Revised Application Proposal

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BACKGROUND:

Santa Clara County, more commonly referred to as "Silicon Valley" is located at the southern end of the San Francisco Bay and encompasses 1,312 square miles. The county's population of over 1.8 million is the sixth largest in the state and the largest of the nine Bay Area counties. Its population constitutes about one-forth of the Bay Area's total population.

In 1998, eighteen Silicon Valley (Santa Clara County, CA) jurisdictions, representing about thirty law enforcement, fire and emergency medical services agencies joined together and formed a jointly funded and governed partnership referred to as the Silicon Valley Regional Interoperability Project (SVRIP) tasked with enhancing inter-agency coordination and communication between their public safety agencies during daily operations and all-hazard situations. The goal of SVRIP has been to identify viable approaches and technologies that can resolve the various challenges to voice and data interoperability.

Fire agencies within Santa Clara County presently run approximately 100,000-150,000 fire and medical calls per year. Approximately 28 percent of those calls involve multi-agency, multi-jurisdictional responses.

The Fire Data Interoperability Project was born from the local fire chief's (Santa Clara County Fire Chiefs Association) commitment to streamline the process of capturing 9-1-1 information and responding to incidents with the closest and most appropriate emergency resource. During this project's pilot "proof of concept" phase, countywide ambulance transport and emergency medical services (EMS) were added to this project to better reflect the close relationship between fire and medical services.

Currently, thirteen (13) of fifteen (15) jurisdictions within the county operate on thirteen (13) standalone and disparate CAD systems, varying in age (0-9 years or older) and system complexity based on their need to support one or more service (law enforcement, fire, and/or emergency medical and transport service) disciplines. Not all agency CAD systems are equally capable. Basic systems provided by various vendors may or may not support the same feature sets as other manufactures.

Essential Problem Statement

Further, not all systems have system interface capabilities or contain, manage or offer informational records or data in the same or similar formats, elements, syntax or specifications vary such that they can not be understood or readily used by other systems.

The Computer Aided Dispatch (CAD) systems used to track and dispatch field personnel and resources are also not linked and have no way of sharing critical information; as a result dispatchers in the thirteen 9-1-1 centers do not have access to and can not readily monitor field personnel and resource information in neighboring jurisdictions and must often engage in time-consuming phone calls to share critical information and/or locate and request the dispatch of the closest available fire and/or medical resource. Dispatch centers providing 9-1-1 alternate answer backup services must also contact the responsible jurisdiction by phone and relay 9-1-1 call information verbally rather than electronically, which prolongs the response to emergency calls.

Unlike APCO 25 (P-25) standards for radios that currently require a standard level of interoperability between disparate radio systems; no industry-wide standards have been developed and/or adopted by CAD vendors to produce similar levels of interoperability between their products, which is a major challenge for this project.

Based on our experience, most vendors' maintain strict proprietary CAD system products that either lack or provide very limited system interface capabilities for sharing data with other CAD systems, as well as between their own systems operating on separate servers. In many cases when more advanced interfaces are made available, dispatch centers do not purchase them as an added option due either to limited project funds or the fact that the open and automated sharing of CAD data with other agencies is a relatively new concept.

PROJECT DESCRIPTION – REVISED:

Based on SVRIP's recent pilot project experiences in linking disparate CAD systems and its increased understanding of the many challenges that must be addressed to achieve overall project success, we are submitting for your approval and funding consideration a revised proposal that utilizes a two-year phased approach to achieve CAD Interoperability support for fire and medical service disciplines.

Phase I, which represents our current grant funding request, addresses the accepted premise that until the computer aided dispatch (CAD) software industry establishes and adopts interoperable standards that provide for CAD-to-CAD connectivity and data sharing an interim solution is needed, to create this functionality which would enable all disparate CAD systems to be able to publish (push-out) data before they can subscribe (receive or pull-in) data from another agency's disparate CAD system.

This project will focus on standardizing CAD data and field unit response, establishing and maintaining regional connectivity, data publishing and added geo-coding to a GIS-based common operating picture (COP) display capabilities between all thirteen (13) disparate CAD systems. It also directly supports the County Emergency Medical Services (EMS) Agency and ten (10) Fire Agencies, which provide fire suppression, rescue, and medical response services amongst and between all fifteen (15) cities and the unincorporated areas of Santa Clara County.

The proposed design and phased approach undertaken through this effort is clearly leading edge, provides valuable tools and enhanced capabilities for public safety service providers, dispatch centers and/or other agencies responsible to manage day-to-day operations and all hazard emergency responses, and clearly reflects the complexity of achieving CAD-to-CAD interoperability between multiple disparate systems.

Completing Phase I facilitates the process of publishing, capturing, and translation of data to a project defined standards-based table supporting emergency call processing. This includes (call creation and response time stamps, location, type, status changes of personnel/equipment resources (assigned/

responding to/arrived at/completed calls and/or available for service) and facilities. It will allow for geo-coding the results to display on a GIS Common Operating Picture that can be used by dispatchers to identify the closest available and most appropriate emergency resource. This phase also identifies the required data elements, format, syntax and/or other specification necessary to complete Phase II, such that when translated by the RIIB and delivered to the subscribing (receiving) agency's CAD system (via subscribe protocols and business rules programming) it will be accepted by the system without error and will react as if the data had originated from within its own native CAD environment.

Phase I will:

- Establish administrative documents between participating agencies necessary to complete the project (MOU between SVRIP and the County of Santa Clara, Non-disclosure documents with local CAD vendors and Santa Clara County, etc).

- Complete an analysis of existing disparate CAD system's (e.g., manufacturer, version, age, current service disciplines supported, anticipated replacement schedule, level of interface capabilities with other systems, and vendors' ability/willingness to provide improved functionality), then based on results identify programming and procedural solutions required to successfully complete the project as phased.

- Complete the purchase and installation of all hardware, software, and related equipment necessary to establish and maintain two-way connectivity between each of thirteen (13) 9-1-1 Call Center's (Primary PSAP) disparate CAD systems (10 new) and the Regional Interoperability Information Broker (RIIB).

- Expand RIIB storage capabilities necessary to provide a regional data repository for CAD event and GIS data (used to improve operational efficiencies, short-term data restorations and spatial data analysis).

- Establish and test PSAP to RIIB connectivity through SVRIP's recently completed 23-site private public safety microwave radio emergency communication network (E-Comm; primary path) and via secured VPN connections from remote sites (secondary path option).

- Conduct facilitated meetings with representatives from the ten (10) fire agencies and their respective dispatch center to identify jurisdictional boundary drops, business rules, practices, and response protocols used to provide Auto Aid (first-in) responses between jurisdictions.

    - This process will help identify where standardization is possible, and where differences exist that can not be readily resolved. It would also provide procedural guidelines to assist affected dispatch centers mitigate conflicts. Results from this process are required for completion of Phase II programming.

    - Note: Mutual Aid protocols have already been standardized, but will require programming in Phase II to automate.

- Complete analysis of disparate CAD system datasets, identifying existing data elements, definitions, levels of importance for operational use, syntax, formats, and other specifications.

- Complete the development of standardized data tables centrally located within the RIIB and provide web based portal access for agencies to manage their specific Business and Data publishing rules

- Test CAD data publishing capabilities of vendor provided automated programming interface (API) to ensure they can publish required data to the RIIB's central data repository.

    - Work closely with CAD vendors of locally based systems to share project goals, identify project generated standards-based dataset tables, and set the minimum interface standards needed to publish and subscribe data between the RIIB and the disparate

CAD systems.

  - As required when vendor provided or available API interfaces are not available or weak, identify and/or develop non-intrusive applications that can be used to capture (scrub) data from the CAD display mask or database records to perform the required data publishing function.

- Complete geo-coding of standardized CAD datasets to the county's comprehensive GIS map centerline to create a Common Operating Picture (COP) that spatially displays active calls, station and resource status that can be viewed (browser-based product) by staff at every 9-1-1 call center and at other locations as needed to address similar public safety and emergency response operational needs.

- Evaluate and test integrated GIS support and special tools used

- Complete programming and integration necessary to establish a Common Operating Picture (COP) capable of displaying at minimum event, resource and facility status and location on top of a public safety focused base-map layer for enhance daily operations. It will also coordinate all-hazards responses and provides local access to administrative tools and other GIS-based data enhancements that facilitate ease of use and provide greater overall system control, flexibility, and functionality, and helps reduce the cost and complexity of implementing future system enhancements and expansions (Phase II and beyond).

- Improve greater regional standardization, day-to-day operational efficiencies, and help build closer and more cooperative working relationships between the SVRIP network partners.

Phase II (separate proposal for 2009 FEMA AFG consideration) as it is currently envisioned builds upon Phase I accomplishments and utilizes standardized data translation tables to enable local dispatch centers to automatically place requests for resources (personnel/equipment) from other dispatch centers in a format that will be accepted by its disparate CAD system, based on their availability and pre-established protocols and/or business rules (Auto-Aid, Mutual-Aid, 9-1-1 call answering backup support, misroutes, etc).

Phase II major tasks include:

- Complete programming and testing necessary to provide data subscribe (receive and respond to request for service) functionality from all thirteen (13) 9-1-1 Call Centers (Primary PSAPs). Requesting agency will enter the event into their own CAD system, then based on business rules the request will be sent through the RIIB and received by the responding agency's CAD system ready for dispatch. The dispatcher will then dispatch the requested resources to the scene, The responding units will switch over to the primary radio channel of the requesting agency when they enroute to the call and will remain under the control of the requesting agency's dispatcher until the call is completed and they have cleared the scene and are returning to base. All unit ID and unit status, as well as facility ID and status, will be displayed on the map using standard icon conventions to provide a common operating picture.

- Refine and provide additional geo-coding necessary to address additional CAD data and update GIS COP display to show resource (equipment/personnel) and facility status in response to calls for service received from other 9-1-1 Call Centers.

- Develop standard reports (min. 5-10) for use by participating PSAPs. For example: Event detail report; Activity-based reports by jurisdiction(s), service discipline, call type, and/or using other definitions, combinations or performance-based criteria, etc.

- Incorporate changes, enhancements and additional requirements to the system that will naturally occur and be identified as PSAPS utilize this new resource.

- In parallel with Phase 2 implementation efforts, begin facilitated meetings on law enforcement representatives to determine level of need for specialized programming regarding policy business rules, auto and mutual aid responses, specialized resources, etc.

Completion of each phase of this project not only provides separate and viable stand-alone products for SVRIP network participants, which can also be used by other agencies outside Santa Clara County to either implement directly or use as a model for similar solutions, they also provide SVRIP with the connectivity, IT environment, tools and related resources necessary to facilitate the implementation of similar CAD-to-CAD support for law enforcement operations (Phase III) in the near future.

Completion of each phase of this project also helps to support the FEMA's mission to reduce the loss of life and property from all hazards, including natural disasters, acts of terrorism, and other man-made disasters, by leading and supporting the Nation in a risk-based, comprehensive emergency management system of preparedness, protection, response, recovery, and mitigation. The work being done through this phased project not only meets these goals and objectives locally, but also those in California, and helps to address those priorities outlined at the national level by FEMA and Homeland Security Presidential Directive 8 (HSPD-8). Two of the Target Capabilities outlined in this Presidential Directive that are supported by this project are Interoperable Communications and Information Sharing.

Additional Information - Pilot Phase Lessons Learned and Project Enhancements:

As discussed previously, published out-bound CAD data will be mapped to standards-based tables centrally located and maintained within a data repository in the Regional Interoperability Information Broker or RIIB.

Disparate CAD system data often have common or similar meanings within each service discipline, but differ in size, format, syntax and location within the data stream. In some cases the data is unique and may or may not be useful to other agencies.

The development of standardized data tables and data mapping processes that provide a common definition and distinct format for each data element or component are crucial to the continued development, successful use and ongoing maintenance for the CAD-to-CAD Interoperability program. Mapping data to a common set of standards also reduces the time and programming complexity required to integrate new program features and address the impact felt by other agencies when an existing CAD system replacement/upgrades in the future.

Since the publish portion of this phased CAD-to-CAD project will be integrated within an existing Countywide GIS browser based system, (an enhanced feature not available or included within the previous grant proposal) which currently contains numerous map-based data layers (150+), additional informational features will be available to local dispatch centers, Fire, Medical, Emergency Operation Centers (EOCs) and other public safety service providers to help improve day-to-day operations and response to major emergencies and disasters.

These added features (layers) may include access to seamless maps, address points; critical infrastructures; jurisdictional boundaries; fire district maps; water mains, hydrants and valves and similar information for other major utilities; natural hazards (flood plains, faults, landslide and liquefaction areas); travel directions and re-routing; vulnerable populations (poor, elderly); resources (hospitals, clinics, Red Cross sites, residential care facilities, homeless shelters, fire and police stations, PSAPs, etc); orthodigital photos; and potentially much more.

The revised project remains on target to enhance the following fire and medical capabilities:

- Firefighting Operations/Support
- Responder Safety and Health

- Emergency Medical Services
- Search and Rescue
- Hazardous Materials Response
- Communications

Phase I, as revised, addresses at a minimum, five of seven important functional areas and features previously submitted and partially addresses the two remaining functional areas and features or about 86% of the original project scope and adds additional GIS capabilities and greater web-based accessibility.

1. CAD Call Creation and Forwarding to one or more Agencies (Phase I – Publish only, GIS COP display; Phase II – Adds subscribe functionality between CAD systems)

2. Assistance Requests (Auto Aid, Mutual Aid, etc – Phase I GIS COP will display active event and station status and resource availability to facilitate decision making process of requesting agency {no request needed if station resource is not available}; Phase II will automate request when station resource are available)

3. Ability to view and receive status on Auto and Mutual Aid responses (Phase I – GIS COP)

4. Messaging between PSAPs and Field Units (Phase I – CAD, SCC Alert Notification System, other options available)

5. Maps for all jurisdictions and directions to locations in any jurisdiction (Phase I – GIS function)

6. Real-time alerting, i.e., Simulcast and alert to both Police & Fire about hazardous conditions (Phase I – GIS map layer function, other options available).

7. Standard Text Messaging format between all users (Phase I – CAD and/or SCC Alert Notification System, other options available)

Use of the Common Operating Picture developed during Phase I and subsequent subscribe capabilities to be developed in Phase II will provide dispatchers with valuable tools that will improve day-to-day operational efficiencies and eliminate or shave off valuable minutes (upwards of three minutes) off the response times of first responders by allowing dispatch personnel to send the most appropriate resources in the most efficient manner possible. This reduction in response time can result in lives saved and decreased property loss. It also will enhance cooperation and collaboration between first responders.

During daily fire operations, terrorism or man-made disasters, seamless integration and sharing of data and resources can save precious minutes and dramatically enhance interagency coordination. An integrated data solution between geographically related communities is a significant unmet gap in emergency preparedness and response. At the moment of an incident or disaster, time spent calling for resources between unconnected and uncoordinated communities can slow response and recovery efforts. The future of emergency resource management is fully integrated CAD to CAD dispatching where neighboring resources are immediately visible to a dispatcher and capable of being dispatched to an emergency.

BUDGET AND RELATED FINANCIAL INFORMATION

The Santa Clara County fire agencies are submitting a budget proposal for the proposed Fire Data Interoperability Project in the amount of $2,681,000 ($2,300,000 Total Equipment and $381,000 Additional Funding). Of that amount, they are requesting $2,144,800 in federal funds under this solicitation and will provide $536,200 as the 20 percent cash-match for this award. The revised proposal funding is $514,000 less than our original budget of $3,195,000. Collaboration on the funding requirements for this grant and commitment of staff resources is indicative of the level of support from each of the participating jurisdictions, and given the troubled financial times of most agencies in the project, is indicative of the commitment level for this project. The governing officials from the participating fire agencies have

committed to the long-term sustainability of this technology.

Cost Breakout:

	Cost
• Equipment Costs:	
Equipment and programming support includes:	
o Includes Windows-based servers, switches, routers, common-off-the-shelf-software (COTS) to support development, applications, and project support,	$ 749,100
o Includes application development and programming support, network configuration support, CAD interface development and integration, GIS integration and common operating picture (COP) development	$1,550,900
o Sub-total Cost:	$2,300,000
• Personnel: (Add Back Request)	
o Project Manager – Coordinate all activities necessary to complete the project on-time and within budget.	$140,000
• Contractual	
o Fire Agency Liaison – Strategic Planning Coordinator to facilitate meetings between local Fire Agencies, Emergency Medical Services and their respective dispatch centers to identify and document all jurisdictional relationships, boundary drops, business rules, practices and protocols used to provide Auto Aid (first-in), fire (Star-Car) and contractual ambulance transport responses.	$100,000
o GIS/ESRI/CAD Vendor Interface technical support	$140,000
o Sub-total Cost:	$240,000
Grant Total:	$2,681.000

A majority of the funds for this project will be expended on hardware, software, engineering and integration services necessary to interconnect, publish and display data from all thirteen (ten new) disparate fire and medical CAD systems in Santa Clara County.

SUMMARY COMMENTS

Since 1998, Santa Clara County agencies have contributed tens of thousands of hours of staff resources to work on interoperable communications, have contributed $1.3 million to complete the design of the voice and data interoperability solutions, and expended $2.5 million on a pilot "proof of concept" CAD Interoperability project and $10.1 million on a regional microwave radio communication network that connects 23 local sites (including all 13 Primary PSAPs) referred to locally as the E-Comm System. The E-COMM network will be cross-connected with the Bay Area Microwave System (under construction, often referred to as BAMS or Bay-Loop) and the Monterey Bay Area Microwave System (completed, MBAMS, formerly known as TRIMAC) to create a 12 County microwave network used to support several voice and data applications (Regional

700 MHz Radio Communications System, linked Records Management Systems (RMS-to-RMS), expansion of CAD-to CAD interoperability, etc).

Along with much of the nation, California and Santa Clara County agencies are struggling to maintain the levels of costly fire and medical services. Many Bay Area agencies are being forced to close fire stations or reduce staffing levels. Of the eighteen jurisdictions in Santa Clara County, most are facing budget shortfalls upwards of $3 million in Fiscal Year 2008-09 (the performance period for this grant award). It is becoming increasingly difficult to staff stations, and ensure personnel are available.

One of the recent and increasingly discouraging challenges facing public safety agencies and projects like this one is the current deteriorating financial status of the State of California. Between the breakdown in the "dotcom" industry within Silicon Valley in recent years and the dire status of state finances, competing priorities make the ability to receive new local dollars to fund interoperability solutions limited to non-existent. Many of the participating agencies in the project faced significant budget cuts and some were forced to lay-off or eliminate key public safety positions. The financial future for local jurisdictions, based on the current financial status of the State, does not look promising. Without alternative sources of funding, such as the FEMA Assistance for Firefighters Grant Program being made available, it is unlikely that implementing any of the strategies necessary to ensure successful inter-agency communication, and establishing true interoperability for public safety will materialize.

If funded, the Santa Clara County region will make our agencies and sites available to other regions and will share any and all information and resources gathered through this project. This regional application represents the first for this region through AFG for interoperable communications. The region has expended other local and DHS dollars on building out voice interoperability solutions. If the funding is not made available through AFG, the region will continue with its efforts to identify monies to complete this important project. Regrettably, there are just no local general fund dollars beyond the 20 percent cash match that can be diverted to this project at this time. If Phase I funding is approved and the Phase II funding request is denied in the future, this project can still move forward, be it at a much slower pace as funds are made available locally on a site-by-site basis.

Clearly the cost/benefit of deploying this type of technology is dramatic. According to the American Heart Association, a victim's chances of survival after a cardiac arrest are reduced by seven to ten percent with every minute that passes without treatment (www.americanheart.org/presenter/jhtml?identifier=604). The faster first responders are able to arrive to the scene of an incident and take care of a victim, the more likely that victim will survive. Other examples include how fast fire moves through a building, the loss to life and property can be dramatically reduced by getting firefighters quickly to the scene safely and efficiently.

With the deployment of the data interoperability solution funded through this grant application the impact on daily operations will be dramatic. Often interoperable communications are focused on having tools and resources available when the disaster or 'big-one' hits. Each day our firefighters cross their jurisdictional boundaries to assist neighboring jurisdictions and get the closest apparatus to the scene as quickly as possible hundreds of times. That translates to the use of this technology tens of thousands of times each year. What better use of funding could there be than to deploy life-saving technology that will be used each and every day.

For Santa Clara County, this need is real, now that we know this technology works - saving three minutes off response times for fire and medical personnel - we are respectfully seeking assistance from FEMA to complete this import work and enable us to deploy this technology to the remaining ten agencies in our jurisdictions.

The Santa Clara County Fire Chiefs and SVRIP Executives feel strongly that this project, to date and as proposed, can serve as a model for Interoperability and Inter-Agency Coordination, and at advancing regional communication systems across the country. Because of the complexities and numbers of disparate systems in this area, the numbers and types of agencies committed to this project, and the phased approach that is being implemented, this project can serve as a "cafeteria-style" model – providing something that can be gleaned by any agency looking at the project.