM 12:30 AM
	35 Sub-Shifts	25 Sub-Shifts	26 Sub-Shifts	37 Sub-Shifts	43 Sub-Shifts	35 Sub-Shifts	28 Sub-Shifts	28 Sub-Shifts
PSD Is & IIs With 22.6%**	124 Positions	132 Positions	123 Positions	117 Positions	114 Positions	127 Positions	125 Positions	123 Positions
Personnel Change From Comparison Base	0	(8)	1	7	10	(3)	(1)	1
Estimated Savings / (Cost)	$0	($448,000)	$56,000	$392,000	$560,000	(168,000)	(56,000)	$56,000
Estimated Overtime and Compensatory Time Savings	$0	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000	$300,000
Total Estimated Savings / (Cost)	$0	($148,000)	$356,000	$692,000	$860,000	$132,000	$244,000	$356,000

FOOTNOTES:

*Starting time changed from 6:15 a.m. to 6:30 a.m. to adapt to model.

**The number of optimized positions is comprised of an optimized base staffing with a 22.6 percent short- and long-term absence rate. The division currently has 124 authorized positions.

***Division's planned TRAC hours are from 9 a.m. to 6:30 p.m. and from 9:30 p.m. to 1 a.m. daily.

****The amount of shifts does not represent a constraint for optimizing as does the restricted starting time; these shifts are the least amount obtainable without diminishing the optimized outcome.

Summary Of Computer Optimization Alternatives

For comparison purposes, we ran the optimization models using the daily 13-hour TRAC service the Division plans to operate. Table 11 on the following page summarizes the results of the computer optimization. As shown on the summary, optimizing results in 7 more positions than the comparison base of 124 positions. The reason optimizing results in 7 more positions is that the optimized alternative provides adequate PSD coverage at all times whereas the current 5-shift pattern does not.

TABLE 11

SUMMARY OF COMPUTER OPTIMIZATION RESULTS
WITH 13-HOUR TRAC

	COMPARISON BASE DAILY 13-HOUR TRAC SERVICE*** CURRENT 5 SHIFTS (not optimized)	DAILY 13-HOUR TRAC SERVICE*** CURRENT 5 SHIFTS (optimized)
Starting Times	6:15 AM 8:30 AM 3:00 PM 6:00 PM 9:00 P.M.	6:30 AM* 8:30 AM 3:00 PM 6:00 PM 9:00 P.M.
PSD Is & IIs With 22.6%**	35 Sub-Shifts	25 Sub-Shifts
Personnel Change From	124 Positions	131 Positions
Comparison Based	0	(7)
Estimated Savings	$0	($392,000)
Estimated Overtime and Compensatory Time Savings	$0	$300,000
Total Estimated Savings/(Cost)	$0	($92,000)

Note: The comparison base assumes 30 to 75 minutes available for briefing. All models assume 30 minutes for briefing.

* Starting time changed from 6:15 a.m. to 6:30 a.m. to adapt to model.
** The number of optimized positions is comprised of an optimized base staffing with a 22.6 percent short- and long-term absence rate. The Division currently has 124 authorized positions.
*** Division's planned TRAC hours are from 9 a.m. to 6:30 p.m. and from 9:30 p.m. to 1 a.m. daily.

Summary Of Computer Optimization Alternatives
With TRAC For A 5-Day, 8-Hour Workweek

For comparison purposes, we ran the optimization models using 5-day, 8-hour workweeks. Table 12 on the following page summarizes the results of the computer optimization with TRAC using 5-day, 8-hour workweeks. We ran the models with and without half-hour briefings and in combination with a 4-day, 10-hour workweek. The 5-day, 8-hour workweek without briefings and the combination 5-day, 8-hour workweek without briefings and 4-day, 10-hour workweek with briefings both resulted in a need for 114 PSD positions. This is the same number of positions required by the 4-day, 10-hour workweek, 10-shift pattern shown in Table 10; however, the latest starting times are 10 p.m. and 11 p.m. The drawback to these alternatives is lack of briefing times for the 5-day, 8-hour shifts. We ran the 5-day, 8-hour workweek with briefings, and that alternative resulted in a need for 123 PSDs. Thus, adding briefings to the 5-day, 8-hour schedule will cost the City an additional $504,000 per year (the difference between 123 PSDs and 114 PSDs).

TABLE 12
SUMMARY OF COMPUTER OPTIMIZATION RESULTS
WITH 5/8 SHIFTS AND COMBINATION 4/10 & 5/8 SHIFTS

	COMPARISON BASE Daily 13-Hour TRAC Service***	ALTERNATIVE OPTIMIZED SHIFTS Daily 24-Hour TRAC Service			
	CURRENT 5 SHIFTS (not optimized)	CURRENT 5 SHIFTS	8 SHIFTS 5-DAY / 8-HOUR SHIFT WITHOUT BRIEFINGS	9 SHIFTS - COMBO 5-DAY / 8-HOUR SHIFT WITHOUT BRIEFINGS 4-DAY / 10-HOUR SHIFT WITH BRIEFINGS	8 SHIFTS 5-DAY / 8-HOUR SHIFT WITH BRIEFINGS
Starting Times	6:15 AM 8:30 AM 3:00 PM 6:00 PM 9:00 PM	6:30 AM* 8:30 AM 3:00 PM 6:00 PM 9:00 PM	5:00 AM 6:00 AM 7:00 AM 1:00 PM 2:00 PM 3:00 PM 9:00 PM 10:00 PM	**48% ON 5/8 SHIFT** 6:00 AM 2:00 PM 10:00 PM **52% ON 4/10 SHIFT** 6:30 AM 8:30 AM 10:00 AM 4:00 PM 6:00 PM 11:00 PM	5:00 AM 6:30 AM 8:30 AM 12:30 PM 2:00 PM 4:00 PM 8:00 PM 9:30 PM
	35 Sub-Shifts	25 Sub-Shifts	26 Sub-Shifts	35 Sub-Shifts	39 Sub-Shifts
PSD Is & IIs With 22.6%**	**124 Positions**	**132 Positions**	**114 Positions**	**114 Positions**	**123 Positions**
Personnel Change From Comparison Base	0	(8)	10	10	1
Estimated Savings / (Cost)	$0	($448,000)	$560,000	$560,000	$56,000
Estimated Overtime and Compensatory Time Savings	$0	$300,000	$300,000	$300,000	$300,000
Total Estimated Savings / (Cost)	$0	($148,000)	$860,000	$860,000	$356,000

FOOTNOTES:

*Starting time changed from 6:15 a.m. to 6:30 a.m. to adapt to model.

** The number of optimized positions is comprised of an optimized base staffing with a 22.6 percent short- and-long term absence rate. The division currently has 124 authorized positions.

***Division's planned TRAC hours are from 9 a.m. to 6:30 p.m. and from 9:30 p.m. to 1 a.m. daily.

Based on our computer optimization of the SJPD's staffing at the Center, we conclude that by using a 10-shift pattern for PSDs, the Division will (1) need only 114 PSDs while at the same time significantly improve its ability to function at or above its minimum staffing level, (2) avoid periods of overstaffing, and (3) save the City as much as $860,000 per year in regular personnel, overtime, and compensatory time costs.

The Bureau Of Field Operations Is Proposing The Addition Of A Fourth Watch

The BFO also uses the 4-day, 10-hour workweek and currently has three watches. The BFO is proposing the addition of a fourth watch in order to improve staffing deployment by increasing staffing during periods of understaffing and decreasing staffing during periods of overstaffing. BFO management wanted to implement the additional fourth watch at the March 1995 shift change but could not because, according to the Division, BFO does not have enough field officers. Furthermore, BFO reports it is now looking at a September 1995 implementation. In our opinion, this workload-driven need for an additional BFO watch evidences the need for a change in the Center shift times.

Division Opposition To Computer Optimization Models

- Allowance For Public Safety Dispatchers' Briefings

In our optimization models, we allocated 30 minutes for PSD daily briefings. The Division's management objects to a 30-minutes briefing allowance and feels it will not be workable.

The Center's PSDs attend the BFO's field officer briefings prior to the beginning of their shifts. BFO briefings begin at 6:30 a.m., 3 p.m., and 9 p.m.

and last from 10 to 40 minutes. At the briefings, PSDs are alerted to potential events or activities they may encounter during their shifts. This may help PSDs to dispatch the correct number of units to an incident. Information received at briefings may also help PSDs to determine call priority. After the field officer briefing, the supervising PSD may hold a 15-minute briefing for the PSDs only.[15] Therefore, the Division allocates at least 45 minutes for daily briefings for the 6:15 a.m., 3 p.m., and 9 p.m. shifts. In addition, the two Center overlay shifts, which begin at 8:30 a.m. and 6 p.m., also have PSD-only briefings. Senior PSDs brief the PSD Is and IIs on these two shifts. The senior PSD briefs the PSD Is and IIs using information from his or her BFO briefing notes and on administrative items pertinent to PSDs. The briefings for these two overlay shifts last from 10 to 25 minutes.

In our opinion, allocating only 30 minutes for daily PSD briefings instead of 45 minutes is workable and responsible for the following reasons:

- The PSD-only briefings are inherently administrative in nature and can usually wait until the following day. BFO briefings, on the other hand, involve crime or emergency information which must be heard on the same day to be useful. However, BFO briefings include officer roll call and other BFO administrative items for which PSDs need not be present.

- PSDs can retrieve All Points Bulletins, which are an important part of the information disseminated at BFO briefings, from the CAD systems at their workstations.

[15] The Division's management reports that 15 minutes is not enough for the Watch I PSD briefing which is held at 6:15 a.m. prior to the BFO briefing. Therefore, twice a week Watch I has a debriefing that only PSDs attend when the swing shift returns from briefing during the 3 p.m. to 4:15 p.m. overlap hour.

- Of the five comparable communications centers we surveyed, only one, San Diego, performs briefings. (See Appendix H for survey results.) The San Diego Communications Center allows 20 minutes for briefings which are not held in conjunction with the patrol officers;

- We estimate that the additional 15 minutes in briefings requires approximately three additional PSDs.[16] Based on an estimated personnel cost of $56,000 per PSD, the extra 15 minutes allocated for briefings amounts to $168,000 annually; and

- Supervising PSDs and/or senior PSDs can attend BFO briefings or obtain pertinent briefing information from the BFO and subsequently brief the PSDs. This is the current procedure for the two PSD shifts which begin at 8:30 a.m. and 6 p.m.

In our opinion, relations between PSDs and patrol officers would not deteriorate if PSDs did not attend BFO briefings. However, if the Division feels that PSD I and II involvement in BFO briefings is essential to maintaining good relations with field officers, then PSDs attending BFO briefings once or twice per shift week should be sufficient.

In our opinion, by limiting the briefing time to 30 minutes, dispatchers can continue to receive briefing information without impacting call-answering effectiveness.

[16] Our estimate is based on 115 PSDs attending briefings an extra 15 minutes a day, 4 days a week, which totals one hour a week. One hour times 115 PSDs equals 115 dispatcher hours or approximately three additional PSDs.

- Continuity Of Supervision

The Division's management is concerned about the possible deterioration of supervision when using more shifts. Management believes that the benefits of the current 5-shift PSD deployment pattern and 3-shift supervision deployment pattern provide coverage that allows most of the PSDs to have the same supervisor throughout their shifts (continuity of supervision) and allows all supervisors to attend weekly or biweekly meetings that are held on Wednesdays.

The Division's supervision staff includes 12 senior PSDs who supervise PSD Is and IIs and 6 supervising PSDs who supervise the senior PSDs. We compared the Center's senior PSD schedules to the current 5-shift PSD I and II schedules, including TRAC, and to the 10-shift PSD schedule shown in Table 10. Additionally, we optimized senior PSD schedules and compared this outcome to the 10-shift PSD schedule. Table 13 shows the continuity of supervision for PSDs and the senior PSD workload.

TABLE 13

OVERALL CONTINUITY OF SUPERVISION AND SENIOR PSD WORKLOAD

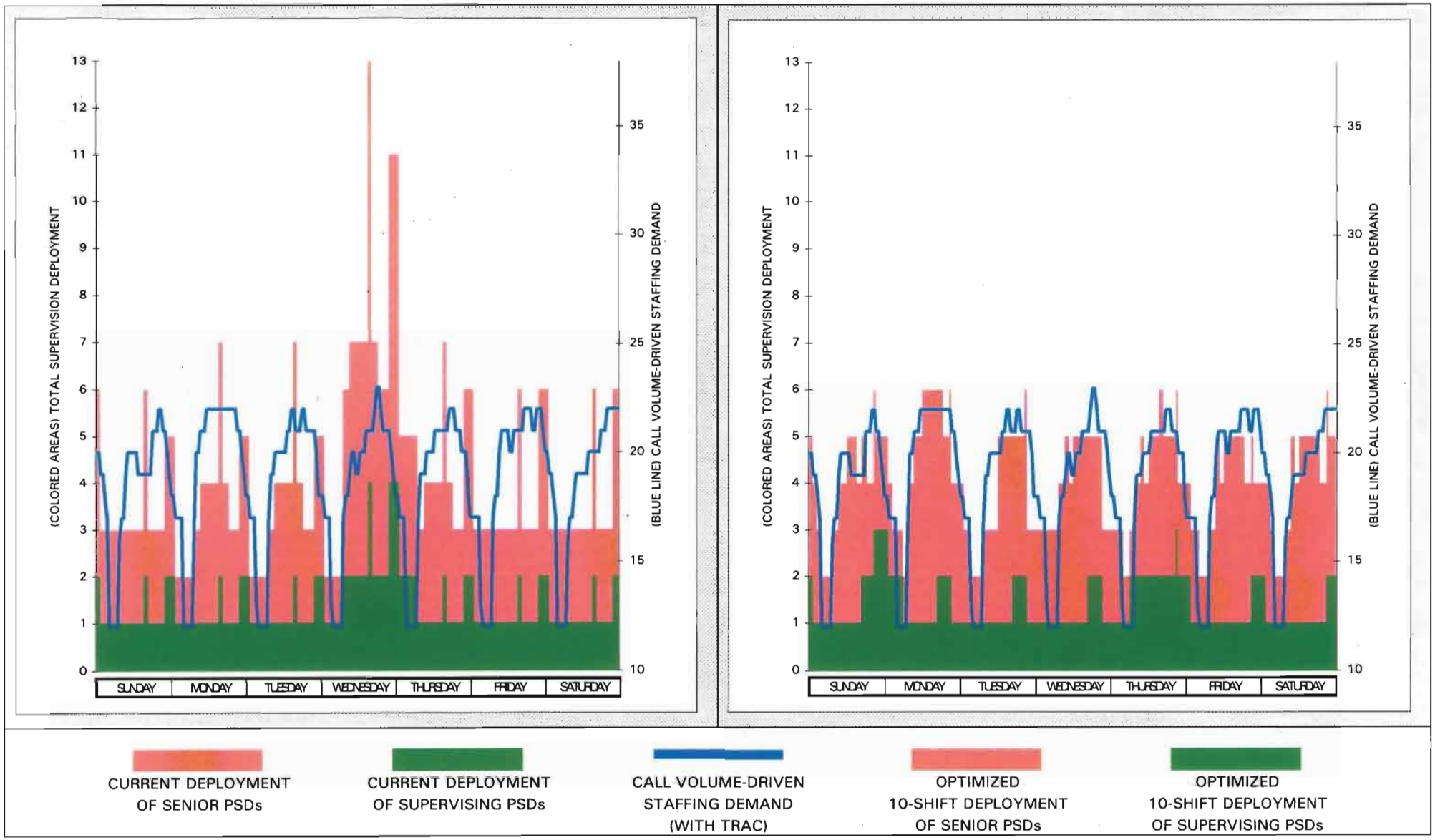
	Measured Supervision Levels		
	Communications Center's Current Senior PSD Schedule To PSD I and II Schedule Including TRAC	**Communications Center's Senior PSD Schedule To Optimized 10-Shift PSD I And II Schedule**	**Optimized Senior PSD Schedule To Optimized 10-Shift PSD I And II Schedule**
Overall Continuity Of Supervision	74%	64%	81%
Average Workload For Seniors (PSDs To One Senior)	10.3 to 1	9.5 to 1	9.5 to 1
Workload Range (PSDs To One Senior)	8.9 to 15.4	7.9 to 12.3	7.40 to 12.6

Our analysis of supervision reveals that going from the current 5-shift deployment to the optimized 10-shift deployment does decrease the continuity of supervision from 74 percent to 64 percent. However, the ratio of PSDs to senior PSDs improves from the current deployment at 10.3 to 1 to an optimized deployment at 9.5 to 1. Further, the optimized 10-shift pattern provides a lower minimum and maximum number of PSDs to one senior PSD (7.9 and 12.3, respectively) than does the current 5-shift pattern (8.9 and 15.4). See Appendix I for charts detailing these statistics. Additionally, as shown in Graph 16, by optimizing supervision as well as the PSD Is and IIs the Division can realize a continuity of supervision that is superior to the continuity of supervision the current 5-shift staffing pattern affords.

GRAPH 16

CURRENT DEPLOYMENT OF 12 SENIOR PSDs AND 6 SUPERVISING PSDs TO CALL VOLUME-DRIVEN STAFFING DEMAND (WITH TRAC)

OPTIMIZED 10-SHIFT DEPLOYMENT OF 12 SENIOR PSDs AND 6 SUPERVISING PSDs TO CALL VOLUME-DRIVEN STAFFING DEMAND (WITH TRAC)



- Parking For The Proposed Shifts That Begin After 12 A.M.

The Division management opposes use of shifts that begin after 12 a.m. for safety reasons. We have identified an opportunity for secured parking at the surface lot between the patrol car garage and the TEC building. This opportunity for secured parking is subject to City Administration approval, funding for reconfiguration of the portion of the lot closest to the TEC building, and funding for a motorized security gate.

- Need To Meet And Confer With Municipal Employees Federation

According to the Office of Employee Relations and City Attorney's Office, they would advise that the Office of Employee Relations meet and confer with the Municipal Employees Federation prior to the Division changing the PSD schedules to those shown in this report that are significantly different from the current schedules. Furthermore, according to the City Attorney's Office, following the meet and confer process would not preclude the City from unilaterally changing the PSD schedules.

CONCLUSION

During the course of our audit of the San Jose Police Department's (SJPD) Communications Center (Center), average 911 call answering improved. Specifically, average 911 call answering improved from 11 seconds in June 1994 to 3 seconds in February 1995 because of the change to off-hook answering. Also, procedural changes lowered the number of calls taking over 60 seconds to answer from 771 calls in August 1994 to approximately 4 calls in February 1995. Our review also revealed that the average PSD on a current 5-shift pattern combined with a short- and long-term leave rate of 22.6 percent results in

overstaffing during periods of each day and understaffing during other periods of each day. The understaffing occurs in spite of PSDs earning over $300,000 per year in paid overtime or compensatory time off. Our review also found that the Communications Division (Division) did not meet one of its four primary emergency call-answering and dispatch objectives in 1991-92, 1992-93, or 1993-94. In addition, during June and August 1994, 15 percent and 21 percent, respectively, of those emergency callers whom PSDs deemed not to be in an emergency situation hung up after being put on hold. Further, during February 1995, 24 percent of those emergency callers whom PSDs deemed not to be in an emergency situation hung up after being put on hold, twice the percentage of calls lost in February 1994.

In May 1995, the Division will assume responsibility for non-emergency report-writing calls that the SJPD's Operations Support Services Division currently handles. The Division has proposed to the City Administration that it can assume this additional responsibility by adding 9 PSDs, for a total of 124 PSDs. However, our review indicates that unless the Division either adds 12 more PSDs or deploys its existing PSDs more efficiently, the conditions described for emergency callers whom police dispatchers deem not to be in an emergency situation will be perpetuated after May 1995 and the Division will continue to function below its own minimum staffing level. Finally, the City Auditor's Office used a computer model to optimize the scheduling of PSDs in the Center. The results of our optimization were that the Division can (1) eliminate 10 PSD positions while at the same time significantly improve its ability to function at or above its minimum staffing level, (2) avoid periods of overstaffing, and (3) save the City $860,000 per year in regular personnel, overtime, and compensatory time costs. Accordingly, we recommend that the

SJPD and the City Administration use the information in this report to develop, and forward to the City Council for concurrence, a staffing proposal for the Center that is both responsive to the public's emergency calling needs and the least costly to the City.

RECOMMENDATION

We recommend that the San Jose Police Department's Communications Division and the City Manager's Office:

Recommendation #1:

Use the information in this report to develop, and forward to the City Council for concurrence, a staffing proposal for the Communications Center that is both responsive to the public's emergency calling needs and the least costly to the City. (Priority 2)

FINDING II

THE SAN JOSE POLICE DEPARTMENT'S COMMUNICATIONS DIVISION CAN IMPROVE ITS MANAGEMENT REPORTING

During our audit, we noted the San Jose Police Department's (SJPD) Communications Division's (Division) computer system does not generate information regarding the length of time it takes to answer 911 calls which are deemed to be non-emergency and transferred to a secondary tier call-taker. We also noted that the Division has inconsistently reported on its Communications Center (Center) call volume. Further, the Division does not report the maximum call-answering delays for answered or lost emergency and non-emergency dispatch calls. Finally, the Division is lacking an analyst position to assist in management reporting. In our opinion, the Division should generate information regarding the length of time it takes to answer non-emergency 911 calls, itemize the calls it receives by type of call, report on the maximum call-answering delays for answered and lost emergency and non-emergency dispatch calls, and include such information in its trimester program management reports. Accordingly, we recommend that the Division and the City Manager request funding for a senior analyst position for the Bureau of Technical Services during the mid-year 1995-96 budget review process.

The Division's Computer System Does Not Generate Information Regarding the Initial Call-Answering Time For Transferred Non-Emergency 911 Calls

During our audit, we noted the Division's computer system does not generate information regarding the length of time it takes to answer 911 and 7-digit emergency calls which are deemed to be non-emergency and transferred to a secondary tier call-taker. However, the Division's computer system does

report on the time it takes to answer a call after it is transferred to a secondary tier call-taker. During February 1995, calls transferred to the non-emergency call-takers represented about 20 percent of emergency calls for the month. Because emergency calls deemed to be non-emergency and transferred to a secondary tier call-taker represent a significant number of Center call volume, in our opinion, the computer system should capture and report both the initial call-answering time and the call-answering time after the call is transferred.

The Division Has Inconsistently Reported On Its Call Volume

Our review indicated that the Division has inconsistently reported on the City's emergency call volume in its program management reports. As a result, it is extremely difficult, if not impossible, to compare emergency call volume from year to year and to track Division performance as well as staffing requirements. Specifically, we noted the following deficiencies in the reporting of emergency call volume:

- Prior to 1992-93, the Division did not include incoming non-emergency call volume in its program management reports. After it added the incoming non-emergency calls, the Division did not note that these components of call volume were being newly reported as part of the overall call volume in the management reports.

- Prior to 1993-94, the Division did not include non-computer system outbound and inbound calls,[17] ringdowns,[18] and miscellaneous calls.[19] Beginning in 1993-94, the Division added these calls to its program management reports; however, the Division did not note that these were newly reported components of call volume. As a result, the Division's management reports would give a casual reader the impression that call volume dramatically increased by over 500,000 calls in 1993-94 when, in fact, it did not.

The Division Should Itemize The Calls It Receives By Type Of Call

The Division should itemize the calls it receives by type of call such as emergency, non-emergency, outbound, miscellaneous and ringdowns, and include such information in its program management reports. This is critical for the following reasons:

- It allows management to compare emergency call volume from year to year;
- It assists management in analyzing staffing requirements; and
- It will enable the Division to determine whether procedural and other program changes that the Division makes actually improve emergency call-answering performance.

Itemizing these call volume components will not require the Division to do additional work. Currently, the individual call volume components are combined

[17] Includes other jurisdictions' All Points Bulletins information, updates, and administrative calls regarding field officers.

[18] Ringdowns are interagency direct calls that do not require dialing, such as outbound calls to County Communications, CHP, other jurisdictions, Airport Police, tow truck service, animal control, sheriff warrants, and burglar alarm service.

[19] Miscellaneous calls include all other inbound and outbound calls.

in program management reports. Thus, the individual components of call volume are already known, just not reported. Finally, by upgrading its program management reports, the Division will be able to prepare more accurate reports and better assess staffing needs.

The Division Needs To Report
On Its Maximum Call-Answering Delays

The Division does not report on its program management reports the maximum call-answering delays for answered and lost emergency and non-emergency dispatch calls. As reported in Finding I, we noted improvements in call-answering performance after we informed Division management about excessive call-answering delays for answered and lost emergency calls. Further, the Center's supervisors now report to the Division's operations manager regarding emergency call-answering delays in excess of 60 seconds. In our opinion, including information regarding call-answering delays and lost calls on trimester program management reports to the Chief of Police would assist Division management in monitoring performance. We acknowledge that the Division does not have computer-generated information available on all non-emergency dispatch calls--only those which have been transferred from an emergency phone number.

The Division Needs Additional Management Assistance

In 1994, the Division's police captain position was frozen, thus reducing part of its management staff. The Bureau of Technical Services (Bureau) plans to request for mid-year 1995-96 a senior analyst position to assist in management planning and analysis both in the Bureau's Operations Support Services and Communications Divisions. In the draft budget request document, the Bureau

indicates it is accountable for maintaining accurate records relating to the SJPD's response to calls for service, arrest, and crime patterns. The Bureau also notes that the technology applied to both police records and emergency communications requires understanding the funding requirements and planning priorities of both systems. Finally, the Bureau states that its personnel processes require proactive planning and analysis. Both Finding I and II in this report demonstrate the complex personnel and technology analysis issues facing the Division. Thus, we recommend that the Division and the City Manager request funding for a senior analyst position in the Bureau of Technical Services during the mid-year 1995-96 budget review process.

CONCLUSION

The San Jose Police Department's Communications Division (Division) does not generate information regarding the length of time it takes to answer 911 calls which are deemed to be non-emergency and transferred to a secondary tier call-taker. Also, the Division has inconsistently reported on its Communications Center call volume. Further, the Division does not include in its program management reports information regarding the maximum call-answering delays for emergency and non-emergency dispatch calls. In our opinion, the Division should improve its management reporting and the Division and the City Manager should request funding for a senior analyst position for the Bureau of Technical Services during the mid-year 1995-96 budget review process.

RECOMMENDATIONS

We recommend that the San Jose Police Department's Communications Division:

Recommendation #2:

Program its computer system to generate call-answering times for those emergency calls deemed to be non-emergencies and transferred to a secondary tier call-taker. (Priority 3)

Recommendation #3:

Itemize on its program management reports the calls it receives by type of call such as emergency, non-emergency, and other calls. (Priority 3)

Recommendation #4:

Include in its program management reports computer-generated information regarding maximum call-answering delays and lost emergency and non-emergency calls. (Priority 3)

Recommendation #5:

Request funding for a senior analyst position in the Bureau of Technical Services during the mid-year 1995-96 budget review process. (Priority 3)

Recommendation Requiring Budget Action

Of the preceding recommendations, #5 cannot be implemented absent additional funding. Accordingly, the City Manager should request during the mid-year 1995-96 budget review process that the City Council appropriate an amount sufficient to implement recommendation #5.

CITY OF SAN JOSÉ - MEMORANDUM

TO: Gerald Silva
City Auditor

FROM: Louis A. Cobarruviaz
Chief of Police

SUBJECT: RESPONSE TO THE AUDIT OF COMMUNICATIONS STAFFING

DATE: May 30, 1995

RECEIVED

APPROVED: [signature]

DATE:

MAY 31 1995

CITY AUDITOR

The Police Department has reviewed the **Audit of the San Jose Police Department - Communications Division's Staffing and Scheduling.** The Police Department agrees conceptually with portions of Finding I and Finding II, however, disagrees with some of the conclusions made as is detailed later in this memorandum. Of the five recommendations offered in the Audit Report, the department agrees (at least in part) with four of those recommendations, but has significant concerns about one recommendation. The Police Department will respond in detail to each element of the Findings and Recommendations contained in this report.

MANAGEMENT BACKGROUND

The Police Department, through its Communications Division, is responsible for answering and processing all 9-1-1 calls made within the city limits of San Jose. In addition to 9-1-1 calls, Police Dispatchers field a wide variety of nonemergency, lower priority calls. While handling telephone calls is an important component of the dispatcher's job, it is only one aspect of the complex profession. Radio dispatching, maintaining accurate police unit status, verifying warrants and coordinating critical field events are just a few of the many responsibilities of the police dispatcher.

This is a 24 hour per day operation, which requires direct coordination and interaction with the Bureau of Field Operations (BFO). Situations occur at the 9-1-1 positions, the radio channels and the Supervisors' bridge, which require that instantaneous, sound decisions are made. Communications personnel seldom have the luxury of analyzing the pro's and con's of various solutions to the problem at hand.

Like BFO, dispatchers are assigned to shifts that correspond with times of peak calls for service. Whenever possible, dispatchers spend the first 30 minutes of their shift in BFO briefing. Because they answer the 9-1-1 call and dispatch the officers to the scene, dispatchers need the same information and need the same opportunity to ask questions as the officers who respond.

When the City of San Jose assumed responsibility for 9-1-1 services in 1990, it was because we wanted to **improve** service levels. We have accomplished that in several ways:

- Service complaints from the public are low (21 complaints generated in 1993-94).
- Call volume is up (1.4 million emergency and nonemergency calls in 1993-94).
- Dispatcher attrition was less than 4% in 1993-94.

During the course of this audit, the Police Department has been asked to review our practice of sending dispatchers to BFO briefings. We have also been asked to consider a shift schedule which would require the assignment of our work force to 10 different shift starting times.

The Police Department, as explained in detail in this memorandum, feels that any savings realized as a result of the implementation of the modified schedules would be offset by a resultant high turnover rate. Also, we feel that the potential for civil liability would increase if dispatchers lost the ability to attend BFO shift briefings on a regular basis. The Police Department's detailed response to the Audit Report is given below:

RESPSONSE TO AUDIT FINDINGS

FINDING I - The San Jose Police Department can save as much as $860,000 per year in personnel costs and improve its service to the public by optimizing its deployment of dispatchers in the City's communications center.

The Police Department agrees with, and appreciates, the Auditor's acknowledgment of our excellent answering times in processing emergency calls for service. We do, however, believe that the savings predicted in the report have been significantly overstated. For example, the $860,000 estimate is contingent upon the complete elimination of overtime staffing for both paid and compensatory hours ($300,000). The Department would never be able to completely eliminate overtime for Police dispatchers. A great deal of the overtime expended is due to last minute, emergency shift coverage (i.e., sick leave and critical events). Also, overtime is necessary for training, special projects and meetings. The remaining projected savings of $560,000 is contingent upon our implementation of an unusual and untested 10 shift work schedule, which would be completely unacceptable to both management and labor. The work schedule would require 10 different shift starting times, some beginning as late as 12:30 a.m. and 1:30 a.m.

The following are comments on specific subsections contained in Finding I:

- ***During the course of our audit, the division changed to off-hook answering. As a result, 911 average call answering improved from 11 seconds in June 1994 to three seconds in February 1995. In addition, call answering improved from 33 percent of 911 calls answered within five seconds in June 1994 to 83 percent of 911 calls answered within five seconds in February 1995.***

The Police Department is proud of those 9-1-1 service statistics and credits the cooperative nature of the audit process for the recent improvements. Because of the exceptionally low citizen service complaint ratio (21 service complaints per 1.4 million telephone calls), we are comfortable with our 9-1-1 service levels. We employ a proactive approach to customer service by sending questionnaires to a random sample of our 9-1-1

"customers" after their calls are concluded. The responses to those questionnaires have consistently reinforced our opinion that the community has been satisfied with the department's 9-1-1 service.

During the course of the audit review, we reviewed our way of doing business and notified your staff of our intent to implement the off-hook method of answering 9-1-1 calls (**automatic** rather than elective answering of 9-1-1 calls). We believed that our overall answering times might be improved. This proved to be correct, even beyond our expectations.

- ***The Communications Center has improved its emergency call answering response time by using an off-hook system.***

We have dramatically improved our **emergency** call answering response times. However, our nonemergency answering times have suffered as a result. This will be discussed later in this report.

- ***The Division implemented procedural changes to lower the maximum 9-1-1 answering times. As a result, the number of 9-1-1 calls that took over 60 seconds to answer decreased from 771 calls in August 1994 to approximately 4 calls in February 1995. In addition, the percentage of 9-1-1 calls that were "lost" (because the callers hung up before their calls were answered) decreased from 6 percent in August 1994 to 2 percent in February 1995.***

Pacific Bell engineers worked with the communications staff to implement the primarily technical changes to the telephone equipment we lease from Pac Bell. Ours is a unique telephone system, combining automation and human dynamics to offer the best possible service to the citizens of San Jose. No other 9-1-1 center is equipped with a telephone system identical to ours, therefore, we have been in the continual process of fine tuning and modifying our system since 1990. The most recent change involved a slight reduction in the built in delay, the postponing of the voice recorder (automatic answering device with a recorded message) from 10 seconds to 30 seconds, and the activation of the 9-1-1 alarm at 20 seconds instead of 45 seconds. We believe that the telephone system has now been adjusted to its optimum efficiency. The statistics cited in the audit report support that opinion.

Regarding "lost calls", some clarification should be offered here. The reduction from six percent to two percent of lost calls appears impressive. But the six percent lost call statistic is actually insignificant, because more than 90% of lost calls are the result of citizens dialing wrong numbers. We know this, based upon the fact that every lost call is recalled by a dispatcher. The reduction of lost calls to two percent simply means that the majority of wrong number calls previously received by the 9-1-1 system are now being answered by a 9-1-1 calltaker instead of the voice recorder. Prior to the system change, as soon as the caller heard the 9-1-1 voice recorder (**which previously answered at 10**

seconds), they realized they had dialed a wrong number, and they hung up. Their call was logged as a "lost call." Today, the recorder does not activate until the caller has heard approximately seven rings of the telephone (30 seconds). Their call, except under very unusual circumstances, will be answered by a 9-1-1 calltaker before they hear the recording. Thus, they do not hang up, and their call is not logged as a "lost call."

In any event, **every abandoned call is called back by a 9-1-1 calltaker**. If contact cannot be reestablished, a police unit is dispatched. To my knowledge, no other 9-1-1 center provides this service.

- ***The average PSD is on a short-term or long-term leave of absence approximately 22.6 percent of the time.***

While we do not disagree with the 22.6 percent figure, some clarification should be offered. That figure includes the time required for training of new hires, as well as ongoing training requirements. Due to the nature of the work, hiring for these positions does take four to six months, and the training of those positions takes a minimum of six months from the date of hire. Frequently, this training is extended from eight to ten months. Once promoted to Public Safety Dispatcher II, the training cycle begins again, with another six to eight month training commitment.

Because of the training for new hires and the time it takes to fill vacant dispatcher positions, it is critical that attrition is kept to a minimum. The Department does this by giving high priority to management practices that maintain employee morale, provide consistent supervision and positive discipline, as well as providing strong training and quality control.

- ***The Center's staffing pattern is inherently inefficient and costly.***

The Police Department strongly objects to this conclusion. The communications center's exemplary record in terms of providing efficient 9-1-1 service to the community contradicts this statement.

- ***The Center's staffing pattern does not correspond to call volume-driven staffing demand. As a result, significant overstaffing occurs during some periods of the day while understaffing occurs during other periods of the day.***

The audit report bases its conclusion on a number of assumptions which the Department disagrees with. According to the report:

(a) **"We considered...information from another jurisdiction in order to estimate the call volume-driven staffing demand."**

While the Police Department does not question the existence of the information from another jurisdiction, we do question the validity and the relevance of the data. Each 9-1-1 center operates with its own unique set of policies, procedures and standards. Our call volume-driven staffing demand has no direct relevance to the San Diego Police Department, for example, nor does their staffing demand have significant relevance for the San Jose Police Department.

(b) The report states repeatedly that there is "significant" overstaffing between the hours of 9:30 p.m. and 1:00 a.m.

The graphs depicting these periods of overstaffing do not reflect the personnel assigned to TRAC (Telephone Report Automation Center) positions. If the graphs reflected the personnel assigned to TRAC, the graphs would then indicate little or no overstaffing during this time period (9:30 p.m.- 1:00 a.m.). The graphs also do not reflect the essential administrative assignments and training that is completed during the overlap period. Only because of the shift overlap is the Communications Division able to complete special projects, training updates, and one-on-one training. The shift overlap is a component of our overall efficiency.

(c) "We found that, absent overtime, the Division cannot meet the call volume-driven staffing demand we calculated."

The Police Department takes exception to this statement, because unless we have vacant positions or unless unusual circumstances have occurred, overtime is not necessary for routine operations. When vacancies occur, overtime will of course be necessary until the position can be replaced.

(d) A key component of the staffing model generated by the computer software program employed by the Auditor's staff for the purposes of this audit, is the assumption that dispatchers will handle a telephone call every four minutes.

While, in theory, this assumption may be practical for developing staffing models for telemarketing or switchboard personnel, the Police Department disagrees that it would be wise to employ such an assumption while developing a staffing model for 9-1-1 services. The report concedes this fact on page 41, "While we were not able to project the effect of calls received simultaneously in the model, we ASSUMED that secondary tier call-takers, who are designated to answer non-emergency calls, could handle simultaneously received emergency calls." This is a simplistic assumption and not based on fact or public safety experience.

In developing the current, and proven to be effective, five shift pattern, the Police Department's Crime Analysis Unit initially aligned the communications shifts with both dispatched events (all priorities) and telephone calls (9-1-1 only). The process to identify

a "best fit" was completed in cooperation with the Budget Office in order to determine the appropriate number of funded PSD positions. In subsequent years, the original shifts were readjusted by the Communications Division to meet changing demands for police services. Again, as a result of this audit process, the department recognizes the need to revisit that "fit." A high priority will be assigned to that process, which will again be coordinated with the City's Budget Office. The Department plans to complete the evaluation by January 1996. In addition, we will incorporate the Department's revised computerized modeling program into our bi-annual shift change staffing design process to accomodate ongoing changes in call volume and call patterns. Future Communications Division staffing models will have to consider a Fourth Watch and Patrol Redistricting in the Bureau of Field Operations.

- ***The center frequently falls below its own minimum staffing level in spite of PSD's earning $300,000 per year in paid overtime or compensatory time off.***

We agree that the communications center at time operates below our minimum staffing levels. However, the term "minimum staffing levels" is misleading. Our civilian communications supervisors are not bound by mandatory, inflexible minimum staffing levels. Instead, they are empowered to make responsible staffing decisions. Depending upon workload demands, supervisors have the flexibility to either go over or under the recommended minimum staffing levels. Based on our 9-1-1 service statistics and the low citizen complaint ratio, it appears that they have been employing their discretionary staffing decision authority in a manner that is both responsible and cost efficient.

- ***The division did not meet one of its emergency call-answering objectives in 1991-92, 1992-93, or 1993-94.***

Taken literally, this finding implies that the Communications Division was unable to meet **any** of its emergency call answering objectives for three consecutive years. The division actually met **or exceeded** most of its objectives for all three years. The objective we did not meet is not attainable, as explained below.

- ***The division's revised emergency call-answering objectives since 1993-94 are slower than the objectives the State of California recommends.***

The audit report is correct when it quotes the State's nonmandatory standard as, "During the busiest hour of any shift, ten seconds should be targeted as the maximum amount of time incoming 9-1-1 calls are to be answered." In order to objectively respond to this concern, we called upon Leah Senitte, the State of California's 9-1-1 Program Manager. Ms. Senitte administers the legislated 9-1-1 Program, including the authorization of funding for local agencies and assuring compliance with state mandates.

I have attached a letter from Ms. Senitte, dated March 14, 1995. Ms. Senitte acknowledges that the **nonmandatory** 10 second objective was established almost 20

years ago, and it has never been adjusted. Further, she states that, "If the same group of public safety officials sat down today to develop standards, consideration would be given to the increase in calls for service in addition to the deployment of new technology in centers that were not commonly used at that time." Also, "I understand your concern regarding your inability to answer calls in a ten-second measurement objective. I also understand the system in your center has a built in delay and the ten-second mark may have only allowed one ring into the system."

Contrary to the opinion of the Auditor's staff, our 9-1-1 system does operate with an unavoidable answering delay. Described as simply as possible, we are either able to answer an incoming call **immediately** (off-hook, automatic feed to the dispatcher); or the system begins a series of complicated calculations, designed to both notify communications staff of the 9-1-1 queuing situation, and to determine where to assign the call when dispatchers become available. This process, **at a minimum**, takes 5 to 13 seconds (hence, the built in delay).

Ms. Senitte goes on to state that, "The State Program views this as a local operational issue and it sounds reasonable to increase your answering time objective to satisfy your local operation. It is my understanding that your overall performance has been outstanding in providing 9-1-1 services to the citizens of San Jose."

- ***During June and August 1994, 15 percent and 21 percent, respectively, of those emergency callers whom PSD's deemed not to be in an emergency situation hung up after being put on hold.***

and

- ***During February 1995, 24 percent of those emergency callers whom Police PSD's deemed to not be in an emergency situation hung up after being put on hold. This is twice the percentage of calls lost when compared to February 1994.***

The 9-1-1 call improvements have not been without cost to nonemergency service levels. However, it is important to note the key phrase contained in the above findings: "**callers whom PSD's deemed not to be in an emergency situation...**" More than 85% of incoming 9-1-1 calls do not involve emergency situations, but we don't know which calls are emergencies until we answer the initial call. Unfortunately, in order to reach those calls, we are forced to "triage" (transfer, place on hold, etc.) those calls which have already been screened, and so the increase in the hang ups once these calls are on hold as noted in the Auditor's Report.

- ***In May 1995, the Division will assume responsibility for nonemergency report writing calls.***

The Police Department officially transferred the telephone report writing function to the Communications Center effective May 15, 1995. We are pleased to report that the transfer

has been a success. The audit report predicted that service levels for TRAC reports would deteriorate, but that has not been the case. While we are still in the transitional phase, preliminary statistical reports indicate a tremendous improvement in both answering times and lost calls.

- ***Absent changes to its current 5-shift pattern and 45-minute briefing periods, the division will need a total of 136 PSD's in order to function at its own minimum staffing level.***

The Police Department disagrees with this conclusion for three reasons: (1) There are philosophical differences of opinion regarding the benefit of dispatchers attending Patrol briefings whenever possible (three of the five dispatcher shifts provide that opportunity). (2) As stated earlier in this report, the term "minimum staffing levels" has been apparently confused with the term "mandatory staffing levels". (3) We also disagree with this conclusion because of the inherent inaccuracy of the mathematical assumption. The audit report concedes, accurately, that only three of the five current dispatcher shifts include a 45 minute briefing period. Two of the dispatcher shifts already provide for the 30 minute briefing period recommended by the Audit Report. Nevertheless, the Auditor's staff used the following formula on page 58:

> "Our estimate (of $168,000 savings) is based on 115 PSD's attending briefings an extra 15 minutes, 4 days a week, which totals one hour a week. One hour times 115 PSD's dispatcher hours or approximately three additional PSD's."

In fact, fewer than 50% of the dispatchers scheduled to work each day attend BFO briefings each day because of "early in's", shift training, and critical events. This significantly reduces the perceived cost of those briefings in terms of both personnel and dollars. We believe this inflated assumption should be eliminated from any predicted savings because, even while attending briefings, dispatchers are available for call back to the control room. The value of the information gained by dispatchers attending BFO briefings has been demonstrated on many occasions.

The assumption that the Police Department would need 136 dispatchers in order to function at its own minimum staffing level may be correct. However, that assumption is predicated on the concept that minimum staffing levels are mandatory. The 136 PSD staffing level also assumes that the City of San Jose can afford to provide the same level of service and response to nonemergency callers that it currently provides to emergency callers.

FINDING II - The San Jose Police Department's Communications Division Can Improve Its Management Reporting.

The Police Department generally agrees with this finding, with the exception of a few statements contained in this section of the audit report. For example, "Prior to 1992-93,

the Division did not include incoming non-emergency call volume in its program management reports. After it added the incoming non-emergency calls, the Division did not note that these components of call volume were being newly reported as part of the overall call volume in the management reports."

This is not correct. Since the first management report was prepared by the communications staff, total call volume has always been included.

Also, "Prior to 1993-94, the Division did not include non-computer system outbound and inbound calls, ringdowns, and miscellaneous calls. Beginning in 1993-94, the Division added these calls to its program management reports; however, the division did not note that these were newly reported components of call volume. As a result, the Division's management reports would give a casual reader the impression that call volume dramatically increased by over 500,000 calls in 1993-94 when, in fact, it did not."
This is not correct. Inbound, outbound, ringdowns and miscellaneous calls have always been included in the management reports.

As explained to the Auditor's staff on several occasions, the same formula has been used to calculate all calls processed by the Communications Center since the first management report was prepared in FY91-92. Contrary to the Audit Report's suggestion that there was a calculated effort to inflate the telephone statistics for 1993-94, there has been a **substantial** increase in calls processed since 1991-92. Through human error, our statistics were probably under reported in the early years of operation because a large portion of the telephone calls processed by the 9-1-1 center are not tabulated by a computer or Management Information System.

RECOMMENDATIONS

The Police Department has reviewed the Auditor's recommendations and offers the following specific responses:

Recommendation No. 1 - Use the information in this report to develop, and forward to the City Council for concurrence, a staffing proposal for the Communications Center that is both responsive to the public's emergency calling needs and the least costly to the City. (Priority Two)

The Police Department agrees with the concept of this recommendation to re-examine the Communications Center's staffing in order to continue to improve efficiency, effectiveness and economy. However, the Police Department strongly opposes any shift pattern which does not take into consideration the human factor, which is not conducive to a productive, healthy and efficient work environment for employees and which would impact service quality.

Excluding the human factor, the shift patterns offered by the Auditor's computer software program makes some sense. However, because Public Safety Dispatchers are the first point of contact with citizens in crisis, it is essential to include the human factor and operational issues in the development of a workable schedule. The Police Department agrees that some form of shift optimization software should be used as a tool in developing shift schedules. From the beginning of the San Jose 9-1-1 center we employed, and continue to employ, a computerized shift optimization program; however, it is not the sole determinant of shift patterns. In determining the "least costly" and best staffing formula, operational issues that must be considered are consistency of supervision, briefing time, employee attrition, customer service, potential liability, public safety, and employee relations issues.

Recommendation No. 2 - **Program its computer system to generate call-answering times for those emergency calls deemed to be non-emergencies and transferred to a secondary tier call-taker. (Priority Three)**

We agree in principle with this recommendation, but this may not be technologically feasible. We will forward a request to Pacific Bell, the vendor who provides the hardware and software maintenance for our 9-1-1 system. They will be tasked to provide us with an analysis, price quote, and assurance that there would be no degradation of emergency services.

Recommendation No. 3 - **Itemize on its program management reports the calls it receives by type of call such as emergency, non-emergency, and other calls. (Priority Three)**

We agree, and this recommendation has been implemented.

Recommendation No. 4 - **Include in its program management reports computer generated information regarding maximum call-answering delays and lost emergency and non-emergency calls. (Priority Three)**

The Police Department disagrees with the implementation of this recommendation. Our current (and we believe correct) focus and priority is on EMERGENCY calls for service. To apply a measure to "keep score" of answering times for nonemergency telephone calls could tend to shift our focus away from true emergencies. For example, suppose the Communications Division created a performance objective to answer nonemergency calls within 20 seconds, and they were unable to meet that objective. In response, dispatchers might erroneously (but understandably) begin to place emergency calls on hold in order to answer nonemergency calls and meet that objective.

Regarding maximum delays, the type of events which cause delays are generally impossible to predict (floods, greater alarm fires, natural disasters, etc.) and difficult to avoid. There will always be times when the number of incoming 9-1-1 calls exceeds the number of dispatchers on duty. This would be true, even if the number of dispatchers were doubled. In most of those instances, the majority of the calls are duplicate reports of the same major incident. To affix an objective where the Division has limited control over its success or failure is unreasonable. Shift supervisors currently (since the audit process began) forward written reports of all 9-1-1 calls with a maximum delay of 60 seconds or more. These reports include the reason for the delay, and the reports are maintained indefinitely. We believe this operational procedure is a reasonable alternative to an unrealistic and unattainable **performance objective**.

Regarding lost calls, we disagree with including these statistics for basically the same reasons as our objection to including maximum delay statistics. The Division has little or no control over the number of lost calls experienced by the communications center, **as long as the number remains as low as it has been both before and since the audit**. The number of lost calls is insignificant, at either two or six percent. The Police Department believes that there are more important measures of our efficiency, such as rapidly answering 9-1-1 calls and maintaining a low citizen complaint ratio.

Recommendation No. 5 - Request funding for a Senior Analyst position in the Bureau of Technical Services during the mid-year 1995-96 budget review process. (Priority Three)

The budget augmentation request for this position has been prepared and will be submitted by the Department for consideration in 1995-96. This position would provide much needed administrative support for, not only the Communications Division, but the OSSD (Records Division) as well. However, this position is not endorsed at the cost of eliminating sworn personnel. It makes little sense to improve 9-1-1 answering times, if there are insufficient sworn personnel to respond to those calls for service.

CONCLUSION

As the Chief of Police, I take personal and professional pride in the accomplishments and high standards of the Communications Division. The San Jose Police Department's communications center, in less than five years, has become the most highly respected 9-1-1 center in not only the state of California, but also the United States. The report cites data from other 9-1-1 centers, such as Portland, Oregon; Phoenix, Arizona; and San Diego, California. It should be noted that representatives from each of those facilities have visited us, in hopes of learning how the San Jose Police Department maintains its high standards for 9-1-1 service. Network television has compared San Jose favorably with both the Chicago Police Department and the Philadelphia Police Department 9-1-1 centers.

Response to the Audit
of Communications Staffing

The San Jose Police Department provides vital communications services to the citizens of San Jose. Police dispatchers answer the initial emergency calls for the Fire Department and paramedic services, as well as for law enforcement. The Police Department would not want to jeopardize the delicate balance of efficiency and service to the community that has been attained during the past five years.

In closing, the Police Department will continue to work closely with the City's Budget Office to ensure that we have adequate 9-1-1 staffing to provide responsible emergency communications service to the citizens of San Jose in accordance with the majority of the recommendations of this audit.

LOUIS A. COBARRUVIAZ
Chief of Police

LAC:DB:NJ(0355K)

Attachment

STATE OF CALIFORNIA—STATE AND CONSUMER SERVICES AGENCY PETE WILSON, *Governor*

DEPARTMENT OF GENERAL SERVICES
TELECOMMUNICATIONS DIVISION
601 SEQUOIA PACIFIC BOULEVARD
SACRAMENTO, CA 95814-0282
(916) 657-9903

March 14, 1995

Nancy Jackson
Communications Operations Manager
San Jose Police Communications
855 N. San Pedro Street
San Jose, CA 95110

Dear Ms. Jackson:

This is a response to your concern regarding a Nonmandatory Standard addressed in the 9-1-1 Operations Manual. The standards in the manual were developed at the beginning of the program operation in concert with the local agencies that we administer.

The Nonmandatory Standards 1.2 on page one of our manual reads: "During the busiest hour of any shift, ten seconds should be targeted as the maximum amount of time incoming 9-1-1 calls are to be answered." This standard was developed based on how the local agencies could respond to the answering time at that time.

If the same group of public safety officials sat down today to develop standards, consideration would be given to the increase in calls for service in addition to the deployment of new technology in centers that were not commonly used at that time.

The Nonmandatory Standards are for your use as a guideline. Variable factors need to be considered; such as the wide array of equipment and software programs used by the PSAP's and various telephone companies, the numerous ways of measuring 9-1-1 statistical data and uncontrollable situations that may cause an influx of emergency calls into a Communications Center.

I understand your concern regarding your inability to answer calls in a ten-second measurement objective. I also understand the system in your center has a built in delay and the ten-second mark may have only allowed one ring into the system.

It is not the intent of the program to require you comply with a Nonmandatory Standard that is not feasible. Most agencies do not have the ability to measure each call as you do with your Automatic Call Distributor. These are strictly guidelines established early in the program to help get agencies started.

The State Program views this as a local operational issue and it sounds reasonable to increase your answering time objective to satisfy your local operation. It is my understanding that your overall performance has been outstanding in providing 9-1-1 services to the citizens of San Jose.

Nancy, I have enjoyed working with you in 9-1-1 through the years. If you need any further information on this issue, please do not hesitate to contact me directly at (916) 657-9911.

Sincerely,

LEAH A. SENITTE
9-1-1 Program Manager

LAS:n

OFFICE OF THE CITY AUDITOR
COMMENTS ON THE RESPONSE
OF THE CITY ADMINISTRATION
TO AN AUDIT OF THE SAN JOSE POLICE DEPARTMENT -
COMMUNICATIONS DIVISION'S
STAFFING AND SCHEDULING

The following comments are presented to expand upon, clarify, and correct statements in the response of the City Administration to *An Audit Of The San Jose Police Department - Communications Division's Staffing And Scheduling.*

Administration's Response-Page 2, Paragraph 2

> *The Police Department, as explained in detail in this memorandum, feels that any savings realized as a result of the implementation of the modified schedules would be offset by a resultant high turnover rate.*

Auditor's Comments

In our opinion, the overall pay and benefits package offered to San Jose Public Safety Dispatchers (PSDs) I and II affects the Communications Center turnover rate much more so than does staff scheduling. The overall pay and benefits package for Public Safety Dispatchers I and II includes the following:

- 4-day, 10-hour workweek
- Paid one-half hour lunch
- Daily briefings
- Up to ten months initial training period
- Up to eight months promotional training period
- Annual 40-hour continuing training
- Annual salary range of $35,000 to $49,300 (including holiday pay, excluding overtime and shift differential)
- City of San Jose benefits

Further, our survey of other communications centers did not show a correlation between staff scheduling and turnover rates. Specifically, when San Diego, California used a 3 shift 5-day 8-hour workweek it had a 20 to 25 percent turnover rate. In addition, Phoenix, Arizona uses 13 shifts and has a turnover rate less than 10 percent. Finally, Portland, Oregon, which has six shifts, starts its last shift at 2 a.m. and also has a 10 percent turnover rate.

Administration's Response-Page 2, Paragraph 2 and Page 8, Paragraph 4

Also, we feel that the potential for civil liability would increase if dispatchers lost the ability to attend BFO shift briefings on a regular basis.

and

In fact, fewer than 50% of the dispatchers scheduled to work each day attend BFO briefings each day because of "early in's", shift training and critical events.

Auditor Comments

The above two statements are inconsistent and contradictory. On one hand, the Administration states that PSDs not attending Bureau of Field Operations (BFO) briefings may create additional civil liability for somebody (presumably the City) while at the same time, the Administration states that "*. . . fewer than 50 percent of dispatchers . . . attend BFO briefings*." Does this mean that the City is already exposed to civil liability because half of the PSDs do not attend BFO briefings?

It should be noted that the ten-shift staffing schedule in our report does, in fact, include 30 minutes for dispatchers to attend two of the three BFO briefings. As noted on pages 56 and 57 of our report:

In our opinion, allocating only 30 minutes for daily PSD briefings instead of 45 minutes is workable and responsible for the following reasons:

- *. . . BFO briefings include officer roll call and other BFO administrative items for which PSDs need not be present.*
- *PSDs can retrieve All Points Bulletins, which are an important part of the information disseminated at BFO briefings, from the CAD systems at their workstations.*

- *Of the five comparable communications centers we surveyed, only one, San Diego, performs briefings . . . . The San Diego Communications Center allows 20 minutes for briefings which are <u>not</u> held in conjunction with the patrol officers; . . .* [Emphasis added.]

- *Supervising PSDs and/or senior PSDs can attend BFO briefings or obtain pertinent briefing information from the BFO and subsequently brief the PSDs. This is the current procedure for the two PSD shifts which begin at 8:30 a.m. and 6 p.m.*

In our opinion, relations between PSDs and patrol officers would not deteriorate if PSDs did not attend BFO briefings. However, if the Division feels that PSD I and II involvement in BFO briefings is essential to maintaining good relations with field officers, then PSDs attending BFO briefings once or twice per shift week should be sufficient.

<u>Administration's Response- Page 3, Paragraph 2</u>

*During the course of the audit review, we reviewed our way of doing business and notified your staff of our intent to implement the off-hook method of answering 9-1-1 calls (**automatic** rather than elective answering of 9-1-1 calls).*

<u>Auditor Comments</u>

At a meeting to discuss the draft audit report, Division management thanked the City Auditor for recommending the off-hook method of answering 9-1-1 calls noting that they had been skeptical of the results prior to implementation.

<u>Administration's Response- Page 4, Paragraph 3</u>

While we do not disagree with the 22.6 percent figure, some clarification should be offered. That figure includes the time required for training of new hires, as well as ongoing training requirements. Due to the nature of the work, hiring for these positions does take four to six months, and the training of those positions takes a minimum of six months from the date of hire. Frequently, this training is extended

from eight to ten months. Once promoted to Public Safety Dispatcher II, the training cycle begins again, with another six to eight month training commitment.

Auditor Comments

It should be noted that several times during our audit, Division management indicated that the short- and long-term leave and training rate for PSDs during the past two years was 35 percent. In addition, we verified that the short- and long-term leave and training rates plus vacancy rate for PSDs for the six months ending December 1994 ranged from 32 percent to 37 percent. As such, the 22.6 percent figure in our report is conservative and further emphasizes the need for efficient PSD scheduling.

Administration's Response- Page 4 Paragraph 6

"The Audit report bases its conclusion on a number of assumptions which the Department disagrees with. According to the report:

(a) "We considered . . . information from another jurisdiction in order to estimate the call volume-driven staffing demand.

While the Police Department does not question the existence of the information from another jurisdiction, we do question the validity and the relevance of the data. Each 9-1-1 center operates with its own unique set of policies, procedures and standards. Our call volume-driven staffing demand has no direct relevance to the San Diego Police Department, for example, nor does their staffing demand have significant relevance for the San Jose Police Department.

Auditor Comments

We derived the Communications Center's call volume-driven staffing demand entirely from San Jose Police Department's Communications Center information. The information from another jurisdiction was only used to compare it against San Jose's historical call-handling time. We reiterate the following paragraph from page 24 which describes the call volume-driven staffing demand:

*In order to compare the Center's actual PSD staffing pattern to the call-volume driven demand, we had to first determine call volume by the day of the week and time of day. In order to do this, we first documented the historical call-volume workload for emergency and non-emergency calls described in Appendix C. After we documented emergency and non-emergency call volume we needed to forecast the number of PSDs required on an hourly basis to handle the call-taking, radio, service, and relief workload. We refer to the number of PSDs needed on an hourly basis as the call volume-driven staffing demand. We considered historical call-handling time, information from Division management and from another jurisdiction (*comparison purposes only*) in order to estimate the call volume-driven staffing demand.* [Language added]

Administration's Response - Page 5, Second Paragraph

(b) The report states repeatedly that there is "significant" overstaffing between the hours of 9:30 p.m. and 1:00 a.m.

The graphs depicting these periods of overstaffing do not reflect the personnel assigned to TRAC (Telephone Report Automation Center) positions. If the graphs reflected the personnel assigned to TRAC, the graphs would then indicate little or no overstaffing during this time period (9:30 p.m.- 1:00 a.m.).

Auditor's Comments

This is inaccurate. Had Graph 1 on page 25 reflected the personnel assigned to TRAC, the graph would still show an overstaffing of at least 10 to 15 PSDs during the 9:30 p.m. to 1 a.m. time period. Further, Graphs 5 to 14, on pages 39 to 48, do include TRAC and clearly show that there is still substantial overstaffing during the 9:30 p.m. to 1 a.m. time period.

Administration's Response-Page 5, Paragraph (c)

(c) "We found that, absent overtime, the Division cannot meet the call volume-driven staffing demand we calculated."

The Police Department takes exception to this statement, because unless we have vacant positions or unless unusual circumstances have occurred, overtime is not necessary for routine operations. When vacancies occur, overtime will of course be necessary until the position can be replaced.

Auditor Comments

As shown on page 29, Graph 3, and Appendix D, Graphs D-1 through D-4, the Center routinely uses overtime to meet its minimum staffing levels. Furthermore, Table 7 on page 31 shows an 88 percent increase in overtime and compensatory time costs for calendar year 1994 when compared to calendar year 1993.

Administration's Response-Page 5, Paragraph 4

(d) A key component of the staffing model generated by the computer software program employed by the Auditor's staff for the purposes of this audit, is the assumption that dispatchers will handle a telephone call every four minutes.

While, in theory, this assumption may be practical for developing staffing models for telemarketing or switchboard personnel, the Police Department disagrees that it would be wise to employ such an assumption while developing a staffing model for 9-1-1 services. The report concedes this fact on page 41, "While we were not able to project the effect of calls received simultaneously in the model, we ASSUMED that secondary tier call-takers, who are designated to answer non-emergency calls, could handle simultaneously received emergency calls." This is a simplistic assumption and not based on fact or public safety experience.

Auditor Comments

As noted on Page 41 of the audit report,

> *Emergency call-taking talk time averages about two minutes. We estimated call-takers could handle either one emergency or one non-emergency call every four minutes. The city of Phoenix, Arizona's, communications center also uses a criterion of one call every four minutes.*

Furthermore, our assumption regarding secondary tier call-takers handling simultaneously received emergency calls is based on our observation and our understanding of the Center's two-tier answering operations and on how the Automated Call Distribution computer system is designed to work.

Administration's Response-Page 5, Paragraph 5

> *In developing the current, and proven to be effective, five shift pattern, the Police Department's Crime Analysis Unit initially aligned the communications shifts with both dispatched events (all priorities) and telephone calls (9-1-1 only). . . . In addition, we will incorporate the Department's revised computerized modeling program into our bi-annual shift change staffing design process to accommodate ongoing changes in call volume and call patterns.*

Auditor Comments

In our numerous discussions with Division management over more than a year, this memo is the first time we have heard that the Police Department used dispatched events and telephone calls to establish the original five communications shifts or that the Department has a "computerized modeling program."

Administration's Response-Page 8, Paragraph 2

> *"Our estimate (of $168,000 savings) is based on 115 PSD's attending briefings an extra 15 minutes, 4 days a week, which totals one hour a week. One hour times 115 PSD's dispatcher hours or approximately three additional PSD's."*
>
> *In fact, fewer than 50% of the dispatchers scheduled to work each day attend BFO briefings each day because of "early in's", shift training, and critical events. This significantly reduces the perceived cost of those briefings in terms of both personnel and dollars.*

Auditor Comments

We believe we have actually understated not overstated the cost of the briefings. Although three of the five shifts (60 percent) attend BFO briefings, 76 percent of the PSDs are scheduled on the three shifts corresponding to the BFO shifts. Furthermore, although the report indicates that PSDs on the three primary shifts spend 45 minutes in briefings, Division officials have indicated that in fact they spend **more** than 45 minutes in briefing. As stated on page 56 of the audit report,

> *The Division's management reports that 15 minutes is not enough for the Watch I PSD briefing which is held at 6:15 a.m. prior to the BFO briefing. Therefore, twice a week Watch I has a debriefing that only PSDs attend when the swing shift returns from briefing during the 3 p.m. to 4:15 p.m. overlap hour.*

Thus, the Watch I and the Watch II overlaps frequently average 1 hour each for briefing. Finally, the City Auditor's Office wonders how the Administration knows what percentage of PSDs attend BFO briefings when we were told during the course of our audit that the Division did not keep briefing attendance records.

Administration's Response-Page 8, Paragraph 3

> *The assumption that the Police Department would need 136 dispatchers in order to function at its own minimum staffing level may be correct. However, that assumption is predicated on the concept that minimum staffing levels are mandatory.*

Auditor Comments

During the course of our audit, Division staff never mentioned the concept of mandatory versus minimum staffing levels. However, at various points during our audit Division staff did inform the City Auditor's Office that staffing the Center below the Division's minimum staffing levels could endanger the safety of the citizens of San Jose.

Administration's Response- Page 9, Paragraph 2, and 3

This is not correct. Inbound, outbound, ringdowns and miscellaneous calls have always been included in the management reports.

Auditor Comments

The statements regarding the exclusion of the non-computer generated call volume statistics are based on (1) the City Auditor's Office recalculation of the Division's call volume statistics because documentation for the non-computer generated statistics was not maintained and (2) interviews with the Division staff who prepared the statistics. We do not infer that this is a calculated effort to inflate the telephone statistics, rather it appears to be due to insufficient documentation and review of the call volume statistics in prior years. Hence, we recommended and the Division agreed to itemize the types of calls on the program management reports.

Administration's Response- Page 10, Paragraph 1

The Police Department agrees that some form of shift optimization software should be used as a tool in developing shift schedules. From the beginning of the San Jose 9-1-1 center we employed, and continue to employ, a computerized shift optimization program; however, it is not the sole determinant of shift patterns.

Auditor Comments

As noted previously, this is the first time the City Auditor's Office has heard that the Division has always used a computerized shift optimization program. Also, as noted in this response and in the audit report, the Center's 5-shift pattern is not optimally responsive to the public's emergency and non-emergency calling needs nor the least costly to the City.

Administration's Response- Page 10, Recommendation 4

The Police Department disagrees with the implementation of this recommendation. Our current (and we believe correct) focus and priority is on EMERGENCY calls for service. To apply a measure to "keep score" of answering times for non-emergency telephone calls could tend to shift our focus away from true emergencies. . . .

Regarding maximum delays, the type of events which cause delays are generally impossible to predict (floods, greater alarm fires, natural disasters, etc.) and difficult to avoid. There will always be times when the number of incoming 9-1-1 calls exceeds the number of dispatchers on duty. . . .

Regarding lost calls, we disagree with including these statistics for basically the same reasons as our objection to including maximum delay statistics. The Division has little or no control over the number of lost calls experienced by the communications center, ***as long as the number remains as low as it has been both before and since the audit.*** *The number of lost calls is insignificant, at either two or six percent. The Police Department believes that there are more important measures of our efficiency, such as rapidly answering 9-1-1 calls and maintaining a low citizen complaint ratio.*

Auditor Comments

The Administration does not understand what this recommendation is intended to do. The recommendation is not to establish a performance objective for lost or transferred calls. Rather the Division should accumulate and report on maximum delays for both answered and lost emergency and non-emergency calls. This will ensure that management can monitor performance for these calls and take appropriate action to address identified problems.

Finally, the City Auditor finds it curious that the Division belittles its achievement in reducing the percentage of calls lost from 6 percent to 2 percent. The number of calls lost should be a function of call answering. In other words, answering calls faster should reduce the number of lost calls. As such, reducing calls lost by

two-thirds should be a result of faster call answering and a point of pride for the Administration. Further, by reducing the number of calls lost, the Center also reduces the number of calls for which a call back is required. Specifically, reducing calls lost by two-thirds eliminates the need for PSDs to call back 1,000 to 1,300 callers each month. Furthermore, it is the Police Department's policy to dispatch an officer when a PSD calls back a caller that hung up but cannot contact the caller. Thus, reducing the number of calls lost also reduces the potential for unnecessary police dispatches.

APPENDIX A

DEFINITIONS OF PRIORITY 1, 2, AND 3
AUDIT RECOMMENDATIONS

The City of San Jose's City Policy Manual (6.1.2) defines the classification scheme applicable to audit recommendations and the appropriate corrective actions as follows:

Priority Class[1]	Description	Implementation Category	Implementation Action[3]
1	Fraud or serious violations are being committed, significant fiscal or equivalent non-fiscal losses are occurring.[2]	Priority	Immediate
2	A potential for incurring significant fiscal or equivalent fiscal or equivalent non-fiscal losses exists.[2]	Priority	Within 60 days
3	Operation or administrative process will be improved.	General	60 days to one year

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1 The City Auditor is responsible for assigning audit recommendation priority class numbers. A recommendation which clearly fits the description for more than one priority class shall be assigned the higher number. **(CAM 196.4)**

2 For an audit recommendation to be considered related to a significant fiscal loss, it will usually be necessary for an actual loss of $25,000 or more to be involved or for a potential loss (including unrealized revenue increases) of $50,000 to be involved. Equivalent non-fiscal losses would include, but not be limited to, omission or commission of acts by or on behalf of the City which would be likely to expose the City to adverse criticism in the eyes of its citizens. **(CAM 196.4)**

3 The implementation time frame indicated for each priority class is intended as a guideline for establishing implementation target dates. While prioritizing recommendations is the responsibility of the City Auditor, determining implementation dates is the responsibility of the City Administration. **(CAM 196.4)**

APPENDIX B

CITY OF SAN JOSÉ - MEMORANDUM

TO:	Gerald A. Silva City Auditor	FROM:	Louis A. Cobarruviaz Chief of Police
SUBJECT:	MANAGEMENT ACCOMPLISHMENTS - POLICE COMMUNICATIONS	DATE:	February 21, 1995
APPROVED:		DATE:	

In response to your draft audit report of February 9, 1995, this memorandum is intended to outline the significant management accomplishments in the Communications Division. Your previous letter requested that our input specifically address those accomplishments relative to Police Communications staffing and scheduling.

REORGANIZATION OF POLICE AND FIRE COMMUNICATIONS

After a year of partial consolidation of police and fire communications services, the Fire Chief and I agreed to reorganize 9-1-1 services transferring fire communications back to the Fire Department on October 9, 1994. We agreed that the duties and responsibilities of the two departments were unique and warranted further specialization. In accordance with that reorganization, the affected employees were reclassified and the generic classification of "Public Safety Dispatcher" no longer exists. Instead, dispatchers' job titles are either Police Dispatcher or Fire/Emergency Medical Services Dispatcher.

DISPATCHER ATTRITION RATE

Because the time factor for the replacement of public safety dispatchers is six to nine months, all vacancies have a detrimental impact on service levels. Vacancies are expensive, because of the extensive training required for the position. High attrition rates in a 9-1-1 center have a subtle negative impact on service levels as well. This is exhibited through increases in sick leave abuse, mandatory overtime, citizen complaints, and disciplinary actions.

Our dispatcher attrition rate has continued to decline every year. Prior to the cutover to City communications in 1990, Santa Clara County reported a 70% dispatcher attrition rate. During FY 1990-91, our attrition rate was 18%. In 1991-92, it dropped to 11%, and in 1992-93, it was only 5%. In 1993-94, our attrition rate was 3.4%. This is the lowest dispatcher attrition rate in the state of California for large communications facilities (Sacramento, Fresno, San Diego, Los Angeles and San Francisco).

SERVICE COMPLAINT RATIO

Courteous, efficient service to the community is the highest priority for the Communications Division. Beginning with the entry level academy, and reinforced through ongoing training (shift and annual CPT), that priority is stressed to dispatch personnel. As a result, in terms of customer service, dispatchers display the highest of

standards. The number of telephone calls processed continues to increase, but the number of service complaints remains remarkably low. In FY 1993-94, only 21 sustained 9-1-1 service complaints were received, while 1.4 million telephone calls were processed in the 12 month period.

SELECTION AND TRAINING OF DISPATCHERS

The entry level testing process developed by the Department of Human Resources and communications staff has proven to be an outstanding tool in identifying individuals who possess the requisite knowledge, skills and abilities to be a successful police dispatcher. It is a performance based, four phased examination process, which has been developed in cooperation with the POST Commission and has been enhanced by our utilization of the Communications Learning Center for keyboard practical examinations. Through bilingual certification, we have had the opportunity to hire candidates from throughout a list of over 100 candidates, and those candidates have successfully passed the training program.

This testing process has been a major contributing factor to our low attrition rate. As a result, we are now conducting only one or two basic dispatcher academies per year, resulting in considerable savings for the City of San Jose.

COMMUNITY POLICING

Police Dispatchers are an integral component of Community Policing. The efficient and quick response of BFO to calls for service from the community begins with the 9-1-1 call to communications. As many communities have learned, a mishandled 9-1-1 call will generate intense negative media attention. When the 9-1-1 system has credibility with the community, the public will become involved. Members of the community will report crimes in progress and suspicious circumstances to the Police Department, because they are confident that the system works and that their calls are welcome. Dispatchers have actively participated in community meetings, 9-1-1 presentations at schools, the Curfew Centers and other community policing projects.

POSITIVE MEDIA COVERAGE

The communications center was featured on a segment of ABC World News Tonight on December 21, 1994. The piece highlighted the training and professionalism of the call-taking and dispatch staff, and said San Jose's Communications Center was the "best there is." The television series "Rescue 9-1-1" is featuring the San Jose Police Department's communications center on February 21, 1995. After the recent January floods we received a great deal of local media coverage, and compliments from the

Mayor and City Manager, as a result of the Disaster Hot Line. The hot line was a tremendous success with the community, and we plan to activate it anytime there is an EOC activation.

TRAC PROGRAM

The Police Department has long recognized the need to improve the telephone crime reporting process. Currently citizens call, or are referred to, the Information Center (277-5300) in order to complete certain misdemeanor reports by telephone, rather than by the dispatching of an officer. 35% of all the crime reports taken by the department are processed by Information Center personnel.

Because of staffing shortages, outdated equipment, lack of training and crowded working conditions in the Information Center, service levels to the public have been below par. There were frequent citizen complaints regarding long waits while on hold and long answering times. We completed a study to identify a work plan to move TRAC (Telephone Report Automation Center) services to the communications center. We have hired the necessary dispatchers and project a target date of May 14, 1995, to take over that function, with a greatly improved level of service for the community.

SUMMARY

Emergency communications, if not aggressively managed, can quickly become a liability for local government. Because of the critical nature of the tasks performed by public safety dispatchers, there is a very small margin for error. Our policies, procedures, training, supervision and staffing levels are subject to public scrutiny at all times. The quality of service provided by the Police Dispatchers is a credit to the City. The quality of the emergency communications service is also a direct result of the continued support of the officials of the City of San Jose.

LOUIS A. COBARRUVIAZ
Chief of Police

LAC:NJ(0307k)

cc: Regina V.K. Williams, City Manager

APPENDIX C

COMPUTER OPTIMIZATION MODEL

Based on the results of the surveys of other jurisdictions with 4-day, 10-hour workweeks, we determined that the San Jose Police Department's Communications Center would need more than five starting times daily to reduce the overlap. Furthermore, we used a computer optimization model to optimize scheduling of public safety dispatcher (PSD) I and II positions. The scheduling optimization model was run with the Telephone Report Automation Center (TRAC) workload. We used Microsoft Excel Solver software. Solver uses well-established numeric methods for determining optimal allocation of scarce resources. These numeric methods are called iterative methods because they involve successive tries where inputs are supplied and the calculated results are observed. In a sense, they proceed by trial and error, much as a person might by hand. Because the methods involve sophisticated numeric analyses of the results of the previous iterations to arrive at the next set of trial inputs, they typically arrive at a solution far more quickly than the usual guesswork approach.[1] Optimization is sometimes called linear programming. A linear programming text describes the staffing and scheduling optimizing process as follows:

> *The solution process consists of at least 3 parts: (1) Develop good forecasts of the number of personnel required during each hour of the day or each day of the week during the scheduling period; (2) Identify the possible shift patterns which can be worked based on the personnel available and union regulations. A particular shift pattern might be to work Tuesday through Saturday and then be off 2 days; (3) Determine how many people should work each shift pattern so that the costs are minimized and the total number of people on duty during each time period satisfy the requirements determined in (1). All 3 of these steps are difficult.* [Linear Programming] *can help in solving step 3.*[2]

Historical Workload Data

In order to forecast the number of PSDs required on an hourly basis, what we refer to in this report as the call volume-driven staffing demand we began by documenting the historical call volume workload for emergency, non-emergency, and report-writing calls.

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[1] Each iteration required calculation of approximately 15,000 cells in each Communications Center matrix. Also, a typical Communications Center's matrix solution used approximately 800,000 iterations. Therefore, our computers performed over 123 billion computations to provide ten solutions.

[2] Linus & Schrage, Linear Programming Models With LINDO, The Scientific Press, Palo Alto, 1981, p.8.

Emergency Call Volume

The Communications Division provided us with 1994 911 and 7-digit emergency call volume by average hour for each of the seven days of the week for each month of the year. We calculated the yearly average number of calls for each hour of the day and for each of the seven days of the week. The graphs showing the average emergency calls for each day of the week are shown in the Average Daily Call Volume graphs on pages C-8 through C-14.

For the emergency call volume, we noted the similarities between each day of the week. The lowest call volume was around 4 a.m. or 5 a.m., then increasing steadily through the day and decreasing during either the evening or late night hours.

The 1994 daily emergency call volume showed that Saturdays, Fridays, and Sundays were the busiest days of the week. Shown below is the average number of calls received per day of the week. Call volume for the average week is 8,216. Annualized call volume is 427,232.

Day	1994 Average Daily Emergency Call Volume
Saturday	1,281
Friday	1,232
Sunday	1,210
Monday	1,163
Thursday	1,115
Tuesday	1,111
Wednesday	1,104
TOTAL	8,216

Non-Emergency Call Volume

For non-emergency call volume, we used a total of three weeks' judgmental sample from an automated study Pacific Bell performed for the Communications Division. The three weeks are weeks ending July 17, 1993; July 24, 1993; and August 21, 1993. The Division's computer system is not able to document the non-emergency call volume. We recognize the drawbacks to using such a small sample for demand; however, given that the period of time is from the summer, we assume demand to be higher than normal.

The Pacific Bell study provides call volume information by hour of the day and day of the week. To derive demand, we took the calculated average call volume by hour of the day and by day of the week from the three-week period. The graphs of this average call volume are shown on the Average Daily Call Volume graphs on pages C-8 through C-14. Subsequently, we calculated the moving average for each hour each day of the week.

Shown below are the average number of calls received per day of the week. Call volume for the moving average week is 5,859 calls. The annualized volume is 304,668 calls compared to Division's estimated 260,208 calls.

Day	Average Daily Non-Emergency Call Volume
Monday	987
Thursday	858
Friday	856
Tuesday	855
Wednesday	818
Sunday	755
Saturday	730
TOTAL	5,859

We reviewed our estimated non-emergency call volume with officials at the Communications Center. These officials thought our estimates were reasonable.

Report-Writing Call Volume

Police data specialists currently answer report-writing calls five days a week, Monday through Friday, from 7 a.m. to 8 p.m. The draft proposal dated March 17, 1994, recommends transfer of the function from the Operations Support Services Division to the Communications Division. It also recommends report-writing calls answered from 8:30 a.m. to 6:30 p.m., Monday through Friday, utilizing transferred positions from the Operations Support Services Division Information Center, and from 9 p.m. to midnight every day of the week, utilizing the 9 p.m. to 1 a.m. overlap staff. On the basis of annual call volume and the results of a two-week report-writing pilot performed at the Communications Center, we estimated the Division would

receive an average of 429 calls per day for information and that roughly one-third of the calls would require a report.

We did not have information regarding the number of Information Center calls by hour. We assumed the calls received probably would follow the same pattern as those for non-emergency calls. Therefore, we allocated our estimated 3,000 report-writing calls per week to each day and hour in the same proportion as the daily and hourly non-emergency moving average call volume. We decided to determine demand during this time period because the Division plans to implement the report-writing program daily 24 hours a day. The graphs of the average call volume are shown in the Average Daily Call Volume graphs on pages C-8 through C-14.

Dispatcher Briefings

The model allows one half hour for briefing. In effect, we show the PSDs available for 9.5 hours of work time, with relief positions covering lunch and breaks. PSDs receive a half-hour paid lunch break. Unless otherwise noted, in each shift alternative, two shift starting times have been purposely set to coincide with the 6:30 a.m. and the 3 p.m. field officer briefings. This will allow PSDs to continue to attend these briefings perhaps once or twice per shift week as noted on page 57 of this report. Otherwise, briefings will be conducted with PSDs only. Demand patterns do not allow for a 9 p.m. shift start time for the 4-day, 10-hour workweek alternatives.
.

Absence Factor

After the computer model calculated staffing requirements under the different alternatives, we added a 22.6 percent absence factor to the total number of required personnel by dividing the base by 77.4 percent. For example, if the model calculated 100 PSDs for a particular shift configuration, the total staffing required is 130 PSDs (100 divided by .774 rounded up).

This absence factor is based on the following assumed non-productive hours for an employee from an annual amount of 2,080 hours. As noted in the report, the Budget Office and the City Auditor's Office revised the non-productive hours during the course of the audit.

Absence Type	Hours
Training	40
Vacation	100
Sick Leave	80
Comp Time	60
Initial or Promotional Training	110
Unpaid Leave	80
Total	470

The Budget and City Auditor's Offices concluded that PSDs are not available to perform call-handling or dispatch tasks 22.6 percent of the available 2,080 annual hours. This resulted in the Budget Office re-estimating Communications Center PSD I and II requirements from 124 PSDs (comprised of 115 PSDs plus 9 PSDs for TRAC) to 136 PSDs. The Budget Office qualified the revision by stating that the additional positions would be considered for funding only to improve 7-digit emergency and non-emergency service in light of the General Fund's financial condition and all General Fund funding requirements.

Full-Time Equivalent Position Analysis

The Budget Office considers the full-time equivalent (FTE) and the daily hours per workstation to determine the number of authorized positions. The Budget Office revised FTE for the Communications Division is 6.121 based on a 12.5 percent overlap. To determine the FTE for the optimization models, each model has a different overlap amount. The FTE analysis using optimization requires a reverse process. The base number of positions is calculated based on optimization and then is divided by the number of positions required for the call volume-driven staffing demand. The result indicates the amount of overlap. The result is multiplied by the number of hours in the year and then is divided by the number of hours a PSD is available during the year. Using the unavailable rate of 22.6 percent results in a corresponding available rate of 77.4 percent. We multiplied by total number of PSD hours (2,080) the available rate to calculate the available PSD hours. The base number of positions is divided by the available rate and rounded up to determine the number of authorized positions.

TABLE C-1

FTE ANALYSIS FOR OPTIMIZATION PATTERNS
SHOWN IN FINDING I, TABLE 10

					Restricted Starting Times		
	Current 5 Shifts	**Alternative 5 shifts**	**Alternative 8 shifts**	**Alternative 10 shifts**	**11 shifts with latest starting time at 10 p.m.**	**6 shifts with latest starting time at 11 p.m.**	**7 shifts with latest starting time at 12:30 a.m.**
Base number of positions required by optimization	102	95	90	88	98	96	95
Number of positions to satisfy call volume-driven staffing demand	82.45	82.45	82.45	82.45	82.45	82.45	82.45
Divide optimized positions by number of positions to satisfy call volume-driven staffing demands	1.24	1.15	1.09	1.07	1.19	1.16	1.15
Multiply overlap by annual hours (8,760)	10,862	10,074	9,548	9,373	10,424	10,162	10,074
FTE based on 22.6 absence rate: Divide annual hours by available PSD hours (1,610)	6.75	6.26	5.93	5.82	6.47	6.31	6.26
Total number of positions required (Base divided by .774 available rate)	132	123	117	114	127	125	123

Shift Selection Methods

We combined computerized methods with manual review to select shift starting times. For seven or less shifts, we reviewed the results of a computerized trial and error program to correlate shifts to the average hourly call volume-driven staffing demand which would minimize the overstaffing resulting from shift overlaps. For eight or more shifts we ran the model with twenty or more shifts, then reduced the number of shifts, selecting those shifts where the computer result used the higher number of PSDs.

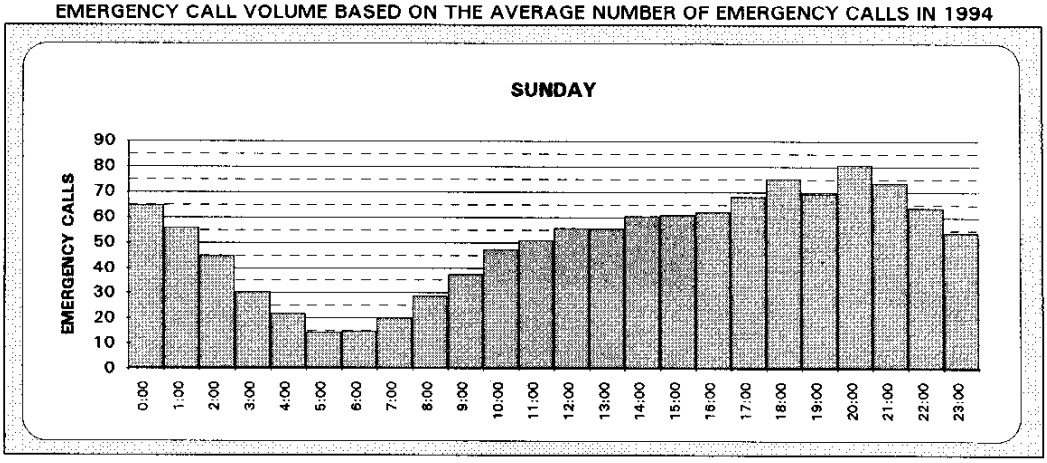
Other Model Information

The optimization model determines the amount of staffing required on a 4-day, 10-hour workweek based on the input values and number of watches. We also ran some models with a 5-day, 8-hour workweek as described in Finding I, Table 12. In addition, the model is structured

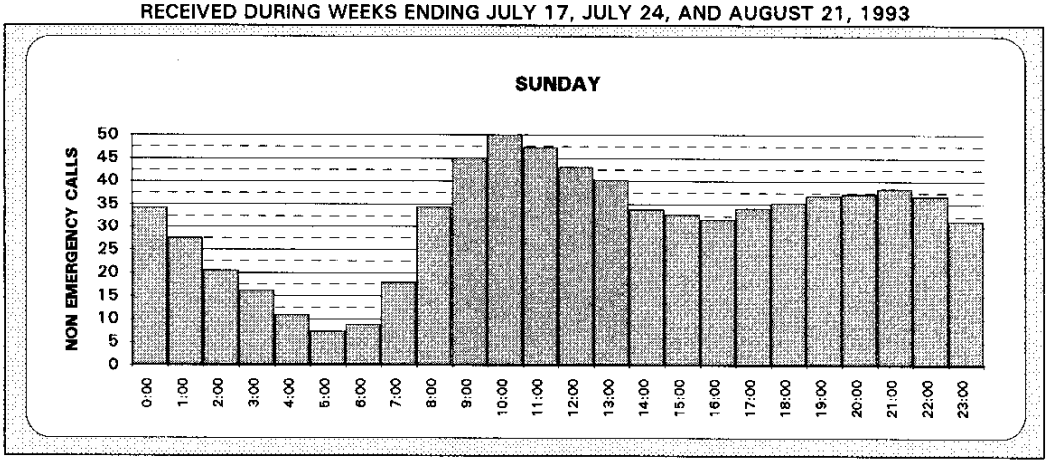
to meet demand at all time periods. The graphs on pages 43 through 45 show the daily call volume-driven staffing demands based on call volume and fixed radio call volume-driven staffing demands. The graphs show the breakdown of the requirements for emergency, non-emergency, minimum emergency and non-emergency, radio console, and report-writing staffing. Appendix F shows the call volume-driven staffing demand for operations with TRAC.

AVERAGE DAILY CALL VOLUME

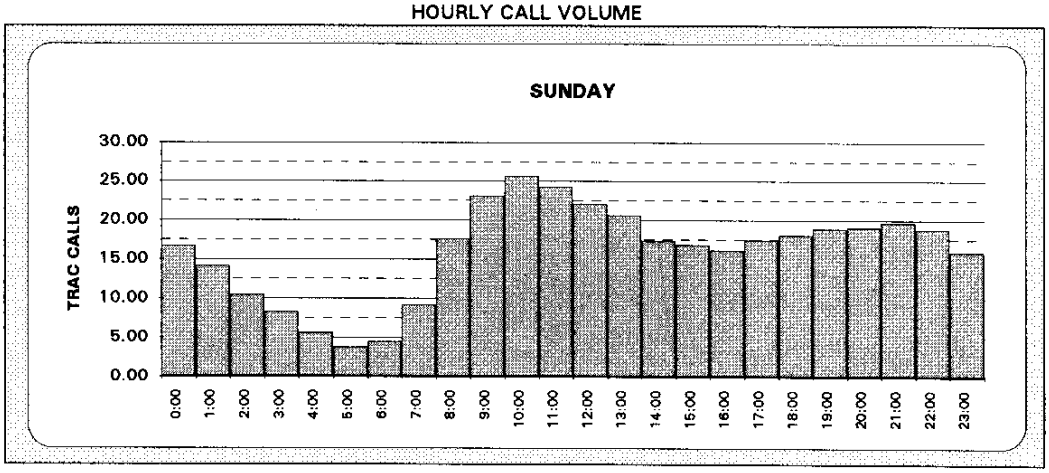
EMERGENCY CALL VOLUME BASED ON THE AVERAGE NUMBER OF EMERGENCY CALLS IN 1994



NON-EMERGENCY CALL VOLUME BASED ON THE AVERAGE NUMBER OF NON-EMERGENCY CALLS RECEIVED DURING WEEKS ENDING JULY 17, JULY 24, AND AUGUST 21, 1993

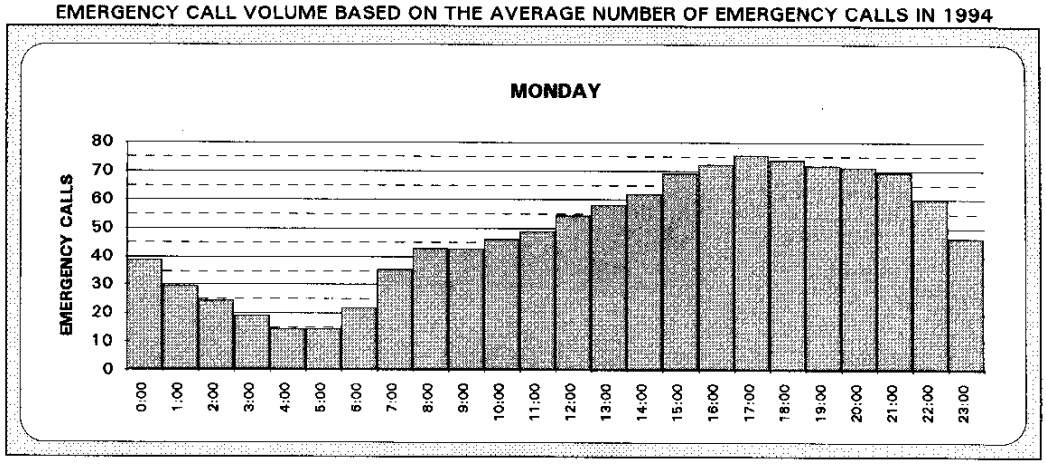


TRAC CALL VOLUME BASED ON 3,000 CALLS WEEKLY IN PROPORTION TO NON-EMERGENCY SAMPLE HOURLY CALL VOLUME

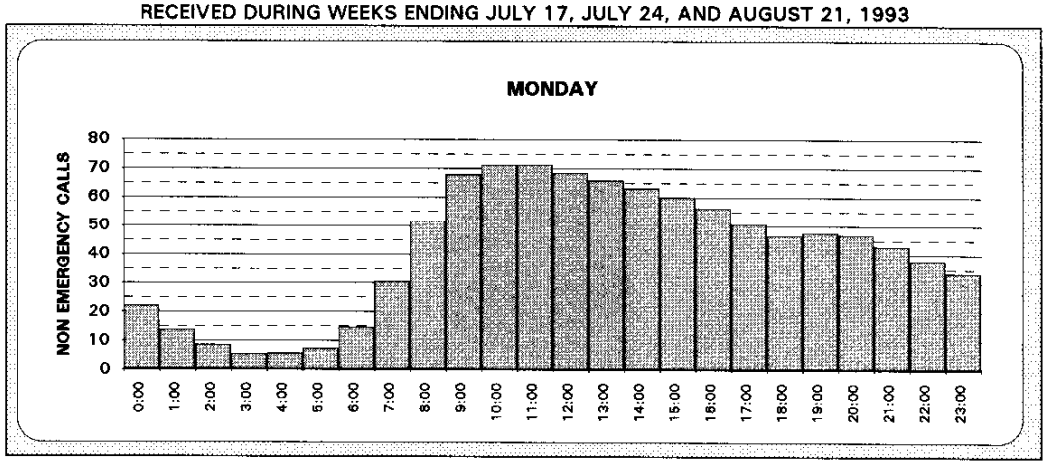


AVERAGE DAILY CALL VOLUME

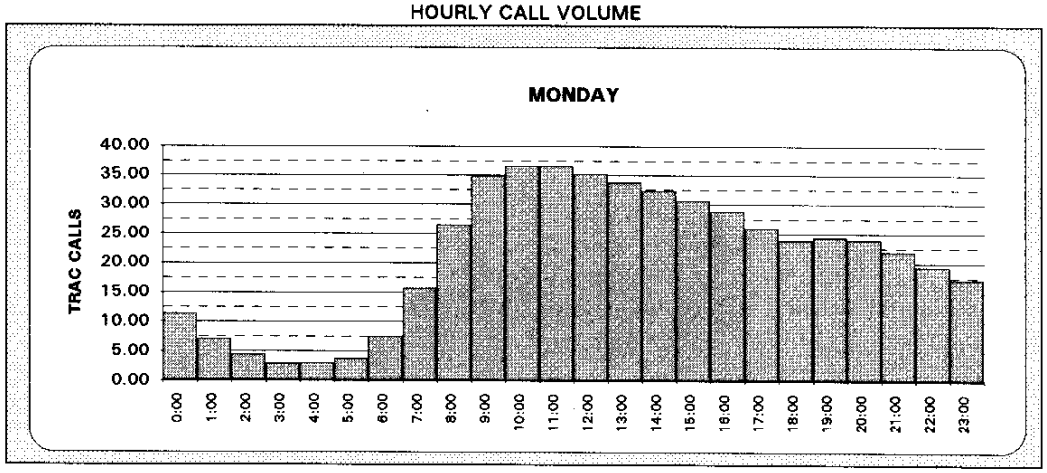
EMERGENCY CALL VOLUME BASED ON THE AVERAGE NUMBER OF EMERGENCY CALLS IN 1994



NON-EMERGENCY CALL VOLUME BASED ON THE AVERAGE NUMBER OF NON-EMERGENCY CALLS RECEIVED DURING WEEKS ENDING JULY 17, JULY 24, AND AUGUST 21, 1993



TRAC CALL VOLUME BASED ON 3,000 CALLS WEEKLY IN PROPORTION TO NON-EMERGENCY SAMPLE HOURLY CALL VOLUME



AVERAGE DAILY CALL VOLUME

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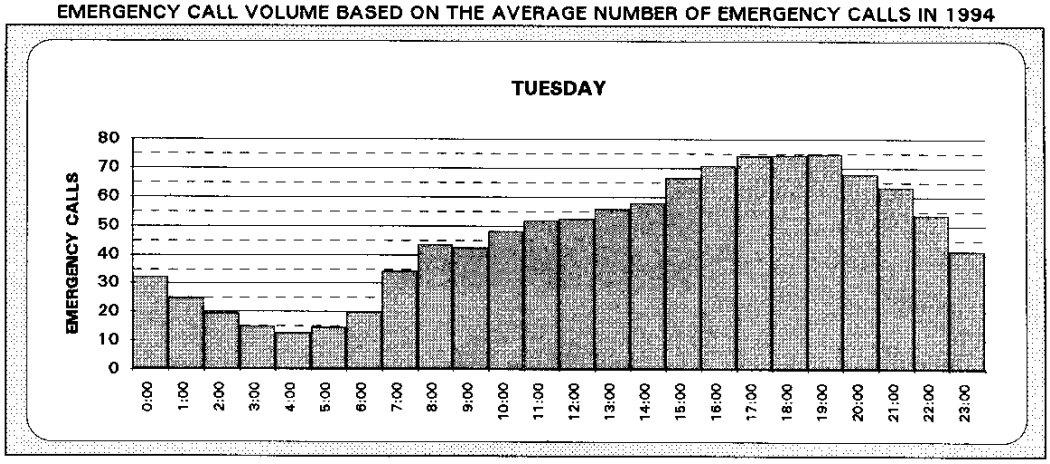
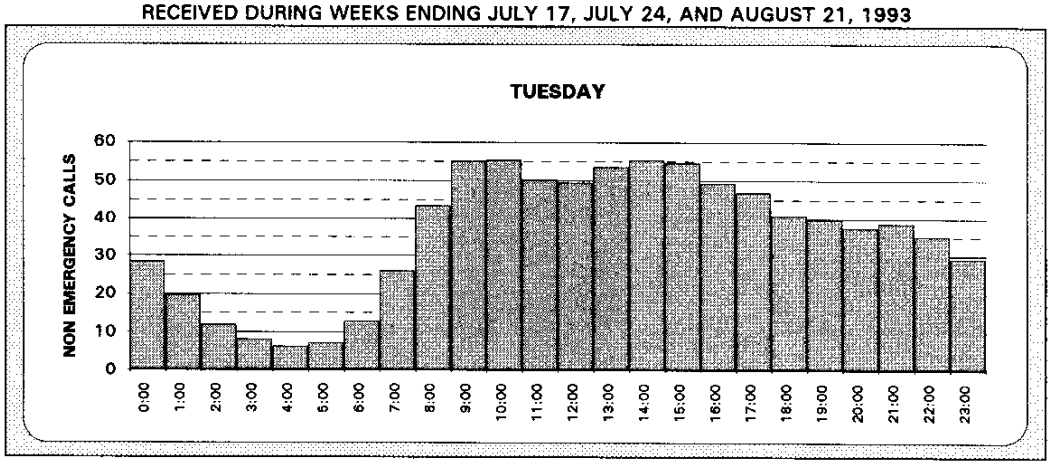
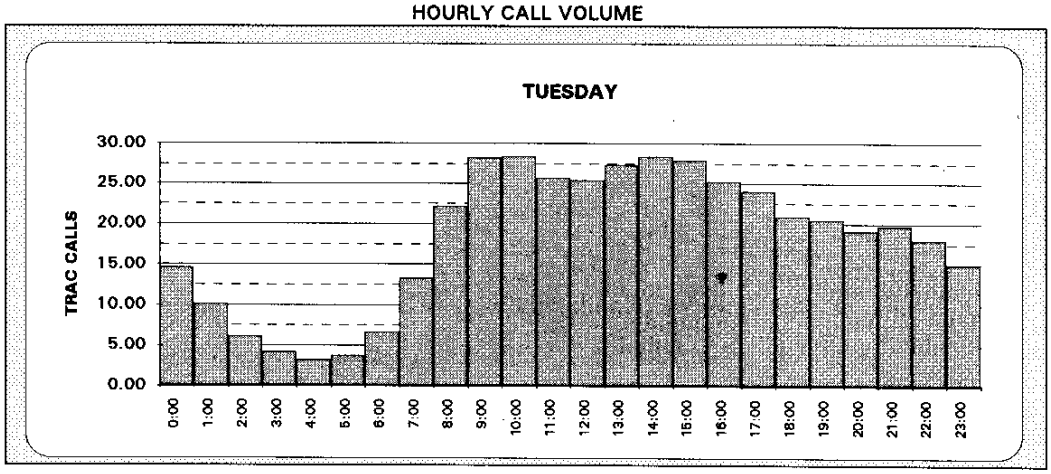


NON-EMERGENCY CALL VOLUME BASED ON THE AVERAGE NUMBER OF NON-EMERGENCY CALLS RECEIVED DURING WEEKS ENDING JULY 17, JULY 24, AND AUGUST 21, 1993



TRAC CALL VOLUME BASED ON 3,000 CALLS WEEKLY IN PROPORTION TO NON-EMERGENCY SAMPLE HOURLY CALL VOLUME



AVERAGE DAILY CALL VOLUME

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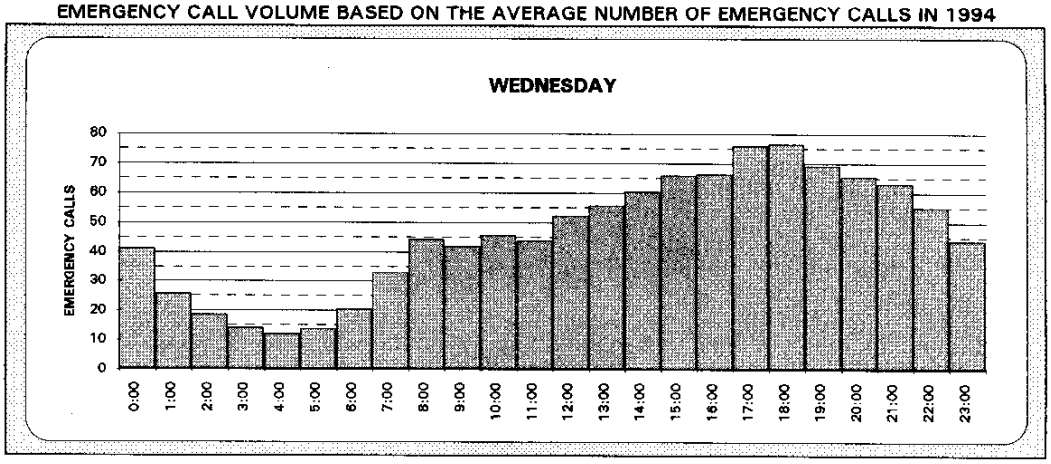
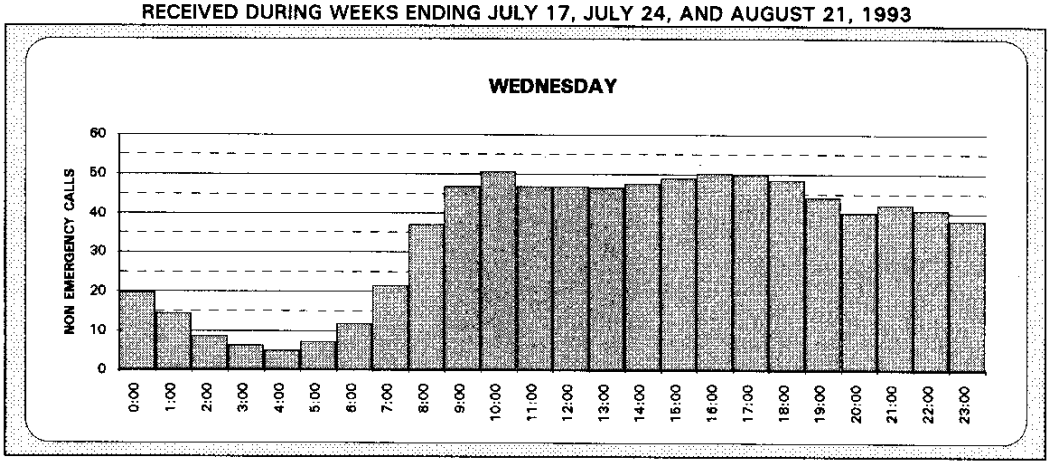
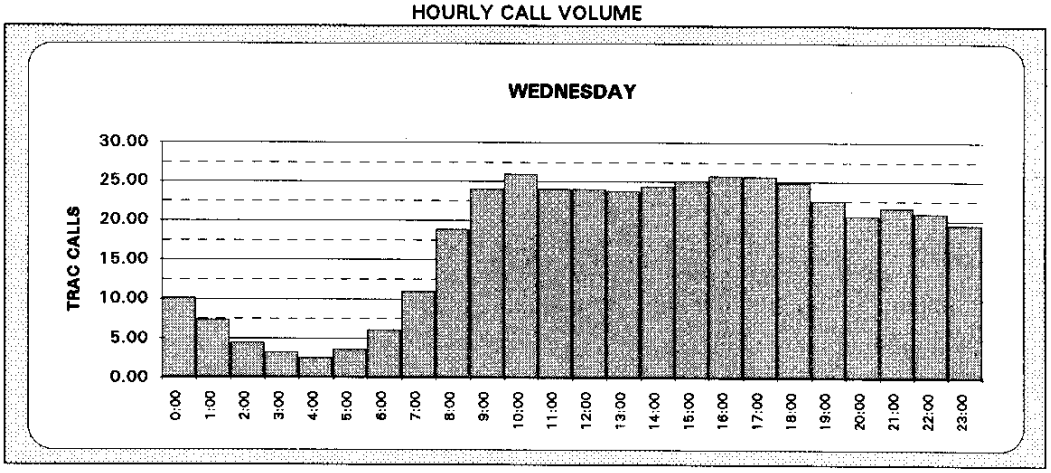


NON-EMERGENCY CALL VOLUME BASED ON THE AVERAGE NUMBER OF NON-EMERGENCY CALLS RECEIVED DURING WEEKS ENDING JULY 17, JULY 24, AND AUGUST 21, 1993



TRAC CALL VOLUME BASED ON 3,000 CALLS WEEKLY IN PROPORTION TO NON-EMERGENCY SAMPLE HOURLY CALL VOLUME



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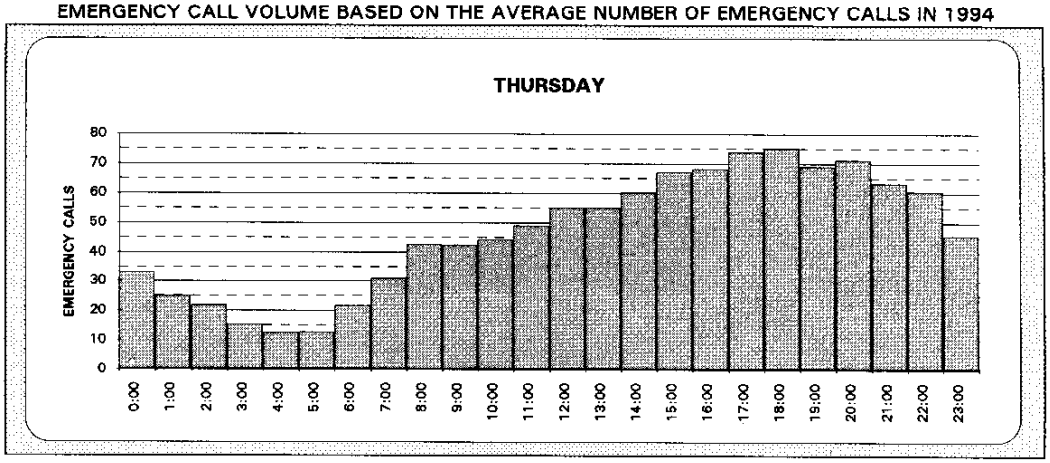
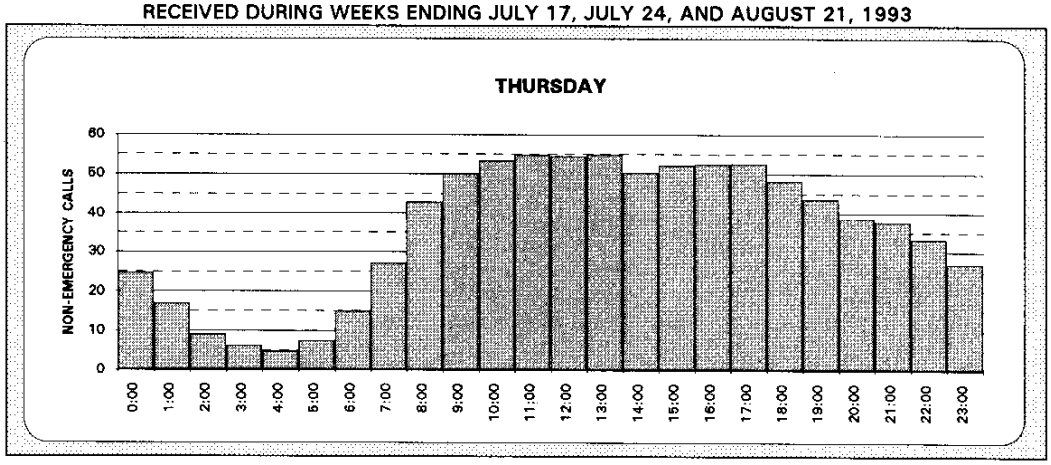
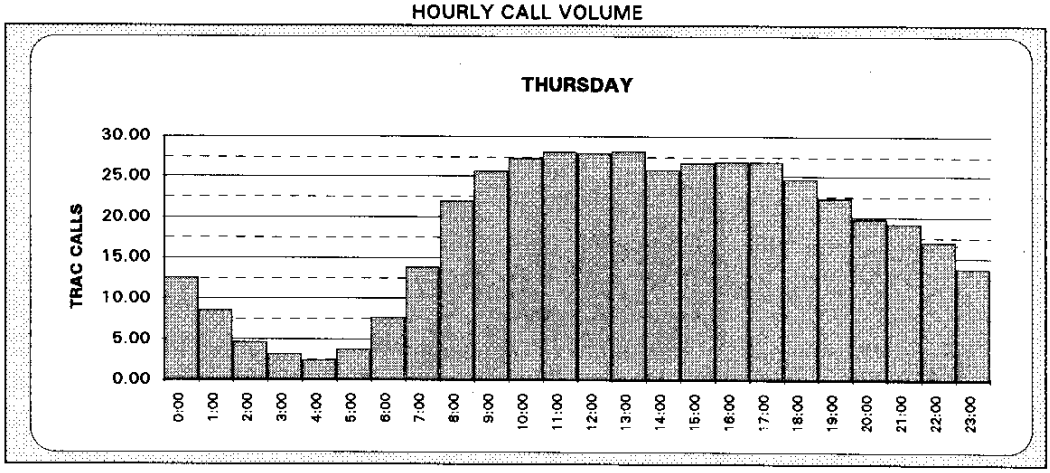
EMERGENCY CALL VOLUME BASED ON THE AVERAGE NUMBER OF EMERGENCY CALLS IN 1994



NON-EMERGENCY CALL VOLUME BASED ON THE AVERAGE NUMBER OF NON-EMERGENCY CALLS RECEIVED DURING WEEKS ENDING JULY 17, JULY 24, AND AUGUST 21, 1993



TRAC CALL VOLUME BASED ON 3,000 CALLS WEEKLY IN PROPORTION TO NON-EMERGENCY SAMPLE HOURLY CALL VOLUME



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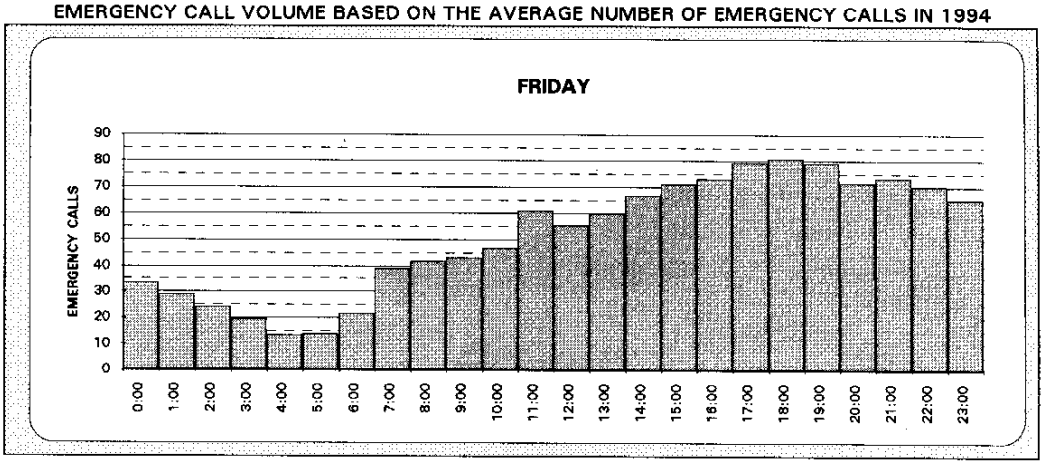
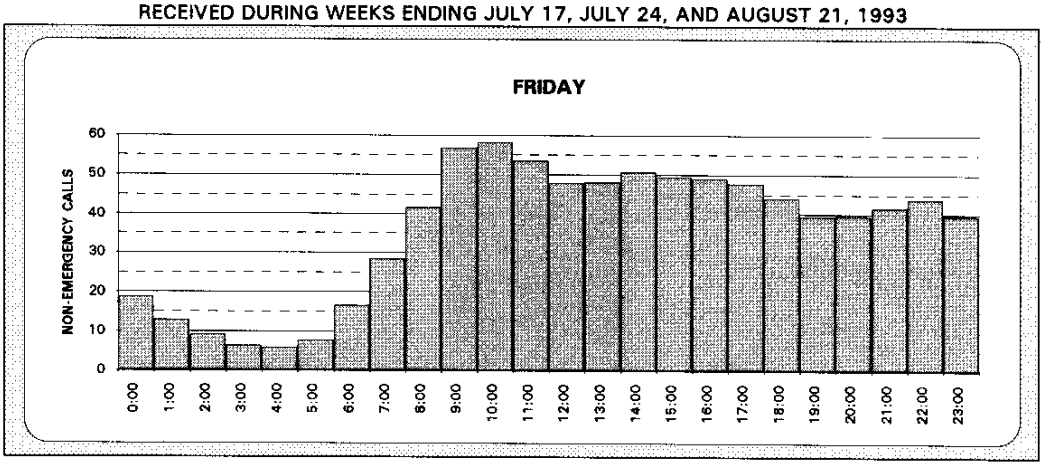
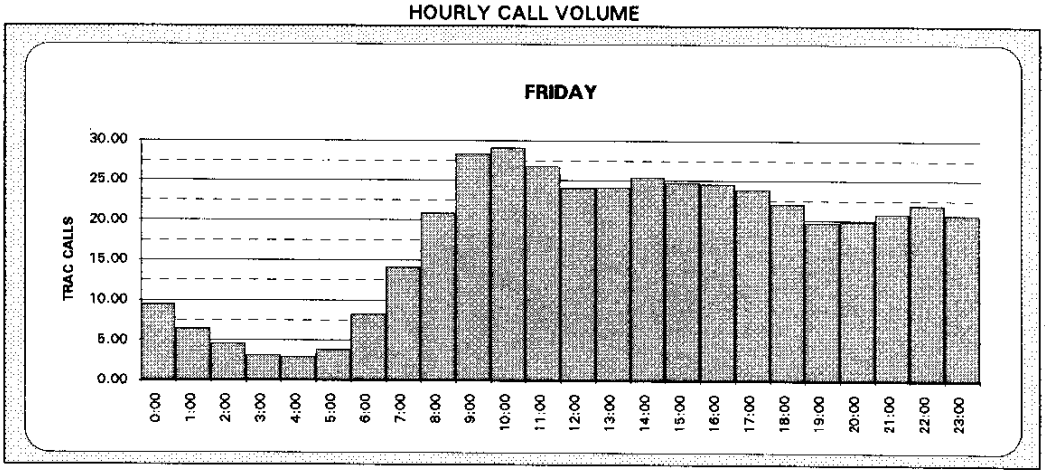


NON-EMERGENCY CALL VOLUME BASED ON THE AVERAGE NUMBER OF NON-EMERGENCY CALLS RECEIVED DURING WEEKS ENDING JULY 17, JULY 24, AND AUGUST 21, 1993

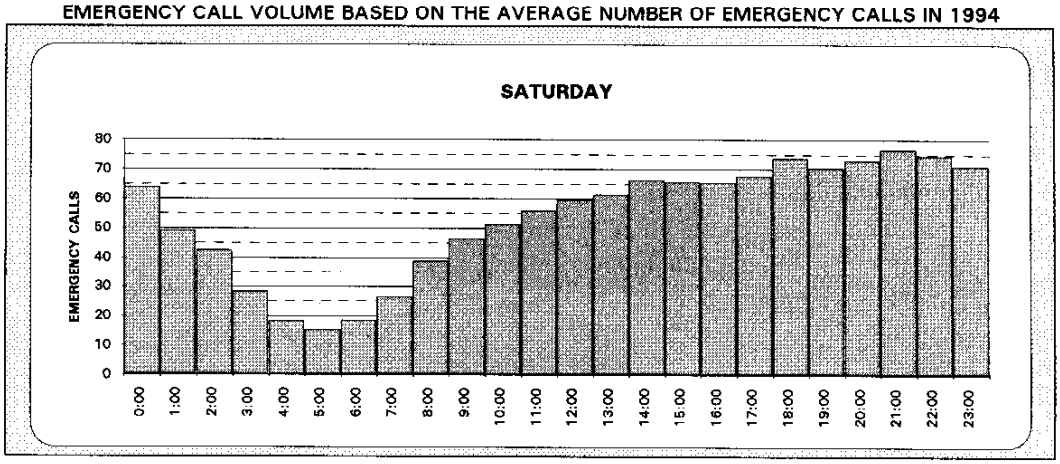


TRAC CALL VOLUME BASED ON 3,000 CALLS WEEKLY IN PROPORTION TO NON-EMERGENCY SAMPLE HOURLY CALL VOLUME

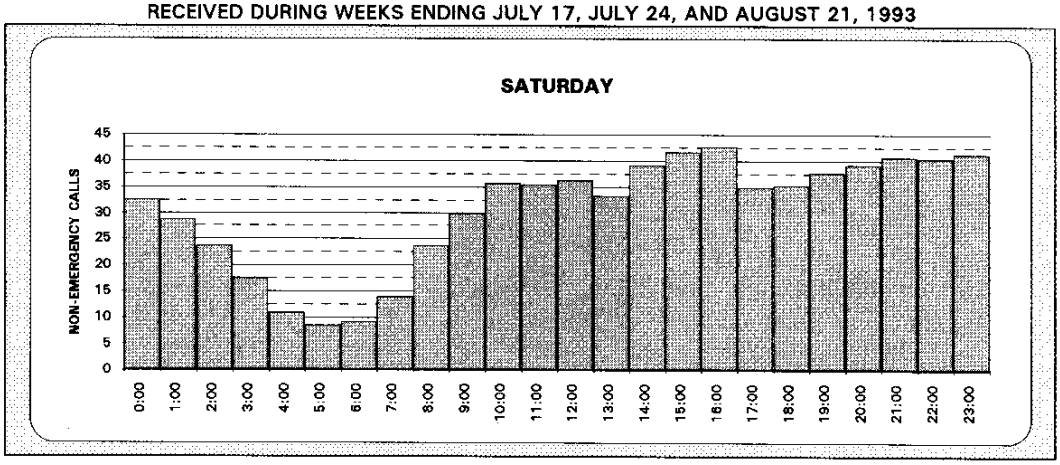


AVERAGE DAILY CALL VOLUME

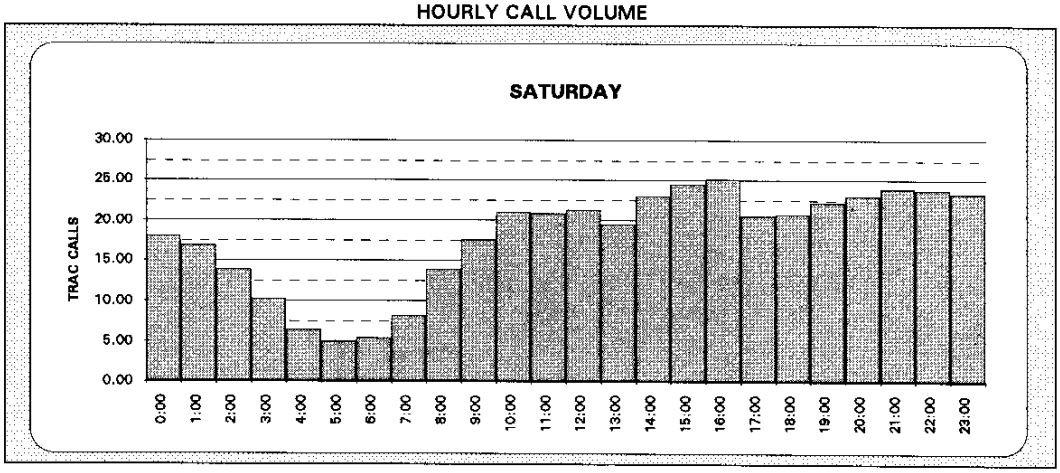
EMERGENCY CALL VOLUME BASED ON THE AVERAGE NUMBER OF EMERGENCY CALLS IN 1994



NON-EMERGENCY CALL VOLUME BASED ON THE AVERAGE NUMBER OF NON-EMERGENCY CALLS RECEIVED DURING WEEKS ENDING JULY 17, JULY 24, AND AUGUST 21, 1993



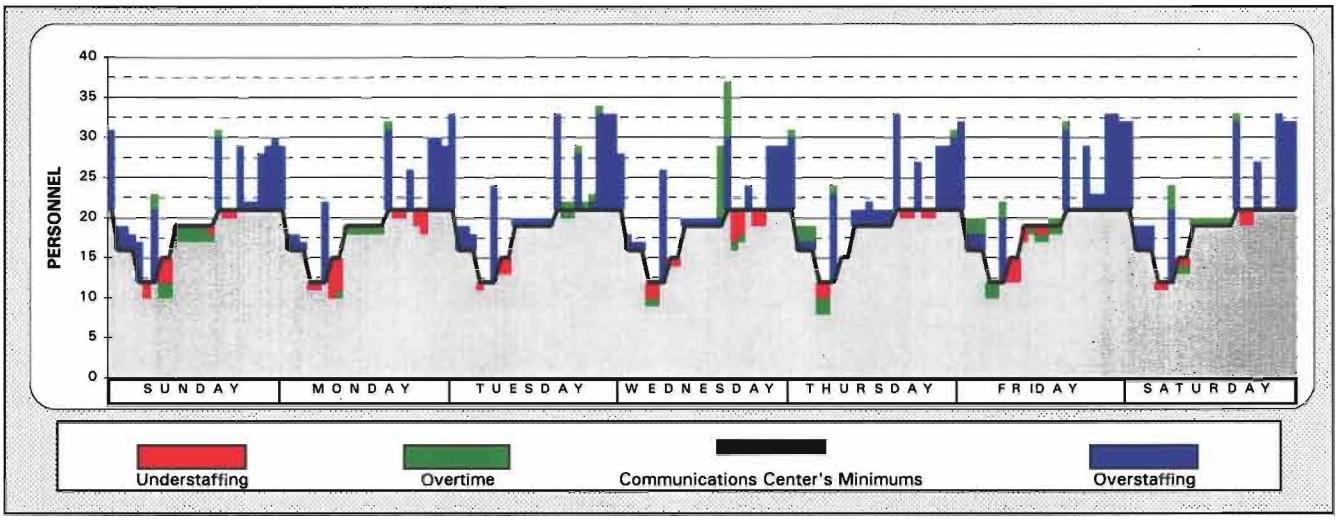
TRAC CALL VOLUME BASED ON 3,000 CALLS WEEKLY IN PROPORTION TO NON-EMERGENCY SAMPLE HOURLY CALL VOLUME



APPENDIX D

GRAPH D-1

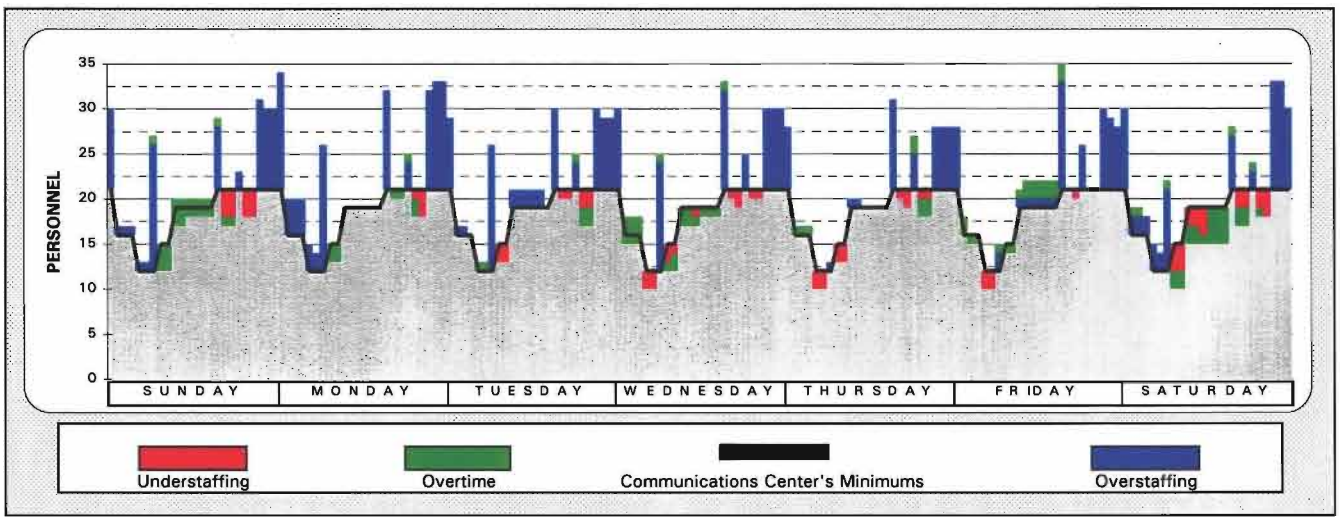
COMPARISON OF THE DIVISION'S MINIMUM STAFFING REQUIREMENT TO ACTUAL STAFFING FOR WEEK ENDING MAY 22, 1994*



*Graph data shows Sunday, May 22, 1994, then Monday, May 16, 1994, through Saturday, May 21, 1994.

GRAPH D-2

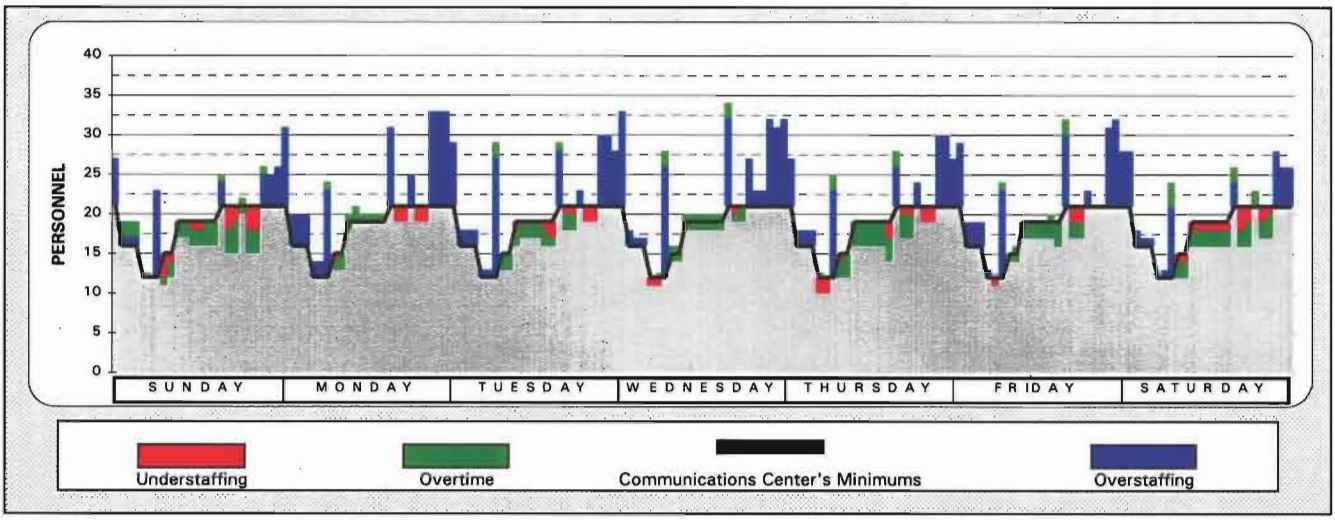
COMPARISON OF THE DIVISION'S MINIMUM STAFFING REQUIREMENT TO ACTUAL STAFFING FOR WEEK ENDING JUNE 10, 1994*



*Graph data shows Sunday, June 5, 1994, through Friday June 10, 1994, then Saturday, June 4, 1994.

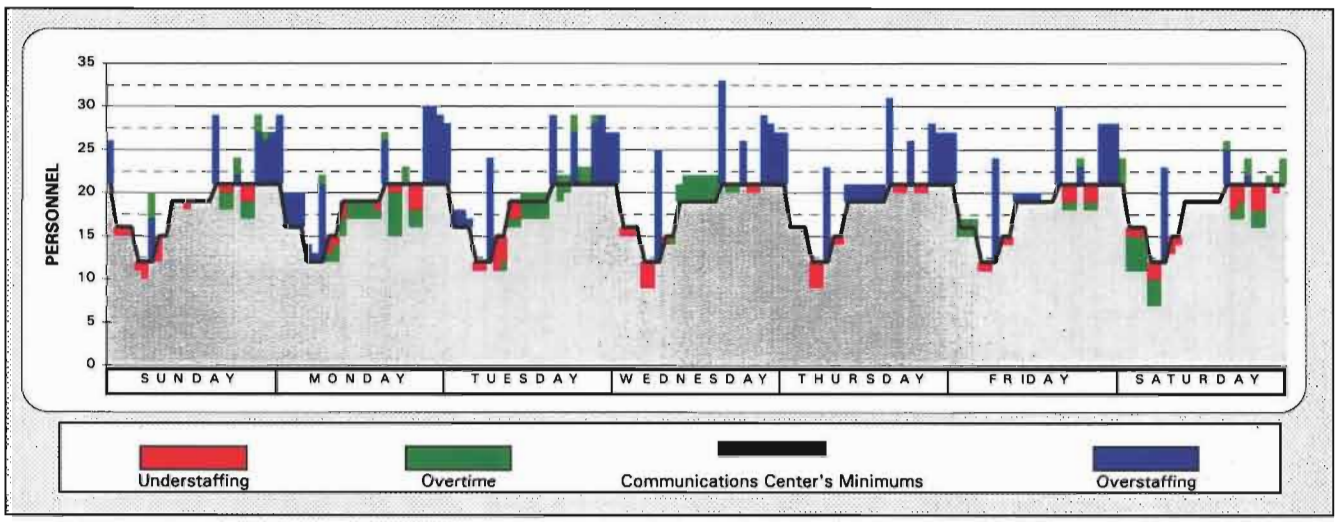
GRAPH D-3

COMPARISON OF THE DIVISION'S MINIMUM STAFFING REQUIREMENT TO ACTUAL STAFFING FOR WEEK ENDING OCTOBER 8, 1994



GRAPH D-4

COMPARISON OF THE DIVISION'S MINIMUM STAFFING REQUIREMENT TO ACTUAL STAFFING FOR WEEK ENDING DECEMBER 8, 1994*



* Graph data shows Sunday, December 4, 1994, through Thursday, December 8, 1994, then Friday, December 2, 1994, and Saturday, December 3, 1994.

APPENDIX E

HOURLY COMPARISON OF SEPTEMBER 1994 SCHEDULED STAFFING TO THE COMMUNICATIONS CENTER'S MINIMUM STAFFING REQUIREMENT WITHOUT TRAC

Table E-1 on the following page compares the Communications Division's scheduled staffing to the Division's minimum staffing requirement without TRAC. Table E-1 is presented graphically in Graph 4 in Finding I. Scheduled staffing is the staff scheduled during the semi-annual shift-bidding process less staff who participated in shift bidding but continue to be on long-term leave. Some of the staff on leave are allowed to bid on shifts because they plan to return to work prior to the next shift bid. Scheduled staffing does not show staff available for the first 30 minutes of the shift which is when the staff is scheduled to attend briefings. Table E-1 also does not reflect staffing to allow for short-term and long-term training or absences. The minimum requirement does not reflect TRAC workload, even though the Division does utilize part of the 9:30 p.m. to 1 a.m. staff overlap to handle TRAC calls daily. As noted in the report, the transfer of the TRAC program will not be implemented until May 1995.

Table E-1 shows scheduled understaffing. Therefore, the Division cannot meet its minimum staffing requirement without incurring overtime staffing.

.

TABLE E-1

HOURLY COMPARISON OF SEPTEMBER 1994 SCHEDULED STAFFING* TO COMMUNICATIONS CENTER'S MINIMUM STAFFING REQUIREMENT** FOR CURRENT 5 SHIFTS WITHOUT TRAC

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	Minimum Requirement	Scheduled Staffing	Difference	Minimum Requirement	Scheduled Staffing	Difference	Minimum Requirement	Scheduled Staffing	Difference	Minimum Requirement	Scheduled Staffing	Difference	Minimum Requirement	Scheduled Staffing	Difference	Minimum Requirement	Scheduled Staffing	Difference	Minimum Requirement	Scheduled Staffing	Difference
0:00	21	33	12	21	34	13	21	34	13	21	33	12	21	33	12	21	31	10	21	34	13
1:00	16	19	3	16	20	4	16	21	5	16	19	3	16	19	3	16	18	2	16	20	4
2:00	16	19	3	16	20	4	16	21	5	16	19	3	16	19	3	16	18	2	16	20	4
3:00	16	19	3	16	20	4	16	21	5	16	19	3	16	19	3	16	18	2	16	20	4
4:00	12	14	2	12	14	2	12	15	3	12	13	1	12	13	1	12	13	1	12	14	2
5:00	12	14	2	12	14	2	12	15	3	12	13	1	12	13	1	12	13	1	12	14	2
6:00	12	14	2	12	14	2	12	15	3	12	13	1	12	13	1	12	13	1	12	14	2
7:00	15	13	-2	15	15	0	15	14	-1	15	13	-2	15	13	-2	15	14	-1	15	14	-1
8:00	15	13	-2	15	15	0	15	14	-1	15	13	-2	15	13	-2	15	14	-1	15	14	-1
9:00	19	19	0	19	21	2	19	20	1	19	19	0	19	20	1	19	21	2	19	20	1
10:00	19	19	0	19	21	2	19	20	1	19	19	0	19	20	1	19	21	2	19	20	1
11:00	19	19	0	19	21	2	19	20	1	19	19	0	19	20	1	19	21	2	19	20	1
12:00	19	19	0	19	21	2	19	20	1	19	19	0	19	20	1	19	21	2	19	20	1
13:00	19	19	0	19	21	2	19	20	1	19	19	0	19	20	1	19	21	2	19	20	1
14:00	19	19	0	19	21	2	19	20	1	19	19	0	19	20	1	19	21	2	19	20	1
15:00	21	19	-2	21	21	0	21	20	-1	21	19	-2	21	20	-1	21	21	0	21	20	-1
15:30	21	33	12	21	34	13	21	34	13	21	33	12	21	33	12	21	35	14	21	34	13
16:00	21	33	12	21	34	13	21	34	13	21	33	12	21	33	12	21	35	14	21	34	13
16:30	21	20	-1	21	19	-2	21	20	-1	21	20	-1	21	20	-1	21	21	0	21	20	-1
17:00	21	20	-1	21	19	-2	21	20	-1	21	20	-1	21	20	-1	21	21	0	21	20	-1
18:00	21	20	-1	21	19	-2	21	20	-1	21	20	-1	21	20	-1	21	21	0	21	20	-1
18:30	21	20	-1	21	19	-2	21	20	-1	21	20	-1	21	18	-3	21	20	-1	21	19	-2
19:00	21	20	-1	21	19	-2	21	20	-1	21	20	-1	21	18	-3	21	20	-1	21	19	-2
20:00	21	20	-1	21	19	-2	21	20	-1	21	20	-1	21	18	-3	21	20	-1	21	19	-2
21:00	21	20	-1	21	19	-2	21	20	-1	21	20	-1	21	18	-3	21	20	-1	21	19	-2
21:30	21	34	13	21	34	13	21	33	12	21	33	12	21	31	10	21	34	13	21	33	12
22:00	21	34	13	21	34	13	21	33	12	21	33	12	21	31	10	21	34	13	21	33	12
23:00	21	34	13	21	34	13	21	33	12	21	33	12	21	31	10	21	34	13	21	33	12

*Scheduled staffing is staff scheduled during the semi-annual shift-bidding process less staff on long-term leave but allowed to bid on shifts because they plan to return to work prior to the next shift bid.

**Minimum staffing requirement is discussed on page 27.

APPENDIX F

HOURLY COMPARISON OF CALL VOLUME-DRIVEN STAFFING DEMAND TO AVAILABLE STAFFING WITH 22.6 PERCENT STAFFING ALLOWANCE FOR LONG- AND SHORT-TERM ABSENCES AND TRAINING FOR TEN SHIFTS WITH TRAC

Table F-1 on the following page compares available staffing to the call volume-driven staffing demand. This table is shown graphically in Graph 15 in Finding I. Available staffing is the number of employees deployed based on scheduling by computer optimization to meet the call volume-driven staffing demand. Available staffing shown on Table F-1 does not reflect staff attending half-hour briefings. Table F-1 does reflect staffing allowance for short-term and long-term training or absences. The call volume-driven staffing demand is the hourly required staffing level described on page C-1. The call volume-driven staffing demand includes staffing for emergency, non-emergency, minimum emergency and non-emergency, radio consoles, and TRAC.

For example, Table F-1 shows that at midnight on Sunday there is a requirement for 20 PSD Is and IIs. The computer-optimized schedule for the 10-shift schedule with TRAC allocates 29 PSD Is and IIs at midnight on Sunday. Therefore, there are 9 PSD Is and IIs more than the call volume-driven staffing demand. These 29 PSDs have different beginning shift hours. Because the PSD Is and IIs on long-term leave would not be scheduled at the semi-annual shift-bidding process, the number of PSDs available would be less than those shown above. The components of the call volume-driven staffing demand are graphically presented on pages 43 through 45.

TABLE F-1

HOURLY COMPARISON OF AVAILABLE STAFFING TO CALL VOLUME-DRIVEN STAFFING DEMAND FOR 10 SHIFTS WITH TRAC WITH A 22.6% STAFFING ALLOWANCE FOR LONG- AND SHORT-TERM LEAVES AND TRAINING

	Sunday			Monday			Tuesday			Wednesday			Thursday			Friday			Saturday		
	Call Volume-Driven Staffing Demand	Available Staffing	Difference	Call Volume-Driven Staffing Demand	Available Staffing	Difference	Call Volume-Driven Staffing Demand	Available Staffing	Difference	Call Volume-Driven Staffing Demand	Available Staffing	Difference	Call Volume-Driven Staffing Demand	Available Staffing	Difference	Call Volume-Driven Staffing Demand	Available Staffing	Difference	Call Volume-Driven Staffing Demand	Available Staffing	Difference
0:00	20	29	9	18	27	9	18	26	8	18	26	8	18	26	8	17	25	8	20	29	9
:30	20	29	9	18	27	9	18	26	8	18	26	8	18	26	8	17	25	8	20	29	9
1:00	19	23	4	17	21	4	17	20	3	17	22	5	17	25	8	17	21	4	19	24	5
1:30	19	23	4	17	21	4	17	20	3	17	22	5	17	25	8	17	21	4	19	24	5
2:00	18	22	4	17	21	4	17	21	4	17	23	6	17	24	7	17	22	5	18	23	5
3:00	17	22	5	17	21	4	13	21	8	13	23	10	13	24	11	13	22	9	17	23	6
4:00	12	16	4	12	15	3	12	16	4	12	17	5	12	18	6	12	17	5	12	17	5
5:00	12	16	4	12	15	3	12	16	4	12	17	5	12	18	6	12	17	5	12	17	5
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6:00	12	16	4	12	15	3	12	17	5	12	17	5	12	18	6	12	16	4	12	17	5
6:30	12	16	4	12	15	3	12	17	5	12	17	5	12	18	6	12	16	4	12	17	5
7:00	16	21	5	17	25	8	17	24	7	17	24	7	17	25	8	17	23	6	16	22	6
8:00	17	21	4	20	25	5	19	24	5	18	24	6	19	25	6	18	23	5	17	22	5
8:30	17	21	4	20	25	5	19	24	5	18	24	6	19	25	6	18	23	5	17	22	5
9:00	19	28	9	21	31	10	20	27	7	19	31	12	19	30	11	20	31	11	18	30	12
10:00	20	28	8	21	31	10	20	27	7	20	31	11	20	30	10	21	31	10	19	30	11
10:30	20	26	6	21	29	8	20	26	6	20	28	8	20	26	6	21	27	6	19	26	7
11:00	20	26	6	22	29	7	20	26	6	19	28	9	20	26	6	21	27	6	19	26	7
11:30	20	26	6	22	29	7	20	28	8	19	29	10	20	27	7	21	27	6	19	26	7
12:00	20	26	6	22	29	7	20	28	8	20	29	9	21	27	6	20	27	7	19	26	7
13:00	19	26	7	22	29	7	21	28	7	20	29	9	21	27	6	20	27	7	19	26	7
14:00	19	26	7	22	29	7	21	28	7	20	29	9	21	27	6	21	27	6	20	26	6
15:00	19	26	7	22	29	7	22	28	6	21	29	8	21	27	6	21	27	6	20	26	6
15:30	19	27	8	22	31	9	22	30	8	21	27	6	21	30	9	21	31	10	20	28	8
16:00	19	27	8	22	31	9	21	30	9	21	27	6	21	30	9	21	31	10	20	28	8
16:30	19	30	11	22	31	9	21	29	8	21	30	9	21	29	8	21	32	11	20	31	11
17:00	19	30	11	22	31	9	21	29	8	22	30	8	22	29	7	22	32	10	20	31	11
18:00	21	30	9	22	31	9	22	29	7	23	30	7	22	29	7	22	32	10	21	31	10
18:30	21	29	8	22	30	8	22	32	10	23	29	6	22	29	7	22	30	8	21	29	8
19:00	21	29	8	22	30	8	21	32	11	22	29	7	21	29	8	22	30	8	21	29	8
20:00	22	29	7	22	30	8	21	32	11	21	29	8	21	29	8	21	30	9	22	29	7
20:30	22	34	12	22	34	12	21	39	18	21	34	13	21	35	14	21	36	15	22	36	14
21:00	21	27	6	21	26	5	21	26	5	21	26	5	20	25	5	22	29	7	22	29	7
22:00	20	27	7	20	26	6	20	26	6	20	26	6	20	25	5	22	29	7	22	29	7
23:00	19	27	8	19	26	7	18	26	8	19	26	7	18	25	7	21	29	8	22	29	7

APPENDIX G

SCHEDULE OF PSD Is AND IIs BY SUB-SHIFTS AND SHIFTS FOR 10-SHIFT PATTERN WITH TRAC

Table G-1 shows how many PSD Is and IIs begin each sub-shift and each shift. A sub-shift is a schedule in which the employees work both the same starting time and the same days of the week. For example, on Wednesday at the starting time of 8:30 a.m., a group of three PSD Is and IIs who work the same days of the week--Sunday, Monday, Tuesday, and Wednesday--work the same sub-shift. There are also four other PSD Is and IIs who start at the same time of 8:30 a.m. but work on Wednesday, Thursday, Friday, and Saturday. This second group of four PSD Is and IIs have only Wednesday in common with the first group of three for a total of seven PSD Is and IIs beginning a shift on Wednesday, as shown in the right hand side of Table G-1. These PSDs can attend a half-hour PSD briefing at 8:30 a.m. and should begin working at their workstations by 9 a.m. Those PSD Is and IIs who begin the 6:30 a.m. or the 3 p.m. sub-shifts can attend either a patrol officer briefing or PSD briefing and should begin working at their workstations at 7 a.m. or 3:30 p.m., respectively.

TABLE G-1

SCHEDULE OF PSD Is AND IIs FOR 10 SHIFTS WITH TRAC WITH 22.6% STAFFING ALLOWANCE FOR LONG- AND SHORT-TERM LEAVES AND TRAINING

SCHEDULED DAYS ON / SHIFT STARTING TIME	10 SHIFTS														
	PSD Is and IIs Beginning a Sub-Shift								Total PSD Is and IIs Beginning a Shift						
	TH,F,S,S	F,S,S,M	S,S,M,T	S,M,T,W	M,T,W,TH	T,W,TH,F	W,TH,F,S	Shift Total	SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
0:00															
0:30	1	1			1		2	5	2	2	1	3	4	4	4
1:00															
1:30	2	1	4		3	4		14	7	8	11	7	9	7	7
2:00															
2:30															
3:00															
3:30															
4:00															
4:30															
5:00															
5:30	2		1	4			3	10	7	5	5	7	5	5	6
6:00															
6:30		5			5	2		12	5	10	7	7	7	7	5
7:00															
7:30															
8:00															
8:30	1	3		3			4	11	7	6	3	7	5	8	8
9:00															
9:30															
10:00															
10:30															
11:00	2		5		3	5		15	7	8	13	8	10	7	7
11:30															
12:00															
12:30															
13:00															
13:30															
14:00															
14:30															
15:00	3	3	2		2	3		13	8	7	7	5	8	9	8
15:30															
16:00		4		4	2		4	14	8	10	6	10	6	8	8
16:30															
17:00															
17:30															
18:00	1	1	2	2		2	2	10	6	5	6	6	5	6	6
18:30															
19:00															
19:30															
20:00	1		4			3	2	10	5	4	7	5	6	6	7
20:30															
21:00															
21:30															
22:00															
22:30															
23:00															
23:30															
EMPLOYEE TOTAL WITH 22.6% ABSENCE FACTOR								114							
TOTAL NUMBER OF SUB-SHIFTS								43							

APPENDIX H

SURVEY OF COMPARABLE JURISDICTIONS

We surveyed similar emergency communications centers regarding workweeks. The results are shown below.

Jurisdiction	Type of Work Schedule	Attend Briefings (Y/N)
San Diego, California	Call-takers and radio channel operators started working on a 4-day, 10-hour workweek on a trial basis in September 1994, and the trial period will end April 1995. The change is reportedly working well with enough coverage for the workload. The shift pattern is five shifts beginning at 5:40 a.m., 10 a.m., 3 p.m., 7:30 p.m., and 11:30 p.m. The dispatchers receive an unpaid lunch; thus, they are at the Center for 10 1/2 hours each day. The dispatchers attend a 20-minute briefing prior to performing call-answering and work tasks. If briefing lasts less than 20 minutes, they begin their work tasks as soon as briefing is over. Prior to September 1994, San Diego had three watches for call-takers: 7 a.m. to 3 p.m., 3 p.m. to 11 p.m.; and 11 p.m. to 7 a.m. The radio channel operators had five shifts to ensure coverage at peak hours. The dispatchers receive an unpaid lunch; thus, they were at the Center for 8 hours and 20 minutes each day. Thus, effectively San Diego paid the dispatchers 10 minutes of the lunch period per day.	Yes. The dispatchers attend briefings without field officers that last about 20 minutes. Information for briefings is received by fax or sent interoffice from the different units such as burglary unit, sex crimes unit, etc. The San Diego communications division believes that the briefings help alert the dispatchers to identifying criminal suspects when taking calls because they are the first to receive information on subsequent incidents.

Jurisdiction	Type of Work Schedule	Attend Briefings (Y/N)
Phoenix, Arizona	911 call-takers are on both 4-day, 10-hour and 5-day, 8-hour workweeks based on seniority bidding. Approximately 50 to 52 911 call-takers are on 4-day, 10-hour workweeks, with 16 to 18 on a 5-day, 8-hour workweek. All the radio operators are on a 5-day, 8-hour workweek. The radio channel operators have a fixed amount of staffing hours. On the other hand, the 911 call-takers' staffing hours are staggered to provide better service to citizens during peak activity and also to level out the number of calls the dispatchers handle. 911 call-takers use the following schedule: Watch I starts at 6 a.m. The starting times for call-takers are at 6 a.m., 7:30 a.m., 8 a.m., and 10 a.m. Watch II starts at noon. The starting times for call-takers are at noon, 1 p.m., 2 p.m., 3 p.m., 4 p.m., and 5 p.m. Watch III starts at 6 p.m., Starting times are 6 p.m., 8 p.m. and 10 p.m.	No.
Oakland, California	Dispatchers are on a 5-day, 8-hour workweek. The employees are currently negotiating for a certain percentage of dispatchers to work a 4-day, 10-hour workweek. A certain percentage of police officers work a 4-day, 10-hour workweek. The remainder work 5-day, 8-hour workweeks.	No. The dispatchers do not attend briefings, and briefings are not a factor in switching to 4-day, 10-hour workweeks. Dispatchers want it primarily for child care purposes.
Santa Clara County	5-day, 8-hour workweek. The three watches are 7 a.m. to 3 p.m., 3 p.m. to 11 p.m., and 11 p.m. to 7 a.m.	No.

Jurisdiction	Type of Work Schedule	Attend Briefings (Y/N)
Portland, Oregon	4-day, 10-hour workweek. They have six watches beginning at 2 a.m., 8 a.m., noon, 4 p.m., 6 p.m., and 10 p.m.	No. Dispatchers do not attend briefings on a regular basis. When a major incident occurs, dispatchers involved in the particular incident may attend de-briefings with field officers.

Of the five centers we surveyed, three centers solely or primarily use the 4-day, 10-hour workweek. Two of these centers have more than five starting times. Portland and Phoenix management believe that the 4-day, 10-hour workweek helps staffing in proportion to call volume. The San Diego center has changed to the 4-day, 10-hour workweek primarily for employee morale. San Diego is the only center we surveyed that provides dispatcher briefings; however, they are not held together with the field officers. Phoenix staggers its shifts in order to provide better service.

Supervision

We asked a Phoenix police communications shift supervisor how they handle supervision with the staggered shifts. During each watch, the call-takers are assigned to the senior dispatcher who sees them the most during the workweek. The assigned senior dispatcher is responsible for evaluations. If an employee has a problem which requires supervisory attention when the employee's senior dispatcher is not available, then the employee discusses the situation with a senior dispatcher who also is on the watch. The senior dispatcher who was present during the incident will inform the senior dispatcher responsible for the employee. Normally, the three will sit down and discuss the problem. The Phoenix shift supervisor believes this process works well.

APPENDIX I
CONTINUITY OF SUPERVISION

As noted in Finding I, the Communications Division's management is concerned about the possible deterioration of supervision when using more shifts. Therefore, we compared the continuity of supervision under the current and proposed shift patterns. Our analysis focuses on senior PSDs who supervise PSD Is and IIs. The Division's supervision staff includes 12 senior PSDs who supervise PSD Is and IIs and 6 supervising PSDs who supervise the senior PSDs. We compared the Communications Center's senior PSD schedules to its current 5-shift PSD I and II schedules with TRAC and to the 10-shift PSD schedule shown in Table 10. Additionally, we optimized senior PSD schedules and compared this outcome to the 10-shift PSD I and II schedule.

We reviewed the supervision level relating to the PSD Is' and IIs' perspective using the current 5-shift pattern with TRAC. The PSD Is' and IIs' perspective in Chart I-1 shows overall continuity of supervision at 74 percent. Chart I-1 also shows that only 29 PSD Is and IIs out of 124 will see at least one senior PSD for 100 percent of their shift. We also reviewed supervision workload, as measured by the ratio of PSD Is and IIs to one senior PSD. Under the current 5-shift pattern, the senior PSDs will have an average workload of 10.3 PSD Is and IIs to one senior PSD and will be divided amongst the senior PSDs with a spread of 6.4, ranging between a low of 8.9 to a high of 15.4. For hourly comparison of these senior PSD sub-shift average workloads see Graph I-1.

CHART I-1

CURRENT 5 SHIFTS

PSD Is' AND IIs' PERSPECTIVE OF SUPERVISION

START TIME	DAYS OFF	DAYS ON	SCHEDULED PSD Is AND IIs	AMOUNT OF LARGEST CONTRIBUTOR OF CONTINUITY OF SUPERVISION	NUMBER OF SENIOR PSDs CONTRIBUTING TO THE INDICATED SUPERVISION
6:00	S,M,T	W,TH,F,S	4	100%	2
6:00	M,T,W	TH,F,S,S	3	75%	2
6:00	T,W,TH	F,S,S,M	8	50%	4
6:00	W,TH,F	S,S,M,T	5	75%	2
6:00	TH,F,S	S,M,T,W	2	100%	2
6:00	F,S,S	M,T,W,TH	5	79%	1
6:00	S,S,M	T,W,TH,F	5	75%	2
8:00	S,M,T	W,TH,F,S	2	79%	2
8:00	M,T,W	TH,F,S,S	4	59%	2
8:00	T,W,TH	F,S,S,M	4	39%	4
8:00	W,TH,F	S,S,M,T	2	59%	2
8:00	TH,F,S	S,M,T,W	2	79%	2
8:00	F,S,S	M,T,W,TH	5	100%	1
8:00	S,S,M	T,W,TH,F	3	75%	1
15:00	S,M,T	W,TH,F,S	5	100%	2
15:00	M,T,W	TH,F,S,S	4	75%	2
15:00	T,W,TH	F,S,S,M	4	50%	4
15:00	W,TH,F	S,S,M,T	5	75%	2
15:00	TH,F,S	S,M,T,W	5	100%	2
15:00	F,S,S	M,T,W,TH	3	75%	2
15:00	S,S,M	T,W,TH,F	5	75%	2
18:00	S,M,T	W,TH,F,S	1	68%	4
18:00	M,T,W	TH,F,S,S	1	51%	4
18:00	T,W,TH	F,S,S,M	2	34%	4
18:00	W,TH,F	S,S,M,T	1	51%	3
18:00	TH,F,S	S,M,T,W	2	68%	3
18:00	F,S,S	M,T,W,TH	1	51%	3
18:00	S,S,M	T,W,TH,F	2	51%	4
21:00	S,M,T	W,TH,F,S	4	100%	2
21:00	M,T,W	TH,F,S,S	4	75%	2
21:00	T,W,TH	F,S,S,M	6	50%	3
21:00	W,TH,F	S,S,M,T	4	75%	1
21:00	TH,F,S	S,M,T,W	4	100%	1
21:00	F,S,S	M,T,W,TH	5	75%	1
21:00	S,S,M	T,W,TH,F	4	75%	2

TOTAL PSD Is AND IIs **124**

OVERALL CONTINUITY OF SUPERVISION **74%**

CURRENT 5 SHIFTS

SENIOR PSDs' PERSPECTIVE OF SUPERVISION

START TIME	DAYS OFF	DAYS ON	SCHEDULED SENIOR PSDs	AVERAGE WORKLOAD (PSD Is and IIs to one senior PSD)
6:00	S,M,T	W,TH,F,S	2	10.6 -to- 1
6:00	TH,F,S	S,M,T,W	2	9.3 -to- 1
8:30	F,S,S	M,T,W,TH	1	8.9 -to- 1
15:00	S,M,T	W,TH,F,S	2	10.0 -to- 1
15:00	TH,F,S	S,M,T,W	2	10.7 -to- 1
21:00	S,M,T	W,TH,F,S	2	9.2 -to- 1
21:00	TH,F,S	S,M,T,W	1	15.4 -to- 1

TOTAL SENIOR PSDs **12**

AVERAGE FOR COMMUNICATIONS CENTER **10.3 -to- 1**

SPREAD **6.43**

CHART I-2

OPTIMIZED 10 SHIFTS, CURRENT SUPERVISION

PSD Is' AND IIs' PERSPECTIVE OF SUPERVISION

START TIME	DAYS OFF	DAYS ON	SCHEDULED PSD Is AND IIs	AMOUNT OF LARGEST CONTRIBUTOR OF CONTINUITY OF SUPERVISION	NUMBER OF SENIOR PSDs CONTRIBUTING TO THE INDICATED SUPERVISION
1:00	S,M,T	W,TH,F,S	2	47%	2
1:00	M,T,W	TH,F,S,S	1	53%	2
1:00	T,W,TH	F,S,S,M	1	39%	2
1:00	F,S,S	M,T,W,TH	1	58%	1
2:00	M,T,W	TH,F,S,S	2	43%	2
2:00	T,W,TH	F,S,S,M	1	32%	2
2:00	W,TH,F	S,S,M,T	4	43%	2
2:00	F,S,S	M,T,W,TH	3	79%	1
2:00	S,S,M	T,W,TH,F	4	43%	2
6:00	S,M,T	W,TH,F,S	3	100%	2
6:00	M,T,W	TH,F,S,S	2	75%	2
6:00	W,TH,F	S,S,M,T	1	75%	2
6:00	TH,F,S	S,M,T,W	4	100%	2
7:00	T,W,TH	F,S,S,M	5	45%	4
7:00	F,S,S	M,T,W,TH	5	79%	1
7:00	S,S,M	T,W,TH,F	2	67%	2
9:00	S,M,T	W,TH,F,S	4	68%	2
9:00	M,T,W	TH,F,S,S	1	51%	2
9:00	T,W,TH	F,S,S,M	3	34%	4
9:00	TH,F,S	S,M,T,W	3	75%	2
11:30	M,T,W	TH,F,S,S	2	43%	2
11:30	W,TH,F	S,S,M,T	5	43%	2
11:30	F,S,S	M,T,W,TH	3	74%	1
11:30	S,S,M	T,W,TH,F	5	55%	1
15:30	M,T,W	TH,F,S,S	3	75%	2
15:30	T,W,TH	F,S,S,M	3	50%	4
15:30	W,TH,F	S,S,M,T	2	75%	2
15:30	F,S,S	M,T,W,TH	2	75%	2
15:30	S,S,M	T,W,TH,F	3	75%	2
16:30	S,M,T	W,TH,F,S	4	89%	2
16:30	T,W,TH	F,S,S,M	4	45%	4
16:30	TH,F,S	S,M,T,W	4	89%	2
16:30	F,S,S	M,T,W,TH	2	67%	2
18:30	S,M,T	W,TH,F,S	2	79%	2
18:30	M,T,W	TH,F,S,S	1	59%	2
18:30	T,W,TH	F,S,S,M	1	39%	2
18:30	W,TH,F	S,S,M,T	2	51%	2
18:30	TH,F,S	S,M,T,W	2	68%	2
18:30	S,S,M	T,W,TH,F	2	59%	2
20:30	S,M,T	W,TH,F,S	2	100%	2
20:30	M,T,W	TH,F,S,S	1	75%	2
20:30	W,TH,F	S,S,M,T	4	36%	3
20:30	S,S,M	T,W,TH,F	3	75%	2

TOTAL PSD Is AND IIs **114**

OVERALL CONTINUITY OF SUPERVISION **64%**

OPTIMIZED 10 SHIFTS, CURRENT SUPERVISION

SENIOR PSDs' PERSPECTIVE OF SUPERVISION

START TIME	DAYS OFF	DAYS ON	SCHEDULED SENIOR PSDs	AVERAGE WORKLOAD (PSD Is and IIs to one senior PSD)
6:00	S,M,T	W,TH,F,S	2	10.2 -to- 1
6:00	TH,F,S	S,M,T,W	2	9.4 -to- 1
8:30	F,S,S	M,T,W,TH	1	8.6 -to- 1
15:30	S,M,T	W,TH,F,S	2	9.4 -to- 1
15:30	TH,F,S	S,M,T,W	2	9.7 -to- 1
20:30	S,M,T	W,TH,F,S	2	7.9 -to- 1
20:30	TH,F,S	S,M,T,W	1	12.3 -to- 1

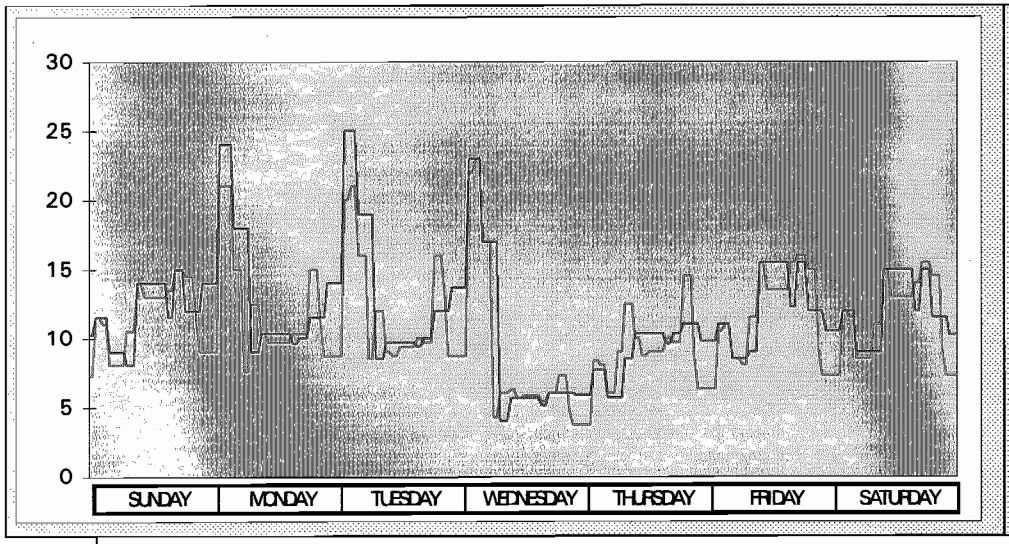
TOTAL SENIOR PSDs **12**

AVERAGE FOR COMMUNICATIONS CENTER **9.5 -to- 1**

SPREAD **4.34**

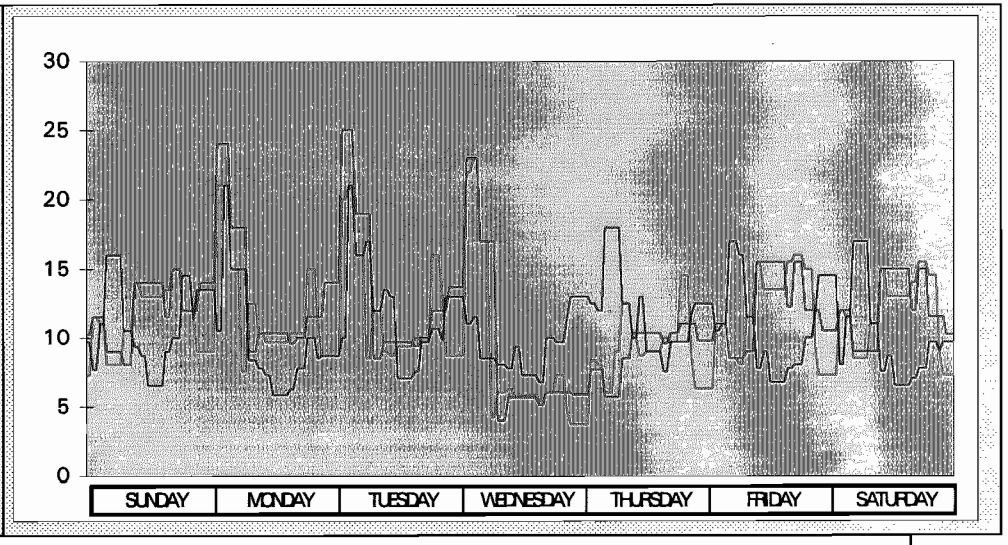
GRAPH I-1

COMPARISON OF RATIOS OF CURRENT PSD I AND II DEPLOYMENT TO CURRENT SENIOR PSD DEPLOYMENT AND OPTIMIZED 10-SHIFT PSD I AND II DEPLOYMENT TO CURRENT SENIOR PSD DEPLOYMENT



GRAPH I-2

COMPARISON OF RATIOS OF CURRENT PSD I AND II DEPLOYMENT TO CURRENT SENIOR PSD DEPLOYMENT; OPTIMIZED 10-SHIFT PSD I AND II DEPLOYMENT TO CURRENT SENIOR PSD DEPLOYMENT; AND 10-SHIFT OPTIMIZED PSD I AND II DEPLOYMENT TO OPTIMIZED SENIOR PSD DEPLOYMENT



Ratio of Current PSD I and II Deployment to Current Senior PSD Deployment

Ratio of 10-Shift Optimized PSD I and II Deployment to Current Senior PSD Deployment

Ratio of 10-Shift Optimized PSD I and II Deployment to Optimized Senior PSD Deployment

We also reviewed the supervision level relating to the PSD Is' and IIs' perspective using the optimized 10-shift deployment. The PSDs' perspective as shown in Chart I-2 shows overall continuity of supervision at 64 percent. Chart I-2 also shows that only 9 PSDs out of 114 will see at least one senior for 100 percent of their shift. We also reviewed supervision workload, as measured by the ratio of PSDs to one senior. Under the optimized 10-shift deployment, the senior PSDs will have an average workload of 9.5 PSDs to one senior PSD and will be divided amongst the senior PSDs with a spread of 4.34 ranging between a low of 7.92 to a high of 12.26. For hourly comparison of these senior sub-shift average workloads see Graph I-2.

As shown on Charts I-1 and I-2, our analysis reveals a decrease in the continuity of supervision and an increase in the distribution of the supervision workload. One notable factor between the current 5-shift pattern and the optimized 10-shift pattern is that the number of sub-shifts increases only from 35 sub-shifts to 43 sub-shifts. The result is that the continuity of supervision decreases from 74 to 64 percent. However, the ratio of PSD Is and IIs to senior PSDs improves from 10.3 to 9.5 percent, and the distribution of the workload among the senior PSDs improves from an average spread of 6.4 to 4.3.

We acknowledge Division management's concerns regarding continuity of supervision for both subordinates and supervisors. The supervison schedule allows seniors and supervisors to attend weekly and/or biweekly supervisor meetings on Wednesdays. Nonetheless, in order to improve the continuity of supervision under the optimized 10-shift pattern, we optimized the senior PSD schedules and compared them to the optimized 10-shift pattern. The PSDs' perspective as shown in Chart I-3 shows overall continuity of supervision at 81 percent. Chart I-3 also shows that 45 PSDs out of 114 will see at least one senior for 100 percent of their shift. We also reviewed supervision workload, as measured by the ratio of PSDs to one senior. Under the optimized senior PSDs schedule, senior PSDs would have an average workload of 9.5 PSDs to one senior PSD, divided amongst the senior PSDs with a spread of 5.17 ranging between a low of 7.4 to a high of 12.6. For hourly comparison of these senior sub-shift average workloads see Graph I-2.

CHART I-3

OPTIMIZED 10 SHIFTS, OPTIMIZED SUPERVISION					
PSD Is' AND IIs' PERSPECTIVE OF SUPERVISION					
START TIME	DAYS OFF	DAYS ON	SCHEDULED PSD Is AND IIs	AMOUNT OF LARGEST CONTRIBUTOR OF CONTINUITY OF SUPERVISION	NUMBER OF SENIOR PSDs CONTRIBUTING TO THE INDICATED SUPERVISION
1:00	S,M,T	W,TH,F,S	2	100%	1
1:00	M,T,W	TH,F,S,S	1	75%	1
1:00	T,W,TH	F,S,S,M	1	50%	1
1:00	F,S,S	M,T,W,TH	1	50%	1
2:00	M,T,W	TH,F,S,S	2	67%	1
2:00	T,W,TH	F,S,S,M	1	47%	1
2:00	W,TH,F	S,S,M,T	4	43%	1
2:00	F,S,S	M,T,W,TH	3	47%	1
2:00	S,S,M	T,W,TH,F	4	67%	1
6:00	S,M,T	W,TH,F,S	3	68%	1
6:00	M,T,W	TH,F,S,S	2	67%	1
6:00	W,TH,F	S,S,M,T	1	75%	1
6:00	TH,F,S	S,M,T,W	4	100%	1
7:00	T,W,TH	F,S,S,M	5	100%	1
7:00	F,S,S	M,T,W,TH	5	100%	1
7:00	S,S,M	T,W,TH,F	2	75%	1
9:00	S,M,T	W,TH,F,S	4	100%	1
9:00	M,T,W	TH,F,S,S	1	75%	2
9:00	T,W,TH	F,S,S,M	3	100%	1
9:00	TH,F,S	S,M,T,W	3	68%	1
11:30	M,T,W	TH,F,S,S	2	55%	2
11:30	W,TH,F	S,S,M,T	5	100%	1
11:30	F,S,S	M,T,W,TH	3	75%	1
11:30	S,S,M	T,W,TH,F	5	100%	1
15:30	M,T,W	TH,F,S,S	3	67%	1
15:30	T,W,TH	F,S,S,M	3	89%	1
15:30	W,TH,F	S,S,M,T	2	67%	1
15:30	F,S,S	M,T,W,TH	2	100%	1
15:30	S,S,M	T,W,TH,F	3	75%	1
16:30	S,M,T	W,TH,F,S	4	79%	1
16:30	T,W,TH	F,S,S,M	4	100%	1
16:30	TH,F,S	S,M,T,W	4	67%	1
16:30	F,S,S	M,T,W,TH	2	89%	1
18:30	S,M,T	W,TH,F,S	2	100%	1
18:30	M,T,W	TH,F,S,S	1	75%	1
18:30	T,W,TH	F,S,S,M	1	79%	1
18:30	W,TH,F	S,S,M,T	2	79%	1
18:30	TH,F,S	S,M,T,W	2	59%	1
18:30	S,S,M	T,W,TH,F	2	75%	1
20:30	S,M,T	W,TH,F,S	2	79%	1
20:30	M,T,W	TH,F,S,S	1	59%	1
20:30	W,TH,F	S,S,M,T	4	100%	1
20:30	S,S,M	T,W,TH,F	3	59%	1
	TOTAL PSD Is AND IIs		114		
	OVERALL CONTINUITY OF SUPERVISION			81%	

OPTIMIZED 10 SHIFTS, OPTIMIZED SUPERVISION				
SENIOR PSDs' PERSPECTIVE OF SUPERVISION				
START TIME	DAYS OFF	DAYS ON	SCHEDULED SENIOR PSDs	AVERAGE WORKLOAD (PSD Is and IIs to one senior PSD)
1:00	S,M,T	W,TH,F,S	1	11.8 -to- 1
6:00	TH,F,S	S,M,T,W	1	8.8 -to- 1
7:00	T,W,TH	F,S,S,M	1	7.8 -to- 1
7:00	F,S,S	M,T,W,TH	1	8.6 -to- 1
9:00	S,M,T	W,TH,F,S	1	8.1 -to- 1
9:00	T,W,TH	F,S,S,M	1	7.4 -to- 1
11:30	W,TH,F	S,S,M,T	1	8.2 -to- 1
11:30	S,S,M	T,W,TH,F	1	8.6 -to- 1
15:30	F,S,S	M,T,W,TH	1	10.3 -to- 1
16:30	T,W,TH	F,S,S,M	1	10.5 -to- 1
18:30	S,M,T	W,TH,F,S	1	11.3 -to- 1
20:30	W,TH,F	S,S,M,T	1	12.6 -to- 1
	TOTAL SENIOR PSDs		12	
	AVERAGE FOR COMMUNICATIONS CENTER			9.5 -to- 1
			SPREAD	5.17