



2004-2005 SANTA CLARA COUNTY CIVIL GRAND JURY REPORT

CALLING 9-1-1: MANAGING INFORMATION TECHNOLOGIES IN THE SANTA CLARA COUNTY EMERGENCY DISPATCH CENTER

Summary

The 2004-2005 Santa Clara County Civil Grand Jury (Grand Jury) visited the Santa Clara County (County) Communications Center and observed that emergency 9-1-1 operations were being supported by obsolete computer equipment. Subsequently, the Grand Jury initiated an inquiry to ascertain why such a critical system was not based on more modern, maintainable Information Technology (IT). This inquiry included interviews with IT management leaders in the County Executive's office (CE), the County Chief Information Officer (CIO) in charge of the Information Services Department (ISD), the management of County Communications Department (CD, also often referred to as County Communications or COC), and heads of emergency communications services for the City of Palo Alto, the City of Sunnyvale, and the City and County of San Francisco. The Grand Jury also inquired into the Silicon Valley Regional Interoperability Project (SVRIP).

The County 9-1-1 operation is highly professional and effective in the emergency dispatch services it provides and the Grand Jury makes no finding to the contrary. The Grand Jury has serious concerns about a lack of effective and consistent IT leadership for the County 9-1-1 system development, a passive involvement of the County Communications Department in SVRIP activities, and a lack of leadership to better coordinate and consolidate, where appropriate, emergency dispatch services in the County.

The Grand Jury has made four findings summarized here and explained in more detail in the *Findings and Recommendations* section of this report:

- Until the end of 2004, the County Communications Department's 9-1-1 information technology infrastructure relied on hardware and software already obsolete in the late 1990s. This delay exposed County residents to the possibility of a failure in a critical service.
- The decision to develop the replacement Computer-Aided Public Safety System in-house, as opposed to considering alternative commercial-off-the-shelf (COTS) systems or contract development, appears to be flawed. There is only a limited record of any detailed evaluation of alternative system sources and costs to justify this decision objectively. The replacement system, completed in November 2004, appears to work reliably and with full functionality. However, the consequences of deciding on an in-house development leave the County exposed to the full range of risks inherent in this kind of idiosyncratic system.

- The management of the project to upgrade the IT infrastructure of the County 9-1-1 dispatch operation does not conform either to industry standards for prudent software engineering practice or to the current standards used by the County CIO in centrally controlled projects. There are no formal system and interface specification documents, design documents, development milestone schedules, testing and rollout plans, or adequate system cost accounting. New programmers on the project, who replace the key developers who recently retired, must study the system code to understand the system.
- The County Executive and the Communications Department appear to lack a clear commitment to the Silicon Valley Regional Interoperability Project and its evaluation of Internet-based technologies to strive to achieve better interoperation and information-sharing among emergency response services. The County 9-1-1 service, while highly professional in the services it offers, appears to operate within a limited scope of providing the services within its mandate, to the exclusion of providing longer range vision, leadership, and collaboration to other jurisdictions and agencies in the region.

Background

The following sections summarize briefly the background of County Communications Services, the Criminal Justice Information Control system, and the Silicon Valley Regional Interoperability Project.

COUNTY COMMUNICATIONS DEPARTMENT

The Communications Department was established in 1948 by the County Board of Supervisors to provide public safety dispatching and technical support services to the County. The Dispatching Services division of CD provides emergency dispatching services to various law enforcement, fire, medical, and local government agencies. CD also provides Enhanced-9-1-1 (E-9-1-1) emergency telephone answering services and directly supports other mandated County programs.

The Dispatch Operations (DO) unit has a staff of about 80 which provides “24/7” response coverage. DO receives nearly 1,000 calls a day (almost one per minute) of which approximately one-third are 9-1-1 calls. When an emergency call is received, it is evaluated and the appropriate response is dispatched. An enhanced emergency 9-1-1 telephone system automatically routes 9-1-1 calls based on the law enforcement provider's jurisdictional areas, and provides dispatchers with the caller's phone number, address, and appropriate law enforcement, medical transport and fire service providers.

DO provides emergency and routine dispatching services to more than 60 client agencies, including the Sheriff's Office, the County Fire Department, and emergency medical services. The Sheriff's Office provides law enforcement services to the communities of Cupertino, Los Altos Hills, Saratoga and the unincorporated areas of the County. The Sheriff's Office also provides contracted services to the Valley Transportation Authority and the County Parks Department. The County Fire Department is a Fire Protection District serving unincorporated areas of the County and the communities of Campbell, Cupertino, Los Altos, Los Altos Hills, Los Gatos, Monte Sereno, Morgan Hill and Saratoga. American

Medical Response-West (AMR) provides paramedic ambulance transport for all areas of the County except the City of Palo Alto, which does its own transporting.

Most dispatchers are cross-trained and about three quarters of them are able to work in multiple support areas, including medical emergency support, fire service support, and law enforcement. The County has an Emergency Medical Dispatching (EMD) system under which dispatchers provide emergency, physician-approved medical instructions to callers until paramedic help arrives. Most dispatchers are trained to give telephone instructions for first aid, childbirth, cardiopulmonary resuscitation (CPR), and a variety of other medical procedures.

Dispatch Operations is supported by a computer-aided dispatching system called Computer-Aided Public Safety System (CAPSS). CAPSS supports display of call-session status information and aids the dispatcher in filling out a structured form to capture vital details of each call. CAPSS also includes interfaces with various data communications facilities and data resources, such as the Sheriff's Law Enforcement Telecommunications System (SLETS), an Automatic Vehicle Location system, a computer mapping system, the City of San Jose Computer Aided Dispatch (CAD) system, E-9-1-1 automatic location identification system, an alphanumeric pager system, a Zetron Inc. tone encoder communication system for fire dispatch, and the Criminal Justice Information Control (CJIC) system.

CRIMINAL JUSTICE INFORMATION CONTROL SYSTEM

The Criminal Justice Information Control (CJIC) system is Santa Clara County's automated criminal history and case tracking system. It records adult criminal activity from the time of arrest through final court adjudication and probation, and records juvenile booking information which remains in the criminal history should the juvenile continue to offend as an adult. Specific countywide information elements available in CJIC include:

- Person descriptors;
- Arrest and booking information/charges;
- Court-filed charges;
- Court appearances and results;
- Adult criminal warrants;
- Custody status and release;
- Final sentencing, modifications and dispositions; and
- Probation grants.

CJIC is used extensively by law enforcement agencies, the District Attorney, the Public Defender, the Superior Court, the Department of Correction, and the Probation Department. CJIC is integrated with the Automated Fingerprint Identification System (AFIS) database which is run by the San Jose Police Department (SJPD) Central Identification Unit (CIU) and SLETS. The SLETS network infrastructure is presently shared for secure CJIC access to several police agencies. Efforts are underway to define requirements for an eXtended Markup Language (XML) interface with SLETS. CJIC reflects a strong commitment to information-sharing by law and justice leadership and facilitates interagency cooperation

and cross-agency work flow. It is estimated by CJIC management that this information service produces more than \$10 million annual return on investment.

In calendar year 2004, 63,129 court cases and 70,339 formal bookings were processed and the system provides an accurate, reliable, and secure information resource on over 550,000 persons. The CJIC information technology has the capacity to serve in excess of 5,000 users and provide sub-second response time for most frequently used queries. CJIC interfaces with the Computer Aided Dispatch systems, Victim Notification System (VNS), Pre-Trial Services Case Management System, and the California Department of Motor Vehicles. CJIC also provides data to Social Security services (County, State, and Federal).

SILICON VALLEY REGIONAL INTEROPERABILITY PROJECT

In 1998, 18 Santa Clara County jurisdictions, representing some 30 public agencies in law enforcement, fire, and emergency medical service partnered to enhance coordination and communication among their public safety agencies and to exchange critical information and resources in real time during an emergency. The resulting Silicon Valley Regional Interoperability Project operates under the general direction of the Santa Clara County/Cities Managers' Association and a Joint Powers Agreement executed by the governing bodies for each of the participating jurisdictions. An Executive Steering Committee acts as the governing body to provide oversight and management of the project (see Appendix A).

Data integration and real-time sharing of information in a time-critical manner are among the important issues that plague fire, emergency medical service, and law enforcement providers. One month after the September 11, 2001 attacks on the United States, the U.S. Conference of Mayors met to examine the new security issues confronting the country. In the "National Action Plan for Safety and Security in America's Cities" the Conference of Mayors adopted a key recommendation: "There must be communication system interoperability to ensure clear communications among city departments and federal, regional, state and other local entities responding to disasters." The timely and efficient communication of information is critical to effective public safety services, especially in a time of shrinking budgets. One of the key challenges is to exploit technology to upgrade and integrate existing public safety infrastructure to make best use of limited public safety personnel.

The various County jurisdictions employ more than 3,300 emergency responders and handle nearly 1.5 million calls for service each year. Many first responder agencies have to contend with performance issues associated with a lack of interagency field communications and lengthy call switching and processing times. Today, response delays on fire or medical automatic aid calls (calls where an outside agency is closer to a location) average 3 to 5 minutes. Although County agencies have implemented business practices to try to minimize the impact, every second counts in getting emergency resources to the scene.

The major challenges to effective communications and information interoperability are the disparate systems and standards in use. Although public safety computer systems vary from jurisdiction to jurisdiction, linking these systems is technically possible by leveraging technologies that are commonplace in the private sector and in specialized government command and control applications. Such technologies are designed to be robust, failure-resistant, reconfigurable, and distributed so that they can survive a disaster while facilitating

high-speed, multi-media communications. By using protocol-standards-based communications over resilient communications media, it is expected that this approach will dramatically improve the sharing of time-critical information among dispatch centers, field personnel, and government command organizations.

In 2003, SVRIP contracted with Northrop Grumman to design an interoperability and integration plan to achieve a more timely and efficient communication and sharing of information among cooperating jurisdictions. The overarching design is an Internet-protocol-based data communications network, using digital microwave, fiber optic lines, land mobile radio systems, or wireless technologies, which delivers services for voice and data communications and sharing. A "Re-configurable Internet Information Broker" (RIIB) technology combines internet protocols, database technologies, and access control and sharing logic to dynamically connect regional databases and to facilitate navigation and pertinent information extraction and sharing.

SVRIP has five key project objectives being pursued in collaboration with Northrop Grumman Mission Systems. All of these projects are predicated on a design that is robust and expandable to allow emergency applications (e.g., Records Management Systems and Mobile Data Systems) to cooperate in a secure environment for regional selective data sharing. Specific demonstration projects include:

- Achieve CAD to CAD interoperability among all County Public Safety Access Points for command and control coordination;
- Facilitate intelligence information-sharing to reduce response times by automating transfers between Record Management Systems (RMSs);
- Develop a Voice Over Internet Protocol (VOIP) capability using radio transmission technologies to link emergency responder groups;
- Create a prototype of a regional broadband wireless network system to achieve a high level of radio interoperability beyond the present capabilities of the Bay Area Mutual Aid Communications System (BayMACS); and
- Develop an integrated medical network system that can help coordinate medical disaster response and triage, public health, and public safety efforts.

Numerous projects similar to the Silicon Valley Regional Interoperability Project are underway across the country. SVRIP appears to be a nationally recognized leader of this group in terms of its highly effective management structure and its sound architectural approach to integrating modern technology. Challenges remain to make the demonstration technology fully operational and to extend the reach of the SVRIP approach to surrounding counties, and including state and federal agencies which operate within the County.

Discussion

The Grand Jury conducted its investigation of the computer infrastructure for County Communication Services in several stages, including:

- Studying the background and evolution of the County Computer-Aided Public Safety System;
- Studying the procedures used by County management to supervise and control IT projects such as the CAPSS (re)implementation;
- Visiting emergency response operations in other parts of the County and in San Francisco; and
- Assessing County commitment to and participation in long-range development of shared and interoperable emergency services.

BACKGROUND AND EVOLUTION OF THE COUNTY COMPUTER-AIDED PUBLIC SAFETY SYSTEM

In 1970, County CD bought a computer aided dispatch software system from Kustom Signals, Inc. to better automate what had been an entirely manual dispatch process. This was the time when the “Warren-911-Emergency Assistance Act” was passed to establish 9-1-1 as a universal telephone number for emergency services (see California Government Code Sections 53100 et seq.). By 1978, it became clear that Kustom Signals could not provide long-term support for the CAPSS system, and County CD acquired the source code and took over maintenance and development of the system. The system ran on Digital Equipment Corporation (DEC) PDP-11 computer systems and was written in the DEC Macro (assembly) language. The system evolved with many changes developed by in-house County ISD programming staff (equivalent to three full-time people), who are permanently assigned to CD, and moved to a set of PDP-11/84 computers around 1990. This was the system (hardware and software) observed by the Grand Jury during its August 2004 visit to the County Communications Center.

The Grand Jury observation that the CD CAPSS system was running on obsolete hardware is not new. In 1995, the ISD staff and CD recognized that the DEC-based CAPSS was becoming unmanageable and began considering an upgrade. A working proposal for an in-house replacement was completed by ISD staff in 1996 and was approved that year by the Information Systems Planning and Policy Committee (ISPPC), the CE’s IT oversight group. A study was commissioned and funded in 1996 out of the budget of the Director of the Communications Department and contracted to Telecommunications Engineering Associates (TEA). A goal of the contract was “to study the feasibility of continuing in-house software development... It is unusual for a public safety dispatch facility to use a CAD system that is not maintained by an outside contractor and the County wants to validate its strategy.” The TEA report, dated May 1996, makes a number of points:

- Most cities and counties license software for Computer Aided Dispatching (CAD) from commercial software developers;
- The present CAD software is a classic example of a legacy system that is essential to the service that GSA Communications provides to its customers. Each

community (customer) served by the system has its own standards and policies that are accommodated by the system...;

- The present CAD system uses a hybrid of old mini-computers (DEC PDP-11) with modern personal computers. It is a very clever design that works well, however the County must migrate away from the old mini-computers. Replacement parts and technical support for the PDP-11 are increasingly difficult to obtain as the systems age [The Grand Jury adds a note to this observation: By 1998, DEC was acquired by Compaq Computer, its brand name disappeared, and sales of new PDP-11s had long since ceased.];
- The system has undergone a continuous stream of enhancements and changes since it was first implemented, resulting in a highly customized system that is unique to Santa Clara County;
- One of the most complex components of the present CAD system is its external interfaces for data communications. The interfaces for the Santa Clara County system are the most diverse and complicated that we have seen. If a commercial solution were to be implemented, there would be significant costs to reimplement these interfaces; and
- Our [TEA] study examined the issues related to continuing development of the current system versus procuring a new commercially available-product... it is our opinion that the best alternative is for GSA Communications to continue with its plan to enhance and modernize the current system. We believe that the risks and expense of procuring a new system outweigh the risks and expense of continued in-house software development.

Based on this TEA opinion, ISD and CD management and staff mounted a project to *translate* the old DEC-based CAPSS system – with little functional redesign or enhancement. This project began in earnest in 1998. There was no apparent further consideration of purchasing a commercial-off-the-shelf CAD software system, even though every other emergency response jurisdiction in the County and most such operations elsewhere in the state use vendor-supported systems successfully. The translation project took over 6 years – the final rollout occurred in late November and early December 2004. The new system is based on Windows 2000 PCs and various parts of the system are written in the Visual Basic, C, and C⁺⁺ programming languages.

The Grand Jury makes the following observations about this project:

- There is no evidence of any contemporary software engineering methodology in use for the CAPSS project, such as would be mandatory in the commercial sector. There was little schedule planning with measurable milestones. Documentation is informal, consisting of a collection of memos written over the years. No overall conceptual system architecture diagram could be found. A physical system component diagram is part of the existing documentation. When a new programmer on the project was asked how he came to understand the system and how it fits together, he admitted that he had to consult the system code and comments. The County CIO's office has now collected and organized the system documentation that exists.

- Project budget documents state the total cost of this project to be \$1.14 million over the six-year term of the project. The Grand Jury could not verify that this represents the *total* cost of the new CAPSS system, including all allocations of existing staff time, incremental staff time, overhead such as management time, hardware and software, and other ancillary costs.
- The project took too long, forcing continued dependence on the old and obsolete DEC-based hardware and software. Apparently little provision was made in project planning for Year 2000 issues that sidetracked programming staff for approximately one year, thus extending a planned five-year project to six years. Meantime, between 1998 and 2004, at least two generations of software engineering tools became available in the marketplace and have been used advantageously by e-commerce and web-based information service start-ups. The “middleware” services that are part of such tools emphasize the flexible and manageable integration of diverse interfaces that are so central to the CAPSS system and many other commercial applications. The CAPSS system, as implemented, does allow adding new interfaces to accommodate emergency service customer needs as well as incremental technologies such as biometric authentication and new data communication services. The County is now the owner and sole maintainer of a unique system that will likely remain in its current architectural and core software implementation form for the foreseeable future, independent of new software technology advances occurring in the marketplace.
- The new, translated system is in place and appears to work well in that the full previous functionality is in operation and a high-standard of call-response service prevails. The rollout and debugging transition took 1-2 months, using an informal, spreadsheet-based bug-tracking system. Nevertheless, the approach to implementing the new IT system entails significant risks.
- The new CAPSS system appears to embody many of the advantages and risks of classical in-house systems. CAPSS is designed specifically to accommodate existing business practices of CD and does so effectively. It is a system entirely dependent on a group of three in-house programmers for maintenance and development. Two of the system programmers involved in the software translation have since left. One replacement programmer was hired in early 2005 but approval for an opening for the second programmer was delayed because of County budget problems. That opening was finally approved and the second programmer was hired in early May 2005. This means that the system is dependent on a staff that has to learn its unique design. Such specialized knowledge is hard to maintain and transfer, should personnel leave, get ill, or otherwise become unavailable.

COUNTY INFORMATION TECHNOLOGY MANAGEMENT

A process is in place for oversight of County Information Technology projects under the Information Technology Executive Committee (ITEC) chaired by the County CIO. The charter for ITEC is shown in Appendix B. The overall goal of ITEC, which replaces the earlier ISPPC, is to provide recommendations on IT policy and priorities to the CE and BOS. This is to include leadership for County IT strategic plans and directions, priorities, standards, evaluation criteria, process-reengineering initiatives, and continual IT

governance improvements. In practical terms, however, the CIO and ITEC operate somewhere between a *centralized* model for IT management and a *decentralized* model. This means that the CIO carefully prioritizes and chooses those aspects of IT infrastructure that are broadly common across the County and that must be centralized. For example, network and security standards are set centrally. The overarching architecture for County web pages is designed centrally, although individual departments are responsible for their particular content. The CIO also operates common services like financial management software.

Systems that are mainly the domain and interest of local departments are left to decentralized management. The CD CAPSS system is a good example of this delegation, as are specialized systems in the Santa Clara County Health and Hospital System, the Sheriff's Office, and other groups. A good feature of this kind of management delegation is that the owners or stakeholders in such local systems have the most invested in meeting local business needs effectively. A negative feature is that decentralized groups may make IT decisions based on less than objective criteria. For example, it appears to the Grand Jury that the TEA study was formulated with at least a bias of justifying the retention of the in-house approach to CAPSS implementation and maintenance.

The current CIO joined the County in April 1998, when County concerns over Year 2000 IT service continuity were reaching a crescendo. By that time, the proposed approach for replacing the outdated CAPSS system had been approved and authorization given to initiate the project, based on the ISPPC/ITEC reviews and the TEA report, without conducting a further review of COTS offerings. The programming staff for the CAPSS project technically work for the CIO, but are assigned permanently to the Communications Department. ISD staff members agree that there was no overall detailed design plan for the CAPSS project, there was no formal project management methodology in place, and there was only the short-term goal of translating a long-existing system to a new platform while maintaining a functional design status quo. Like all County IT projects, funding was tight.

Because of funding constraints, in addition to organizational issues, the CIO is careful about priorities in asserting an active role in the IT efforts of the various County agencies and departments. The CIO has prepared a Strategic Plan and a prioritized three-year project portfolio from a Countywide perspective. The CIO readily concurred, however, that there were far-reaching aspects of the CAPSS effort that warrant broader coordination – for example achieving interoperability between various computer-aided dispatch and records management systems in use by County and regional agencies. The ISD CJIC system is an example of a broadly integrated service, but generalizing CAD/RMS interoperability is beyond the reach of current funding and staffing resources. The CIO is therefore forced to let it proceed as a more localized set of demonstration projects (see the SVRIP description).

9-1-1 DISPATCH OPERATIONS IN OTHER JURISDICTIONS

To assess approaches to integrating CAD systems in other emergency dispatch centers, the Grand Jury visited the centers in the City of Palo Alto, the City of Sunnyvale, and the City and County of San Francisco.

City of Palo Alto 9-1-1 Center

The City of Palo Alto (CPA) 9-1-1 center is of moderate size, handling about 53,000 calls per year with 3 or 4 dispatchers on duty 24/7. The CPA center dispatches police, fire, medical, Stanford University police and fire, animal services, and utilities calls for the city. CPA operates its own paramedic team. The CPA 9-1-1 center IT infrastructure has been in place for five years and was selected and implemented with close cooperation between the Police Department and the CPA CIO. A careful decision was made to buy a COTS solution from Public Safety Systems, Inc. and to adapt call center procedures to use the system with a minimum of customization. This buy-versus-build approach appears to be the preferred choice for most CPA IT systems and appears to be effective both operationally and financially. CPA has developed its own GIS in cooperation with CPA Utilities and Public Works. This system is based on aerial photographs and an off-the-shelf software system to catalog and manage the GIS data.

City of Sunnyvale 9-1-1 Center

The City of Sunnyvale 9-1-1 center is of moderate size, handling about 35,500 calls per year with 3 or 4 dispatchers on duty 24/7. The Sunnyvale center dispatches police, fire, and medical calls for the city, but has no local paramedic team. Sunnyvale contracts with AMR for pre-hospital care services. The current Sunnyvale 9-1-1 center IT infrastructure has been in place for seven years and was selected and implemented with close cooperation between the Public Safety Department and the Sunnyvale IT services group. A previous U.S. West CAD/RMS system was replaced by a Tiburon Inc. COTS system and has been installed with no local customization. Sunnyvale has adapted its call center procedures to use the system "out of the box". As with Palo Alto, this buy-versus-build approach is preferred for most Sunnyvale IT systems and appears to be effective both operationally and financially. Sunnyvale does not have GIS capability currently, but is moving in that direction as it upgrades its 9-1-1 center to handle cell phone calls more effectively.

City and County of San Francisco 9-1-1 Center

The City and County of San Francisco (SF) has a combined 9-1-1 center that handles about 1 million calls per year, of which about half are 9-1-1 emergency calls. The SF 9-1-1 Center has about 150 dispatchers who are certified in emergency medical and fire call handling so that they can triage police, fire, and medical calls from a first single point of contact. The SF 9-1-1 center must coordinate with four other Public Safety Answering Points in the area, including the University of California at San Francisco campus, the University of San Francisco campus, the Presidio, and the Coast Guard. The SF 9-1-1 center IT infrastructure has been in place for 10 years and is based on a highly modified Tiburon Inc. system. SF has adapted the Tiburon system to the complex needs of their call center procedures. The SF 9-1-1 center has a very complex environment in which to work, where radio communications do not operate well in many areas between and inside of tall buildings, and where some large hotels have their own emergency response operators.

POSSIBILITY OF SHARED AND/OR INTEROPERABLE EMERGENCY SERVICES

The Grand Jury met at length with the Executive Steering Committee of the Silicon Valley Regional Interoperability Project and with the County CIO and the Director of the Criminal Justice Information Control system. The purpose of these meetings was to assess the potential and actual levels of cooperation and interoperation among County emergency service and information providers.

Silicon Valley Regional Interoperability Project

The six-year-old SVRIP effort is considered to be a model program by many in local, state, and federal agencies responsible for public safety and homeland security. In 1998, each of the thirteen 9-1-1 jurisdictions involved contributed \$20,000 and the project has received about \$6.5 million in federal grant and contract funds to date. The total budget for the project to complete the five demonstration projects outlined in the Background section will be about \$20 million. Today, the police departments and fire departments in Santa Clara County can communicate with each other by shared radio frequencies. The broader interoperability goals depend on future funding. SVRIP members are actively working on proposals to complete its funding goals. Such effort and support could not be forthcoming without a deep and demonstrable cooperation between participating agencies.

This commitment was echoed by all members of the Steering Committee and the personnel in local municipal public safety agencies the Grand Jury visited. Statements during these visits offered compelling evidence of broad commitment among County Police Chiefs, Fire Chiefs, and City Managers.

The lone member of the SVRIP Executive Steering Committee who was absent during the Grand Jury visit was the representative of the County Executive's Office. When the Grand Jury visited the County Communications Department, this sense of lack of involvement with SVRIP was repeated. The last meeting attended by CD personnel was nine months ago, and when asked about their assessment of the technical architecture and demonstration projects underway in SVRIP, the CD representatives indicated a passive interest. One of the CD technical managers commented, "If they want to deliver data to our back porch [a term used in regard to the Re-configurable Internet Information Broker technology being used in SVRIP projects], we will figure out how to accept it." The attitude at CD, as conveyed to the Grand Jury, appears to be that CD has its own business charter and mission, CD is comfortable with the way it has implemented technology to support that mission, CD will develop in-house whatever *ad hoc* interfaces are necessary to allow them to send or receive data from local CAD or other information systems, and CD is not particularly interested in exploring different technological approaches.

Criminal Justice Information Control System

The Grand Jury was highly impressed with the history, the smooth and professional operation, and the ongoing broad support for the CJIC system, under County ISD. CJIC has been functioning since the 1970s as a service for a broad group of County agencies involved in the justice system, law enforcement, and public safety (more details are given in the Background section of this report). The Grand Jury believes the CJIC model, which is based on a central resource governed by a board of user executives, could be a useful model for consideration in other aspects of emergency response systems.

Centralized versus Decentralized Operations

The Grand Jury found that many different systems are in operation among the 13 emergency response jurisdictions in the County to support local, autonomous response services. It could be advantageous to combine at least some of these operations to achieve economies of scale in 24/7 dispatch support, IT procurement and operations, and ancillary services such as Geographic Information Systems and mapping. The Grand Jury realizes that there are impediments to this kind of consolidation of disparate systems. The experience of the County Communications Department itself gives some pause. Up to 1989, County CD supplied County-funded dispatch services to the City of San Jose, but when the County wanted to impose a fee, San Jose decided to terminate its agreement with the County and begin its own Public Safety Answering Point. Another reason given by San Jose officials for breaking the previous relationship is that San Jose did not have sufficient control over County CD priorities in operating the joint emergency dispatch center. It was beyond the scope of this Grand Jury inquiry to investigate these options in detail, but they would seem to warrant deeper consideration by County and Municipal groups.

In discussions with the SVRIP Executive Steering Committee, the two most powerful potential impediments to cooperation were identified as *control* and *funding*. Most jurisdictions feel themselves closely linked to the communities they serve and feel they are in the best position to understand and provide the emergency services best tailored to the needs of the community. Whenever funds have to cross jurisdictional boundaries, there is a sense of loss of control over how those funds are spent in terms of priorities and lines of accountability. CJIC would seem to provide a counterexample, in that its method of governance and history of performance has convinced participant users of its value and efficacy. The Director of County CD stated that “You cannot run 13 separate Public Safety Answering Points cheaply... Consolidation is less expensive ...” The Grand Jury agrees with this assessment.

There does not appear to be any leadership within Santa Clara County to consider appropriate consolidations of service. Not even the SVRIP Joint Powers group is willing to explore opportunities for shared infrastructure and staffing for 9-1-1 service centers. It views itself as a temporary entity for completing the demonstration projects it is facilitating. The County Executive, County CIO, and Communications Department would seem to be ideal sources of leadership for such planning.

Conclusions

As a result of its inquiry, the Grand Jury has serious concerns about a lack of effective and consistent IT leadership affecting the County 9-1-1 system development, about the passive involvement of County Communications in SVRIP activities, and about a lack of leadership to better coordinate and consolidate, where appropriate, emergency dispatch services.

The Grand Jury has made four Findings and Recommendations:

Finding 1

Until the end of 2004, the County Communications Department's 9-1-1 information technology infrastructure relied on hardware and software already obsolete in the late 1990s. The upgrade of the Computer-Aided Public Safety System, in the planning stages since the mid-1990s, took much too long. This delay exposed County residents to the possibility of a failure in a critical service.

Recommendation 1

The County Executive and Chief Information Officer should ensure that an inventory of indispensable (mission-critical) IT systems exists covering *all* County departments and service providers. This inventory should be reviewed regularly to be sure all systems:

- Are operating efficiently and with professional supervision;
- Are based on modern and maintainable hardware, software, communications, and security technologies;
- Have fully functional plans for system backups and contingency replacements in place; and
- Pose acceptable risks for maintaining effective and continuous operation of mission-critical County services.

The evaluation criteria should include a periodic comparison of features, performance, and cost-effectiveness of alternative systems available in the commercial marketplace or from other governmental providers.

Finding 2

The decision to develop the replacement CAPSS system in-house, as opposed to considering alternative commercial-off-the-shelf systems or contracted development, appears to be flawed. The consultant, whose study was used as background and justification for the "build" decision, did not document any detailed evaluation of capabilities and costs of alternative systems to justify this decision objectively. The CAPSS system, developed over the past six years, does appear to work reliably and with full function. However, the consequences of deciding on an in-house development leave the County exposed to the full range of risks inherent in this kind of idiosyncratic system. For example, the full cost of maintenance must be borne locally, the departure of key personnel exposes the County to risks of inadequate maintenance and support, it may be hard to attract professional IT staff to work on a one-of-a-kind local system, and the system may fall behind in terms of technology because of lack of investment by the County in on-going development. The delays in completing this system to date mean that it is based on already outdated software technology.

Recommendation 2

The Santa Clara County Board of Supervisors and County Executive should institute immediately a county-wide requirement to justify in detail any decision to build, operate, and maintain in-house a mission-critical software system or service. It should be expected that the most common approach will be to purchase commercial-off-the-shelf systems and services wherever possible. Any decision to approve an in-house solution should be revisited regularly, on a time scale appropriate to the evolution of relevant technologies, to revalidate such an in-house implementation decision.

Finding 3

The management of the project to upgrade the IT infrastructure of the County 9-1-1 dispatch operation does not conform either to industry standards for prudent software engineering practice or to the current standards used by the County CIO in projects controlled centrally. While a collection of memos and documents related to system development exists, there are no formal system and interface specification documents, design documents, development milestone schedules, testing and rollout plans, or *total* system cost accounting. The project appears to have overlooked the impact that Year 2000 information technology upgrades would have on its schedule. New programmers on the project, who replace the key developers who recently retired, must study the system code to understand the system and perform their functions of supporting, maintaining, and extending the system.

Recommendation 3

The County CIO has already established project management and software engineering standards for information technology projects that come directly under his control. These standards should be mandatory for any other mission-critical information technology projects that may be delegated by the CIO to be managed directly under other autonomous County Departments. There should be no exceptions to the enforcement of software engineering practices that conform to best practices in commercial software development and service enterprises.

Finding 4

The County Executive and the Communications Department appear to lack a clear commitment to the Silicon Valley Regional Interoperability Project and its evaluation of Internet-based technologies to try to achieve better interoperation and information-sharing among emergency response services. The County 9-1-1 service, while highly professional in the services it offers, appears to operate within a limited scope of providing the services within its mandate, to the exclusion of providing longer range vision, leadership, and collaboration to other jurisdictions and agencies in the region.

Recommendation 4

The Santa Clara County Board of Supervisors and the County Executive should reaffirm their commitment to information-sharing, infrastructure-sharing, system-interoperation, and collaboration among all emergency service providers in the County and region. This commitment should include the County taking an active leadership and coordinating role in on-going projects such as the Silicon Valley Regional Interoperability Project and in initiating other efforts seeking to develop more responsive, reliable, integrated, and cost-effective approaches to providing emergency public safety response capabilities, including the possible consolidation of some of the current 13 separate 9-1-1 operations in the County. The County should take an active role in seeking state and/or federal funding to facilitate such projects.

PASSED and ADOPTED by the Santa Clara County Civil Grand Jury on this 18th day of May 2005.

Michael A. Smith
Foreperson

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Documents

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2. Chief Deputy County Executive, Santa Clara County, 21 Oct. 2004.
3. Chief Information Officer, Santa Clara County, 7 Feb. 2005.
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6. Director, GSA Communications Department, Santa Clara County, 17 Dec. 2004.
7. Deputy Director, GSA Communications Department, Santa Clara County, 17 Dec. 2004.
8. Chief Dispatcher, GSA Communications Department, Santa Clara County, 16 Dec. 2004.
9. Application Services Assistant Manager, Information Services Department, Santa Clara County, 24 Feb. 2005.
10. Senior Programming Analyst, Information Services Department, Santa Clara County, 24 Feb. 2005.
11. Chief, Palo Alto Police Department, 4 Feb. 2005.
12. Coordinator, Technical Services Division, Palo Alto Police Department, 4 Feb. 2005.
13. Chief Information Officer, City of Palo Alto, 4 Feb. 2005.

Interviews (cont'd.)

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Appendix A

PARTICIPANTS AND MANAGEMENT OF THE SILICON VALLEY REGIONAL INTEROPERABILITY PROJECT

JOINT POWERS AGREEMENT SIGNATORIES

The signatories of the Joint Powers Agreement (amended most recently in September 2004) include:

- City of Campbell
- City of Cupertino
- City of Gilroy
- City of Los Altos
- City of Milpitas
- City of Monte Sereno
- City of Morgan Hill
- City of Mountain View
- City of Palo Alto
- City of San Jose
- City of Santa Clara
- City of Saratoga
- City of Sunnyvale
- Town of Los Gatos
- Town of Los Altos Hills
- South Santa Clara County Fire District
- County of Santa Clara
- San Jose State University
- Santa Clara Valley Water District

SVRIP EXECUTIVE STEERING COMMITTEE MEMBERSHIP

The SVRIP Executive Steering Committee membership includes:

- A City Manager from the Santa Clara County/Cities Managers' Association
- A Fire Chief from the Santa Clara County Fire Chief's Association
- A Police Chief from the Santa Clara County Police Chief's Association
- The Santa Clara County Executive or his or her designee
- A Metropolitan Statistical Area Representative from the San Jose Urban Area Security Initiative (UASI)
- A Data Project Director designated by a majority vote of the Steering Committee
- A Radio Project Director designated by a majority vote of the Steering Committee

- A representative from the Public Safety Communications Manager's Association
- A Project Coordinator designated by a majority vote of the Steering Committee

SVRIP STAKEHOLDER AGENCIES

The various stakeholder agencies interested in SVRIP activities include:

- California Department of Forestry
- Campbell Police Department
- Criminal Justice Information Center
- Gilroy Fire Department
- Los Altos Police Department
- Los Gatos/Monte Sereno Police Department
- Milpitas Fire Department
- Milpitas Police Department
- Morgan Hill Police Department
- Mountain View Fire Department
- Mountain View Police Department
- NASA Ames Fire Department
- Palo Alto Fire Department
- Palo Alto Police Department
- San Jose Fire Department
- San Jose Police Department
- San Jose Airport Police (SJPD)
- San Jose State University
- Santa Clara County Communications
- Santa Clara County District Attorney
- Santa Clara County EMS Authority
- Santa Clara County Fire Department
- Santa Clara County Medical Director
- Santa Clara County Sheriff
- Santa Clara Fire Department
- Santa Clara Police Department
- Santa Clara Valley Water District
- Saratoga Fire District
- Sheriff's Law Enforcement Telecommunications System
- Silicon Valley Transportation District
- Sunnyvale Department of Public Safety

Appendix B

INFORMATION TECHNOLOGY EXECUTIVE COMMITTEE (ITEC)

Mission

To provide recommendations on Information Technology Policy and Priorities to the County Executive and Board of Supervisors, consistent with the business goals and objectives of Santa Clara County.

Roles:

To:

- Provide the leadership for information technology direction in the County, in an advisory capacity.
- Review and provide input to the formulation of information technology policy, for recommendation to the County Executive and the Board of Supervisors.
- Review information technology strategic plans for recommendation to the County Executive.
- Recommend County information technology funding priorities to the County Executive.
- Serve as business advisors for information technology countywide projects.
- Recommend performance evaluation criteria for information technology projects.
- Review information technology standards for the County.
- Sponsor business process-reengineering initiatives prior to, or as part of new technology projects.
- Review and recommend changes and enhancements to IT Governance structure on an annual basis.
- Provide a streamlined decision making process to implement information technology within the County.

To be the:

- Sponsor and Champion of technology development and innovation.
- Sponsor of information sharing and investing in a countywide information repository.
- Sponsor of information technology training.
- Sponsor of continual development of a collaborative and excellent work force.

Membership

- Representation for this Committee will come from all county strategic areas.
- Membership will be from the highest level of each agency/department.
- Business alternates may attend meetings and give input.

Member Responsibilities

- To participate whenever appropriate in Board workshops and dialogues.
- To consider issues and make appropriate recommendations.
- To be advocates for information technology.
- Members will provide consistent attendance.
- Members missing meetings will take the initiative to get updated.
- Members must participate and show commitment.

Decision Making Process

The team will try to reach timely consensus on all issues and continually work towards closure as a group. The focus will be on alignment to County business strategies. When consensus is not achieved, all members should be responsible for bringing back a proposed resolution. At this time, the committee will discuss the key issues and proposed alternative solutions to come to a consensus. After sufficient discussion, if consensus has not been achieved, the issues and recommendations will be provided to the CIO to decide.

Meeting Frequency

Meetings will take place once monthly unless otherwise called. They are scheduled for the first Friday of every month and held at 70 W. Hedding, E. Wing, 11th floor [San Jose, CA], in conference rooms #1-2.

Meeting Ground Rules

- Everyone to assume good intentions and trust of each other.
- Everyone is willing to speak up and ask questions.
- Everyone's input will be documented and considered.
- Everyone will be considerate and appreciate what the speakers are saying.
- Agenda and material will be distributed in advance.
- Come prepared to the meetings; complete the homework.
- Pagers and cell phones will be on silent.
- Do not be judgmental.
- Do not interrupt.
- No apologies for being late.

Procedure for making policy recommendations to the County Executive and the Board of Supervisors

- Any committee member or County organization can bring an issue to the ITEC for policy consideration, through the CIO. Supporting materials should accompany the request.
- The CIO's office will bring any projects, considerations, and issues to the ITEC in the form of discussion papers, concept papers or business cases after review and comment by the ITGC and appropriate sub-committees or focus groups.
- The ITGC will bring any projects, considerations, and issues to the ITEC in the form of discussion papers, concept papers or business cases after review and comment by appropriate sub-committees or focus groups.
- The CIO's office will conduct the necessary research before presenting the recommendation to the ITEC Committee.
- The recommendation for the new policy will be provided to the committee in the form of a discussion paper, prior to the next scheduled ITEC meetings, at least four workdays prior to the meeting.
- The ITEC committee will review and discuss the issue/policy, for recommendation to the Board of Supervisors, or refer back to the CIO, for further research.
- The CIO will communicate the decision or recommended policy to the appropriate audience, throughout the County.