OFFICE OF THE
CITY AUDITOR

ANALYSIS OF THE NUMBER OF PUBLIC SAFETY DISPATCHER POSITIONS REQUIRED TO ADEQUATELY STAFF THE TWO NEW POLICE RADIO CHANNELS

A REPORT TO THE
CITY OF SAN JOSE
FINANCE COMMITTEE

DECEMBER 1997

97-08

CITY OF SAN JOSÉ, CALIFORNIA

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Honorable Mayor and
Members of the City Council
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Transmitted herewith are the results of the City Auditor's analysis of the number of Public Safety Dispatcher (PSD) positions required to adequately staff the two new police radio channels. The results include the City Auditor's analysis, conclusions, and recommendations.

The City Auditor's analysis indicates that the most prudent staffing option requires 10 additional PSD positions plus a Senior PSD. However, our review also found that a staffing option requiring only 7 additional PSD positions plus a Senior PSD may also be viable. However, the viability of this option cannot be proven until further analysis is performed at least six months after the Police Department implements its new redistricting plan.

Based on our analysis, we recommend the following:

1. The Police Department immediately hire 10 PSDs plus a Senior PSD so that training will be completed in time for the start of redistricting in September 1998.
2. The City Council authorize two additional permanent PSD positions and three overstrength PSD positions for 1997-98 and 1998-99.
3. The City Council direct the City Auditor to review police channel utilization six months after the implementation of redistricting and initiation of dispatching on eight channels, to determine if a less costly staffing option is viable.

The City Auditor's analysis, conclusions, and recommendations were discussed with the City Manager's Office and the Police Department.

The City Auditor will present the results of this analysis at the December 10, 1997, Finance Committee meeting.

Respectfully submitted,

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City Auditor

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BACKGROUND

Audit Request

During a June 1997 City Council meeting, the City Manager requested that the City Council direct the City Auditor to perform a review of the staffing needs for the two new police radio channels. These channels were scheduled to be operational in September 1998, in conjunction with the San Jose Police Department's (SJPD) Redistricting Project. Specifically, the City Manager requested that the City Auditor work with the SJPD and the City Manager's Office to develop a prudent approach to staffing the two new radio channels without jeopardizing field response times, officer and citizen safety or the SJPD's Redistricting Project. The City Manager also recommended and the City Council approved a 1997-98 General Fund appropriation and authorization for five Public Safety Dispatcher (PSD) IIs to staff one of the two new radio channels. In addition, the City Manager recommended and the City Council approved $331,000 in the 1997-98 General Fund Budget for five additional PSD IIs and one Senior PSD to staff the second new radio channel. Even though funding was provided for these six additional positions for the second new radio channel, the positions themselves were not authorized pending the results of the City Auditor's study.

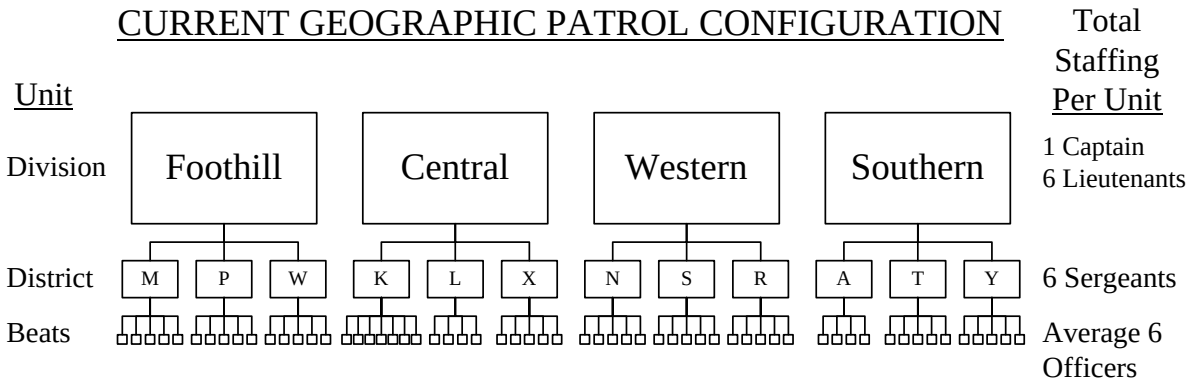
Effect of Redistricting on Radio Channel Requirements and Staffing

Since 1986, the SJPD had divided San Jose into three geographic patrol divisions - the Foothill, Central and Western and staffed each division to provide 24 hour per day, seven day a week coverage. Each Division had one captain and six lieutenants. Each division was sub-divided into four districts with six sergeants per district. Each district was further divided into beats, with an average of six officers per beat.[1] In spring 1997, a fourth division, the Southern Division was created and one captain and six lieutenants were added to staff the Southern Division. This new geographic patrol configuration is shown on Chart I.

[1] On duty during each shift there is one lieutenant per division, one sergeant per district, and an average of one officer per beat.

CHART I

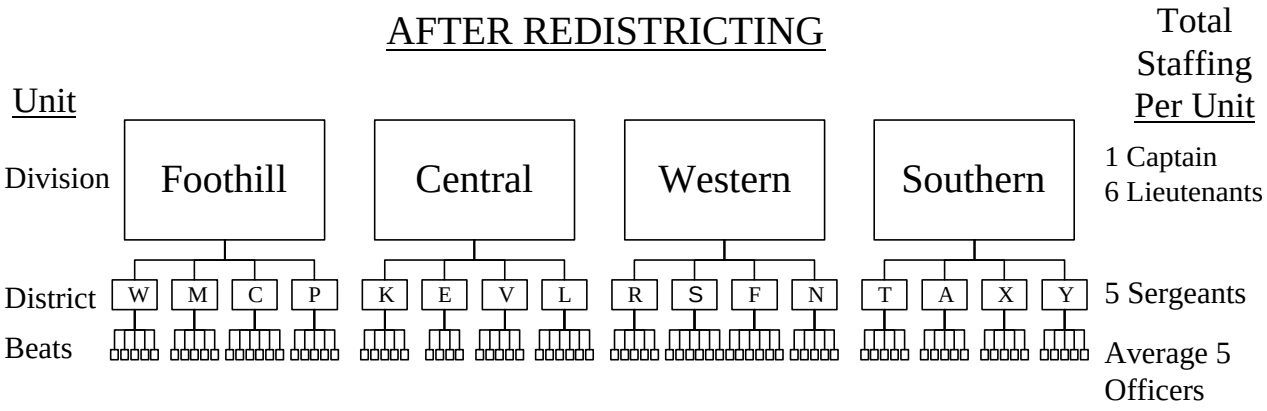
CURRENT GEOGRAPHIC PATROL CONFIGURATION



Due to geographic and demographic changes in the City, the SJPD began a Redistricting Project to equalize patrol officer calls for service workload and priority levels. The redistricting project will result in 16 districts and 83 beats and is illustrated below.

CHART II

GEOGRAPHIC PATROL CONFIGURATION AFTER REDISTRICTING



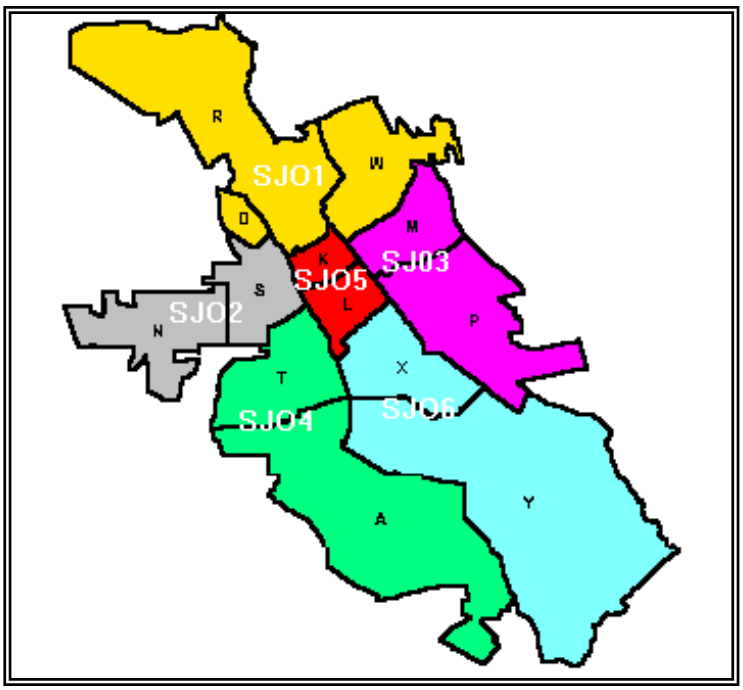
The Police Department plans to implement its Redistricting Plan at the September 1998 shift change.

Radio Dispatching

Under the current configuration, the Communications Division operates 6 radio channels for 12 districts; thus each radio channel carries two districts. Channel 1 also carries the Airport. This configuration is illustrated in Map I.

MAP I

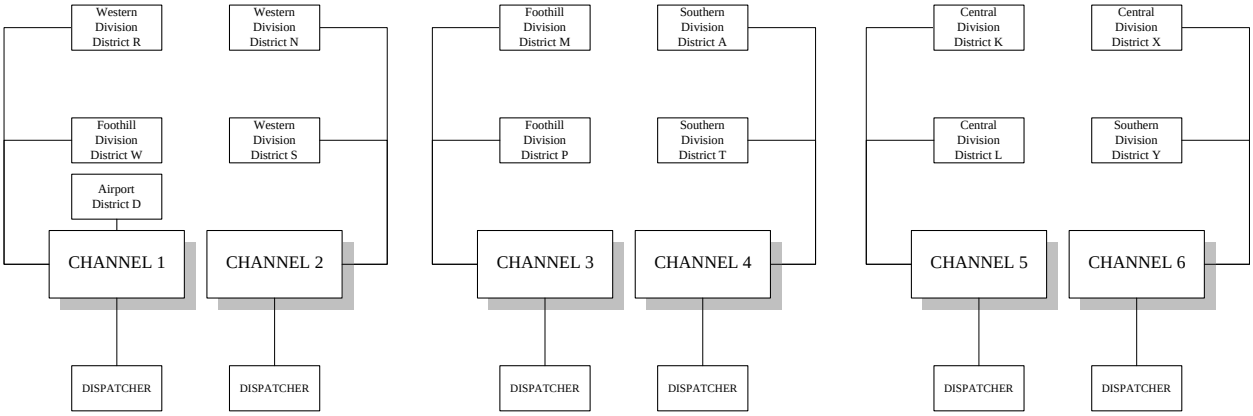
CURRENT RADIO CHANNEL DIVISION/DISTRICT ASSIGNMENTS



INDEX TO MAP I		
Color	**Channel**	**Division/District**
Yellow	1	Western/R
Yellow	1	Foothill/W
Yellow	1	Airport/D
Grey	2	Western/N
Grey	2	Western/S
Purple	3	Foothill/M
Purple	3	Foothill/P
Green	4	Southern/A
Green	4	Southern/T
Red	5	Central/K
Red	5	Central/L
Blue	6	Central/X
Blue	6	Southern/Y

Chart III also depicts the current Division/District to radio channel configuration.

CHART III
CURRENT DIVISION/DISTRICT TO RADIO CHANNEL CONFIGURATION
6 DISPATCHERS WORKING WITH 6 RADIO CHANNELS

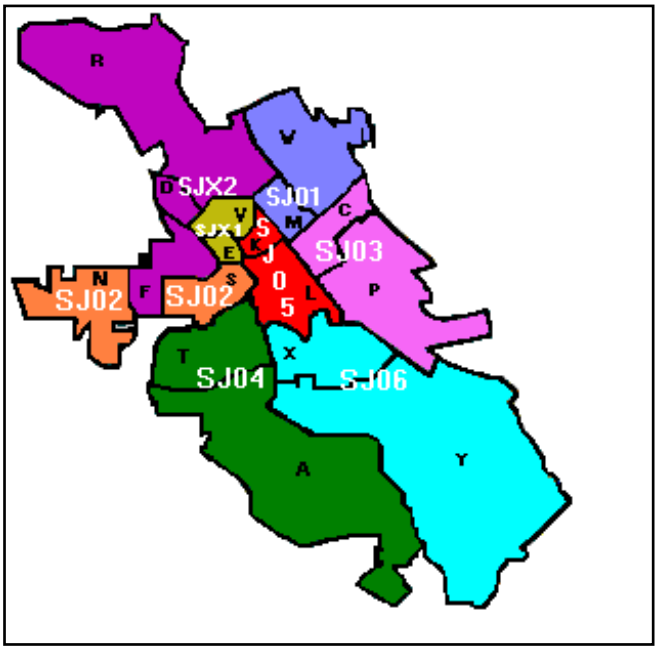


In addition to the radio channels shown above, the SJPD has three back up channels that are available to the Bureau of Field Operations Special Units, Bureau of Investigation and other special units. Also, there are three data channels that officers can use to communicate with PSDs on their mobile data units (MDTs). The SJPD recently upgraded two existing channels to a higher speed, and installed a third data channel. All three channels operate at the same high speed and are used with new lap top computers that were recently installed in all patrol cars.

Upon implementation of redistricting, the Communications Division will operate 8 radio channels for 16 districts; thus each radio channel will continue to carry two districts. Of the two new radio channels, one (Channel X2) will also carry the Airport. Map II illustrates the radio channel to Division/District configuration after redistricting:

MAP II

RADIO CHANNEL DIVISION/DISTRICT
ASSIGNMENTS AFTER REDISTRICTING



INDEX TO MAP II		
Color	**Channel**	**Division/District**
Dark Blue	1	Foothill/W
Dark Blue	1	Foothill/M
Orange	2	Western/N
Orange	2	Western/S
Pink	3	Foothill/C
Pink	3	Foothill/P
Green	4	Southern/T
Green	4	Southern/A
Red	5	Central/K
Red	5	Central/L
Light Blue	6	Southern/X
Light Blue	6	Southern/Y
Yellow	X1	Central/V
Yellow	X1	Central/E
Purple	X2	Airport/D
Purple	X2	Western/R
Purple	X2	Western/F

Radio Channel Utilization

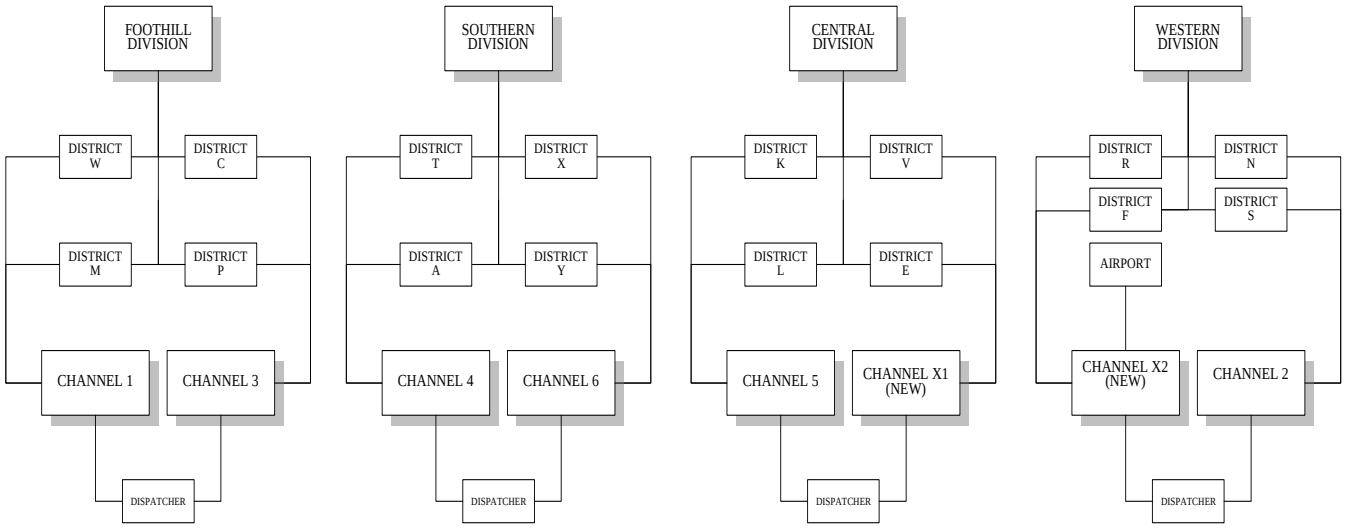
Radio channel utilization is the total amount of time elapsed during a voice communication transaction between a dispatcher and officer on a radio channel. According to SJPD management and other jurisdictions, 50 percent radio channel utilization is an acceptable industry standard. In September 1996, the Police Department purchased computer software that measures the radio channel utilization. However, to measure the radio channel utilization, a support position in the Communications Division must run daily radio channel tapes. As a result, the Communications Division produces channel utilization reports only when requested to do so. It should be noted that the channel utilization software does not measure "Code 33" activity. A "Code 33" is when an officer or dispatcher requests that other officers limit use of a radio channel for safety reasons. For example, the City Auditor's staff observed a dispatcher receiving a "Code 33" when police officers were entering a building where a reported burglary was in progress.

Simulcasting

During simulcasting, each dispatcher handles two channels and four districts instead of one channel and two districts. With simulcasting, police officers continue to operate on their assigned channels. According to the Communications Division Manager, the normal simulcast period is from 4 a.m. to 7 a.m.[2] Chart IV shows the projected simulcasting configuration and the SJPD's district to radio channel configuration after Redistricting.

[2] The Budget Office allocates staffing to the Communications Division based on a simulcast period between 3 a.m. to 7 a.m.

CHART IV
GEOGRAPHIC PATROL TO RADIO CHANNEL CONFIGURATION AFTER REDISTRICTING DURING SIMULCASTING
4 DISPATCHERS WORKING WITH 8 CHANNELS, 4 DIVISIONS AND 16 DISTRICTS



SCOPE AND METHODOLOGY

The purpose of our audit was to determine the most appropriate number of PSD positions needed to staff the two new police radio channels, taking into consideration workload issues and officer and citizen safety. To conduct our audit, we obtained four weeks of data on radio channel utilization, estimated radio channel utilization under the SJPD's Redistricting plan and analyzed radio channel utilization rates under various PSD staffing options.

CURRENT AND PROJECTED RADIO CHANNEL UTILIZATION AFTER REDISTRICTING

We reviewed current radio channel utilization and projected radio channel utilization after redistricting. Specifically, we reviewed radio channel utilization data for the weeks ended April 12, May 17, June 21 and July 12, 1997. In order to estimate the radio channel utilization after redistricting we assumed that the workload would be equally distributed among the available number of radio channels. We also estimated radio channel utilization during simulcasting periods.

Staffing Options

We determined various staffing options by reviewing the channel utilization data assuming a 50 percent radio channel utilization standard and allowing for current operational processes and constraints. Such processes and constraints include officer and citizen safety, span of control and Division integrity. Further, we considered less than full staffing for periods of lower radio channel utilization. Due to time constraints, we limited our analysis to the radio channel staffing of the Communications Division.

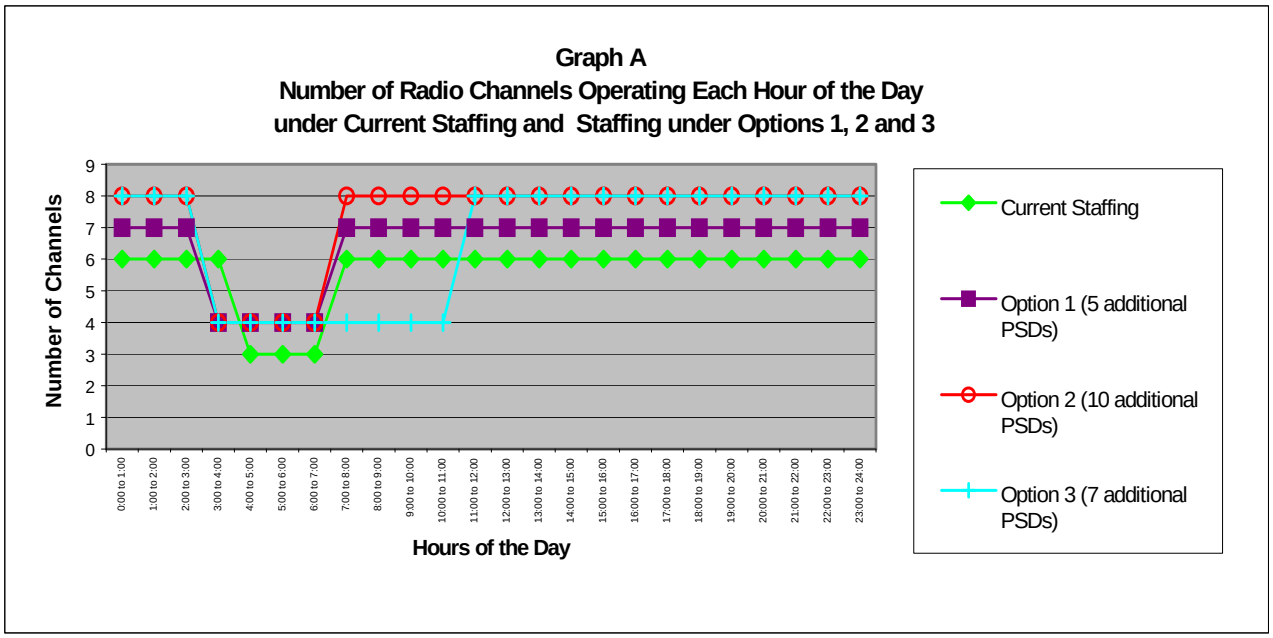
Audit Results

We developed various staffing options and compared those options with the current radio channel staffing. We then selected three radio channel staffing options for presentation to the Administration and the Finance Committee. For these three options we compared the number of PSDs needed and the associated advantages and disadvantages. Table I summarizes the current radio channel staffing and compares it to the three radio channel staffing options we selected for presentation.

TABLE I CURRENT RADIO CHANNEL STAFFING PATTERN AND OPTIONS				
	Current Staffing Pattern	**Option 1** **Five Additional PSDs**	**Option 2** **Ten Additional PSDs**	**Option 3** **Seven Additional PSDs**
Staffing Pattern[3]	3 a.m. to 7 a.m. - Three PSDs handle two simulcast channels each (four districts each). 7 a.m. to 3 a.m. - Six PSDs dispatch two districts each.	3 a.m. to 7 a.m. – Four PSDs handle two simulcast channels each (four districts each). 7 a.m. to 3 a.m. – Seven PSDs. Five PSDs dispatch two districts each and two PSDs dispatch three districts each.	3 a.m. to 7 a.m. – Four PSDs handle two simulcast channels each (four districts each). 7 a.m. to 3 a.m. – Eight PSDs dispatch two districts each.	3 a.m. to 11 a.m. – Four PSDs handle two simulcast channels each (four districts each). 11 a.m. to 3 a.m. – Eight PSDs dispatch two districts each.
Incremental PSDs	N/A	5	10	7
Total PSDs	34	39	44	41
Incremental Cost	N/A	$287,970	$575,940	$403,158
Advantages	• Each channel handles two districts under the current 12 district configuration.	• Reduced channel utilization on five of the seven channels when compared to the current channel utilization. The channel utilization on five of the seven channels is the same as the channel utilization on Option 2. Least costly option.	• Provides full staffing of the two new channels with the exception of the normal simulcasting period. Produces the lowest channel utilization.	• Provides for full staffing of the two new channels during the busiest shift of the day, the swing shift. Requires less staffing during periods of lower channel utilization by extending simulcasting from 7 am to 11 a.m. Less costly than Option 2, but provides the same radio channel utilization during busiest periods.
Disadvantages	• High actual channel utilization rates. Daily maximum channel utilizations as high as 94%.	• High channel utilization rates for the two channels with three districts each with daily projected utilizations as high as 82%. When a sergeant is absent or vacancies occur, a sergeant covering 2 districts may need to listen to two channels. Operational difficulties may compromise officer or citizen safety.	• More expensive than Options 1 and 3. • May provide excessive coverage during the 7 a.m. to 11 a.m. time period.	• Study limitations preclude estimating peak radio channel utilization data or exact district radio traffic after redistricting.

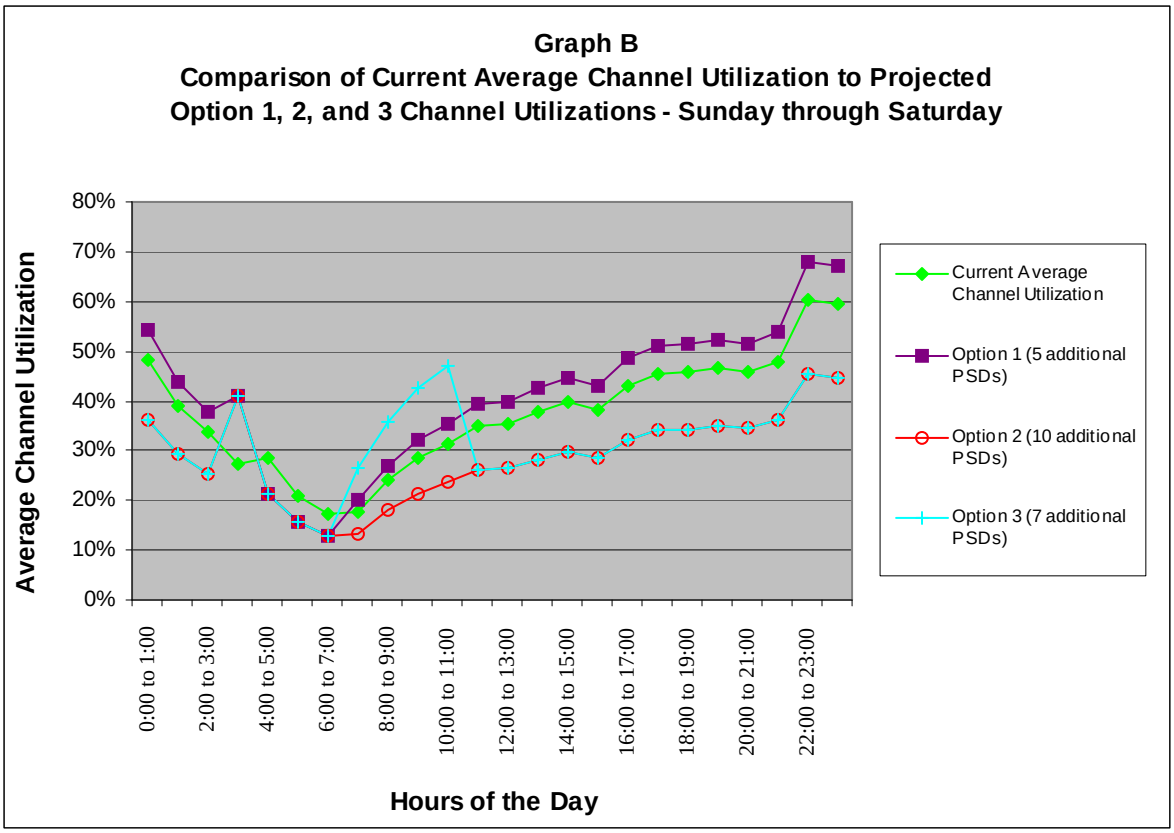
[3] Staffing pattern is for primary radio channels only.

The primary differences between the current staffing pattern and Options 1, 2 and 3 are the number of radio channels operating throughout the day and resultant channel utilization. Graph A shows the number of channels in operation each hour of the day under current staffing and staffing under Options 1, 2 and 3.



Graph A shows that Options 1 and 2 provide for more radio channels than current operations from 7 a.m. to 3 a.m. Option 3 provides for more radio channels than current operations except from 3 a.m. to 4 a.m. and 7 a.m. to 11 a.m. which is the extended simulcast period. It should be noted that the SJPD provides staffing for six radio channels from 3 a.m. to 4 a.m. even though the Budget Office only provides funding to staff three radio channels during that one-hour period.

Graph B compares the current average channel utilization to Options 1, 2, and 3 channel utilization for all days of the week.

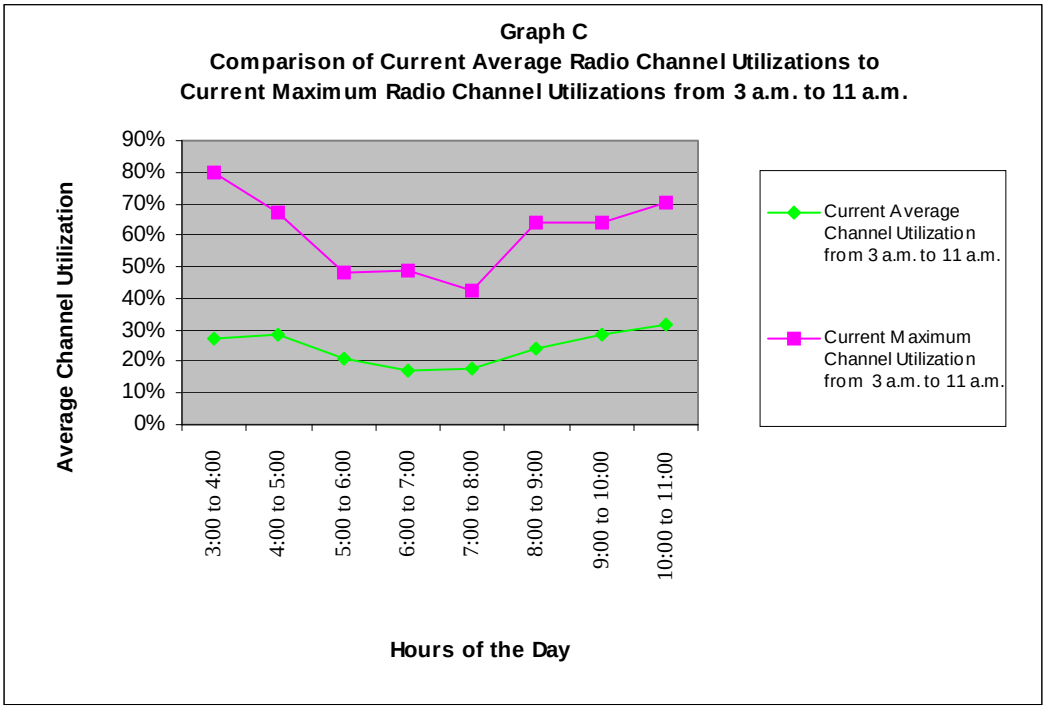


Graph B shows that on an average day, the current average and the Option 1 projected average (for those two channels with three districts each) will exceed 50 percent channel utilization. Further, although the current average radio channel utilization uses six channels and Option 1 uses seven channels, the projected Option 1 radio channel utilization shown is higher. This is because seven radio channels cannot be divided equally into 16 districts. As a result, under Option 1 two radio channels must carry three districts each. Graph B also shows that the average radio channel utilization for Option 3 does not exceed 50 percent at any time during an average day.

Given the projected average radio channel utilizations shown in Graph B, Option 3 appears to be a viable staffing alternative. Further, Option 3 would 1) require 3 fewer PSDs and save $173,000 per year when compared to Option 2; 2) produce the same average radio channel utilization as Option 2 except for the expanded simulcast period from 7 a.m. to 11 a.m.; 3) avoid the possible overstaffing situation that Option 2 could

create from 7 a.m. to 11 a.m.; and 4) produce projected utilizations that are less than the 50 percent benchmark.

In discussing Option 3 with the SJPD, they were quick to point out that average radio channel utilization is not the same as maximum radio channel utilization. In other words, even though average radio channel utilization during a period of time may appear prudent, maximum radio channel utilization during that same time period may be unacceptably high. In response to the SJPD's concern, we prepared Graph C which compares actual average radio channel utilizations to actual maximum radio channel utilizations from 3 a.m. to 11 a.m.



As shown in Graph C, the difference between current average and maximum radio channel utilizations can be significant. In fact, Graph C shows that maximum radio channel utilization can be more than twice as high as average radio channel utilizations.

It should be noted that one of the limitations of our study was that while we could project average redistricting radio channel utilization by hour of the day, we could not project maximum radio channel utilizations. Consequently, we cannot say with certainty, that Option 3, although viable on a projected average radio channel utilization basis, would not produce unacceptably high maximum radio channel utilizations during an expanded simulcast period from 7 a.m. to 11 a.m.

It should also be noted that although we cannot project the maximum radio channel utilizations under Option 3, it could be less than the current maximum channel utilization. This is because the maximum radio channel utilization shown in Graph C is the maximum for any of the radio channels in operation at that time. In other words, if one radio channel had a maximum utilization of 50 percent and the other five channels had a maximum utilization of less than 30 percent, Graph C would show the 50 percent utilization. Should redistricting result in a leveling of the workload among the eight radio channels, a reduction in maximum channel utilizations, even under Option 3, could result.

CONCLUSION

Our review concluded that, at this time, the most prudent option for staffing the two additional police radio channels is Option 2 (10 additional PSD positions plus one Senior PSD). Our analysis also indicates that Option 3 (7 additional PSD positions) may be viable. However, because of the limitations associated with our radio channel utilization projections, we cannot conclusively state that this option would not result in periodic higher than acceptable radio channel utilization rates. These uncertainties arise from our not being able to accurately estimate 1) peak radio channel utilization during the extended simulcasting period from 7 a.m. to 11 a.m. and 2) actual channel utilization after redistricting. An additional review should be conducted six months after redistricting has been in place with dispatching on eight channels, to adequately evaluate whether Option 3 is still viable and prudent.

RECOMMENDATIONS

1. We recommend that the Police Department hire ten public safety dispatchers plus a senior public safety dispatcher immediately so that training will be completed in time for the start of redistricting in September 1998.

2. The City Council should authorize two additional permanent positions and three overstrength positions for fiscal year 1997-98 and 1998-99.

3. The City Council should authorize the City Auditor to review police radio channel utilization within six months after the implementation of redistricting and of dispatching on eight channels, to determine if Option 3 or other less costly staffing options are viable and prudent.