

Executive Summary

The County of Sonoma Information Systems Department has retained the consulting services of CTA Communications (CTA) to perform a Public Safety Communications Needs Analysis & Design Alternatives project. This project will provide the County with important information regarding what the County's strategic options are to meet the need for growth in daily operability of the County's voice and data network systems, as well as provide us a road map for how the County might participate in the Bay Area's efforts toward establishing regional interoperability.

The project has three main purposes:

1. Complete Needs Analysis Phase
2. Develop multiple system design options for possible future implementation
3. Match potential technology upgrades to operational, political & funding realities

This Executive Summary of the Needs Analysis Report summarizes the current voice radio and mobile data systems' used throughout the geographic area of the County of Sonoma. The Needs Analysis report considers the operational requirements for voice and data radio communications.

Summary of Voice and Data Radio Systems

Sonoma County's operational area consists of separate radio systems in various frequency bands including VHF highband, VHF lowband, and UHF. The largest two radio systems are the County of Sonoma Sheriff's UHF conventional simulcast system and the Redwood Empire Dispatch Communications Authority's (REDCOM) VHF conventional system that supports a majority of the fire agencies in Sonoma County. The infrastructure for both of these systems is maintained and installed by the County of Sonoma Information Systems Department (ISD). Sonoma County has a large number of radio users, which are shown in Table 1.

Table 1
Sonoma County Radio Counts

Radio Type	Sheriff's System	REDCOM	Other City and County Users	Totals
Number of Mobiles	164	375	1015	1554
Number of Portables	399	555	1205	2159

County of Sonoma Sheriff's UHF radio system

The County of Sonoma Sheriff's system is a 5 channel UHF, full-duplex, 12-site, simulcast public safety radio system. It is comprised of M/A-COM Mastr III transceivers, M/A-COM Voters and a Tait Quasi-Sync II simulcast controller. All sites are identical with the exception of transmit power settings which have been optimized by site for best overlap results.

Dispatches originate from the County of Sonoma Sheriff Dispatch Bureau using MODUCOM consoles. The County of Sonoma Sheriff Dispatch Bureau dispatch services to the Sheriff's Department, Town of Windsor, City of Sonoma, local government agencies and some state agencies.

REDCOM VHF radio system

The REDCOM radio system consists of 5 primary channels and 14 tactical fireground operations non-repeated VHF simplex channels. The main dispatch channel, REDCOM consists of twelve sites in a repeated system that normally operates with repeat turned off (selectable via console button). The REDCOM channel is a simulcast channel, but has been configured as a paging channel where dispatch talks out and the

responding unit's response is heard only by dispatch. The remaining repeated channels (Control 2-4) are used by dispatch in three geographical areas of the County (North, South and the Santa Rosa area).

The REDCOM dispatch center dispatches for Fire and EMS for the entire County's operational area with the exception of Petaluma Fire Department, Rohnert Park Department of Public Safety, and the Town of Cloverdale.

Additional radio systems

Table 2 summarizes the Sheriff's voice radio system, REDCOM voice radio system and other radio systems that are in use by agencies in Sonoma County.

**Table 2
Radio Systems in Sonoma County Operational Area**

Radio System	Frequency Band	Repeated / Simplex	Number of Channels	Number of Sites
ISD Communications Division	UHF	Repeated	1	6
County of Sonoma General Services	UHF	Repeated	1	3
County of Sonoma Sheriff's System	UHF	Repeated	5	12
County of Sonoma Probation	UHF	Simplex	1	N/A
Sonoma County Transit System	UHF	Repeated	1	6
County of Sonoma UHF MEDS	UHF	Repeated	10	6
Santa Rosa Police Department	UHF	Repeated	4	NR
Sebastopol Police Department	UHF	Repeated	1	NR
Sonoma Police Department	UHF	Repeated	2	NR
Healdsburg Police Department	UHF	Mix	2	NR
Petaluma Police Department	UHF	Repeated	2	NR
Cloverdale Police Department	UHF	Repeated	1	NR
Cotati Police Department	UHF	Repeated	1	NR
Santa Rosa Junior College Police Dept	UHF	Repeated	1	NR
County of Sonoma FASTER	VHF	Simplex	2	N/A
County of Sonoma MEDCOM	VHF	Repeated	10	8
REDCOM	VHF	Mix	5	12
HAM Auxiliary Communication Service	VHF HAM	Repeated	1	12
Intercity Network	VHF Lowband	Simplex	1	N/A
County of Sonoma Regional Parks and Transportation and Public Works	VHF Lowband	Simplex	1	N/A
County of Sonoma Water Agency	VHF Lowband	Repeated	1	1
County of Sonoma Animal Control, AG Inspector and Weighs & Measures	VHF Lowband	Repeated	1	1

N/A – Not Applicable, NR = Not Reported

Mobile Data radio system

Mobile data in Sonoma County is provided through the Mobile Data Radio System. The system is a 5 channel 800 MHz DataRadio system. The system has been in place since January 2003 and is funded by the user fees paid by the member agencies of Sonoma County Public Safety Consortium. The Mobile Data system provides coverage to over 90% of the County. The County of Sonoma ISD provides system administrator support for the Mobile Data Computer (MDC)'s and the Sonoma County ISD Communications section provides engineering and maintenance of the two-way radio infrastructure.

There is a Federal Bureau of Investigation and California Department of Justice (DOJ) encryption requirement for the Data Radio of 3DES or AES 128 bit encryption along with Federal Information Processing Standardization (FIPS) 140-2 compliancy. The mobile data radio system must meet this encryption requirement by June 30, 2010.

Summary of Voice and Data Radio Problems

Although the current two-way radio communications capabilities are characterized by well maintained, well developed systems that adequately meet the needs of user agencies, several voice and data radio problems were reported to CTA during the data gathering phase of the project. The data gathering efforts included interviews, distribution of worksheets, and a thorough review of all documentation provided by agencies in Sonoma County. Throughout the data gathering process CTA focused on problems related to radio coverage, in building coverage, channel capacity, radio counts, interoperability, cost and reoccurring cost problems and user perception of the need for improved performance. A summary of these problems are listed below and a complete list can be found in Section 3 of the Needs Analysis Report.

Voice Coverage Problems

Several coverage problems were reported throughout the County. The areas that have poorest coverage include areas along the coast, along Bohemian Highway, and in the northern portion of the County. Many of the poor coverage areas are a result of the many river valleys and hilly terrain throughout the County. Some agencies also reported in building coverage concerns, especially in the Juvenile Justice Center and the Hall of Justice.

Channel Capacity Problems

Both of the larger voice radio systems (Sheriff's System and REDCOM) are near or exceeding recommended capacity. Many users reported channel capacity problems on the main channels of these two systems. The channel crowding has not got to the point that emergency responder safety is jeopardized, but growth could cause more serious problems. In addition, any large incident would immediately push these systems beyond current capacity capabilities and could threaten emergency responder safety.

Radio Count Problems

No agencies reported any significant concerns on the number of radios they have in their position.

Interoperability Problems

Many agencies expressed the need for daily interoperability between fire and law enforcement agencies. Many short term solutions can be activated to meet interoperability needs of larger incidents. These solutions include the Sheriff's Satellite Truck, console patches and radio caches. However, there are no fixed interoperability channels for daily communication between agencies within the County and with neighboring counties. Although agency needs are met, in some cases agencies lack the ability to directly and conveniently communicate among critical public safety functions; particularly between law enforcement and fire agencies. Interoperability problems are most prevalent in the areas along the coast, in and around Lake Sonoma and along Hwy 37 in the south of the County. All of these areas are typified by incidents that regularly require multiple jurisdictions to respond to the incident.

Cost and Reoccurring Cost Problems

No agencies reported any concerns with current voice radio system costs. County of Sonoma agencies are able to meet the demands for replacement subscriber units and for the maintenance of their own subscriber units.

User Perception of need for improved performance

Several agencies identified problem areas that if corrected, could contribute to improved performance. One of these areas related to radio coverage outside the County. Many agencies frequently travel outside the County and the only means of communication for these agencies is the use of a cell phone. Many of the smaller agencies reported that the age of their radio systems, especially VHF lowband systems, was a concern. Also, from the user comments, the simulcast timing appears, at times to become out of synchronization. There may be a need to further examine the timing source.

In addition, agencies reported the need for training on the use of radio assets, especially for those users who do not use the radios on a daily basis. Training and programming consistency is also needed for the radios in use by the fire agencies. In addition, the Bendix King Portables in use by many of the volunteers have buttons that are difficult to use with a gloved hand and have knobs that can be inadvertently changed when putting on turnout gear. The County of Sonoma Fire/ Department of Emergency Services is working on installing a software upgrade to correct this problem.

Mobile Data Problems

Mobile Data users reported many of the same coverage problems as the voice radio users. The number one problem reported by mobile data users was the data rate or speed of the DataRadio connection for the MDCs. The current data rate does not support many of the existing user needs. In addition, mobile data users reported that commercial aircards offered a potentially viable solution but recurring costs make them a poor long term solution for most agencies. Another potential problem exists with the method the DataRadio system uses to select the best radio site connection.

Summary of Voice and Data Radio Needs

The primary need of the voice and data radio users in the County is to address the problems identified above for the existing voice and data radio systems. In addition, CTA has uncovered several additional needs that were identified during the data gathering process.

Voice Radio Needs

One of the most pressing needs is a backup dispatch center for the Sheriff's dispatch. Although a temporary backup solution could be deployed quickly, a more deliberate backup center is needed. REDCOM also needs to complete the backup center plans that have already been initiated.

The capacity concerns for the main two systems (Sheriff's and REDCOM) must be addressed. Unless additional channels are added, any large incident, any growth of current agencies or any new agencies that may be interested in joining either of these two radio systems would push the capacity well beyond recommended limits.

The County of Sonoma ISD is making very good progress on updating the mountaintop sites to support narrowbanding mandates of January 2013, but some agencies need additional assistance to update their older mobiles and portables.

In addition, the Marine Unit of the Sheriff's department reported the need for several equipment updates and enhancements.

Mobile Data Radio Needs

The proper encryption standards must be in place by June 30, 2010 in order to maintain access to Federal, State, and other local criminal information systems for the SCPSC agencies utilizing the County of Sonoma mobile data radio system.

Several users expressed the need for the MDC to be able to support connection to the Mobile Data system, as well as an internet. User perception of the Mobile Data radio system consistently points to the need to provide additional training on the MDCs and the need to optimize the existing system. Finally, additional bandwidth is also needed to support current mobile data needs. Currently, software updates and automated field reporting takes too long and users must find a way to work around.

Summary of Frequency Assets

CTA has reviewed the licensing information including licenses for the County of Sonoma, REDCOM agencies, and some of the cities and other agencies throughout the County. CTA then conducted a search of the FCC database to identify additional licensed frequencies. The results of our frequency research were compared to the data contained in the Sonoma County Tactical Interoperable Communication Plan (TICP). The goal of our research was to determine frequency assets that are used throughout the County's operational area. Our research determined that additional UHF frequencies may potentially exist for use within the County, but additional VHF frequencies are not available and existing licenses do not meet current needs.

Background information is on file at:

County of Sonoma Board of Supervisors Office
575 Administration Drive, Room 100A
Santa Rosa, CA 95403

It can be viewed and/or copies requested during regular business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday. Call (707) 565-2241 for more information.